CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

CLIMATE CHANGE STRATEGY AND ACTION PLAN

ANNUAL IMPLEMENTATION REPORT

FINANCIAL YEAR 2021/22

Making progress possible. Together.

Electronic document navigation shortcuts:

- Entries on the contents page link to the relevant page.
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* References are numbered (1, 2, etc.) as superscript and listed at the end of the document on pg 91.
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If you have any comments or suggestions, please send an email to ClimateChange.Enquiries@capetown.gov.za.

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Cover photograph:
Dune rehabilitation towards increased coastal resilience.

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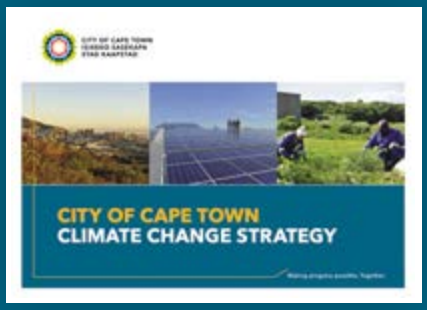
INTRODUCTION

This is the first annual progress report on the implementation of the City of Cape Town Climate Change Strategy and Action Plan. The Climate Change Strategy was adopted by Council in May 2021, and the Climate Change Action Plan (CCAP) – a detailed programme-level implementation plan of the strategy – was approved by the City Manager in August 2021. Subsequently, a monitoring and evaluation framework was developed and approved, in the aim of tracking both progress against the actions contained in the action plan and monitoring trends in indicators that have been developed to assess whether medium-term outcomes related to the goals of the strategy and action plan are being achieved.



City of Cape Town Climate Change Strategy:
https://bit.ly/CCT-ClimateChangeStrategy

City of Cape Town Action Plan Implementation Report:
www.capetown.gov.za/ClimateChangeActionPlan

This report will cover the following:

- A short overview of the local and global context since the approval of the Climate Change Strategy and Action Plan
- An assessment of progress towards the achievement of 97 programme-level actions contained in the CCAP. Four Climate Change Leadership Review actions will be assessed through triennial reviews, to take place during 2023/24
- An assessment of progress against a set of 49 medium-term outcome indicators linked to the goals of the Climate Change Strategy and Action Plan

This report was written in November and December 2022 and was intended to cover the previous financial year – between July 2021 and June 2022. However, as many actions were already undergoing implementation at the time that the action plan was approved, some reporting may describe activities that were initiated before this date. In addition, some of the matters discussed in the Context section may include events that have occurred up until the time of drafting.

This reporting process is intended to serve multiple purposes. First, it is intended to determine whether the CCAP is on track and whether it requires amendment or updating. The action plan is intended to be a 'living' document that is updated regularly to reflect any changes in the City's approach to climate change response. Second, the process is intended to identify any significant implementation gaps so that these can be addressed and additional support – for example, technical assistance or external finance – can be sought. Third, this process is intended to promote transparency and openness regarding the City's climate change response work, and therefore to support our existing reporting commitments through the CDP[i] and to our international partner organisations. Finally, this report is intended to provide information to City staff and other local and regional stakeholders in order to ensure that those working on activities related to climate change response remain up to date and informed on the progress that the City is making.

i CDP was initially established as the 'Carbon Disclosure Project' and is a not-for-profit organisation that runs a global climate change response disclosure system for investors, companies, cities, states and regions. It is the main reporting platform for C40 cities.

CONTEXT

Since the approval of the Climate Change Strategy and Action Plan in 2021, a number of significant events have occurred locally, nationally and internationally. Climate change response is a very fast-moving area of work, and therefore any policy document or report will necessarily be somewhat out of date by the time it is published. As a result, this section of the annual progress report will provide a much-needed updated context in which the City's implementation progress should be situated.

CLIMATE GOVERNANCE

INTERNATIONAL CLIMATE CHANGE AGREEMENTS AND MEETINGS

Since the adoption of the Climate Change Strategy and Action Plan, two UNFCCC (United Nations Framework Convention on Climate Change) COPs (Conference of the Parties) have been held. These are important annual events that support the implementation of the Paris Agreement. The outcomes from the past two conferences – COP26, hosted in Scotland; and COP27, hosted in Egypt – resulted in the most notable recent developments since the ratification of the Paris Agreement in 2015. The main decisions from COP26 and COP27 are outlined below.

COP26: The Glasgow Climate Pact outlines the following:

- Parties agree to the role of fossil fuels as the cause of climate change.
- Parties commit to the phase down of unabated coal and inefficient fossil fuel subsidies.
- Cities and local government are key role players in global climate action.
- The main elements of the Paris Agreement Rulebook are now finalised.

COP27: The Sharm el-Sheikh Implementation Plan outlines the following:

- Parties agree to establish a Loss and Damage Fund and the institutional arrangements to operationalise the Santiago Network for Loss and Damage.
- Parties re-affirm fossil fuel commitments made in the Glasgow Climate Pact.
- Parties agree to a two-tier carbon market.
- Parties acknowledge the need for transformation of the financial system and its structures.
- Parties agree to the establishment of a work programme on 'just transition'.

UNFCCC COP26 in Scotland. Photos by UNClimateChange.

In the run-up to COP27, the triennial C40 Summit was held in Buenos Aires, Argentina, during October 2022. This was attended by three South African representatives, including the Deputy Mayor of Cape Town. The summit showcased how C40 cities around the world are leading climate action through implementing solutions and innovations based on three key pillars: finance, fairness and inclusivity, and well-being.

Another key international event was the G20 Leaders Summit, held in November 2022, where world leaders – including South Africa's president – committed to playing their part in implementing the Paris Agreement and committed to pursue efforts to limit warming to 1,5 °C. This outcome strengthens support for climate action implementation and decision-making globally and in national contexts.

UNFCCC COP27 in Egypt and Deputy Mayor Ald. Andrews at the 2022 C40 Cities Summit.

NATIONAL CLIMATE CHANGE POLICY DEVELOPMENT

During COP26 in November 2021, South Africa, together with the governments of France, Germany, the United Kingdom, the United States and the European Union, announced the Just Energy Transition Partnership (JETP). The partnership of R154 billion is aimed at assisting South Africa in moving towards a low-carbon economy and society within the framework of a 'just transition'. The endorsement of the JETP Investment Plan by the International Partners Group (IPG) followed in November 2022 during COP27. The R1,5 trillion Investment Plan aims to guide the economic transition to renewable energy and secure current and future energy security, address poverty and reduce South Africa's GHGs.

During September 2022, Cabinet approved South Africa's Just Transition Framework after an extensive consultation process with key stakeholders. The City of Cape Town, along with a number of other South African cities, provided input into this process. The framework aims to guide South Africa's journey towards reaching climate resilience and net-zero carbon emissions by 2050, through the implementation of policies, principles and governance structures that prioritise and enable a just transition.

The framework is available here:

https://pccommissionflo.imgix.net/uploads/documents/A-Just-Transition-Framework-for-South-Africa-with-dedication-FSP-002.pdf

The National Climate Change Bill was introduced to the National Assembly by the Minister of Forestry, Fisheries and the Environment in February 2022, and went out for public comment in April and May 2022, with additional public hearings held during September 2022 and facilitated by the Portfolio Committee on Environment, Forestry and Fisheries. The Climate Bill will serve as the country's statutory framework in responding to climate change. When it comes into effect, the Climate Change Act will define the roles and mandates of all sectors at a local, provincial and national scale to ensure that role players are empowered to respond to climate change and implement adaptation and mitigation measures.

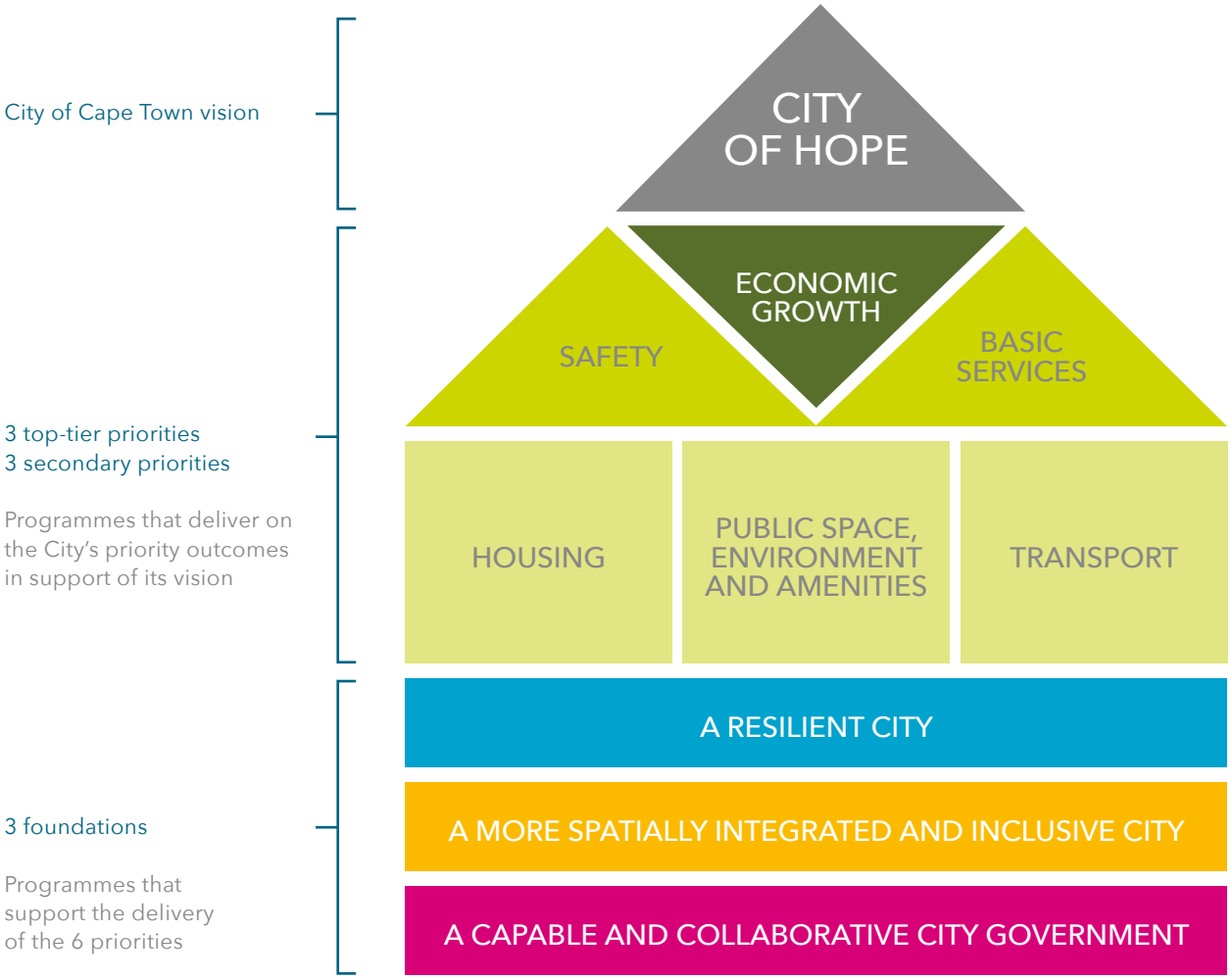
Finally, the Department of Mineral Resources and Energy is currently in the process of reviewing and updating the 2019 Integrated Resource Plan (IRP). The IRP is a 'living' document that outlines South Africa's plan for electricity infrastructure and capacity development, focusing on electricity demand, supply and cost. The updated plan is set to be published in late 2023, and will be informed by South Africa's mitigation targets in the updated Nationally Determined Contributions (NDCs) and the Just Energy Transition Dialogues convened by the Presidential Climate Commission (PCC) between July and October 2022.

WESTERN CAPE PROVINCIAL CLIMATE CHANGE POLICY DEVELOPMENT

The Provincial Government of the Western Cape published an updated Western Cape Climate Change Response Strategy in March 2022, and subsequently developed the implementation framework for the strategy. The strategy sets out the Western Cape's vision to achieve net-zero emissions and climate resilience for the province by 2050, and prioritises the principles of equity and inclusiveness.

CITY OF CAPE TOWN CLIMATE CHANGE INSTITUTIONAL ARRANGEMENTS

During 2022, an organisational realignment process took place, following a Council resolution in early 2022 to implement restructuring to align with the set of priorities of the new term of office. The monitoring, evaluation and reporting of the Climate Change Strategy and Action Plan are now coordinated by the Resilience Department, under the newly established, transversally functioning Future Planning and Resilience Directorate. The FPR Directorate reports directly to the Mayor at a political level and consists of departments focused on the short-, medium- and long-term future planning of the city. The climate change planning and monitoring function therefore sits alongside impactful transversal functions for the whole organisation, including corporate programme, project and portfolio management; communications, policy and strategy; organisational performance management; and organisational effectiveness and innovation.



The IDP strategic plan, comprising priorities and foundations that all support the vision of creating a city of hope

The location of the climate change function in this directorate and within the Resilience Department therefore provides a greater opportunity to mainstream and prioritise climate change as part of the overall resilience function of the city. This is a notable development of the new political administration and positions climate change in an increasingly transformative position. The Future Planning and Resilience Portfolio Committee now also plays a political oversight role for this function. The development and submission of annual progress and review reports on the Climate Change Strategy and Action Plan is embedded in the FPR Directorate's business plan from 2022/23 onwards.

Another notable change that took place during 2021/22 was the increased integration of climate change response into the City's new Integrated Development Plan (IDP 2022–2027). The plan, approved by Council in June 2022, includes a dedicated programme on Climate Change Planning and Monitoring under one of three foundational priorities, called 'a resilient city'. Projects that contribute to climate change response have been tagged in the IDP and their link to the City's CCAP actions identified. Furthermore, the new IDP has prioritised various projects related to energy security (including cleaner energy and energy efficiency), new water programmes, public transport and improved waste management as one of its top three tier priorities (i.e. excellence in basic services).

GREENHOUSE GAS EMISSIONS

THE STATE OF CAPE TOWN'S GREENHOUSE GAS (GHG) EMISSIONS

Cape Town's GHG emissions are reported to the CDP annually. Consistent with global best practice, the data are drawn from a GHG inventory prepared according to the methodology of the Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories (GPC). The CDP reviews the quality of the annual submissions and awarded the City of Cape Town an 'A-rating' for its 2021 submission in November 2021. Cape Town was the only African city to receive this rating in 2020 and 2021.

The most recent inventory update was completed in June 2022 (based on 2019 data) (see figure 1). The data indicate that, taking uncertainty into account, citywide GHG emissions in Cape Town were relatively stable between 2012 and 2019, with an apparent drop from 21 914 762 ton to 20 757 873 ton of CO_2eq recorded over this period (see figure 2). This shift is mostly due to a steadily reducing demand for electricity from households in particular, but also improvements in waste data quality which offset increases in transport energy demand because of a growing increase in the use of private cars and the ongoing decline of the rail system. The trend of electricity demand decoupling from economic growth is a long-term phenomenon of the last 20 years with some rebound seen in households owing to the cessation of water restrictions (linked to energy use for water heating) and the complex economic impacts of Covid-19 and associated restrictions.

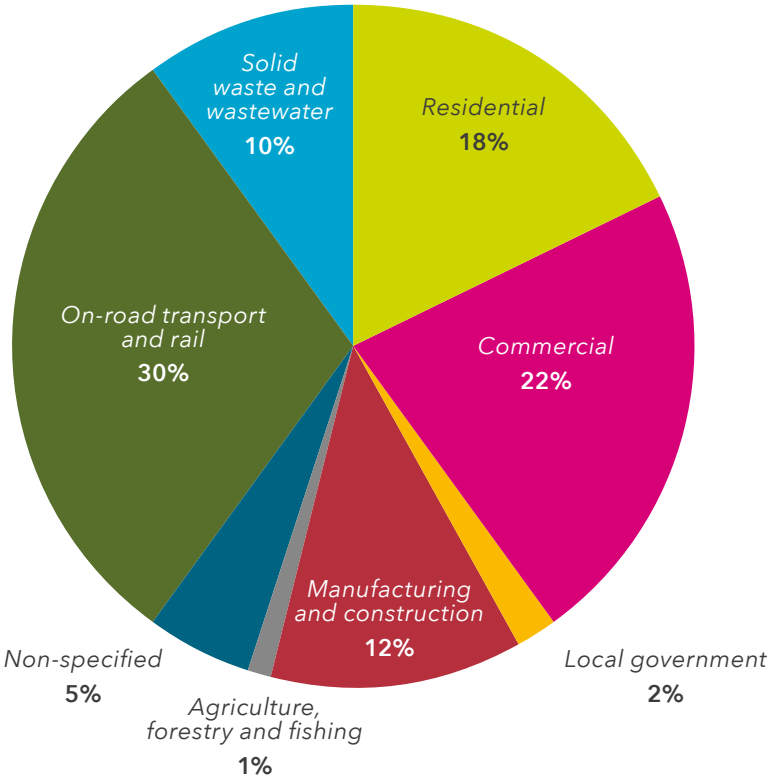


Figure 1: Sectoral GHG emission contributions for Cape Town (2019)

The 1,65% increase in emissions between the last two reporting years (2018 and 2019) is attributable to an apparent increase in petroleum fuel consumption. The quality of these data are, however, increasingly problematic with respect to being able to attribute the sales surveyed by the Department of Minerals and Energy on a local municipality basis. The City continues to find better methods to collect and analyse data for reporting. The estimation of petroleum use by transport, in particular, now needs to be transitioned to bottom-up modelling methods requiring greater time, effort and expertise. So-called 'territorial emissions' have also steadily increased due to the increased use of the Ankerlig diesel peaking plant inside the city boundary to supplement national electricity supply; these emissions can be expected to be very high in 2022 as a result of the load-shedding crisis.

