

National Water Reuse Programme: Programme Design and Preparation of a Full Funding Proposal to the Green Climate Fund (GCF)



Financial Architecture

Annex 3

09 June 2023

This deliverable has been prepared by the Development Bank of Southern Africa with the support of Pegasys (Pty) Ltd in association with:

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- Yubifin (Pty) Ltd.

All referred to as the 'Service Provider' in the Service Level Agreement executed between Pegasys and the DBSA on 10 January 2021.

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ACRONYMS & ABBREVIATIONS

AE	Accredited Entity
AMD	Acid Mine Drainage
ATP	Advanced Treatment Plant
AUM	Assets Under Management
BFS	Blended Finance solution
BNR	Biological Nutrient Removal
BOOT	Build Own Operate Transfer
BOT	Build Operate Transfer
BCR	Economic Benefit-Cost Ratio
BFS	Blended Finance solution
BNR	Biological Nutrient Removal
BOOT	Build Own Operate Transfer
BOT	Build Operate, Transfer
BRCCJ	Building resilience to cope with climate change in Jordan
CEC	Chemicals of Emerging Concerns
CFADS	Cashflow Available For Debt Service
CIB	Corporate And Investment Bank
COD	Chemical Oxygen Demand
COGTA	Department of Cooperative Governance and Traditional Affairs
CP	Conditions Precedent
CSIR	Council for Scientific and Industrial Research
DBO	Design Build Operate
DBSA	Development Bank of Southern Africa
DD	Due Diligence
DFI	Development Finance Institution
DPR	Direct Potable Reuse
DSCR	Debt-Service Coverage Ratios
DWS	Department of Water and Sanitation
ECSA	Engineering Council of South Africa
EIRR	Economic Internal Rate of Return
ENPV	Economic Net Present Value
EPC	Engineering Procurement Contract
ESCAP	Economic and Social Commission for Asia and the Pacific

FAA	Funded Activity Agreement
FICA	Financial Intelligence Control Act
FIRR	Financial Internal Rate of Return
FNPV	Financial Net Present Value
GCF	Green Climate Fund
GTAC	Government Technical Advisory Centre
GVA	Gross Value Added
HACCP	Hazard Analysis Critical Control Point
IBCF	Independent Blended Capital Facilitator
IFC	International Finance Corporation
INR	Industrial Reuse
IPR	Indirect Potable Reuse
IR	Irrigation Reuse
IRR	Internal Rate of Return
JSE	Johannesburg Stock Exchange
LMU	Loan Management Unit
MISA	Municipal Infrastructure Support Agency
MTEF	Medium-Term Estimates Framework
NBFIs	Non-Bank Financial Institutions
NT	National Treasury
O&M	Operations and Maintenance
PCG	Partial credit guarantees
PEP	Politically Exposed Persons
PM	Programme Memorandum
PPP	Public Private Partnership
REIPPP	Renewable Energy Independent Power Producer Programme
RO	Reverse Osmosis
SA	South Africa
SALGA	South African Local Government Association
SLA	Service Level Agreement
SPV	Special Purpose Vehicle
WACC	Weighted Average Cost of Capital
WHO	World Health Organisation
WPO	Water Partnerships Office
WRP	Water Reuse Programme

WRU	Water Reuse Unit
WRUTIA	WRU's Technical Implementing Agent(s)
WSUD	Water Sensitive Urban Design
WSA	Water Service Authority
WTW	Water Treatment Works
WWTW	Wastewater Treatment Works
Y-o-Y	Year-Over-Year

1. Introduction

1.1 Project Context

South Africa is a water-stressed nation with increasing pressure on its national water resource system and a potential 17% water deficit forecast by 2030. A number of interventions have been initiated by national government to avoid this projected water deficit with a key element being the diversification of the “mix” of water supply sources. The South African National Water and Sanitation Master Plan (2018) makes a specific note of the need to reduce water demand and increase water supply through amongst others the “*re-use of effluent from wastewater treatment plants, water reclamation, as well as desalination and treated acid mine drainage*”.

At present, most effluent discharge and urban run-off are not reused and in light of The South African National Water and Sanitation Master Plan note, the opportunity to initiate a framework for the scaled development of water reuse infrastructure is evident. To this end, the Development Bank of Southern Africa (the ‘DBSA’) has partnered with various government departments (including the Department of Water and Sanitation (the ‘DWS’), the Department of Cooperative Governance (‘COGTA’) through its agency the Municipal Infrastructure Support Agency (‘MISA’), and the National Treasury for the development of a National Water Reuse Programme (‘WRP’ or ‘the Programme’). In addition, as an Accredited Entity (AE) of the Green Climate Fund (‘GCF’), the DBSA also submitted a proposal to the GCF to support the design and implementation of the WRP in South Africa. Noting the importance of water reuse to diversifying the ‘water mix’ in South Africa, and the challenges and barriers to entry that exist in the development of these water reuse projects at scale, the development of a focussed programme to address these challenges and ultimately implement pathfinder projects is critical to contributing towards building a more resilient water future.

Pegasys (Pty) Ltd, (the ‘Consultant’) was appointed in January 2021 by the DBSA for the provision of specialist consultancy services in respect of this programme design for the implementation of the WRP in addition to the preparation of a full-funding proposal to the Green Climate Fund (GCF) (the ‘Assignment’). This Financial Architecture deliverable is one of many deliverables as part of this consultancy, and wholly integrated with the other deliverables.

1.2 Purpose of the Financial Architecture

The urgent and **substantial infrastructure funding gap** in South Africa’s water sector, calls for alternate financing solutions. We believe an opportunity exists for municipalities to access a mix of different capital sources (referred to herein as “blended finance”), and especially tap into private capital sources in a meaningful way. Against this backdrop, the Consulting Team has been tasked to develop a Financial Architecture for Water Reuse projects in South Africa, that enables the creation of a new, investment-grade asset class.

We create a new asset class by: (a) clearly defining the investment value of water reuse infrastructure, and (b) creating the enabling institutional and financial environment, that supports taking the asset to market.

The five core objectives of the Financial Architecture of the WRP, are depicted in Figure 1-1, and all respond to the principal objective of a new, investment-grade asset class.

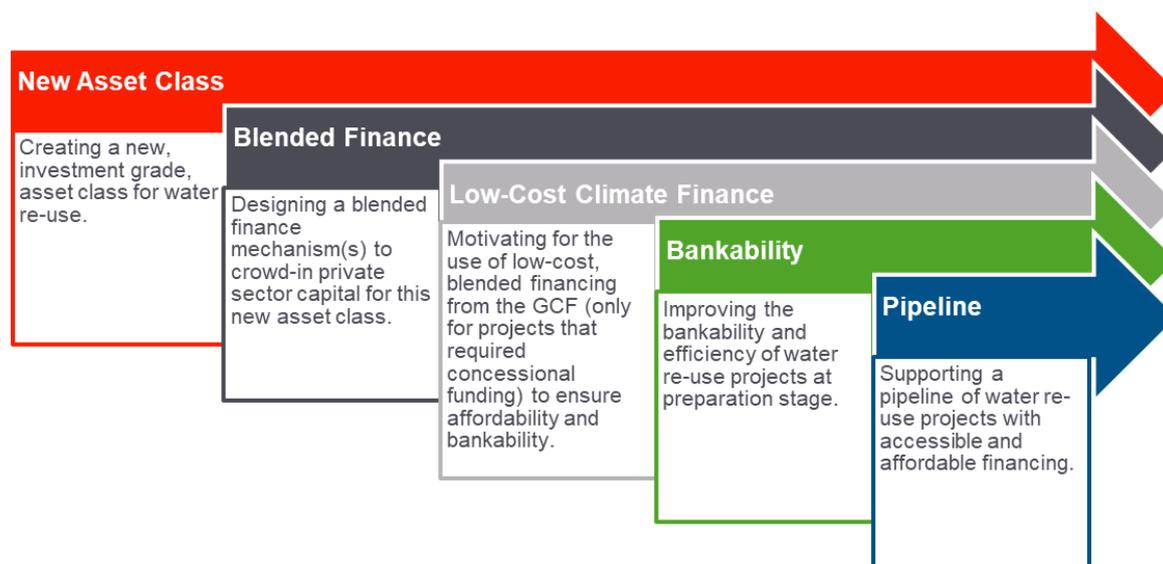


Figure 1-1. Core objectives of the WRP’s Financial Architecture.

Whilst the Financial Architecture does include the proposed financial structuring and fund flows, it has other critical, and related functions. Firstly, it outlines the WRP’s **implementation arrangements** highlighting governance, contractual and legal arrangement. The Financial Architecture is wholly premised on these arrangements, which is why they are included upfront in this report. Secondly, the programme’s financial structure is justified with the support of a financial and economic assessment which emphasises, among other things, the **validity of the GCF funding request**. The Consulting Team has produced a Programme Financial Model, which seeks to demonstrate the financial efficacy of the programme, to numerous key parties, not the least being the GCF. Finally, this report articulates how the financial architecture of the WRP has been designed to be **effective, efficient and support the ultimate objectives of the programme**.

1.3 Structure of the Report

The Financial Architecture report is structured as follows:

- **Section 2: Financial Arrangements**, describing the proposal to finance the WRP’s underlying water reuse projects, using a Blended Finance solution.
- **Section 3: GCF Funding Justification**, justifying the GCF Funding Request, including the WRP’s choice of financial instruments, risk allocation, the approach to articulating the financial and economic case in the full funding proposal, as well as how the financial architecture supports efficiency and effectiveness of the WRP).
- **Annex A: Key Financial & Economic Assumptions**
- **Annex B: Programme Financial Model Outputs**

2. Financial Arrangements

This section describes the key tenets, structures and arrangements of the WRP's Financial Architecture. It begins with an outline of the objectives and principles that underpin the development of the Financial Architecture – elements such as programme costs and the blended finance solution, and the GCF capital. Thereafter, it presents the proposed fund flow regimes.

2.1 Overarching Objectives & Principles

The objectives and/or principles that underpin the development of the WRP's Financial Architecture are as follows:

- i. **Phased Approach:** The design and establishment of the WRP will be premised on a phased approach, whereby, during the first 3 years of establishment, the DBSA will be the Implementing Agent, and the WRP's Core Costs will likely be covered by grants via the National Treasury and the GCF. However, over the medium-term, the WRP's Core Costs will be covered through a repayment mechanism as part of the financing of project implementation.
- ii. **Blended Finance Solution:** It is intended that the WRP will have a Blended Finance solution, which will make use of: (a) pooled programmatic capital; (b) private capital through different instruments; and (c) credit enhancement instruments from Development Finance Institutions (DFIs) and others.
- iii. **Project Financing Approach:** Project financing will be supported by the Blended Finance Solution (BFS) on a project-by-project basis. Cross subsidising the financing of a project, using the capital, income and/or any other proceeds from another project in the WRP's portfolio, will not be possible. There may be the prospect of pooling instruments (individual projects bonds) once the programme becomes more mature.
- iv. **Programmatic Development Capital:** Pooled programmatic capital will be applied by the Blended Finance Solution in a way that supports the affordability and long-term financial sustainability of the project to the project owner and/or sponsor (municipality). The Water Partnerships Office (WPO) will apply a pre-determined and OC approved capital allocation protocol to determine the concessionality of finance needed for each project, individually, to ensure the long-term financial sustainability of the Blended Finance Solution.
- v. **Co-Funding Commitments:** DBSA, in its role as the Accredited Entity, will not commit co-funding to the programmatic development capital tranche of the BFS. Instead, it will look to provide credit enhancement (subordinated debt and/or tenor extension) in a market-competitive way and assess the magnitude of its contribution on a project-by-project basis. In so doing, the DBSA will seek to support the leveraging of private sector capital, by using subordinated debt as a credit enhancement mechanism.
- vi. **Private Capital:** Private capital will flow through different instruments, which will require setup in advance of the WRP launching, and agree to the overarching objectives of the WRP, its WPO
- vii. WPO and the Blended Finance solution.

