SUSTAINABLE DEVELOPMENT GOALS

Localising the Sustainable Development Goals in Windhoek, Durban and Bremen

A trilateral baseline report of selected SDGs

City of Windhoek
The Gateway to Endless Opportunities

ETHEKWINI MUNICIPALITY

Freie Hansestadt Bremen

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INTRODUCTION

Background, frame and purpose of this report

The cities of Windhoek (Namibia), Durban (South Africa), and Bremen (Germany) have engaged in trilateral exchanges on areas of shared interest, leveraging their long-standing partnerships. Bremen formalized its twinning agreement with Durban in 2011 and had an established Charter Agreement with Windhoek signed in 2000 through the two states of Namibia and Germany. In September 2024, Windhoek and Bremen elevated their cooperation by transitioning from a Charter Agreement to a Sister Cities Agreement.

Likewise, in September 2024, recognizing the synergies and mutual goals identified over years of collaboration, Windhoek and Durban formalized their partnership through a Twinning Agreement, promoting South-South cooperation. To further strengthen their collective efforts, the three cities signed a Tripartite Sister City Agreement with a focus on the implementation of the Sustainable Development Goals (SDGs) across their three cities.

Bremen has participated in the SKEW[1]-project 'Municipal Climate Partnerships' with both cities and has implemented numerous projects to improve municipal structures and adapt to climate change. At the strategic level, all three cities are committed to implementing the Sustainable Development Goals[2] (SDGs) at the municipal level and have launched their own strategies to improve living conditions in various areas. However, these strategies vary greatly from city to city, both in terms of their thematic focus and their systematic approach. Similarly, there is a lack of overarchingly defined indicators to establish comparability of the starting position with other cities. The three cities embarked on a project to prepare a trilateral report on the implementation status of the SDGs. The project was supported by Engagement Global with its Service Agency Communities in One World with funding from the Federal Ministry for Economic Cooperation and Development.

This report contains a set of indicators that all participating cities have agreed to report on to provide a baseline assessment. The report can be used to identify areas where there is a particularly high need for action. On this basis, one or more trilateral future cooperation project(s) could then be identified and implemented. Ideally, these projects will be in areas where projects have already been carried out on a bilateral level and a promising transfer of experience to the third partner can take place.

This report contains indicators related to SDG 6, SDG 11, SDG 13 and SDG 17 at a municipal level. The SDGs and indicators were selected after a series of technical workshops where all 17 goals and related indicators were discussed and prioritised within the cities. Furthermore, we added good practice examples and insights in projects in all three cities. At the beginning of every chapter, there is a description of the chosen SDG and indicators, followed by insights from Durban, Windhoek and Bremen. At the end, we discuss the content of this report, our learnings during the process and the way forward.

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[1] *Service Agency Communities in One World*

[2] *In 2015, the countries of the world agreed upon the 2030 Agenda for Sustainable Development. It consists of a total of 17 goals, the Sustainable Development Goals (SDGs).*

Durban, Windhoek and Bremen

City of Durban

Also known as eThekwini Municipality, the city is the third largest in the country. EThekwini Municipality:

- Has an area of approximately 2556km^2
- Has a Population of 4.2 million residents, which is growing daily
- Has 18 Sister City partnerships, and several more project partnerships with non-sister cities.

City of Windhoek

The City of Windhoek is the only city in the Republic of Namibia with the following attributes:

- Approximately 5,200 km² in area
- Population of 494,605 residents
- 23 international partnerships

City of Bremen

The state of Bremen consists of the two cities Bremen and Bremerhaven.

The city of Bremen has the following characteristics:

- Approximately 325 km² in area
- Population of 563,925 residents
- 8 city partnerships

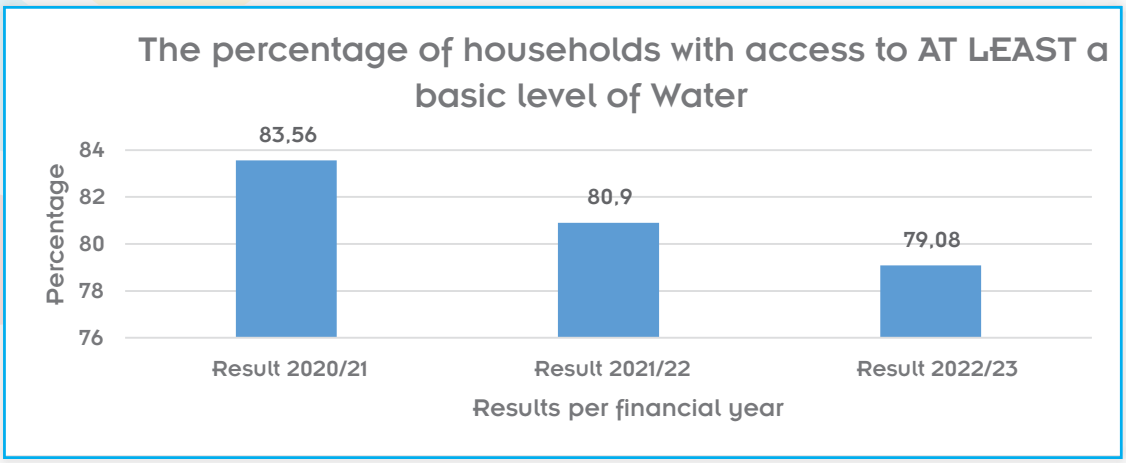
Sustainable Development Goal 6: Clean Water and Sanitation

Sustainable Development Goal 6 (SDG 6) aims to ensure the availability and sustainable management of water and sanitation for all. This goal is crucial for cities like Durban, Windhoek, and Bremen. In Durban, access to clean water and sanitation is vital for improving public health and reducing the spread of waterborne diseases in its densely populated areas. Windhoek, located in a semi-arid region, faces significant water scarcity challenges, making efficient water management and conservation essential for its sustainability and growth. Bremen, while having better access to water resources, must focus on maintaining water quality and managing wastewater to prevent pollution and protect its waterways. Achieving SDG 6 in these cities not only enhances the quality of life for their residents but also promotes environmental sustainability and resilience against climate change. Therefore, SDG 6 was selected, based on the mutual benefit of achieving the targets for the 3 cities.

CHOSEN INDICATORS

Indicator chosen	The percentage of households with access to at least a basic level of Water	The percentage of potable water samples that are compliant with national potable water standards	The percentage of households with access to at least a basic level of Sanitation
Definition	Percentage of households with access to basic water supply, defined as the household's main source of drinking water is piped (tap) water inside dwelling/house, piped (tap) water inside yard, and/or piped water to a community stand: <200 m.	The percentage of water samples measured that comply with potable water standards over a 12-month period for the defined parameters. Various tests are involved with associated standard limits for application.	Percentage of households accessing ("using") a toilet facility that meets minimum standards for basic sanitation out of all households within the municipality. Minimum standards are currently defined as either a flush toilet (sewerage system) and/or flush toilet (septic tank), and/or a pit toilet connected to ventilation (VIP).

The percentage of households with access to at least a basic level of Water



Source: eThekwini Municipality Annual Report (2020/2021-2022/2023)

In eThekwini Municipality, the minimum standards for water supply are guided by national norms and standards set by the Department of Water and Sanitation. These standards ensure that all residents have access to a basic level of water supply through a connection to their house, in their yard or a communal tap within 200m of their house. This is designed to meet essential needs such as drinking, cooking, and hygiene. Within eThekwini Municipality, indigent househlds with their own connection receive 6kl of free water per month as part of the free basic service package. When assessing water and sanitation delivery to households, it is important to consider the context. Progress updates use the total number of households and total number of indigent households in the municipality as the basis for calculations. Migration into the municipality in recent years has resulted in a substantial increase in both total households and total indigent households (Stats SA General Household Survey 2019 – 2022). However, annual delivery remained steady or declined due to financial constraints. With the annual update of the household and indigent household count, the annual percentages cannot be used to reflect a trend unless compared with the household count and indigent household count for those respective years.
However, when the number of households and indigent households is analysed, we observe that there is annual delivery of new connections, indicating progress is being made on the selected indicators. It should also be noted that the catastrophic flooding experienced in April 2022 resulted in major damage to water and sanitation infrastructure, thereby negatively impacting the percentage of households with access to a basic level of water. Providing access to water is also hampered by the hilly terrain which prevents the installation of infrastructure. Furthermore, aging infrastructure and illegal connections cause damage to the water network, creating further challenges in water provision.

The percentage of potable water samples that are compliant with national potable water standards

In South Africa, the quality of the domestic water supply that is considered safe for human consumption is assured by monitoring for compliance with the South African National Standards (SANS 241).
The drinking water quality standard (SANS 241:2015) requires both chemical and microbiological components to meet the minimum compliance standard of 95% for a given population.

Drinking water quality below 95% is considered unacceptable and the Department of Water and Sanitation may impose penalties for non-compliance.

MICROBIOLOGICAL COMPLIANCE

Microbial water quality is the state of the water with respect to the absence (good water quality) or presence (poor water quality) of micro-organisms. Microbial water quality is usually indicated by reporting the count (number) of indicator organisms present in a given volume of water. SANS 241 requires >95% compliance for a population of 100 000 people or more.

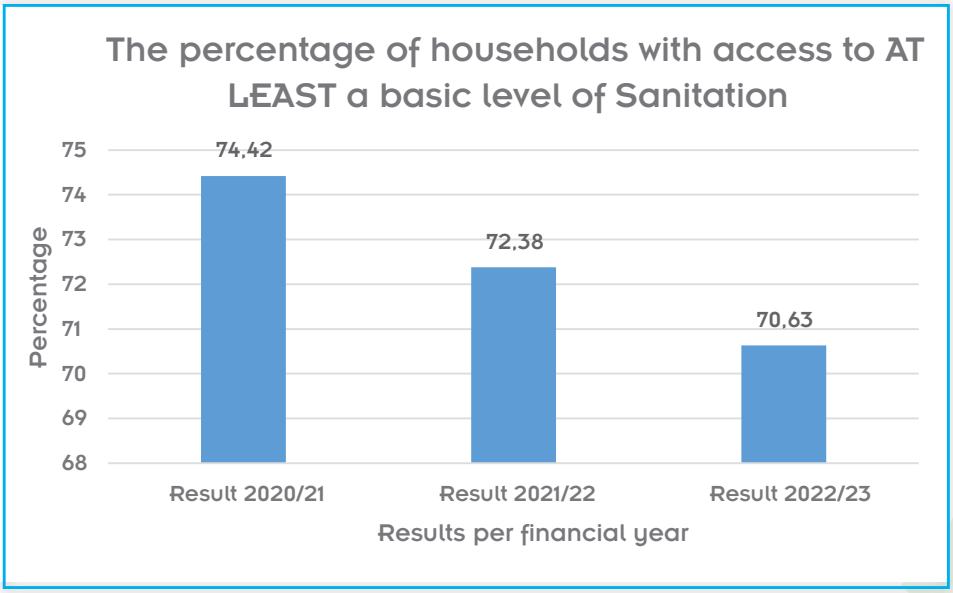
CHEMICAL COMPLIANCE

Chemical water quality refers to the nature and concentration of dissolved substances such as salts, metals and organic chemicals. All determinants with a possible threat to health are listed. SANS 241 requires a minimum >95% compliance for a population of 100 000 people or more.

Drinking water quality - % compliance to SANS 241			
Year	Acute Health - Microbiological	Acute Health - Chemical	Chronic Health Chemical
2020	99.6%	>99.9%	>99.9%
2021	98.6%	>99.9%	>99.9%
2022	98.3%	>99.9%	>99.9%
2023	99.5%	>99.9%	>99.9%
2024	98.5%	>99.9%	>99.9%

Data Source: https://ws.dws.gov.za/IRIS/dashboard_status.aspx

The percentage of households with access to at least a basic level of Sanitation



Source: eThekwini Municipality Annual Report (2020/2021-2022/2023)

Access to sanitation within the municipality is currently provided through either a flush toilet (sewerage system) and/or flush toilet (septic tank), and/or a pit toilet connected to ventilation (VIP). Community ablution blocks have been installed in many parts of the city. These community ablution blocks were not meant to be a permanent solution, and as such no new installations of these facilities is taking place.

The results presented for this indicator are also affected by the increasing household count figures. There is steady delivery of sanitation but the percentage of households with access to sanitation decreases year-on-year due to the annual increase in the number of households within the municipality.

Good practice example: Durban Water Recycling Plant *

Source: Veoliawatertechnologies.com (2019)

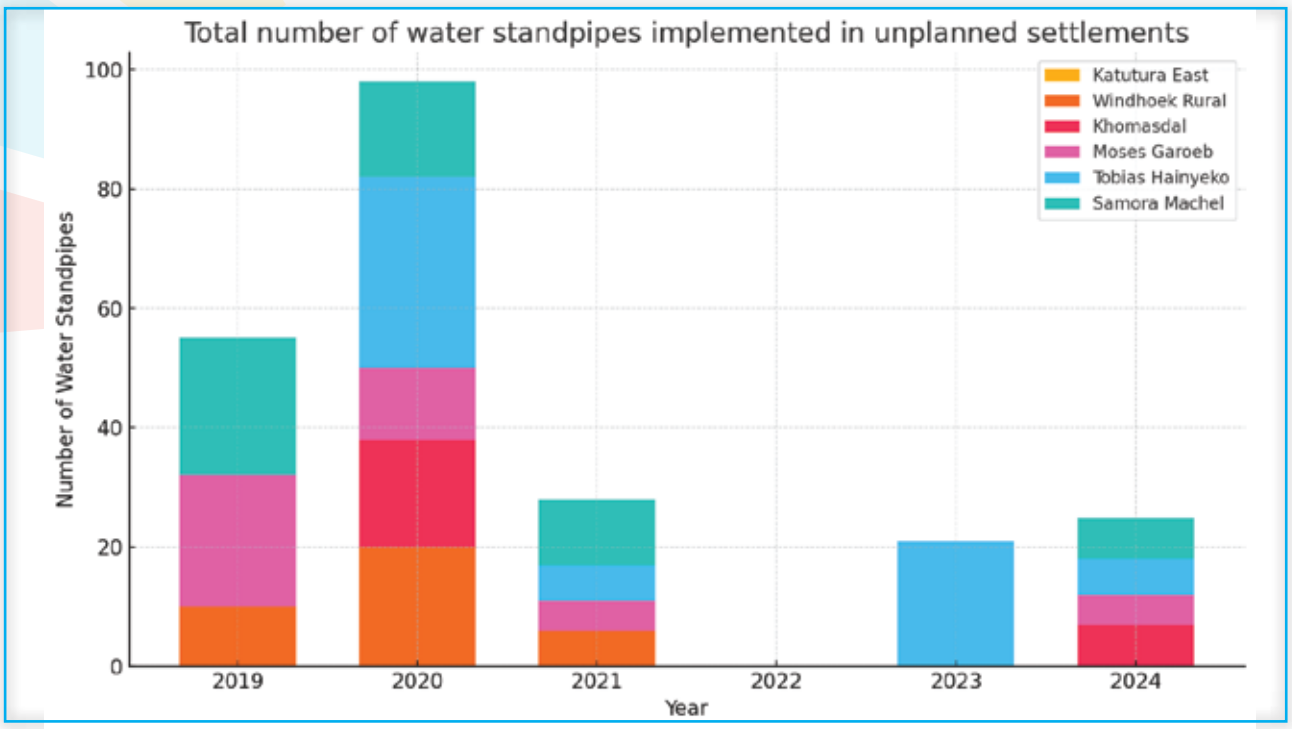
The City's first Public-Private Partnership (PPP) was the Durban Water Recycling (DWR) Plant, which has been successfully operational since its commissioning in 2001. This plant has a capacity of 47.5 ML/d (megalitres per day) where domestic and industrial wastewater is treated to a near-potable standard for sale to industrial consumers, for direct reuse in their processes. The project is an excellent example of a PPP that leverages the synergies of the partners to achieve an outcome that addresses key water security issues, ensuring future water supply. The city has registered a new PPP with the National Treasury that aims to optimize the current plant and incorporate a new 20 ML/d reuse plant for potable water.