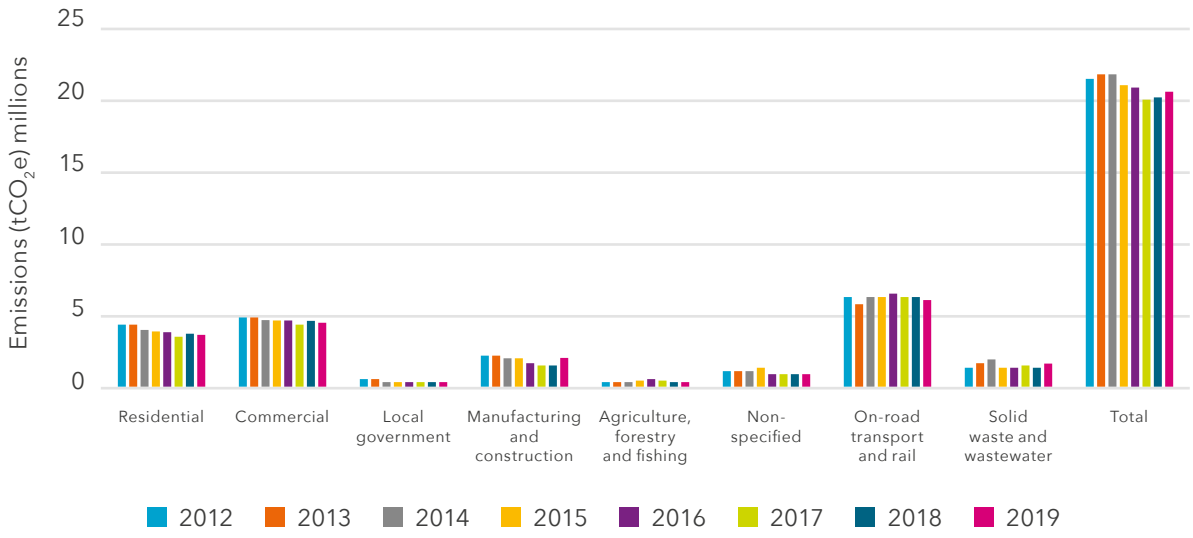


Figure 2: Sectoral trends in GHG emissions – City of Cape Town

A detailed overview of Cape Town energy and carbon emissions can be found in the City's latest Cape Town State of Energy and Carbon Report. The City's Sustainable Energy Markets Department produced the fourth iteration of the Cape Town State of Energy report at the end of 2021, now known as the Cape Town State of Energy and Carbon Report. The report is a robust evidence base that profiles the City's energy system in detail, and directly supports the goal of a data-driven and evidence-led administration. It informs the City's GHG inventory and climate mitigation planning and can be utilised by decision-makers, researchers and planners. It is published on the City's website in publication form and in data form on the City's Open Data Platform.

CAPE TOWN'S CARBON EMISSIONS REDUCTION TARGETS

As part of its 2021 CCAP, Cape Town adopted a 'science-based target' (SBT) for GHG emission reduction. These SBTs have emerged from collaboration by a number of organisations to bring consistency and integrity to claims by sub-national entities to align with the goals of the Paris Agreement through their target-setting processes. Currently, three main methodologies are recognised and are starting to be integrated into the CDP reporting and evaluation process. As a C40 city, Cape Town adopted the C40 Deadline 2020 Framework, which assigns different decarbonisation trajectories depending on the establishment of a socioeconomic typology reflecting a city's state of economic development and resulting capacity to transition in the short term.

Cape Town is a 'late peaking developing city' in this typology system, meaning modest growth to 2030 at the margin of the emissions reduction target envelope, followed by a rapid reduction in absolute emissions thereafter. The City set targets within this typology envelope through a comprehensive technical process that was presented to the Executive Management Team in September 2020. This supplemented an extensive scenario-based decarbonisation modelling exercise undertaken during the CCAP planning phase, with additional analysis, including benchmarking and an assessment of uncertainty in the sectoral emissions systems of electricity and buildings, transport and waste.

The City's 2030 and 2050 emission reduction targets, informed by this process, are summarised as follows with progress status:

Target	Target year	Baseline emissions (2016)	Emissions in most recent reporting year (2019)	Target trajectory emissions	% of target achieved
9,4% absolute cut in emissions (off a 2016 baseline)	2030	21 252 347 tCO_2e	20 757 873 tCO_2e	19 252 347 tCO_2e	24,7%
81% absolute cut in emissions (off a 2016 baseline)	2050	21 252 347 tCO_2e	20 757 873 tCO_2e	4 000 000 tCO_2e	2,9%

Although a 9,4% (2 MT) absolute emissions cut by 2030 may seem modest in the context of the Paris Agreement – which requires global average cuts of 40–60% – Cape Town's population growth must be accounted for. If the current 2% annual population growth rate persists, which is likely, this equates to a 30% decrease in per capita emissions, which is appropriately challenging for the current economic circumstances in the local context.

A high share of the target has seemingly been achieved, but an upturn in economic growth and continued population growth could change the picture considerably on even a five-year view. The key driver in the next eight years is electricity supply and demand. It is estimated that attaining the target requires a net 26% energy efficiency improvement by 2030, combined with a 7% electricity supply – including small-scale embedded generation (SSEG) own consumption – coming from locally procured or produced renewable generation. The foundation of this scenario is energy from 250 MW of utility-scale solar PV capacity either procured by the City or wheeled to customers.

The severity of load-shedding in 2022 is driving planning faster than this; if it persists, significantly higher renewable capacities including wind and supported by storage are possible, with the potential of attaining 15–20% renewable electricity share. Even dispatchable thermal capacity sited locally will have lower emissions than the current grid average. If, however, in another scenario, national capacity programmes turn out to be successful and constrain local capacity, the benefit will be seen, although diluted, in lower grid emissions. The worst case is a deepening national crisis but where regulatory, procurement and legal constraints frustrate the local measures currently in progress. At this stage, however, there is reason to be optimistic that the load-shedding crisis will drive an outcome where the interim carbon target is exceeded even if transport and waste emissions increase significantly for the time being.

CLIMATE SCIENCE

IPCC SIXTH ASSESSMENT REPORT CYCLE

The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6) cycle is currently in process and will produce a number of key outputs, including reports by its three working groups and an overall synthesis report, three special reports and a refinement to its latest methodology report. AR6 builds on the work of the previous AR5, which was released between 2013 and 2014. The three special reports were released between 2018 and 2019, and included the Special Report on Global Warming of 1,5 °C (October 2018), which significantly informed the development of the Climate Change Strategy and Action Plan, the Special Report on Climate Change and Land (August 2019) and the Special Report on the Ocean and Cryosphere in a Changing Climate (September 2019).

The Working Group I report (The Physical Science Basis) was released on 9 August 2021, the Working Group II report (Impacts, Adaptation and Vulnerability) was released on 28 February 2022 and the Working Group III report (Mitigation of Climate Change) was released on 4 April 2022. Each of these reports includes a summary for policymakers. As of November 2022, the synthesis Report is in the drafting phase and is scheduled to be released by early 2023 in order to inform the 2023 Global Stocktake under the UNFCCC. The overall trajectory of climate change projections in AR6 does not differ substantially from those of AR5; however, these have been significantly refined and updated based on the latest models and observations, and include a greater degree of certainty than previous assessment reports.

The Special Report on Global Warming of 1,5°C is available here:

https://www.ipcc.ch/site/assets/uploads/sites/2/2022/06/SR15_Full_Report_HR.pdf

Some key headline findings of the Working Group I report are as follows[1]:

- It is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred.
- The scale of recent changes across the climate system as a whole – and the present state of many aspects of the climate system – are unprecedented over many centuries to many thousands of years.
- Human-induced climate change is already affecting many weather and climate extremes in every region across the globe. Evidence of observed changes in extremes such as heatwaves, heavy precipitation, droughts and tropical cyclones, and, in particular, their attribution to human influence, has strengthened since AR5.

- Global surface temperature will continue to increase until at least mid-century under all emissions scenarios considered. Global warming of 1,5 °C and 2 °C will be exceeded during the 21st century unless deep reductions in CO_2 and other GHG emissions occur in the coming decades.
- Many changes due to past and future GHG emissions are irreversible for centuries to millennia, especially changes in the ocean, ice sheets and global sea level.
- From a physical science perspective, limiting human-induced global warming to a specific level requires limiting cumulative CO_2 emissions, reaching at least net-zero CO_2 emissions, along with strong reductions in other GHG emissions. Strong, rapid and sustained reductions in CH_4 emissions would also limit the warming effect resulting from declining aerosol pollution and would improve air quality.

SEA-LEVEL RISE PROJECTIONS FOR CAPE TOWN

In 2022, the UK Meteorological Office (Met Office) produced a set of updated sea-level rise projections for the Cape Town area based on a combination of observational data and updated recent climate models. This work fell under the banner of the Weather and Climate Science for Service Partnership (WCSSP). This is a programme in which the UK Met Office is 'working collaboratively on projects that focus on the global challenges of weather and climate with partners in Brazil, China, India, South Africa and Southeast Asia[2] and which is funded by the Newton Fund, managed by the UK's Department for Business, Energy and Industrial Strategy.

This recent analysis (Palmer et al., 2020[3]; Allison et al., 2022[4]) has found that:

- By 2050, the sea level at Simon's Town is projected to rise by between 15 and 42 cm compared to the end of the 20th century, with up to 62 cm possible.
- By 2100, the projected rise is 50 cm (29–84 cm) in a low GHG scenario and 86 cm (56–138 cm) in a high GHG scenario, with a 1,87 m rise representing a possible but low likelihood outcome.
- Changes are 10–14% greater than projections of global sea-level rise.

A summary of the results is provided in the following table:

Time period	Low climate change/high mitigation (RCP 2,6)	High climate change/low mitigation (RCP 8,5)	Extreme[ii]
2050	0,24 m (0,15 m to 0,35 m)	0,28 m (0,18 m to 0,42 m)	0,62 m
2100	0,50 m (0,29 m to 0,84 m)	0,86 m (0,56 m to 1,38 m)	1,87 m

ii This extreme scenario was developed 'using IPCC AR6 low-likelihood, high-impact storyline with a high CO_2 emissions scenario and including ice-sheet instabilities, multiplied by local-global ratio'.

In 2022, the UK Meteorological Office produced a set of updated sea-level rise projections for Cape Town.

Flooding and its associated impact on people and infrastructure is one of the key climate risks for Cape Town.

EXTREME EVENT ATTRIBUTION STUDIES

Extreme event attribution is a growing area of climate science. The goal of these studies is to scientifically determine whether, and to what extent, extreme weather events are linked to climate change. Since 2014, the World Weather Attribution (WWA) initiative has developed and implemented methods to conduct extreme event attribution quickly but thoroughly. This is in order to address the challenge posed by the traditional scientific publishing model in which 'scientific studies, going through peer-review, are usually published a year or longer after an event occurred, when the public has moved on and questions about rebuilding or relocating have been answered without taking scientific evidence on the role of climate change into account.[5]

In 2018, scientists associated with this group conducted a study[6] which showed that the drought that affected Cape Town between 2015 and 2018 was three times more likely to have occurred due to climate change than a scenario in which anthropogenic global warming had not occurred. Most recently, analyses by the group have found the following:

- ☑ High temperatures exacerbated by climate change made 2022 northern hemisphere droughts more likely (October 2022)
- ☑ Climate change likely increased extreme monsoon rainfall, flooding highly vulnerable communities in Pakistan (September 2022)
- ☑ Without human-caused climate change, temperatures of 40 °C in the UK would have been extremely unlikely (July 2022)
- ☑ Climate change increased heavy rainfall, hitting vulnerable communities in eastern Northeast Brazil (July 2022)
- ☑ Climate change-exacerbated rainfall caused devastating flooding in eastern South Africa (May 2022)
- ☑ Climate change made devastating early heat in India and Pakistan 30 times more likely (May 2022)
- ☑ Climate change added $4 billion to damage of Japan's Typhoon Hagibis (May 2022)
- ☑ Climate change increased rainfall associated with tropical cyclones, hitting highly vulnerable communities in Madagascar, Mozambique and Malawi (April 2022)
- ☑ Factors other than climate change are the main drivers of recent food insecurity in southern Madagascar (December 2021)
- ☑ Limited role of climate change in October 2020 Vietnam flooding (December 2021)
- ☑ Heavy rainfall which led to severe flooding in Western Europe made more likely by climate change (August 2021)
- ☑ Western North American extreme heat virtually impossible without human-caused climate change (July 2021)

Full details of all the studies mentioned above, including the methodology used, are available on the WWA website: **www.worldweatherattribution.org**

SIGNIFICANT WEATHER AND CLIMATE EVENTS

Extreme weather events are a feature of South Africa's climate, and it is not unusual for one or more extreme events to occur each year across the country. As noted in the previous section on Climate science, it is not straightforward to determine whether individual extreme events are linked to climate change or are simply natural variations in weather patterns.

However, the IPCC AR6 WG1 Report notes that, *"Regional changes in the intensity and frequency of climate extremes generally scale with global warming. New evidence strengthens the conclusion from the IPCC Special Report on Global Warming of 1,5 °C (SR1.5) that even relatively small incremental increases in global warming (+0,5 °C) cause statistically significant changes in extremes on the global scale and for large regions (high confidence). In particular, this is the case for temperature extremes (very likely), the intensification of heavy precipitation (high confidence) including that associated with tropical cyclones (medium confidence), and the worsening of droughts in some regions (high confidence)."*[7] As a result, it is reasonable to anticipate that extreme weather events will increase in both intensity and frequency as climate change continues.

FLOODING IN KWAZULU-NATAL AND GLOBALLY

During April 2022, severe floods occurred in KwaZulu-Natal, with heavy rainfall starting on 8 April and persisting for several days, due to the presence of an intense cut-off low weather system. A level 5 extreme weather warning was issued by the South African Weather Service at 16:00 on 11 April, which was escalated to a level 8 warning at 20:00 the same day. Owing to intense rainfall that was experienced on the night of 11 April, this was further upgraded to a level 9 warning, which remained in place on 12 April. Between 200 and 400 mm of rain fell between 11 and 12 April[8] in various parts of the province, with the area around Durban (eThekwini municipality) being the worst affected.

It was estimated that over 400 people lost their lives due to this disaster. Approximately 7 200 homes were destroyed and around 12 000 homes were severely damaged, with at least 77 600 people being temporarily displaced or having their lives significantly disrupted.[9] In addition, port operations at the Port of Durban were significantly negatively affected, as were key road and rail freight routes in the region.[10] A provincial state of disaster was declared almost immediately, which was later upgraded to a national state of disaster due to the severity and extent of the damage as well as the downstream effects on the national economy because of the disruption of operations at the country's busiest port.

In May of 2022, the Department of Co-operative Governance and Traditional Affairs estimated that the cost of damage to both public and private infrastructure may be as high as R25 billion.[11] As of November 2022, recovery and reconstruction operations were still under way. Although significant progress had been made in terms of the full restoration of water and electricity services and the completion of the majority of key road repairs, repairs to schools and sanitation infrastructure were still ongoing and a number of people remained displaced and in temporary shelter.[12] Owing to the severity and scale of the disaster, it is likely that impacts will be felt in the province for several years to come.

Durban KwaZulu-Natal floods 2022.

Although warnings were issued by both the South African Weather Services and the eThekwini Municipality Disaster Management Centre, there are some indications that the warnings had limited reach; those who did receive warnings were unsure of how to prepare or what actions to take.[13] As a result, South African climate scientists and technical experts have emphasised that early warnings are likely insufficient as a resilience measure, and that more work needs to be done to both create 'climate literacy' regarding extreme events and to empower people to take practical steps to improve disaster preparedness at the household level.[14]

A study conducted by scientists from the WWA initiative found that climate change likely played a role in the devastating floods, including a halving of the expected return period for such an event (from 1 in 40 years to 1 in 20 years) and increasing the intensity of such an event by between 4 and 8%.[15] The study authors also highlighted the increased risk caused by high levels of vulnerability in combination with an extreme weather event, noting that "initial assessments show that the floods disproportionately affected marginalised communities, with particular devastation in informal settlements. Thus, the magnitude of this disaster on these groups has been exacerbated by pre-existing structural vulnerability in the region".[16]

LOWER THAN AVERAGE RAINFALL AND POSSIBLE FUTURE DROUGHT CONDITIONS IN THE CAPE TOWN REGION

During 2022, rainfall in the greater Cape Town region was below average for several months of the winter and spring rainfall season. Although normal rainfall was experienced in May, and above normal rainfall in June and August, significantly below normal rainfall was experienced in July, September and October. The South African Weather Service forecasts a likelihood of La Niña conditions during the latter half of 2022 and early 2023, moving into a neutral ENSO (El Niño Southern Oscillation) state in later 2023. Short- and medium-term forecasts show a hotter than average summer season for the Cape Town region and normal to slightly above normal rainfall, although it must be noted that summer rainfall in the region is normally low.[17]

As of mid-December 2022, dam levels in the Western Cape Water Supply Scheme – which supplies Cape Town and surrounds – stood at around 73%. Although this is higher than the same time in 2018, when dam levels were in the process of recovering from severe drought, it is lower than the previous three years in which dam levels were at between 80% and 97% at the same point in the year. Accordingly, the City set a proactive water-saving target of no more than 950 ML per day for the 2022/23 summer season in order to avoid the need for water restrictions in the following summer season.[18] Water usage levels in mid-December 2022 stood at approximately 930 ML per day, indicating that this target is achievable. Although there is no immediate cause for concern, it is possible that drought conditions may be developing in the region; careful monitoring and proactive water-saving measures are therefore warranted.