2.2 Overview of Programme Costs

The WRP will include a portfolio of projects, wherein it is assumed that:

1. **Core Costs** are the WPO's staffing and office costs, which represent the backbone of the WPO. These costs need to be covered whether project preparation or implementation is being undertaken, or not. These costs are usually covered through grants by national government organs, DFI and/or bi- and multi-national development banks, so they can claim significant leverage of the capital for implementation. However, over the long-term, it is preferable to cover these costs by capitalising them as part of the implementation costs.
2. **Project Preparation & Transactional Advisor Costs** will initially be borne by the WRP and Municipalities, through grants and reimbursable grants from the WRP, DFIs and other providers of project preparation funding, and/or capital allocation budgets from participating municipalities. The GCF may provide grant funding to contribute to these costs, via the WRP.
3. **Implementation Costs** comprise two separate kind of costs, namely capital and operating (O&M) costs. Each of these is noted below. Importantly, depending on the delivery model used (PPP, Municipal Service Level Agreement (SLA), etc.) these costs will be covered in different ways. In the case of a typical PPP project finance approach, the capex and opex will likely be covered by the water consumption tariff.
 - a. **Capital Costs ("Capex")** will be arranged on a project-by-project basis, through a Blended Finance solution. The primary source of repayment will be the tariff (or user charge per kL) that is agreed by the off-takers.
 - b. **Operating & Maintenance Costs ("Opex")**, including financing costs, will be borne by the project owner through the life of the project. Ideally, the user charge (tariff) should be fully cost reflective. The standard of treated effluent quality that the advanced treatment plant (ATP) receives from the municipality's WWTW, is a critical risk factor for the ongoing financial viability of projects.

Therefore, the costs of the WRP, to administer, operate and implement its objectives are depicted in Figure 2-1.

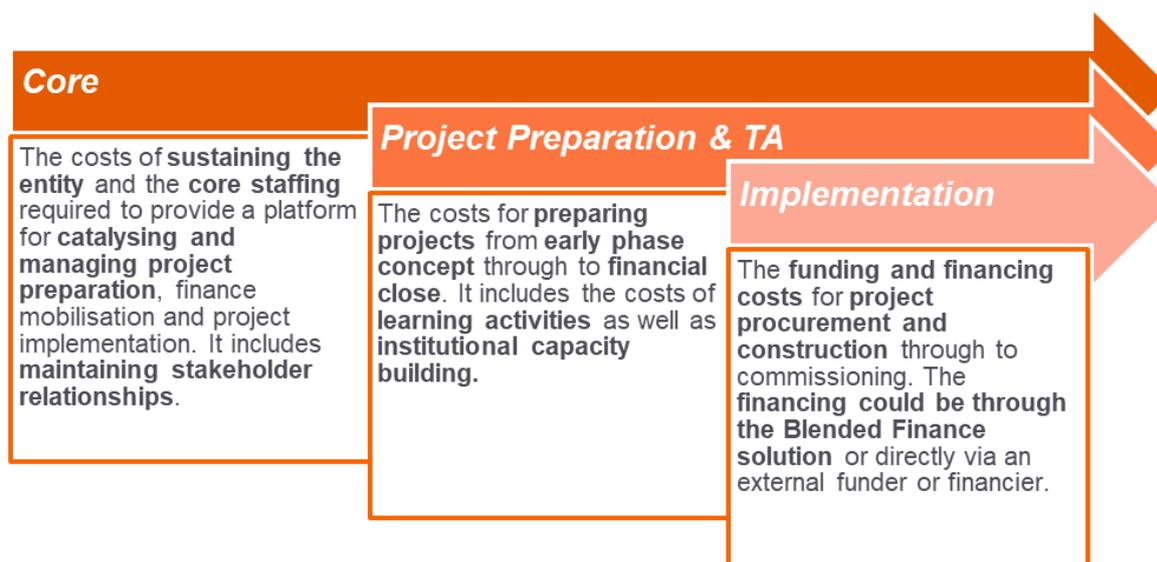


Figure 2-1. Expected costs to administer, operate and implement the WRP objectives.

These costs are presented in more detail in Section 4.

2.3 Blended Finance Approach

A **Blended Finance Solution (BFS)** will be established with the following key objectives:

- a) Primarily cover **Capex**, and make use of a range of capital, especially **low-cost, climate finance** and private debt.
- b) Support the use of **different project financing instruments**.
- c) **Take Water Reuse Projects to market**, by enabling the participation of private sector capital (equity and debt), securitise the underlying assets, to create a new asset class.
- d) The **solution will support any water reuse project nationally**, even if the project was prepared and/or established independently of the Programme, provided the project meets the GCF Investment Criteria, and the criteria laid out by the Implementing Agent (DBSA).
- e) The solution's legal form requires collaboration with other initiatives, to ensure complementarity and coherence, for example:
 - i. It could be established as a separate embedded facility or separate entity; or
 - ii. It could be established within or alongside other key national infrastructure delivery facilities, such as the Climate Finance Facility, Embedded Generation Investment Programme, and/or Infrastructure Fund.

2.4 Financial Instruments Selection Rationale

When considering financing for water reuse projects, a key step is understanding who is providing the capital, what is expected in return, and how capital flows in these transactions. Often, financial instruments are discussed without differentiating them from de-risking instruments that provide credit enhancement, or the structuring approaches and funding model used to repay capital providers. The result is a lack of shared

understanding (financial literacy) that undermines efforts to engage private capital providers in particular. The key concepts support a clearer understanding of what finance instruments are, and how they can be used. The WRP’s ambition is to significant private capital investment through the promotion of blended finance, which is agnostic of the types of financial instruments. It is helpful to understand these concepts as elements of approaches to mobilise capital for water reuse projects and related activities.

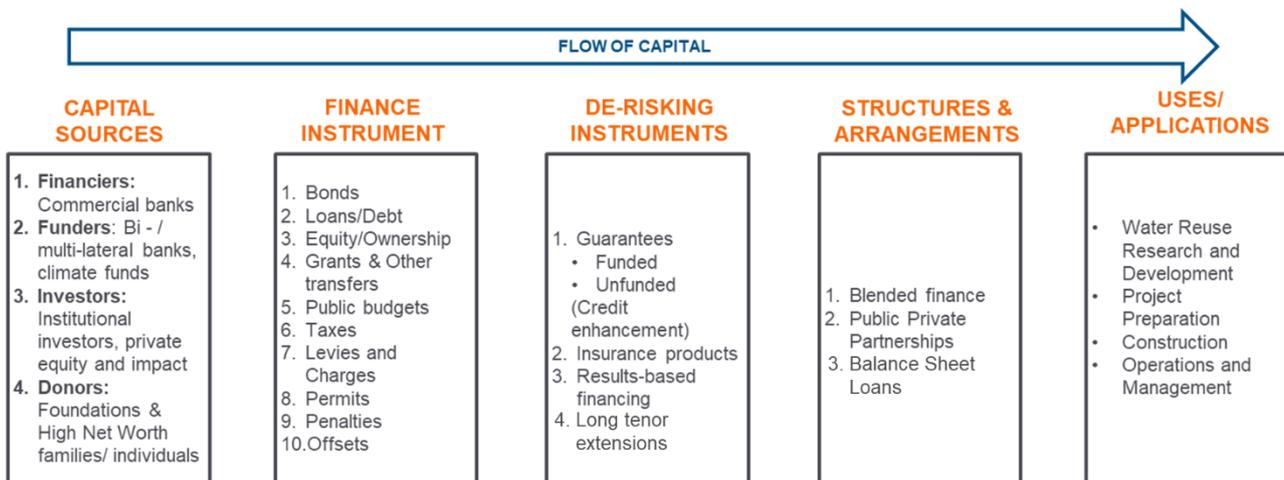


Figure 2-2 Key concepts to understand finance instruments for water reuse

Illustrating the key concepts along the flow of capital is helpful to outline how the WRP has approached mobilising additional capital for water reuse. The diagram outlines the approach taken for the WRP, starting with an understanding of the capital source, then identifying appropriate finance mechanisms that source might deploy, the instruments that assist with risk management and credit enhancement, overall structuring and arrangement of financing, to ensure applicability to the ultimate use or application which requires finance.

Importantly, different types of capital, from different sources, can be combined to create scale, reduce risk and direct funding toward water reuse. This practice is commonly referred to as blended finance. The WRP will use blended finance as a means of unlocking greater amounts of capital for water reuse projects that require it but are deemed too risky for any one capital provider to finance the project on their own. The WRP’s key objective of the blended finance solution designed is to ensure the financial sustainability of individual water reuse projects by creatively blending types of capital and making use of a range of different project financing instruments.

There are few water reuse projects in South Africa, and these have not typically attracted significant private sector capital. In order to manage these challenges, blended finance allows for non-return-seeking and concessional capital (which is more affordable) to be used alongside return-seeking capital. Blended finance structures help to reduce the cost of borrowing on a project level and these lower financing costs (and potentially longer tenors) may help in the facilitation of tariffs that are more attractive and affordable to end-customers, thus enhancing project bankability.

Blending capital can happen vertically (using multiple types of capital for a single project, at a fixed point in time) or horizontally (spread through time) depending on the needs of a project. For example, where an investment requires a lot of upfront capital with limited potential for returns to be sustainable (as is the case for many fishery investments), spreading capital horizontally, with philanthropic, public or concessional capital used upfront, can attract more commercial capital towards the tail end of the project, where revenue-generating activities that are dependent on a sustainable foundation can take place. The different types of capital blended together in a single structure is often referred to as the ‘capital stack’ and includes guarantee facilities, commercial and concessional debt, and equity in various arrangements. The position of each type of capital in the capital stack normally responds to the appropriate risk and repayment position determined by the capital provider’s appetite and willingness. Figure 2-3 illustrates a subset of possible blending options to demonstrate how the capital stack can be arranged to realise different outcomes regarding *inter alia* repayment and risk.

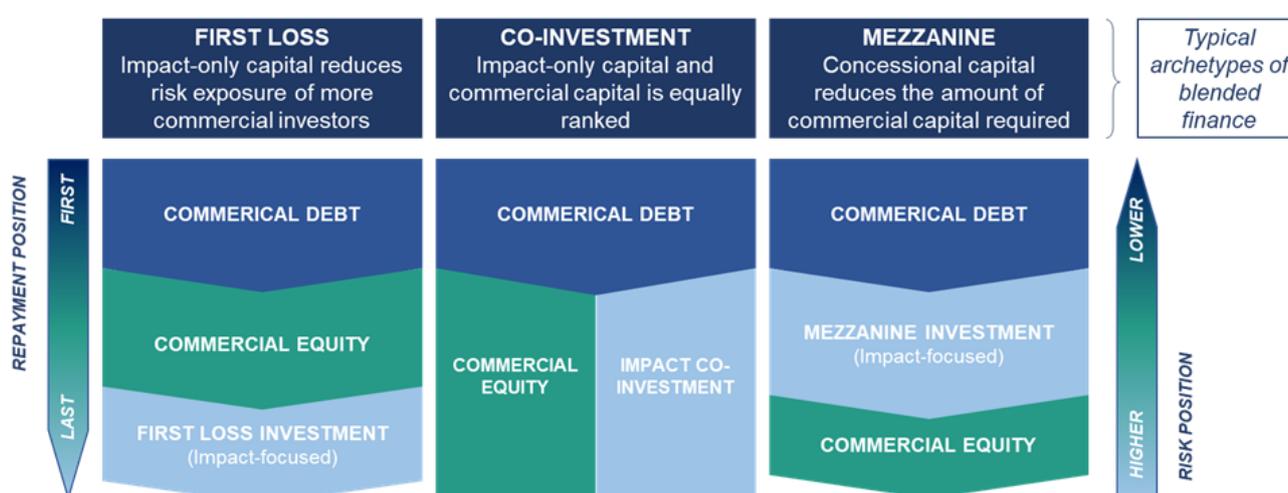


Figure 2-3 Typical blended finance arrangements (Friends of Ocean Action, 2020)

By blending the GCF funding with private investor funding, the WPO will enable private funders and municipalities to lower their risk exposure on a project-by-project basis. Increased participation from the private sector in this newly created asset class would, over time, allow for private sector support to be sustainable without continued GCF participation. However, GCF funding is critical to initially mobilise the Programme and create the new asset class for future participation by the private sector. The finance instruments being used in the WRP are described in Table 2-1.