The project demonstrates innovative approaches to sustainable water resource management, reducing water consumption and environmental pollution, and achieving technically challenging water and wastewater treatment goals. It demonstrates that by pooling resources and expertise in a PPP, and by focusing on long-term sustainability goals, all stakeholders can benefit, including the environment.

** EThekwini Municipality Voluntary Local Review 2024*

SDG 6 WINDHOEK

The percentage of households with access to at least a basic level of Water



Source: City of Windhoek internal AMALI Database reporting tool for 2024

Total number of water standpipes implemented in unplanned settlements

Constituencies		Year					
	Existing Before 5 Year Plan 30/06/2019	2019	2020	2021	2022	2023	2024
Katutura East	2	0	0	0	0	0	0
Windhoek Rural	7	10	20	6	0	0	0
Khomasdal	80	0	18	0	0	0	7
Moses Garoeb	300	22	12	5	0	0	5
Tobias Hainyeko	357	0	32	6	0	21	6
Samora Machel	306	23	16	11	0	0	7
Total per year		**55**	**98**	**28**	**0**	**21**	**25**

In Windhoek, all formalised areas have access to residential water supplies. Therefore, water accessibility reporting primarily focuses on informal or unplanned settlements where water infrastructure is not currently in place. Six constituencies—Katutura East, Windhoek Rural, Khomasdal, Moses Garoeb, Tobias Hainyeko, and Samora Machel—contain unplanned informal settlements, where not all households are connected to residential water services. In these areas, water is provided through communal standpipes, which serve as a vital resource for residents. The graph above depicts the number of standpipes installed in these constituencies from 2019 to 2024.

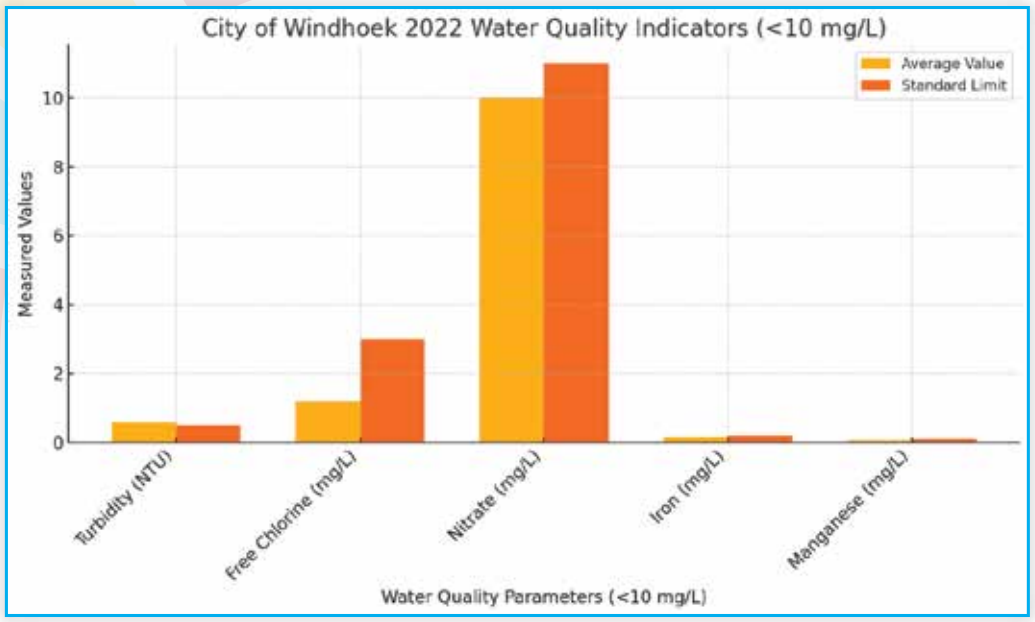
The year 2020 saw the highest installation of standpipes, with 98 units added across the constituencies. This was followed by a significant drop in 2021, when only 28 standpipes were installed, primarily due to limitations in infrastructure. However, it is important to note that in the 2021-2022 financial year, no additional standpipes were installed as a result of the COVID-19 pandemic. Funds that were initially allocated for infrastructure development were reallocated to address the immediate health crisis and mitigate the impacts of the pandemic on the city's vulnerable populations. The year 2023 saw a moderate recovery, with 21 new standpipes added, and 25 more in 2024.

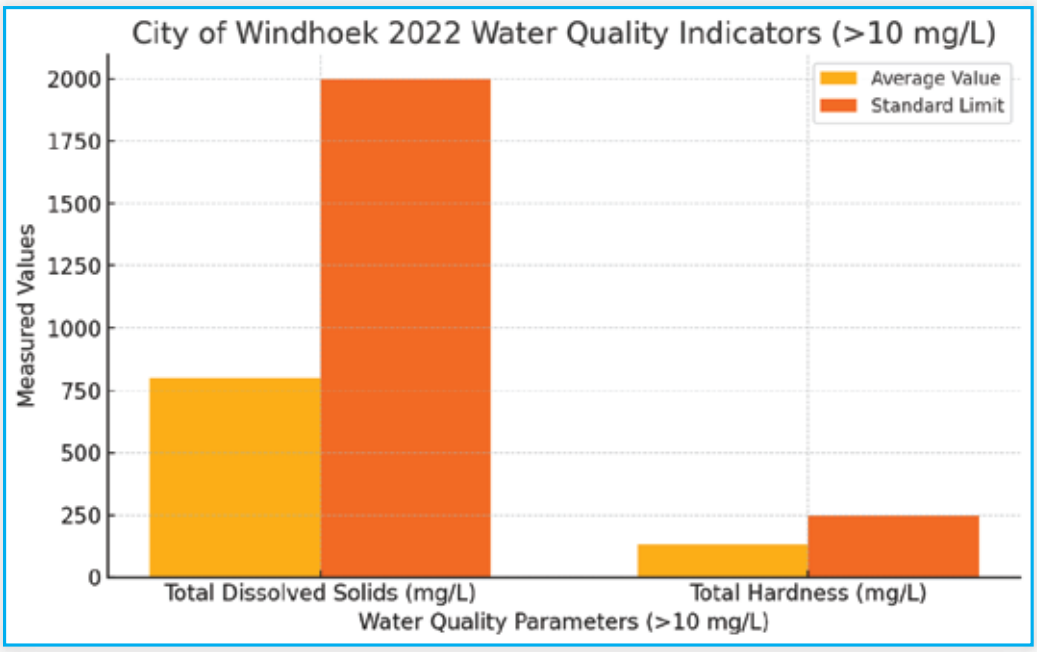
The installation of communal water standpipes continues to be a key strategy in addressing water access for residents in informal settlements, as efforts to improve service delivery in these areas while simultaneously upgrading these informal settlements.

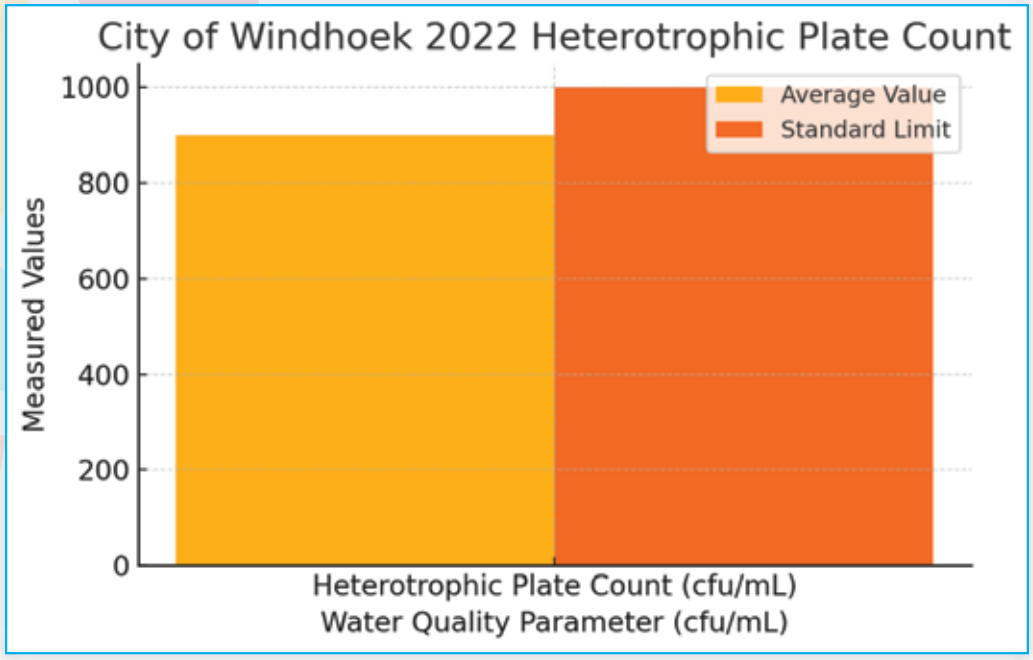
Installation of five pre-paid communal standpipes located in Moses Garoeb Constituency

Source: City of Windhoek internal media database

The percentage of potable water samples that are compliant with national potable water standards







Data Source: City of Windhoek 2022 Annual Drinking Water Quality Status Report (2022-2023 financial year)

The City of Windhoek maintains a robust and detailed water quality monitoring system to ensure the safety and reliability of its drinking water. In 2022 and 2023, the city sourced its water from surface water, reclaimed water, and groundwater, each with distinct treatment processes. The monitoring program includes daily weekly, monthly, and annual testing for various parameters to ensure compliance with the Namibian Water Quality Guidelines and Standards.

Key indicators of water quality, such as turbidity and chlorine levels, highlight the city's success. For instance, turbidity, which measures the cloudiness of water and is crucial for detecting potential contaminants, remained well within the standard limits throughout the year. Surface water turbidity was maintained below the stringent 0.5 NTU guideline, with only minor deviations early in the year, and borehole water turbidity stayed consistently below the 2.0 NTU threshold, underscoring the effectiveness of Windhoek's treatment processes (Nikodemus, 2022).

Chlorine, vital for disinfection, was also meticulously managed, with free chlorine levels across the distribution system consistently falling within the optimal range of 0.5 to 1.6 mg/L (Nikodemus, 2022). This not only ensured the elimination of harmful pathogens but also provided a safeguard against any potential contamination within the extensive water distribution network.

Even in the face of challenges, such as elevated nitrate levels in specific areas, Windhoek's innovative approach to blending water sources effectively mitigated any risks, maintaining nitrate concentrations within safe limits across most of the distribution system. This proactive strategy exemplifies the city's commitment to using advanced techniques to ensure water safety.

Moreover, the city's ongoing investments in monitoring and infrastructure improvements reflect its pioneering role in water quality management. By maintaining stringent standards and adopting cutting-edge practices, Windhoek continues to set a benchmark for other cities, ensuring that its residents have access to some of the highest quality drinking water in the region.

Reference:
Nikodemus, K., 2022. City of Windhoek 2022 Annual Drinking Water Quality Status Report. Windhoek: City of Windhoek.

Good practice example: Direct Potable Water Reclamation in Windhoek

Windhoek has made significant strides in water sustainability through its innovative water reclamation efforts. The city successfully practices direct potable reclamation (DPR) by reclaiming potable water directly from sewage effluent. This domestic wastewater undergoes thorough treatment to produce high-quality effluent, which is further treated to yield safe, potable water. A cornerstone of this process is the continuous maintenance of a multiple-barrier treatment sequence, which safeguards against pathogens and other harmful contaminants. Since 1968, intensive bio-monitoring and testing of reclaimed water have shown no adverse health effects. This multiple-barrier approach ensures effective contaminant removal by employing at least two, often three or more, removal processes for each potentially harmful or aesthetically objectionable contaminant (Menge, 2010; du Pisani, 2006; Van Rensburg, 2006).

Reclaimed water is supplied by the Windhoek Goreangab Operating Company (WINGOC) from the New Goreangab Water Reclamation Plant (NGWRP), located in the western parts of the city. The NGWRP employs a series of advanced treatment processes, including pre-oxidation and coagulation, flocculation, dissolved air flotation, rapid gravity sand filtration, ozonation, biological activated carbon (BAC), granular activated carbon (GAC), membrane filtration, disinfection, and stabilisation. The final treated water is blended with surface water and or groundwater (Menge, 2010; Lahnsteiner, Sevitz, and Lempert, 2004)

References:

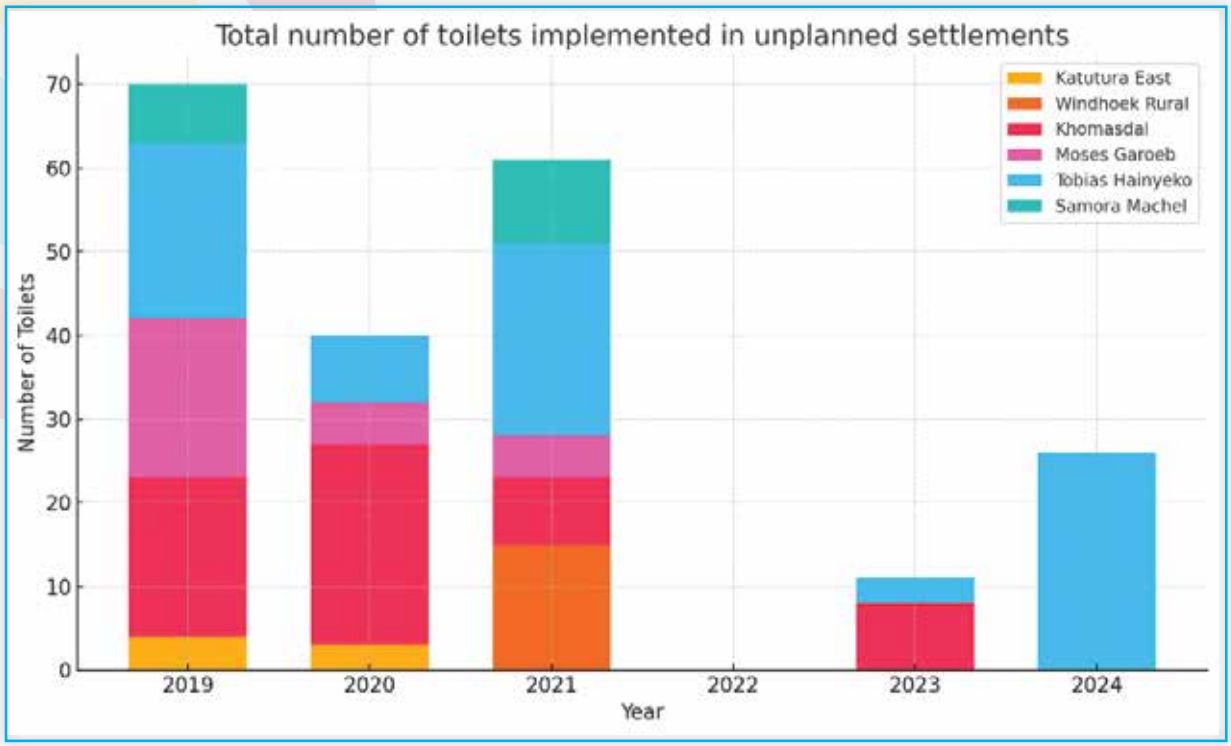
Van Rensburg, F. 2006. Urban Water Security in the City of Windhoek. Published Master's thesis. Stellenbosch: Stellenbosch University.