HEATWAVES IN CAPE TOWN AND GLOBALLY

Heatwaves are potentially deadly weather events, as prolonged periods of hot temperatures are associated with significant health risks, including increased mortality among vulnerable groups such as the elderly,

babies and children, and people with chronic health conditions. In warm regions, such as Cape Town, extreme heat events may be overlooked by the public who see these simply as normal summer weather, rather than a potentially dangerous weather event. People may therefore be unaware of the risks and lack information about how to protect themselves.

During January and February 2022, a number of extreme heat warnings were issued for Cape Town and the surrounding region. Heatwaves that occurred during this time resulted in high levels of demand for cooling at the city's public pools and beaches and significant traffic disruption in the vicinity of these attractions. Unfortunately no information is currently available about health impacts of these heat events as monitoring programmes that track mortality figures against recorded temperatures are still under development. This is a priority area of research for the immediate future.

In June and July 2021, intense heatwaves occurred in western Canada and the north-western part of the United States, with temperatures reaching a high of 46,9 °C in the small town of Lytton, British Columbia. Shortly thereafter Lytton was destroyed in a wildfire, driven by the hot and dry conditions of the heatwave and exacerbated by strong winds. Researchers found that this heatwave was caused by "two major climate-change factors – the disruption of a jet stream that usually carries air west-to-east across the Pacific and extremely dry soil in the region".[19] This disruption of the jet stream, due to high ocean surface temperatures, was also linked to heatwaves in Scandinavia, Eastern Europe, western Russia, and northwest Siberia at the same time.

During July of 2022, much of Europe experienced a significant heatwave, with temperature records being broken in several places. In the UK, the Met Office found that more than half of the UK's oldest active weather stations recorded their hottest day ever in 2022, and new all-time highs were set at 56 of the 109 longest-standing stations during the heatwave.[20] In a notable finding, the UK Met Office study found that "only one in five of the longest-standing weather stations in the UK has a temperature record that was set before 2000. The remaining 80% were all set in the past two decades", indicating that climate change has had a significant role to play in extreme heat events in northern Europe.

PROGRESS AGAINST GOALS AND ACTIONS OF THE CLIMATE CHANGE STRATEGY AND ACTION PLAN

This section of the report consists of status updates of a set of indicators that have been developed so as to monitor and evaluate the City's progress towards achieving the goals of the Climate Change Strategy and Action plan. These indicators are intended to measure longitudinal changes and trends from the baseline and to observe both quantitative and qualitative medium-term outputs and outcomes.

OVERVIEW OF INDICATOR FRAMEWORK AND ACTION STATUS REPORTING PROCESS

These indicators are designed to meet the principles of SMART indictors – to be specific, measurable, achievable, reliable and time-bound. As a result, some of the indicators shown here have been selected on the basis of their fulfilment of SMART criteria due to factors such as data availability and ability for the relevant department to report accordingly. In future years, additional indicators may be included that provide a more comprehensive assessment of outcomes if improved data sources are available.

The indicator framework for the Climate Change Strategy and Action Plan was established through an extensive internal departmental engagement process and includes a comprehensive set of 49 progress indicators across 37 goals. The indicator set consists of 23 new CCAP indicators and 26 indicators that are aligned with existing reporting processes and requirements. The indicators can be summarised into the following categories:

- Service Delivery Budget Implementation Plan (SDBIP) indicators: Performance-based indicators and targets that City departments monitor and report on, on a quarterly or annual basis
- Circular 88 indicators: Indicators that the City is required to monitor and report on to National Treasury
- New CCAP indicators: Indicators that have been drafted for the purpose of tracking goals across the strategic focus areas and cross-cutting work areas of the Climate Change Strategy and Action Plan

In some cases, targets for indicators have been set as part of a directorate or departmental business plan/ SDBIP process. These have been included here where they are available. Where existing baseline data are available, these have been included too; however, for new CCAP indicators as well as for several new SDBIP indicators, 2021/22 will be the first year of reporting and therefore will serve as the baseline year for future reports.

SUMMARY OF PROGRESS DURING 2021/22

The CCAP consists of 101 programme-level actions across ten strategic focus areas and five cross-cutting work areas. The following table provides an indication of the trend in the status of these actions since these were approved in August 2021:

Action status	Number of actions as of August 2021	Number of actions as of 30 June 2022
New (concept)	19	7
New (in planning)	23	14
Expansion of existing programme	27	23
Implementation	32	50
Completed	0	2
On hold	0	4
Cancelled	0	1

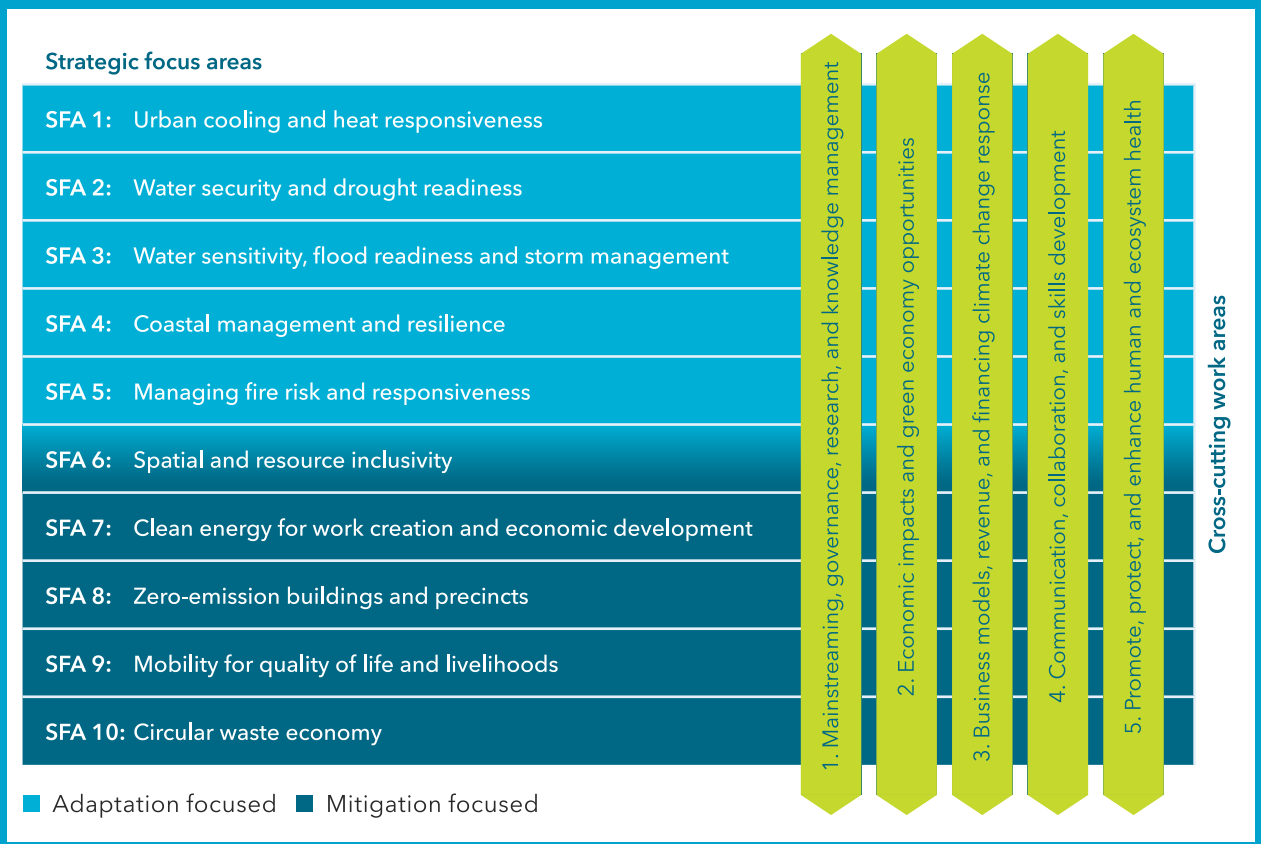
During the reporting year, two actions were completed and the number of actions categorised as implemented increased from **32 to 50 actions**. In addition, four actions have been placed 'on hold' which means that they are temporarily paused while the approach to implementation is reassessed or due to appropriate mechanisms for implementation not currently being available. Only one action has been cancelled as it was determined that it was not necessary to be implemented in light of the new organisational structure.

A total of **21 actions** are now categorised as 'new (concept)' or 'new (in planning)'. This is a significant decrease compared to the initial **42 actions** falling within those same categories, and is an indication of a positive trend towards future implementation. The overall implementation of the actions in the CCAP shows gradual and continued progress during the reporting year.


CAPE TOWN'S COMMITMENT TO CARBON NEUTRAL BY 2050
THE PARIS AGREEM
REQUIRES THE
ECONOMIES TO A
CARBON NEUT
BY 20
THIS MEAN
GLOBAL
TO
TSHWANE, JOBURG
HAVE JOINED OVER 100 CITIES
COMMITTING TO DEVELOPING
CLIMATE ACTION PLAN
11 CITIES HAVE A PLAN
EFFICIEN
ACROSS
NEEDED
SUSTAINABILITY

IMPLEMENTATION PER STRATEGIC FOCUS AREA AND CROSS-CUTTING WORK AREA

Implementation per Strategic Focus Area (SFA) and Cross-cutting Work Area (CCWA) is detailed in the following section of the report. Each section provides an overview of key progress at the action level during the 2021/22 financial year as well as progress against the goals set to measure medium-term outcomes.



STRATEGIC FOCUS AREA 1: URBAN COOLING AND HEAT RESPONSIVENESS

OVERVIEW

Implementing initiatives aimed at urban cooling and heat responsiveness is becoming more essential, as temperatures continue to increase and threaten the effectiveness of City operations and infrastructure, increase risks for public health and well-being, and affect the resilience of vulnerable groups.

Reporting on this Strategic Focus Area covers two goals:

- GOAL 1: Reduce immediate risks to health during heatwaves and high heat days
- GOAL 2: Proactively reduce heat impacts on the city through urban greening

PROGRESS DURING 2021/22

During 2021/22, there has been continued progress in programmes that have contributed to the roll-out of urban greening initiatives across the city. The City continued to prioritise urban greening and tree planting initiatives during 2021/22, through various platforms and programmes that also involved interdepartmental collaboration. The initiatives include food gardens and urban gardening projects, greening in townships and low-income housing developments, and greening as part of road upgrades.

In addition to working towards an annual target of planting 2 000 trees, the City continued to be actively involved in implementing national and provincial environmental campaigns and partnerships, including working towards advancing the Two Million Trees Programme. In recognition of the City's dedication and efforts towards increasing urban greening throughout the city, the City received first prize in the Metropolitan Municipality Category of the National Arbour City Awards in September 2021.

Other developments for this work area include the drafting of a heatwave and high heat day action plan, and a draft urban forest policy. The draft Heatwave and High Heat Day Action Plan consists of a set of implementation actions, categorised into two main focus areas. Focus area 1 deals with governance and systems and outlines a set of actions related to the implementation of governance structures, the development of systems and the research required to support these. Focus area 2 is specific to response implementation and provides an overview of a set of actions related to the implementation of heat response during heat events, including general actions that need to be implemented by all City departments. The Action Plan also includes an overview of preliminary results of a historical temperature data analysis on high heat days and heatwaves for Cape Town, proposed implementation phases and a proposed monitoring and evaluation plan.

The draft Urban Forest Policy aims to guide a transversal approach to tree planting and management across City, state and privately owned land. The policy will work towards the City's urban forest goal, and aims to increase tree planting numbers at a citywide scale through the promotion of tree planting among various stakeholder groups. These include members of the public, private companies, community organisations and other City departments. The main features of the draft policy are recognition of tree management in the

Heat action planning is under way.

The City is work towards an annual tree planting target of 2000 trees.

The City is working towards a transversal approach to tree planting and management across City, state and private owned land.

context of climate change, water scarcity and other key impacts on tree health and growth such as pests and disease. The policy also includes a goal to develop programmes aimed at prioritising locations vulnerable to urban heat stress such as major through routes, intersections and areas identified through the Green Infrastructure Network and the heat island maps (produced as part of the City's Climate Change Hazard, Vulnerability and Risk Assessment study).

PROGRESS INDICATORS

GOAL 1: Reduce immediate risks to health during heatwaves and high heat days			
Medium-term outcome	Indicator name	Baseline	Update as of 30 June 2022
Reduced risks to health during heatwave and high heat days	Number of real-time heat-monitoring network sensors operating	0	0
	Date of approval of most recent Heatwave and High Heat Action Plan	New indicator	Action plan has been drafted as of 30 June 2022 but has not yet been approved

GOAL 2: Proactively reduce heat impacts on the city through urban greening				
Medium-term outcome	Indicator name	Baseline	Target	Update as of 30 June 2022
Reduced heat impacts on the city through urban greening	Number of trees planted in line with Urban Forestry Plan	2 414 (2020/21)	2 000	2 334

STRATEGIC FOCUS AREA 2: DROUGHT READINESS

OVERVIEW

Drought remains a significant risk for Cape Town, as climate change projections show strong indications of a hotter and drier future. Consequently, drought readiness programmes are a key pillar of the City's climate change response work, and account for the majority of the City's capital spending on climate resilience.

Reporting on this strategic focus area covers two goals:

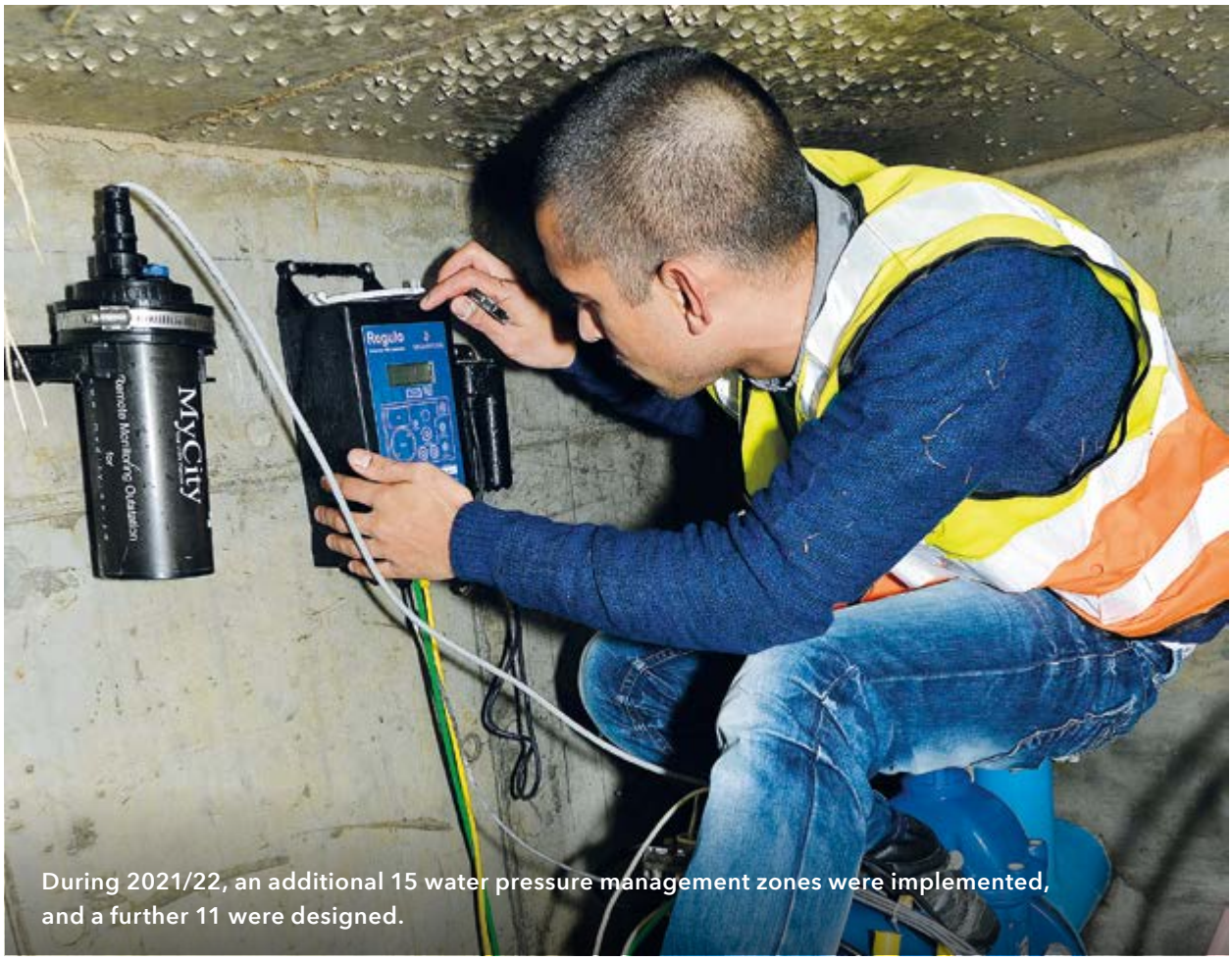
- GOAL 3: Reduce demand for water to protect water resources and ensure sustainability of supply
- GOAL 4: Work to augment and increase water supplies to achieve 99,5% assurance of supply

