GreenCape

2022 WATER MARKET INTELLIGENCE REPORT

GreenCape

GreenCape is a non-profit organisation that works at the interface of business, government, and academia to identify and remove barriers to economically viable green economy infrastructure solutions. Working in developing countries, GreenCape catalyses the replication and large-scale uptake of these solutions to enable each country and its citizens to prosper.

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LIST OF ABBREVIATIONS AND ACRONYMS

AFD	French Development Agency
B-BBEE	Broad-based Black Economic Empowerment
C&I	Commercial and Industrial
CoGTA	Cooperative Governance and Traditional Affairs
COVID-19	Coronavirus disease
CSD	Central Supplier Database
DBSA	Development Bank of Southern Africa
DEADP	Department of Environmental Affairs and Development Planning (Western Cape Government)
DFFE	Department of Forestry, Fisheries and the Environment
DFI	Direct foreign investment
DWA	Department of Water Affairs (now DWS)
DWAF	Department of Water Affairs and Forestry (now DWS)
DWS	Department of Water and Sanitation
ELU	Existing lawful use
EME	Exempted micro enterprise
ERRP	Economic Reconstruction and Recovery Plan
GA	General Authorisation
GDP	Gross Domestic Product
GN	Government Notice
GTAC	Government Technical Advisory Centre
ISUPG	Informal Settlements Upgrading Partnership Grant
MFMA	Municipal Finance Management Act No. 56 of 2003
MIG	Municipal Infrastructure Grant
MIR	Market Intelligence Report
MLD	Megalitres (million litres) per day
NBI	National Business Initiative
NDP	National Development Plan
NSSS	Non-sewered sanitation systems
NRW	Non-revenue water
NT	National Treasury
NWA	National Water Act
NW&SMP	National Water and Sanitation Master Plan
PICC	Presidential Infrastructure Coordinating Commission
PPP	Public Private Partnership
RBIG	Regional Bulk Infrastructure Grant
SALGA	South African Local Government Association
SANS	South African National Standard
SDG	Sustainable Development Goal
SIDAFF	Sustainable Infrastructure Development and Financial Facility Programme
SLA	Service level agreement
TIF	Technology and Innovation Forum
TMG	Table Mountain Group
UISG	Upgrading of Informal Settlements Grant
VAT	Value-added tax
WASH	Water, sanitation, and hygiene
WASH-FIN	USAID Water, Sanitation and Hygiene Finance Project
WCWSS	Western Cape Water Supply System
WCG	Western Cape Government
WEF	World Economic Forum
WMA	Water Management Area
W&S	Water and Sanitation
WRC	Water Research Commission
WSI	Water services intermediary
WSIG	Water Services Infrastructure Grant

WUL	Water Use Licence
WWTW	Wastewater Treatment Works
W&WW	Water and wastewater

Provinces:

EC	Eastern Cape
FS	Free State
GP	Gauteng
KZN	KwaZulu-Natal
LP	Limpopo
MP	Mpumalanga
NC	Northern Cape
NW	North West
WC	Western Cape

Metropolitans:

BC	Buffalo City
CCT	City of Cape Town
Ekur	Ekurhuleni
eThek	eThekwini
JHB	Johannesburg
Mang	Mangaung
NMB	Nelson Mandela Bay
Tshw	Tshwane

Conversions:

1 Megalitre = 1 million litres = 1 000 000 litres = 1 000 kl = 1 000 m^3

Exchange rate used:

1 US Dollar = R15

EXECUTIVE SUMMARY

This year's market intelligence report (MIR) is written for investors and businesses interested in opportunities in the South African public water and wastewater infrastructure sector, with particular emphasis on the Western Cape region and South African metropolitan municipalities.

The pursuit of water security, resilience, universal access to water and wastewater (W&WW) services and sustainable economic development have become key drivers for investment in the country's public W&WW infrastructure. South Africa (SA) is facing a water crisis primarily due to recurrent droughts driven by climate change, and ageing W&WW infrastructure caused by inadequate maintenance and investment in infrastructure renewal and refurbishment.

The National Water and Sanitation Master Plan (2019) estimates that SA has accumulated refurbishment and renewal backlogs of ~ R25 billion and ~R332 billion in municipal W&WW infrastructure, respectively. Furthermore, national water supply and demand gap is forecasted to keep growing, leading to an overall 10% gap by 2030, even if the planned additional water supply projects are implemented.

To achieve water security and equitable access to W&WW services by 2030 and beyond, SA and the Western Cape (WC) will need to invest in new W&WW infrastructure projects, and the refurbishment, renewal, repair and maintenance of existing ageing W&WW infrastructure, particularly municipal infrastructure such as treatment works, pump stations and reticulation networks.

Furthermore, the country must do more to reduce water losses and water demand by adopting smart systems that will help improve water and energy efficiency, enable better management utility operations and infrastructure maintenance and assist in futureproofing the public W&WW sector.

This year's MIR draws on market trends and presents emerging longer-term investment and business opportunities to improve water security, resilience, and universal access to W&WW services as key enablers of sustainable economic growth, and social progress. Specifically, the report focuses on the following opportunities in the public W&WW market in SA:

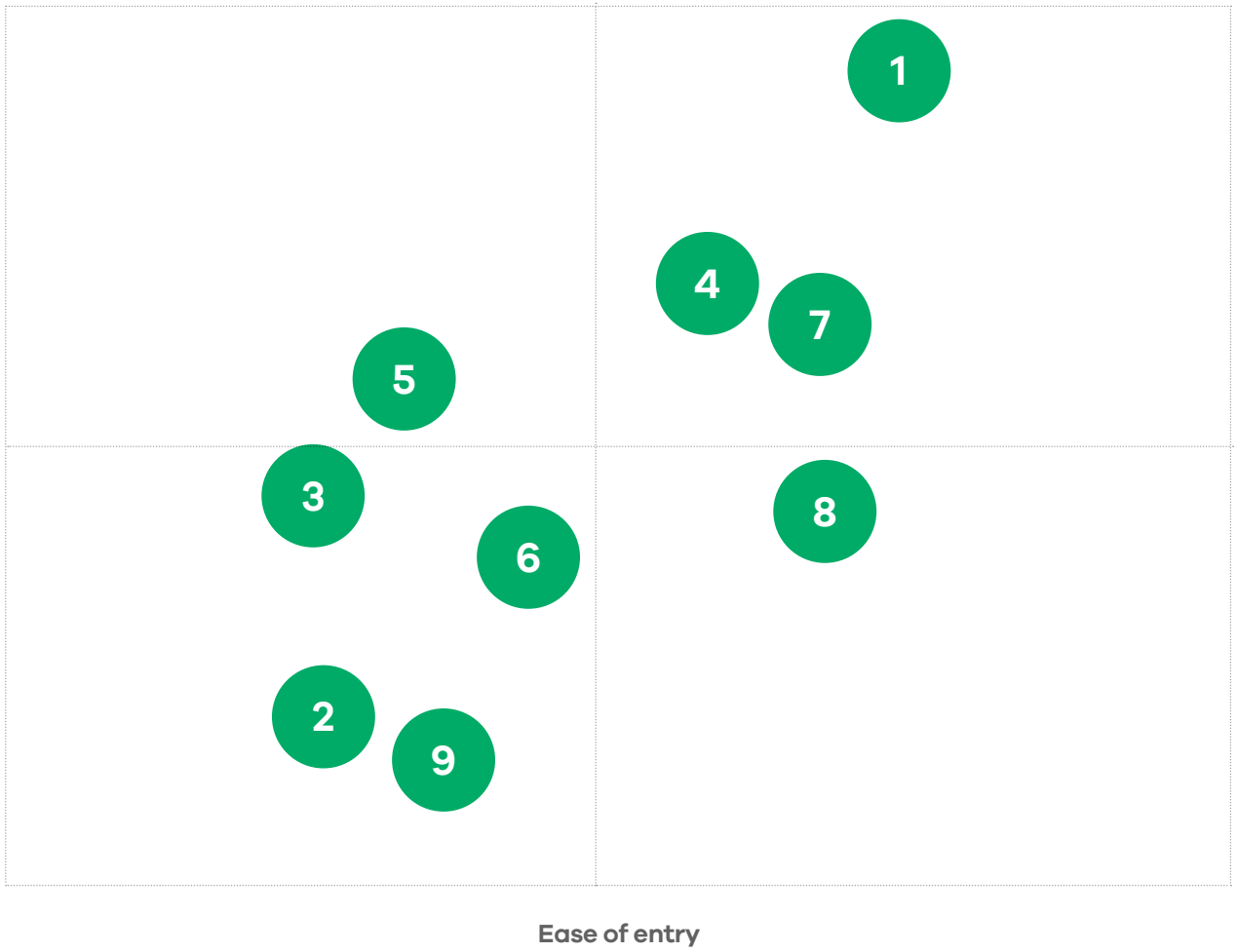
- **New W&WW infrastructure, renewal, and refurbishment** to address the challenge of delivering sustainable and equitable W&WW services to industries, new property developments, rural communities, low-income and informal settlements. **Repairs and maintenance** of ageing W&WW infrastructure will accelerate the eradication infrastructure backlogs, improve W&WW service delivery and reduce non-revenue water (NRW) and environmental pollution.
- **Smart systems** are important for achieving water security through improving water and energy efficiency, management and optimal functioning of W&WW utilities and infrastructure. Smart systems also assist the public W&WW sector in making informed decisions about which W&WW infrastructure must be prioritised for repairs and maintenance given their limited resources.

Key *drivers* of these opportunities are:

- **Water security:** Achieving water security is key to sustainable economic recovery and growth. Water crisis and social instability were jointly ranked as the third highest risk for doing business in SA in 2021 by the World Economic Forum (WEF). The South African Economic Reconstruction and Recovery Plan (ERRP) has W&WW infrastructure development as a key component to attracting investment, providing a foundation for ease of doing business, and improving the provision of basic W&WW services.
- **Increased urbanisation and lack of universal access to W&WW services**: The historical backlogs in accessing W&WW services and rapid urbanisation are key drivers for new W&WW infrastructure in SA. The operational reality is that existing ageing W&WW infrastructure has been stretched due to significant underinvestment and delays in maintenance and renewal. Large renewal backlogs and upgrades exist in municipal infrastructure such as treatment works, pump stations and reticulation networks.
- **Project preparation support:** Project preparation support for W&WW infrastructure projects from national government to municipalities has increased. A Project Preparation Facility and Infrastructure Fund led by the Development Bank of Southern Africa (DBSA) and supported by other strategic organisations was set up to prepare infrastructure projects, including the prioritised Strategic Infrastructure Projects (SIPs). In the WC, the Provincial Government is developing a project preparation support for catalytic municipal infrastructure projects through the Sustainable Infrastructure Development and Financial Facility (SIDAFF) Programme.

While the public W&WW sector represents the largest business and investment, there are a few *barriers* specific to this market. They relate to the **inability to access funding, capacity constraints, procurement processes,** and a lack of **locally demonstrated technologies.**

Nonetheless, the urgency to redress poor basic service delivery, political will, and support structures, will likely ease some of the barriers to the market. The opportunity matrix below gives a summary of the highlighted market size and the ease of gaining access to these opportunities. To provide context, it includes opportunities highlighted in the 2020 and 2021 MIRs as well.



1. 2022: Water & wastewater infrastructure
2. 2022: Smart systems
3. 2021: Non-revenue water systems
4. 2021: Non-sewered sanitation systems
5. 2021: Sludge beneficiation
6. 2020: Water efficiency and reuse in agri-processing
7. 2020: Water reuse (municipal)
8. 2020: Biogas at wastewater treatment works
9. 2020: Energy efficiency at wastewater treatment works

Figure 1: Market opportunity matrix showing the market size and ease of entry for investment and business opportunities highlighted in the 2020, 2021 and 2022 market intelligence reports

Opportunity	Key drivers	Barriers	Key market segments
Public sector water and wastewater infrastructure Section 4.1	• COVID-19 pandemic reemphasised the need for access to clean water, dignified sanitation and proper hygiene measures. • National development plan/national economic reconstruction and recovery plan/national infrastructure plan 2050 government strategies and initiatives aimed at service provision through infrastructure development. • Innovative blended financing models debut in water sector. • High operational expenditure on ageing infrastructure highlighting lifecycle savings of upgrading. • Constraints on urban residential development due to lack of bulk infrastructure. • Increase in project preparation support and available development finance linked to impact and sustainable development goals.	• Available grant funding for water and wastewater services is insufficient. • Financial mismanagement of municipalities. • Lack of locally verified or demonstrated technologies limits municipal confidence in innovation. • Limited research on climate mitigation impacts from W&WW investments reduces access to climate finance. • Current state of policies & regulations (changes in progress in procurement legislation could turn these into drivers in the next ~2 years). • Lack of municipal technical capacity.	• **~R105 bn** for 11 W&WW Strategic Integrated Projects (excl repairs and maintenance), of the **~R1 trillion** in development finance to be unlocked by the Infrastructure Fund with seed funding of R100 bn from National Treasury over the next 10 years. • **R24.8 bn** budgeted by metros for W&WW infrastructure expenditure over the next 3 years with an additional **R9.8 bn** for repairs and maintenance. • **R10.1 bn** budgeted by Western Cape municipalities (incl. R7 bn for CCT) for W&WW infrastructure expenditure over the next 3 years with an additional **R3.8 bn** (R 2.75 bn for CCT) for repairs and maintenance.
Smart systems for water and wastewater management Section 4.2	• Water security constraints. • Potential financial savings and reduced GHG emissions (due to efficiency). • Improved asset management for effective preventative maintenance. • Effective water demand management. • Increased availability of project preparation support. • Increased availability of development finance. • Increased accessibility to technical solutions.	• Aging infrastructure limiting ease of integration. • Risk of poor data integrity and security. • Low public confidence in operational capacity of municipalities. • High initial cost for network establishment. • Lack of municipal technical capacity for developing business cases to attract financing. • Theft and vandalism. • Financial mismanagement of municipalities. • Lack of trust, understanding, and buy-in of municipalities. • Complex contracting and financing models.	• **~R14 bn** savings annually in bulk water costs across all metros. • **~R1.2 bn** in planned smart meter installation in CCT over 8 years. • **~R5.5 m** in subsidy for smart metering in WC shools (FY: 2020/2021).

WHAT'S NEW?

CLICK HERE TO ACCESS PREVIOUS WATER MIRS

The 2021 MIR focused on the various emerging long-term investment opportunities in the South African municipal sector that promote sustainable development, water security and resilience.

The report highlighted business and investment opportunities in NRW reduction, beneficiation of wastewater sludges and alternative sanitation.

The COVID-19 pandemic exposed the continued neglect of SA's W&WW infrastructure, magnified long-standing socio-economic inequities as well as environmental stressors.

Investments in achieving water security and universal access to W&WW services are important in addressing the persistent socio-economic challenges, climate vulnerability and in stimulating economic recovery. According to the WEF's annual Global Risks Report series, water crisis has been in the top five risks of doing business in SA for three consecutive years.

Given the above, while the market opportunities presented in the 2020 and 2021 Water MIRs are still relevant, this year's Water MIR focuses on a detailed analysis of two additional business and investment opportunities in the public sector: **W&WW infrastructure in the public sector and smart systems for W&WW management.**

Investors and business owners are encouraged to read the previous water MIRs together with this 2022 MIR.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INTRODUCTION AND PURPOSE

This report is written for investors and business owners interested in the South African water and wastewater sector, with particular emphasis on opportunities in the Western Cape and South African metropolitan municipalities.

Berg River Dam
©Cilnette Pienaar

This report provides insights into the WC's water and wastewater (W&WW) sector, but also into South Africa's metropolitan W&WW sector. The report also outlines market opportunities and barriers to be considered by both businesses who are active or interested in doing business in the W&WW market, and investors who are active or interested in growing businesses in the W&WW market.

The key drivers of growth and long-term investment in the W&WW sector in the WC and more broadly in SA are three-fold: increasing resilience to recurrent droughts; ensuring water security for sustainable economic recovery and growth; and achieving universal access to W&WW.

This year's report focuses on investment and business opportunities within the public market: W&WW infrastructure **(new, renewals, upgrades, repairs and maintenance of water supply schemes and reservoirs, pipelines, pump stations, and treatment works)** and water conservation and water demand management **(smart systems for W&WW management).**

The report provides a sector overview (**Section 2**), which outlines water supply and wastewater service provision in both the South African and WC context.

This is followed by an overview of relevant policies and regulations (**Section 3**) that are attendant to W&WW infrastructure, and details of investment and business opportunities linked to W&WW infrastructure and barriers to realising these opportunities (**Section 4**). The final sections focus on finance and incentives (**Section 5**), give an overview of the WC as Africa's growing Greentech hub (**Section 6**), and explain GreenCape's work within the green economy space (**Section 7**).

While this report focuses on the public sector water market, there are inherent links between agricultural and urban water use projects, and between biosolids production projects and their land application.

Similarly, there are links between organic waste valorisation and energy production related to treating wastewater, as well as resource recovery opportunities throughout the water value chain.

These opportunities have been included where they fall within the water value chain; however, please consult the **2022 Sustainable Agriculture Market Intelligence Report, Waste Market Intelligence Report** and **Energy Services Market Intelligence Report** for opportunities specific to those sectors.


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SECTOR OVERVIEW

Water scarcity and inequities in access to water and sanitation are major challenges that fall within the remit of the South African government. Investment to address these challenges present a substantial opportunity in the municipal water sector for investors and businesses.


©Bruce Sutherland, CCT

2.1. South African context

South Africa (SA) is ranked as the 30th driest country in the world and has been characterised as a water scarce country, with low rainfall and high rainfall variability as a result of climate change. In 2021, the water crisis and social instability were jointly ranked as the third highest risk for doing business in SA, behind unemployment (WEF 2021) which is at 46.6% at the time of writing (StatsSA 2021) and failure of critical infrastructure for energy generation. In addition to being a water-stressed country, SA is also characterised by an uneven rainfall distribution, and extreme climate resulting in evaporation rates that often exceed precipitation.

The country has a reliable yield (i.e. supply from current infrastructure) of 15 billion kl/year (at 98% assurance of supply – or 2% annual probability of supply failure). Most of this yield is from surface water (68%) and return flows that support surface water (13%), as shown in **Figure 2**.

In SA, agriculture is the largest water use sector (61%), followed by municipalities (27%), which covers residential, commercial, and industrial water users supplied by municipalities (**Figure 3**; DWS 2019a). The relative proportion of municipal and agricultural use differs between provinces and municipalities, depending on human settlement patterns and local economy.

Billed revenue for water services against adopted budgets for the metros indicated a shortfall for the 2020/2021 financial year (National Treasury, 2021). In summary:

- Billed water revenue totalled R12.8 billion against expenditure of R13.9 billion indicating a deficit and;

- Billed wastewater management revenue totalled R3.6 billion against expenditure of R3.6 billion (breakeven).

The distribution of water sales among water users is shown in **Figure 3**. From the municipal sales, about 58% typically comes from domestic residential use, and 40% from commercial and industrial (C&I) use.

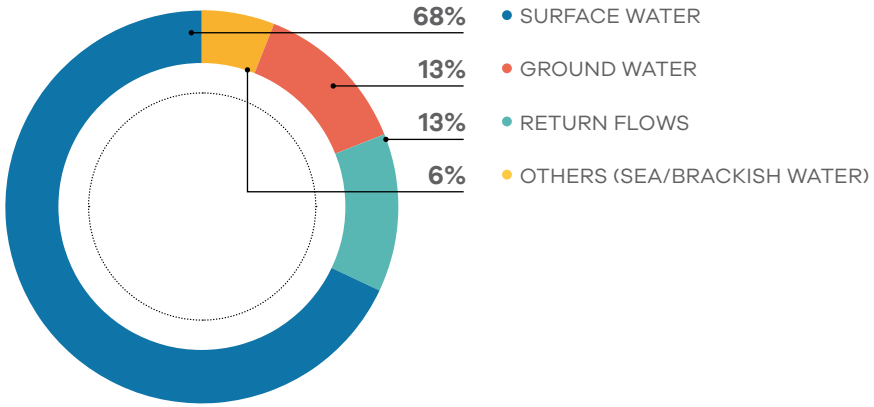

Figure 2: Water sources in South Africa[1]

Source: DWS 2017a

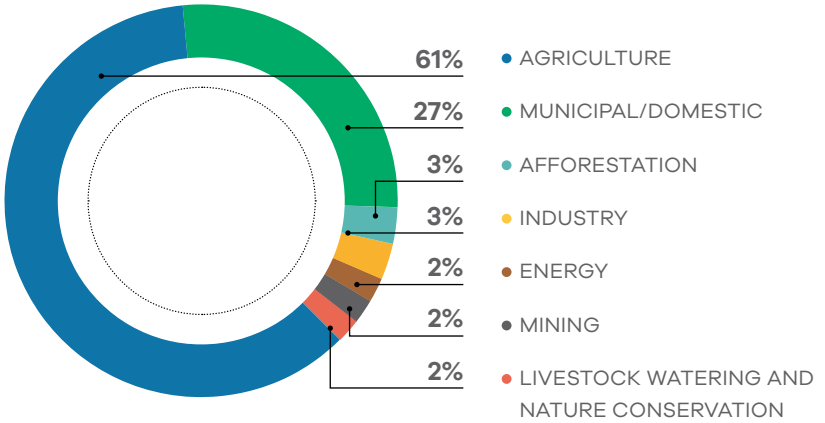

Figure 3: Water use in South Africa

Source: DWS 2019a

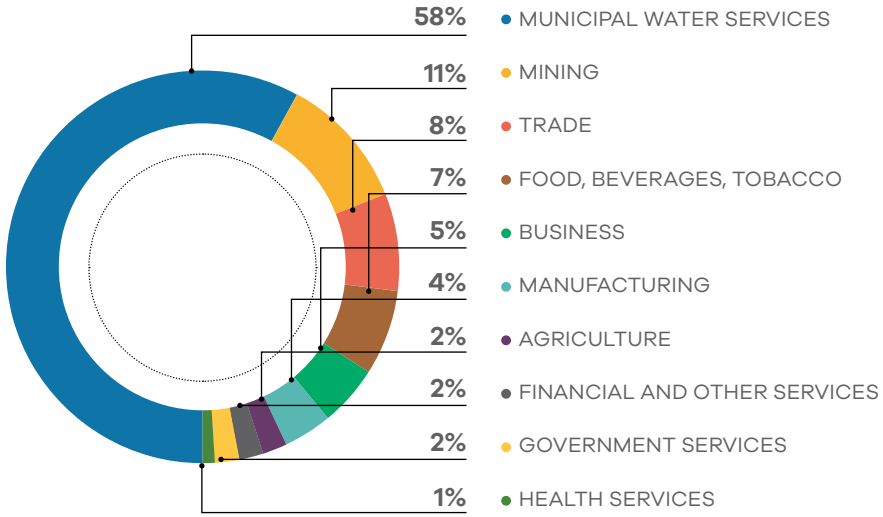

Figure 4: Financial value of water sales by sector

Source: GreenCape 2017

[1] 'Return flows' refers to water that is used and then recycled

Despite SA being a water-scarce country, the national average consumption is around 233 litres/capita/day (l/c/d) and consumption in the WC is around 201 l/c/d. These figures are much higher than the international benchmark of 173 l/c/d (DWS 2019a)[2]. Forecasts indicate that water demand will exceed supply by 10% by 2030 (DWS 2019a). This will be driven by low water tariffs, inefficient use, inadequate cost recovery, leakages, inappropriate infrastructure choices (e.g., water-borne sanitation in a water-scarce country), and increased demand in the municipal, industrial, and agricultural sectors (Donnenfeld et al., 2018).