Du Pisani, P.L., 2006. Direct reclamation of potable water at Windhoek's Goreangab reclamation plant. Desalination, 188(1-3), pp.79-88.

Menge, J., 2010, April. Treatment of wastewater for re-use in the drinking water system of Windhoek. In Water Institute of Southern Africa Conference: Midrand, Southern Africa.

Lahnsteiner, J. and Lempert, G., 2007. Water management in Windhoek, Namibia. Water Science and Technology, 55(1-2), pp.441-448.

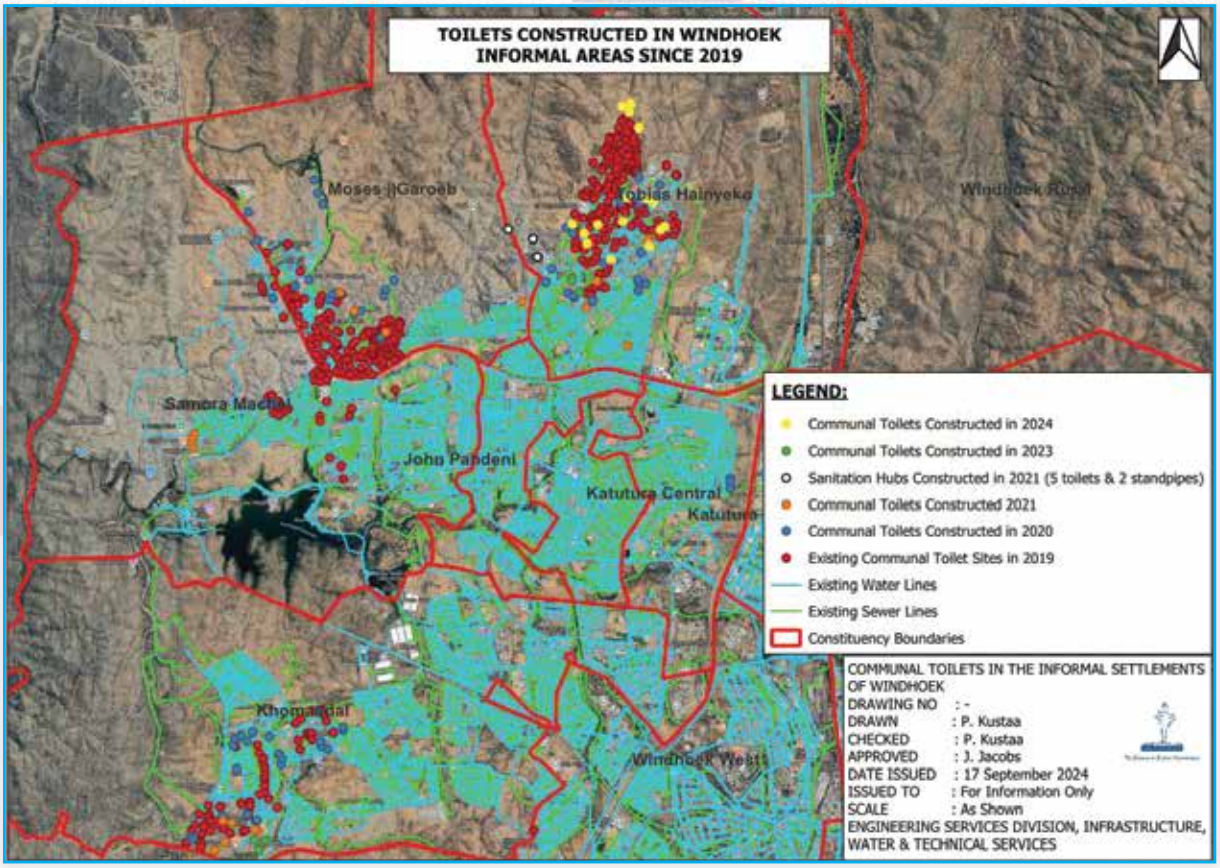
The percentage of households with access to at least a basic level of Sanitation



Source: City of Windhoek internal AMALI Database reporting tool for 2024

Total number of toilets implemented in unplanned settlements							
Constiuencies		**Year**					
	Existing Before 5-year Plan 30/06/2019	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Katutura East	0	4	3	0	0	0	0
Windhoek Rural	0	0	0	15	0	0	0
Khomasdal	216	19	24	8	0	8	0
Moses Garoeb	310	19	5	5	0	0	0
Tobias Hainyeko	641	21	8	23	0	3	26
Samora Machel	53	7	0	10	0	0	0
Total per year		**70**	**40**	**61**	**0**	**11**	**26**

Source: City of Windhoek internal AMALI Database reporting tool for 2024



Sanitation improvements in Windhoek demonstrate a clear distinction between formal and informal areas. In formal, planned areas, all residents benefit from comprehensive sanitation provision as part of the established urban infrastructure. However, the challenge remains in addressing the needs of informal settlements, where rapid urbanization has outpaced infrastructure development. To mitigate this, the City of Windhoek provides communal toilets in these unplanned areas, aligning with the Development and Upgrading Policy. This policy ensures that sanitation facilities are within a 100-meter walking distance and that each communal toilet serves approximately thirty residents. These efforts aim to improve access to basic sanitation and enhance the overall living conditions in informal settlements.

The installation of communal toilets in 2023 and 2024 was prioritized following the completion of a rapid assessment conducted by the City of Windhoek. This assessment identified areas most in need of improved sanitation, with Khomasdal and Tobias Hainyeko being key focus areas. In 2023, Khomasdal received eight communal toilets, serving an estimated 240 residents, while Tobias Hainyeko's 3 toilets catered to approximately ninety residents. In 2024, Tobias Hainyeko saw a substantial increase with twenty-six toilets, expected to serve 780 residents. These installations mark a significant improvement in providing essential sanitation services to underserved communities.

The percentage of households with access to at least a basic level of Water

Connection rate, water supply to final customers				
Territorial unit	Time	Total population on 31.12.	Public water supply Inhabitants connected to the public water supply on 30.06.	Percentage
City of Bremen	2019	569693	569693	100
City of Bremen	2016	563257	563257	100
City of Bremen	2013	546357	546357	100

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In Bremen, all residents are connected to the public water supply.

Good practice example: Public drinking water fountains

Drinking water regularly is important, not only in hot weather. Sufficient hydration must also be ensured when out and about and outdoors. In order to protect vulnerable or particularly exposed population groups from the consequences of increasing heat, public drinking water fountains have been installed at 11 central locations in the city since mid-2020. Another 2 public drinking water fountains have been installed and belong to the church. The fountains are operated between May and October and provide a drinking water supply around the clock during this period. The Bremen health authority regularly checks the quality of the drinking water. In addition, the fountains are automatically flushed every 30 minutes to prevent any loss of water quality. The heat action plan provides for the construction of further drinking fountains in the coming years.

There are also numerous stores in Bremen that take part in the Refill concept and dispense drinking water free of charge.

Source: Trinkwasserbrunnen und Wasserspender - Gesundheitsamt Bremen

The percentage of potable water samples that are compliant with national potable water standards

Quality of the tap water (in Germany drinking water quality is according to the Drinking Water Ordinance)

Bremen's drinking water meets the strict requirements of the Drinking Water Ordinance both bacteriologically and chemically. The limit values are always exceeded many times over. The health authority monitors the quality of the drinking water in accordance with the Ordinance on the Quality of Water for Human Consumption (Drinking Water Ordinance - TrinkwV).
Trinkwasserqualität & -analyse | swb

Water treatment

The water supplied by Stadtwerke Bremen (swb[3]) is 100 percent treated from groundwater. The substances naturally occurring in groundwater in northern Germany - iron, manganese and carbon dioxide - are removed from the groundwater in the waterworks. The treatment substances used, their purity and permitted addition as well as the maximum concentration permitted in the drinking water supplied after treatment are also specified in the Drinking Water Ordinance. Only substances that have been approved by the Federal Ministry of Health may be used, and swb is obliged to inform its customers about the substances used.

trinkwasser-analyse-bremen.pdf (swb.de)

Drinking water supply concept for the state of Bremen

Climate change and increasing competition for the use of water resources are also affecting the water supply sector. Bremen is faced with the task of ensuring a future-proof supply of high-quality drinking water for the population, trade and industry. While the drinking water for the city of Bremerhaven comes entirely from swb's own waterworks, most of the drinking water supply for the city of Bremen comes from the surrounding areas of Lower Saxony. Drinking water extraction often cannot take place without affecting surface water bodies. This in turn has an impact on the complexity and duration of approval procedures. The dry years of 2018 and 2019 illustrate how higher temperatures in summer, changes in the distribution of precipitation and the increase in extreme weather situations lead to changes in peak loads for water suppliers. At the same time, irrigation requirements for agriculture are also increasing.

Climate change and changing usage requirements pose new challenges for the drinking water supply. With the drinking water supply concept for the state, scenarios are to be developed, based on an inventory of the water supply in the state of Bremen, as to how future drinking water requirements can be met by 2050. The Senator for the Environment and swb are working together with Lower Saxony's water suppliers and specialist authorities as well as an external expert to develop the necessary data.

The following information should be available for future water management planning:

- An inventory of the water supply system,

- the development of available water resources in the state of Bremen and the surrounding area,

- a presentation of user interests and future drinking water requirements for the time horizons 2030 and 2050, and

- an assessment of specific supply scenarios, influencing factors and options for action to secure Bremen's drinking water supply.

[3] *Municipal Utilities*

The percentage of households with access to at least a basic level of Sanitation.

Inhabitants with connection to the public sewer system				
Territorial unit	Time	Inhabitants in total	Number of which with connection to central wastewater treatment plants	Percentage
Stadt Bremen	2019	569693	568484	99,79
Stadt Bremen	2016	563257	561853	99,75
Stadt Bremen	2013	546357	544898	99,73

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In 2019, 99.79% of households in Bremen were connected to the public wastewater disposal system, with the remainder having access to sanitary facilities via small sewage treatment plants.

Source: Management report on municipal wastewater disposal in Bremen

Good practice example: Free public toilets

Two public and free toilet facilities for Bremen's main railway station were installed in 2023. There is also a toilet container at Hanseatenhof, which is also accessible for people with disabilities. Further public toilet facilities are to follow in the next few years.

Senator Kathrin Moosdorf and Daniela Enslein, executive board Bremen city cleaning (DBS)

Picture: Senator for environment, climate and science, City of Bremen

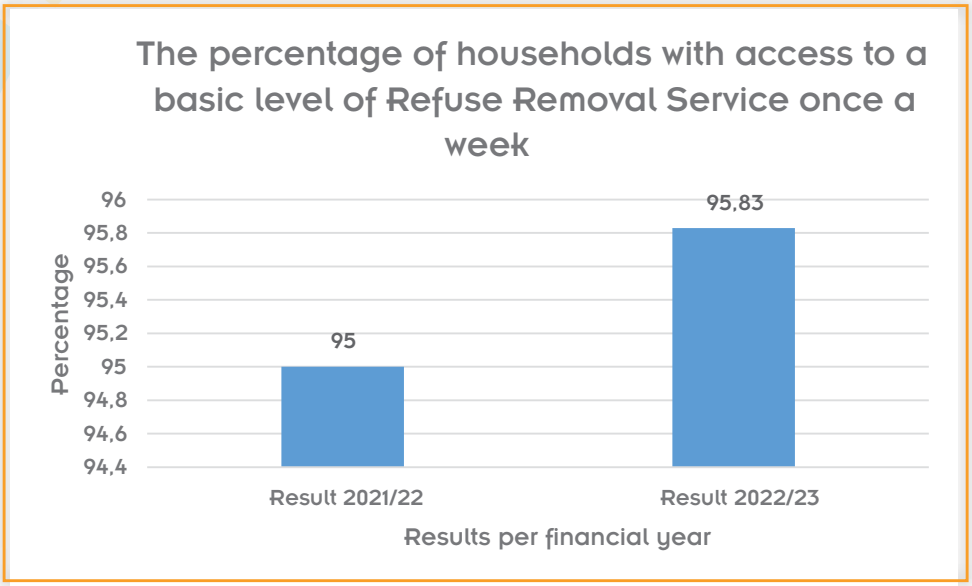
Sustainable Development Goal 11: Sustainable cities and communities

SDG 11 focuses on making cities and human settlements inclusive, safe, resilient, and sustainable. With all 3 partners being cities, this SDG is of prime importance. Key deliverables relate to effective and efficient basic service delivery. Some basic services are the focus of other SDGs selected for this report. Therefore, this section will focus on access to refuse removal services, public transport and electricity.

CHOSEN INDICATORS

Indicator	The percentage of households with access to a basic level of Refuse Removal Service once a week	Proportion of population that has access to scheduled public transport within 800m of their home	The percentage of households with access to a basic level of electricity
Definition	Households with basic refuse removal services or better defined as a minimum of once weekly collection, as a percentage of total municipal households.	This indicator measures the proportion of the population within an 800m radius of a scheduled public transport service.	Percentage of households that have access to electricity services within the municipal area.