PROGRESS DURING 2021/22

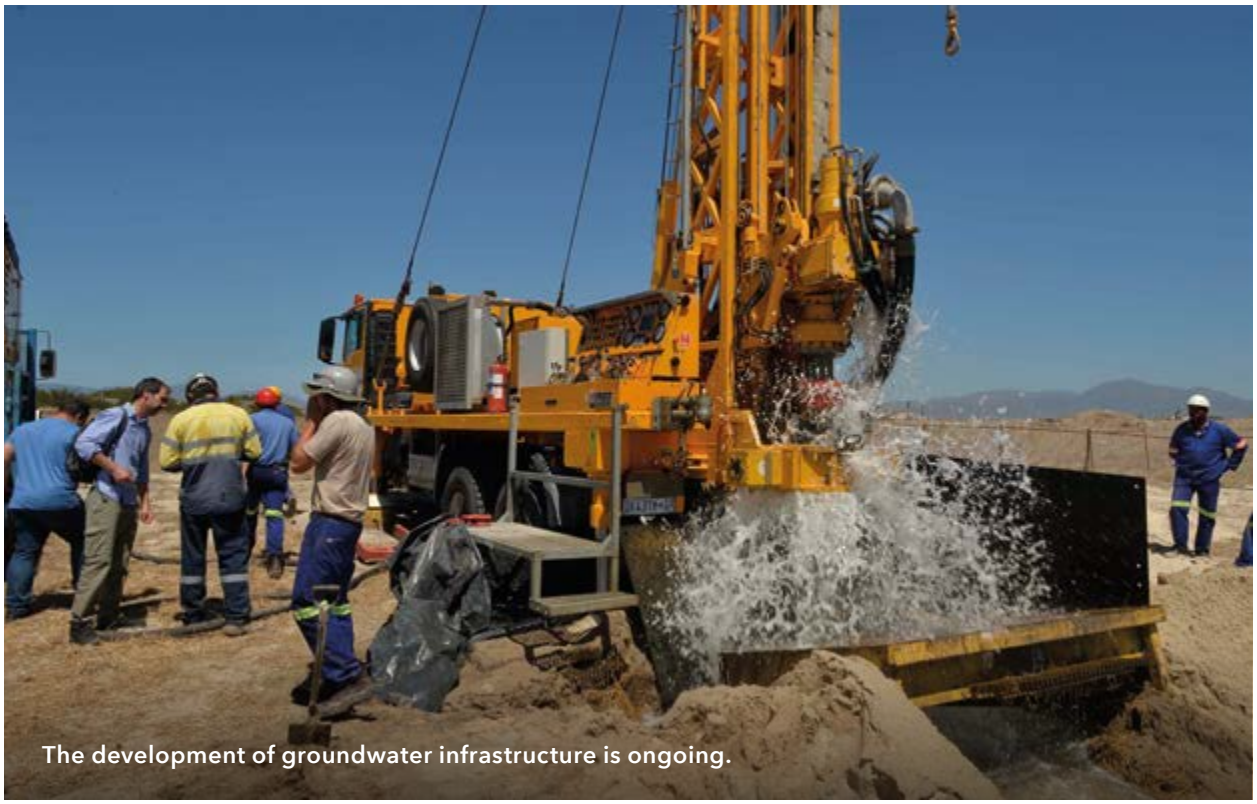
Implementation of the City's water demand management programmes continued during the year under review. Water demand management measures have been in place in Cape Town since the early 2000s, when drought became a significant issue in the region. Although significant gains in the implementation of water demand management infrastructure and technology were made during the 2015–2018 drought period, this remains an ongoing work area as these interventions continue to be rolled out across the city.

Pressure management and zone metering remains one of the most effective tools that the City has to manage water demand effectively. By ensuring that water is delivered at an acceptable but not excessive pressure, the incidence of pipe bursts and leaks – both within the reticulation system and at the end user – is significantly reduced. This also allows the City to reduce water pressure during drought periods in order to reduce overall demand. During 2021/22, an additional 15 pressure management zones were implemented, and a further 11 were designed. Currently 181 zones are in place and monitored via remote technology.

The City's new water programme is a more recent programme that was initiated as a result of the planning process that took place for the Cape Town Water Strategy. This strategy was devised at the height of the 2015–2018 drought, and is a response both to that period of severe drought as well as longer-term water supply challenges in the region. The programme includes a number of different interventions, including desalination, groundwater use and recharge, water reuse and invasive species management.



During 2021/22, an additional 15 water pressure management zones were implemented, and a further 11 were designed.



The development of groundwater infrastructure is ongoing.

A number of significant projects moved forward in both the planning and implementations aspects of this programme. Work areas that are in advanced planning include desalination, water reuse and surface water augmentation. The City is in the process of entering into a water supply agreement with the national Department of Water and Sanitation for the Berg River to Voëlvlei Augmentation Scheme, which aims to deliver water by 2026. The City has also initiated a study to investigate the possibility of diverting excess winter water from the Lourens River.

During 2021/22, feasibility studies were completed for various aspects of the desalination programme, including an investigation of various different design and site options, and a cost-benefit analysis which determined that desalination would be marginally beneficial. Owing to the complexity of desalination and the high costs involved, the Water Research Commission was appointed to facilitate and manage an independent advisory panel to review all feasibility reports and make recommendations. The Government Technical Advisory Centre was also appointed to obtain the services of a transaction advisor who will advise the City on the optimal project procurement and delivery method. This will ensure that decision-making regarding desalination is supported by the best available evidence.

Water reuse is another technically complex area of work that is currently in the advanced planning stage. Detailed design on the Faure New Water Scheme has been largely completed during the reporting period and will be finalised following final input from City stakeholders. The City has also entered into an agreement with the Water Research Commission for coordination and provision of research, development and innovation as well as technical advisory services in order to support the implementation of water reuse. This includes an independent advisory panel consisting of a distinguished and internationally recognised group of engineers, scientists and practitioners in the field of potable water reuse. Given the magnitude of the capital

commitment and the design and operational complexities of such projects, it is imperative for the City to obtain expert advice and guidance during the planning, design, implementation and operation of these schemes. A stakeholder engagement and public consultation process is also planned for 2023 in order to inform decision-making regarding water reuse.

The development of groundwater infrastructure continued in 2021/22, and included commissioning a seventh borehole for the Table Mountain Group Aquifer, giving a total maximum yield of 18,4 ML/day and a sustainable yield of 15 ML/day. Construction of electrical upgrades and an acid dilution system for the Atlantis aquifer continued during the year under review, and four wellfields on the Cape Flats aquifer are in development. Construction of various supporting infrastructure for these wellfields continued during 2021/22, including commencing the construction of the recharge treatment works.

Finally, invasive species clearing in key catchment areas and aquifer recharge areas is a key tool for increasing water supply by reducing the amount of water lost to water-intensive invasive tree species. Between April 2019 and June 2022, 27 965 hectares of invasive species were cleared as part of the invasive species removal programme of the Greater Cape Town Water Fund (GCTWF) (both within and outside the boundaries of the city), including 23 048 hectares of initial clearing and 4 917 hectares of follow-up. Together, this has resulted in 11,4 billion litres per year, or 31 ML per day, being made available for use. During 2021/22, 4 617 hectares were cleared in the City of Cape Town's priority sub-catchments, with a further 2 977 hectares in progress.

The City's invasive species clearing programme in key catchment areas and aquifer recharge areas is a key tool for increasing water supply.

PROGRESS INDICATORS

GOAL 3: Reduce demand for water to protect water resources and ensure sustainability of supply				
Medium-term outcome	Indicator name	Baseline	Target	Update as of 30 June 2022
Reduced water demand	Total per capita consumption of water (cubic metres [m^3] per capita per day)	136,2 m^3 per capita daily (June 2020) 149,9 m^3 per capita daily (June 2021)	190 m^3 per capita daily	150 m^3 per capita daily An increase has occurred following the low levels achieved during the drought. However, this remains well below the target.

GOAL 4: Work to augment and increase water supplies to achieve 99,5% assurance of supply			
Medium-term outcome	Indicator name	Target	Update as of 30 June 2022
Increased water supply to achieve target of 99,5% assurance of supply	Total augmented water capacity in megalitres per day (MLD)	20 MLD (2022/23)	The maximum yield of the Table Mountain Group Aquifer is 18,4 MLD, with sustainable yield at 15 MLD. Invasive species clearing has added 31 MLD to the supply system.

STRATEGIC FOCUS AREA 3: WATER SENSITIVITY, FLOOD READINESS AND STORM MANAGEMENT

OVERVIEW

Although Cape Town is projected to experience a hotter and drier future, flooding will remain a risk, particularly during intense rain events which are projected to continue to occur into the future and possibly increasing in intensity over time. Programmes that address flood risk will therefore continue to be implemented alongside drought readiness programmes, with a particular focus on improving catchment management through green and hybrid infrastructure solutions which also support a water-sensitive city approach.

Reporting on this strategic focus area covers two goals:

- ☑ GOAL 5: Proactively reduce flood risk through the implementation of a water-sensitive City strategy or plan
- ☑ GOAL 6: Take action to reduce flood risk and storm damage through disaster mitigation approaches

PROGRESS DURING 2021/22

During 2021/22, this work area achieved significant progress due to the initiation of a project, supported by the Cities Finance Facility (CFF), to develop a business case for green infrastructure in catchment management, as well as the continued roll-out of the Liveable Urban Waterways programme. During this time, the Liveable Urban Waterways implementation framework was finalised and engagement with external stakeholders continued to take place; notably, the UCT Future Water Institute is in the process of aligning its research agenda to meet some of the Liveable Urban Waterway research needs.

Five Liveable Urban Waterways projects have now commenced in the Sand catchment (Sand/Langevlei Canal, Grootboschkloof, Spaanschemat, Keyser and Westlake rivers), with a total value of approximately R50 million. Progress has also been made on further developing two demonstration projects, including a project in Trafalgar Park as part of the new District Six Public Realm Strategy and the Adderley Street fountain project. Research on the land value benefits of the Adderley Street fountain project was conducted, with support from the National Treasury Cities Support Programme and the World Bank, which demonstrated the value of undertaking this project.

Various Liveable Urban Waterways projects are under way.

During 2021, the City applied for support from the CFF, jointly run by C40 and GIZ. This support, to the value of approximately R10 million, was awarded and the project officially launched in June of 2022. The project will focus on the development of a business case for green infrastructure in catchment management, with a focus on flood risk reduction, and will also support the scaling up of the Liveable Urban Waterways and Green Infrastructure programmes. With this support, a masterplan and project pipeline of waterway rehabilitation projects will be developed in the Diep River (South) and Zeekoe catchments. A cost-benefit assessment will also be undertaken to build the case for the investment required to take the project pipeline to implementation. The Roscommon Road project, one of the original Liveable Urban Waterways demonstration projects, is located in the Diep River (South) catchment and will be included in this masterplan.

During the year under review, the City's Winter Readiness Programme continued to be developed and implemented. This included a review and assessment of mitigation measures implemented during 2021 in order to inform planning for 2022, a multi-channelled public awareness and preparedness communication campaign, and bi-weekly coordinated meetings with stakeholders involved in the execution of the programme. The programme was further developed through the identification of 38 high flood risk areas across the city, using a vulnerability assessment. The Winter Readiness Programme also gained additional high-level support through the establishment of an Executive Management Team (EMT) subcommittee.

Looking ahead, the revised Winter Readiness Strategic Management Framework highlighted the need for additional work required by Urban Mobility to upgrade transport infrastructure in the city's most flood-prone areas, and also identified the need to increase flood risk reduction projects through advancing catchment management planning. These work areas will be put forward for additional support in future budget cycles.

The City's Winter Readiness Programme includes multi-channelled public awareness and communication campaigns.

PROGRESS INDICATORS

GOAL 5: Proactively reduce flood risk through the implementation of a water-sensitive city strategy or plan				
Medium-term outcome	Indicator name	Baseline	Target	Update as of 30 June 2022
Reduced flood risk through implementation of flood alleviation projects identified by catchment, storm water and river management plans	Number of catchment forums established	0	3 (2022/23)	One formal catchment forum is in place (Hout Bay) and one more is in the process of being established (Diep River). Various Friends groups and Protected Area Advisory committees are in place, which partially perform some roles of catchment forums
	Length of waterways rehabilitated or restored in the previous financial year	New indicator	2022/23 FY – 3 625 m planned for upgrading	2021/22 FY – 380 m completed

GOAL 6: Take action to reduce flood risk and storm damage through disaster mitigation approaches			
Medium-term outcome	Indicator name	Target	Update as of 30 June 2022
Reduced flood and storm damage through disaster mitigation approaches	Number of formal and informal structures affected by flooding during the previous financial year	New indicator	22 415*

** This number is affected by the intensity and frequency of severe weather events and may vary greatly from year to year.*

STRATEGIC FOCUS AREA 4: COASTAL MANAGEMENT AND RESILIENCE

OVERVIEW

Cape Town's coastline is a valuable asset to the city's economy, tourism and recreation. The impacts of climate change-induced pressures (such as sea-level rise, storm surges and coastal erosion) combined with human-induced pressures (such as urban development close to the coastline) have already started to compromise the natural dynamic functions and state of the coast and its coastal ecosystems.

Reporting on this strategic focus area covers two goals:

- GOAL 7: Promote coastal resilience to the benefit of both coastal communities and coastal ecosystems
- GOAL 8: Put in place effective cooperative and empowering mechanisms for addressing complex coastal management issues in the context of climate change

PROGRESS DURING 2021/22

During 2021/22, the City continued to implement and enforce its regulatory frameworks, consisting of the City of Cape Town's Coastal By-law, the City's Coastal Management Line and the Coastal Edge (as defined in the Municipal Spatial Development Framework [MSDF]). In March 2021, the existing Coastal Edge was gazetted as the Coastal Management Line (CML) in line with the Integrated Coastal Management Act, Act 24 of 2008. The City of Cape Town therefore became the first coastal municipality in South Africa to have a CML gazetted. The purpose of the CML is to protect the coastal protection zone and coastal public property and to guard public and private infrastructure against the impacts of coastal processes such as coastal erosion, storm surge and inundation, and migrating dune systems.

The City is currently working towards the planning, development and implementation of a Coastal and Sea-Defence Decision Support Framework for Cape Town's coastline. This framework will consist of two components, which are currently dependent on the availability of external funding for implementation.

The first component will be informed by research on metrics applicable to Cape Town, including global mean sea-level rise predictions and degrees of confidence, regional differences in sea-level rise, tidal surges and local biophysical characteristics that may influence risk and vulnerability. The second component will include the development of a pipeline of coastal resilience infrastructure projects in response to the results of the first component of the framework, a high-level technical and financial feasibility assessment for this pipeline of projects and a business case for investment in coastal resilience infrastructure. The pipeline of coastal resilience infrastructure projects will include green infrastructure, 'grey' infrastructure and a hybrid approach combining green and grey infrastructure. An application for grant funding to carry out the research and project pipeline development in support of the Coastal and Sea-Defence Decision Support Framework has been submitted to a climate finance partner. It is anticipated that a decision on this funding will be made by the funder in early 2023.

As discussed in the Climate science section of this report, during 2022 the UK Meteorological Office (Met Office) conducted research to produce a set of updated sea-level rise projections for the Simon's Town area in Cape Town. The projections are based on a combination of observational data and updated recent climate models. Although the projections only focus on one area of the coastline, the research provides an important opportunity to inform coastal management and planning. In addition, the CSIR compiled a Coastal Climate Change Resilience discussion document which consisted of a review of the current evidence base and listed recommendations for new analyses to be conducted to strengthen decision-making in this regard. This report was enabled by technical assistance provided by the National Treasury Cities Support Programme.