Table 2-1 Financing Instruments to be used in WRP

Financing Instrument	Description
1. Equity	Private Equity investments also involve a capital contribution in exchange for ownership. Capital is provided upfront with the expectation of a share in the revenue and profit generated. There is also usually the expectation that the project will develop profitable margins, stable cash flow, and will be able to service a significant amount of debt.
2. Senior Debt - Commercial Term Loan (Nominal)	A senior commercial term loan is categorised as commercial when it comes from a commercial bank or investor that only accepts higher interest rates (usually market rate + 1 - 3%)
3. Senior Debt - Inflation-linked Term Loan	Another instrument in the senior debt level, provided by institutions who link the terms of the loan to inflation rates.

4. Senior Debt - Concessional Term Loan	Concessional loans are characterised by interest rates below those available on the market or by longer repayment periods, or a combination of these.
5. Commercial Bond Facility	Bonds would be issued against the expected revenue of a particular project. The capital raised is used only for the project in question.
6. Subordinated Loan	Subordinated loans are also concessional loans, with loan providers having a lower repayment position than senior concessional loan providers.
7. GCF Concessional Loan	This concessional loan would be subordinated with a similar ranking to that of debt from development finance institutions (DFIs).

2.5 GCF Capital Parametrisation & Criteria

The DBSA and Consulting Team have worked in collaboration with a GCF team, to understand the likely parameters of GCF capital, including instruments, capital magnitudes, tranches, etc. Importantly, the GCF have consistently reiterated the importance of responding to the following two primary questions, to substantiate the need for GCF capital:

- **Climate Benefits:** How will GCF Capital be used to achieve climate benefits?
- **Additionality:** What is the likelihood of the WRP being established and implementing climate adaptation projects without the GCF Capital?

These two primary questions are addressed in the sections that follow, which have been structured to respond to numerous other key GCF capital considerations, such as efficiency and effectiveness.

The GCF team proposed that the Consulting Team pitch the Programme at around (US Dollar denominated) **USD 1 billion** (ZAR 15 billion), with GCF co-funding of around 25%. The idea is to indicate that this is the **first phase** of a much larger water reuse-infrastructure investment ambition, so there will likely be a bigger need in time. The GCF team also proposed that the WRP use the following GCF funding instruments in the Concept Note and Full Funding Proposal, with the proposed capital magnitude as follows, acknowledging that these values will be further discussed with the GCF:

- A grant of USD 35 million** – primarily intended for project preparation and capacity development.
- Concessional loan of USD 200 million** – primarily intended for capex.

Based on the guidance provided by the GCF team, the following table (Table 2-2), and the notes that are linked to it, have now been included in the GCF Concept Note.

Table 2-2. GCF Capital contributions proposed in GCF Concept Note.

Component/Output	Indicative cost (USD)	GCF financing		Co-financing		
		Amount (USD)	Financial Instrument	Amount (USD)	Financial Instrument	Name of Institutions
Component 1A: Core Costs^A (WPO)	2 mil	Nil	-	2 mil	Grant	SA National Treasury
Component 1B: Project Preparation & Transaction Advisory Costs^B	60 mil	30 mil	Grants	30 mil	Budget allocations, grants, and in-kind support	SA National Treasury, Other Participating Organisations (Municipalities, DFIs, etc.)

Component 2: Implementation Costs^C (Blended Finance Solution)	1.400 bil	Nil	-	200 mil	A. Equity	Private Development Partners
		Nil	-	650 mil	B. Senior Debt	Private Debt Capital Partners
		Nil	-	150 mil	C. Subordinated Debt	DBSA, DFI Partners
		200 mil	D. Concessional Loans	Nil	-	-
		Nil	-	150 mil	E. Budget Allocations, Grants	Participating Municipalities, SA Infrastructure Fund
		Nil	-	50 mil	Guarantee ^D	Public Development Corporation(s)
Component 3: Capacity Development and Information Communication Education Program^E	10 mil	5 mil	Grants	5 mil	F. Budget Allocations, Grants	Participating Municipalities, SA Infrastructure Fund
Indicative total cost (USD)	USD 1.472 bil	USD 235 million		USD 1,237 million		

Note A Component 1A – Core Costs: Costs represent the establishment and operational cost of the Water Reuse WPO, which are estimated at USD 2 mil, over the first 3 years of establishment. The SA National Treasury is covering these costs for the first 3 years, only; after which, the WPOs ongoing core costs for operations will be covered through the levying of a financial-close premium, which will be proportioned and capitalised as part of the implementation costs of each project.

Note B Component 1B – Project Preparation and Transaction Advisory (TA) Costs: The WPO's primary focus is the preparation of bankable water reuse projects. The proposed USD 30 mil Grant from the GCF will be allocated alongside USD 30 mil of capital from SA National Treasury, other participating organisations, to leverage USD 1 bil of private capital for the Programme. It is noted that the USD 30 mil Grant will be allocated to sub-projects and is aimed to be transferred for the account of the winning bidder, thus allowing for this facility to be replenished through the life of the Programme. There will therefore be reimbursable and non-reimbursable elements to this component.

Note C Component 2 – Implementation Costs: Costs will be covered by a Blended Finance solution comprising the following:

A. Equity of approx. USD 200 mil from private development partners (based on a D:E ratio of 75:25).

B. Senior Debt of approx. USD 650 mil from private debt capital partners such as commercial banks and institutional investors, currently representing 50% of the total implementation cost cover.

C. Subordinated Debt of approx. USD 150 mil from the DBSA and DFI Partners with the discrete purpose of enhancing the creditworthiness of individual projects.

D. Concessional Loans of approx. USD 200 mil from the GCF to target the gap financing requirements and ensure the financial viability of individual projects across the Programme.

E. Budget Allocations & Grants of approx. USD 150 mil from participating authorities and the SA Infrastructure Fund.

Note D Guarantee of approx. USD 50 mil by a national public development corporation (s) (subject to further legal review), does not form part of the direct Implementation Costs, but is used to enhance the creditworthiness of individual projects, to catalyse USD 650 mil Senior Debt from private debt capital partners.

Note E Capacity Development and Information Communication Education Program will be funded through an equal contribution by the GCF (through grants) and national budget allocations.

Furthermore, the WRP’s underlying projects need to demonstrate that they meet the GCF’s 6 investment criteria, as do potential funders, financiers and investors. A synthesis of the GCF Investment Criteria is included in Figure 2-4.



Figure 2-4 Synthesis of GCF Investment Criteria.

2.6 Project Finance Approach

To conceptualise the financing of numerous water reuse projects in a programme, the Consulting Team first conceptualised a standard project finance approach. Importantly, the standard approach hinges on the type of delivery model being applied for each project (see Section 3.4). Delivery models are wholly dependent on the asset owner or sponsor; however, in the absence of knowing these preferences, the Consulting Team developed a simplified project finance approach, depicted in Figure 2-5.

For the purposes of understanding an applicable project financing case across the indicative project portfolio, the Consulting Team used the uMhlathuze Water Reuse Project Model. The uMhlathuze model is a legitimate project in South Africa, at an advance stage of project preparation. Furthermore, for the purposes of the indicative portfolio of projects, the uMhlathuze model has been included as “Indicative Project A”.

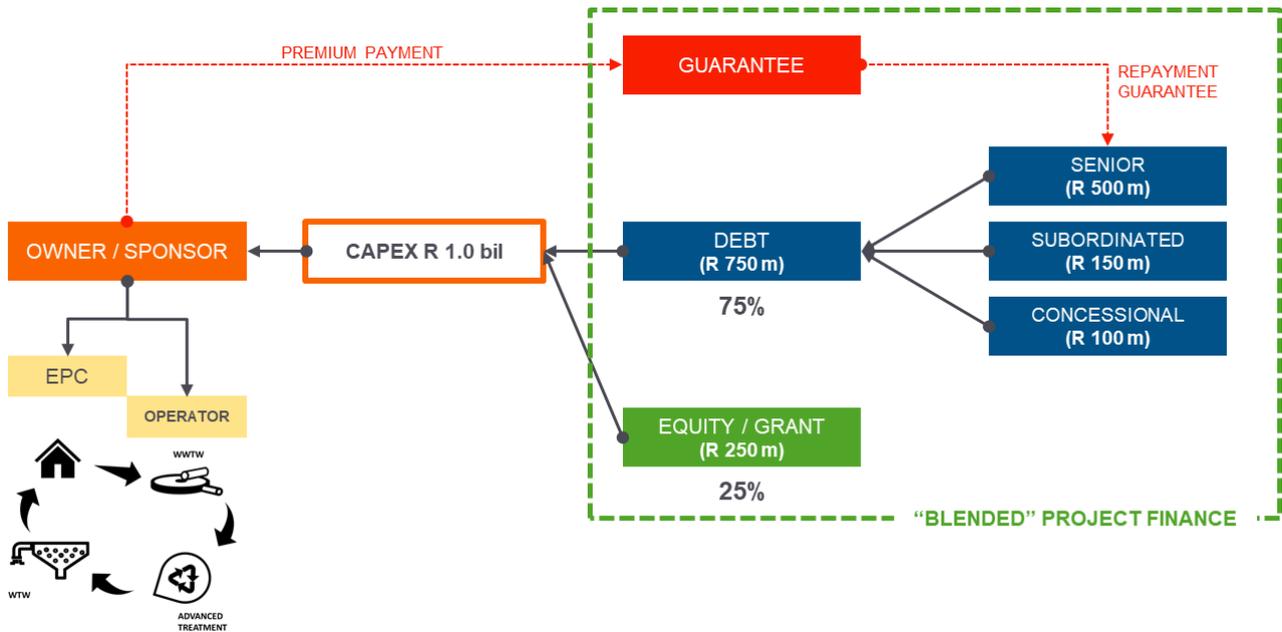


Figure 2-5. Simplified project finance approach.

The simplified approach has the following key features:

- i. **Ownership:** It is assumed that the ownership model will be either a local government authority (municipality) or special purpose vehicle (SPV) – the latter comprising municipalities, the private sector, and/or possibly a national government entity (depending on size). In both instances, it is assumed that municipalities will be meaningfully involved in the project, providing resources such as integrated planning approval, land, in-kind human resources, and possibly capital budgets. It is also assumed that the owner will be the primary revenue collector, on behalf of the project.
- ii. **EPC / Operator:** It is assumed that the construction and operations of the Water Reuse archetypes will be undertaken by the private sector. This can either be undertaken through contract with a municipality or the project SPV, which is dependent on the ownership structure of the project. The operations of the plant, against a strict performance specification, will be tantamount in securing private capital.
- iii. **Capex:** A capex value of R1 billion has been used to illustrate the splits between different capital sources. The simplified project financing approach assumes that the opex will be covered through revenue collection, via water consumption tariffs.
- iv. **Equity / Grant:** The Consulting Team needed to assume the split between debt and equity. The uMhlatuze Water Reuse Project Model assumed an 80/20 split; however, after desktop research and informal market soundings with private capital financiers, it was decided to increase the equity portion of the split, to use a 75/25 split. This assumption applies in the instance when the project owner is likely to be an SPV. However, when the project is wholly owned and delivered by a municipality, the Consulting Team has assumed that 25% of the Capex will be covered through a budgeted grant, in keeping with their integrated development planning. This ensures that the same split is applied in the simplified project finance approach.

- v. **Debt:** The debt components of the simplified project finance approach is where there is a significant opportunity to apply blended finance principles. The Consulting Team has made a distinction between three types of debt: (a) Senior, (b) Subordinated, and (c) Concessional. There are numerous different ways in which these can be applied, and it is not our intention to conflate the ranking of debt (senior vs subordinated) with its financial repayment expectations (commercial vs concessional). Instead, the Consulting Team is introducing a blending narrative, which demonstrates that significant senior debt can be leverage when one intentionally blends with subordinated and/or concessional debt. This is illustrated computationally in the Programme Financial Model.
- vi. **Guarantee:** A guarantee instrument to facilitate private sector investment into water reuse projects forms part of the financial structure of the WRP. Potential funders (including GCF, subject to further legal review) and guarantee providers are being approached to fund the guarantee instrument.
- vii. **Blended Project Finance:** The diagram illustrates that a blended finance approach can be achieved by using the various equity, debt and guarantee instruments. Importantly, the instruments are not mutually exclusive – their individual characterisation is wholly dependent on other instruments, i.e. bringing in subordinated debt will likely reduce the interest rate of senior, commercial debt, thereby increasing the amount of senior, commercial debt. This begs the question: which capital source and/or instrument should be prioritised? In responding to this, the Consulting Team understand that the DBSA are seeking to maximise private capital investment in the WRP, and the GCF want to ensure that the principle of least concessionality has been applied. Therefore, the senior, commercial debt is prioritised higher than all other debt types, and the Programme Financial Model has been designed to solve for a higher private capital split in each underlying project.