The percentage of households with access to a basic level of Refuse Removal Service once a week



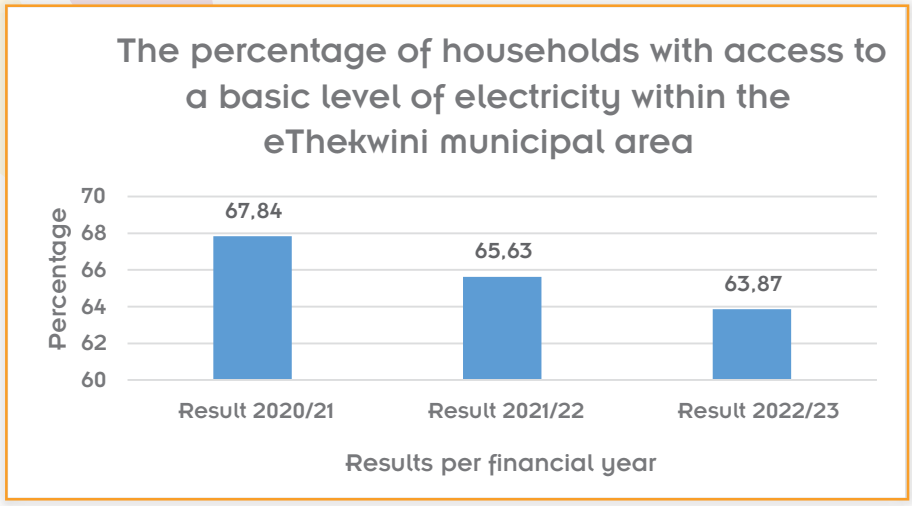
Source: eThekwini Municipality Annual Report (2020/2021-2022/2023)

Refuse removal services are undertaken either by municipal staff or by contractors, dependent on the area within the municipality. EThekwini Municipality provides refuse removal services to households once a week through the collection of black refuse bags, and to businesses more frequently, either through green wheely bins or skips. There has been a consistent refuse removal service in most parts of the municipality, with the last two years showing an increase in the number of households serviced. The results for this indicator are once again impacted by the number of households in the municipality, but the increased households serviced has resulted in a higher percentage of households with access to a basic level of refuse removal service once a week. Recycling initiatives are also on the rise, with several municipal recycling buy-back centres and community drop-off centres in operation. Awareness campaigns to promote recycling are ongoing, in efforts to reduce the amount of waste going to landfill sites, as landfill space is running out. Involvement from NGOs, academia and the private sector in these initiatives has been very encouraging, with innovative ideas being launch regularly.

Proportion of population that has access to scheduled public transport within 800m of their home

At this stage, data for reporting on this indicator is not available. Whilst efforts are ongoing to provide access to public transport within 800m of a home, the municipality is not the only provider of this service. Public transport services are provided either by the municipal bus service, private busses or private taxis. Private busses and taxis stop randomly, resulting in the 800m measurement criteria being difficult to ascertain.

The percentage of households with access to a basic level of electricity



Source: Statistics South Africa general household survey (2016/2017-2021/2022)

As with the statistics for the percentage of households with access to water, the result is affected by the number of households. Annual updates to the total number of households commenced in 2019/20, and with increasing migration into the city increasing the number of households, the percentage of households with access to electricity became irregular. This is also affected by the annual number of new electricity connections. Overall, when reviewing the number of electricity connections within the municipal area, there is a steady increase.

Good practice example: Solar installations on municipal buildings*

The energy crisis in South Africa has heightened the need to identify alternative sources of renewable energy. While the generation of electricity is the responsibility of the national power producer, ESKOM, eThekwini Municipality initiated projects to explore alternative sources for electricity generation even before the adoption of the SDGs. The municipality launched its Solar (Photovoltaic (PV)) project with the installation of solar panels on five municipal buildings: at Ushaka Marine World, the Moses Mabhida Stadium sky car, People's Park restaurant at Moses Mabhida Stadium, Metro Police Headquarters and the eThekwini Water and Sanitation Unit Customer Services centre. In total, the installations saved the city 426.75MWh of electricity a year, with a cost saving of R337 396 in the first year (Global Africa network, 2017). The project provided valuable insights into PV installations, and the lessons learned have informed future projects and policies.
The municipality is currently exploring the hydrogen economy as another source of energy and has been instrumental in convening summits, workshops, and events to explore renewable energy options.

Source: https://www.globalafricanetwork.com

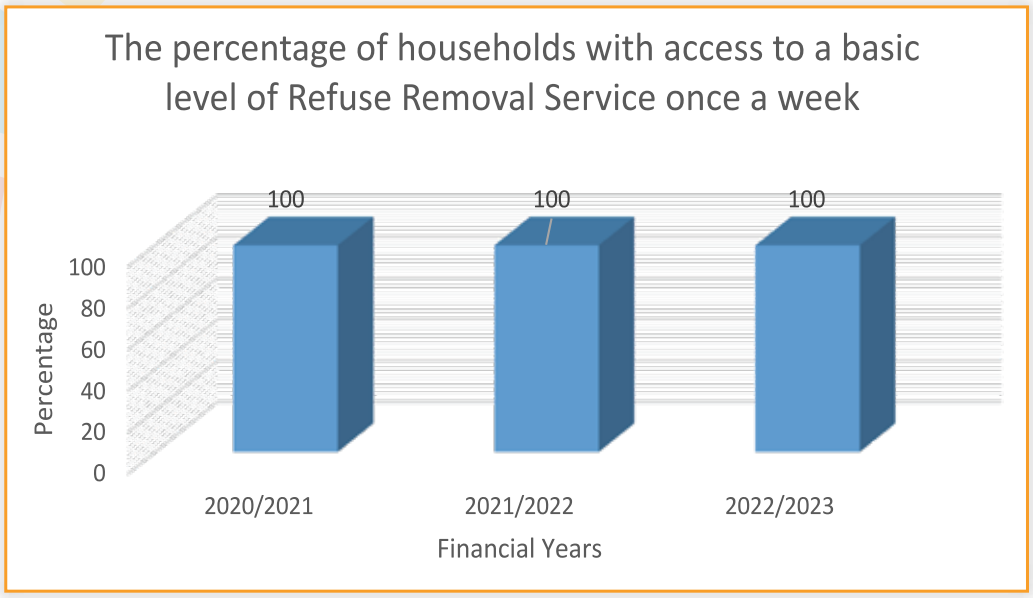
REFFECT AFRICA Project*

Another project underway is REFFECT Africa which seeks to convert waste to produce energy. The project is funded by the European Commission, with the eThekwini Municipality being one of twenty-nine partners from sixteen countries working on the project. The project will produce three gasification demonstrators at three separate locations in Africa – one in Durban, one in Ghana and one in Morocco. The Clairwood Fresh Produce Market will host the Durban demonstrator. This project is in the third year of its 5-year period with the civil works currently underway. Once commissioned, the gasifier will gasify wood waste to produce energy that will be fed back into the grid at the market to reduce reliance on ESKOM supply.

** EThekwini Municipality Voluntary Local Review 2024*

SDG 11 WINDHOEK

The percentage of households with access to a basic level of Refuse Removal Service once a week



Data source: Solid Waste Management Division waste monitoring database, City of Windhoek

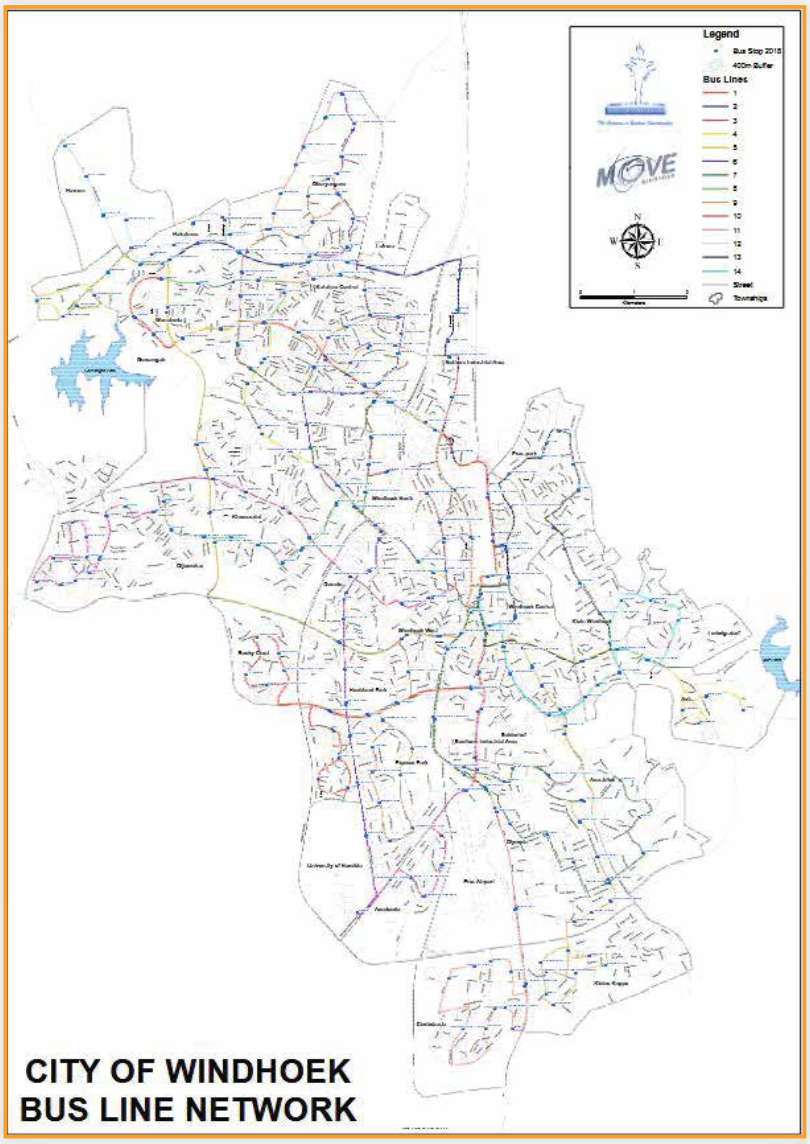
Within the formalized areas of Windhoek, the City of Windhoek ensures the weekly removal of solid waste across all suburbs and constituencies through a green Wheelie-bin per household system. Likewise, to address waste removal in the informal settlements, where vehicles cannot easily reach, the city employs a black bag system. Residents in these areas are encouraged to bring their waste to central locations for weekly collection.

Recently, the City of Windhoek has encountered challenges with its only landfill, Kupferberg, which is nearing capacity. In response, the city has partnered with Bremen and Durban to explore sustainable waste management solutions. A flagship initiative in this effort is the EU-funded project titled “Improving Solid Waste Management in Windhoek.” This project aims to implement two Waste Buy Back Centres, promote waste management awareness through sorting initiatives, and enhance the capacity of City of Windhoek staff to manage waste more effectively. The initiative aims to create a circular economy in Windhoek, with the Buy Back Centres encouraging residents to view waste as a source of income, thereby promoting recycling and reducing the overall waste burden on the city.

Recycling initiatives at Kupferberg Landfill

Source: https://www.windhoekcc.org.na/solid-waste-management/

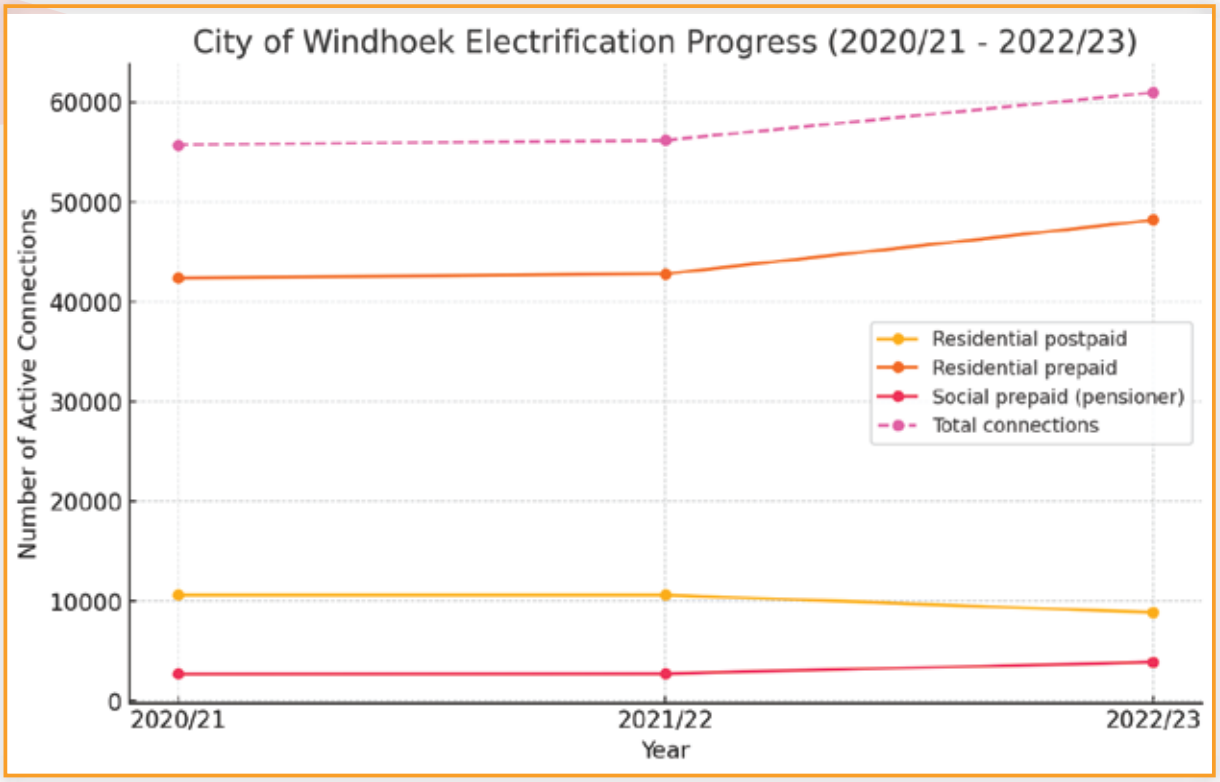
Proportion of population that has access to scheduled public transport within 800m of their home



Source: https://www.windhoekcc.org.na/wp-content/uploads/2023/11/Bus-Lines-Network-Map.pdf

The City of Windhoek's public transport system plays a crucial role in providing access to the Central Business District (CBD), particularly for residents from low-income areas in the northeast, many of whom work in affluent suburbs. The City's bus services offer two payment options for commuters: payment via smartcard at N$ 8.50 per trip, or cash payment at N$ 9.50 per trip. Despite the availability of a bus route, the service operates predominantly during peak hours, offering two morning and two late afternoon trips, primarily to facilitate commuting to and from work. The limited schedule has resulted in the widespread use of five-seater taxis, which operate throughout Windhoek and serve areas beyond the bus route. Taxi fares start at N$ 13.00 and vary based on the distance travelled.

The change of households with access to a basic level of electricity



Data source: Electricity Department, City of Windhoek internal database for household basic electricity connections

The City of Windhoek has made substantial progress in expanding access to electricity from 2020/21 to 2022/23, with a notable increase in residential prepaid and social prepaid connections. This reflects the city's commitment to making electricity more accessible and manageable for its residents, particularly the vulnerable populations. In parallel, Windhoek has embraced sustainable urban solutions, actively investing in solar and green energy projects to provide affordable, cost-effective alternatives, especially in informal settlements. These initiatives underline the city's dedication to ensuring reliable and sustainable energy access for all its residents while promoting environmental responsibility.

Good practice example: Electrification of the Informal Settlements

His Worship Joseph Uapingene,
Mayor of City of Windhoek 2023,
switching on electricity
in an informal settlement as part of the
Electrification of Informal Settlement

Source:
City of Windhoek internal media database

Prepaid Electricity Meter

Source:
City of Windhoek internal media database

The City of Windhoek has electrified over 3,500 households in informal settlements over the past five years (2018-2023), and the project has been extended to target an additional 4,000 households in informal settlements. This initiative, aligned with SDG 7[4], includes the installation of high mast lights in key public areas, enhancing safety. Despite resource challenges, the City remains committed to improving access to essential services in informal settlements, especially in regard to electrification.