The growth in demand by the municipal sector is expected to be the greatest, which is partly driven by urbanisation, but also by increased industrial production, commercial activity, and population growth.

A model of the future water balance for SA indicates that if planned additional water supply is added, and realistic water efficiency[3] is achieved, the gap between supply and demand by 2030 can be narrowed substantially (**Figure 5**; DWS 2019).

The additional water supply sources are mainly groundwater, desalinated seawater in coastal areas, and wastewater reuse (see **Figure 6** for distribution of new supply between regions). The largest new water sources are planned in the Orange River and Vaal River catchments, followed by the WC and Richards Bay (DWS 2019). Furthermore, implementation of adaptation projects that promote water conservation and demand management would aid in narrowing the supply-demand gap.

Some projects such as the Working for Water and Working for Wetlands programmes that involved the removal of alien vegetation and protection of water resources, respectively, have been implemented and are expanding nationally with an added goal of job creation (DFFE 2020). The recently published national ERRP highlights the retrofitting of public and private buildings with technologies to improve water efficiency as a major part of SA's green agenda. The extension of the programme to public buildings has the potential to build a labour-intensive local industry (Presidency 2020).

[2] These figures are based on the system input volume divided by the population served. The system input volume includes commercial and industrial demand, and water losses through infrastructure leaks.

[3] The water demand management target aims to reduce the per capita water consumption by 26% from 2018 to 2030 to match the international benchmark. During the 2016-2018 drought in the City of Cape Town, a far greater (~50%) per capita reduction in water consumption was achieved over a period of four years, which suggests that this target is very achievable.

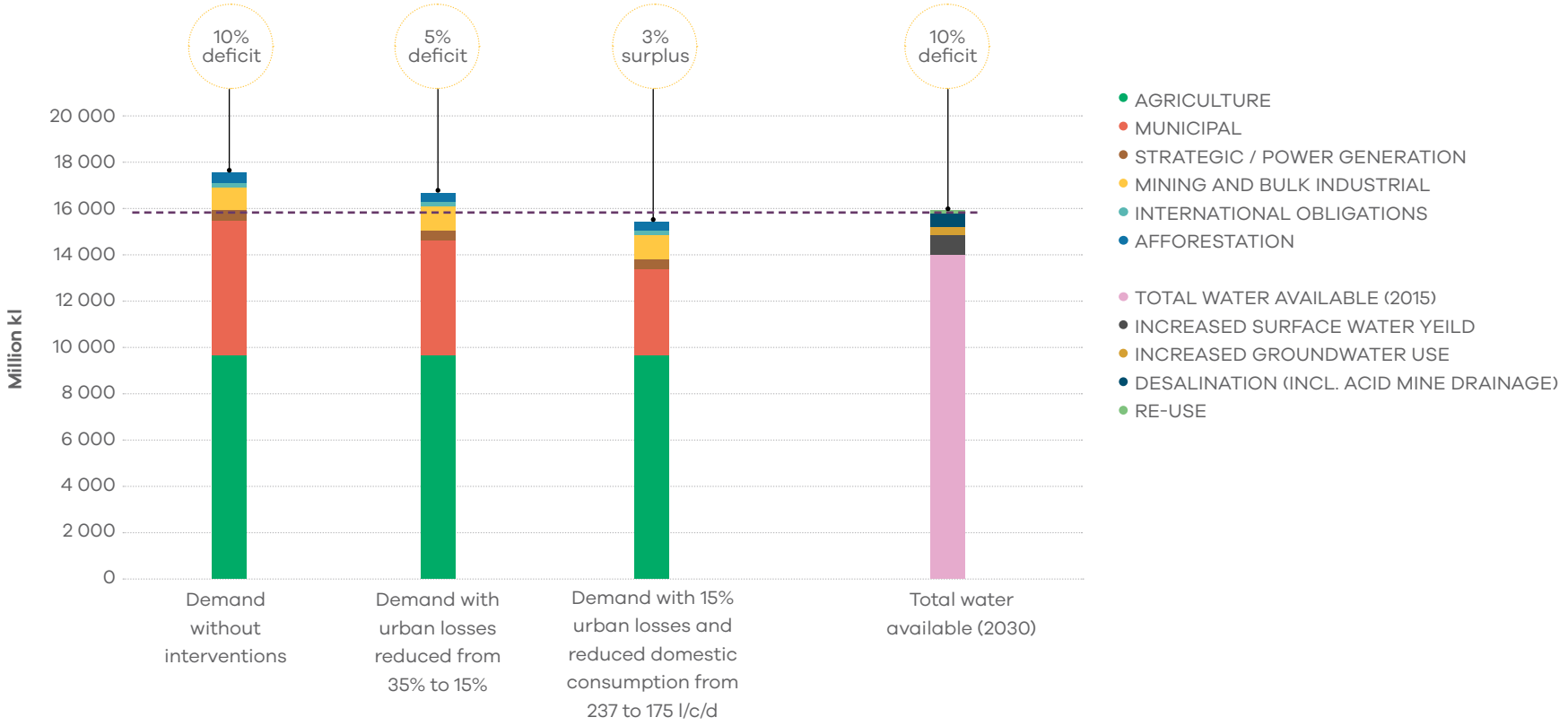

Figure 5: National water balance projections by 2030 with and without critical interventions

Source: DWS 2019a

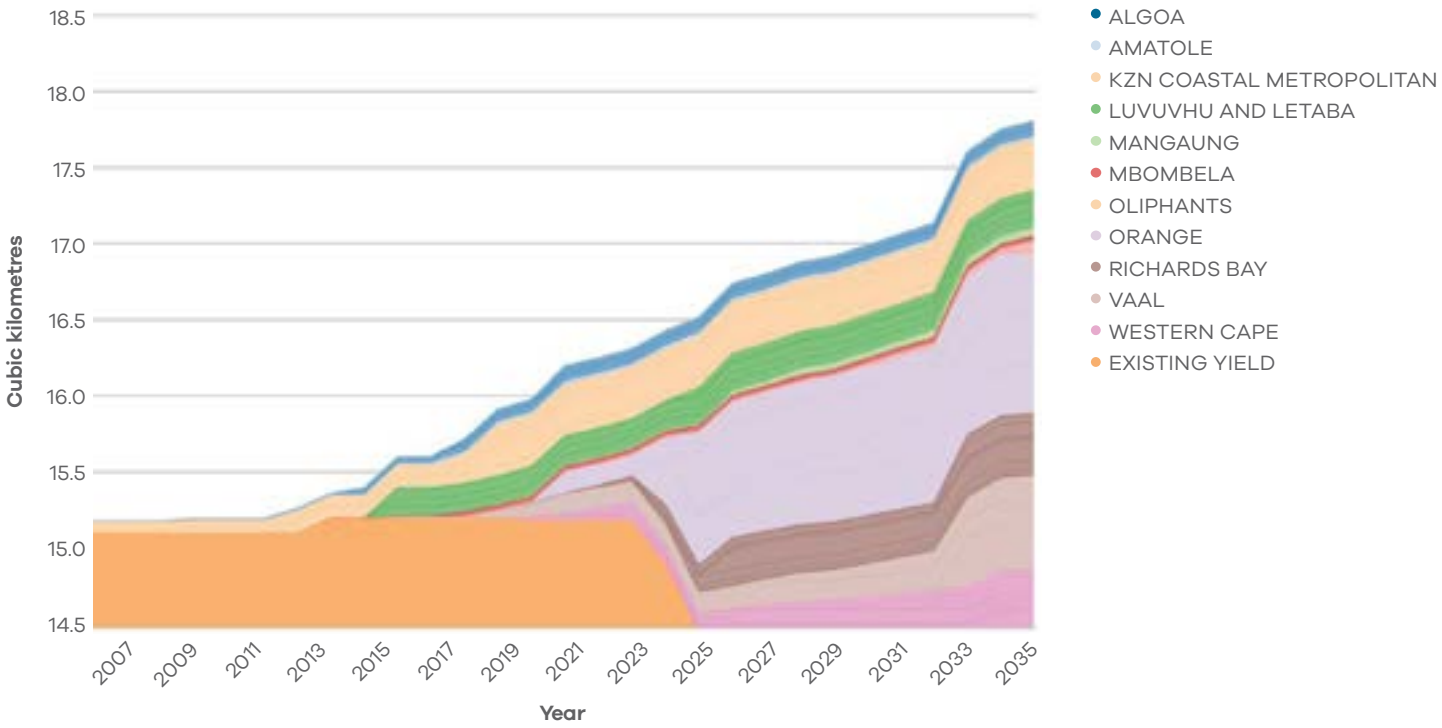

Figure 6: Planned increases in yield extracted from all published large-scale reconciliation strategies in South Africa

Source: Donnenfeld et al., 2018

While total demand is projected to increase despite increased efficiency, and planned augmentation schemes can narrow the supply gap, it is important to note that the augmentation sources must be diversified. Climate change models project that SA will receive less rainfall, but also that the incidence of extreme climate events will increase.

The ongoing drought in the WC has been well documented (see 2019 Water MIR), and this was preceded in 2015 by the lowest total rainfall in recorded history (since 1904) for the whole country.

Towards the end of 2019, the Eastern Cape and NC were declared disaster areas by the national government due to the ongoing droughts in these provinces. In March 2020, the national government declared drought as a national state of disaster alongside the on-going COVID-19 pandemic.

However, the drought-induced national state of disaster was revoked in July as some parts of the country had received good rains, but areas such as Nelson Mandela Bay Metro and central Karoo are still under severe water restrictions due to water shortages. These events highlight the need to reduce reliance on surface water.

The **National Water and Sanitation Master Plan** (NW&SMP) (DWS 2019a) specifies that groundwater, wastewater reuse, and desalination should increasingly contribute to the national water supply mix.

The supply risks based on changing rainfall patterns and population growth will vary by region. By 2050, many parts of SA (including major industrial zones) are expected to be vulnerable to water supply risks.

Figure 7 shows the predicted water supply vulnerability across the country assuming a medium population growth at different climate change scenarios, with both map showing areas with insufficient water supply, and the 10% climate scenario is considered the less likely to occur.

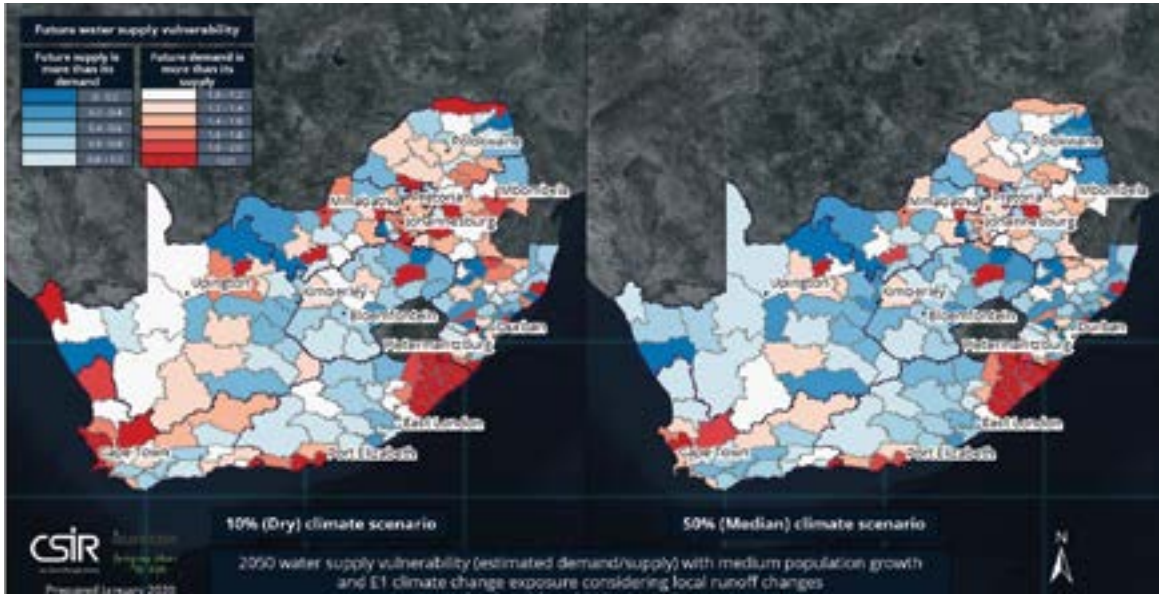

Figure 7: Predicted water supply vulnerability in 2050, under medium population growth and different climate change exposure scenarios[4]

Source: Green Book 2019

[4] The 50% refers to the 50th percentile (median), while 10% refers to the 10th percentile (least likely of occurrence) in terms of probability when projected to 2050 assuming normal distribution (www.greenbook.co.za)

Approximately 56% of the more than 1 150 municipal wastewater treatment works (WWTWs) are in poor or critical state and ~40% of the WWTWs are completely dysfunctional. Additionally, ~44% of the 962 WTWs in the country are in a poor or critical state. The resulting raw water pollution from untreated wastewater and poorly managed WWTWs presents a significant environmental challenge, as well as a health and socio-economic risk to vulnerable communities that access water directly from rivers. Additionally, poor surface water quality increases treatment costs for potable uses and has a negative impact on agricultural yields.

In 2019, approximately 90% of households had access to piped or tap water in their dwellings, either off-site or on-site, and ~83% had access to improved[5] sanitation facilities (StatsSA 2019a). The General Household Survey for 2019 was published in May 2021 and is available from **StatsSA**.

However, insufficient water infrastructure maintenance and investment, vandalism, urbanisation, and immigration may have hampered growth or led to the negative growth in access to water and sanitation. Meeting the Clean Water and Sanitation Sustainable Development Goal (SDG 6) and National Development Plan's (NDP) 2030 targets relating to water and sanitation will require investing towards rapid acceleration of infrastructure provision towards service delivery (UN-Water 2020; NPC 2012). SA's ERRP has targeted an increase in access to basic services as a method for both job creation and poverty alleviation.

The government is finalising the draft **National Infrastructure Plan 2050** (**NIP 2050**) which aims to identify the most critical immediate actions needed for sustained improvement in public infrastructure delivery. The draft NIP 2050 has multiple set targets for water infrastructure, including:

- Augmenting the existing list of 18 Strategic Integrated Projects (see Table 9) and priority actions to be delivered by 2023/24.
- Establishing the National Water Resources Infrastructure Agency (NWIA) by 2023/24 FY.
- The NWIA will improve the management of bulk water resources and fast-tracking the country's advancement towards universal access to water sanitation. In this regard, the NWRIA will work with water boards, municipalities, financial institutions, and industry.
- Establishing a single national water regulator in 2022/23 FY.
- Finalising the raw water pricing strategy in 2021/22 FY.
- Establishing the National Water Programme project management office to support municipalities in water management and project development in 2021/22 FY.
- Completing a plan for ensuring viability of municipal wastewater plants 2021/22 FY.
- Finalising a policy for water usage in agriculture in 2022/23 FY.
- Finalising reconciliation strategies for all water systems by 2022/23 FY.

It is estimated that ~R90 billion per year of investment is needed in water and sanitation infrastructure over the next 10 years (DWS 2017a; DWS 2019a) in order to ensure reliable water supply and wastewater treatment. This includes refurbishing and upgrading of existing infrastructure, and new infrastructure to support population and economic growth. Budgeted funding of R44.9 billion in 2021/2022 falls well short of what is required, but estimated medium-term budgets indicate that the national government has plans in place to reduce the shortfall (**Table 1**).

[5] These facilities are defined as flush toilets connected to a public sewerage system or a septic tank, or a pit toilet with a ventilation pipe

The DWS is expected to publish the Green Drop Report, assessing the state of municipal wastewater management systems by 31 March 2022. Based on the results of the report the department will prioritise medium-term projects for implementation in the water services infrastructure grant. The budget for municipal water and sanitation is expected to increase from R11.6 million in 2021/2022 to R13.9 billion in 2024/2025.
Public funding gaps provide a potential opportunity for private sector financing of water and sanitation projects, as outlined in Section 4.

Table 1: Required, budgeted, and projected public sector funding for water & sanitation services & infrastructure
Source: National Treasury 2022

Funding (R billion)	Revised estimate 2021/2022	Medium term estimates 2022/2023	Medium term estimates 2023/2024	Medium term	Average year-on-year increase (%)
Community development:	**11.6**	**12.7**	**13.8**	**13.9**	**6.3%**
Regional and local water and sanitation services (subsidies for basic services)	11.6	12.7	13.8	13.9	6.3%
Water and sanitation infrastructure:	**33.3**	**42.6**	**46.9**	**54.2**	**1.6%**
Water resource and bulk infrastructure	27.5	36.4	40.1	47.4	19.9%
Regional Bulk Infrastructure Grant (RBIG)	2.2	2.5	2.9	2.8	7.3%
Water Services Infrastructure Grant (WSIG)	3.6	3.7	3.9	4.0	3.4%
Total planned public sector funding for water and sanitation	**44.9**	**55.3**	**60.7**	**68.1**	**12.9%**
Total estimated annual capital requirements (DWS 2019):	**90.0**	**90.0**	**90.0**	**90.0**	**-**
Water supply infrastructure	70.0	70.0	70.0	70.0	-
Wastewater infrastructure	20.0	20.0	20.0	20.0	-
Funding shortfall	**-45.1**	**-34.7**	**-29.3**	**-21.9**	**-21.3%**

2.2. Western Cape context

The Western Cape Province, which is in the South-West corner of SA, falls predominantly within two water management areas (WMAs), the Breede-Gouritz and the Berg-Olifants (Figure 6). Irrigation to support agriculture and urban water use constitutes the main water uses in these two WMAs. While SA is one of the most water-stressed countries in the world with a medium to high baseline water stress (20-40% average annual withdrawal of available water supply), most of the WC falls within the two highest water stress categories (40-80% and >80%) (Water Resources Institute 2019)[6].

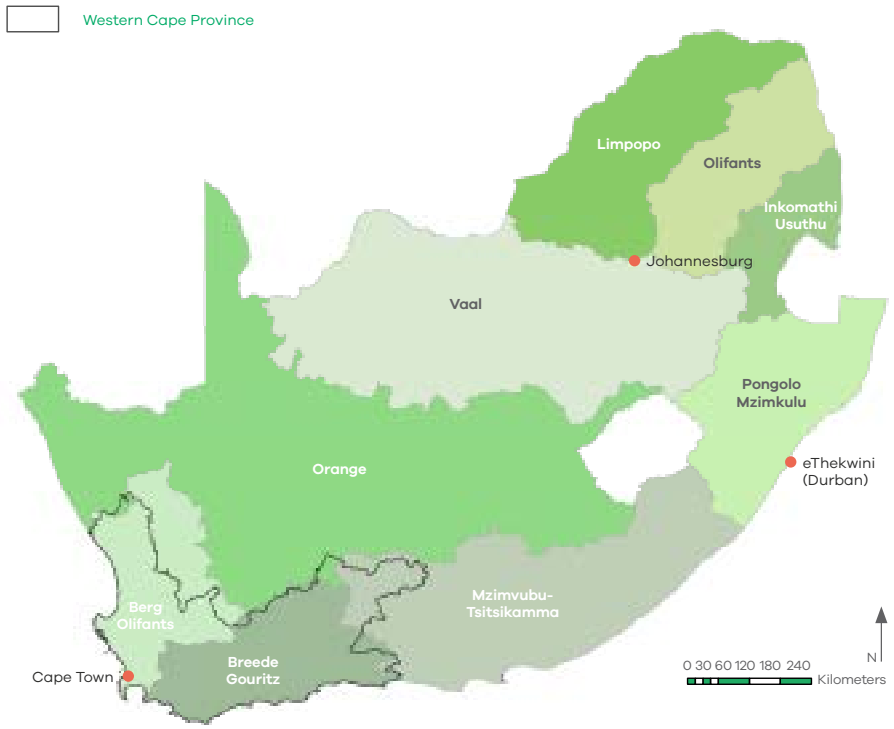

Figure 8: Water Management Areas in South Africa[7]

Source: NWRS2, 2013

2.2.1. Western Cape Water Supply System

The Western Cape Water Supply System (WCWSS), which supplies water to several municipalities within the Berg-Olifants WMA, is one of the most important supply systems in the country. It supplies water to a region that produces 84% of the province's gross domestic product (GDP), and approximately 14% of the national GDP (City of Cape Town 2019). The WCWSS is a complex, interlinked system of dams, pipelines, and distribution networks, that supplies water to the City of Cape Town (CCT), West Coast District Municipality (which supplies water to Swartland, Saldanha Bay, and Bergrivier local municipalities), Stellenbosch, Drakenstein, and Witzenberg local municipalities, and certain agricultural users (**see 2019 Water MIR for map with details of the WCWSS**).