PROGRESS INDICATORS

GOAL 7: Promote coastal resilience to the benefit of both coastal communities and coastal ecosystems				
Medium-term outcome	Indicator name	Baseline	Target	Update as of 30 June 2022
Increased coastal resilience for the benefit of coastal communities and coastal ecosystems	Number of coastal notices issued per year in terms of the City's Coastal By-law	0	N/A	3
	Percentage of coastline with protection measures in place	New indicator	6,27%*	6,20%

** The intention is not to exceed the target of 6,27%. In doing so, this implies more infrastructure is being located in risk areas, requiring more protection. This would be indicative of poor decision-making.*

GOAL 8: Put in place effective cooperative and empowering mechanisms for addressing complex coastal management issues in the context of climate change			
Medium-term outcome	Indicator name	Target	Update as of 30 June 2022
Effective cooperative and empowering mechanisms are in place to address complex coastal management issues related to climate change	Proportion of quarterly provincial coastal committee meetings attended (% of meetings held) per year	New indicator	100%

STRATEGIC FOCUS AREA 5: MANAGING FIRE RISK AND RESPONSIVENESS

OVERVIEW

Fire poses a risk to both the natural environment and communities living at the urban or natural interface and in informal settlements. Climate change that leads to increased hot, dry and windy conditions – all of which are projected to increase in both the mid and far future – increases the risk of intense wildfires. Although the link between informal settlement fires and climate factors is less clear, there is evidence that strong winds – prevalent in Cape Town's summer months – have the potential to significantly exacerbate the spread of fires in informal dwelling.

Reporting on this strategic focus area covers one goal:

- ☑ GOAL 9: Proactively reduce fire risk and the impact of fires on communities and natural areas

PROGRESS DURING 2021/22

During 2021/22, the City's Fire Services Department continued to implement ongoing activities in support of reducing the risk of urban fires and the impact of these fires on communities. This included ongoing public safety education programmes in communities and at fire stations, maintaining and servicing fire hydrants, and maintaining predetermined response plans to ensure high risk areas are adequately covered to ensure an early response to informal settlement fires.

In terms of reducing wildfire risk and reducing the impact of wildfires, the City continued to implement various ongoing measures including maintaining and servicing fire hydrants and maintaining predetermined response plans to quickly respond to wildfires. During 2021/22, firefighting resources were supplemented by the employment of 120 seasonal firefighters to ensure effective response during the peak wildfire season. Planned ecological burns also continued to be implemented during the year under review; these are necessary both for the health of the fynbos ecosystem (which is fire dependent) and to prevent the excessive build-up of fuel in the environment over a long time period, which can contribute to the occurrence of more intense wildfires.

Regarding the implementation of affordable and safe energy solutions for low-income and informal households, work carried out in 2021/22 focused on research and raising awareness. A concept note on providing an alternative energy subsidy to residents that cannot be connected to grid electricity has been drafted and a costing exercise for the provision of such a subsidy is currently under way.

Research on households' and communities' perceptions of alternative energy services was initiated in 2021/22 and is planned to be conducted in the 2022/23 financial year, which will support the implementation of an alternative energy subsidy, should it be approved. The data gathered through the study will be used to determine low-income households' perceptions of solar-powered energy sources and liquefied petroleum gas (LPG).

Planned ecological burns continued to be implemented during the year under review.

The French Development Bank (AFD) also funded a study that modelled the thermal efficiency in subsidised low-cost housing (RDP) to motivate further funding for ceiling retrofits and other energy efficiency measures.

Awareness-raising programmes focused on energy safety as well as general information about energy types and a range of other sustainability focused topics. These programmes included the Smart Cooking and Home Safety Programme, focused on clean and safe energy alternatives for cooking and home safety, and the Smart City Kids Programme, which educates learners on what energy is, where it comes from and practical energy safety.

Research on communities' perceptions of alternative energy services in low-income and informal households was initiated in 2021/22.

Smart Cooking and Home Safety Programme education and awareness raising.

PROGRESS INDICATOR

GOAL 9: Proactively reduce fire risk and the impact of fires on communities and natural areas			
Medium-term outcome	Indicator name	Target	Update as of 30 June 2022
Reduced fire risks and impacts on communities and natural areas	Number of dwellings in informal settlements affected by structural fires annually	New indicator	1 968 informal dwellings affected

STRATEGIC FOCUS AREA 6: SPATIAL AND RESOURCE INCLUSIVITY

OVERVIEW

Spatial planning has been identified as a key mechanism for implementing both the adaptation and the mitigation programmes. A compact, efficient and accessible urban form supports reduced transport emissions and offers the opportunity to put in place measures to increase urban resilience, while promoting access to economic opportunities.

Reporting on this strategic focus area covers two goals:

- GOAL 10: Densify mass transit routes through mixed-use developments that support public transport and include social housing
- GOAL 11: Ensure low-income residents are climate resilient and have equitable access to essential services

PROGRESS DURING 2021/22

A number of different work areas progressed during the year under review. A review of the eight District Spatial Development Frameworks took place and included a detailed investigation of development mechanisms to facilitate the implementation of key spatial development proposals and support the recovery of the City's economy post-pandemic. An incentive overlay zone (IOZ) was identified as one such mechanism which is currently undergoing further investigation to be incorporated into the Municipal Planning By-law. The purpose of the IOZ is to allow for development of desired densities, land use types and economic sector types in development focus areas through the enhancement of development rights and reduced timeframes for approval.

Work also commenced on an additional transit-oriented development enablement mechanism – a reduced parking offering in areas well serviced by public transport, called 'PT areas'. The goal of these areas is to ease the approval process for land use and building applications for all land uses with reduced parking requirements. This enables greater intensification of land use, as it frees up parking spaces for more productive uses and discourages private transport use to those centres, in support of public transport or non-motorised transport.

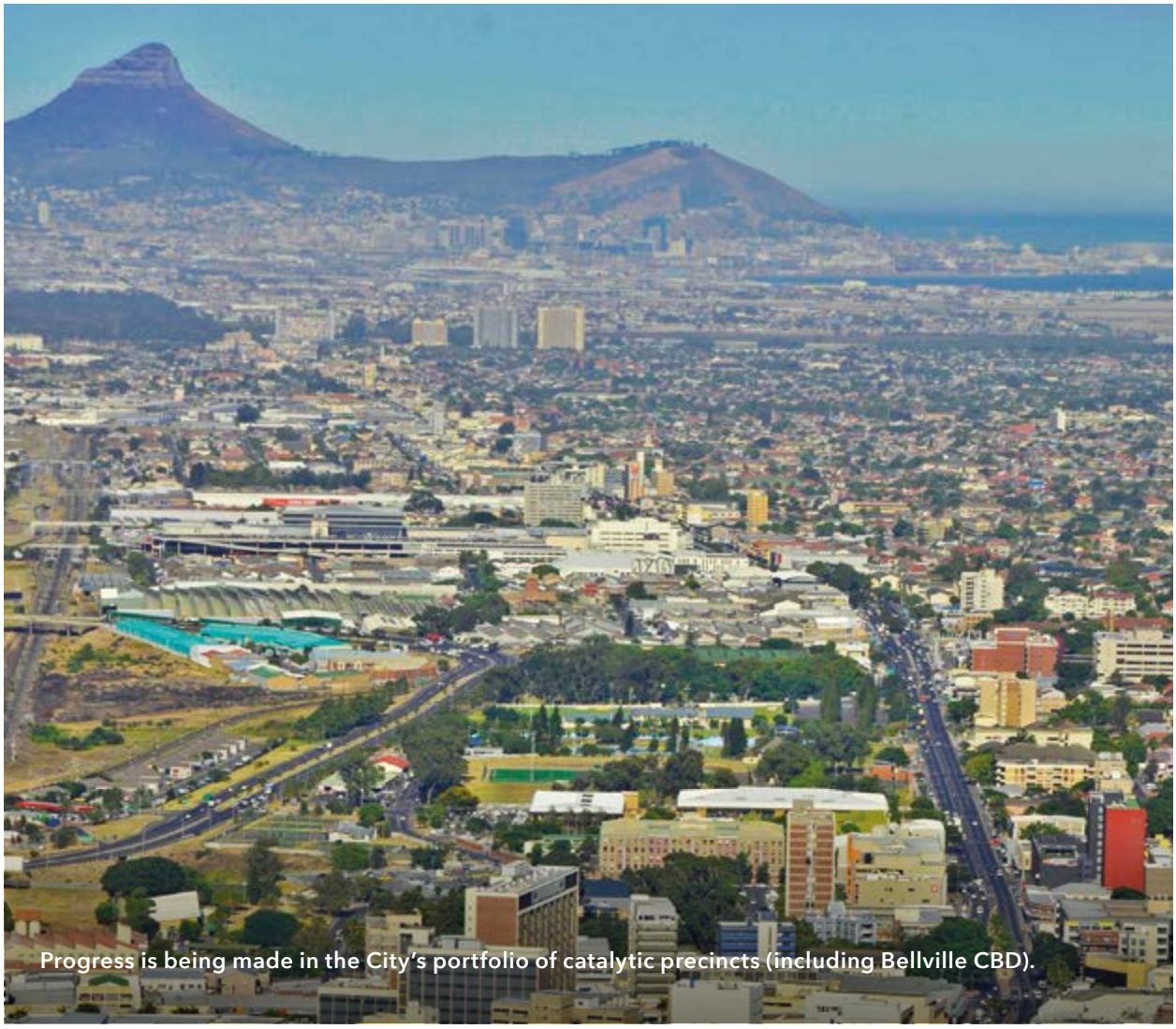
During the year under review, progress was also made on inclusionary housing. A financial feasibility analysis to inform policy choices in the draft Inclusionary Housing Policy was finalised, and a new policy approach is now under development. At the same time, the Mayoral Priority Programmes for 'Land release for affordable housing developed by the private sector' commenced implementation, with a focus on establishing a pipeline of well-located City land that can be released for medium- to high-density social and affordable housing, to be developed by social housing institutions and the private sector.

Progress is also being made in the City's portfolio of catalytic precincts in terms of formulating high-density mixed-use precinct development plans as a basis for increasing affordable housing in these central and transit-accessible locations, and related project preparation actions. Significant work is being undertaken to de-risk and incentivise investment and participation by the private sector in these precincts, alongside preparing for the necessary public infrastructure investment. These precincts include the Bellville CBD,

Foreshore Gateway precinct, Philippi Opportunity Area, Diep River station precinct, Athlone CBD, Claremont CBD and the four sites involved in the C40 Reinventing Cities initiative.

Finally, a number of work areas related to energy poverty progressed during 2021/22. Work commenced on a survey on household energy use patterns and perceptions of household energy options for informal settlements not connected to grid electricity in Cape Town. C40, under the Inclusive Climate Action (ICA) programme, also supported the assessment of previous energy poverty alleviation work and hosted an interdepartmental dialogue on energy poverty alleviation which brought together relevant City departments to discuss progressing and mainstreaming this work area.

Work is also under way to review the City's public lighting approach in areas that are currently serviced, through high mast lights that are often undesirable due to the shadows they cast across pathways between informal dwellings, in addition to their susceptibility to vandalism. Work has been initiated on a cost-benefit analysis of high mast lights versus three alternative public lighting solutions, particularly for areas with no access to grid electricity; this will be carried out in 2022/23 by GreenCape.



Progress is being made in the City's portfolio of catalytic precincts (including Bellville CBD).

PROGRESS INDICATOR

GOAL 11: Ensure low-income residents are climate resilient and have equitable access to essential services			
Medium-term outcome	Indicator name	Target	Update as of 30 June 2022
Improved climate resilience and access to essential services for low-income residents	Percentage of households living in informal dwellings	18,6% (2020)	16,6 % (2021)*

** The sample sizes for the 2020 and 2021 General Household Surveys were significantly smaller than in previous years. This may have had an impact on the statistical findings of the General Household Survey data as used here, and the data should thus be viewed with caution and within that context.*

STRATEGIC FOCUS AREA 7: CARBON-NEUTRAL ENERGY FOR WORK CREATION AND ECONOMIC DEVELOPMENT

OVERVIEW

Energy diversification to enhance security of supply for economic growth has become one of the key programmes under the new Mayoral Priority Programme and in the City's new IDP 2022–2027. Decarbonising energy in Cape Town is, however, crucial to its growing green economy sector and to the industries that would otherwise be left behind as world values trade increasingly moves to carbon neutrality across entire supply chains.

Reporting on this strategic focus area covers three goals:

- GOAL 12: Move as quickly as prices and opportunities allow towards 100% clean electricity supply by 2050
- GOAL 13: Get technologically and commercially ready to operate the metropolitan distribution grid of the future
- GOAL 14: Minimise the economic cost of energy transition through maximising energy efficiency and developing a regional value chain for carbon-neutral molecular fuels

PROGRESS DURING 2021/22

The 2021/22 reporting year has seen active progress towards these goals. The City's increasing focus on achieving energy security in response to the national energy crisis has led to decisive steps to implement its programme of energy diversification through the City's renewable energy own-build projects, SSEG programme, wheeling and independent power producer (IPP) programmes. Significant changes have also been announced at a national level to alleviate policy blockages and constraints and unlock new generation in the electricity sector.

A notable highlight has been the issuing of the first tender to procure 200 MW from IPPs within the City's electricity supply area. The City has also issued a tender for the engineering, procurement and construction

of a planned 7 MW Atlantis solar photovoltaic (PV) plant, but this has elicited less interest from the market despite a large number of parties registering for tender documents. However, a strong team continues to systematically tackle the many procurement, regulatory and technical challenges to expanding renewable energy supply at scale, exploring different options.

A three-year 25 c/kWh incentive on the feed-in (export) tariff for SSEG customers aims to stimulate the installation industry and the energy resilience of small businesses in particular. The City has in the meantime issued tenders for SSEG plants at three of its own sites, totalling 1,56 MW. Wheeling contracts require data protocols to be in place and the City chaired the technical committee that developed NRS 049 Part 5–2: 'Automatic exchange of formal metering information between systems' to support an extensive wheeling pilot that includes 25 generators, 40 customers and a proposed total of 355 MW to be wheeled.

The roll-out of City campaigns aimed at promoting energy efficiency, such as the Electricity Savings Campaign and the Energy Water and Waste Forum have also continued – these are detailed in reporting on strategic focus area 8 (Buildings) and cross-cutting work area 4 (Communication). Efforts to strengthen the City's energy planning work during the reporting year include a number of data-related projects, including the completion of Electricity Pathways for Cape Town study, which modelled an optimal electricity supply mix for Cape Town in three scenarios and compared that to a 'business as usual' scenario of continued reliance on Eskom. A process to develop a City of Cape Town Energy Strategy to guide decision-making for the future energy system in Cape Town also commenced over the past year, with the first draft expected to go out for public comment in the first quarter of 2022/23.

A notable highlight has been the issuing of the first tender to procure 200 MW from IPPs within the City's electricity supply area.

Load-shedding is accelerating private and public investment in local generation and storage. Continued load-shedding of the severity seen recently may even lead to embedded renewables with capacity approaching the minimum system load and supported by utility-scale storage in the near to medium future. This variable renewable energy resource combined with the surpluses from wheeling contracts and rapidly increasing SSEG are one of the factors driving the need for the transition of the utility to a distribution system operator (DSO), supplied directly by transmission grid connections and embedded generation. This DSO will undertake local grid management, optimising supply and demand balance including efficient utilisation of renewables, peak demand and ramp management and other ancillary services on the local grid. This has led to much effort and investment in an advanced distribution management system (ADMS) and the highly detailed GIS-linked asset master data required to support it.

The City is investing in advanced distribution management systems in response to the changing energy system.

PROGRESS INDICATORS

GOAL 12: Move as quickly as prices and opportunities allow towards 100% clean electricity supply by 2050				
Medium-term outcome	Indicator name	Baseline	Target	Update as of 30 June 2022
More accessible and affordable clean energy that constitutes an increasing share of the City's electricity supply	Share of City-enabled renewable energy of the total electrical energy supplied to the City's distribution grid	0,08% (2020)	7% (2030)	0,08% (2020)*

GOAL 13: Get technologically and commercially ready to operate the metropolitan distribution grid of the future			
Medium-term outcome	Indicator name	Target	Update as of 30 June 2022
Increased resilience of the City's electricity utility business while maintaining grid reliability in the face of transitioning disruption	Total capacity of approved, grid-tied and commissioned SSEG installations	60,7 MVA (total end 2020/21)	80,2 MVA

GOAL 14: Minimise the economic cost of energy transition through maximising energy efficiency and developing a regional value chain for carbon-neutral molecular fuels				
Medium-term outcome	Indicator name	Baseline	Target	Update as of 30 June 2022
More energy-efficient Cape Town economy that enables energy data transparency and carbon-neutral products	Electricity intensity of the city's economic output	19,7 kWh electricity supplied/thou (2021 ZAR real GDP 2018)	15 (2030)	19,7 kWh electricity supplied/thou (2021 ZAR real GDP 2018)*
	Number of energy data sets on City's Open Data Portal	16 (2022)	30 (2025)	16*

** Baseline data provided as progress as this reporting is happening in same year that the indicator was developed. To be updated 2022/23.*

STRATEGIC FOCUS AREA 8: ZERO-EMISSION BUILDINGS AND PRECINCTS

OVERVIEW

The use of energy across commercial, municipal and residential buildings makes up the largest total contribution to GHG emissions in Cape Town. The City is committed to accelerating transformative climate action in the built environment – demonstrated through the net-zero carbon buildings targets embedded in the Climate Change Strategy and Action Plan. These commitments require net-zero carbon performance for all new buildings on a citywide basis by 2030 and the pursuit of net-zero carbon for all existing buildings by 2050. To lead by example, the City has also committed to ensuring that – for its own operations – all new facilities are net-zero carbon in operation by 2030, and – to the extent that this is possible – to achieve the same for existing facilities.