[4] *SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all.*

SDG 11 BREMEN

The percentage of households with access to a basic level of Refuse Removal Service once a week

Every property in Bremen must be equipped with a sufficiently large residual waste garbage can. The size of the residual waste garbage can depends on how many people live together in a household. A minimum volume of 15 liters per week is prescribed. In addition to the residual waste garbage can, every household has the option of ordering an organic waste garbage can and a paper garbage can from the municipal waste disposal service and also a yellow garbage can from the dual systems for plastic waste. These garbage cans are collected alternately every 14 days. Once a year, every household has the option of having 5cbm of bulky waste collected free of charge.

Bremen also has well-developed collection systems for paper, cardboard, glass, textiles, lightweight packaging, metals, electronic waste, batteries, hazardous substances and garden waste, which are well used by citizens. In the municipality of Bremen, organic waste is also collected separately. This led to an increase in separately collected recyclables to 159,000 Mg or 240 kg/E by 2002. In the meantime, the quantity has fallen to 144,000 Mg or around 212 kg/E in 2017. This is due to the decline in the overall volume of household waste, fewer and lighter disposable glass beverage containers and the decline in the volume of waste paper. The proportion of separately collected recyclable materials in the total volume of household waste has remained constant at between 47% and 48% on average since 2000. Bulky and residual waste is recycled for energy in both cities, in some cases after processing.

Source: Bremen's municipal waste management and environmental status report

Recycling yard
Picture: Die Bremer Stadtreinigung, Tristan Vankann/Fotoetage

Proportion of population that has access to scheduled public transport within 800 m of their home

Proportion of the population living within 600 m or 1,200 m (in the case of railroad stations) of a stop with at least 20 public transport departures per day in 2020 in %	
City of Bremen	
Time	Percentage
2020	98,9%

Source: Laufende Raumbeobachtung des BBSR; Abfahrtstatistik der Hacon Ingenieurgesellschaft mbH; Bevölkerungszahlen im 100-m-Raster, Grundlage infas360 GmbH

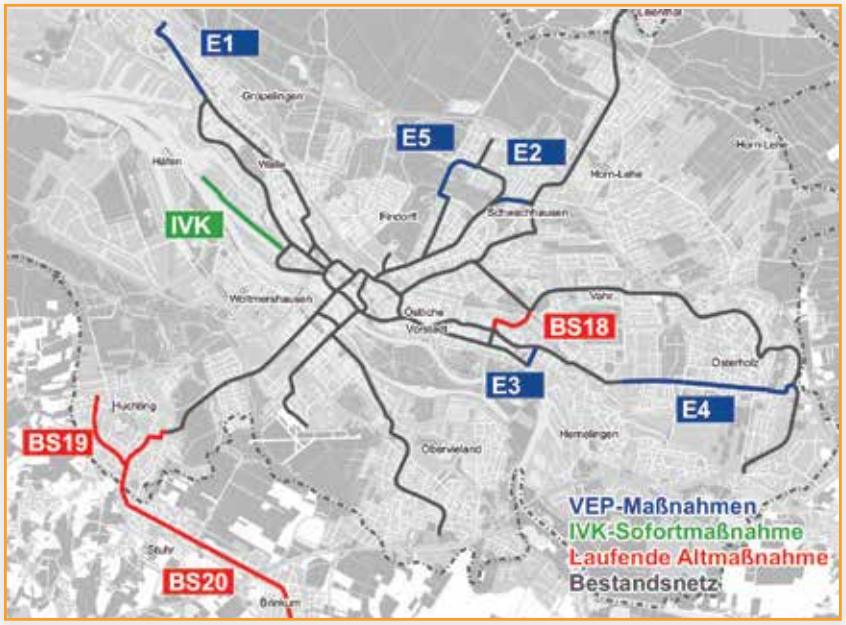
Public transportation

A well-developed, reliable public transport network is an essential prerequisite for shifting journeys from private motorized transport to eco-mobility with buses and trains. Less exhaust fumes and turbulence reduce particulate pollution compared to private transport. In addition, good public transport connections ensure the accessibility of residential and business locations. Public transport is often described as the backbone of climate-friendly mobility and therefore plays a key role. In the city of Bremen, the public transport network covers large parts of the city and offers almost all households access to the system within a 600-meter radius of a stop. In 2020, 98.9% of all Bremen residents lived within this radius. Public transport services in Bremen were further developed as part of the 2019-2021 update of the transport development plan.

Road-based local public transport

Together with Bremer Straßenbahn AG , a “service offensive” was developed in eleven stages, which should ultimately lead to a 5-minute frequency on the vast majority of lines in the priority network. The first stage of the offensive was approved by the Senate in December 2021 and includes increased frequencies during the week in off-peak hours and on Sunday afternoons. This stage started on 29.08.22. In addition, individual selective improvements have been made in recent years, especially in the bus network.

Source: Environmental status report



Measures for the streetcar network (excerpt from the transport development plan),

Picture: Senator for environment, climate and science, City of Bremen

[5] *Bremer tramway company*

The percentage of households with access to a basic level of electricity

Electrification in Bremen is at 100% of all households.
https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?end=2021&locations=DE&start=1990&view=chart

Around a third of Bremen's CO^2 emissions are caused by the consumption of electricity. The use and generation of electricity is therefore one of the most important fields of action in Bremen's climate protection policy. An important goal here is the expansion of electricity generation from renewable energies. The Bremen Senate supports the expansion of wind energy by designating wind priority areas and making public areas available for wind turbines. The number of wind turbines in the state of Bremen was increased by six to 89 by 2018. A total of 200 MW of capacity was installed in Bremen in 2021. On a longer-term average, an annual electricity yield of around 470 MWh can be expected from wind turbines in the state of Bremen. In mathematical terms, this ensures the electricity supply for around 190,000 households. In addition, a total of 949 additional photovoltaic systems with an output of around 18-megawatt peak were installed in the state of Bremen in the 2018 - 2021 reporting period. By the end of 2021, a total of 2,767 photovoltaic systems with an output of around 60-megawatt peak and an expected electricity yield of around 50 MWh per year had been connected to the electricity grid. This is enough to supply around 20,000 Bremen households with electricity.

Source: Environmental status report

Photovoltaic landfill

Picture: Die Bremer Stadtreinigung, Tristan Vankann/Fotoetage

Good practice example: Ellener Hof

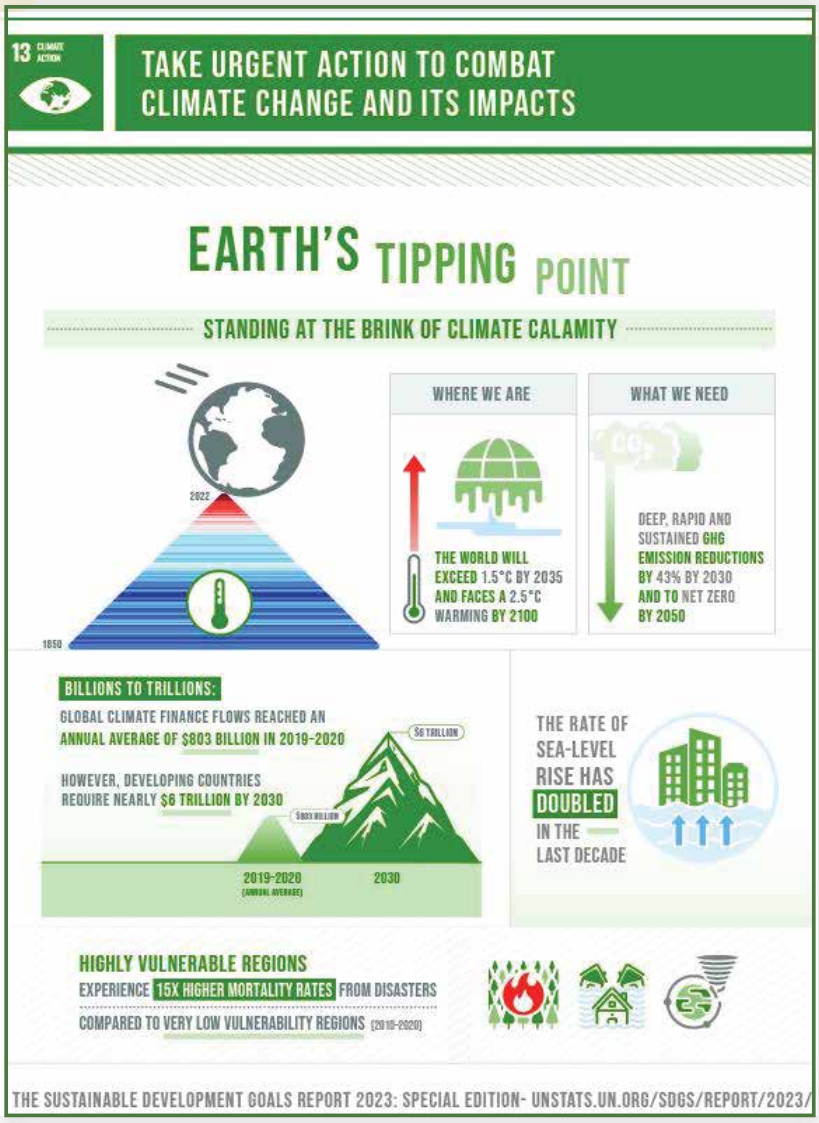
Land conversion contributes to the creation of additional living space. With the realization of the Ellener Hof on a large, little-used area, a “social-ecological model district” is being created in Bremen Osterholz, which takes into account a sustainable urban development policy and active climate protection as well as focusing on social neighbourhood development. Around 500 new residential units for different user groups in various forms of housing will be built on the almost 10-hectare site. Aspects of sustainable construction with wood, the realization of the buildings in the BEG40 standard, the complete infiltration of rainwater and a local heating network are also part of the project. Ellener Hof is also a climate and cycling district, meaning that various climate protection measures are being implemented and exemplary measures to promote cycling are being put in place.

Source: Environmental status report

Parcels are delivered to the central parcel distribution station at the entrance to the neighborhood and distributed from there on handcarts or cargo bikes by employees of the operator bras e. V. in the neighborhood.

Picture: Roads and traffic department, City of Bremen (ASV)

Sustainable Development Goal 13: Climate action



SDG 13 calls for urgent action to combat climate change and its impacts. For Durban, this goal is critical as the city faces rising sea levels and increased frequency of extreme weather events, which threaten its coastal infrastructure and communities. In Windhoek, located in a region prone to droughts, SDG 13 emphasizes the need for climate resilience strategies to ensure water security and sustainable agriculture. Bremen, while less vulnerable to immediate climate threats, must focus on reducing its carbon footprint and enhancing its climate adaptation measures to protect its urban environment and support global climate efforts. Achieving SDG 13 in these cities not only safeguards the future of our cities, but also contributes to global efforts to mitigate climate change and promote sustainable development, making this SDG a critical one.

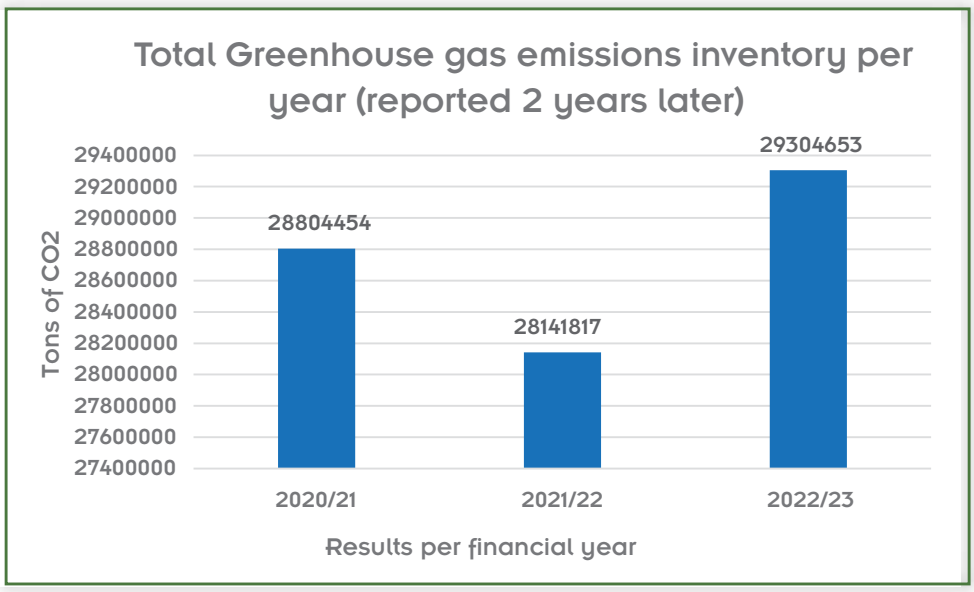
CHOSEN INDICATORS

Indicator	Total Greenhouse gas emissions inventory per year	Number of deaths attributed to major incidents - fire	Number of deaths attributed to major incidents - rain/ wind/ storm
Definition	This indicator measures the quanitity of Greenhouse gas emissions per year into the Earth's atmosphere that contribute to the greenhouse effect. These gases, include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O).	This indicator measures the number of lives lost in fires, originating from natural phenomenon.	This indicator measures the number of lives lost during natural disasters i.e. extreme rain, wind or storms.

SDG 13 DURBAN

Like many cities globally, eThekwini Municipality has expereinced an increase in the number and severity of climate related disasters in recent years, with several major weather related incidents occuring since 2019. Whilst climate change has an impact, the situation is hampered by factors such as accelerated growth of alien invasive plants in rivers, pollution of water bodies, refuse being improperly disposed of in stormwater infrastructure, and aging infrastructure. Several disaster risk reduction, disaster preparedness and disaster management related initiatives are underway but a holistic and collaborative approach is required to deal with behavioral factors for collective success.