[6] Water Resources Institute (https://www.wri.org/blog/2019/08/17-countries-home-one-quarter-world-population-face-extremely-high-water-stress)

[7] Western Cape outlined in black

The total water allocation for the system is ~590 million m³ per year, which is allocated to various end users (Figure 9). Approximately two-thirds of the allocation is for urban use (including residential, commercial, and industrial use), and the remainder is allocated for agriculture, which is predominantly used in the summer months (DWS 2019b). Even without making provision for the ecological reserve, the total allocations exceed the 2018 revised system yield of 547 million m³ per year (DWS 2018). There are no further opportunities to raise dam walls and build additional large dams to augment the supply (DWS 2015). Consequently, even prior to the 2015 drought, the system was already constrained. The estimated average combined urban and agricultural water demand for 2009/10 – 2018/19 was 538 million m³ (DWS 2018). In November 2021, dam levels were significantly higher than in November 2020.

By the end of the hydrological year (31 October 2021), the WCWSS dam levels had recovered to ~101%. No water restrictions were in place for 2021, however, users were still urged to use water responsibly. Subsequently, the demand in the CCT has remained well below 800 MLD since 2017[8]. The ongoing effective demand side management, and resultant lower water use, was a key enabler in the recovery of dam levels. Non-revenue water (NRW) for some municipalities in the WC remains high at above the global best practice level (15%) as seen in Figure 10, with the red line indicating global best practice. Lower than average rainfall will necessitate ongoing demand side reduction to avoid dam levels approaching the critical 10% level. The Gouritz Catchment, which includes the Greater and Klein Karoo area and Southern Cape coastal area, was still under drought, with dam levels at 31.5% at the end of November 2021 (WCG 2021[9]).

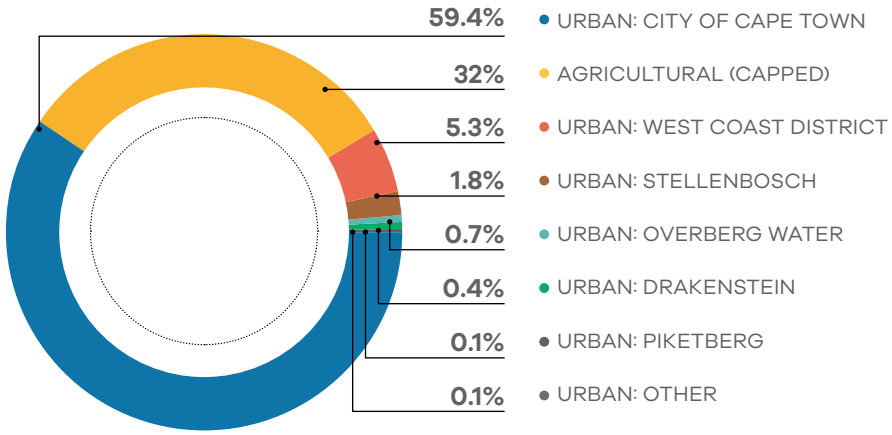

Figure 9: Overview of Western Cape Water Supply System allocations by type

Source: DWS 2018

[8] https://resource.capetown.gov.za/documentcentre/Documents/City%20research%20reports%20and%20review/damlevels.pdf

[9] https://www.westerncape.gov.za/110green/economic-water-resilience

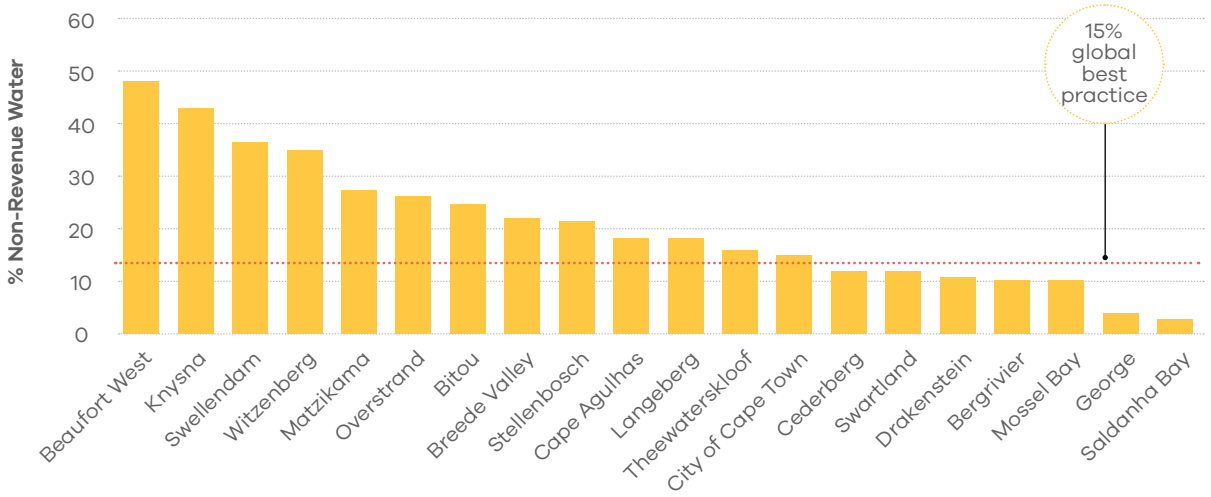

Figure 10: Non-revenue water levels for Western Cape municipalities for 2020

Source: DWS Dashboard, 2020

The WCWSS reconciliation strategy study was completed in 2007, and annual status updates are produced by the Department of Water and Sanitation (DWS), formerly the Department of Water Affairs and Forestry (DWAF), and later the Department of Human Settlements, Water and Sanitation (DHSWS). The latest available update (2018) compares several future water balance assessment scenarios.

Figure 11 presents the most realistic base scenario of future water supply without additional water conservation and demand management interventions. In terms of demand, there are several scenarios. Scenario 1 assumes a projected 2.8% p.a. growth rate in water demand (DWS, 2018). Solid fills show the planned water supply interventions, along with their height (or stacked thickness) indicating the estimated yields for the different interventions.

2.2.2. Long-term planning

The climate projections for the WC indicate a warming trend and projected drying in many areas, with longer periods between increasingly intense rainfall events (DEADP 2018). It also remains to be seen whether the recent drought represents a 'step-change' in the rainfall patterns (such as was experienced by Perth in the 1970s), or whether the decrease in average annual rainfall will occur gradually.

Additionally, population and economic growth will place an additional burden on water supply and sanitation systems, which in turn will lead to a decrease in water security and quality, which will have a negative impact on the province and consequently the country's economy. Water, sanitation, and hygiene (WASH) will continue to be a focus for the WC.

It presents a platform on which government, business, investors, and citizens can collectively engage to implement water and sanitation access and water efficiency, as well as resource recovery initiatives (water, energy and/or materials), to increase resilience.

In order to address future water constraints, reconciliation studies are conducted to reconcile the gap between future demand and supply.

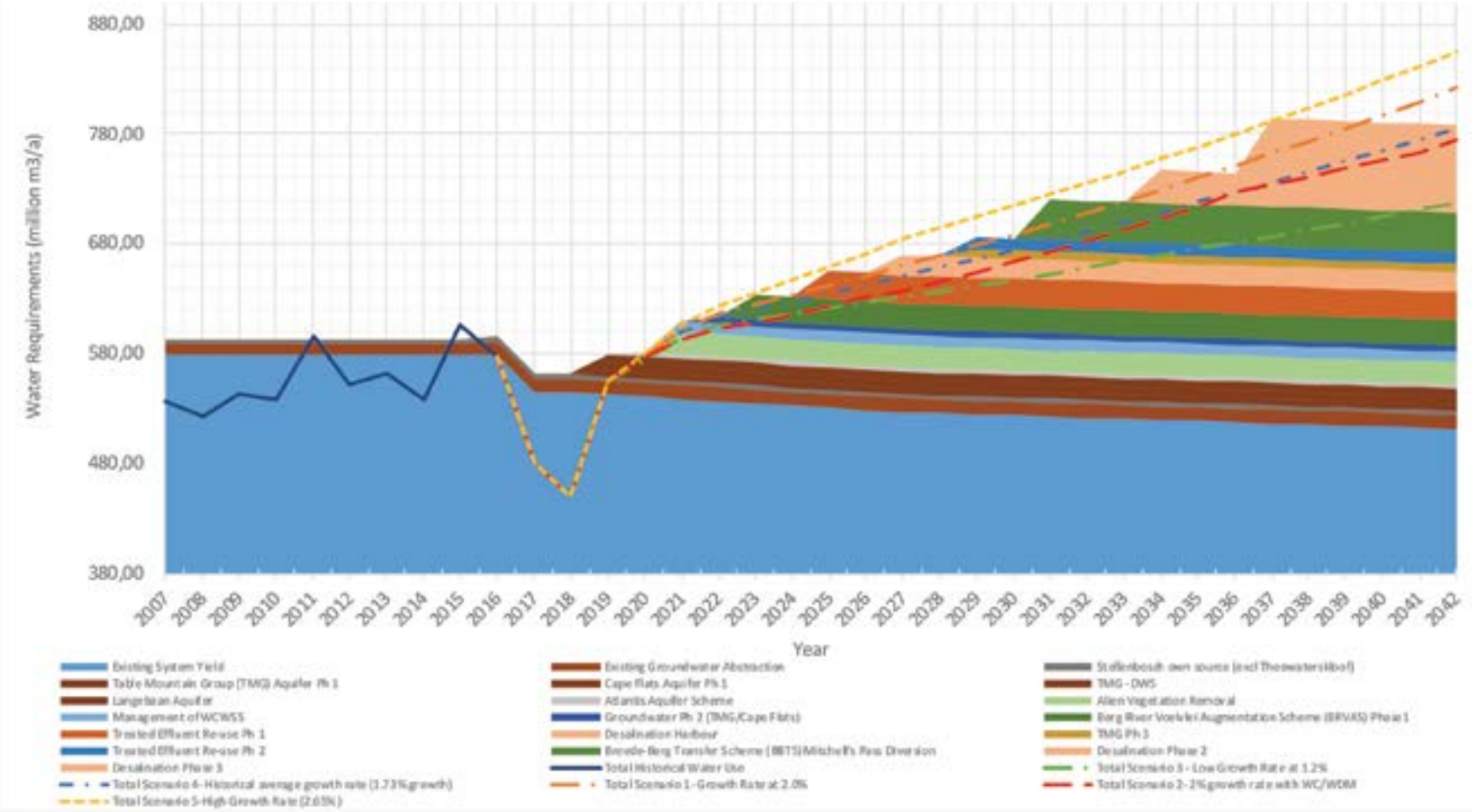

Figure 11: Western Cape Water Supply System planning scenario reconciliation of supply and demand[10]

Source: DWS 2018

SEE FIGURE 8, INCLUDING CCT'S NEW AUGMENTATION SCHEMES

[10] Excludes the recently updated City of Cape Town water strategy (Table 2)

Augmentation schemes include potable water reuse (from WWTWs), groundwater development (new resources and artificial recharge), and large-scale permanent seawater desalination.

In this regard, long-term plans have been in place for several years, and many of the planned projects were brought forward and re-assessed considering the drought and need for economic water resilience (see **Figure 29 in 2019 MIR** and **Table 8 in 2020 MIR**). The CCT has implemented its groundwater schemes while other planned augmentation schemes are at different project phases (**Table 2**).

To date, the CCT augments its surface water with ~7 megalitres per day (MLD) from groundwater and springs (CCT 2021 [11]). This is likely to rise by ~40 MLD from the recently commissioned Table Mountain Group (TMG) aquifer when it is fully operational. Other phased augmentation schemes will contribute a total of ~240 MLD by 2026 (**Table 2**).

Furthermore, the CCT supplies ~75 MLD of treated effluent from its WWTWs to ~950 registered users, mainly farmers and businesses, through a 277 km permanent pipeline connection (CCT, 2020d). This supply network with be extended to ~938 km in the next 10 to 15 years.

[11] https://resource.capetown.gov.za/documentcentre/Documents/City%20research%20reports%20and%20review/damlevels.pdf

Table 2: City of Cape Town new water program (Source: City of Cape Town, 2020)

Intervention	First water	Capacity (MLD[12])	Total CAPEX (R million)	Unit CAPEX (R million)	Operating cost (R/kl)
Table Mountain Group Aquifer – Steenbras	Jul-20	25	468	18.7	5.5
Table Mountain Group Aquifer – Nuweberg	Jul-23	15	523	34.9	5.5
Table Mountain Group Aquifer – Groenlandberg	Nov-23	12	376	31.3	2.2
Cape Flats Aquifer – Strandfontein	Jul-21	5	378	75.6	6.5
Cape Flats Aquifer – Hanover Park	May-22	4	158	39.4	8.5
Cape Flats Aquifer – Strandfontein North and East	Dec-22	15	772	51.5	6.5
Cape Flats Aquifer – Philippi	Dec-24	6	434	72.3	8.5
Cape Flats Aquifer – Mitchells Plain	Jul-25	20	673	33.7	8.5
Atlantis Aquifer Rehabilitation and Expansion	Jul-22	16	314	19.6	8.5
Berg Voëlvlei River Augmentation Scheme	Jul-23	40	–	–	4.62
Water Reuse – Faure New Water Scheme	Jul-25	70	1 882	26.9	5.7
Desalination	Dec-26	50	1 800	33-40	9.0
Alien Vegetation Clearance	–	–	372	–	–
Improved Supply System Management (WCWSS)	To be confirmed once more detailed information becomes available				
Water Conservation/Demand Management					
Total	–	278	8 150	–	–

[12] 1 MLD = 1 megalitre per day, or 1 000 000 litres per day, or 1 000 kl per day

2.3. State of Municipalities in South Africa

Municipalities play an important role in providing water and sanitation services, and as such constitute a key market in the water sector. However, there are several barriers within the market, one of which can generally be described as capacity. An analysis of municipalities in SA that captures various aspects of 'capacity' as they relate to water projects, indicates that only about 23% of municipalities have a 'good' score related to capacity[13] to implement water projects (UNIDO 2019, GreenCape analysis). Similarly, the National Business Initiative study on opportunities for Public Private Partnerships (PPP) in municipalities concluded that 28 (13 were Western Cape municipalities) of the 144 (19%) municipalities surveyed were theoretically suitable for water PPPs[14].

One further barrier is that smaller municipalities do not have credit ratings to compete in credit markets to access finance. Other barriers relating to technical capacity, jurisdiction to service informal settlements on private land, and legislation are discussed in Section 4.5.

The USAID Water, Sanitation and Hygiene Finance (WASH-FIN)[15] project has recently assessed the credit rating of 21 select intermediary (secondary) municipalities in SA, with 18 of these resulting in an investment grading. This indicates that there is a greater potential for external financing for intermediate municipalities than is currently being realised by the municipalities. There may be several reasons for this, which could vary among municipalities. Such reasons could include low appetite for debt, the long-term nature of infrastructure financing vs shorter term political cycles, or technical and managerial staff turnover. The municipalities with 'intermediate scores' on the WASH-FIN Municipal Grading Index in most cases need select interventions to assist them in accessing credit for infrastructure projects. In addition, they are well suited to projects that do not necessarily require debt, such as service level agreements for water efficiency and wastewater sludge beneficiation.

2.4. Municipal market

The urban W&WW market is centred around municipalities, which are typically the Water Services Authorities (WSAs) and Water Services Providers (WSPs) for urban areas.

In most cases, municipalities are supplied with raw or bulk water by the National Department of Water and Sanitation (DWS) or their local water boards. Municipalities then supply businesses and households via water reticulation infrastructure which covers more than 290 000 kms of pipelines (StatsSA 2016a). Information related to all these entities is therefore included in this section as part of the broader municipal market value chain, and how they fit into a global context.

In SA, municipalities, and in particular metropolitan municipalities, represent a significantly large and growing market for water and sanitation (W&S) technologies and services. In the 2020 National Treasury Budget Review, R117.1 billion was budgeted to be spent on W&S over the next three years, accounting for ~14.4% of public-sector infrastructure expenditure.

[13] The criteria used included skills/capacity of senior/executive municipal staff to manage municipal finances effectively and manage infrastructure projects; financial standing of the municipality to access commercial or development finance institution (DFI) finance; skills/capacity among water department staff to successfully motivate for and implement water infrastructure projects.

[14] https://www.nbi.org.za/wp-content/uploads/2019/05/NBI_KYM-Report-4_Water-PPP-Opportunities.pdf

[15] https://www.globalwaters.org/WASH-FIN

About a third of the budget, R41.6 billion, was allocated to water infrastructure development programmes over the next three years.

The annual capital expenditure on W&S related projects by the eight metropolitan municipalities in SA was just over ~R5 billion in the most recent financial year (Figure 12), made up of a combination of grants (~25%), internal and loan financing.

The average year-on-year increase between 2014/15 and 2018/19 was ~3% (equal to inflation as of August 2020), with the exception being the CCT, where annual spend has increased by 14% or more in each of the financial years represented.

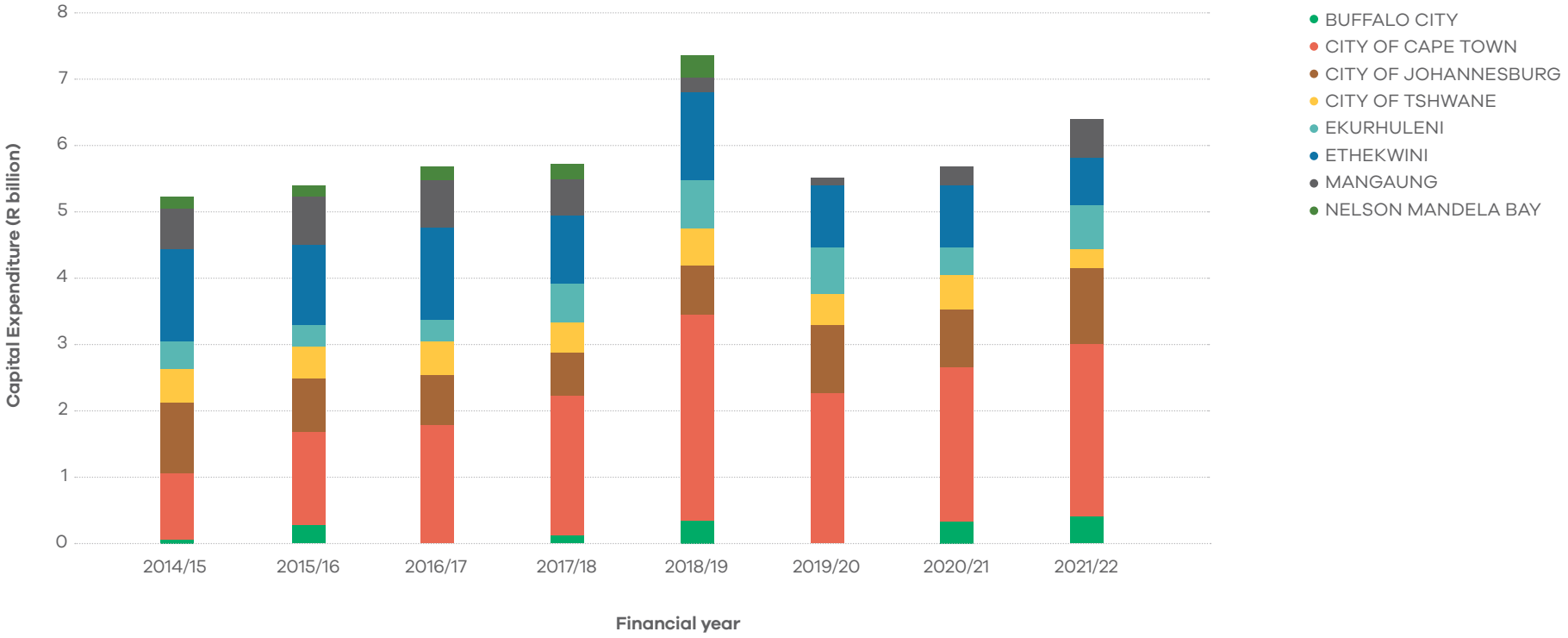

Figure 12: Capital expenditure on water and sanitation projects undertaken by metropolitan municipalities between 2014/15 and 2021/22[16]

[16] All figures compiled from annual reports of the respective metropolitan municipalities, except for Johannesburg for 2014/15 and 2015/16, which were extracted from Johannesburg Water annual report. Data for Buffalo City and Nelson Mandela Bay not available.

Of the R41.6 billion budgeted for W&S infrastructure in the medium term, R33.2 billion is allocated to funding the Regional Bulk Infrastructure Grant (RBIG) and the Water Services Infrastructure Grant (WSIG) for new and existing projects. Funding from these grants is being used to implement two mega projects: 26 large and more than 280 small regional bulk and water services infrastructure projects (National Treasury 2020). An additional R2.4 billion from the Upgrading of Informal Settlements Grant (UISG) was allocated in 2020 for the provision of W&S services in informal settlements in response to the COVID-19 pandemic. However, the NW&SMP estimates that a further R12 billion in funding would be needed each year over five years to refurbish and upgrade existing W&S infrastructure (DWS 2019).