Reporting on strategic focus area covers three goals:

- GOAL 15: All new buildings (residential, commercial and municipal) to be net-zero carbon by 2030
- GOAL 16: All existing residential and commercial buildings to be retrofitted with energy-efficient technologies to be net-zero carbon in operation by 2050
- GOAL 17: All existing municipal buildings (excluding industrial plants) to be net-zero carbon by 2030

PROGRESS DURING 2021/22

Key developments in pursuing net-zero carbon private buildings include the promulgation of edition 2 of SANS 10400-XA, which increases the energy efficiency ambition of national building regulations. This shifts the focus away from the need for city-specific regulations and towards supporting compliance with greater ambition in the national regulations. The City has a number of projects planned that are linked to training in the new SANS 10400-XA standard as well as a compliance study to understand the current level of compliance with national building regulations and to determine where further input is required to enable more efficient buildings.

A draft roadmap for new buildings has been developed. This roadmap include the energy use intensity (EUI) values that must be met for different building typologies in order to reach the net-zero carbon objectives by 2030. It also seeks to understand what mechanisms can be used to monitor and track progress towards net-zero carbon targets.

There is continued support of technical assistance to internal City departments on new building and precinct projects regarding how these can incorporate net-zero carbon principles. In terms of low-income communities, engagements with stakeholders in the state-subsidised housing value chain have commenced to improve the climate resilience and energy efficiency of state-subsidised housing. There is also an increasingly strong focus on the development of social housing in close proximity to transport nodes.

The City continues to engage with property and energy market stakeholders and has implemented various awareness-raising initiatives during the reporting year, including the ongoing hosting of the Energy, Water and Waste (EWW) Forum events, activations of My Clean Green Home, the redesign of the Let's ACT at

Home exhibition at the Cape Town Building Centre, the promotion of the Smart Home Disclosure form via the creation of an interactive digital checklist, the creation and dissemination of Smart Office posters, SSEG information booklets and much more.

In the municipal buildings space, the City continues to implement energy efficiency retrofits and has expanded the scope to include lighting systems and split-unit air conditioning systems. Energy audits are ongoing and SmartFacility continues to be utilised for building performance monitoring and management.

A key focus area of the municipal buildings programme over the reporting year is the City's work towards achieving Energy Performance Certificates (EPCs) – a new national building regulation which requires public buildings that meet the criteria (certain occupancies and larger than 1 000 m^2) to have an EPC publicly displayed. The City of Cape Town is leading the country in EPC compliance by holding the most EPCs (25) for any public or private property portfolio and has been involved in a number of knowledge-sharing platforms to empower other municipalities to learn from its experience. EPCs are an important stepping stone towards the goal of net-zero carbon buildings because they pave the way for data collection and benchmarking.

Furthermore, a 'Roadmap for Net Zero Carbon Municipal Buildings by 2030' was completed and significant work is under way in developing City-owned renewable generation projects to offset the City's operations (see SFA 7 for more detail) and procuring embedded solar PV for municipal buildings. Currently, the City is also involved in a number of external assistance programmes to support the municipal net-zero carbon programme. This includes a feasibility study to expand the current building energy efficiency programme, and C40 CFF support for a technical feasibility study for the development of a solar PV plant in Paardevlei, Somerset West, which could yield 30–60 MW of renewable energy generation capacity.

The promulgation of the new SANS 10400-XA energy efficiency standard has shifted the need for city-specific regulations to supporting compliance.

PROGRESS INDICATORS

GOAL 15: All new buildings (residential, commercial and municipal) to be net-zero carbon by 2030			
Medium-term outcome	Indicator name	Baseline	Update as of 30 June 2022
All new buildings (residential, commercial) are designed and constructed to be net-zero carbon by 2030	Percentage of City of Cape Town building control officers, planners and examiners trained and capacitated on the SANS 10400: XA (2021) 2nd edition regulations	New indicator	0% (RFQ being developed post-June 2022)
	Improving data collection of building energy efficiency	New indicator	Investigations into data availability under way

GOAL 16: All existing residential and commercial buildings to be retrofitted with energy-efficient technologies to be net-zero carbon in operation by 2050			
Medium-term outcome	Indicator name	Baseline	Update as of 30 June 2022
More enabled residential and commercial sectors to achieve net-zero carbon building compliance through incentives, guidelines and disclosure	Total number of approved grid-tied installations commissioned (legalised) for the residential and commercial sectors	1 698 (residential = 1 349, commercial = 349)	2 487 (residential = 2 033, commercial =453)

GOAL 17: All existing municipal buildings (excluding industrial plants) to be net-zero carbon by 2030				
Medium-term outcome	Indicator name	Baseline	Target	Update as of 30 June 2022
All existing and new municipal buildings (excluding industrial plants and utilities) are retrofitted or designed and constructed to be net-zero carbon by 2030	Annual measured and verified electricity savings from energy efficiency projects in municipal operations	2020/21 savings target serves as baseline: 1 200 000 kWh	Savings target 2021/22: 1 600 000 kWh	1 625 270 kWh
	Share of zero-carbon electrical energy used by City-owned or -leased buildings for public sector service and administrative function purposes	1%	100% (2030)	1%

STRATEGIC FOCUS AREA 9: MOBILITY FOR QUALITY OF LIFE AND LIVELIHOODS

OVERVIEW

In recent years, the transport sector has consumed roughly half of the total energy used in Cape Town. Fossil fuels used by internal combustion engines are the second biggest source of the city's emissions (after electricity consumption), contributing significantly to Cape Town's carbon footprint and local air pollution. It is also a net drain on the economy and exposes the local economy to volatile crude oil prices. The goals within this strategic focus areas focus on achieving a system of mobility in Cape Town that is not only carbon neutral but also enables an improved quality of life and livelihoods.

Reporting on this strategic focus area covers the following four goals:

- GOAL 18: Through the City's role as the transport planning authority as well as the contracting authority for bus rapid transport (BRT) services, support the restoration, rehabilitation and expansion of the rail system to a carrying capacity of 30% above 2010 levels by 2030, and put in place a contingency for alternative mass transit infrastructure in the event that the rail system does not recover or ceases to be functional altogether
- GOAL 19: Integrate transport modes to improve efficiency and fast-track a modal shift from passenger kilometres by private vehicles to other modes (decreasing from 58% in 2016 to 23% in 2050)
- GOAL 20: Prepare for a scenario of complete transition to electric or alternative fuel-powered freight, bus, taxi and passenger vehicles by 2050
- GOAL 21: Develop and maintain indicators for greenhouse gases and local air pollutants from the transport sector, both citywide and for city operations, ensuring that they inform City transport planning, procurement and regulation

PROGRESS DURING 2021/22

During the year in review, the City embarked on a process to update its Comprehensive Integrated Transport Plan (CITP). The new CITP 2023–2028 sets out the plan towards the delivery of an integrated, intermodal and interoperable transport system and its related road and rail network. The plan, anticipated to be adopted in 2023, aligns with the City's new IDP and the MSDF.

The update of the Integrated Public Transport Network (IPTN) 2032 Plan is also under way and a number of IPTN sensitivity scenarios were run through the City's transport model in 2021. The new approach embraces critical uncertainties, including future scenarios where the provision of rail does not occur with other modes addressing travel needs. The IPTN review also intends to include a more explicit focus on the importance of non-motorised transport (NMT). The implementation plan will consider incrementalism and approaches for incrementally increasing public transport efficiencies. Meanwhile, in the context of the ongoing sharp decline of passenger rail in Cape Town (and across South Africa), the City continues to explore the devolution of the rail service. A project is under way to investigate the feasibility, risk and implications of the urban passenger rail function as part of the City's public transport function. A professional service provider for this work was appointed during the reporting year.

The City is undertaking feasibility study work on on alternate energy and zero-emission bus technologies to help inform future MyCiTi fleet procurement decisions.

Congestion management-related work in 2021 included a project to identify road sections where public transport users are affected most by congestion and to identify associated improvement interventions. The study identified and prioritised 40 locations across the city, and further prioritised 11 public transport priority locations.

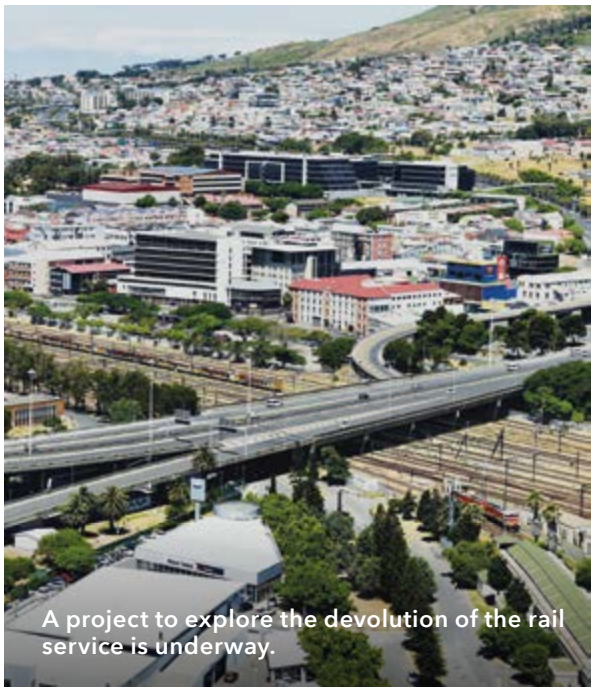
Strategic planning and implementation of the NMT implementation programme is ongoing and infrastructure projects in progress or completed in the 2021/22 reporting year include NMT facilities in Grassy Park and the Cape Town central business district as well as pedestrianisation facilities in various low-income areas. The Universal Design Access Plan (UDAP) was completed in January 2022 following an extensive review and update of the previous 2013 UDAP.

Owing to the initial Covid-19 lockdown and later the range of alert levels, the City's Flexible Working Programme was superseded by the 'Future of Work' (FoW) Programme which recognises that the way in which people work is evolving. Shifts in the working arrangements that occurred during the pandemic are likely to have lasting effects. Accordingly, internal reporting is now done against the FoW Programme. As part of this programme, remote and hybrid working guidelines were drafted for the City as an organisation, and the intention is to engage other large organisations to encourage the promotion of similar programmes citywide.

The City's planning and enabling work in transitioning to electric or alternative fuel-powered transport has steadily progressed over the reporting year. The City's Public Transport Department undertook a feasibility study on alternate energy and zero-emission bus technologies to assist the City with future fleet procurement decisions regarding MyCiTi buses. The report's main recommended option is electric buses and an inter-directorate study is currently being undertaken to determine the financial cost implications, infrastructure requirements, phasing-in approach, most appropriate funding model and specifications of battery electric buses. In parallel, the City's corporate fleet Electric Vehicle (EV) Pilot Programme, coordinated by the Fleet Management Department, is ongoing. The Sustainable Energy Markets Department also continues to collect and monitor the data of the two solar-powered public EV charging stations at municipal buildings. The stations employ the City's web-based SmartFacility data application/dashboard to collect data on charger use and customer behaviour, and to track and show the system's energy consumption in near real time.

The City, in collaboration with GreenCape as the EV task team secretariat, has continued its citywide EV uptake-enabling activities. This included the convening of four EV task team sessions to discuss topics of interest related to the barriers and opportunities for the uptake of EVs in Cape Town. A synthesis report was developed on the outcomes of these engagements, including recommendations and next steps towards the development of policy or pilot projects which could unlock jobs and investment in the electric mobility industry. The City has completed its first draft of the EV Framework for further engagement.

Finally, transport emission data management and improvement highlights include the completion of a three-year pilot to calculate the relevant emissions for three directorates, including the Urban Mobility Directorate. The directorate is planning to initiate a scoping process on the integration of the Enterprise Performance and Carbon Management (EPCAM) carbon footprint model with other City's data models, in close collaboration with key stakeholders.



A project to explore the devolution of the rail service is underway.

EV charging monitoring.

Strategic planning and implementation of the NMT implementation programme is ongoing.

PROGRESS INDICATORS

GOAL 18: Through the City's role as the transport planning authority as well as the contracting authority for bus rapid transport (BRT) services, support the restoration, rehabilitation and expansion of the rail system to a carrying capacity of 30% above 2010 levels by 2030, and put in place a contingency for alternative mass transit infrastructure in the event that the rail system does not recover or ceases to be functional altogether				
Medium-term outcome	Indicator name	Baseline	Target	Update as of 30 June 2022
Rail system carrying capacity restored to 30% above 2010 levels by 2030 and contingency plans for alternative mass transit infrastructure developed	Modal split between private, public transport and walking by main mode to work	58% : 33% : 9%	N/A	58% : 33% : 9%
	Provision of professional services to undertake an investigation enabling the City of Cape Town to support the restoration and sustainability of passenger rail services that align with the City's Comprehensive Integrated Transport Plan	New indicator in SDBIP	Phase 2: Baseline assessment of the City's rail system – 60% complete (2022/23)	The MOA for this contract was signed by both parties and the service provider was appointed

GOAL 19: Integrate transport modes to improve efficiency and fast-track a modal shift from passenger kilometres by private vehicles to other modes (decreasing from 58% in 2016 to 23% in 2050)			
Medium-term outcome	Indicator name	Baseline	Update as of 30 June 2022
Public transport share (including NMT) is maintained or increased	Modal split between private, public transport and NMT by main mode (weighted average of work and education combined)	45% : 29% : 26%	45% : 29% : 26%
	Length of NMT paths built*	29,8 km (2020/21)	22,4 km

** The number of NMT km constructed is derived from the sum of the lengths of the footways, cycle paths and shared facilities to be constructed, measured in terms of actual progress reported on the latest approved construction programmes.*

GOAL 20: Prepare for a scenario of complete transition to electric or alternative fuel-powered freight, bus, taxi and passenger vehicles by 2050				
Medium-term outcome	Indicator name	Baseline	Target	Update as of 30 June 2022
Increased proportion of electric or alternative fuel-powered freight, bus, taxi, City fleet and passenger vehicles	Percentage of MyCiTi fleet which is low emissions*	0%	N/A	0%
	Number of multi-stakeholder engagements to grow the eMobility ecosystem in the Western Cape	3 per annum	3 per annum	4

GOAL 21: Develop and maintain indicators for greenhouse gases and local air pollutants from the transport sector, both citywide and for city operations, ensuring that they inform City transport planning, procurement and regulation			
Medium-term outcome	Indicator name	Baseline	Update as of 30 June 2022
Improved climate change and air quality metrics for the transport sector are developed and adopted	Climate change and air quality metrics for the transport sector developed (qualitative)*	New indicator	Carbon footprint developed as follows: 2018 = 35 220 tCO_2e 2019 = 36 306 tCO_2e 2020 = 29 948 tCO_2e

** This indicator assesses if a baseline carbon footprint measurement assessment and action plan for the Urban Mobility Directorate has been produced, updated and integrated, and if an environmental index (including air quality) has been developed to supplement the UDI.*

STRATEGIC FOCUS AREA 10: CIRCULAR WASTE ECONOMY

OVERVIEW

The City recognises that landfilled organic waste is not only a contaminant of other potentially recoverable materials in the waste system, but is also a major source of methane emissions in Cape Town. This has historically resulted in the waste sector being responsible for 10–11% of Cape Town's citywide GHG emissions. Furthermore, the organic waste resulting in this GHG contribution needs to be considered as part of the larger transition to a circular waste economy as a shared responsibility and in conjunction with supporting measures to reduce the disposal of any material to landfill. Many of the actions within this strategic focus area aim to increase the understanding of the costs and benefits of – and resources required for – this transition, and to strengthen the evidence base and technical capacity.

Reporting on this strategic focus area covers four goals focused on gaining economic benefits from waste and reducing its environmental impact:

- GOAL 22: Develop and implement an integrated waste management strategy that is financially feasible, and maximises material efficiency by prioritising waste avoidance, reduction, treatment and recycling in line with national targets
- GOAL 23: Reduce organic waste disposal to landfill (in line with Provincial Integrated Waste Management Plan targets) by 50% by 2022 and 100% from 2027 through better waste separation, treatment and utilisation
- GOAL 24: Increase diversion of recyclables from disposal to landfill by 40% by 2025, 55% by 2030, >70% by 2035 and 85% by 2050 through improved collection, waste separation and providing support to informal workers
- GOAL 25: Reduce the climate and environmental impact of waste disposal and wastewater treatment facilities by increasing biogas and landfill gas collection efficiency, treatment and utilisation

Actions are under way to work towards increased diversion of recyclables from landfill.

PROGRESS DURING 2021/22

The City has already made some inroads in addressing emissions from this sector, with plans to invest in landfill gas capture and methane flaring at landfills, and various organic waste diversion pilots and programmes are under way. The diversion of organic waste in the Cape Town context is challenging as organic waste generation is not adequately mitigated by efficiency-based interventions as, for example, in the energy sector, and will therefore grow directly in proportion to the population. Achieving these goals, aligned with stringent national and ambitious provincial diversion targets, will require partnering with communities, business and the private sector and the acceleration of various programmes. At a planning and policy level, the City's new Integrated Waste Management Plan (2022/23–2026/27) was adopted by Council in April 2022 and a Waste Strategy development process is under way.