Total Greenhouse gas emissions inventory per year



Source: eThekwini Greenhouse Gas Inventory Summary report

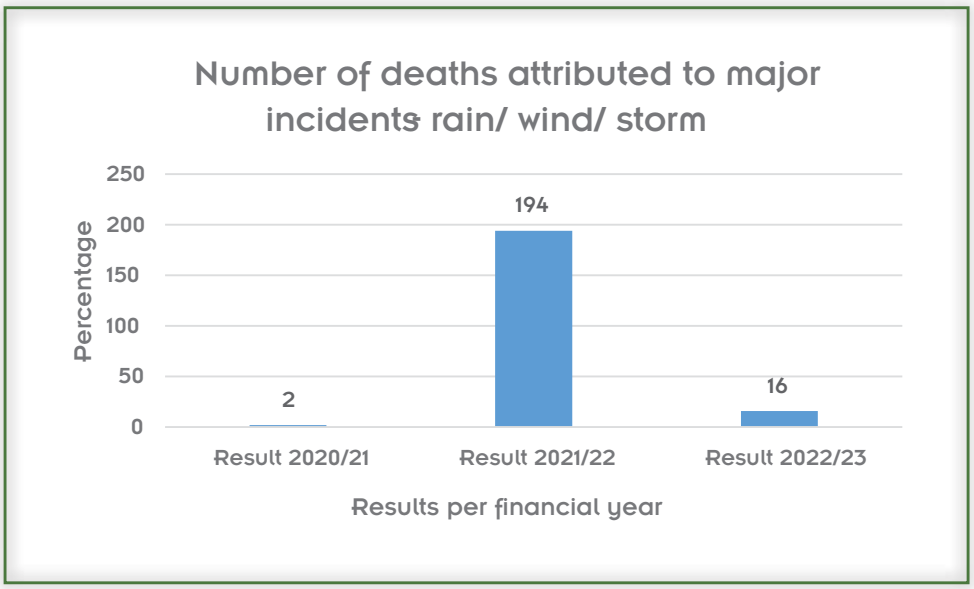
EThekwini is the first African city to complete a Paris-aligned Climate Action Plan (CAP) in collaboration with the C40 Leadership Group. The plan sets out ambitious emissions reduction targets of 40% by 2030 and 80% by 2050. There is an urgent global need to reduce Greenhouse Gas emissions to minimise the impact on climate change. Greenhouse gas emissions within eThekwini Municipality have shown a steady increase since monitoring first commenced in 2010. The improvements in monitoring and reporting have a role to play in this increase but there has been a significant increase in the actual emissions, predominantly in the transport and industrial sectors. The eThekwini Greenhouse Gas Emissions Inventory 2022 Summary Report, states that total local government emissions for the 2022 period were 1,719,252 tCO^2e, whilst total community emissions recorded for 2022 equated to 27,901,415 tCO^2e. Energy consumption is the source of the majority of GHG emissions, with the Durban Climate Change Strategy aiming for 40% of energy consumption to be met by renewable energy by 2030.

It is important to note that the Greenhouse Gas emissions are reported 2 years later, for example the tons of CO^2 depicted for 2020/21 represents the emissions for the 2019 calendar year. With the lag in reporting, the results presented for 2021/22 are related to the period when the country was in lockdown due to the Covid-19 pandemic. This accounts for the reduction in the tons of CO^2 reported. As the lockdown was phased out, the monitoring returned to normal, accounting for the increase in the results reported.

Number of deaths attributed to major incidents - fire

Whilst data on the number of deaths during fires in retained, the fires recorded are a combination of those caused by natural disasters and those caused by human actions. Therefore, the figures have not been included in this report as it is difficult to determine those deaths resulting from natural fires retrospectively. An important point to note is that the impact of climate change might increase the risk of fire e.g. dry conditions. Furthermore, at a National level, there is a requirement to begin reporting on this indicator and other disaster related indicators per capita i.e. per 100 000 population to eliminate the bias when comparing statistics globally. As the municipality improves on SDG monitoring and reporting, this indicator and the way data is collected for reporting will change.

Number of deaths attributed to major incidents - rain/ wind/ storm



Source: Municipal Disaster Management System

Source: iol.co.za (2023)

The results above reflect only the deaths that have been reported through municipal processes, and does not include those reported to the South African Police Service and other organisations. Even with this in mind, the comparison above yields interesting results as there is a drastic spike in the number of households affected in the 2021/22 fiscal year. The devastating floods of April 2022 resulted in a considerable number of deaths. The severity of these floods is significant when comparing the statistics over the 3 years. EThekwini Municipality has embarked on a process to review its plans and processes to ensure better responses in the event of future disasters. This is coupled with urban resilience initiatives using electronic data analysis tools such as Greenbook Metroview.

Good practice example: Forecast Early Warning system (FEWS) *

The eThekwini Municipality Coastal, Stormwater and Catchment Management Department has implemented a Forecast Early Warning System (FEWS) to better manage and mitigate the effects of flood-related disasters. The city experiences flooding on an annual basis, with these events varying in severity from minor damage to loss of lives and infrastructure. Although these events are natural disasters, an action plan is needed to minimize their effects. Changes in rainfall patterns, rising sea levels, population growth and economic activity are driving an increase in demand for flood risk forecasting and mitigation engineering. Worldwide, flood disasters account for about one-third of all natural disasters. South Africa's increasing demand on cities for employment results in large-scale urbanization into flood plains and river courses. Furthermore, the capacity of ageing urban drainage systems to cope with infrastructure development and changes in climatic rainfall patterns will increase the probability of extreme events.

Source: Earthjournalism.net (2023)

The South African constitution states that everyone has the right to an environment that is safe and not harmful to their health. According to the National Disaster Management Act, prevention and mitigation are top priorities, with early warnings being a key aspect of disaster prevention. The development of the FEWS is a groundbreaking initiative in South Africa and Africa.

FEWS is a disaster management and data monitoring tool that simulates flood scenarios, environmental water quality, coastal erosion, and wave behaviour. Access to reliable weather forecast data allows the system to predict the effects of natural disasters ahead of time, allowing enough time for the information to be provided for emergency resource allocation so that the city is better prepared. A web app was developed by the Coastal, Stormwater and Catchment Management Department for the public. The eThekwini Coastal Live website is an initiative to primarily communicate weather-related information within the municipality. It is built for 'mobile first' technology with the intention of having users engage more often. Coastal Live was launched by the Municipal Mayor in November 2020.

* *EThekwini Municipality Voluntary Local Review 2024*

SDG 13 WINDHOEK

Total Greenhouse gas emissions inventory per year

The City of Windhoek does not have a dedicated emissions monitoring programme. There are however plans in the Windhoek Integrated Climate Change Strategy and Action Plan to build local capacity for Windhoek to start collecting data and compiling its own greenhouse gas emissions inventory.to institute such a programme in the near future This program is planned to materialise in the medium term. Emissions in Namibia are measured at a national level. The national inventory covers the full territory of the country and the results are presented at the national level. It is difficult to extract Windhoek specific data from the national inventory as data is presented per sector not geographical areas.
The gases covered in the national inventory are the direct gases carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) and the indirect gases nitrogen oxides (NO_x), carbon monoxide (CO), non-methane organic volatile compounds (NMVOCs) and Sulphur dioxide (SO_2). Once the City of Windhoek's gas emissions inventory is started it will be aligned to the national protocols. Namibia's GHG inventory uses 2015 as the base year. Total emissions from all the sectors excluding forestry were estimated at 4.22 MtCO2e for 2015.

Windhoek Integrated Climate Change Strategy and Action Plan

The municipal Council of Windhoek approved its Integrated Climate Change Strategy and Action Plan in July 2023 to facilitate its response to climate change. Through this Strategy and Action Plan, Windhoek is ensuring that it is playing its part in meeting local, national, regional and international targets. Apart from our obligation to build a climate resilient city, this strategy is also driven by our ambitions to become a smart and caring city. The strategy has the following focus areas:

Adaptation:

- Water Security and Efficiency;
- Biodiversity and Ecosystem Goods and Services;
- Human Settlements;
- Healthy Communities;
- Disaster Preparedness; and
- Sustainable Urban Agriculture

Mitigation:

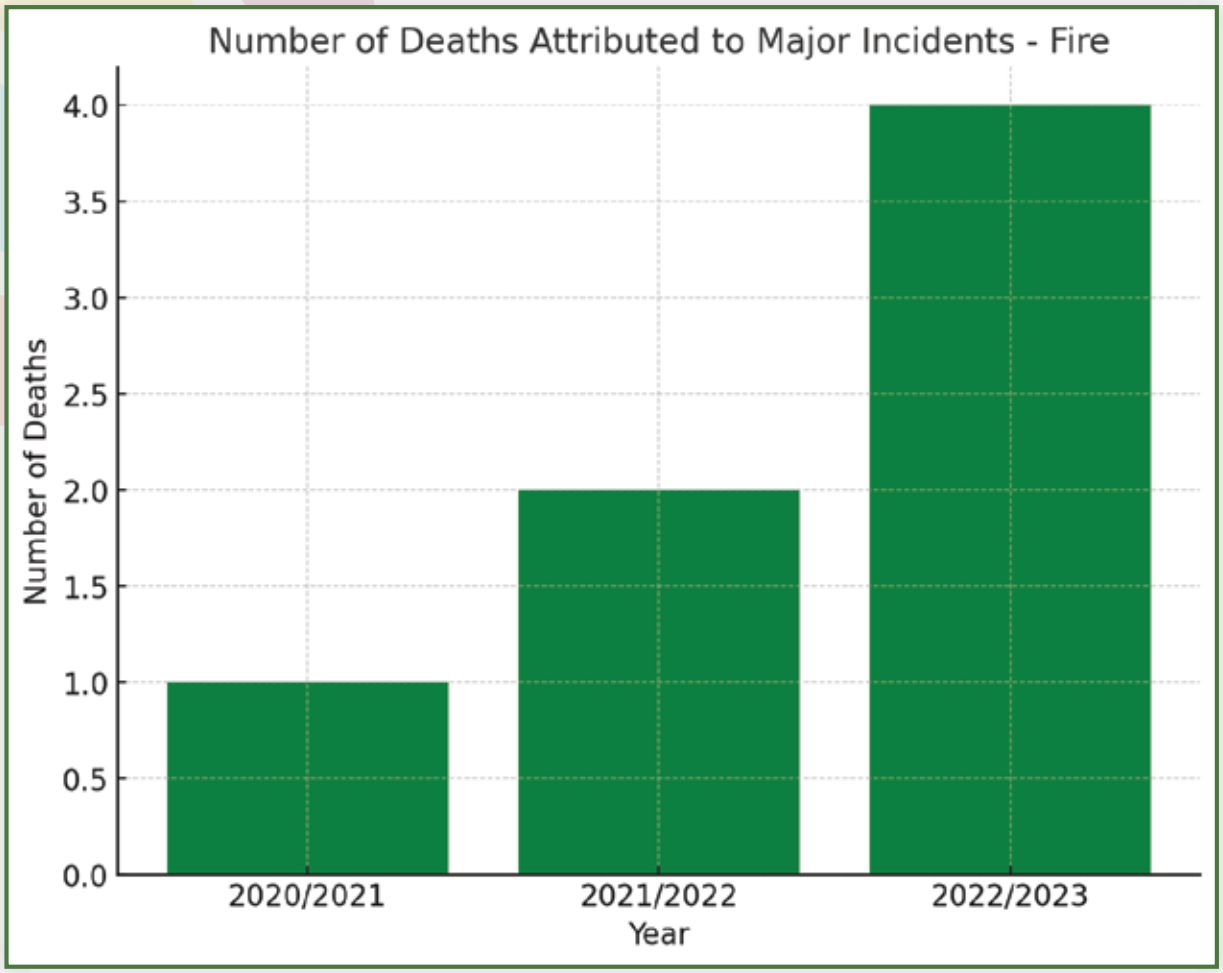
- Sustainable Energy and Low Carbon Development;
- Waste Minimization and Management; and
- Sustainable Transportation.

Crosscutting issues:

Public Awareness and Capacity Building.

For more information on the Integrated Climate Strategy and Action Plan, visit:
Windhoek acts on climate change (eif.org.na) and Helping Windhoek plan for climate change | SEI

Number of deaths attributed to major incidents – fire

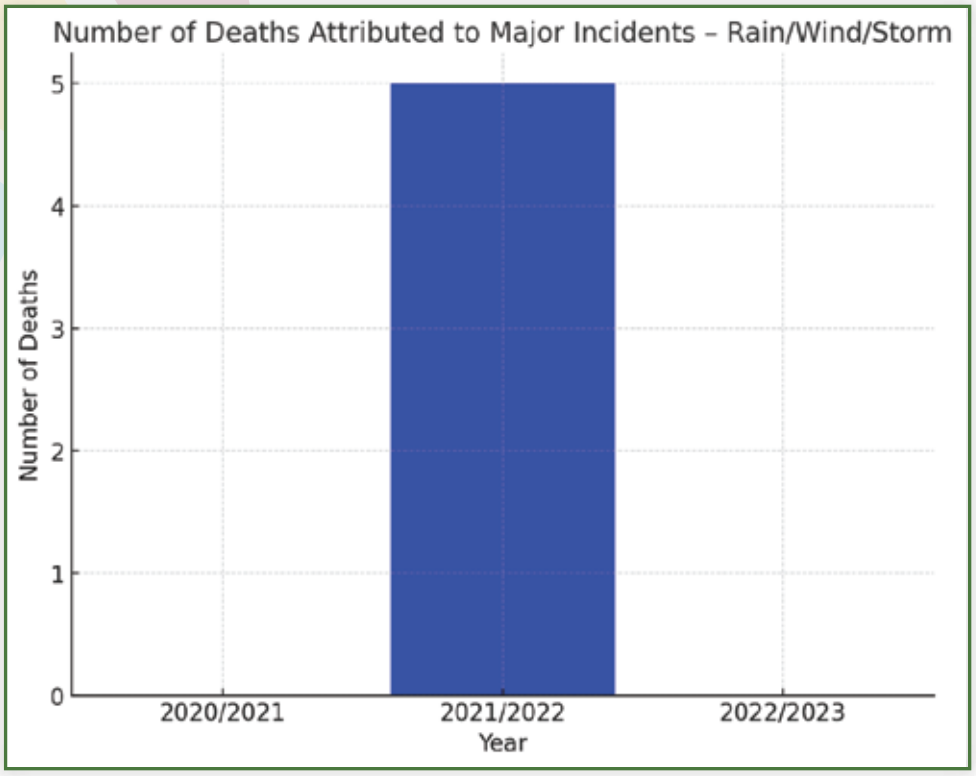


Source: Emergency Services Division, City of Windhoek internal database for reported incidents

Despite Windhoek's susceptibility to veld fires due to Namibia's hot and dry climate, the relatively low number of fire-related deaths between 2020 and 2023—compared to previous years—can largely be attributed to the COVID-19 lockdown regulations. With more people staying at home, the number of major fire incidents impacting residential areas decreased. Additionally, the City of Windhoek's Fire Brigade, along with an effective disaster risk and emergency strategy, has played a significant role in keeping these figures low. The city's proactive measures, such as creating fire breaks and cut lines, proved crucial in containing fires. The collaboration between the Fire Department, the Dog Unit, surrounding farmers, residents, and media further strengthened efforts to manage and mitigate veld fires.
Public warned against dangers of veld fires – Windhoek Observer (observer24.com.na).