2.7 Blended Finance Solution

The Consulting Team have developed a Blended Finance Solution (BFS) concept in collaboration with the DBSA team, Nedbank & IFC teams, GCF team, and wider public sector stakeholder group in South Africa. The BFS has been designed with a sequential logic in mind, and is based on the simplified project finance approach presented in the preceding subsection. The proposed BFS concept is depicted in Figure 2-6, and described thereafter.

The BFS is not intended to be a standalone institutional fund or separate incorporated legal entity. Instead, it will be an unincorporated managed fund embedded in the WPO of the Water Programme. Therefore, it is not meant to house on-balance sheet capital; instead, it will facilitate the flow of numerous sources of capital, through their associated instruments, to the underlying water reuse projects. This will be done in conjunction with the standardised governance, implementation, procurement and communication approaches developed as part of the WRPs design. The facilitation of the flow of capital will be in accordance with a Blended Finance protocol, to ensure that the objectives of the DBSA and GCF, as well as the GCF Investment Criteria, are met.

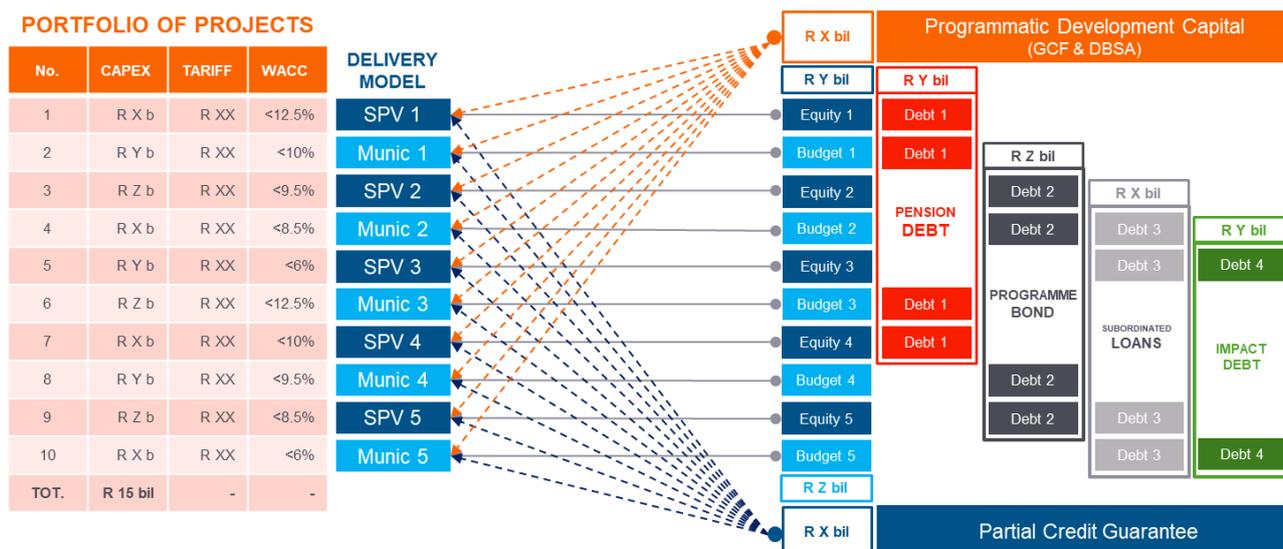


Figure 2-6. Proposed Blended Finance Solution (BFS) concept.

The BFS concept logic is sequential and runs as follows:

- i. **Portfolio of Projects:** The BFS is premised on the financing of a portfolio of water reuse projects. The development of the portfolio of projects was done on an indicative basis (see Market Study report), so as to provide high-level capex, opex, and water tariff assumptions for the Programme Financial Model. The Consulting Team have conceptualised the BFS responding to a portfolio of projects, alongside the other standardised elements of the WRP (governance, implementation, procurement, etc.) to respond to the need to streamline the financing of water reuse projects, and creating a new asset class (taking these assets to market).
- ii. **Delivery Models:** Two primary delivery models have been assumed for the BFS conceptualisation, which are presented in Section 3.4. The delivery models provide insight into the ownership, construction and operational aspects of each project, thereby providing a primer to the high-level capital stack of each project.
- iii. **Private Equity and/or Budgeted Grants:** It is assumed that, based on the selected delivery model, the initial capital investment into the project will be the owner's equity contribution (25% of project capex) or the municipalities' budgeted grant contribution (also 25% of project capex). Equity and grants are seen as the most junior of all capital sources in each project's capital stack. This is in and of itself a credit enhancement mechanism. A higher proportion of equity and/or grants with likely result in improved interest rates for the debt capital portion of the capital stack.
- iv. **Private Debt Capital:** A wide selection of private debt capital instruments were considered for the BFS concept, to test whether numerous instruments, from different debt capital sources, could be used in tandem, and alongside other capital sources and instruments, such as equity, grants, programmatic concessional capital, and/or a partial credit guarantee. The debt instruments are conventional loan mechanisms in addition to patient capital instruments and impact debt.

- v. **Programmatic Development Capital:** This capital predominantly comprises GCF concessional loans, DFI concessional loans and subordinated loans from DBSA. Pooled programmatic capital will be applied by the BFS solution in a way that supports the affordability and long-term financial sustainability of the project to the project owner and/or sponsor (municipality). The WPO (through its specialist service provider) will apply its discretion as to the concessionality of finance needed for each project, individually, to ensure the long-term financial sustainability of the Blended Finance solution.
- vi. **Partial Credit Guarantee:** A partial credit guarantee is being conceptualised in collaboration with the GCF team. The early concept is to make use of a “Funded” Guarantee to partially cover both liquidity and default risks, on the owner’s senior debt capital repayment. It is envisaged that the partial credit guarantee will meaningfully improve the senior debt capital contribution across the Programme, thereby reducing the GCF concessional loan contribution. This contributes to an important GCF principle of least concessionality.
- vii. **Blended Finance Solution (BFS):** Therefore, the full BFS comprises the following four primary capital stack components: (i) Equity and/or Budgeted Grants; (ii) Private Debt Capital; (iii) programmatic Development Capital; and (iv) a Partial Credit Guarantee. As noted above, the BFS is conceptualised as an unincorporated managed fund, meaning it will facilitate the flow of capital to the WRPs underlying projects, on a project-by-project basis.

2.8 Potential Programme Bond

One of the potential capital instruments displayed in the Blended Finance Solution is a Project Bond Programme. This subsection presents options and considerations for how a bond instrument might be used to support the WRP’s objectives.

In 2020, Nedbank Corporate and Investment Bank (CIB) developed considerations for a water reuse project bond programme to support a potential national water reuse programme initiative, in response to a formal request for proposal from DBSA. By exploring a potential project bond programme, the intention was two-fold: (a) enable a programmatic and streamlined approach to funding future water reuse projects at scale; and (b) to widen the pool of liquidity beyond that of commercial bank funding¹. A bond instrument can enable the funding of water reuse projects through issuance of rated or unrated debt instruments. Most institutional investor mandates require an investment grade rating (Long-term rating of BBB or higher). In order to achieve this rating requirement and to attract meaningful institutional funding, certain projects may require credit enhancement that could be provided through a blend of inter alia GCF and/or subordinated first loss funding in the capital structure of each water reuse project. Apart from appropriate subordination of the capital structure, the required rating would be achieved by setting appropriate terms and covenants in the project finance terms, including inter alia appropriate debt-service coverage ratios (DSCR), interest coverage ratios,

¹ Commercial bank funding is typically priced to ensure a return on Basel regulatory capital and as such more expensive for long term funding than the capital markets. Moreover, the most suitable form of funding would be long-tenor inflation linked funding which, generally is more expensive given the limited inflation linking hedging instruments in the interbank market, and as such, funding on an inflation linked basis at the outset directly with patient capital (Pension Funds) directly needs to be explored further.

reserve requirements as well as leverage ratios. Hence, one of the WRP's core objectives could be to create a new, investment-grade asset class (in time) within its overall blended finance structure at programme level.

Nedbank CIB proceeded by conceptualising and evaluating four different legal formats for a potential capital market bond programme. The purpose of these legal formats is to optimise time and cost efficiencies for numerous bond issues, i.e. on a project-by-project basis. They critically assessed whether each of the four different legal formats, as a central issuance platform, could help expedite the funding of water reuse projects. Importantly, the conceptualisation and evaluation of the different legal formats was done on the basis of several guiding assumptions, including, *inter alia*:

- i. The uMhlatuze Water Reuse project was assessed as a potential pilot water reuse project through the programme, with the desire to catalyse additional projects to access the programme;
- ii. Given the importance of achieving water offtake tariffs no higher than current rates for water, combined with the capex costs of constructing the programme, the uMhlatuze project faced specific funding challenges and a funding gap to ensure the offtake tariff met the required hurdle;
- iii. The uMhlatuze project is the first of its kind in that it was focused on corporate offtake of the water, meaning in financing terms, taking corporate credit risk as opposed to municipal risk which is reliant on direct/indirect government guarantees;
- iv. The costs of a water reuse project bond programme appear not to be punitive, with the most significant costs being a public credit rating and the placement fees².
- v. A credit support facility would be needed (perhaps made available by the GCF/DBSA and/or associated funders) for qualifying projects, because many projects may not lend themselves to bond funding if they are too small or too complex at the construction phase with a bond only being contemplated post completion.
- vi. However, we believe that there are institutional investors "patient capital from the Pension Sector" who would be prepared to take construction risk of projects through a capital market issuance platform, and the Bond programme, may, lend itself to finance projects on a pre-construction basis provided mitigates are incorporated and adhered to (credit strength of the off-taker, EPC, O&M accordingly).

Nedbank CIB considered four options for the creation of a bond funding platform, under a capital market master programme. All of the options have been tested in the South African debt capital markets for other asset classes (such as securitisation and loan repackage programmes) and can be applied to project bonds. The four options are:

- A. Master Programme with a single Issuer SPV used to fund multiple projects and municipalities;
- B. Master Programme with multiple Issuer SPV's each used to fund projects on a standalone basis;
- C. Master Programme with a single Issuer SPV structured on a serialised segregated basis where a single Issuer SPV is established to fund multiple projects on a ring-fenced basis; and
- D. Standalone programme where a new Issuer SPV is established to fund each separately and which framework can be replicated for different projects.

² These fees are incurred on a per issue basis and the costs of using one central issuance platform do offer some savings, but this is not significant in the long run.

It is Nedbank’s view that either Option C or D would be the best approach. Whereas Option A is a structure that would fund multiples projects through a Single bond instrument, the other 3 options set out legal constructs for issuance of single project risk. Option A is intended for the funding of a significant pool of project finance exposures (preferably post completion) through the issuance of a single project bond (akin to a securitisation). This was further supported by the Consulting Team during technical discussions with Nedbank, DBSA and the IFC, as the Blended Finance Solution was being developed. The structure and key considerations of Options C and D are briefly presented below, including its *pros* and *cons* as well as a recommendation in respect of the most optimal structure proposed by Nedbank.