National Treasury (NT) has urged municipalities to prioritise spending on infrastructure. NT, in its municipal finance management act (MFMA) circulars, recommends that a minimum of 40% of a municipality's capital budget should be for renewal of existing assets as opposed to new infrastructure. In the 2021/22 capital budget, the renewal of existing assets equates to R1 927 million (23.2%), upgrading of existing assets represents R2 149 million (25.8%) and new assets represents R4 239 million (51%). It is important to note that existing assets may be renewed or upgraded, while new assets will result in an increase in the asset base.

As national government reshuffled its finances to provide for much needed COVID-19 related requirements for health, social, infrastructure and local provisions, it was to be expected that this would impact on future grant allocations to municipalities. During the pandemic, additional allocations were made, and the CCT received additional Local Government Equitable Share (LGES) as well as the approval of conversion of unspent grants to cover COVID-19 related expenditure. National government, as part of its fiscal consolidation policies aimed at reducing government deficits and debt accumulation, reduced the LGES and Fuel levy transfers to municipalities over the 2021/22 medium term revenue and expenditure framework (MTREF).

In the case of the CCT, for example, these transfers were much lower than what was projected when compared to the 2020/21 indicative allocations. This reduction in revenue received from national government was one of the major impediments in getting the CCT's 2021/22 MTREF to a balanced position. The implication of this is that it delays the implementation of infrastructure projects. This necessitates municipalities to seek external funding to realise planned infrastructure projects.


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POLICIES AND REGULATIONS

This section provides an overview of the regulatory environment for the urban water sector[17].

[17] The section does not comprehensively cover all relevant legislation; it highlights key information that may be useful to potential investors.


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3.1. National legislation

3.1.1. The National Water Act

The National Water Act (36 of 1998) (NWA) provides the legal framework for the effective and sustainable management of water resources (including surface water and groundwater) by the Department of Water and Sanitation (DWS) on behalf of the national government. The NWA gives DWS the overall responsibility and authority to manage the use of water; protect water quality; allocate water; and promote inclusive water management.

The NWA under Section 21 describes 11 different 'water use' activities, which include taking and storing water, reduction of stream flow, waste discharges and disposals, altering of watercourses, abstraction of underground water, recreation, and any controlled activities which detrimentally impact water resources.

Section 26 regulates water use activities, design, construction, and operation of any waterworks, including the registration of respective personnel. This is particularly relevant to alternative water supply projects, including water reuse. Generally, a water use must be licensed unless it is listed in Schedule I, is an existing lawful use (ELU), is permissible under a general authorisation (GA), or if the need for a water use licence (WUL) is waived.

3.1.2. Categories of legal water use

The NWA classifies any lawful water use under four categories:

3.1.2.1. Schedule 1

Generally, applies to low volume (reasonable) water use with low impact activities, consistent with domestic use (non-commercial uses), recreational use, livestock watering, and for emergencies. This water use is permissible and does not require licensing or registration[18].

Residents may use groundwater on their properties for reasonable domestic use without a licence[19]. However, water use entitlement under Schedule 1 does not supersede and is subject to any limitation by any other law, ordinance, **by-law** (section 3.2), or regulation set by the responsible authority in that area, e.g., municipality and provincial government.

3.1.2.2. Existing Lawful Use

Legal water use obtained under the Water Act (54 of 1956) two years prior to the commencement of 1998 NWA is considered as ELU and is subject to terms and registration under the NWA. However, such users must prove with relevant records that their water use existed before 1998, and this must be verified and validated by the DWS.

3.1.2.3. General authorisation

General Authorisations (Gas) replace the need for a licence in terms of Section 21 of the NWA as outlined in a Government Notice (GN) and is site specific. There is a GN for each water use activity which sets the limits and circumstances suitable for issuing a GA (NWA 1998)[20].

Businesses involved in water use activities that are neither registerable under Schedule 1 nor under ELU must register the use(s) under a GA or apply for a WUL. The free registration of a GA through DWS typically takes a few weeks.

3.1.2.4. Water use licence (WUL)

A WUL applies if the water use activities cannot be covered under Schedule 1, ELU, or GA in accordance with Section 21 of the NWA. Currently, a WUL application may take up to 300 working days.

[18] Although in some cases the local municipality may require registration.

[19] Municipalities may still require registration of boreholes or well points — see Section 3.2.3.

[20] For the list of site-specific GAs, see https://cer.org.za/virtual-library/legislation/national/water/national-water-act-1998

The DWS is fast-tracking the WUL application process to ensure that, from March 2022, WULs are issued within 90 days. The WUL application forms are currently out for public comment from DWS.

3.1.3. The National Building Regulations and Building Standards Act

In terms of design and construction, water systems must be consistent with the National Building Regulations (NBRs) under the National Building Regulations and Building Standards Act, Act 103 of 1977, which governs all building and construction work in SA.

At present, the NBRs do not include provisions relating to water efficiency or alternative water supply; however, a few years ago the Department of Trade, Industry and Competition (dtic) initiated the process to include these aspects. It is unclear how long this process will take.

The project focusses on the development and promotion of water efficiency standards for tap faucets and showerheads, as an innovative and cost-effective way to reduce both water and energy consumption.

This is also in support of the NW&SMP's Action item to "Establish Water Efficiency Labelling and Standards Scheme".

3.1.4. National Environmental Management: Waste Act (59 of 2008)

The national norms and standards under the Act prohibit the landfill disposal of:

- liquid waste with a moisture content >40%, angle of repose <5°, free flowing when transported or at ≤60 °C (banned since 2019);
- brine or waste with a high salt content (>5%) and a leachable concentration for total dissolved solids of >100 000 mg/l (ban effective from 2021).

3.1.5. Other key national legislation and standards

Other key national laws and regulations that may be relevant to projects in the water sector are listed in **Table 3**.

Table 3. Other key national legislation and standards

Authority	Document	Application
Department of Water and Sanitation	Water Services Act (108 of 1997)	Relevant to the regulation of water and sanitation services provided by municipalities and water service authorities.
	Guidelines for the utilisation and disposal of wastewater sludge (2008)	Published to assist municipalities with proper management and safe disposal options, these guidelines include a number of options for managing sludge, from composting and thermal treatment, to the manufacturing of bricks. Included in the guidelines are the methodologies to reduce or remove the inherent pathogens present in the sludge.
	National Water and Sanitation Master Plan (2019).	While not an act or legislation, it is an important guiding document to inform the development of the water sector according to national priorities.
	Municipal Priority Action Plan (MPAP)	Strives to identify and resolve key vulnerabilities at municipalities to enable them meeting the National Medium Term Strategic Framework (MTSF) target of 90% reliable water services.
Local Government	Municipal Systems Act (32 of 2000).	Provides for the core principles, mechanisms and processes that are necessary to enable municipalities to move progressively towards the social and economic uplift of local communities, and ensure universal access to essential services that are affordable to all. According to Section 25 each municipal council must adopt an Integrated development plan which may include a water services development plan (WSDP).
Department of Forestry, Fisheries and the Environment (DFFE)	National Environmental Management Act (107 of 1998).	Relevant to environmental authorisations.
	National Environmental Management: Air Quality Act (39 of 2004).	Regulates the thermal treatment of sludge.
	National Environmental Management: Integrated Coastal Management Act (24 of 2008).	Regulates the discharge of brine to the ocean.
Department of Trade, Industry and Competition (dtic)	Water and Sanitation Industrialisation Masterplan.	Seeks to support the rapid growth of the local water and sanitation industry while upgrading their technological base and competitiveness. The plan also supports socio-economic development.
Department of Trade, Industry and Competition (dtic)	Industrial Policy Action Plan (IPAP) 2018/19 – 2020/21.	Highlights water and sanitation as a key sectoral focus area.

Table 3 continued...

Authority	Document	Application
South African Bureau of Standards (SABS)	South African National Standard for Drinking Water (SANS 241: 2015).	Specifies the general safety and performance requirements for potable water.
	South African National Standards (SANS 30500: 2019) for non-sewered sanitation systems (NSSS).	Specifies the general safety and performance requirements for design and testing as well as sustainability considerations for non-sewered sanitation systems (NSSS).
National Treasury	Preferential Procurement Policy Framework Act (5 of 2000).	Makes provision for the dtic to designate certain areas for local production and content. Local content designation is assessed according to the SABS through the technical specification number SATS 1286:2011 and SANS 1286:2017.
	Municipal Finance Management Act No. 56 of 2003.	The MFMA aims to modernise budget, accounting and financial management practices by placing local government finances on a sustainable footing in order to maximise the capacity of municipalities to deliver services to communities. It also aims to put in place a sound financial governance framework by clarifying and separating the roles and responsibilities of the council, mayor and officials.
Department of Agriculture, Land Reform and Rural Development	Fertilisers, Farm Feeds, Seeds and Remedies Act 36 of 1947	Makes provision for registration and regulates the importation of composts, fertilisers, farm feeds, sterilising plants, and certain remedies.

Further information can be obtained from the responsible authorities indicated.

Key policy and legislative developments in the pipeline include (DWS Annual Report, 2020):

1. **Mine Water Management:** This policy seeks to balance the mining sector's economic development with the protection and sustainable use of water resources. This policy will provide a coherent and integrated South African approach by building on existing strengths addressing barriers and seizing identified mine water management opportunities including acid mine drainage (AMD).

2. **Sustainable Hydropower Generation:** This policy aims to support the energy security master plan that pursues hydropower as part of the energy supply mix. In addition, it will also provide policy positions relating to infrastructure establishment and development of hydropower which will be owned by DWS.

3. **Integrated Water Quality Management:** This policy seeks to develop an intergovernmental water quality management approach to facilitate a coherent and integrated response to address water quality challenges. This policy will strengthen the existing integrated water quality management strategy that identifies priority programmes to be implemented country-wide.

4. **National Water and Sanitation Act:** DWS conducted a legislative review which sought to consolidate the National Water Act, 1998 (NWA) and the Water Services Act, 1997 (WSA) to a single legislation named the National Water and Sanitation Act. The aim of this consolidation is to clarify the legislative framework regarding water management across the water and sanitation value chain.

3.2. Municipal by-laws and tariffs

Municipalities have the constitutional competence to enact laws (known as by-laws) in respect of water and sanitation services, regulated by the Municipal Systems Act (32 of 2000) and the Water Services Act (108 of 1997). These by-laws have the same power and force as other national and provincial legislation and must be made publicly available. The Department of Water Affairs and Forestry (DWAF), as it was known at the time, developed model water services by-laws for municipalities in the early 2000s. The model by-laws included provisions to empower municipalities to prevent wasteful use of water, impose water restrictions, require large users to submit annual water audits, and specify standards relating to the quality of fittings. The by-laws contained general clauses relating to water efficiency but left the specifics to the municipality to decide. Several municipalities have developed water by-laws based on these model by-laws.

Municipal by-laws also include provisions relating to the discharge of wastewater and industrial effluent to sewer. Such provisions may include the maximum discharge limits for various water quality parameters, and the requirement for an industrial discharge permit. Wastewater that exceeds the water quality limits may incur surcharges, or denial of a permit to discharge to sewer.

3.2.1. Water restrictions

The National Department of Water and Sanitation (DWS) imposes restrictions on different user categories in catchments facing water supply constraints. Municipalities then pass these restrictions on to their water users. Restriction levels impose volume limits, time limitations, and bans on certain types of water use in order to decrease demand during periods of water insecurity. Restriction levels and their requirements vary from municipality to municipality. Most municipalities have up to five restriction levels – the higher the restriction level, the greater the limitations imposed.

3.2.2. Water tariffs

Municipalities either purchase untreated raw water from DWS, taken directly from dams, springs, rivers and boreholes, or purchase bulk water from bulk water providers, e.g. water boards, which is then treated to a potable standard. The CCT owns some dams and, together with other municipalities in the WCWSS, also purchases raw water from DWS-owned dams and then treats the water in municipal-owned facilities. The water sector does not have a distinct or independent regulator, which means that in the absence of an economic panel of experts to assess water costing and pricing, water boards can propose different tariffs for the same service within their jurisdiction.

However, the draft National Infrastructure Development Plan 2050[21] included the establishment of an independent water regulator by 2022/23 FY to regulate tariffs, standards and performance in the water services sector.

Municipalities distribute potable water to their consumers and charge a retail tariff. On average, revenue from water sales accounts for around 13% of municipal operating revenue (DWS 2017a). Each municipality sets its own tariffs, in terms of which it may differentiate between users. Most municipalities have separate tariffs for residential, commercial, and industrial water users based on the volume of water used and provide a free basic allowance of water to indigent households. In SA, around 59% of households do not pay for water and sanitation services (in 2018), because they are either unable (indigent) or unwilling to do so (StatsSA 2019a).

Municipalities generally use a rising block (stepped) tariff structure, where R/kl tariffs increase as usage increases. However, in some cases, a fixed volumetric rate (R/kl) applies, e.g., CCT and eThekwini's water and sanitation tariffs for C&I water users. In addition, the tariffs are linked to restriction levels, with tariffs increasing as restrictions increase. Water (**Table 3**) and sanitation (**Table 4**) tariffs (excluding surcharges) and tariff structures vary between metros[22] and municipalities and impacts on the business case for water technologies. **Figure 13** and **Figure 14** indicate the differences in monthly tariffs for a household consuming 15 kl, and for a commercial or industrial business consuming 20 kl, respectively, across metros and their likely impact on a business case.

For example, investing in water technologies that reduce demand for a commercial or industrial business situated in Johannesburg and eThekwini has a good business case due to the higher water tariffs. On the other hand, investing in water reuse will have a good business case for a similar commercial or industrial business situated in Johannesburg and Cape Town due to higher sanitation tariffs in these metros.

[21] http://www.publicworks.gov.za/PDFs/44951_10-8_PublicWorksInfras.pdf

[22] Minimum restriction level tariffs. Residential tariffs are for non-indigent, single dwelling houses (post-paid) at minimum (synonymous with "no restriction level"; we have used this convention since the exact terminology varies between municipalities). All fixed charges assume 20 mm connections. The sanitation charges exclude any industrial effluent surcharges if effluent exceeds discharge limits. Sanitation charges apply to an assumed sewage discharge volume that is linked to water consumption, which has already been pre-applied to relate costs directly to water consumed, as shown in **Table 4**.

Table 4: Water tariffs (ex VAT) for selected metros (minimum restrictions) for FY2021/22

		Cape Town		eThekwini		Tshwane (L1)[23]		Ekurhuleni		Johannesburg	
	Step	Monthly use (kl)	R/kl	Monthly use (kl)	R/kl	Monthly use (kl)	R/kl	Monthly use (kl)	R/kl	Monthly use (kl)	R/kl
Residential	0	Fixed monthly	109.73	Fixed monthly	N/A	Fixed monthly	129.65	Fixed monthly	N/A	Fixed monthly	28.32
	1	0-6	15.86	0-6	27.83	0-9	0.00	0-6	14.58	0-6	0.00
	2	6-10.5	21.79	6-25	32.96	10-18	22.98	7-15	24.02	6-10	20.28
	3	10.5-35	29.61	25-30	43.83	19-30	31.10	16-30	29.42	10-15	21.17
	4	>35	54.65	30-45	67.65	31-42	35.80	31-45	36.61	15-20	29.68
	5	–	–	>45	74.35	43-60	38.30	>45	45.14	20-30	41.01
	6	–	–	–	–	>60	41.01	–	–	30-40	44.86
	7	–	–	–	–	–	–	–	–	40-50	56.59
	8	–	–	–	–	–	–	–	–	>50	60.65
Commercial & Industrial	0	Fixed monthly	109.73	Fixed monthly	346.79	Fixed monthly	N/A	Fixed monthly	N/A	Fixed monthly	249.99
	1	Not stepped	28.39	Not stepped	39.65	0-10 000	28.23	0-5 000	31.50	0-200	48.03
	2					10 001-100 000	26.79	5 001-25 000	32.01	>200	50.67
	3					>100 000	24.97	>25 000	33.39	–	–

[23] City of Tshwane's lowest published water tariff (minimum restrictions) is for Level 1 water restrictions. The water restrictions did not impact the sanitation tariffs.

Table 5: Sanitation tariffs (ex VAT) for selected metros (no restrictions) for FY2021/22

		Cape Town		eThekwini[24]		Tshwane		Ekurhuleni		Johannesburg	
	Step	Monthly water use (kl)	R/kl of water used	Monthly water use (kl)	R/kl of water used	Monthly water use (kl)	R/kl of water used	Monthly water use (kl)	R/kl of water used	Property size (m²)	R (Res) or R/kl (C&I)
Residential	0	Fixed monthly	N/A	Fixed monthly	N/A	Fixed monthly	77	Fixed monthly	N/A	Fixed monthly	N/A
	1	0≤4.2	13.94	0-6	4.02	0-9	0.00	0-6	14.58	0-300	243.57
	2	<4.2≤7.35	19.15	6-25	5.31	10-12	15.06	7-15	24.02	301-1 000	474.15
	3	>7.35≤24.5	26.89	25-30	10.13	13-18	12.55	16-30	29.42	1 001-2 000	717.30
	4	>24.5≤35	42.30	30-45	13.65	19-24	10.04	31-45	36.61	>2 000	1033.51
	5	–	–	>45	14.05	25-30	8.70	>45	45.14	–	–
	6	–	–	–	–	31-42	1.67	–	–	–	–
	7	–	–	–	–	>42	0.17	–	–	–	–
Commercial & Industrial	0	Fixed monthly	N/A	Fixed monthly	204.11	Fixed monthly	N/A	Fixed monthly	N/A	Fixed monthly	N/A
	1	Not stepped	25.51	Not stepped	9.65	Not stepped	8.57	0-5 000	11.34	Not stepped	35.91
	2							5 001-25 000	6.05		
	3							>25 000	3.93		

[24] Residents from eThekwini is charged an infrastructure levy of R1.50/kL for water and sanitation effective from June 2021.

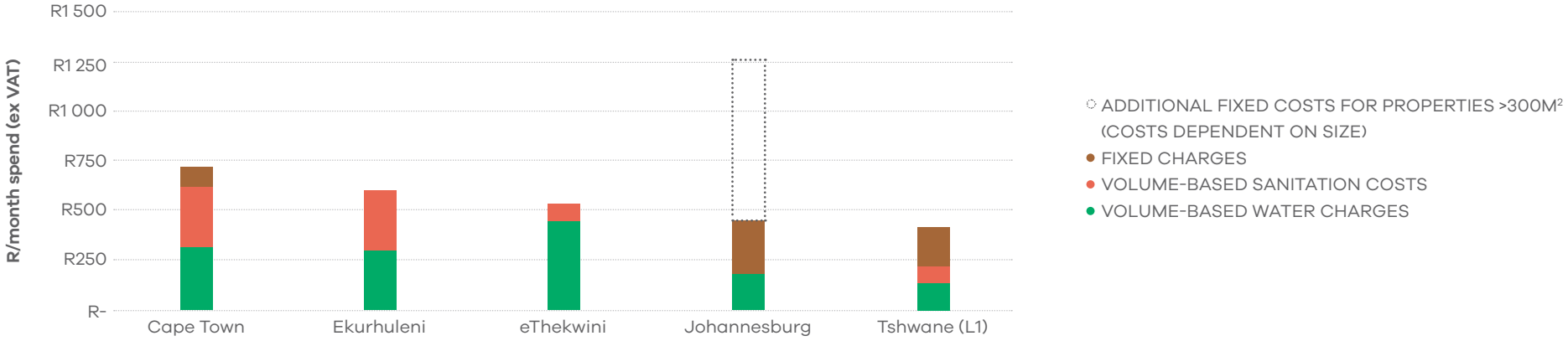

Figure 13: Comparison of monthly household water costs (2020/21) for 15 kl/month across various metros

Source: GreenCape analysis[25]

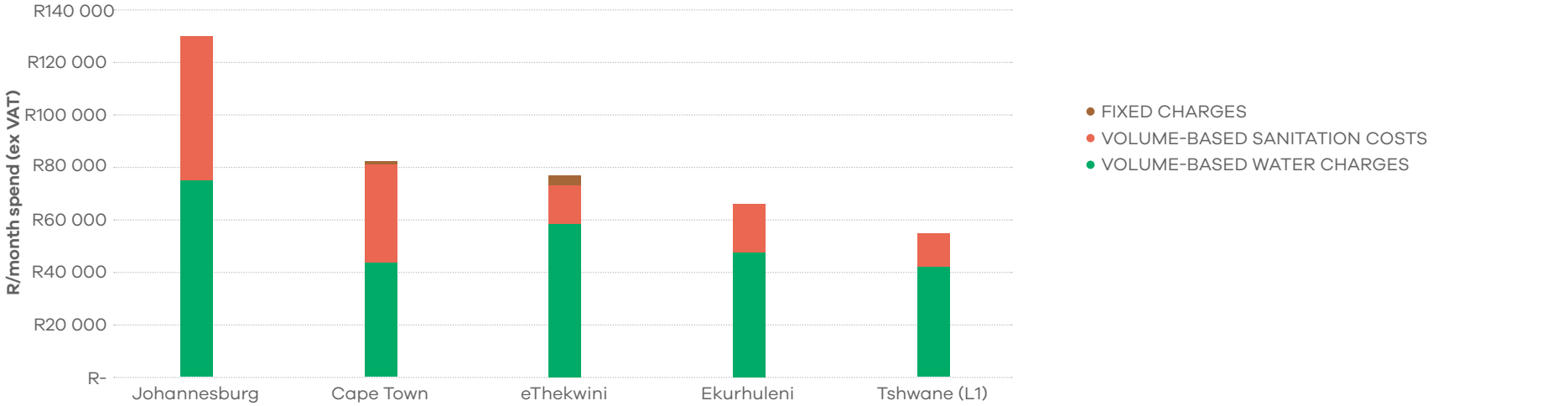

Figure 14: Comparison of monthly costs (2021/2022) for commercial and industrial businesses for 20 kl/month (50 mm connection) across various metros

Source: GreenCape analysis[26]

[25] The figure reflects the non-indigent, single household, post-paid water and sanitation charges (including any 20 mm connection fixed charges) at minimum or no restrictions for property values > R750 000 (incl. VAT)

[26] The figure reflects the water and sanitation charges (including any 50 mm connection fixed charges) at minimum or no restrictions.