In 2022/2023, the City of Windhoek launched a new initiative to chop down old trees and clear dry grass to prevent bushfires from escalating. The Disaster Risk Management Division took swift action, responding to a record number of veld fires experienced in previous years. Strategically placed firebreaks, resembling gravel roads, were established to serve as barriers, helping to prevent the spread of fires. These firebreaks, positioned with consideration to wind direction and vegetation, ensured the rapid containment of fires and allowed for easier access by firefighting teams.
No damage reported during Windhoek veld fires - Top Story 2 - The Namibian

Number of deaths attributed to major incidents - rain/ wind/ storm



Source: Emergency Services Division, City of Windhoek internal database for reported incidents

Windhoek, typically characterized by its arid conditions and low rainfall, occasionally experiences flash floods due to sudden and intense rainstorms. This was evident in the 2021-2022 financial year, where five deaths were recorded from rain, wind, and storm incidents. Despite the overall low rainfall, flash floods continue to pose a significant risk, particularly to informal settlements and low-lying areas prone to flooding. In January 2021, Windhoek received 105.4 mm of rain—1.4 mm more than the average—triggering flood warnings and emergency responses and higher-than-average rainfall during February 2022 and December 2023 *Namibia Weather, Windhoek - Windhoek Yearly Rainfall Summary Reports (namsearch.com),* with 2022 receiving what would characteristically be three months rainfall in mere hours *(Updated) Namibia – Floods in Windhoek After 3 Months' Worth of Rain in 24 hours – FloodList.*

Source: 'Unprecedented' flooding wreaks havoc in Windhoek - Namibia (africa-press.net)

The City of Windhoek has taken proactive measures to mitigate the effects of flash floods. The Windhoek Fire Brigade and Disaster Risk Management Division have implemented strategies such as creating fire breaks, clearing dry vegetation, and enhancing stormwater drainage systems to prevent potential disasters. In 2021, the city's emergency response teams attended to fourteen flood-related incidents and initiated patrols in flood-prone areas to ensure the safety of residents. Public advisories urged residents to be vigilant, with special precautions for those in high-risk areas near rivers and dams
Windhoek Mayor warns of floods as heavy rains persist | Namibia Economist

These concerted efforts, along with collaboration from the community, have contributed to the relatively low number of deaths in recent years, showcasing the effectiveness of Windhoek's disaster preparedness and emergency response initiatives.

SDG 13 BREMEN

Total Greenhouse gas emissions inventory per year

State of Bremen (Bremen + Bremerhaven)	Energy-related GHG emissions in CO2 equivalents. Index: 1990 = 100	Energy-related GHG emissions in CO^2 equivalents In thousand tons
2018	92,8	12.415
2019	85,5	11.443
2020	68,9	9.217
Source: ***Veröffentlichungen | Statistikportal.de*** Länderarbeitskreis Energiebilanzen (Datenbankabruf: 20.07.2023); für Deutschland Umweltbundesamt, Nationale Trendtabellen für die deutsche THG-Berichterstattung (NIR 2023), 15.04.2023		

Wie haben sich die Treibhausgas-Emissionen in Bremen entwickelt - Statistisches Landesamt Bremen

The amount of greenhouse gas emissions in Bremen has changed significantly since 1990. The decrease is mainly due to the carbon dioxide share of total greenhouse gas emissions. Here again, the steel industry plays the most important role in Bremen. Depending on the economic situation, different quantities of raw materials were used, resulting in different amounts of CO^2 being emitted. The rise in raw material prices in 2005 and the economic crisis in 2009 are therefore also noticeable here. Since 2017, the decreasing use of coal in power generation plants has also played a role.

As the CO^2 reduction target of the CEP 2020 applies to the state of Bremen (excluding the steel industry), the CO^2 reporting also primarily relates to this demarcation. In 2020, consumption of end use energy in the state of Bremen (excluding the steel industry) caused CO^2 emissions of around 4.7 million tons. Of this, 86% was attributable to the city of Bremen and 14% to Bremerhaven. From a sectoral perspective, the consumer group “Households, trade, commerce, services, other consumers” accounted for the largest share of CO^2 emissions in the state of Bremen (excluding the steel industry) at around 46%. Around 29% was attributable to the manufacturing industry and around 26% to the transport sector. In 2020, CO^2 emissions in the state of Bremen (excluding the steel industry) were around 2.1 million tons below the level of the base year 1990. This corresponds to a CO^2 reduction rate of 31%. Compared to 2010, CO^2 emissions have fallen by 25.5 %.
Source: State of the Environment Report

Number of deaths attributed to major incidents – fire

Bremen has not yet been affected by forest fires. *Source: BMEL-Statistik: Waldbrandstatistik*

German Weather Service (DWD) measures weather data at 105 stations in the north

The DWD publishes a daily index indicating how high the regional forest fire risk is. For the northern federal states of Lower Saxony, Schleswig-Holstein, Mecklenburg-Western Pomerania, Hamburg and Bremen, it is calculated based on weather data from 105 measuring stations.

Source:https://www.ndr.de/nachrichten/info/Waldbrandgefahr-im-Norden-So-hoch-ist-das-Risiko-in-Ihrer-Region,waldbrand756.html

Number of deaths attributed to major incidents - rain/ wind/ storm

No figures for deaths caused by natural disasters are available for the city of Bremen. However, the climate crisis is making natural disasters and extreme weather events more likely. To counter these climate changes, the state of Bremen adopted the Climate Adaptation Strategy in 2018. Some key measures of this climate adaptation strategy have already been fully implemented, such as the "Information and information system for heavy rainfall prevention", where citizens can find out about the risk of heavy rainfall in their homes and neighborhoods. Individual key measures were technically specified and conceptually further developed, such as the "Action Concept for Urban Trees" for the city of Bremen, which was adopted in February 2021. In the last ten years, the number of street trees in the city of Bremen has already been increased by almost 4,000. As part of the GreenFirst project, a further 130 new trees are to be planted in the city in 2022 and 2023.

Heat stress

The number of summer days (days that reach 25°C or more) has increased significantly in Bremen. While the heat stress still appears moderate compared to southern European cities, the urban climate analysis for Bremen (2013) clearly shows that the bioclimatic situation differs on a small scale. In particular, sealed and densely built-up areas with little vegetation heat up more in summer. Accordingly, vulnerable or exposed population groups and neighborhoods are a particular focus of climate adaptation.

Heavy rain

With increasing climate change, heavy rainfall events are occurring more frequently and more intensively. Since 2012, the cooperation project "KLAS - KLimaAnpassungsStrategie Extreme Regenereignisse" (KLAS - KLima Adaptation Strategy Extreme Rain Events) has been working on how the municipality of Bremen can adapt to these extreme events (www.klas-bremen.de). A new information system was developed and implemented from 2018 to 2021 in a sub-project funded by the German Federal Environmental Foundation with €120,000 entitled "Information and information system for heavy rain precautions (AIS) as a contribution to the 'Climate Adaptation Strategy Extreme Rain Events (KLAS) in Bremen'. The heavy rain precaution portal (starkregen.bremen.de) serves to inform the public and offers the opportunity to call up a heavy rainfall map, request information on flooding hazards on one's own property and/or obtain personal on-site advice from specialist staff on possible property protection measures. Another application, the so-called AIS intern, was created to support planning and decision-making processes within the authorities and accompanies the consideration of heavy rain prevention issues in urban land-use planning in the sense of climate-adapted urban development.

Floods

Around 86% of the area of the state of Bremen is potentially at risk from flooding. Approximately 532,000 people live within these endangered areas. Flood protection is therefore an existential task for the state of Bremen. Flood risk management pursues two objectives: One is to reduce the dangers that floods pose to human health, the environment, cultural heritage and economic activities. Secondly, it aims to improve the management of flood hazards. Implementation takes place in three stages:

Stage 1: Assessment of the flood risk

Stage 2: Preparation of hazard and risk maps

Stage 3: Preparation of the Weser flood risk management plan

The second cycle of the directive was completed with the publication of the second Weser Flood Risk Management Plan in December 2021. Based on the update of the preliminary assessment, the hazard and risk maps were updated, and appropriate objectives and measures were formulated for the Lower and Middle Weser, Blumenthaler Aue, Beckedorfer Beeke, Schönebecker Aue and Ihle watercourses reported to the EU. The focus is on prevention, precaution and protection, as well as managing and reducing the adverse consequences of flood events. It was drawn up in close cooperation with the seven riparian states that have joined forces in the Weser River Basin Community. The Environment Ministry defined a total of 108 individual measures in the FRM plan with the following priorities:

- Improving public information
- Improvement of the municipal warning system
- Implementation of the general plan for coastal protection
- Conceptual measures, e.g. creation of flood protection concepts

Flood risk management is an ongoing process. The three processing steps are updated every six years. Maps and further information are available on the Internet at

Hochwasserrisikomanagement - Die Senatorin für Umwelt, Klima und Wissenschaft (bremen.de).

Source: State of the Environment Report

City route drone flight

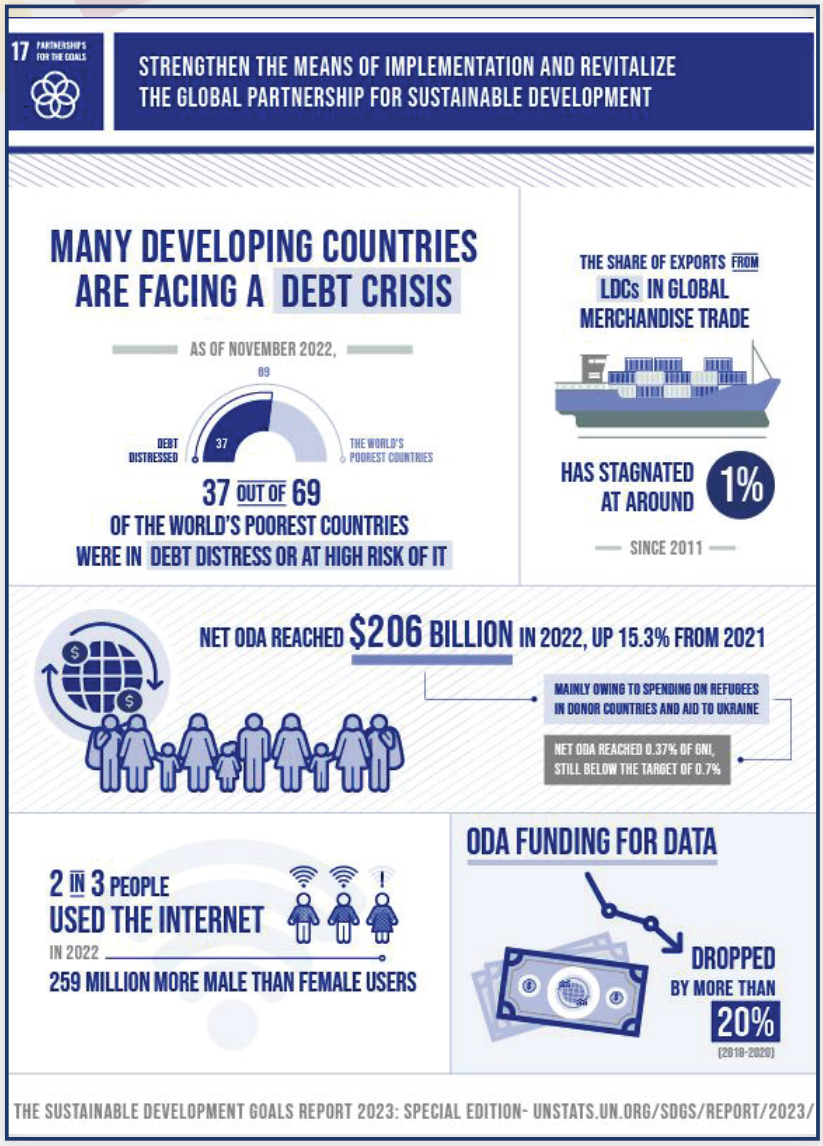
Source: Juri Krebs

Good Practice Example: phasing out coal-fired power generation

On April 30, 2024, the last coal-fired power plant in Bremen was taken off the grid. No more coal-fired electricity will be generated in Bremen and fed into the grid. We are a big step closer to the important goal of making Bremen climate-neutral and emitting no more CO^2 by 2038. Stadtwerke Bremen (swb) relies on natural gas for electricity and heat production instead. The new combined heat and power plant is technically designed to be able to use biomethane or even hydrogen in addition to regular natural gas.

Stillgelegt: Letztes Bremer Kohlekraftwerk vom Netz - Pressestelle des Senats (bremen.de)

Sustainable Development Goal 17: Partnership for the goals



The focus of Goal 17 is revitalizing the global partnership for sustainable development. The 2030 Agenda is universal and calls for action by all countries – developed and developing – to ensure no one is left behind. It requires partnerships between governments, the private sector, and civil society.

To be successful, everyone will need to mobilize both existing and additional resources and developed countries will need to fulfill their official development assistance commitments. The indicators and targets for SDG 17 are difficult to measure at city level. However, the 3 cities acknowledge the importance of this SDG which speaks to this trilateral report, and the success of collaborative projects being implemented in the 3 cities. Whilst no specific indicators are selected for reporting and monitoring, the following indicators are related to this project:

Multi-stakeholder partnerships

17.16 Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries

17.17 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships

Projects related to the chosen Sustainable Development Goals

The SDGs are the basis for the cooperation between all three cities. Many former and ongoing cooperations and projects underline this. The project descriptions that follow are only a selection from a wide range of the three cities successful cooperation.

SDG 6 Operational cooperation between the municipal wastewater companies in Bremen and Windhoek

More than 8.000 km distance... but a lot of similarities! There are similar tasks and special local tasks in both cities. Hansewasser Bremen, Umweltbetrieb Bremen and City of Windhoek work closely together. (*hansewasser_windhoek-koop-flyer_2023.pdf and BAB - Forschungsprojekt mit bundesweiter Strahlkraft (bab-bremen.de)*

SDG 11 EU-Project ' Improving Solid Waste Management', Project Partner: Windhoek and Bremen (2019-2025: ongoing project)

The Free Hanseatic City of Bremen and the City of Windhoek share a longstanding partnership and city-to-city cooperation. Peer-to-peer learning among municipal experts and the exchange of knowledge are key elements of this collaboration. Since August 2022, the project has been implemented through a series of activities aimed at mitigating the impacts of global climate change and environmental pollution, particularly through the initiatives of the City of Windhoek's Solid Waste Management Division. The project aims to attain the following outputs:

- Output 1: Members of Windhoek City Council and senior administration officials in Bremen, Windhoek and Durban are more familiar with the policies, legal framework and strategies geared toward waste minimization, recycling and reuse in the three cities.
- Output 2: New Business model in the sector of waste recycling, reuse and reclamation have been developed within the City of Windhoek.
- Output 3: The population in Windhoek has been activated/engaged towards waste recycling

As part of the approved annual work plan for 2023 to realise Output 1, the Free Hanseatic City of Bremen invited six officials from the Department of Infrastructure, Water and Technical Services, and the Department of Finance and Customer Services of the City of Windhoek to an exchange visit. A technical group of three participants visited Bremen in June, followed by a finance and administration group of three participants in July 2023. During these visits, delegation members engaged in workshops, meetings, and discussions, actively participating in the daily operations of The Bremer Stadtreinigung (DBS).

They gained insights into various aspects of solid waste management in Bremen, including collaboration with multiple stakeholders, private companies, state-owned enterprises, NGOs, and successful startups along the solid waste management value chain. These visits aim to strengthen the partnership between Windhoek and Bremen and enhance capacity, which is one of the key project outcomes. Additionally, the City of Durban provides technical assistance to the City of Windhoek, facilitating a political and technical exchange program focused on capacity building and best practice sharing regarding buy-back centres. Notably, an engagement to capacitate political leaders in Windhoek took place in 2022, and following the opening of the first buy-back centre in 2024, a further technical benchmarking exchange on best practices for facility management in an African context is planned for late 2024 for Durban, South Africa. Moreover, an additional three technical visits are expected to take place in Bremen, Germany focusing on capacitating City of Windhoek Officials from the Corporate Communications, Marketing and Public Participation Division, External Relations and Networking as well as the project staff of Education Officers and Administrative Officer under Solid Waste Management Division

https://www.windhoekcc.org.na/improving-solid-waste-management-in-windhoek/

SDG 13 'Environmental Education and Improved Surface Water Quality in Townships in Windhoek, Namibia' Project partner: Windhoek and Bremen (finished project)

The cooperation between Bremen and Windhoek has a longstanding tradition, dating back to 1975 and formalized through the signing of a Charter Agreement in 2000. Over the years, this partnership has increasingly focused on environmental protection and resource conservation, with particular attention given to improving the quality of surface water in Windhoek's townships.