Option C – Serialised Bond Programme

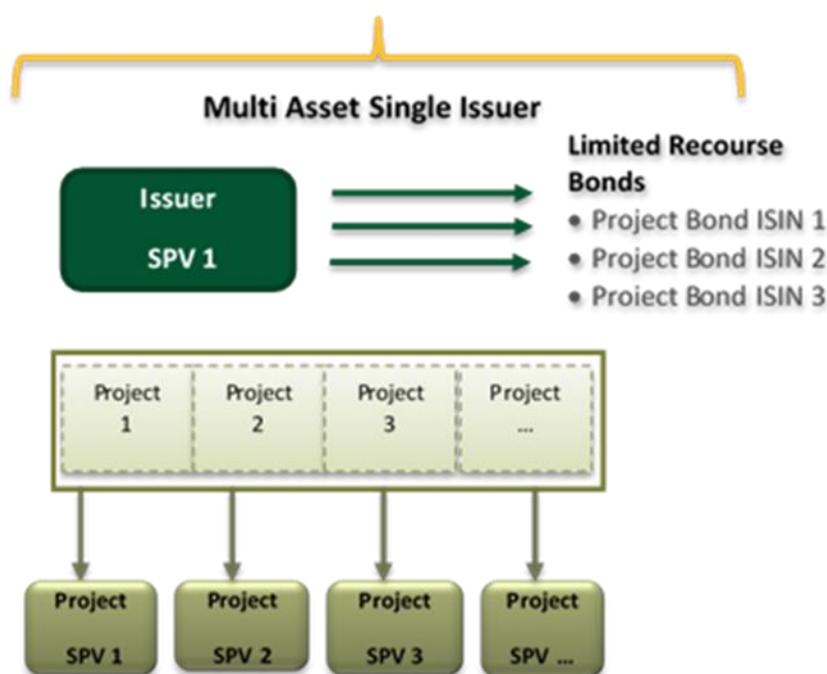


Figure 2-7. Option C - Segregated serialised programme with Single Issuer SPV (Nedbank CIB, 2020)

Key Considerations

With reference to Figure 2-7, this option is characterised as follows:

- A Single Issuer debt programme is established;
- A master Programme Memorandum (PM) with generic issuance terms and conditions is prepared and approved by the JSE upfront;
- A single Issuer SPV is established under the programme to raise funding for each project;
- Issuer Supplements to PM and pricing supplements are prepared and approved by the JSE per project;

- The individual transactions entered into by the Issuer SPV in respect of each project are segregated into ring-fenced series in terms of which note holders in a specific series have limited recourse to the assets in the that series only³; and
- DBSA and/or GCF credit enhancement can be provided at Project SPV or Issuer SPV level to uplift rating, depending on the blending of the capital structure on each project accordingly.

Pros

- A degree of legal cost savings due to the master PM, whereas deal specific issuance documents would still be required, the costs of which will be dependent on complexity and stakeholders at project level;
- There are likely to be corporate cost savings due to the use of a single Issuer SPV funding multiple projects;
- It is likely to meet investor preference to subscribe on a deal-by-deal basis and the bonds are matched to underlying project maturity profile; and
- There is typically consistency with regards to the issuance documentation.

Cons

- In Nedbank CIB’s experience, the transaction specific legal documents are not standard, resulting in additional time and cost to draft documentation for individual projects acceding to the programme not significantly cheaper.
- A potential cost efficiency could be, that with a single Issuer SPV there will be only one Board of Directors and set of Trustees of the Owner Trust and one audit.
- These costs are approximately R500k/yr as indicated in 2019) and given the large debt volumes per project and the long tenor, these costs are minimal in terms of impact on overall annualised cost of debt.
- Note, in our view, these costs exclude Debt Sponsor Costs, as well as Arranger Costs per the issuance of each note, as well as rating costs (if required).

Option D – Individual Bond Issues

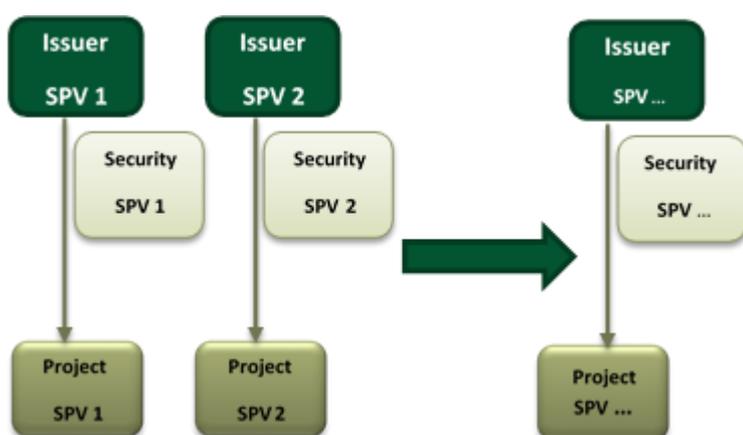


Figure 2-8. Option D – Individual bond issues through Single Issuer SPVs (Nedbank CIB, 2020).

³ This is achieved by either setting up a unique security SPV for each series or as seen more recently a single Security SPV for each Issuer and separate guarantees given for each specific series.

Key Considerations

With reference to Figure 2-8, this option is characterised as follows:

- Each projects is financed on a standalone basis, without a master programme memorandum (PM);
- A PM is prepared for each finance transaction through individual issuers⁴;
- Whilst it is possible for the project SPV to issue bonds directly, if an Issuer SPV is interposed it would result in the issuer being insolvency-remote, which bondholders prefer; and
- Even though these individual bond issuances are separate, they would be perceived as a programme, where the documentation used for issue number one could be utilised for successive projects⁵.

Pros

- Limited restrictions to having to meet the programme requirements.
- Terms and conditions relevant to each individual project and investor appetite.
- Good flexibility with regards to the engagement of capital arrangers and legal counsel.
- Credit enhancement can be tailored for the transactions specific credit risk.
- In Nedbank CIB's experience, the legal drafting can become more cost effective, because after numerous issues the market will copy templates that are widely accepted.

Cons

- There are unlikely to be corporate costs savings because a new Issuer and Security SPV is established for each project to segregate risk.
- Initially legal costs may be higher per issue. However, in the case of frequent issuers the PM or offering circulars are largely identical and legal costs are reduced once consistency and similarities are achieved.

2.9 Proposed Partial Credit Guarantee

Partial credit guarantees (PCG) are widely used internationally to assist in alleviating funding constraints faced the development of public infrastructure for climate resilience, specifically in environments where short to medium term liquidity risk is deemed to be significant, or there is concern around default risk. The nascent status of water reuse projects in South Africa means project owners have limited or no access to affordable, unsecured funding from banks to implement public sector projects. Delivering water reuse projects at a local and provincial level creates an added level of complexity and risk for funders who will look to the municipality/province to assess the risk of repayment.

The PCG conceptualised for the WRP will lower the risk to the lenders by substituting part of the risk of the project owner and public sector contracting party with that of the issuer of the PCG. The guarantee is envisaged to be for adverse market events only, during the operations period of the underlying projects; whereas construction risk will be covered by the sponsors as per the norms for transactions of this nature. In addition,

⁴ Nedbank CIB note that this is similar to a number of frequent securitisation issuers such as SA Home Loans (the Thekwini programme) and Blue Granite (Standard Bank's Residential Mortgage Backed Security programme).

⁵ Nedbank CIB note that individual issuers would likely replicate the first deal, and should the DBSA provide support to the bond holders (similar to the EIB Project Bond 2020 Initiative), the issues, although unique, would be perceived by the market as a DBSA programme.

the guarantee fund envisaged for the WRP also seeks to lower the risk to both the lender and project owner in respect of delayed payments by the public sector (short term liquidity risk). Lastly, the partial credit guarantee also substitutes a portion of the lender’s risk in the event of default.

Structure

It is envisaged that the guarantee will be a fully cash collateralized guarantee. The security of the PCG is provided to the senior debt issued via the blended finance solution. It will be administered and managed by the DBSA, and the DBSA will be the guarantor on record for each of the projects that require a guarantee. This will be determined on a project-by-project basis, as is also the case for finance from the Blended Finance Solution. The PCG’s cash collateral should only be reduced under one of the following adverse “events”:

- A liquidity event;
- A public sector default event; or
- A default event by the project owner.

Figure 2-9 illustrates a conceptual structure for the proposed PCG.

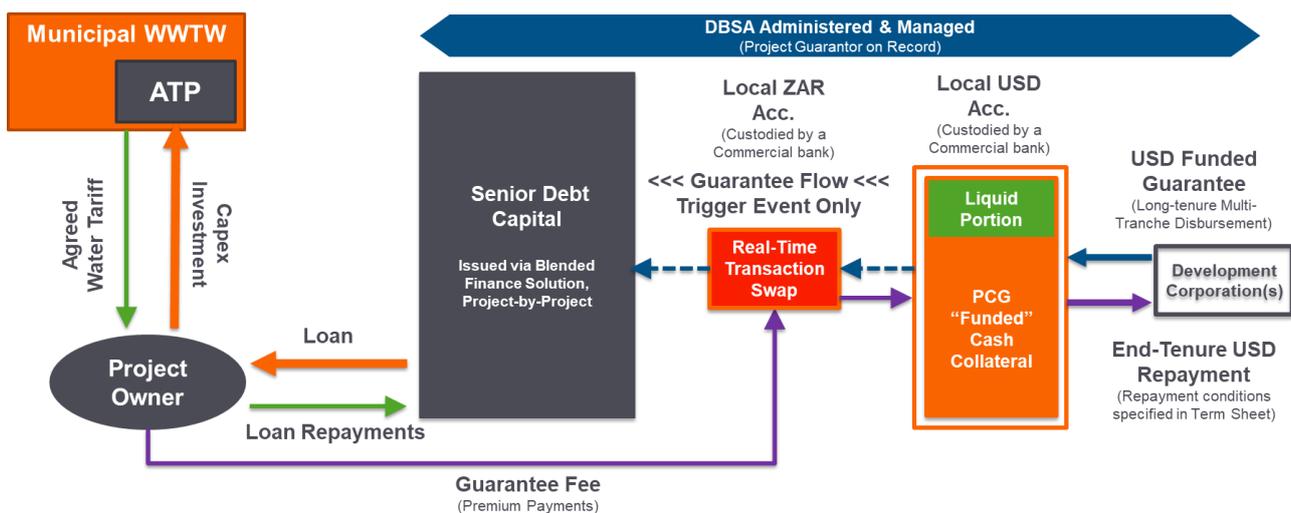


Figure 2-9 Proposed early partial credit guarantee concept

With reference to the PCG concept, the DBSA will open a separate USD account with a reputable commercial bank. The guarantee shall be cash collateralized and provided through a letter of credit from the selected commercial bank. Importantly, the DBSA will not provide a corporate guarantee as lenders may require that additional due diligence (DD) is conducted on the DBSA, which should be avoided to ensure the process is simpler. The cash collateral is supplied by a development corporation⁶, or GCF (subject to further legal review), according to pre-agreed tranches. The cash collateral is managed and administered by the DBSA, with the DBSA being listed as the guarantor on record, for each project that requests a guarantee. However, GCF takes the project risk; meaning the DBSA is not required to repay the collateral that is used in an adverse event (i.e.

⁶ The Accredited Entity would like to explore the guarantee funded by the GCF. This will need to be explored after the Programme becomes operational, to prevent the GCF funding application from being delayed.

if default occurs twice over the guarantee tenure of 20yrs, for a sum of USD 20 mil, the DBSA will not be required to repay).

DBSA will administer and manage the guarantee, and require a fee from the guarantee funder to do so. The selected commercial banks costs to custody the guarantee cash collateral will be included in DBSA's cost. The cash collateral will be held in USD until such time as it is required. When it is called upon, the portion that is called upon is swapped into ZAR and disbursed to according to the guarantee agreement at a project level.

Furthermore, it is envisaged that the guarantee fund will support project owners during a "liquidity event". The Liquid Portion is a small portion of the total cash collateral that is available to cover a "liquidity event". The liquidity event is when a municipality or other off-taker does not fulfil its tariff payment to the Project Owner on time, meaning the Project Owner cannot make his/her/their loan repayment on time. In this instance the liquid portion covers this monthly loan repayment and recovers this exact cost from the Project Owner when they can make payment.

The Liquid Portion is shown as distinct from the total cash collateral, because it needs to be available to be paid as soon as it is required (i.e within 48hrs). We anticipate that the cash collateral will be custodied in fixed income, notice deposit investment, as a default event typically takes many months to materialise. This is to ensure the cash collateral generates meaningful interest when it is not being called upon. The cash collateral should generate income over its tenure and provided that the returns earned on the collateral are positive in real terms, the fund's collateral should be protected against the erosive effect of inflation.