The NW&SMP states that water and sanitation tariffs should be determined on the principle of cost recovery, although historically, this has not been the case. As the raw water quality and quantities decline, the cost of more expensive alternative water sources to increase supply will lead to increased tariffs.

Tariffs have been increasing across selected metros at an annual average of approximately 11.8% (**Figure 15**) although future tariff increases are expected to be higher. The 2020/21 average tariff increase for bulk water supply to these major metros was 8.4%.

The DWS had proposed raw water price increases of at least 16.5%, effective from March 2020 (The South African 2019). However, an increase in bulk water tariffs proposed by each water board was rejected by DWS, partly due to the COVID-19 pandemic, except in the case of Rand Water that was granted a 6.5% increase (PMG 2020).

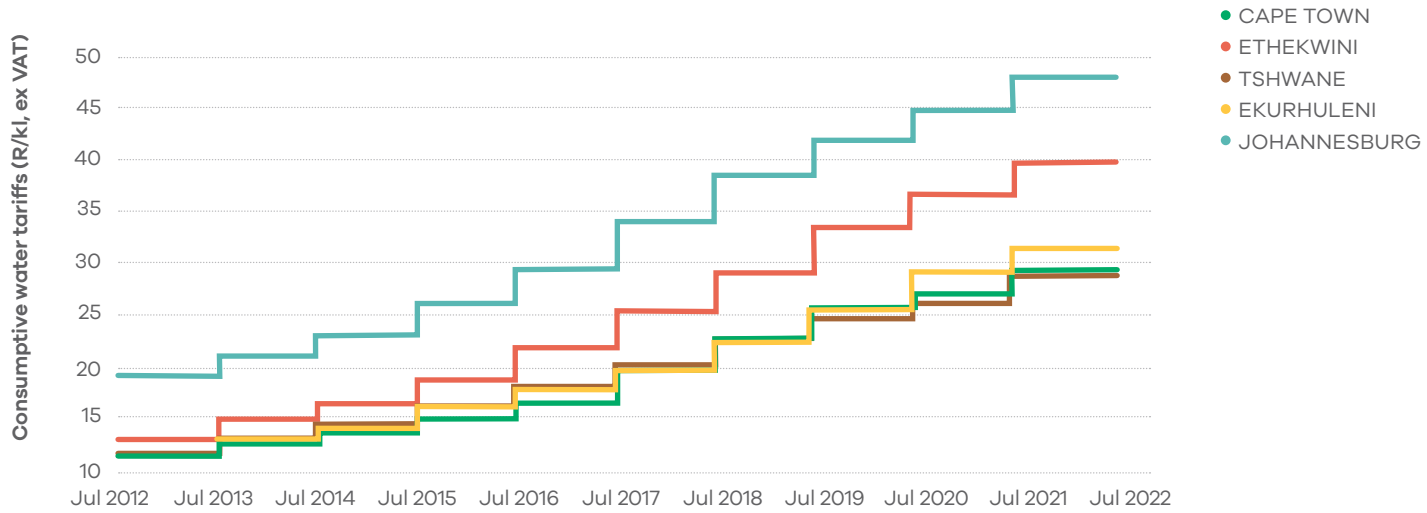

Figure 15: Commercial and industrial water tariffs when minimum restrictions (no restrictions) are in place, for selected metros 2012-2022

Source: GreenCape analysis[27]

[27] The figure reflects the consumptive water tariffs only (excluding any fixed charges or sanitation charges) at minimum or no restrictions. The tariffs are for the first tariff step only.

3.2.3. Alternative water use and installation of sub-meters

The CCT Water Amendment by-law (2018) requires that all new developments (C&I or residential) install water saving measures or alternative water systems, as well as sub-metering of multi-unit properties. The by-law stipulates that only municipal potable water can be used for domestic purposes (drinking, ablution and culinary, excluding toilets and urinals). However, businesses and residential developments can use alternative water for domestic purposes if they enter into a contract with CCT to become water services intermediary (WSI). The contract outlines various conditions that must be adhered to, including water quality monitoring and compliance.

In order to address the absence of national standards for the installation of alternative water systems (such as greywater, rainwater, groundwater, and treated effluent), CCT has developed summary installation guidelines.

The guidelines outline the required measures to protect the municipal supply and the water users within the property, in line with CCT's water amendment by-law 2018. Approvals are required from the CCT for all plumbing installations for alternative water systems, and a certificate of compliance is required once the installation has been completed. Furthermore, the water amendment by-law also provides for the compulsory installation and maintenance of one of the following on each pipe branch by October 2020: an isolating valve, a water management device, prepayment meter, or private sub-meter.

The extension of this deadline to compensate for the impact of COVID-19 has not been communicated.

3.3. Municipal procurement

Municipal procurement is regulated by the MFMA (56 of 2003) and its regulations, including the Municipal Supply Chain Management Regulations (2005).

These regulations specify the minimum requirements, but municipalities are allowed to apply stricter standards. The MFMA outlines the competitive procurement processes, and unsolicited bids are not encouraged. NT also sets further requirements such as local content under designated sectors through the Preferential Procurement Policy Framework Act (5 of 2000).

As stipulated by NT (2017), for projects worth more than R30 000, but less than R50 million (incl. VAT), the price contributes 80 points of the total score and the Broad-based Black Economic Empowerment (B-BBEE) status contributes 20 points. For projects above R50 million, the price contributes 90 points and B-BBEE status 10 points.

Municipalities can also specify prequalification criteria to limit the competition to certain groups. These groups include companies with higher B-BBEE scores, exempted micro enterprises (EMEs) and qualifying small business enterprises (QSEs).

Municipalities are also allowed to issue directives on emergency procurement procedures when a state of disaster has been declared under Section 55(2) of the Disaster Management Act (57 of 2002).

For example, to facilitate emergency procurement of water and sanitation services to prevent the spread of COVID-19, DWS established the National Disaster Water Command Centre led by Rand Water and permitted direct engagement with manufacturers to provide water tanks, ablution blocks, sanitation packs, and related water services to communities without access to these services.

The procurement of services is permitted for a period of up to three years. If a contract is anticipated to extend beyond this three-year limitation, a municipal department must motivate for such an extension to be granted by its municipal council in accordance with the MFMA (Section 33). The process involves inviting comments from national and provincial treasury, relevant national and provincial departments, and the public.

For the provision of services by an external service provider, the Municipal Systems Act (MSA) (Sections 77 & 78) requires a feasibility study to justify the advantage of external over internal service provision. In addition, for public-private partnerships (PPPs), the MFMA (Section 120) requires a bankable feasibility study. GreenCape compiled an industry brief detailing the steps and procedures to access the municipal market. The brief can be accessed **here** via the GreenCape website.

3.3.1. City of Cape Town procurement

Companies wishing to do business with CCT must first register with the national Central Supplier Database (CSD)[28], then with the City's supplier database via its eServices portal[29], and then register on the City's procurement portal and/or tender portal[30].

The CCT publishes Requests for Quotations (RFQs) on its portal for goods and services worth less than R200 000, while those exceeding R200 000 incl. VAT require a formal bidding (tender) process. Tenders are also advertised in local newspapers and on the **national tender portal**. The bidding process for tenders valued at more than R10 million is more extensive and requires additional documentation.

More information on the procurement processes of the CCT can be found on the CCT website[31]. The list of tenders received by the City, and their prices, can be accessed via the CCT website **here**.

3.4. Technology Platforms

The South African Local Government Association (SALGA) in partnership with the Water Research Commission (WRC) has launched the Technology and Innovation Forum (TIF).

The TIF will provide a collaborative platform for municipal partners to share their innovation needs and mobilise partnerships to jointly conceptualise programmes, projects, and funding.

[28] Register for the CSD at https://secure.csd.gov.za/

[29] Steps to register as a CCT supplier are available at https://www.capetown.gov.za/City-Connect/Register/Business-and-trade/Register-as-a-supplier

[30] Register for the CCT procurement/tender portal at https://web1.capetown.gov.za/web1/ProcurementPortal/Account/Register

[31] The City's Supply Chain Management page is available at http://www.capetown.gov.za/Departments/Supply%20Chain%20Management%20(SCM)%20Department

The Western Cape Government (WCG) seeks to promote green technologies and services in order to promote economic water resilience. In an effort to link water users with technology and service providers who can assist in improving water resilience, a public database of suppliers has been developed. Technology and service providers are encouraged to register their technologies on the WCG's database which can be accessed from **here**.

The Western Cape Water Innovation Network (WCWIN) is an initiative that aims to help catalyse networks that support water and sanitation (W&S) innovators in the WC and across South Africa.

The initiative is funded by the WCG and implemented by GreenCape. It aims to help address some of the challenges faced by water and sanitation sector innovators and entrepreneurs such as:

- barriers to accessing the public water and sanitation sector market
- low technology commercialisation rates
- full scale technology demonstration in the public water and sanitation sector market

To access the support from this initiative interested stakeholders must email **water@green-cape.co.za**

The CCT has a New Technology Platform to gain an understanding of innovative water technologies in the market. It gives companies the opportunity to present their products and services to the government in a fair manner. Information on how to submit information to the committee can be obtained by contacting **Water.NewTechnology@capetown.gov.za**.


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OPPORTUNITIES, DRIVERS AND BARRIERS

The pursuit of sustainable economic recovery and growth, poverty alleviation and universal access to water and wastewater services in South Africa presents substantial opportunities for investors and businesses in the public water and wastewater market.


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In this section, business and investment opportunities, together with associated drivers and risks, are discussed. Opportunities have been selected from the largest water market segment in South Africa, namely the public sector water and wastewater (W&WW) services, and their associated infrastructure and smart systems. Long-term opportunities arise from the need for **new, upgraded or refurbished public W&WW infrastructure**, with the largest expenditure expected in **water supply schemes** on a national and regional scale, and **water distribution, wastewater treatment and sewage collection infrastructure** on a municipal scale.

Short-term opportunities relate to the **repairs and maintenance** of W&WW infrastructure and the installation of decentralised wastewater treatment systems. While the former relates to budgeted infrastructure development and maintenance, the latter and **smart systems for W&WW infrastructure management** are emerging opportunities. The advantage of smart systems as an important component in achieving water security is being demonstrated locally through the reduction of water losses, the improvement of efficiency and compliance, and the value-added asset management that they can offer.

The need for water and wastewater infrastructure for water security and universal access to water and sanitation presents investment opportunities for (i) financing national and municipalities' capital projects, (ii) technology suppliers and service providers to supply, renew, upgrade, repair and maintain water and wastewater infrastructure in municipalities, and (iii) investment in these technology suppliers and service providers.

Readers of this report are advised to also read the **2020** and **2021 Water Market Intelligence Report** and **the Public Water Sector Market Industry Brief** for broader context to the public water market segment and value chain.

The focus of the market information presented in this section is on the WC municipalities and metropolitan municipalities (metros) in the rest of SA. Where available, information for non-metro municipalities in the rest of South Africa is provided.

Table 6: Summary of market opportunities

Opportunity	Key drivers	Barriers	Key market segments
Public sector water and wastewater infrastructure Section 4.1	• COVID-19 pandemic re-emphasised the need for access to clean water, dignified sanitation and proper hygiene measures. • National development plan/national economic reconstruction and recovery plan/national infrastructure plan 2050 government strategies and initiatives aimed at service provision through infrastructure development. • Innovative blended financing models debut in the water sector. • High operational expenditure on ageing infrastructure highlighting lifecycle savings of upgrading. • Constraints on urban residential development due to lack of bulk infrastructure. • Increase in project preparation support and available development finance linked to impact and sustainable development goals.	• Available grant funding for water and wastewater services is insufficient. • Financial mismanagement of municipalities. • Lack of locally verified or demonstrated technologies limits municipal confidence in innovation. • Limited research on climate mitigation impacts from W&WW investments reduces access to climate finance. • Current state of policies & regulations (changes in progress in procurement legislation could turn these into drivers in the next ~2 years). • Lack of municipal technical capacity.	• **~R105 bn** for 11 W&WW Strategic Integrated Projects (excl repairs and maintenance), of the **~R1 trillion** in development finance to be unlocked by the Infrastructure Fund with seed funding of R100 bn from the National Treasury over the next 10 years. • **R24.8 bn** budgeted by metros for W&WW infrastructure expenditure over the next 3 years with an additional **R9.8 bn** for repairs and maintenance. • **R10.1 bn** budgeted by Western Cape municipalities (incl. R7 bn for CCT) for W&WW infrastructure expenditure over the next 3 years with an additional **R3.8 bn** (R 2.75 bn for CCT) for repairs and maintenance.
Smart systems for water and wastewater management Section 4.2	• Water security constraints. • Potential financial savings and reduced greenhouse gas emissions (due to efficiency). • Improved asset management for effective preventative maintenance. • Effective water demand management. • Increased availability of project preparation support. • Increased availability of development finance. • Increased accessibility to technical solutions.	• Aging infrastructure limiting ease of integration. • Risk of poor data integrity and security. • Low public confidence in the operational capacity of municipalities. • High initial cost for network establishment. • Lack of municipal technical capacity for developing business cases to attract financing. • Theft and vandalism. • Financial mismanagement of municipalities. • Lack of trust, understanding, and buy-in of municipalities. • Complex contracting and financing models.	• **~ R14 bn** savings annually in bulk water costs across all metros. • **~R1.2 bn** in planned smart meter installation in CCT over 8 years. • **~R5.5 m** in subsidy for smart metering in WC schools (FY: 2020/2021).

4.1. Water and wastewater infrastructure in the public sector

The South African ERRP was published in October 2020 as a blueprint for achieving economic growth in the country. A key component of the ERRP is a focus on infrastructure development, both to attract investment and provide a foundation for ease of doing business, as well as for poverty alleviation via job creation and basic service provision. W&WW infrastructure is a significant component of this infrastructure development focus, especially since the COVID-19 pandemic highlighted the essential nature of access to clean water, dignified sanitation and proper hygiene measures.

The opportunities are specifically in pipelines, pump stations, water and wastewater treatment, water supply and storage, water conservation and demand management (WCDM) infrastructure (**Table 7**). These business and investment opportunities are supported by the commitment to the Sustainable Development Goals (SDGs 2030), 2013 National Water Resources Strategy Second Edition (NWRS2)[32], National Water and Sanitation Master Plan (NW&SMP)[33], Water and Sanitation Industry Master Plan, National Development Plan (NDP 2030)[34], Draft National Infrastructure Plan for 2050 (NIP2050)[35], and the associated action plans.

At a municipal level, the specific opportunities are supported by integrated development plans (IDPs) and water services development plans (WSDP). The CCT has also published the Climate Change Strategy[36] and Water Strategy[37] that has plans to invest in W&WW infrastructure resilience and efficient technologies.

The typical components and services required in implementing each type of infrastructure project are listed in **Table 7**. This breakdown has been provided to indicate the granular opportunities for technology suppliers within the water value chain and range of technologies, that could be accessible via the project level opportunities. A list of typical financing mechanisms has also been provided for each project type, as an indication of the reliability of project financing, and hence the project implementation.

[32] http://www.dwa.gov.za/documents/Other/Strategic%20Plan/NWRS2-Final-email-version.pdf

[33] https://www.gov.za/sites/default/files/gcis_document/201911/national-water-and-sanitation-master-plandf.pdf

[34] https://www.gov.za/sites/default/files/gcis_document/201409/ndp-2030-our-future-make-it-workr.pdf

[35] http://www.publicworks.gov.za/PDFs/44951_10-8_PublicWorksInfras.pdf

[36] https://resource.capetown.gov.za/documentcentre/Documents/City%20strategies%2c%20plans%20and%20frameworks/Climate_Change_Strategy.pdf

[37] https://resource.capetown.gov.za/documentcentre/Documents/City%20strategies,%20plans%20and%20frameworks/Cape%20Town%20Water%20Strategy.pdf

Table 7: Typical components and services required and financing mechanisms per infrastructure project type

Project type	Typical components required	Typical services required	Typical funding sources
Pipelines			
Bulk water main	Pipes, bends, fittings, valves, concrete, graded sands, manholes.	Design, civil earthworks and construction, pipe and valve installation, monitoring, repairs and maintenance.	Municipality's own funding, loans, MIG/USDG/ RBIG [38] grants
Water distribution			Municipality's own funding, loans, USDG and ISUPG [39] grants
Sewer reticulation			
Outfall sewers			Municipality's own funding, loans, MIG/USDG grants
Pump stations			
Water	Pumps, screens and associated equipment, pipes, bends, fittings, valves, concrete, masonry, electrical equipment.	Design, civil earthworks and construction, mechanical and electrical installation, monitoring, repairs and maintenance.	Municipality's own funding, loans, MIG/USDG grants
Sewer			
Treatment works			
Water	Screens, filters, pumps, mixers, settling tank bridges, disinfectant dosing equipment, dewatering equipment, weirs, pipes, bends, fittings, valves, concrete, masonry, electrical equipment.	Design, civil earthworks and construction, mechanical and electrical installation, monitoring, repairs and maintenance.	Municipality's own funding, loans, MIG/USDG grants
Wastewater	Screens, degritters, pumps, settling tank bridges, aerators, diffusers, compressors, mixers, membranes, odour control, chlorine dosing equipment, ultra-violet equipment, dewatering equipment, weirs, pipes, bends, fittings, valves, concrete, masonry, electrical and electronic equipment.		

[38] MIG: Municipal Infrastructure Grant. USDG: Urban Services Development Grant. RBIG: Regional Bulk Infrastructure Grant.

[39] ISUPG: Informal Settlements Upgrading Partnership Grant.

Table 7 continued...

Water supply and storage			
Groundwater	Pumps, screens, pipes, bends, fittings, valves, concrete, masonry, electrical equipment.	Design, civil earthworks and construction, mechanical and electrical installation, monitoring, repairs and maintenance.	Municipality's own funding, loans, MIG/ USDG grant
Dams and weirs	Concrete, masonry, weirs, pumps, pipes, bends, fittings, valves, electrical equipment, turbines, generator, invertors.		Municipality's own funding, loans, RBIG grant
Reservoirs	Concrete, pumps, pipes, bends, fittings, valves, electrical equipment.		Municipality's own funding, loans, MIG/ USDG grant
Demand management	Water meters, smart water meters, pressure release valves (PRVs), flow control valves, flow limitation devices, smart and digital support systems	Networks design and planning, installation, repairs and maintenance, monitoring, data analysis, and reporting.	Municipality's own funding, loans, USDG and ISUPG grants for new settlements

4.1.1. Opportunities for new and upgrades of bulk, regional and national water and wastewater infrastructure

Nationally, in line with the Infrastructure Development Act of 2014, 11 W&WW Strategic Integrated Projects (SIPs), with an estimated value of R105 billion, have been selected for prioritisation (**Table 9**).

Prioritisation allows projects to follow an expedited path to delivery with set and shorter time frames for regulatory processes. The projects are expected to create about 20 000 temporary jobs during construction and 14 000 jobs once the projects are operating over a period of 10 years. The Draft National Infrastructure Plan for 2050 (finalisation expected in 2022) identified a further 5 potential W&WW projects to be included as SIPs.

Two other SIPs that apply to the water sector include a national programme for water savings on government buildings and the removal of alien vegetation programme (**Table 9**).

The SIPs are being assessed for eligibility for blended financing from the Infrastructure Fund (IF) established in August 2020. The IF will be seed funded with R100 billion over the next 10 years by NT and managed by the Development Bank of South Africa (DBSA) to access R1 trillion in development finance.

Table 8: Water, wastewater and related Strategic Integrated Projects selected for prioritisation[40]

Classification	Project description	Key features	Location	Estimated capital cost	Implementing agent
SIP 19: Water and Sanitation	Phase 2 of the Lesotho Highlands Water Project (Vaal River System)	Construction of a 165 m high, concrete-faced rockfill embankment Polihali dam; a 50 m high saddle dam; a 38 km long, 5 m diameter Polihali–Katse dam tunnel; a hydropower scheme; and associated infrastructure.	Lesotho	R40 billion	Lesotho Highlands Development Authority
	Phase 2A of the Mokolo Crocodile River (West) Augmentation Project	Phase 2 will include an abstraction weir in the Crocodile River, de-gritting channels with high and low lift pump stations, and approximately 160 km of pipeline with break pressure and balancing reservoirs.	Limpopo	R13 billion	Trans-Caledon Tunnel Authority (TCTA)
	uMkhomazi Water Project	The 81 m high Smithfield Dam, a 3.5 m diameter transfer tunnel of ~32.5 km, and a 2.6 m diameter raw water pressure pipeline of ~5.2 km.	KwaZulu Natal	R4.7 billion	Umgeni Water
	Phase 2 of the Olifants River Water Resource Development Project	The bulk infrastructure comprises pipelines ranging from 1.1 to 1.8 m in diameter and a total length of ~200 km, a 13 MW Steelpoort pump station, three pump stations of 4MW each, a balancing reservoir, a break-pressure tank, and fibre optic cables for remote control centre operations.	Limpopo	R7.6 billion	Trans-Caledon Tunnel Authority
	Vaal-Gamagara Water Supply Scheme refurbishment and upgrade project	Includes the refurbishment of Delportshoop abstraction works and WTW; upgrade of 3 pump stations; construction of a 430 km pipeline from Delpoortshoop to Black Rock; equipping of 3 borehole sites; and associated infrastructure (access roads, fibre optics).	Northern Cape	R18 billion	Sedibeng Water Board
	Mzimvubu Water Project	Includes the Ntabelanga, Laleni and Mbokazi dams; a hydropower scheme; a centralised WTW at Ntabelanga; and R7.5 billion in water distribution infrastructure.	Eastern Cape	R15 billion	DWS & Trans-Caledon Tunnel Authority
	Rehabilitation of the Vaalharts-Taung Irrigation Scheme	Includes rehabilitation of 122 km of main canal, 625 km of feeder canal, drainage to the main off-farm systems, 5 overnight dams and balancing dams, and electricity connection in the area.	Northern Cape & North West	R9 billion	DWS & Vaalharts Water User Association

[40] https://www.gov.za/sites/default/files/gcis_document/202007/43547gon812.pdf

Table 8 continued...