During the year in review, various pieces of circular economy planning work commenced in collaboration with GreenCape. A Circular City Waste Scan was conducted for the Urban Waste Management Directorate, which included a waste materials flow baseline and a comprehensive list of waste and materials-related activities to consider. A project is under way to explore the unlocking of opportunities for the beneficiation of organic waste in Cape Town through innovative organic waste beneficiation technologies. Work under the Western Cape Industrial Symbiosis Programme (WISP) has continued, which included a 'Business Opportunity Workshop'.

The City has a number of programmes and pilots towards increased organic waste diversion, including the roll-out of home composting containers.

Landfill gas infrastructure has been installed at the Bellville, Coastal Park (photo) and Vissershok landfill sites.

The City has also initiated a number of programmes and pilots towards increased organic waste diversion. These include the following:

- A process to require all businesses in Cape Town in the hospitality, food manufacturing and food processing industries to update their integrated waste management plans to reflect how they will reduce organic waste, as per the provincial targets
- Garden waste drop-off sites and chipping/composting thereof for reuse by private business
- Rolling out home composting containers (28 500 to date) to residents across the city, free of charge
- Investigating various ways to work with informal traders to separate and compost their food waste, with trials already implemented
- The development of a waste recyclers map showing the location and contact details of private drop-off sites and organic waste collectors operating in Cape Town

Activities linked to the communication and marketing of a future Circular Economy Action Plan (currently still in the conceptual phase) is longer term in nature. Various waste-related awareness-raising programmes and clean-up activities are, however, ongoing, including clean-up campaigns, drop-off and community exhibitions, collaboration with the My Clean Green Home activations, accredited training on waste to business and the ongoing production of online published postings and booklets.

Work is also ongoing towards improving the waste management evidence base. An online application system has been implemented by the City for the accreditation of waste service providers and generators, and the continuous improvement of systems and processes to enhance solid waste diversion and disposal data management and reporting is under way.

The City is in the process of planning and designing additional materials recovery facilities, which will enable larger scale expansion and participation in the Think Twice dry waste collection service by residents. The Think Twice programme is now offered to over 190 0000 service points across Cape Town and diverts over 30 000 ton of recyclables from landfills every year.

There is currently no official programme active for the collection of textile and fabric waste for recovery. A proposal to address reporting on this specific waste category stream is the subject of future investigation. The segregation of recyclables and organics and collection at municipal buildings and facilities also requires further engagement to establish appropriate institutional structures and mechanisms for this work as the action relies on the buy-in of multiple departments.

Landfill gas infrastructure has been installed at the Bellville, Coastal Park and Vissershok landfill sites. Currently the landfill gas is being flared and is generating carbon credits as a registered Clean Development Mechanism project under the Programme of Activities (PoA). Work has continued during 2021/22 on the development of biosolids beneficiation facilities (BBFs). The detail design of the Southern BBF (to be located at the Cape Flats wastewater treatment works) is in the process of being amended and split into two phases for implementation to ease budget constraints.

PROGRESS INDICATORS

GOAL 22: Develop and implement an integrated waste management strategy that is financially feasible, and maximises material efficiency by prioritising waste avoidance, reduction, treatment and recycling in line with national targets			
Medium-term outcome	Indicator name	Baseline	Update as of 30 June 2022
Improved integrated waste management planning and implementation in line with national targets through the development of planning and financial mechanisms based on an improved evidence base	Finalisation of a new City of Cape Town Waste Strategy and annual reporting*	New indicator	Waste Strategy development at 50% (draft framework and action plans)

** This indicator measures the percentage completion of the City of Cape Town Waste Strategy, and annual reporting.*

GOAL 23: Reduce organic waste disposal to landfill (in line with Provincial Integrated Waste Management Plan targets) by 50% by 2022 and 100% from 2027 through better waste separation, treatment and utilisation			
Medium-term outcome	Indicator name	Baseline	Update as of 30 June 2022
Reduced organic waste disposal to landfill in line with relevant provincial and national targets	Organic waste diverted by City programmes as a percentage of organic waste the City handles	26% (excluding wastewater sludge) 42% (including wastewater sludge)	26% (excluding wastewater sludge) 42% (including wastewater sludge)

GOAL 24: Increase diversion of recyclables from disposal to landfill to 40% by 2025, 55% by 2030, >70% by 2035 and 85% by 2050 through improved collection, waste separation and providing support to informal workers*				
Medium-term outcome	Indicator name	Baseline	Target	Update as of 30 June 2022
Increased diversion of recyclables from disposal to landfill through improved collection, waste separation and support to informal workers	Percentage of waste diverted from landfill sites through Council waste-minimisation initiatives	21,34% (362 371 ton) ☑ Organics = 104 535 ☑ Builders' rubble reused = 222 094 ☑ Builders' rubble stockpiled = 434 411 (still to be reused)	14,9% (2022/23)	21,34% (362 371 ton) ☑ Organics = 104 535 ☑ Builders' rubble reused = 222 094 ☑ Builders' rubble stockpiled = 434 411 (still to be reused)

** For the purposes of this goal, 'recyclables' refer to any waste stream that can be diverted from landfill for beneficiation in the economy, including recyclable packaging, organic waste and builders' rubble.*

GOAL 25: Reduce the climate and environmental impact of waste disposal and wastewater treatment facilities by increasing biogas and landfill gas collection efficiency, treatment and utilisation			
Medium-term outcome	Indicator name	Baseline	Update as of 30 June 2022
Increased biogas and landfill gas collection, efficiency, treatment and utilisation	Landfill methane destruction (flaring and waste to energy consumption)	New indicator	361 287 tCO_2eq for Coastal Park landfill 78 139 tCO_2eq for Bellville landfill
	Number of BFFs installations online	0 BBFs	0 BBFs are currently online as the programme is still in the design phase

CROSS-CUTTING WORK AREA 1: MAINSTREAMING, GOVERNANCE, RESEARCH AND KNOWLEDGE MANAGEMENT

OVERVIEW

Mainstreaming is essential in order to make sure the City's climate change response is not seen as the responsibility of only one or two departments, but rather becomes a shared responsibility across all City departments and functions and is integrated into all relevant strategies, policies and plans.

Reporting on this cross-cutting work area covers two goals:

- GOAL 26: Mainstream climate change responses into key City strategies, policies, processes and plans
- GOAL 27: Conduct and commission climate change-related research and ensure that the City remains up to date with emerging research in the field

PROGRESS DURING 2021/22

During 2021/22, various pieces of work were conducted that contributed towards mainstreaming climate change response to both the City's operations and the City's strategic planning work. The most significant of these is the climate resilience assessment of the City's three-year capital project portfolio, undertaken by GreenCape on behalf of the City, with the support of funding from UK PACT. This assessment examined the capital project portfolio in order to identify projects which are proactively creating resilience through their implementation. In doing so, the assessment also identified gaps in the capital project portfolio where climate resilience projects were lacking and where further project development is required so as to address these challenges.

The outcomes of this project include the development of a methodology to run a similar assessment process on an annual basis and the development of a handbook to assist project managers with tagging resilience projects using the screening mechanism that was previously included in the SAP project and portfolio management interface. Ultimately, the results of this assessment and future assessments will be used to inform the City's sector planning process and to ensure that climate change response is integrated into this, as well as to further develop a pipeline of proactive climate change response projects.

Work has also continued on mainstreaming climate change considerations into City policy processes. Since the approval of the CCAP, a number of policy instruments have incorporated climate change considerations as part of the development process. These include the Sector Plan Standard Operating Procedure (SOP), the City's Recreational Vleis SOP, Energy Strategy, Community Fire Safety By-law (review), CITP (review), Air Quality Management Plan Policy (review), Free Basic Alternative Energy Subsidy Policy, Environmental Strategy (review), Cultural Heritage Strategy (review), and Floodplain and River Corridor Management Policy (review).

Climate change-related research remains an important focus area for the City. In order to more effectively manage the City's approach to climate change research, a research pipeline is currently under development which will identify key knowledge gaps and design a systematic approach to addressing these. At the same time, work has been initiated to develop an online library of all existing climate change-related research so as to avoid the duplication of effort as well and to ensure that knowledge products are more effectively disseminated. The Knowledge Transfer Programme (KTP) continues to be implemented in partnership with the UCT African for Cities and a memorandum of agreement for 2021–2024 has been signed. The City has also recently signed framework agreements with all four universities in the greater Cape Town area and surrounds (CPUT, SU, UCT and UWC), covering the period 2022–2025. Initial discussions and the preparation of Annual Programmes of Action and Themes are under way, to be confirmed in 2023, and will likely include climate change-related topics.

Incorporating innovation into climate change response remains an important work area. The Future Cities Dialogue series – which covers a range of future-focused topics, including climate change – moved to an online-only series of events in 2020, whereas in 2021 hybrid options were made available. As of 2022, the series has resumed in-person engagements. A series of 'Futurecasting' webinars was also held in 2021/22, facilitated by the Western Cape Economic Development Partnership (EDP). The series covers a range of future-focused topics, including climate change, and in 2021/22 included webinars on risk and insurance, mental health, heatwaves, building resilience at different scales and flood preparedness.

During 2021/22, work continued on implementation of activities to enhance the City's climate change data management approach. This includes the development and costing of a SmartFacility expansion proposal which has been included in the national Department of Science and Innovation's VVISDP (Viability and Validation of Innovations for Service Delivery) programme. The data for the State of Energy and Carbon 2021 were shared on the City's Open Data Portal (ODP), and a summary set of energy and carbon data commonly requested by partners, DFIs and advocacy groups is being prepared for display on a public website and the ODP. During the reporting period, work was also ongoing to improve the quality and systematic collection of data supporting the City's annual CDP submission. Finally, the load-shedding mitigation programme is driving a significant amount of electricity system analysis that will ultimately support the decarbonisation of the local electricity system.

PROGRESS INDICATORS

GOAL 26: Mainstream climate change responses into key City strategies, policies, processes and plans			
Medium-term outcome	Indicator name	Baseline	Update as of 30 June 2022
Climate change response is mainstreamed into key City strategies, policies, processes and plans	Extent to which climate change response is mainstreamed into the City's Project Portfolio Management (PPM) process	Climate change adaptation/resilience considerations have been included in the City's PPM process as a screening item	A resilience assessment of the City's capital project portfolio has been carried out. The results of this assessment will inform future mainstreaming processes

GOAL 27: Conduct and commission climate change-related research and ensure that the City remains up to date with emerging research in the field			
Medium-term outcome	Indicator name	Baseline	Update as of 30 June 2022
Climate change-related research is commissioned and conducted and the City remains up to date with emerging research	Percentage of city areas for which a climate change hazard, vulnerability and risk assessment has been undertaken within the past five years	100%	100%

CROSS-CUTTING WORK AREA 2: ECONOMIC IMPACTS AND GREEN ECONOMY OPPORTUNITIES

OVERVIEW

Climate change threatens to stagnate both local and global economic growth and development through the impacts on international market competitiveness and the socioeconomic impacts of climate risks. Economic growth, especially in developing countries, therefore needs to shift to economic activities that prioritise a low-carbon and resource-efficient approach in addition to resilient economic systems.

Reporting on this cross-cutting work area covers two goals:

- GOAL 28: Advance the local green products and services market, and reduce the risks of climate impacts on local economic development
- GOAL 29: Support the development of climate-resilient and carbon-neutral green economy through City operations

PROGRESS DURING 2021/22

Progress towards developing Cape Town's green economy continued during the reporting year through the implementation of activities focused on internal supply chain management processes and decision-making, facilitating investments in the local green economy and capacity-building opportunities. The City has committed to prioritising green procurement in its operations and capital projects in an effort to use its buying power to develop the local green economy. The Green Procurement Action Plan was adopted in 2020 and the City has continued to develop the priority short-term deliverables of the action plan during the reporting year. These included the development of a set of sustainable design principles for greening large capital projects, and a series of successful green procurement projects and case studies of successful green procurement projects and tenders as part of prioritising communication. In addition, the City's Supply Chain Management Policy makes provision for green procurement decision-making. The policy guidelines were strengthened through a detailed commenting process during the review of the policy to ensure the additional incorporation of green procurement.

The City is working towards facilitating investments in the local green economy.

The Atlantis Special Economic Zone (ASEZ) was declared a green technology SEZ in 2018, and has been a pivotal component in advancing Cape Town's green economy sector. A major achievement for the ASEZ was the recent scheduling of the Atlantis SEZ Company (ASEZCo) as a provincial business enterprise by National Treasury. This decision will broaden prospects for new investments and additional opportunities that can greatly advance the ASEZ as a local and international green technology investment destination of choice.

GreenCape serves as one of the City's special purpose vehicles, and is actively involved in the International Cleantech Network (ICN), which is a global network of clean technology organisations working towards the acceleration of clean technologies through project collaboration and internationalisation. GreenCape's CEO was elected as chair of the ICN, thereby creating a significant opportunity to increase Cape Town's profile as a green tech destination.

PROGRESS INDICATORS

GOAL 28: Advance the local green products and services market, and reduce the risks of climate impacts on local economic development				
Medium-term outcome	Indicator name	Baseline	Target	Update as of 30 June 2022
Economic growth is stimulated through a climate-resilient local economy and the development of local green products and services markets	Value of green tech investments facilitated/brought to Cape Town	New indicator	R600 000 000*	R194 650 000
	Number of industry events hosted	New indicator	9	19

** During 2021/22, the economy was recovering from the impacts of the Covid-19 pandemic and lockdown, and the priorities of investors were therefore not focused on investments in the green economy. However, with the positive economic shift in late 2021 and continuing into 2022, the target for 2022/23 is already being exceeded.*

GOAL 29: Support the development of a climate-resilient and carbon-neutral green economy through City operations			
Medium-term outcome	Indicator name	Baseline	Update as of 30 June 2022
A climate-resilient and carbon-neutral green economy is developed and supported through City operations	Number of job opportunities created as a result of the implementation of green job projects	New indicator	3 811

CROSS-CUTTING WORK AREA 3: BUSINESS MODELS, REVENUE AND FINANCING CLIMATE CHANGE RESPONSE

OVERVIEW

Climate finance is an important mechanism for enabling the implementation of both mitigation and adaptation programmes and projects; the finance includes loans, grant funding and technical assistance. In addition, reviewing the way that the City does business – through its revenue model and other mechanisms – may offer important opportunities for responding to the various financial risks posed by climate change.

Reporting on this cross-cutting work area covers two goals:

- GOAL 30: Investigate sources of climate finance and the use of innovative financial mechanisms to support climate change response and implement where feasible
- GOAL 31: Use financial mechanisms including business models, tariffs, investment and divestment to respond to climate change impacts and mitigation opportunities

PROGRESS DURING 2021/22

One area of important progress in 2021/22 was the formation of the new Technical Partnerships Unit in the City's Policy and Strategy Department. This unit is responsible for coordinating technical assistance offered by funding partners, including international climate finance partners, and coordinating climate response-related grant funding.

In the year under review, numerous key pieces of technical assistance were secured that will help to support the City's adaptation and mitigation programmes through the provision of expert advice and technical support. This technical assistance includes:

- Two projects supported by the C40 CFF and co-funded by GIZ, one focused on developing a business case for the use of green infrastructure in catchment management and the other focused on the use of renewable energy in municipal buildings.
- Support from the International Finance Corporation (IFC) on several different work packages focused on building energy efficiency, developing an IPP programme, and developing a strategy and roadmap for renewable energy accounting, pricing and promotion.
- Support from the UK Partnering for Accelerated Climate Transitions (UK PACT) programme on several different work packages focused on supporting the integration of resilience, alternative service delivery approaches, and climate change adaptation and mitigation into the implementation of the City of Cape Town's Infrastructure Planning and Delivery Framework (IPDF).
- A number of other technical assistance projects were also initiated in 2021/22, funded by a range of partners including USAID, the UK Foreign and Commonwealth Office, Resilient Cities Network, and the National Department of Science and Innovation.

The City also continued to support the divestment of financial assets from fossil fuels and investment in climate-friendly opportunities through the implementation of the City's Cash Management and Investment Policy. The policy outlines a list of prohibited investments under section 9.1 and includes prohibited investments "in instruments which consist of assets and activities whose value is realised through the release of unmitigated high levels of carbon dioxide". Fund managers contracted by the City are required to annually certify that investments are managed in accordance with this policy.

Actions related to the investigation of special rating areas as a possible mechanism for funding climate change response have been placed on hold due to the negative economic impact of the Covid-19 pandemic and associated global cost-of-living crisis. This action may be reinitiated in the future at an appropriate time.

Actions related to the use of insurance products as a mechanism for climate adaptation have also been put on hold as it has been determined that the City has largely put in place all of the measures that it is able to at this point, having contracted insurance brokers that monitor emerging risks to the City's asset portfolio. This action may be reinitiated in the future if the insurance landscape in South Africa changes and if new products become available. There is also significant scope for further integration of risk management into the City's capital project planning process, which will be taken up as part of work under CCWA 1 in the future.