The guarantee will be treated like a reimbursable grant, with a long tenure (i.e. 20-years). Provided no trigger events take place, the full principal will be called upon by the development corporation(s), not adjusted for USD inflation. The guarantee repayment between DBSA and development corporation(s) will follow the follow logic: Guarantee principal repayment equals the original principal in USD (not adjusted for USD inflation), minus all trigger event disbursements, minus the administrative and management fees of the DBSA, minus the selected commercial bank's custodial fees (net of interest), plus all guarantee premium payments from Project Owners (ZAR swapped to USD at a spot rate on the transaction date). If there is a trigger event that requires the disbursement of the guarantees cash collateral for that specific project, then the commercial bank will make payment following instruction from DBSA. The DBSA would then step in to recover the amount from the relevant counterparty.

Adverse Events

The capital for the PCG will be exposed to a number of risks, including credit risk in respect of the project owner that is entering into a loan; credit risk of the municipality/province that will be contracting with the project owner; and liquidity risk in respect of temporary non-payment by a municipality or province.

Ideally the capital for the PCG should be managed to diversify its portfolio as much as possible by avoiding significant exposures to the following categories:

- A single municipality; and
- A single project owner.

The PCG will take on the following obligations in the event of a liquidity event or default.

Event	Description	Obligation of the PCG	Project Owner's obligation
Liquidity event	Payment from public sector entity to the project owner is overdue by a pre-agreed time (for example 60 days)	The DBSA can access the PCG meet capital and interest repayments until the municipality/ province resumes payments. The total aggregate payments will be capped at the value of the guarantee.	Project owner to reimburse capital and interest upon receipt of overdue payment(s) to the PCG account
Public sector default event	Payment from the public sector entity to the project owner becomes impossible.	The full amount guaranteed, minus any payments made in respect of a liquidity event, can be transferred from the PCG account to reduce the portfolio loan.	The project owner remains liable to repay outstanding debt and interest amount less amount transferred from the collateral account. The GCF takes credit risk on this portion.
Project Owner default event	The project owner fails to meet debt repayments in the absence of a liquidity event or public sector default event.	The full amount guaranteed can be transferred from collateral account to reduce the portfolio loan.	The project owner remains liable to repay outstanding debt and interest amount less amount transferred from the collateral account. The GCF takes credit risk on this portion.

2.10 Independent Blended Capital Facilitator (IBCF)

The proposed Blended Finance Solution (“BFS”) is designed to finance water reuse projects in a way that (a) optimises the use of climate finance, and (b) enhances the use of private capital, thereby taking this critical infrastructure to market.

It achieves this by blending numerous sources of capital and their underlying instruments, for each distinct project. Blending numerous sources of capital is not straightforward, given the multiplicity of conditions associated with each source. On the surface, blended finance is both a novel and attractive approach to financing infrastructure in South Africa; however, no truly like-for-like local examples exist to demonstrate how this might be achieved in practice. Furthermore, whilst it is being proposed that the financing of water reuse happens at a project-level, there needs to be protocols in place at the programme-level to ensure a consistent and standardised approach across all projects that interact with the Water Reuse Programme. This will underpin the Water Reuse Programme as a “centre of excellence” in terms of infrastructure finance solutions.

2.11.1 Guiding Principles

Therefore, the Consulting Team has considered specific activities and functions that would be required to facilitate the effective, efficient, and independent blending of numerous capital sources. Optimisation will be via economies of scale for process and efficiency, from standardised templates and documentation.

The Team defines the principles of such blending as follows:

- **The Principle of Effective Blending** has been developed to ensure that the way capital is blended achieves the Water Reuse Programme’s core objectives⁷. It is achieved by applying a clear and transparent set of rules that direct the unique “stacking of capital”⁸ for each project, that optimises the use of climate finance, enhances bankability to increase private capital, and supports the equitable use of financial resources for climate adaptation. This includes risk and return optimisation by tranche of funding and within the total package, i.e. bearing of risk by the party willing to bear it at the lowest cost.
- **The Principle of Efficient Blending** has been developed to ensure that the process of blending capital is streamlined and underpins the Water Reuse Programme’s long-term, financial sustainability. It is achieved by delivering on a protocol to timeously reach bankability and methodically create a unique capital stack per project. The blending is required to provide credit enhancement, per project, which supports, achieves and ultimately optimises the cost of finance, using concessional climate finance, to enable the Water Reuse Programme’s core objectives.
- **The Principle of Independent Blending** has been developed to ensure the unbiased blending of different capital sources and instruments. It is achieved through the application of a transparent and rules-based mandate, per project and per off-taker, which underpins the allocation decision of different capital sources and instruments in an objective manner, independent of all possible capital providers.

2.11.2 Proposed Role

In order to appropriate the abovementioned blended capital principles for the Water Reuse Programme, the Consulting Team is proposing the role of an IBCF. The IBCF is being proposed as a specialist service provider in the WPO, working alongside the Water Reuse Unit (WRU) and the Project Preparation Panel.

A key differentiating factor is the skill set underpinning the IBCF, which must encompass a deep understanding of the requirements of the full spectrum of capital providers. This includes the “patient capital sector”, defined as investor lenders, including pension funds, collective investment schemes, long-term insurers, etc. Historically, this is an untapped capital source in the private capital markets. Patient capital is different from lenders such as banks and non-bank financial institutions (NBFIs). Crowding in patient capital, structured correctly, will meet the objectives of the private investors and be aligned to achieve the Water Reuse Programme’s core objectives and the GCF Investment Criteria.

The proposed IBCF’s role and responsibilities, as well as its relationships with the organs and projects of the Water Reuse Programme and the Blended Finance Solution, is illustrated in Figure 2-10 and described in the numbered content that follows. To ensure clear segregation of responsibility, there will be separation and collaboration within the IBCF between the “alchemist” designing the stack and the “capital finders” who identify the various funding providers.

⁷ The Water Programme’s core objectives are related to climate adaptation, climate finance and project bankability.

⁸ In this report, a project’s capital stack refers to the arrangement of different sources of capital (including their magnitudes, instruments and repayment terms) in a way that covers the full implementation costs of the project (with or without project preparation costs).

- b. This includes the distinct prerequisites, conditions, and due diligences required from the WRP, to enable the sourcing of, determination of, and flow of different capital sources, across all three components of the BFS, to each WRU approved underlying project, namely: a) Private Sector Capital, (b) Credit Enhancement Instruments, and (c) allocation of the Programmatic Concessional Financing.
- c. Critically, it must include the requirements of the GCF Investment Criteria and be wholly compliant with the Mandate as developed by the Water Reuse Programme and Blended Finance Solution.
- d. The **IBCF mandate**, and the usage of the climate finance element of the BFS is what sets the Water Reuse Programme apart from other local infrastructure technical assistance facilities, and is therefore an element that the **IBCF will** invest significant intellectual capacity in developing.
- e. The **IBCF will** develop the framework and documentation to solicit all possible capital sources and instruments, in a transparent way.
- f. The **IBCF will** undertake this solicitation process on a bi-annual basis to: (a) assess the appetite of different capital providers, and (b) understand the prerequisites, conditions and repayment conditions for different capital providers and instruments.
- g. The **IBCF will** evaluate all respondents against their ability to meet the Mandate as developed by the Water Reuse Programme and Blended Finance Solution, as well as the GCF Investment Criteria.
- h. Following this evaluation process, the **IBCF will** pre-approve capital providers and instruments across all three components of the BFS, over a bi-annual period.

4. Water Reuse Unit

- a. The **IBCF will** advise the WRU's Technical Implementing Agent(s) ("WRUTIA") of the prerequisites, conditions and due diligences required that will enable optimal usage across all capital sources to enable project bankability. This advisory needs to take place at a programme-level, in advance of the Programme assisting any one project.
- b. The **IBCF will** agree with the WRUTIA the standardised bankability checks and balances and associated technical due diligences required for the WRU to enable project-level respective terms of references ("ToRs") for each individual project seeking finance under the BFS. The purpose of this is to ensure all technical studies and assessments are aimed at improving the timeliness and quality of project bankability across all capital sources.
- c. The **IBCF will** develop a close working relationship with the WRUTIA to improve the Programme's ongoing project bankability.

5. Project Bankability Due Diligence

- a. Once project studies and assessments have been completed through a process facilitated and/or delivered by the WRUTIA, the **IBCF will** be the first stage gate to assess bankability.
- b. The **IBCF will** methodically screen projects against the prerequisites, conditions and due diligences for each of the capital source and instruments, that have been pre-approved as part of the BFS.

- c. Critically, the **IBCF will** also assess the project(s) against the predetermined GCF Investment Criteria, and the IBCF's Mandate.
- d. The **IBCF will** "graduate" projects if they pass the IBCF's bankability due diligence, and are then moved forward by the IBCF to determine their blended capital stack (see Steps 6, 7 and 8).
- e. If a project graduates, the **IBCF will** develop equity and debt terms.
- f. The **IBCF will** "demote" projects if they do not satisfactorily pass the bankability screening criteria. They are then sent back to the WRUTIA to revise their technical studies and/or assessments, accordingly.
- g. The **IBCF will** engage with funders, financiers and investors at an early stage, to ensure that they are *at idem* with the assessment.

6. Private Capital Solicitation

- a. For each bankable project, the **IBCF will** determine a capital magnitude "band" and general repayment terms (tenors, tails, etc.), which it will use to seek private capital sources and instruments, from the pool of pre-approved private capital providers.
- b. The **IBCF will** prepare the term sheet and project prospectus for lenders which shall include the following details, *inter alia*: the financial aspects of the project, its technical aspects and legal aspects. Lenders would require sight of a technical due diligence, legal due diligence and a financial due diligence. This key prospectus enables the respective credit assessments from the pool of pre-approved capital providers, which will streamline approval processes to allow for efficient disbursements into projects that meet the parties' respective due-diligence and investment criteria.
- c. The **IBCF will** solicit bids from the pool of pre-approved private capital providers, according to the "band" and general repayment terms.
- d. The **IBCF will** evaluate the private capital bids, and select the most optimum capital providers and instruments, using the Programme Financial Model. This will be an "interim" selection, and not be final until all other capital solicitation and application processes have been undertaken.
- e. The **IBCF will** facilitate the project and credit due diligence process as required by the capital providers to enable their respective "credit committee" approvals, for disbursement to each project.
- f. The **IBCF will** act as the intermediary between capital providers, the WRUTIA, WRU, WPO in respect of the BFS.
- g. It is envisaged that the **IBCF will** perform the function of mandated lead arranger (MLA), documentation agent and facility agent.

7. Credit Enhancement Application

- a. The **IBCF will** apply the credit enhancement instrument(s), such as a funded guarantee for liquidity and default risk, to improve the finance terms of the pre-selected private capital providers. Whilst the idea will be to identify numerous capital sources, including patient capital, thought will be given to possible sources of liquidity, but clearly not intending to create daily

liquidity. The terms of the instruments used must allow for full transferability without the requirement of consent – this will create liquidity in the underlying instruments, i.e. ensure that it is transferable. More important is ensuring there is a suitable valuation protocol for the marking to market of third-party funds.

- b. The **IBCF will** further negotiate with the pre-selected private capital on their terms following the application of the credit enhancement instrument(s).
- c. The **IBCF will** conclude on the appropriate type and magnitude of credit enhancement required, per project, which supports the optimum finance terms of the pre-selected private capital providers. The credit enhancement selected, as well as the pre-selected private capital providers, will remain “interim” until the programmatic concessional capital has been applied, and the project owner has approved a blended capital stack.
- d. The **IBCF will** then determine a funding gap “band” that will be used to determine the application of programmatic concessional capital to a project’s blended capital stack.

8. Programmatic Concessional Capital Application

- a. The **IBCF will** assess the pre-selected sources of programmatic capital (incl. GCF capital) against the funding gap “band”.
- b. The **IBCF will** apply programmatic concessional capital to the project, using the Programme Financial Model, and negotiate changes to finance terms with the pre-selected private capital providers. Changes are likely to arise, because the programmatic concessional capital is subordinated debt, which will improve the finance terms of the pre-selected private capital providers.
- c. The **IBCF will** use the Programme Financial Model to ensure that the GCF concessional capital (“climate finance”) is being utilised effectively across the programme, i.e. it is not being under- or over-utilised, which could threaten the Water Programme’s financial sustainability.