Classification	Project description	Key features	Location	Estimated capital cost	Implementing agent
SIP 19: Water and Sanitation	Groot Letaba River Water Development Project - Nwamitwa Dam	Includes the construction of the 36 m high Nwamitwa Dam embankment with a total crest length of 3.5 km; and a WTW, pipelines and 4 reservoirs for the regional bulk distribution of water.	Limpopo	R4.6 billion	DWS
	Berg River Voëlvlei Augmentation Scheme	Includes the construction of an abstraction works on the Berg river, comprising a diversion weir, sediment traps and a 5 MW pump station; and a 6.3 km long 1.7 to 1.9 m diameter rising main pipeline from the Berg river to Voëlvlei dam.	Western Cape	R550 million	Trans-Caledon Tunnel Authority
	Rustfontein Water Treatment Works Extension	Involves the extension of the WTW capacity from 100 Ml/day to 150 Ml/day.	Free State	R500 million	Bloem Water
	Orange-Riet Canal Increase of Bulk Raw Water Supply	Extension of capacity and range of canals.	Free State	Unknown	DWS & Orange-Riet Water Users' Association
Projects under consideration for inclusion under SIP 19 (NIP2050)	Raising of the Tzaneen Dam wall	Raising of the 730 m long embankment by 3 m and associated water distribution infrastructure.	Limpopo	R550 million	DWS
	The raising of the Clanwilliam Dam wall and Irrigation Scheme	Raising of the 235 m long concrete wall by 13 m and associated infrastructure.	Western Cape	R4 billion	DWS
	Municipal wastewater treatment plant improvements	Unknown	South Africa	Unknown	Unknown
	Expand Sundays River sub-system and other projects to service Gqeberha	Unknown	Eastern Cape	Unknown	Unknown

Table 8 continued...

Classification	Project description	Key features	Location	Estimated capital cost	Implementing agent
Projects under consideration for inclusion under SIP 19 (NIP2050)	Water supply augmentation for Mbombela,	Unknown	Mpumalanga	Unknown	Unknown
SIP 28	Photovoltaic and Water Savings on Government Buildings Programme	Water efficiency aiming to achieve a water use intensity reduction of between 30% and 55% (~R540 to R990 million in water cost savings)	South Africa	Unknown	Department of Public Works and Infrastructure (DPWI)
SIP 31	Removal of Alien Vegetation and Innovative Building Materials Programme	Alien vegetation removal improves catchment runoff volumes	South Africa	R1.9 billion over the next 3 years	Department of Fisheries Forestry & Environment and DWS

4.1.2. Opportunities for new, upgrades and refurbishment of municipal water and wastewater infrastructure

Over the next three years, metros plan to spend a total of R24.8 billion on new water and wastewater infrastructure, upgrades and refurbishments. The three-year medium term capital expenditure budgets (2021-2024) for W&WW projects in metros are presented in **Figure 16**.

Each metro has prioritised projects in different segments of their water and wastewater management services and the biggest opportunities are in **water distribution** (25% of total capital expenditure, R6.2 billion), **waste-water treatment works** (21%, R5.2 billion), and **sewer reticulation** (20%, R4.9 billion).

Metros are spending ~66% of their infrastructure budget on major capacity upgrades at wastewater treatment works (WWTWs), and the installation of new pipelines or their refurbishment for water distribution and sewer reticulation to cater to rapid urbanisation. Residential developments in some metros are constrained due to a lack of capacity at WWTWs.

Metros have budgeted ~72% of their capital expenditure over the next three years for new water and wastewater (W&WW) infrastructure, upgrades and refurbishment and ~28% on repairs and maintenance. Over the next three years, almost 39% (~R9.8 billion) of the CCT's R25 billion capital expenditure plan will be invested in W&WW infrastructure.

Similar to other metros (at 66–76%), CCT will spend 72% of the W&WW infrastructure budget on new W&WW infrastructure, upgrades and refurbishment..

The exception is Buffalo City, which has budgeted 97% of their W&WW infrastructure budget on new W&WW infrastructure, upgrades and refurbishment with 63% of this budget set to be spent on outfall sewers and sewer reticulation.

The CCT is further projecting a minimum investment of R8 billion for major WWTWs upgrades at Potsdam, Macassar and Zandvliet over the next 10 years[41]. Upgrades at WWTWs also present opportunities to shift to more advanced, energy efficient, theft proof and/or vandal resistant technologies.

See **Table 7** for the different components that apply to these projects. Metallic technologies are at risk of being stolen, vandalised and/or salvaged as scrap metal.

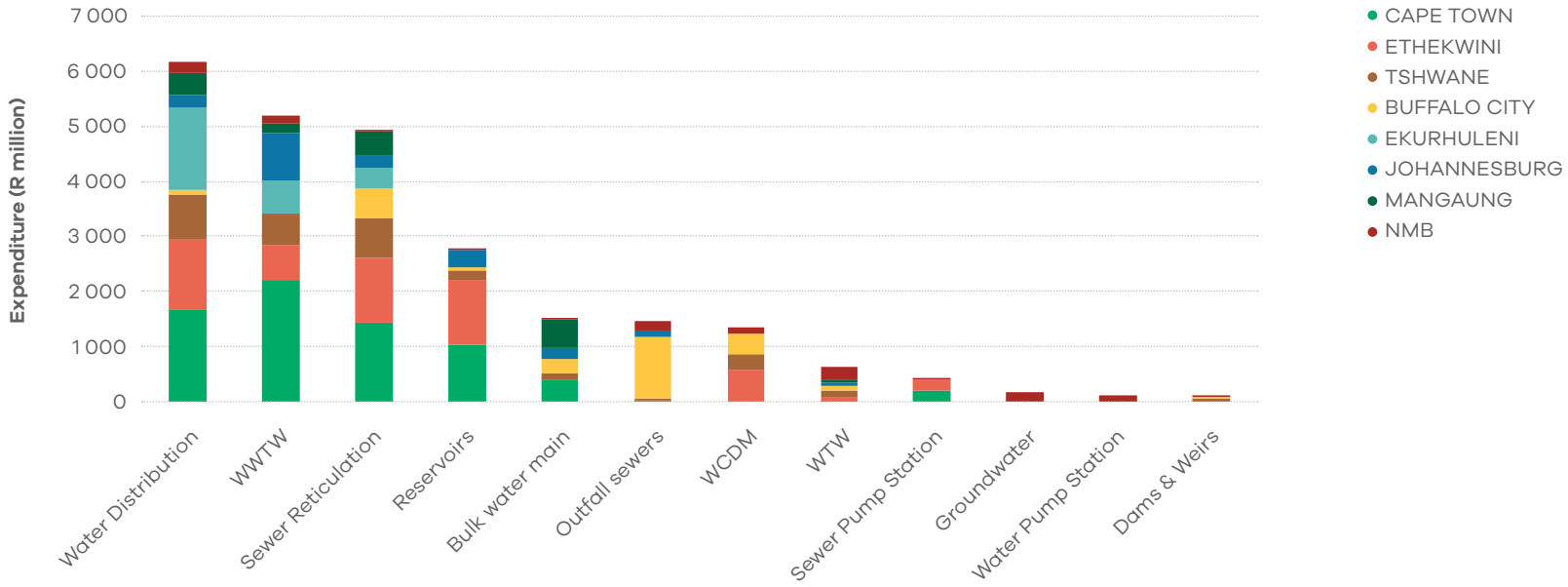

Figure 16: South African metros' three-year budgeted capital expenditure on new, upgrade and refurbishment of water and wastewater infrastructure) by individual municipalities and as a percentage of the total spend by all metros[42]

Source: Medium Term Budgets, 2021

[41] https://www.capetown.gov.za/Media-and-news/City%20to%20ensure%20sustainable%20development%20while%20Waste%20Water%20Treatment%20capacity%20upgrades%20are%20under%20way

[42] NMB – Nelson Mandela Bay, WCDM – water conservation and demand management, WTW – water treatment works, and WWTW – wastewater treatment works

In the WC, the combined three-year capital expenditure budgets on W&WW projects for local municipalities (excluding CCT) is R3.1 billion. The three-year medium term expenditure budgets (2021-2024) for water and wastewater projects in the WC local municipalities are presented in **Figure 17** for new, upgrade and refurbishment infrastructure of water and wastewater infrastructure.

The biggest opportunities are in water distribution (25% of total capital expenditure, R740 million), sewer reticulation (20%, R556 million), and wastewater treatment works (21%, R535 million) infrastructure (based on a comparable relative breakdown as for the case of metros).

These infrastructure segments are required components to support municipalities' goals of providing water and sanitation services to all. Considering the significant cost of transporting water to communities and collecting wastewater from communities (42%, R1.3 billion, including bulk water mains, water distribution and sewer reticulation), there are emerging opportunities in alternatives such as decentralised water supply and wastewater treatment, where significant costs of an extensive distribution and collection system can be saved.

The total value of W&WW capital works opportunities in all the WC local municipalities combined (R3.1 billion) is less than half of the R9.8 billion expenditure budget of the CCT over the next 3 years. Therefore, the largest public water sector investment and business opportunities lie in the metro. These W&S infrastructure projects are mainly expected to be financed by external financing funds[43], grant funding, revenue and capital replacement reserves[44].

[43] Borrowing (loans, bonds and financial leases) obtained by the metros that attract interest and depreciation charges and have a direct impact on the tariffs

[44] A fund replenished from surplus in previous financial year

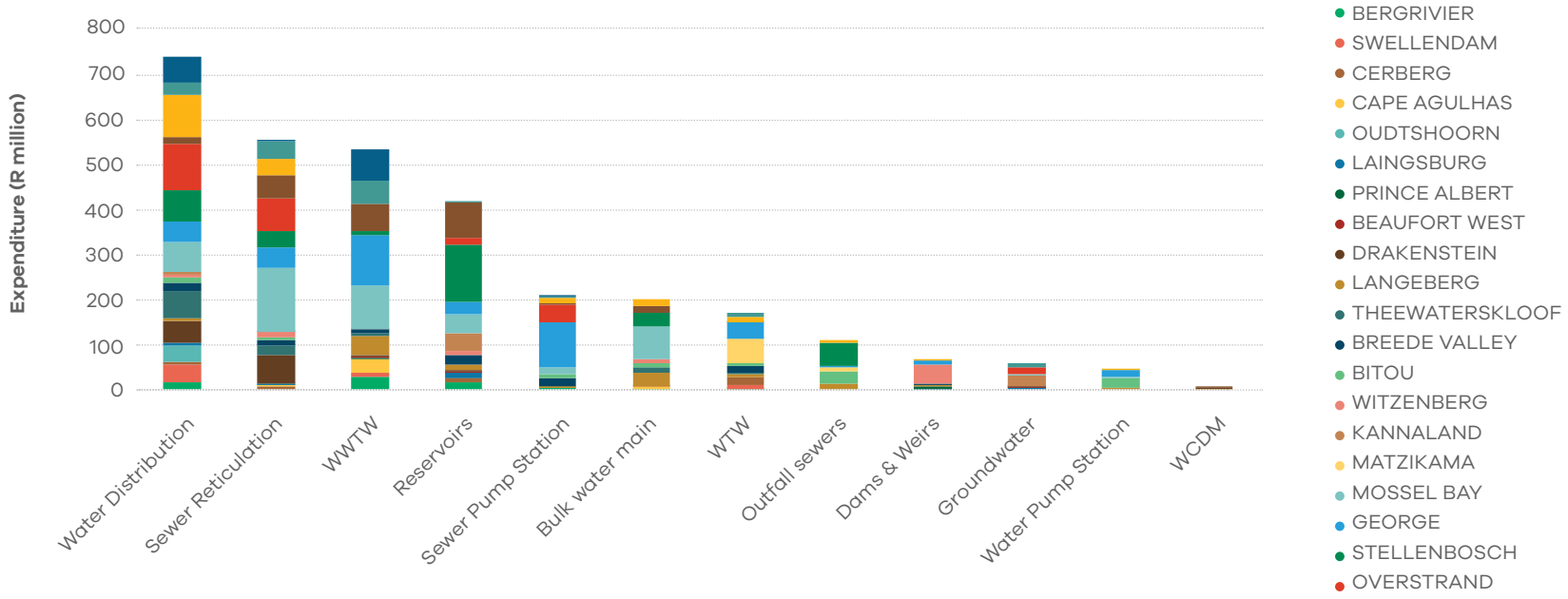

Figure 17: Western Cape local municipalities' 3-year budgeted capital expenditure on new, upgrade and refurbishment of infrastructure by individual municipalities and as a percentage of the total spend by municipalities

Source: Medium Term Budgets, 2021

4.1.3. Opportunities for repairs and maintenance of municipal water sector infrastructure

Figure 18 and Figure 19 present three-year expenditure budgets for repairs and maintenance of W&WW infrastructure for metros and WC local municipalities, respectively.

Metros have budgeted ~28% (R9.8 billion), and WC local municipalities ~26% (R1.1 billion), of their three-year expenditure budget on repairs and maintenance.

The majority of this budget will be spent on repairing and maintaining the water distribution network, sewer reticulation and WWTWs (comparable focal points to the capital expenditure budgets).

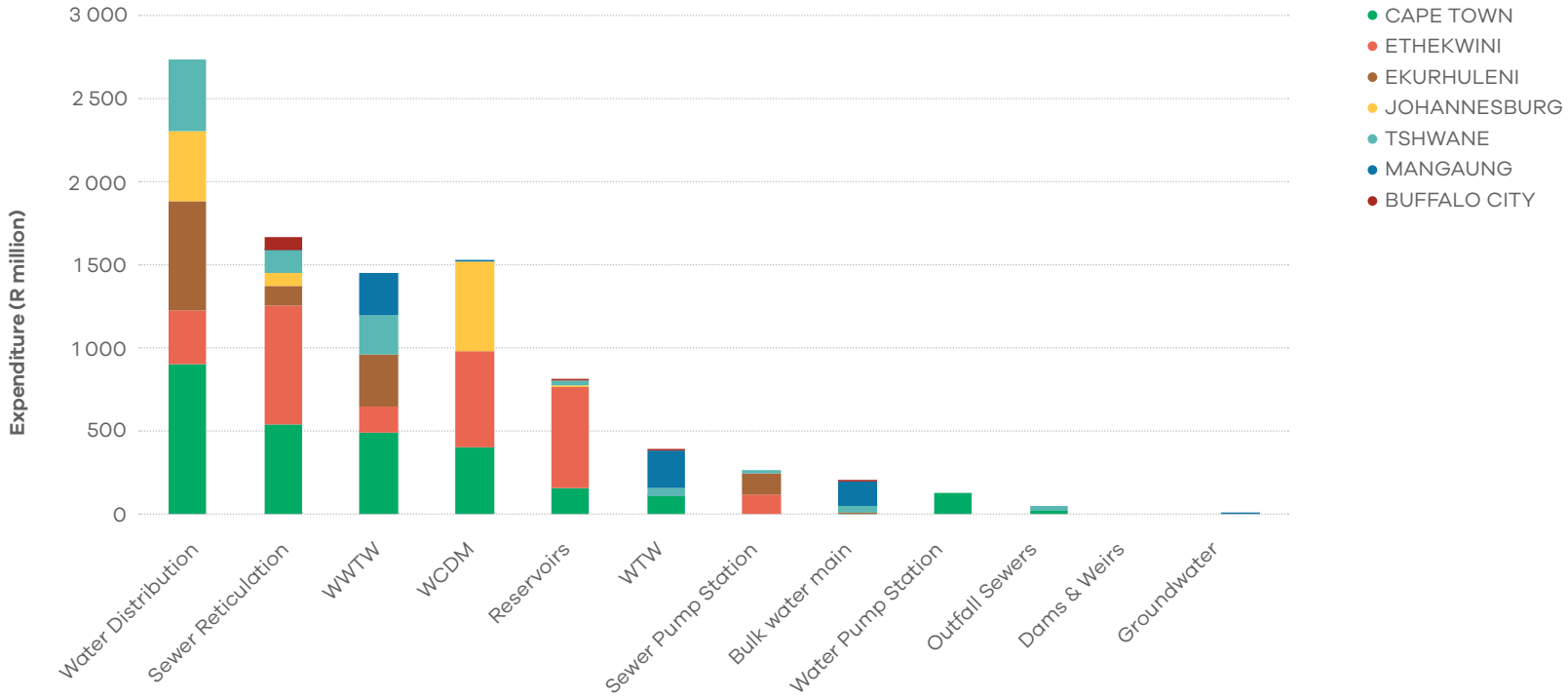

Figure 18: South African metros' 3-year budgeted expenditure on repairs and maintenance of water and wastewater infrastructure by individual municipalities and as a percentage of the total spend by all metros[45]

Source: Medium Term Budgets, 2021

[45] WCDM – water conservation and demand management, WTW – water treatment works, and WWTW – wastewater treatment works

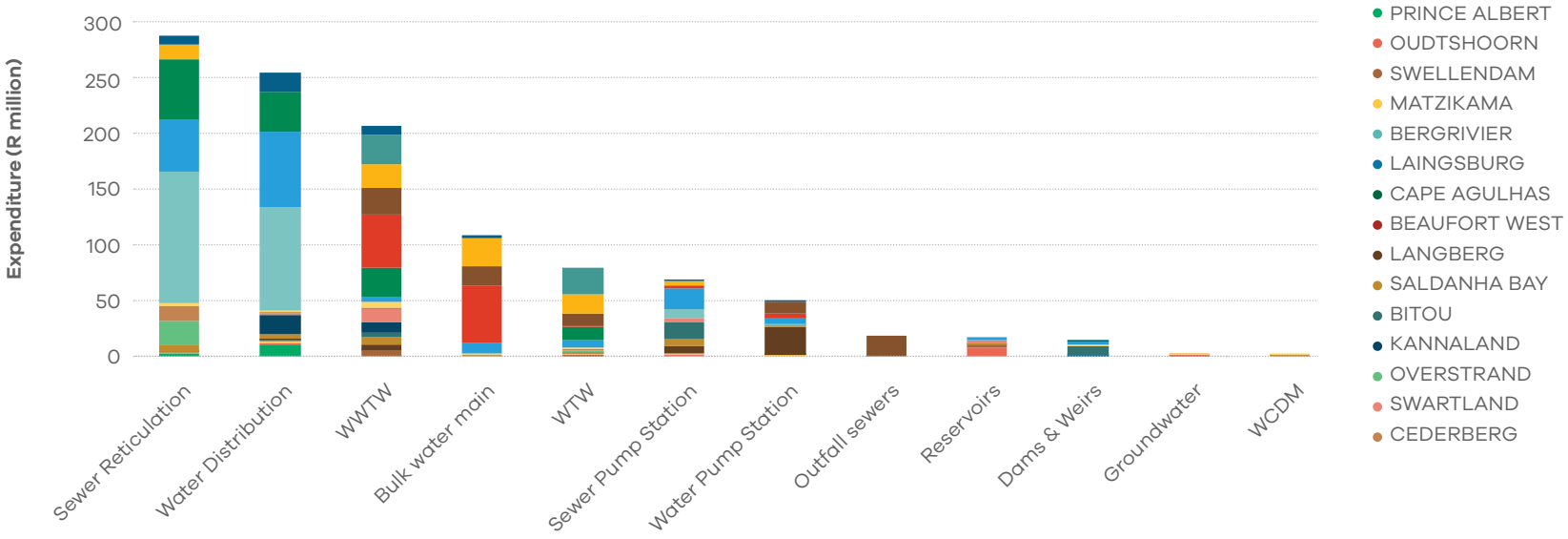

Figure 19: Western Cape municipalities' 3-year budgeted expenditure on repairs and maintenance of infrastructure by individual municipalities and as a percentage of the total spend by all municipalities[46]

Source: Medium Term Budgets, 2021

[46] WCDM – water conservation and demand management, WTW – water treatment works, and WWTW – wastewater treatment works


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Table 9 below summarizes the medium-term capital budgets on infrastructure projects in the South African metros and WC municipalities. A total investment and business opportunity of R 10.1 billion on new infrastructure, replacements and upgrades while R3.85 billion on repairs and maintenance of W&WW in the WC.

Table 9: Summary of medium-term capital expenditure for metros and Western Cape municipalities on water and wastewater infrastructure projects (Medium Term Budgets, 2021)

Municipality	Expenditure on new, upgrade and refurbishment (R million)	Expenditure on repairs and maintenance (R million)	Total expenditure (R million)
Metros			
Cape Town	7007	2746	9753
Ethekwini	5138	2525	7664
Tshwane	2843	1231	4074
Buffalo City	2545	1047	3593
Ekurhuleni	2479	961	3440
Johannesburg	2026	632	2658
Mangaung	1556	522	2078
Nelson Mandela Bay	1252	90	1342
Sub-total Metros	24 847	9 753	34 600
Western Cape Local Municipalities			
Mossel Bay	442	161	603
George	390	81	471
Stellenbosch	324	81	405
Drakenstein	119	222	341
Overstrand	247	23	270
Saldanha Bay	228	30	258
Hessequa	136	107	243
Knysna	186	50	236
Theewaterskloof	98	129	227
Swartland	136	21	157
Langeberg	117	38	155
Breede Valley	95	38	133
Bitou	94	27	121
Kannaland	72	26	97
Witzenberg	82	14	96
Matzikama	64	5	69
Swellendam	55	10	65

Municipality	Expenditure on new, upgrade and refurbishment (R million)	Expenditure on repairs and maintenance (R million)	Total expenditure (R million)
Bergrivier	61	3	63
Cederberg	42	18	60
Oudtshoorn	37	11	47
Cape Agulhas	41	0	41
Laingsburg	24	2	26
Prince Albert	11	13	23
Beaufort West	8	0	8
Sub-total WC Local Municipalities	**3 110**	**1 107**	**4 217**
Total	**27 957**	**10 860**	**38 817**

The largest opportunities in water conservation and demand management (WCDM) are presented by the metros, where 5% (R1.4 billion) of the medium term capital expenditure (**Figure 16**) and 16% (R1.5 billion) of the repairs and maintenance budget (**Figure 17**) has been dedicated to WCDM, compared to 0.2% (R6.8 million) (**Figure 18**) and 0.1% (R1.2 million) (**Figure 19**), respectively, in the local municipalities of the WC.