Windhoek faces significant challenges due to its dry climate, making the supply of clean water crucial. One major environmental concern is the contamination of surface water in townships caused by the illegal disposal of waste oils, paints, and other hazardous materials by informal backyard mechanics. Despite the environmental risks, these informal car service businesses provide essential income and employment opportunities for many unskilled workers in the townships. Recognizing the mechanics' willingness to address these issues, the project 'Environmental Education and Improved Surface Water Quality in Townships in Windhoek, Namibia' was initiated.

The project, which was part of the Municipal Climate Partnership Bremen-Windhoek (Nakopa[6] 2014-2017), aimed to improve surface water quality by educating mechanics and the broader community on the environmental and health hazards posed by improper waste oil disposal. Key objectives included raising environmental awareness among backyard mechanics, modernizing a waste oil retention system, and promoting water quality testing.

Workshops were conducted to educate mechanics on environmental protection and waste oil management. These workshops included presentations by City of Windhoek staff and facilitated open dialogues, revealing a need for better disposal options. As a result, the project led to the modernization of an old oil retention facility and the installation of additional oil collection tanks at the Menarovandu site, enabling the proper disposal of waste oil by over 100 backyard garages.

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[6] *Local German authorities can use the funding instrument "Sustainable municipal development through partnership projects" (Nakopa) to apply for a grant for development policy projects that are developed and implemented in the context of partnership-based municipal relations with a country in the Global South.*

The project also fostered knowledge exchange between Windhoek, Bremen, and Durban, with Durban providing valuable insights on waste oil management. This exchange was supported by students and trainees from the Bremen University of Applied Sciences and Namibia University of Science and Technology (NUST), who contributed to developing environmental education materials and conducting socio-economic surveys.

This Nakopa project marked the beginning of a deeper collaboration between Bremen and Windhoek, paving the way for further participation in the project 'Municipal Climate Partnerships' programme and the exchange of best practices with Durban. The successful implementation of this project has set the foundation for a broader waste oil management system in Windhoek, but continued efforts are needed to establish comprehensive waste oil collection and treatment across the city.

SDG 17 'Digital twin' Project partner: Durban and Bremen (ongoing project)

The Digital Twin project strengthens the digital transformation of both cities. A joint learning process is taking place between Bremen and Durban through the development of digital tools to improve governance and strengthen collaboration between local authorities and external stakeholders. As part of this process, a digital twin of the city of Durban will be developed based on the model of Bremen (www.3d.bremen.de) and an integrated strategic data platform for the city of Bremen will be developed based on the model of Durban (www.strathub.durban.gov.za).

The Bremen and Durban teams during the workshops in Durban and Bremen

Source: Digital Twin Project team

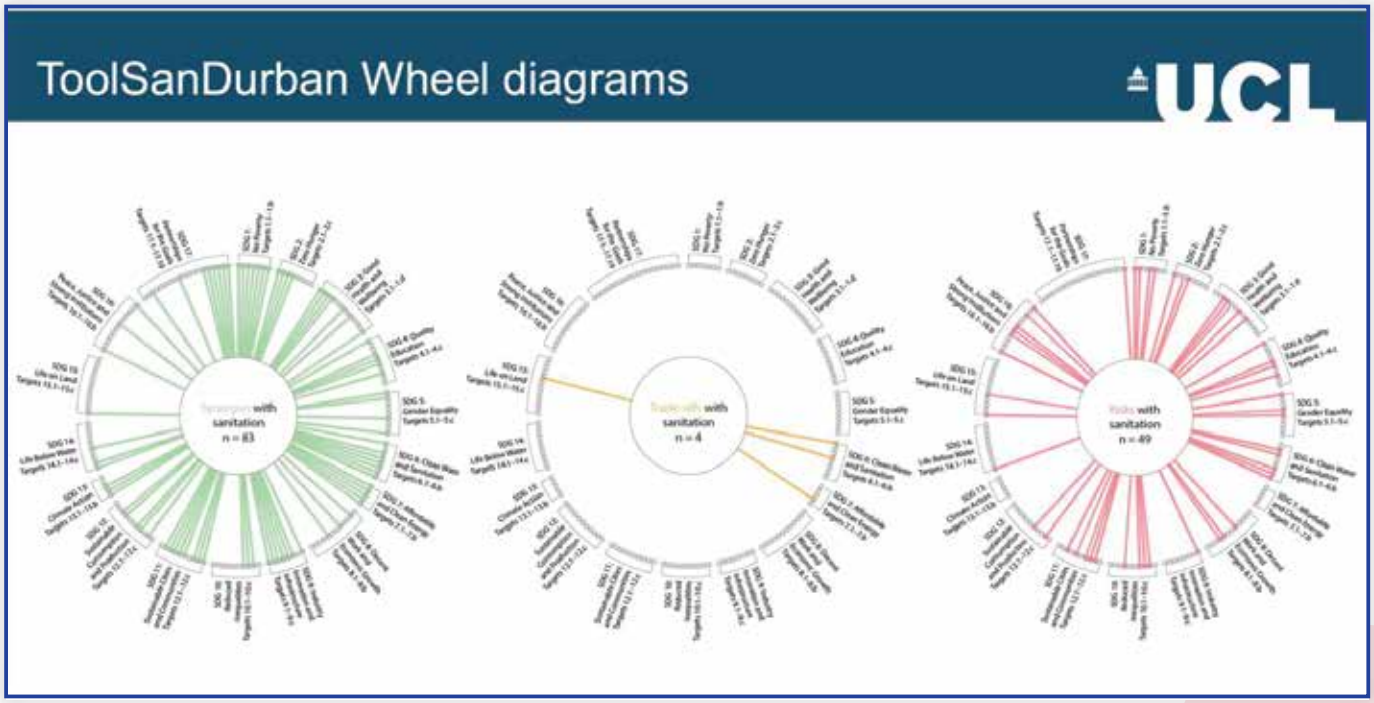
SDG 17 DURBAN

The city is engaged in several partnerships, with the following being of note and producing tangible outputs:

- The Central KZN (KwaZulu Natal) Climate Change Compact, which has been active since 2014. This is a climate change-focused initiative between municipalities, provincial government, and South African Local Government Association (SALGA) in KZN. Another Compact is active in Mpumalanga. Three other Compact members are implementing the Transformative Riverine Management Programme (TRMP) projects funded by provincial government.

- The eThekwini Municipality and the University of KwaZulu-Natal collaborate within the transdisciplinary Durban Research Action Partnership. This partnership has been active since 2011 with multiple research programmes focused on sustainability and climate change. The city-funded Global Environmental Change Research Programme is about to commence its fourth three-year phase, funded by eThekwini Municipality.

- The ToolSan Durban Project is a project in partnership with the University College London(UCL) which focuses on research and benchmarking on SDG 6 related to water and sanitation. The first phase was completed and resulted in a toolkit that can be used for project prioritisation. The partnership has expanded to phase 2 which is currently underway focusing on assessing alternative sanitation solutions are related to SDG6.



Extract from the ToolSanDurban report. Source: eThekwini Municipality/ UCL

- The Durban/Bremen Sister City partnership has yielded several benefits, particularly for eThekwini Municipality. Some of these benefits have been the development of the Green Corridor and the Enviro Champs Programme.

- UN Habitat is another key partner in the SDG-related initiatives, with technical support previously and currently provided for many of the safety-related projects which primarily contribute towards achieving SDG 11. UN Habitat has also been instrumental in introducing the eThekwini Municipality to several partnerships and guiding some of the SDG-related work.

- The World Bank is a partner that has assisted and continues to support us with several projects that contribute to the achievement of the SDGs. Examples of the successes of this partnership include the exchange of lessons learned on the 2019 and 2022 floods, and the current support for the Urban Resilience efforts being undertaken by the municipality. They are also supporting the pre-feasibility studies being undertaken for projects that form part of the Smart City initiative. These projects will contribute to SDG 6, SDG 7, and SDG 11.

- GIZ (The German Development Corporation) has been instrumental in supporting the Transformative Riverine Management programme and several projects relating to SDG 13 which deal with issues of climate action.

- The UK (United Kingdom) Foreign Commonwealth Development Office has been a crucial partner in many projects undertaken over the years. These include supporting the development of an Informal Settlements Information Management System, providing technical support for working on Transit Oriented Development and most recently supporting the development of an eThekwini and KZN Regional Data Strategy.

- The partnership with United Cities and Local Governments on developing the SDG Toolkits for cities as well as train the trainer programmes. This is one of the key programmes that are run nationally and globally.

SDG 17 WINDHOEK

International relations are central to the City of Windhoek's development strategy, based on the understanding that no city can thrive in isolation. Windhoek has made significant strides in internationalizing its operations, recognizing that global partnerships foster growth and innovation. With partner cities across all continents, Windhoek demonstrates its commitment to cross-border collaboration. These partnerships are further strengthened through active participation in international bodies such as the International Council for Local Environmental Initiatives (ICLEI) and the Commonwealth Local Government Forum (CLGF), which enable the city to engage in global discussions on urban sustainability and governance. This multilateral cooperation directly supports the achievement of SDG 17, "Partnerships for the Goals," at local, national, and international levels.

With 27 city partnerships and memberships in global networks, Windhoek capitalizes on shared best practices and focuses on knowledge exchange and capacity development. Key partners include Shanghai, Nantong, Jinan, and Chongqing in China; Vantaa in Finland; and Berlin, Mannheim, and Bremen in Germany. These partnerships prioritize the localization and implementation of SDGs, resulting in tangible projects that benefit grassroots communities. Whether through infrastructure development, sustainability initiatives, or knowledge-sharing programs, these collaborations help Windhoek advance its development agenda while addressing broader urban challenges.

SDG 17 is at the core of Windhoek’s international relations efforts, driving partnerships that go beyond symbolic agreements to serve as platforms for meaningful joint initiatives. By leveraging shared resources and expertise, Windhoek ensures the successful implementation of projects that directly benefit its residents. In this way, SDG 17 provides both a guiding principle and a practical framework for the city's internationalization strategy, fostering a collaborative and inclusive approach to urban development.

SDG 17 BREMEN

City diplomacy encompasses all topics and activities that address issues of global significance at the local level and for which solutions are developed jointly with partners. City partnerships, city friendships and membership of international networks are thus indispensable building blocks of international relations. They enable exchange on a personal level, as well as promoting international understanding and mutual learning.

With the partner cities, topics such as rule of law, democracy and peacekeeping are on the agenda, as are professional exchanges on the implementation of the Sustainable Development Goals or on current issues such as migration and climate protection. Through membership in international networks, Bremen connects with like-minded cities to achieve visibility and speaks up for shared values. Together with our partners around the world, we are aware of our municipal responsibility to develop solutions to global challenges and work together to achieve them.

CONCLUSION AND WAY FORWARD

As envisioned when the project was conceptualized, the process of developing this trilateral baseline report has highlighted areas of possible future collaboration amongst the three cities, whilst simultaneously already allowing for knowledge exchange during the process of the indicator finalization and data collection. Importantly, the process has emphasized the importance of carefully defining what is being measured and monitored, to ensure common understanding amongst the target audience.

Although much time was spent during the SDG conference in Bremen in autumn 2023, where all project partners and delegations met to choose and discuss suitable indicators to be included in this report, it became obvious during the data collection phase, that not all data was available in all three cities. Some data was not available at all, or only on a national level. Alternatively, there was another indicator which better suited the purpose of showing the situation in one of the cities regarding the chosen SDG, compared to the other two cities.

Another factor related to the indicators and their interpretation was, not surprisingly, but important to bear in mind: Indicators are influenced by many factors. Reading and understanding the trend shown by an indicator correctly is complex because external factors (for example the unexpected events like the flood in Durban in April 2022 and in Windhoek in December 2022) also need to be considered.

Based on the report, it is evident that networks and partnerships on all levels i.e. international, national and local, are the only way forward, including cooperation with private stakeholders, scientific stakeholders and civic society. A holistic and collaborative approach is needed. Nobody can thrive in isolation.

This report will be shared amongst other stakeholders and in available platforms for use by other cities. The baselines may be of use, but the major benefit for other cities may arise from the process followed and the future activities. Whilst the team was still engaging and working on the report, we were approached by different stakeholders in all three cities and invited to present this extraordinary project and its outcome at several conferences.

The intention is that this trilateral partnership transforms into learning exchanges amongst the cities involved, and any related partners or stakeholders. These sessions may take the form of virtual knowledge exchanges or technical visits to the countries for practical learning. When the delegations from Durban and Windhoek visited Bremen in October 2023, several meetings with colleagues in Bremen and Bremerhaven took place and the learning and knowledge exchange process was initiated. For example, during a visit to Bremerhaven, some of the discussions focused on climate change initiatives. It came to light that Durban had made significant progress with their policies and implementation plans, and it would be beneficial for Bremerhaven and Durban to engage further on this topic.

Similarly, discussions emerging from the conference and Durban's approach to fully integrate the SDGs into their reporting have sparked conversations and virtual engagements between the Durban and Windhoek teams, resulting in the implementation of SDGs reporting within the City of Windhoek Strategic Plan. To enhance this effort, the City of Windhoek has established an SDGs Localisation Committee to coordinate and improve the reporting on local SDGs implementation. Chaired by Council Members, this committee provides essential political impetus for advancing these initiatives. Through these efforts, the City of Windhoek intends to publish its first Voluntary Local Review, following in the footsteps of its partners Bremen and Durban, to more holistically report on the status of SDG implementation.

Whilst some future activities will be dependent on funding, finding innovative ways of executing the knowledge exchanges will also be explored. The areas identified for future knowledge exchanges may also lead to further projects and partnerships amongst the cities.

The in-person engagement was critical as it created a good baseline for mutual trust and further cooperation. After having a kick-off meeting in Bremen, the following meetings were held virtually. The online meetings took place amongst the three project coordinators, with other colleagues being included when needed. During these working sessions, more topics of common interest were identified, for example the topic of Urban Gardening. All three cities are already active in this field and considering the ecological and social dimensions, there seems to be great potential for a common project and knowledge exchange.

The success of this project and several others being undertaken amongst the 3 cities has resulted in the signing of a Tripartite Sister City Agreement on 26 September 2024 which will foster further collaboration.

Signing of the Tripartite Sister City Agreement in Durban: Dr. Andreas Bovenschulte, Mayor of Bremen, Cllr Cyril Xaba, Mayor of Durban, and Cllr Queen Omagano Kamati, Mayor of Windhoek. Picture: Bremen Senate press office

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Photos sourced from the respective cities

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