9. Blended Capital Stacking

- a. Once the solicitation and application of all capital sources and instruments has been undertaken, the **IBCF will** launch an iterative process, to determine the optimum blended capital stack for the project. This will of course be undertaken alongside the project owner.
- b. The **IBCF will** use the project owner’s detailed project financial model and apply the pre-selected capital sources, across all three components of the BFS.
- c. Once the project owner is comfortable with the blended capital stack, the **IBCF will** engage all pre-selected capital providers, to determine if they are comfortable with the project owner’s preferred blended capital stack.
- d. If all counterparties are agreeable to the blended capital stack, the **IBCF will** draft the final term sheet, as an in-principle agreement, to be signed by all capital providers and the project owner. The Term Sheet will be a standardised template, which the **IBCF will** prepare in advance of project-related negotiation, at the programme-level.
- e. Finally, the **IBCF will** oversee the drafting of contracts between the respective counterparties to reach financial close.

10. Impact, Reporting & Auditing

- a. The **IBCF will** create an Impact & ESG Framework with a two-fold purpose: (a) to measure key impact metrics that may be attractive to a wide array of private capital providers; and (b) to help funders, financiers and investors integrate ESG factors into their portfolios.
- b. The **IBCF will** coordinate the continual measurement, verification and reporting of Impact Metrics, against the Impact & ESG Framework, with the support of the WRU and WPO.
- c. The **IBCF will** be responsible to report on all of its undertaking on a quarterly basis to the WPO, as well as provide an overview of the BFS's use, status and efficacy.
- d. In support of the WPO, the **IBCF will** prepare supporting documentation required for any third-party auditing required by the GCF, according to their timelines.

3. GCF Funding Justification

In response to the impacts of climate change on the water sector, only through the leveraging of GCF funding will the realisation of the WRP be achieved; enabling the scaled development of water reuse projects nationally and ultimately improving South Africa's resilience to water scarcity. GCF capital is catalytic for encouraging private sector participation and reducing risks to investors in water reuse projects in South Africa.

3.1 Principal Reasons for GCF funding

According to a study commissioned by Business Leadership South Africa, infrastructure investment in South Africa has fallen sharply over the past six years, from above 20% of GDP in 2015 to below 18% in 2019, from the National Development Plan's target of 30% of GDP. Further, although availability (and access) to local commercial funding for infrastructure project development is present, the focus of continued investment has been primarily on renewable energy projects in South Africa through the success of the REIPP Programme. Outside of that Programme, the development of bankable projects, especially in the water and water reuse sector, has been challenging.

The development of this Programme is thus critical as it would allow the creation of a new asset class and allow for the diversification and augmentation of South Africa's water mix. In response to the impacts of climate change on the water resources in South Africa, only through the leveraging of GCF funding will the realisation of the WRP be achieved; enabling the scaled development of water reuse projects nationally and ultimately improving South Africa's resilience.

It is noted that although GCF funding will be specifically considered on a project-by-project basis within the larger programme context, the funding from the GCF will only be applied to projects within the Programme that are a) able to demonstrate a material contribution towards the achievement of climate benefits through their location (in a climate vulnerable area) or impact on specific climatic adaptation indicators. The quantum of GCF funding for the Programme will be managed by the AE on a project-by-project basis. Broadly, GCF funding will allow for three key enablers to be realised, namely:

- **Enabling a programmatic approach to water reuse implementation:** The establishment of a replicable programmatic approach to the development, finance and implementation of water reuse infrastructure in South Africa through:
 - the focused selection of climate beneficial water reuse projects at local government level;
 - the preparation and structuring of such projects to bankability;
 - a standardised contracting and procurement approach channelled through a centre of excellence, thus achieving cost efficiencies and reducing the time and cost required to take projects to market.

- **Enabling an environment that enhances access to more affordable finance:** In long term infrastructure financing, the cost of finance is amongst the biggest obstacles to capital formation. GCF funding (in its proposed form of concessional loans) for the Programme would allow for the overall cost of financing on a project level to be lowered, and these lower financing costs (and potentially longer tenors) may help in the facilitation of tariffs that are more attractive and affordable to end-customers, thus enhancing project bankability and sustainability.
- **Enabling an environment providing enhanced access to private capital:** By blending the GCF funding with private investor funding, the WRP will enable private funders and municipalities to lower their risk exposure on a project-by-project basis. Increased participation from the private sector in this newly created asset class would, over time, allow for private sector support to be sustainable without continued GCF participation. However, GCF funding is critical to initially mobilise the Programme and create the new asset class for future participation by the private sector.

3.1.1 Value Added for GCF Involvements

Although the resources requested from GCF are in the region of 30% of the initial total WRP implementation costs, they are expected to be catalytic in enabling a public perception shift in relation to water reuse and bringing about a transformation in the manner in which South Africa manages and utilizes its wastewater. While South Africa is currently classified as an upper middle-income country (World Bank, 2020), South Africa continues to face increasing levels of socio-economic pressures due to growing unemployment, political instability, and corruption.

As a result, South Africa's macroeconomic indicators have weakened (including the downgrading of national credit rating to sub-investment grade by major rating agencies), the fiscal deficit rose, and financing of programmes such as the WRP has become increasingly challenging for government. GDP growth, which averaged 3.5% percent during 2001 and 2010, has since fallen to an average of circa 1.5% between 2011 and 2019. With the unabated continuation of the COVID-19 pandemic, South Africa is likely to continue to face considerable economic pressure, reducing overall public finance available to support the planning and execution of climatic interventions such as the WRP. The investment by GCF to is thus viewed as being catalytic in the establishment of this Programme,

The proposed WRP is critical for enabling municipalities to better manage wastewater and for enabling the crowding-in of private finance to facilitate investments into water reuse infrastructure and increase water resilience in South Africa. Further, the Programme may include the incorporation of irrigation reuse and potentially ecosystem based approached, thus directly (positively) impacting on the agricultural sector of South Africa. The agriculture sector is of critical importance in South Africa, for its central role in food security, rural development and resilience creation.

South Africa also has a high proportion of urban and rural communities living in informal settlements that have limited access to clean water and basic sanitation services. Within these vulnerable communities, women and children are often most vulnerable to the impacts of climate change as they are often more reliant on access to natural resources that are required to support livelihoods. These communities are often also situated in areas that are exposed to hazards such as floods, which place both lives and livelihoods at extreme risk. The

request for financing to GCF is premised on the understanding that an increasing number of South Africans are vulnerable to reduced access to potable water as a result of climate change related aspects.

It is well noted that national governments, through the fiscus, have a critical role to play in supporting investment into climate adaptation programmes such as the WRP. However, traditionally, investments have been lacking in sectors such as the water and water reuse, as these sectors may be viewed as unprofitable, and are seen as 'a public good'. This lack of investment over time significantly contributes towards the funding gaps for such sectors despite national commitments and (apparent) private sector innovation. Thus, GCF funding, coupled with state action will play an extremely important role in catalysing private sector finance for the WRP, which will otherwise not be possible.

The AE is seeking to secure funding through grants and concessional loans from the GCF. Without GCF involvement to catalyse this Programme and enable co-funding, South Africa will be unable to undertake the adequate steps to help diversify its existing water supply sources, enhance water productivity, and enhance water access in the drier, more climate vulnerable South-Western regions of the country. GCF support for this WRP will enable additional investments that will allow the scaling up of other parallel existing efforts, contributing towards a stronger national water programmatic level intervention. GCF funding will also enable the wider participation and involvement from South Africa's relatively well-established private sector (through the debt capital markets), thus increasing collaboration between sectors and ultimately creating a new sustainable asset class for continued future investment.

3.2 Latent Demand from Local Private Capital

Existing capital pools in SA is a sign of buoyant market potential for infrastructure investing. Collectively, the deployment of private sector balance sheets is sized at over ZAR 20 trillion⁹. More than 80% of invested capital pools are concentrated with Banks (38%), Pension Funds (28,5%), and Life Insurers (17,5%). While the duration of assets held may vary, opportunities exist for this capital to find new assets as infrastructure projects come to market. Figure 3-1 shows the quantum of funding deployed per sub-sector in the financial services industry.

⁹ SAVCA, National Treasury and ASISA (2022)

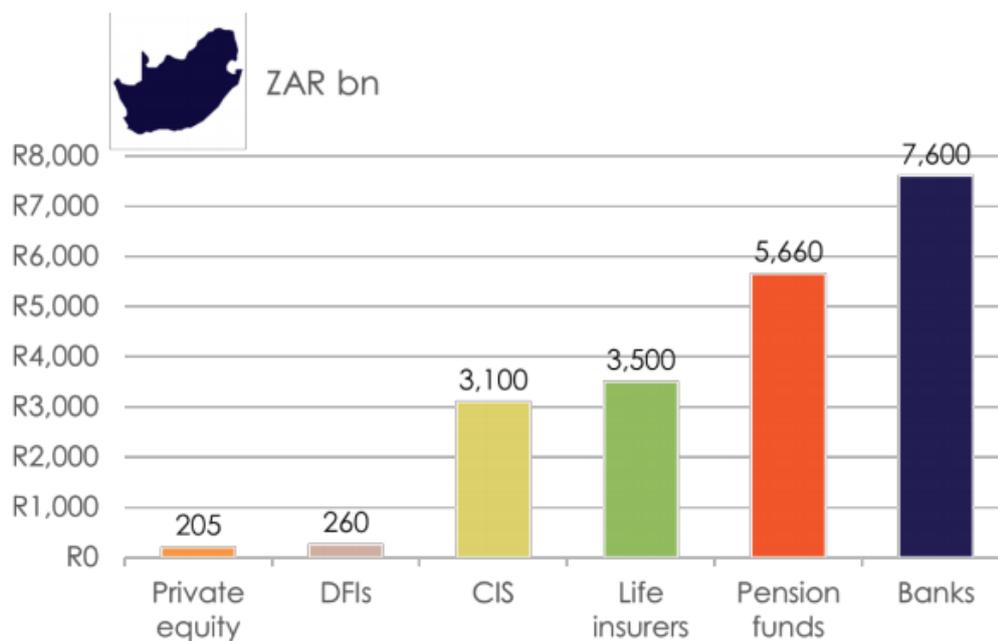


Figure 3-1. South African Funding Pools (Source: SAVCA, National Treasury, ASISA)

Blended finance in the form of concessionary funding with private sector finance will enhance government policy to increase investment into the water sector. This intervention is required at a time when climate change hazards impacting water quality and supply is undoubtedly worsening. According to the World Bank¹⁰, National Treasury (NT) of South Africa is in the process of reviewing municipal and national PPP frameworks to leverage greater public-private partnerships (PPPs). In its latest 2022 Budget Review¹¹, NT affirms financial commitments to projects in water, reinforcing policy aimed at increased levels of private sector participation. According to NT, the Medium-Term Estimates Framework (MTEF) investment in water over the next 3 years will surpass ZAR 131 billion. This funding will require substantial gearing from private sources and concessions if it is to maximise impact on the sector.

Water PPP projects in South Africa have struggled to attract investment from the private sector, as confirmed in Figure 3-2. The industry’s exposure to the sector is substantially lower when compared with other sectors. In future, the sector will require more early-stage project development support from DFIs to de-risk projects, paving the way for sound bankable assessments. This constraint is further compounded by the lack of concessional funding to bring down the Weighted Average Cost of Capital (WACC) on projects, making projects more economically viable.