The City of Cape Town, eThekwini municipality and City of Johannesburg are expected to spend R400, R906 million and R1.2 billion on WCDM projects, respectively. As the water sector digitalises, smart systems for W&WW infrastructure, to tackle NRW and WCDM, is a goal for most cities. This emerging opportunity is discussed in the next section.

4.2. Emerging opportunity: Smart systems for water and wastewater management

Smart water management (SWM) is a concept that utilises electronic and computerised engineering approaches to increase information collection and analytics.
It requires the integration of various systems and complex measures to monitor, control and regulate the usage and quality of water resources as well as maintenance of associated equipment, such as pipes and pumps. Smart water systems have been identified as an emerging opportunity for innovation and investment in the South African water sector. In partnership with SALGA and the Water Research Commission (WRC), GreenCape conducted a survey to understand the water and sanitation innovation needs of municipalities and water boards across SA.

As shown in **Figure 20**, the survey (sent out nationally) identified that municipalities are particularly interested in water innovations and technologies linked to NRW and to smart systems for improved water management. This section highlights the investment opportunities linked to smart systems (including those that help reduce NRW). Further information on opportunities relating to NRW, as well as sludge beneficiation and non-sewered sanitation systems (NSSS) is provided in the **2021 Water Market Intelligence Report**.

Municipalities are moving towards smart systems implementation. A practical example is **Cape Agulhas Municipality** where effective groundwater management strategies have been implemented via the installation of a LoRaWAN[47] network and subsequent smart technologies on boreholes, reservoirs and transferring pumps. A case study on this intervention is available via the website.

[47] LoRaWAN (Long Range Wide Area Networks) is a low-power, wide area networking protocol which wirelessly connects devices to the internet and manages communication between user devices and network gateways. It is built on top of the LoRa radio modulation technique


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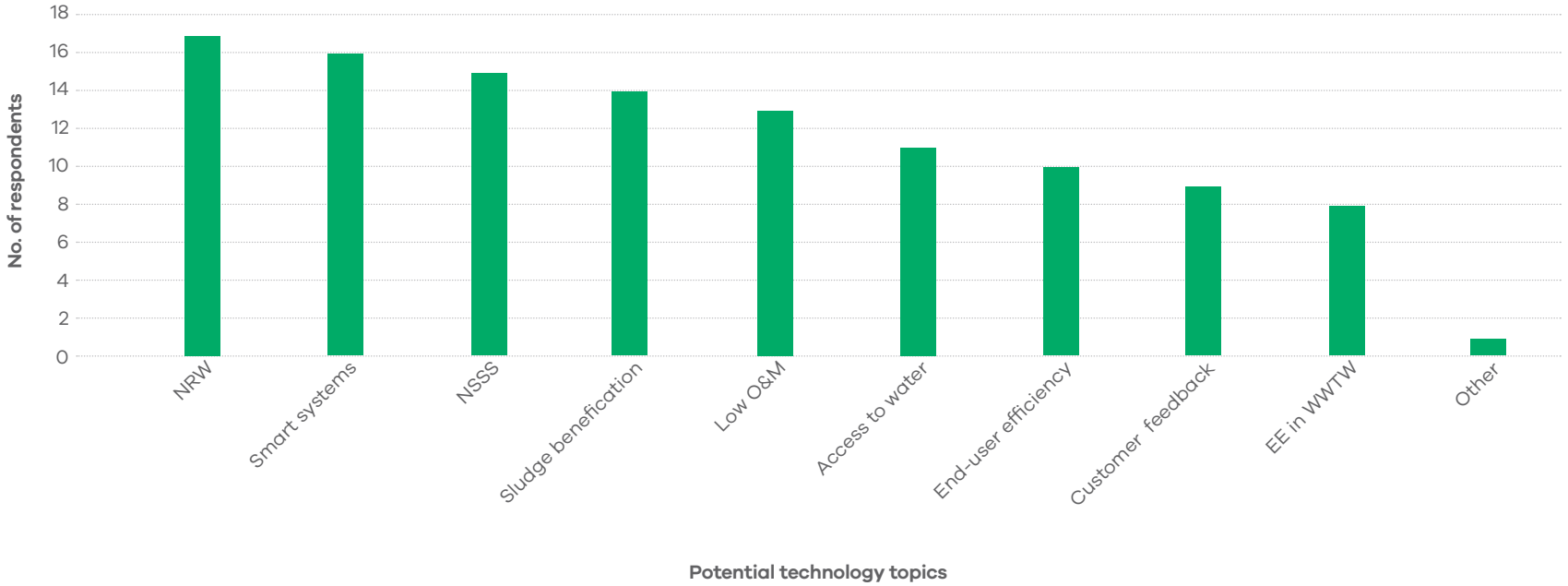

Figure 20: Number of respondents that were interested in the potential technology topics. There were 33 responses from 19 different municipalities/ water boards.[48]

[48] **NSSS:** Innovative non-sewered sanitation solutions for urban informal settlements, **Sludge beneficiation:** Wastewater sludge disposal/beneficiation solutions (including nutrient and energy recovery options), **NRW:** Non-revenue water solutions to reduce water losses and increase revenue (e.g. leak detection and prevention, smart metering etc.), **EE in WWTW:** Energy efficiency solutions for wastewater and water treatment works, **Customer feedback:** Customer feedback systems to improve communication around water and sanitation service provision in informal settlements, **Low O&M:** Water and wastewater treatment technologies with very low operation and maintenance requirements, **Smart systems:** Smart systems (e.g. smart metering, remote water quality monitoring, smart asset/equipment management), **Access to water:** Innovative solutions to improve access to water, **End-user efficiency:** Water efficient technologies for municipal facilities and households.

In the context of water, there are opportunities for investment in smart technologies that are linked to water consumption and demand management, energy **consumption and management, water supply systems, infrastructure maintenance and upgrades** and **smart sewer and sanitation wastewater management.**

Energy consumption and management in the greater water management and distribution network is often overlooked as a critical component. Water management in cities/urban areas often comprise ~50% of the total municipal energy bill and is also considered the largest controllable cost in water and wastewater operations (SALGA Framework 2020). Optimisation of treatment plants and distribution networks is often overlooked as a source of freeing operating funds by cash-strapped municipalities. Facilities can be designed to gather meaningful and actionable data where managers can make informed decisions about operations and thereby optimise the operations.

Projections done by SALGA estimate that 30% savings in energy costs and 15% reductions in water losses can be achieved when smart systems are installed. The **2020 Water MIR** provides information on energy efficiency opportunities in the municipal water sector market.

Water consumption and demand management is considered one of the key factors in measuring the sustainability of a city. Smart water systems enable municipalities to improve their customer management and reduce costs of customer demand management. This is done via the use of applications that are accessible from cellular devices. Smart systems such as water smart meters with applications for water users can empower users to better manage their water use, detect leaks on their properties and improve customer management by enabling them to report faults more easily.

Smart meters can also improve billing accuracy, which can also help improve customer relations. Important to note is that the business case for municipalities to convert from mechanical meters to smart meters will depend on the specific problems that are addressed (e.g., poor customer relations, inaccessible meters for manual meter read etc.) and will be on a case-by-case basis. Investors and technology providers of smart systems should target municipalities where there is a strong business case for smart systems and should clearly demonstrate the benefits to the municipality. In general, municipalities are currently unsure of the benefits/business case for implementing smart metering and there is a need for more data and case studies.

There is an opportunity for investment in smart flow, pressure and leak detection systems that can help municipalities and utilities better understand their water balances and help them address NRW in their **bulk water supply systems**.

South African municipalities cumulatively use around 5 billion kl per year, of which 39.3% is NRW (NW&SMP 2019). The most recent NRW data for the metropolitan and Western Cape municipalities are presented in **Figure 21** and **Table 10**. This translates to ~ R14 billion in lost revenue using the 2020/21 minimum/no restriction tariffs for commercial and industrial businesses in metros (**Figure 14**). Metric sensors that record water flow and pressure within pipelines can be leveraged to decrease NRW. The biggest opportunity for smart systems to address NRW is in well-run municipalities that have medium levels of NRW (15%<NRW<25%) where the most cost-effective interventions have already been implemented. Smart zoning and pressure management have a demonstrated good business case, which represents a growing opportunity that other municipalities in South Africa might be open to exploring further.

There are also opportunities for investment in smart technologies and sensors, such as flow and pressure sensors, as well as robotic devices to be utilised in **infrastructure maintenance and upgrades**. An example of such a project is the refurbishment of both the CCT's Cape Flats 1 and Cape Flats 2 bulk sewer lines[49] which commenced at an estimated cost of R539 million overall, with R133 million budgeted for this financial year (2021/2022) alone.

A total of 28 kms of pipeline is being rehabilitated, making this the largest project of its kind undertaken in South Africa. At the Pelican Park section, a team, with the help of a 90kg robotic crawler[50], inspected the inside of the bulk sewer to determine which sections should be prioritised for refurbishment by measuring orality[51]. This data is then used to determine the best – most affordable, effective, and efficient – method of refurbishing the different sections of the pipe.

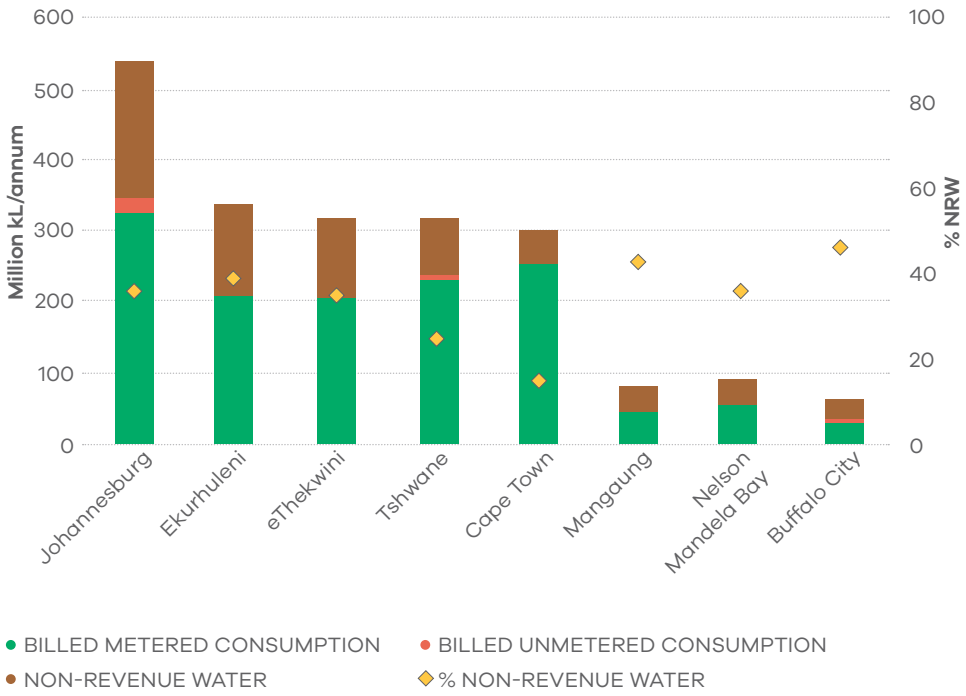

Figure 21: Non-revenue water data for metropolitan municipalities in South Africa (latest data as at 2020).

[49] https://www.capetown.gov.za/Media-and-news/Daring%20work%20and%20 innovative%20technology%20on%20display%20at%20major%20Cape%20Flats%20sewer%20project

[50] A robotic crawler is a remote-controlled vehicle that profiles the inside of the pipeline by recording, among other things, the orality at different points along the way. More detail can be found here.

[51] Orality refers to deviations from perfectly circular measurements inside the shaft, which in turn tells the engineers the extent to which gases have corroded the inside surface of the pipe.

Table 10: Non-revenue water data, water tariffs and potential revenue loss for metropolitan municipalities in Western Cape municipalities (latest data as at 2020)[52]

Municipality	Non-revenue water (%)	Water tariff (R/kL)[53]	Potential loss in revenue (R/kL)
Beaufort West	48	R19.89	R9.55
Bergrivier	10	R8.78	R0.88
Bitou	25	R12.87	R3.22
Breede Valley	22	R12.80	R2.82
Cape Agulhas	18	R9.92	R1.79
Drakenstein	11	R7.11	R0.78
George	4	R17.67	R0.71
Knysna	43	R7.84	R3.37
Langeberg	14.5	R3.07	R0.45
Matzikama	23.4	R8.21	R1.92
Overstand	26	R7.00	R1.82
Saldanha Bay	3	R11.59	R0.35
Stellenbosch	21	R20.82	R4.37
Swartland	12	R24.84	R2.98
Swellendam	36	R11.35	R4.09
Theewaterskloof	16	R11.00	R1.76
Witzenberg	35	R17.91	R6.27

[52] Reliable data could not be obtained for municipalities not listed here.

[53] Based on the lowest residential water tariff when there are minimal or no water restrictions – price includes 15% VAT.

Opportunities for investment in **smart sewer and sanitation wastewater management** technologies include sensor technologies that provide insight into the frequency, extent and consequences of direct discharges into the sewer system. Municipalities are increasingly confronted with waste discharges of hazardous substances into the sewers. Wastewater treatment works (WWTWs) have not necessarily been designed to remove the current concentrations of hazardous waste from the incoming sewers, which could cause downstream contamination of watercourses. Utilising these sensors could make it possible to limit the discharge of hazardous substances into the sewer systems by closing the WWTW's main basin in time. Intended technologies for this application should address the following elements:

- Placement of sensors;
- Passive sampling and analysis (inline monitoring) of sewage water using high-resolution mass spectrometry; and
- Advanced data processing techniques to provide access to real-time data on the plant.

Samples taken manually and analysed in a laboratory provide information retrospectively, leading to possible downstream contamination due to datasets being unavailable immediately. The number of samples required to meet compliance standards is often as high as 1000 samples per municipality (>8000 for Cape Town) (DWS 2018). This can be challenging given the technical capacity constraints at municipalities, particularly smaller ones. Through implementing smart sewer and sanitation technologies, compliance standards can be monitored proactively, requiring fewer human resources.

Smart systems that can be demonstrated to increase revenue will likely have the biggest interest in the public sector market.

4.3. Drivers

There are several drivers that are relevant across all the opportunities in the public market highlighted in this MIR. These general drivers will be presented first, followed by opportunity-specific drivers.

Water security (future water supply deficits), as outlined in **Section 2**, is a key driver of W&WW infrastructure projects in the public market. While some regions in South Africa have potential for new surface water projects, others, like the WCWSS have limited further surface water potential.

Increased urbanisation and lack of universal access to water and wastewater services

The historical backlogs in **accessing W&WW services** and **rapid urbanisation** are key drivers for new W&WW infrastructure in South Africa. The operational reality is that existing **ageing W&WW infrastructure** has been stretched due to significant under-investment and delays in maintenance and renewal. Most municipalities have depleted their Capital Renewal Reserves (CRR) and currently underinvest towards renewal and maintenance of W&WW infrastructure (NW&SMP, 2019). Large renewal backlogs and upgrades exist in municipal infrastructure, such as treatment works, pump stations and reticulation networks.

Increased basic service delivery protests

According to StatsSA (2019), W&WW services related protest events countrywide increased from 528 in 2017 to 737 events in 2018. According to the South African Police Service, over 900 service delivery protests were recorded in the course of six months between 2020 and 2021. While many of these service delivery protests, demanding the provision of W&WW services, were the driving force for W&WW project prioritisation, some also gave rise to malicious damage to W&WW infrastructure, placing significant strain on the already limited budget and infrastructure backlog (which is at the same time also a barrier to investment in W&WW infrastructure). As indicated before, according to the 2021 WEF Global Risk Report (GRR), water crisis and social instability were ranked jointly as the third highest risk for doing business in SA.

Political will and increased expenditure

The **Investment and Infrastructure Office** (IIO)[54] was established in 2019 by The Presidency. The IIO's function is to co-ordinate and integrate economic and social infrastructure development work done by various departments. The body is responsible for developing the country's infrastructure investment strategy and creating expertise and capacity within the government to drive infrastructure development. The IIO's work with the private sector led to the development of the Sustainable Infrastructure Development System (SIDS) methodology[55], and establishment of a new institution, Infrastructure South Africa (ISA).

In the national 2021/22 three-year budget, R120 billion was allocated for W&WW infrastructure development as part of the ERRP. The revised estimate for the 2020/21 W&WW infrastructure spend (R34.8 bn) was 28% higher than the previous highest in 2018/19. In the 2020/21 DWS' budget, about a third was allocated to community development for improving W&WW services. South Africa's water market capital and operational expenditure has an average annual growth of 6.2% and is expected to reach R180 billion at the end of 2022. The civil engineering, and equipment and components which account for 18% and 17% of the South African market, are projected to grow strongly at an annual rate of 7.5% and 6.9%, respectively, over the 2015-2022 period. (Montmasson-Clair 2018, based on data from Global Water Intelligence (GWI).

Project preparation and financing support from the national government to municipalities for W&WW infrastructure projects has increased. The Project Preparation Facility and Infrastructure Fund led by the DBSA, and supported by the Government Technical Advisory Centre (GTAC) and the Presidential Infrastructure Coordinating Commission's (PICC) Technical Project Management Unit under Infrastructure South Africa (ISA) prepares infrastructure projects, including the **prioritised Strategic Integrated Projects** (**Table 8**), by funding and facilitating technical and feasibility studies, increasing the pipeline of projects that can potentially be funded by development finance institutions (DFIs) or private sector finance.

These units have given the **green light to four projects for blended financing via the Infrastructure Fund worth a collective R21 billion**, including the Phase 2A Mokolo Crocodile River (West) Augmentation Project valued at R13 billion. In the WC, the Provincial Government is developing a project preparation support for catalytic municipal infrastructure projects through the Sustainable Infrastructure Development and Financial Facility (SIDAFF) Programme. The Programme, funded by the French Development Agency (AFD), aims to increase bankable municipalities' access to loan financing for infrastructure projects in order to address the decreasing availability of grant funding[56].

[54] https://iio.org.za/about/

[55] The SIDS Methodology relates to the **identification, consideration, evaluation, approval, and implementation of workable infrastructure**, in order to ensure bankability

[56] Contact the WCG Department of Local Government or GreenCape for further information on SIDAFF.

Alongside these innovative financing mechanisms, an international renewed drive towards achieving the SDGs by 2030 has resulted in the publication of an SDG accelerated implementation framework[57] and an **increase in available development finance**. The Department of Resources, Minerals and Energy (DMRE) is running a 3-year programme with municipalities in SA to **support and fund the implementation of energy efficiency (EE) projects for municipal infrastructure including pump stations and WWTWs**[58].

Interventions include aerators, pumps, blowers, motors, etc. The programme is being run by South-African German Energy Programme (SAGEN), with department of Mineral Resource and Energy (DMRE), Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ) and the Water Group as partner stakeholders. Grant funding and technical support is provided to the municipalities to do feasibility studies.

A summary of the financial drivers and support plans for the public water market, as well as their functions and implementing agents, is provided in **Table 11**.

[57] https://www.unwater.org/publications/the-sdg-6-global-acceleration-framework/

[58] http://www.energy.gov.za/EEE/Projects/EEDSM/RFP-for-Implementation-of-EEDSM-2022-23to2024-25.pdf

Table 11: Financial drivers and support initiatives for the public water and wastewater market[59]

Name	Function	Implementing agent
Sustainable Infrastructure Development Symposium (SIDSSA)[60]	SIDSSA is the annual flagship event organised by the IIO within The Presidency. It is a platform that brings together critical active role-players in the public and private infrastructure investment space, to accelerate an infrastructure centred economic recovery and achieving SDGs and NDP. Furthermore, the symposium is intended to pave an enabling environment for infrastructure investment through regulatory and policy reforms, and innovative funding models.	Investment and Infrastructure Office (IIO)
Government Technical Advisory Centre (GTAC)	GTAC was appointed as a Transaction Advisor for the assessment of the financial viability and mechanisms for the delivery of the envisaged City of Cape Town's permanent desalination infrastructure. Some of the key aspects to be considered are the means of financing, procuring and delivering this type and scale of infrastructure.	National Treasury
Viability and Validations of Innovations for Service Delivery Programme (VVISDP)	VVISDP, funded by the European Union and the National Treasury, seeks to demonstrate, pilot and evaluate the suitability and viability of technologies and innovations that can improve the delivery of basic services, improve performance and functioning of municipalities. The programme is designed to build partnerships between technology developers (both in public funded research institutions and the private sector) with municipalities.	Department of Science and Innovation, in collaboration with SALGA and Cooperative Governance and Traditional Affairs (CoGTA)
National Water Reuse Program (WRP)	The WRP committee comprises of DBSA, WRC, COGTA, DWS and WISA amongst other stakeholders. The WRP has been positioned as one of the programmes under the Infrastructure Fund. A centralised programme management office (PMO- centre of excellence) has been established to drive reuse project preparation, facilitate and mobilise funding and monitor project implementation. The PMO also assists municipalities with testing and vetting new technologies, project procurement and communication.	Development Bank of Southern Africa (DBSA)
Municipal Innovation Maturity Index (MIMI)[61]	MIMI is a platform for enhancing municipalities' innovation capabilities in order to improve service delivery, accelerate social transformation, and alleviate poverty in keeping with the ideals of a developmental state. The tool benchmarks the Science, Technology and Innovations (STIs) readiness level of the municipalities (employees and operations) and determines innovation maturity levels of a municipality. The tool provides insights for municipalities to plan for innovation and to migrate to higher levels of innovation maturity.	DSI

[59] AFD– Agence Française de Développement, CoGTA–Department of Cooperative Governance and Traditional Affairs, SALGA–South African Local Government Association, SECO– Swiss State Secretariat of Economic Affairs, WRC–Water Research Commission,

[60] https://sidssa.org.za/about-2/

[61] https://www.mimi.org.za/

Table 11 continued...