PROGRESS INDICATORS

GOAL 30: Investigate sources of climate finance and the use of innovative financial mechanisms to support climate change response and implement where feasible			
Medium-term outcome	Indicator name	Baseline	Update as of 30 June 2022
Innovative financial mechanisms are implemented where feasible, and the City receives climate finance on an ongoing basis	Approximate rand value of climate change-related funding or finance received from external sources per year (incl. technical assistance, grants and loans)	New indicator	Technical assistance to the value of approximately R72,5 million was secured during the 2021/22 financial year

GOAL 31: Use financial mechanisms including business models, tariffs, investment and divestment to respond to climate change impacts and mitigation opportunities			
Medium-term outcome	Indicator name	Baseline	Update as of 30 June 2022
Financial mechanisms are in place to respond to climate change impacts and opportunities	Number of financial mechanisms in place to respond to climate change	New indicator	One financial mechanism is in place – divestment from carbon-intensive investments has been included in the City's Cash Management and Investment Policy

CROSS-CUTTING WORK AREA 4: COMMUNICATION, COLLABORATION AND SKILLS DEVELOPMENT

OVERVIEW

Collaborative climate action across sectors, governments and different stakeholder groups – including communities – is a key accelerator in progress towards global and local climate change goals. This approach is driven and strengthened by enabling the development of appropriate skills across organisations to enhance planning and implementation, and ensuring access to effective climate change related communications platforms and tools that build knowledge, create awareness and increases preparedness.

Reporting on this Cross-cutting Work Area covers three goals:

- Goal 32: Ensure that Cape Town's residents, businesses, visitors and city officials receive timely, effective and appropriate climate change education, communication and training
- Goal 33: Establish and maintain partnerships with local, regional and international organisations to support climate actions
- Goal 34: Work with national government to collaboratively reform or devolve decision-making to support inclusive climate change action

PROGRESS DURING 2021/22

The City continued to implement various climate change communication and awareness initiatives through its climate change communication campaign, 'Let's ACT. For a stronger Cape Town' and the Smart Living Campaign. The Smart Living Campaign focuses on promoting resource-efficient and sustainable behaviour change and Let's ACT serves as the City's communication tool to enable and inform Cape Town's residents, communities, businesses and organisations to take on climate action, as well as a range of other proactive resilience and sustainability measures.

The current focus of the Let's ACT campaign is on reinforcing resource-efficient behaviours relating to energy, water and waste. Initiatives implemented during the reporting year as part of Let's ACT include social media campaigns, activities focused on energy efficiency and buildings, the development of two climate change community murals and the launch of the Creative Futures Climate Change Poster Competition. Let's ACT has also been rolled out on the City's solid waste management vehicle branding as part of the mayoral clean-up campaign and 'spring clean' efforts.

Knowledge development and access for the wider public included the development of a web page to improve access to key energy-related information such as the newly developed and published guides and FAQs on load-shedding, IPP FAQ, Wheeling FAQ, an energy efficiency case study and an updated safe and legal solar PV guide. Internal knowledge products developed to contribute towards climate change-related skills development and capacity building include a climate resilience-tagging handbook for project managers, several resilience guidebooks, the integration of resilience into the City's leadership development programme and the ongoing roll-out of Smart Living Campaign training. There has also been significant progress in terms of on-the-job skills development and skills transfer for staff working on the City's GHG inventory and modelling, which has contributed to a broader base of technical skills available.

The City continued to actively participate in and collaborate on various platforms with a range of local and international stakeholders. The City's CCAP, approved in August 2021, was the product of a collaboration with C40 as part of the City's commitment under the C40 Deadline 2020 programme. The launch event of the Action Plan in October 2021 provided an opportunity to create awareness and introduce the plan to a citywide audience. It included City politicians and officials, other local governments, provincial government, NGOs and private sector organisations. In addition to the C40 Deadline 2020 programme, the City also completed its participation in the C40 South Africa Buildings Programme. Both of these programmes facilitated learning and peer-to-peer sharing with global and local C40 member cities. Other collaboration initiatives between the City and the four C40 SA metros focused on engagements on a just transition for South Africa, and included participating in the SA pilot of the C40 Global Green New Deal initiative and developing a joint paper on the draft national Just Transition Framework.

Other climate-related membership participation activities by the City included ongoing participation in the South Africa Alliance for Climate Action and in specific the ICLEI (Local Governments for Sustainability) network programmes such as the Cities with Nature Action Platform and the ICLEI Africa Urban Systems work stream.

During the reporting year, the City also worked with the Western Cape EDP to implement a project focused on stakeholder engagement processes towards the implementation of the Climate Change Strategy and Action Plan. Activities of this programme during 2021/22 included transport sector stakeholder engagements focused on the update of the CITP and two virtual Futurecasting sessions focused on flooding and the City's carbon-neutral commitment, with speakers from the City, academia and the NGO sector. In addition, planning was initiated during the reporting year to collaborate on a project with the EDP to develop a strategy for meaningful engagement with civil society organisations on the implementation of the CCAP. The project will be implemented during 2022/23.

Graphic harvest of the launch event of the City's Climate Change Action Plan in October 2021.

PROGRESS INDICATORS

GOAL 32: Ensure that Cape Town's residents, businesses, visitors and city officials receive timely, effective and appropriate climate change education, communication and training			
Medium-term outcome	Indicator name	Baseline	Update as of 30 June 2022
Cape Town's residents, businesses, visitors and City officials are informed and capacitated to implement climate action and contribute to the City's climate response	Number of climate change-related communication products developed	New indicator	Seven main initiatives (under Let's ACT climate change-related campaign): ☑ 1 social media campaign (with various posts) ☑ 3 videos ☑ 1 youth campaign ☑ 1 'My Clean Green Home' campaign (with various roll-outs/ activations) ☑ 1 update of Let's ACT at home exhibition
	Number of climate change-related events held per annum (held under CCAP banner)	New indicator	Six events: ☑ 4 Futurecasting events (climate change and mental health; heat; flooding; carbon neutrality) ☑ 2 Food Systems Working Group workshops (impacts of heat on food systems; carbon footprint of Cape Town's food basket)

GOAL 33: Establish and maintain partnerships with local, regional and international organisations to support climate actions			
Medium-term outcome	Indicator name	Baseline	Update as of 30 June 2022
Enhanced knowledge exchange and collaboration with local, regional and international organisations on climate action	This indicator assesses if a platform has been developed and activated to periodically engage external stakeholders on climate action	New indicator	Scoping for the establishment of an engagement platform is under way through a 2022/23 EDP-supported project and due at the end of the 2022/23 financial year


MY CLEAN
GREEN HOME
LET'S ACT
LET'S
ACT

CROSS-CUTTING WORK AREA 5: PROMOTE, PROTECT AND ENHANCE HUMAN AND ECOSYSTEM HEALTH

OVERVIEW

Climate change significantly affects human health and well-being through direct and indirect impacts from different shocks and stressors, such as fires, extreme heat, air and water quality, and food access and availability. The interrelationship between these different shocks and stressors and impacts calls for a cross-departmental approach to managing climate change, the environment and human health.

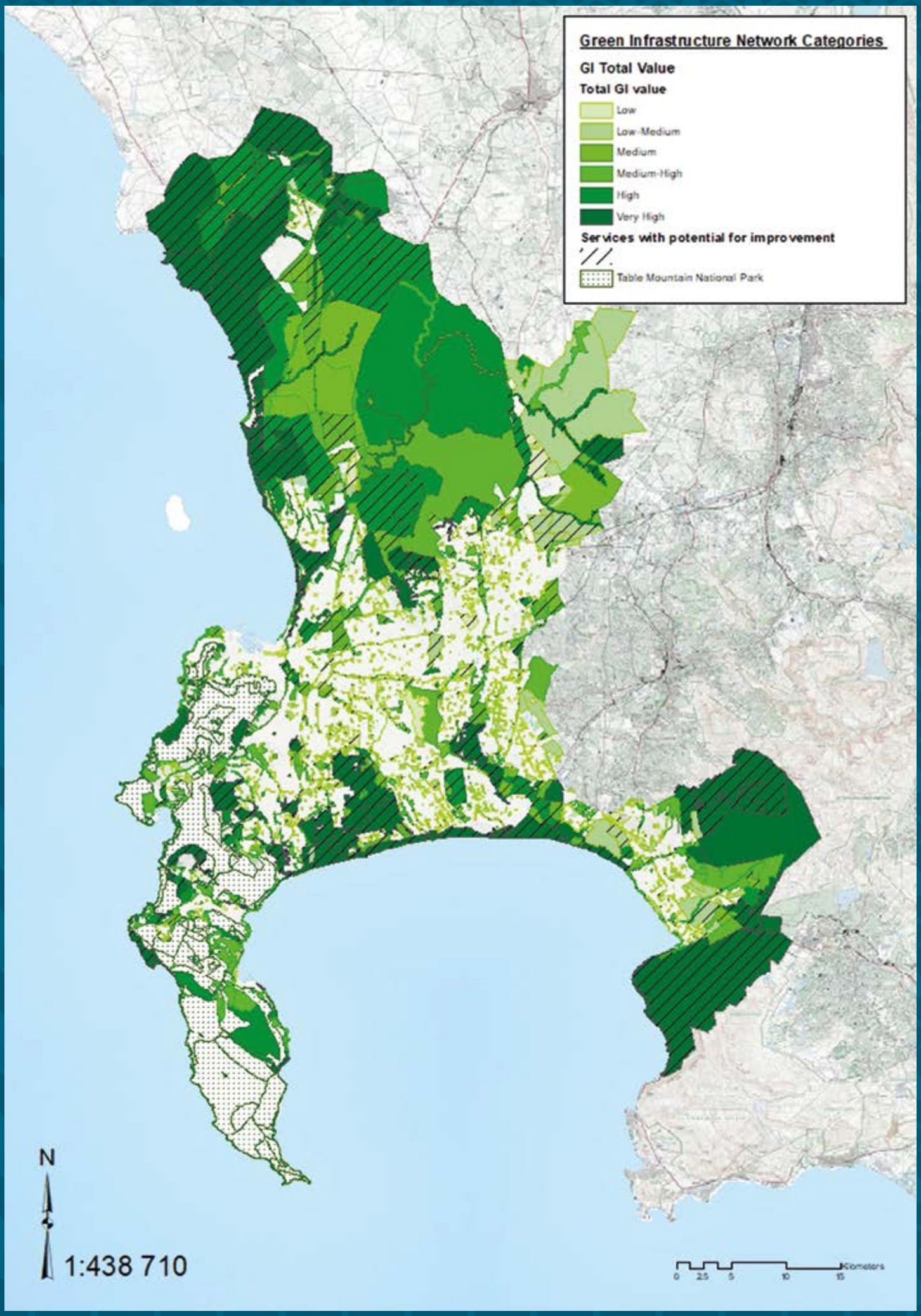
Reporting on this cross-cutting work area covers three goals:

- GOAL 35: Develop and implement a green infrastructure programme that supports climate change response, protects biodiversity, and enhances ecosystem goods and services
- GOAL 36: Ensure that physical health and mental well-being are addressed through the city's climate change response
- GOAL 37: Promote food security as well as low-carbon and climate-resilient food systems in Cape Town

PROGRESS DURING 2021/22

The City continues to protect and manage biodiversity and green open spaces to ensure the realisation of multiple benefits for human health and ecosystem goods and services. The Biodiversity Network (BioNet) is the fine-scaled systematic biodiversity plan for Cape Town. During the reporting year, and specifically during 2021, the City exceeded its BioNet protected area expansion target of 65% by 2022, which currently stands at 65,41%. Other progress during the reporting year includes the first BioNet update since 2016. The update will also include a 10 km buffer around the city to help ensure adequate buffering and connectivity of City protected areas, to protect critical ecological infrastructure neighbouring the city and to conserve threatened ecosystems and species across boundaries. Another significant addition to the BioNet are aquifer protection zones that will assist in groundwater management into the future.

The Green Infrastructure Programme is being implemented through the roll-out of various initiatives including the update of the Green Infrastructure Network (GINet) that informed the drafting of the Municipal and District Spatial Development Frameworks. Mainstreaming green infrastructure principles into the City's policy environment included the review and recommended addition of these principles to 12 existing and new policies, by-laws, strategies and frameworks. The City continues to prioritise air quality management as a response to addressing public health concerns through policy development and legislation enforcement. The City's Air Quality Management Plan (2005) is currently being updated and includes an overview of the PM10, SO2 and NO2 air quality trends between 2010 and 2021, as well as a range of specific outcomes that will contribute to the overall vision of the draft plan. These include investigating options for utilising sensor-based pollution-monitoring technology, adding private monitoring networks to the South African Air Quality Information System (SAAQIS); developing a strategy to monitor, manage and reduce atmospheric emissions; and ongoing training of staff on applicable air dispersion models.


Green Infrastructure Network Categories
GI Total Value
Total GI value
Low
Low-Medium
Medium
Medium-High
High
Very High
Services with potential for improvement
Table Mountain National Park
N
1:438 710
0 2.5 5 10 15
Kilometers

The Water Quality Improvement Programme initiated in 2021 was replaced with the Mayor's Priority Programme (MPP) during 2022. The programme is a comprehensive water quality-focused sanitation infrastructure improvement programme, and includes different work packages focusing on the pollution of waterways and water quality improvement, pump station performance, communication and partnerships, wastewater treatment capacity and upgrades, and sewer network spills and repairs.

To increase the resilience of Cape Town's food systems against various shocks and stressors, including food insecurity and climate change impacts, the City of Cape Town developed the Food Systems Programme with the aim of addressing the challenges and opportunities within Cape Town's food system. A significant development for the Food Systems Programme is its inclusion into the IDP 2022–2027 as a formalised programme; an associated two-year implementation programme is currently being developed. During the reporting year, the Food Systems Working Group continued to influence and advance work focused on critical areas related to climate change impacts and food systems. These included workshopping risks and vulnerabilities under heatwave conditions and global economic crises, convening discussions and initiating research on food's carbon footprint, food waste and the management thereof, and the calculation of AFOLU (Agriculture, Forestry and Other Land Use) emissions.

The City continues to protect and manage biodiversity and green open spaces to ensure the realisation of multiple benefits for human health and ecosystem goods and services.

Various water quality improvement work packages are being implemented.

PROGRESS INDICATORS

GOAL 35: Develop and implement a green infrastructure programme that supports climate change response, protects biodiversity, and enhances ecosystem goods and services				
Medium-term outcome	Indicator name	Baseline	Target	Update as of 30 June 2022
Improved resilience of biodiversity and ecosystem goods and services	Number of City policies and strategic documents that incorporate reference to consider green infrastructure	1	N/A	5
	Proportion of Biodiversity Priority Areas protected	64,95%	65%	65,44%

GOAL 36: Ensure that physical health and mental well-being are addressed through the City's climate change response				
Medium-term outcome	Indicator name	Baseline	Target	Update as of 30 June 2022
The City's climate change response addresses physical health and mental well-being	Percentage river and vlei samples with *E. coli* count ≤4 000 CFU/100 ml	55,5%	60%	44,4%*
	Number of days when air pollution exceeds RSA ambient air quality standards	9	68	10

** Inland water quality test results declined during 2021; however, since early 2022, improvements have been noted.*

GOAL 37: Promote food security as well as low-carbon and climate-resilient food systems in Cape Town			
Medium-term outcome	Indicator name	Baseline	Update as of 30 June 2022
Food security is enhanced and low-carbon and climate-resilient food systems are promoted in Cape Town	Number of initiatives implemented as part of the Food Systems Programme	0	9

The City has developed a Food Systems Programme to increase the resilience of Cape Town's food systems against various shocks and stressors.

CONCLUSION

This report is the first report-back on progress made towards the implementation of the CCAP. Already, significant progress has been noted in terms of the status of the 101 actions that form the core of the CCAP, with 18 actions moving into an implementation phase in 2021/22 and two actions already completed.

A significant amount of time in 2022 was dedicated to the completion of the Monitoring and Evaluation Framework for the CCAP. This was a highly consultative process that took into account the needs of departments responsible for implementation of the CCAP actions, ensuring that the framework was aligned with their existing reporting mechanisms and data availability. During this process, it was determined that some actions need to be reviewed and updated in a future version of the plan, for the following reasons:

- Some actions were written with the intent of further investigating options for implementation; however, initial work has shown that certain implementation mechanisms may not be possible or are not currently appropriate for Cape Town's context. Consequently, these actions need to be revised in order to incorporate the results of the initial investigatory work.
- Significant national policy changes have occurred in a number of areas since the CCAP was approved, most notably the energy sector. Some actions will therefore need to be revaluated and possibly reformulated in light of these policy shifts in order to ensure that they remain up to date and responsive to current conditions.
- A significant organisational realignment process has taken place since the CCAP was approved by the City Manager in August 2021. Accordingly, the lead department and supporting departments for some actions have changed and must be updated, either because certain functions have moved between departments or because departments' names have changed.

Reporting on each SFA and CCWA has provided an overall assessment of the state of implementation of that work area and has noted key successes within those work areas. However, as this is the first year of reporting, it is not possible to determine overall trends in implementation across the entire plan. As the CCAP moves into a stage of longer-term implementation, it will be possible to conduct a more detailed analysis of implementation trends and to identify gaps and areas of concern.

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