Name	Function	Implementing agent
Critical Infrastructure Programme (CIP)[62]	CIP is a cash grant of between 10% and 30% on qualifying infrastructure projects, capped at R50 million. The grant is now open to a larger range of infrastructure projects, including public and private water and sanitation infrastructure, feasibility studies and agro-processing sector infrastructure, inter alia.	DTIC
INCA Municipal Debt Fund (IMDF)[63]	The R3 billion IMDF was established to improve the supply of urban infrastructure in intermediate cities. The project aims to fill a market gap, enabling secondary municipalities with good credit quality to access financial resources, as well as catalyse the participation of local private investors absent from the secondary municipalities' financing segment.	INCA Portfolio Managers (IPM) in partnership with AFD and SECO
Sustainable Infrastructure Development and Financial Facility (SIDAFF)[64]	The SIDAFF Programme is under development to provide project preparation support for catalytic municipal infrastructure projects. The Programme, funded by AFD, aims to increase bankable municipalities' access to loan financing for infrastructure projects in order to address the decreasing availability of grant funding.	WCG Department of Local Government
Climate Finance Accelerator (CFA)[65]	The CFA is a global technical assistance programme, funded by the UK Government's International Climate Finance. It directly responds to the urgency and scale of the climate crisis by supporting highly promising climate projects to become more bankable and appealing to investors, so that they can secure funding more readily. The CFA approach addresses the fact that there is money available for climate finance, but it is often difficult for it to flow to the places where it is needed.	National Business Initiative (NBI) in partnership with GreenCape

62 http://www.thedtic.gov.za/financial-and-non-financial-support/incentives/critical-infrastructure-programme/

63 https://www.afd.fr/en/support-municipalities-south-africa

64 Contact the WCG Department of Local Government or GreenCape for further information.

65 https://www.gov.uk/government/publications/climate-finance-accelerator/climate-finance-accelerator

The following section presents drivers that are specific to the investment and/or business opportunity.

4.3.1. Further drivers for water and wastewater infrastructure in the public sector

The increased operation and maintenance expenditure associated with **ageing W&WW infrastructure** has brought to light the **potential lifecycle savings when upgrading or replacing dilapidated infrastructure**. Metropolitan municipalities are increasingly considering these long-term savings, where the **business case can be proven**. The WCG, through the Department of Environmental Affairs and Development Planning (DEA&DP), has established the Smart Procurement Programme (SPP)[66]. The aim of the programme is to further develop and embed the SPP in the supply chain management practices across the province.

Regulations are being developed by DWS to **regulate bulk water tariffs**, with publication expected in 2022 (Draft NIP2050, 2021). The intention of these regulations is to set affordable tariffs, while also considering the sustainability and cost recovery of the catchment providing the services. Furthermore, many municipalities have published water restriction policies, which describe their **action plans in the face of drought**. These regulations and policies can help municipalities with planning their future water revenue better for **improved budgeting and capital investment**. Businesses will also benefit from predictable restrictions and tariffs in the face of drought, allowing for informed decisions on their water management.

4.3.2. Further drivers for smart systems for water and wastewater management

Digital platforms can help to mitigate plant operator and maintenance risks by developing **predictive maintenance programs**, through logging and data capturing of previous maintenance resulting in support for decision making. SA's **ageing W&WW infrastructure and maintenance backlog** coupled with a **lack of capital** can be solved more readily by using predictive maintenance programs that will assist in the systematic repair and maintenance of infrastructure. Other benefits include **compliance, uptime, efficiency, sustainability and convenience** when operating the treatment works.

Financial support

During 2020, the Western Cape Education Department (WCED) identified 350 schools where smart meters were installed as part of a wider piloting programme. The WCED has since encouraged schools to apply for financial subsidies (~R5.5mil in total available) to cover the cost of smart meter installation. The WCED subsidy will cover the installation costs for the water monitoring devices and the monthly service fees for an agreed period. Schools will be required to enter directly into a service contract with a water metering supplier. An example of the potential impact is that of a school in Kraaifontein, which is reported to have saved on average 1 100 kL (~R50 000) of water monthly due to early leak detection and preventative maintenance as a result of smart meter installation[67].

Contracting models

A unique contracting model taking the form of public-private partnerships (PPPs) and service level agreement (SLA) can be leveraged to overcome the lack of capital funding by municipalities.

[66] https://www.westerncape.gov.za/eadp/files/atoms/files/DEADP%20SmartProcurement%20Analysis%20Report.pdf

[67] https://www.westerncape.gov.za/news/schools-save-whopping-76-million-litres-water-thanks-smart-water-meter

Water and energy-saving performance contracting is a financial model that capitalises on the flexibility and resources of the private sector to pay for the water and/or energy-saving capital upgrades using future water and/or energy savings. This is particularly relevant for smart technologies that enable water and/or energy savings, e.g., water savings by the Kraaifontein school. The initial investment is provided by the private financial community and services will be delivered by water and/or energy service companies (ESCOs).

4.4. Barriers

There are several barriers that are cross-cutting. These general barriers will be presented first, followed by opportunity specific barriers. Although public sector W&WW projects have been prioritised by NT, financing opportunities are increasing and smart cities make financial sense, there are also significant barriers, as set out below.

A **lack of technical skills in municipalities** to develop bankable feasibility studies and structure appropriate contracts reduces the potential of accessing funding. Municipal expenditure on repairs and maintenance is lagging due to shortages in skills and capacity (NW&SMP, 2019). Investors and banks are looking for projects to fund but cannot risk supporting a poorly investigated project. However, successful infrastructure projects can be realised with the existing municipal capacity by starting with small, manageable steps, such as bidding on tenders for installing monitoring devices and collecting data to develop an understanding of the status quo. Although this barrier is being tackled as outlined in **Section 4.3**, there is still a long way to go in overcoming it, especially due to a **high staff turnover** in municipalities.

Municipal finances

Municipalities together with water boards currently owe the DWS ~R9.8 billion. Municipalities alone owe Eskom and water boards more than R11 billion and R6.2 billion, respectively (AGSA, 2020). Municipal-scale projects are capital intensive, and an **inability to access funding** can be a major constraint. Although available grants and municipal funds for specific infrastructure projects are drivers, they are limited (**Section 2**). According to the 2019/20 auditor general's report, irregular, fruitless, wasteful, and unauthorised expenditure totalled R26 billion across all municipalities, while 37.5% (R4.9 billion) of the adjusted capital budget was not spent. Several municipalities underspent on repairs and maintenance (AGSA, 2020). Only a few municipalities have the capacity and financial standing to access private sector financing or procure infrastructure projects using PPPs.

To attract investors, it is important for municipal authorities to have robust and audited financials; strong corporate governance and accountability; obtain a credit rating and seek financial advice on how to restructure their balance sheets.

Limited grant and municipal funding

In areas where most residents are indigent and not able to pay for basic services, municipalities rely on the **limited grant funding** for new infrastructure, renewal, refurbishment and/or maintenance (potential driver). SA's 257 municipalities registered 3.5 million indigent[68] households (~22%) in 2018, and 59% of households did not pay for their W&WW services (up from 50,8% in 2009) (StatsSA 2018[69]).

[68] An indigent household is classified as a family earning a combined income of less than R3 200 per month.

[69] http://www.statssa.gov.za/?p=11722#:~:text=In%202017%20most%20municipalities%20(147,600%20per%20household%20per%20month.

The proportion of residents needing indigent support is projected to increase due to the deteriorated national economic climate associated with the COVID-19 pandemic and limiting of economic activities under the state of emergency lockdowns. Consumers owe municipalities more than ~R128 billion for W&WW services (AGSA 2020).

The **lack of revenue collection** leaves municipalities highly dependent on limited grant funding and may lead to their insolvency. As of 31 March 2021, all municipalities are owed an aggregated amount of R 231 billion by consumers, with metropolitan municipalities being owed R115 billion (National Treasury, 2021[70]). In 2019, metropolitan, district, and local municipalities had a working capital ratio of 1.27, 1.01 and 0.76, respectively (StatsSA 2019b). This indicated that metropolitan municipalities are generally in a better position to settle short-term debt compared with district and local municipalities.

The unreliability of revenue collection also binds municipalities to **poor credit ratings and limits their ability to access loans**, which leaves them dependent on only their water services revenue and grant funding. Given the limited grant funding (**Figure 12**) and own revenue, municipalities have to find innovative funding streams in order to accelerate the eradication of infrastructure renewal backlogs (~R332 billion) and fulfil their development plans. There is a capital funding gap of ~R33.3 billion per annum (NW&SMP, 2019).

Municipal procurement processes (as outlined in **Section 3.3**) can be lengthy, tenders are often poorly specified, and legislation (MFMA) is restrictive to unsolicited bids. Furthermore, the procurement processes make it difficult for municipalities to trial and invest in new (unproven) technologies. For details regarding municipal procurement, please refer to the **Public Water Sector Market Industry Brief**.

[70] National Treasury 2021. Budget Review 2021.

While the mitigation impact may be indirect, the funding of refurbishment or upgrade of a treatment plant can significantly reduce carbon emissions through improved energy efficiency by new equipment. This can reduce carbon emissions threefold compared to leaving wastewater untreated and prevent the carbon release to the atmosphere through the stabilisation of sludge to capture biogas. However, more research and demonstration of W&WW treatment technologies that can reduce the carbon footprint of W&WW treatment works is required. This will open avenues for support from climate finance initiatives.

4.4.1. Smart systems for water and wastewater management

The existing ageing infrastructure (W&WW, energy and telecommunications) may not be compatible to retrofit smart systems. The integration of smart systems requires reliable power supply and wireless networks. The failure of critical infrastructure for energy generation, transmission, distribution and telecommunications can surface and lead to questions of smart systems reliability. Smart systems with backup batteries and/or powered by renewable energy may have market competitiveness.

To fully leverage the advantage of smart systems, a local network needs to be established by which various components can transmit data. Establishing such a network **requires significant upfront capital** investment and can be **complex to implement**. Furthermore, the expensive infrastructure associated with smart systems is often subject to **theft and vandalism**. Allowance thus needs to be made for securing the hardware such as equipment, housing and security.

Data integrity and security: With the dawn of the 4th Industrial Revolution, challenges such as cyber security and hackers gaining access, becomes a major threat as infiltrating treatment systems for malicious intent can be dangerous for human health.

Negative perception regarding new technologies and services due to poorly developed business cases, or poorly managed prior projects is a major barrier. In some cases, engineering consultants are not prepared to carry the risk of recommending new technologies. Thus, the designs provided to municipalities are based on tried and tested technologies, as they present less reputational risk for the consultant and less operational risk for the municipality.

FUNDING AND INCENTIVES

A range of general and sector-specific funding solutions and incentives is available to investors, manufacturers, and service companies in the green economy. It covers Development Finance Institutions (DFIs), local public and private sector financiers and investors, and a considerable range of tax incentives.


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South Africa ranks as one of the top 15 nations in the world in terms of driving the green growth agenda (ahead of Australia, Singapore, and Finland). This drive is on the back of a range of funding solutions and tax incentives available to green technology manufacturers and service companies, as well as those who use or procure such goods and services.

The South African Climate Finance Landscape looks at detailed project-level data, understanding in detail the source, disbursement, instrument and use. The insights can support public and private role-players with information to shape sectoral strategies and selected policies and improve coherence and coordination between public and private level spending in the sectors. The South African Climate Finance Landscape has tracked R62.2 billion in annual climate finance invested in SA. Find out more here.

5.1. General database web page

The GreenCape Finance Desk hosts a web page with a number of Green Finance resources that cover funding and incentives available to companies operating in the green economy. A few of the available database are highlighted below.

The Green Finance Desk (GFD) primarily acts as a facilitator in the financing of green projects and green business. The GFD works across all sector desks at GreenCape. For more support please visit https://www.greencape.co.za/content/sector/green-finance

ACCESS TO THE SOUTH AFRICAN CLIMATE FINANCE LANDSCAPE

5.1.1. Green Finance Database

In conjunction with the Western Government Department of Economic Development and Tourism, GreenCape maintains a database of funding sources and incentives that may be relevant to green economy investors. The database contains information on more than 150 funding opportunities, including an overview of the opportunity and relevant contact details and links. It is ideal for any entity seeking a broad range of funding solutions and financial incentives, with South African institutions being the main source of opportunities. The database is available to view and download online[1].

5.1.2. Government funding and incentives database

An updated document focused on South African government funding and incentives is available to view and download online[2]. These incentives cover local manufacturing, critical infrastructure grants, small enterprise development and a diverse set of sector specific incentives (i.e. Aquaculture Development and Enhancement Programme).

[1] https://www.green-cape.co.za/content/focusarea/green-finance-databases

[2] https://www.greencape.co.za/assets/Uploads/Government-Funding-and-Incentive-Booklet.pdf

5.1.3. Finfind database

Finfind[3] is an innovative online finance solution that brings together SMME finance providers and finance seekers. With a focus on finance readiness, Finfind has more than 200 lenders and over 350 loan products available to SMEs. The database is ideal for South African SMMEs who are seeking funding and/or business advisory services, and those who want to improve their understanding of finance.

Wesgro has partnered with Finfind to assist local companies seeking finance for their business. See more here: https://wesgro.finfind.co.za/quiz/disclaimer/wesgro

5.1.4. AlliedCrowds database

AlliedCrowds[4] is the first complete aggregator and directory of alternative finance providers in the developing world. Sign-up is free and allows users to access a global database where one can filter for sector (including greentech, agriculture and social impact), type of capital (equity, lending, grant), and type of funding (crowdfunding, angel investing, venture capital, impact investing). In addition:

- Themed databases around the Sustainable Development Goals (SDGs) and the World Green Economy Organisation (WGEO) are available.
- Reports, including a number specifically about African funding sources, can also be downloaded for free.
- Businesses / organisations can also contact Allied Crowds to create a customised funding database. This resource is ideal for any entity seeking a broad range of financial solutions on a global scale.

Click the buttons below to access the relevant content

GREENCAPE'S GREEN FINANCE WEB-PAGE

GREEN FINANCE DATABASE

GOVERNMENT FUNDING AND INCENTIVE BOOKLET

FINFIND WEBSITE

ALLIED CROWDS WEBSITE

[3] https://www.finfindeasy.co.za/

[4] https://alliedcrowds.com/

THE WESTERN CAPE: AFRICA'S GREEN ECONOMY HUB

The Western Cape is a world-class investment destination.


©Unsplash

The province provides businesses and investors with prime locations, modern infrastructure, a skilled workforce, low operational costs and an abundance of natural resources. It is also a sought-after place to live, with unrivalled natural beauty, vibrant culture, excellent schools and universities, and an outstanding quality of life.

In 2017, Cape Town was ranked among the top 21 global investment destinations by Foreign Direct Investment (fDi) Intelligence, a division of the Financial Times.

A great place for green business

There are compelling reasons why the Western Cape Province is viewed by many as Africa's green economy hub. Coupled with a strong and rapidly growing market for green technology and services in South Africa and beyond, the Western Cape offers:

- Africa's renewable energy and cleantech hub, with a critical mass of leading companies present.
- Local presence of major professional services and financiers.
- Significant market opportunities for businesses and investors in agriculture, energy services, utility scale solar and wind, waste, water, bioeconomy and resource efficiency.
- A supportive government that has made ease of doing business and the green economy key priorities.
- Five universities with comprehensive R&D capabilities and dedicated green economy skills programmes.
- A range of investment incentives in the Atlantis Special Economic Zone (SEZ) for Green Technologies.

Supporting businesses and investors

The province also offers dedicated support for businesses and investors focusing on greentech and services, including:

Western Cape Department of Economic Development & Tourism: Driving the green economy policy landscape in the Province.
InvestSA One Stop Shop: Offers convenient investor support on permits, licensing and registrations - all under one roof.

City of Cape Town Enterprise and Investment: Creates an enabling environment to attract investment that generates economic growth and job creation in Cape Town
GreenCape: Provides dedicated support and market intelligence to green economy sectors.
Wesgro: The official investment and trade promotion agency for the Western Cape.
SAREBI: A business incubator providing nonfinancial support to green entrepreneurs.
SARETEC: Offers specialised industry-related and accredited training for the wind and solar industries.

Market opportunities in the province and South Africa

Some of the major market opportunity areas in the province and South Africa in the next five years are outlined in the graphic on the next page (see individual MIRs and the GreenCape website for more information).

R&D capabilities and skills

The region's five universities – University of Cape Town, Stellenbosch University, University of the Western Cape, the Cape Peninsula University of Technology and the George campus of the Nelson Mandela Metropolitan University – underpin all of this with comprehensive research and development (R&D) capabilities and dedicated green economy skills programmes.

ATLANTIS SPECIAL ECONOMIC ZONE FOR GREEN TECHNOLOGIES

The Atlantis SEZ is a zone dedicated to the manufacturing and provision of services in the green technology space - technologies that reduce or reverse the impact of people on the planet. Wind turbines, solar panels, insulation, biofuels, electric vehicles, materials recycling and green building materials are all examples of green technologies that will be welcomed to the zone.

The zone welcomes manufacturers, service providers, suppliers and other players in the value chains of different green technologies. The SEZ is situated in the Atlantis industrial area north of Cape Town, south of Wesfleur, east of Dassenberg Road, and west of the Witsand community.

Why invest in the Atlantis SEZ?

There are strong and growing South African and African markets for greentech. The South African greentech manufacturing market is worth at least R30bn; with a growing greentech market in the neighbouring countries. South Africa has opportunities in energy, waste, agriculture, transport and other sectors and is a great entry point for the whole of Africa, in particular the SADC region.

Atlantis is a great location and development ready. 94 hectares of zoned development-ready land is available for leasing to investors. Bulk infrastructure is in place and Atlantis has new public transport and shipping links, whilst boasting fibre connectivity too. Atlantis is also close to major ports, roads, universities and greentech markets.

Investors have access to extensive investment support through the One Stop Shop for investor support and the rest of the investor support ecosystem, which includes InvestSA, GreenCape, the City of Cape Town, and Wesgro. Together the ecosystem provides information and advocacy; market intelligence; facilitated access to permits and licenses, planning and development approval; and skills training.

Investors and tenants are accessing attractive incentives in the form of tax relief and allowances, employment tax incentives, fast-tracked development approvals, fee exemptions and subsidies.

There is an attractive, wide-ranging skills base to recruit from with 5 universities and many more colleges in the province, and a large range of unskilled, semi-skilled, technical and professional candidates.

FOR MORE INFO, CLICK TO EMAIL THE ATLANTIS SEZ BUSINESS DEVELOPMENT EXECUTIVE

atlantis
special economic zone
cape town

CLICK TO VIEW THE ATLANTIS SEZ WEBSITE

GREENCAPE'S SUPPORT TO BUSINESSES AND INVESTORS

GreenCape is a non-profit organisation that works at the interface of business, government and academia to identify and remove barriers to economically viable green economy infrastructure solutions.
Our vision is a thriving prosperous Africa, mobilised by the green economy

GreenCape is a non-profit organisation that works at the interface of business, government and academia to identify and remove barriers to economically viable green economy infrastructure solutions. Our vision is a thriving prosperous Africa, mobilised by the green economy

Working in developing countries, GreenCape catalyses the replication and large-scale uptake of green economy solutions to enable each country and its citizens to prosper. We work with businesses, investors, academia and government to help unlock the investment and employment potential of greentech and services, and to support a transition to a resilient green economy.

We assist businesses by removing barriers to their establishment and growth and provide our members with:

- free, credible and impartial market information and insights
- access to networks of key players in government, industry, finance and academia
- an advocacy platform to help create an enabling policy and regulatory environment for green business

We assist local, provincial and national government to build a resilient green economy by providing:

- support on the development of standards, regulations, tools and policies
- expert technical knowledge on key sectors in the green economy
- access to networks of key players across business, academia, and internationally

Since inception in 2010, GreenCape has grown to a multi-disciplinary team of over 40 staff members, representing backgrounds in finance, engineering, environmental science and economics.

Our market intelligence reports form part of a working body of information generated by sector desks and projects within GreenCape's three main programmes – energy, circular economy and resources.

Benefits of becoming a GreenCape member

We currently have over 2 500 members, and offer free membership. Becoming a member of GreenCape will give you access to the latest information regarding developments in the various sectors; access to tools, reports, and project information; and offer you the opportunity – through our networking events – to meet and interact with various stakeholders in the green economy.

CLICK HERE TO BECOME A GREENCAPE MEMBER

We have facilitated and supported ~R42bn of investments in renewable energy projects and manufacturing. From these investments, more than 19 000 jobs have been created.

Through our WISP (industrial symbiosis) programme, by connecting businesses with waste / under-used resources:

435 000 fossil GHG emissions saved (equivalent to the electrical usage of 117 840 households in SA);

Over R150 million in financial benefits (additional revenue, cost savings and private investments);

398 economy wide jobs.

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