¹⁰ World Bank Group Water. Term of Reference. South Africa: Country assessment for unconventional water resources and resource recovery from wastewater (2022)

¹¹ Budget 2022 Review, National Treasury (2022)

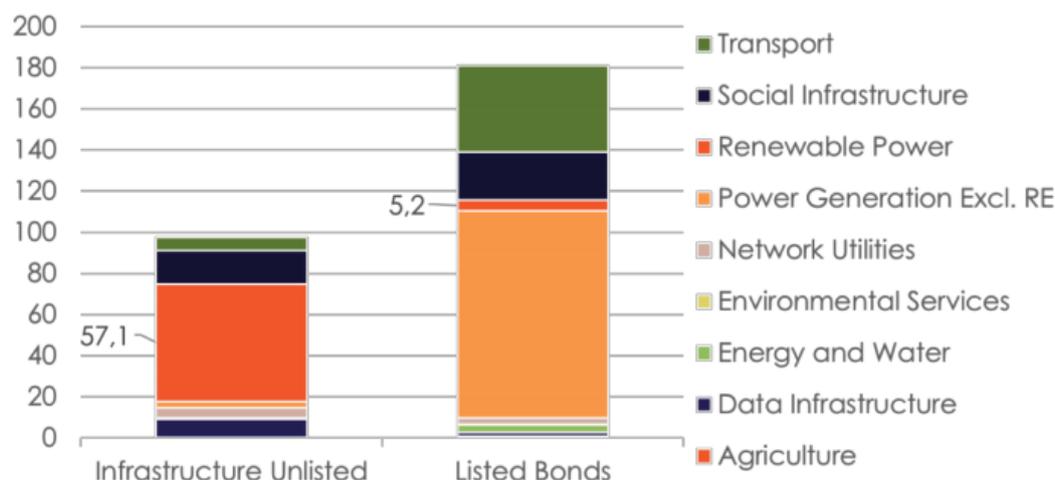


Figure 3-2. SA Private Sector Financial Exposures to Infrastructure Sectors (Source: ASISA, 2021).

In the case of the WRP’s proposed Blended Finance Solution, GCF concessionary funding will coexist with increased levels of private sector finance. Private financiers will be able to leverage increased exposures to climate change adaptation projects on the back of strong anchor investors, such as the GCF and DFIs. The economics of blending private capital with concessionary funding is a positive development towards boosting confidence and raising the profile of water projects amongst willing investors.

Through WRP, the Bank’s approach will be to plug funding gaps using GCF concessionary funding without crowding out the private sector. Lessons learnt from the Renewable Energy Independent Power Producer Programme (REIPPP) has demonstrated that infrastructure projects that overcome construction phase risk to achieve revenue generation from off-takers (commercial combined with fiscal support) are likely to be refinanced in both primary and secondary markets. Figure 3-3 illustrates the transition of typical infrastructure projects over the investment lifecycle. Thus, assets are likely to be taken off-balance sheet into green bonds and similar listed instruments, crowding in other institutional investors, hereby recycling capital for further use in other projects. Figure 3-4 provides a listing of recent green bonds issued by both the private and public sector in South Africa. Further introducing other instruments such as concessionary funding will create an ecosystem that is self-reinforcing, with new instruments and different sources of capital, creating opportunity where there is currently a market failure.

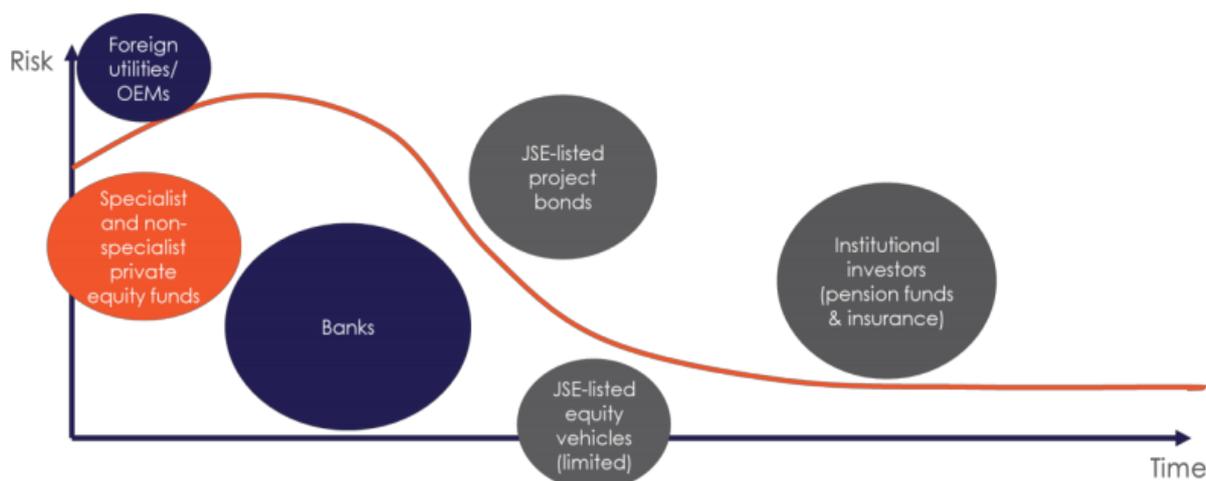


Figure 3-3. Infrastructure Investor Hierarchy (ASISA, 2021).

Date	Issuer	Instrument	Project	Value (ZAR)
2012	Industrial Development Corporation	Green bond	Clean energy infrastructure	5.00bn
2014	City of Johannesburg	Green bond	Biogas to Energy Project and the Solar Geyser Initiative	1.46bn
2017	City of Cape Town	Green bond	Various green projects, electric buses; energy efficiency in buildings; water resilience initiatives; sanitation treatment; and the coastal structure protection and rehabilitation	1.00bn
2017	Growthpoint	Green bond	Green buildings and green initiatives	1.10bn
2019	Nedbank	Green bond	Renewable energy	1.70bn
2022	Barloworld	Social (gender-linked) bond	Women empowerment goals, including reaching or exceeding 15% procurement spend on black women suppliers and reaching or exceeding 50% female representation in leadership by 2025	1.10bn
2022	Redefine Properties	Green bond	Improve environmental sustainability of eligible buildings in its portfolio	1.50bn
2022	Investec	Green bond	Renewable projects (477MW solar & wind)	1.00bn

Figure 3-4. SA Private Sector Financial Exposures to Infrastructure Sectors (ASISA, 2021).

Furthermore, on the regulatory front, recent developments in SA supporting further investment in infrastructure is encouraging. The market regulator has taken steps to increase investment in infrastructure. On 01 January 2023, pension funds will be able to invest 45% of Assets Under Management (AUM) into infrastructure. Water projects are expected to compete for this funding, as they are currently a significantly under-funded sector. Water infrastructure therefore requires a compelling investment thesis if it is to attract financing from the private sector. Water has been given elevated status in SA’s national policy framework, given that SA is a water scarce country, with amplified risks brought by climate change hazards. Demand for secondary market infrastructure assets is expected to increase, supporting the business case for further supply.

According to the World Bank, the Build Operate, Transfer (BOT) model is a preferred financing vehicle favoured by the private sector in the circular economy¹². As per the GCF Funding Proposal, we expect to see the use of SPV structures supporting this claim, as the Water Reuse Programme increases the supply of unconventional water projects in the market.

Overall, the private sector market in SA is well regulated with financial service providers requiring licenses and regulatory approval in order to legally operate. Capital markets possess the depth and track record to raise funding for infrastructure projects where risk-return parameters are justified. Policy changes in SA is showing support for a growing infrastructure investing market to come. The existing market has room for further expansion, but current size far outweighs the total capital requirement of the WRP.

3.3 GCF Concessionality for Overall Viability

For this WRP, GCF funding will be used only on projects within the Programme that are deemed to be ‘in need of GCF funding’ and in order to demonstrate this GCF additionality, an assessment on an initial project pipeline was conducted to assess whether such projects may be deemed to be bankable in the absence of proposed GCF funds.

In the absence of GCF grants, which forms only 30% of the total capital expenditure estimated for the Programme, 7 out of the proposed 10 initial projects were assessed to have target minimum senior debt DSCR of below 1.5x and were thus deemed to be ‘at risk’ for bankability. This not only impacts the financial viability of the individual projects but also the overall viability of the WRP. Hence, even with this initial high-level assessment, it can be seen that GCF funding brings additionality to establishing this Programme and water reuse as a new asset class.

The Government of South Africa through local implementing municipalities have little financial capacity to meet the initial costs of establishing a programme of this nature. GCF grant and reimbursable grant funding, in addition to the concessional loan portion of the requested GCF funding is necessary to overcome this combination of financial, technical, institutional and market barriers that together prevent climate-vulnerable locations in South Africa from adequately building resilience to increasing climate hazards. For example, these barriers include the inability of many regions in the south-western portions of South Africa to manage and sustain their water usage during increasingly more frequent drought periods (such as the droughts experienced in the Western Cape between 2016 and 2018).

3.4 Proposed Risk Allocation Structures

3.4.1 Context

In general, the risk allocation structure for sub-projects within the Programme and subsequently for the Programme itself will be determined by the specific delivery model chosen for the implementation of specific

¹² World Bank Group Water. Term of Reference. South Africa: Country assessment for unconventional water resources and resource recovery from wastewater (2022)

projects. A range of generic delivery models exist for the implementation of infrastructure projects (including water reuse projects) in South Africa. These can be summarised into five overarching delivery types:

1. The delivery of the project by a municipality;
2. The delivery of the project by a municipality with a support contract with a public sector operator such as a water board or public sector utility.
- 3. The delivery of the project by a municipality with a service level agreement (SLA) with a private sector operator;**
- 4. The delivery of the project by a municipality in partnership with a private sector operator via a Public-Private Partnership (PPP) procurement and contracting arrangement;** and
5. The undertaking of a water reuse project by the private sector with no direct relationship to the public sector.

In the context of municipal water reuse projects, the first project delivery type – where projects are developed, implemented and operated by the municipality – is being employed less frequently, as public sector in South Africa often lacks, amongst others, funding for the development and operation of new projects and or expertise and capacity during operations. However, in the case of funding being made available for project preparation and development, the second project delivery type may be employed – where the municipality develops the project, but contracts specialised and experienced private sector entities to operate the project, using SLAs between a municipality and that private sector service provider. In the second project type, it is possible for example for a water board to undertake a water reuse project. It would not be the “primary function” of the water board in terms of the Water Services Act, 1997 and so various approvals would be required including an agreement with the implementing municipality regulating the contractual arrangements.

PPP delivery models may be used, provided that the private sector entity is willing to take significant technical, financial and operational risk in designing, building, financing and operating the project. If the project is funded off-balance sheet, with project finance structures, the funders will require adequate risk flow-down and mitigation measures to ensure an acceptable project risk profile. Such approaches will require careful structuring of the project to ensure the securing of finance as well as the expected climate impact.

The design of the WRP envisions that water reuse projects will either be delivered by a WSA /municipality with a SLA with a private sector operator (delivery type 3 or through a public private partnership (delivery type 4).

The allocation of risk to each of the private and public sector in each delivery model type is primarily driven by the roles and responsibilities of each party in that specific delivery model type. The table below outlines the roles and responsibilities in the delivery of a water reuse project by a municipality with a SLA with a private sector operator or through a public-private-partnership.

Table 3-1 Roles and responsibilities across water reuse delivery model types

Delivery Model	Municipality with Private Sector Service Provider (SLA)	Public-Private Partnership (PPP)
Project Element		
Design	Public sector through local government assumes significant responsibility	Private sector assumes significant responsibility and financial risk
Construction		
Capex and initial Opex funding	Public sector through local government raises grants and debt	Private sector mobilises debt and equity. Local government may provide its share of funding and/or provides land. Private sector raises rest of funds
Employment of Grants	Public sector through local government may raise grants to make funding model more affordable	Public sector through local government may raise grants to make funding model more affordable
Operations and Maintenance	Public sector through local government	Private Sector
Sales and Marketing		

3.4.2 Risk Allocation in Water Reuse PPP's

Risk allocation is often not simply a function of whether a specified risk has occurred, but also why it has occurred. In general, if a party has itself brought about the occurrence of the risk, for example by failing to perform an obligation, that party should expect to have to bear the consequences of that failure. In other cases, the risk may arise because of an external event which the affected parties could not prevent. In those cases, risk allocation cannot be based on blame criteria. An important aspect of PPPs is an explicit arrangement for sharing of risks between parties involved. Many different techniques ranging from rule of thumb (based on past experiences) to sophisticated simulation models are available for the assessment of different risks in a project. In a typical PPP project, a risk matrix may be developed after assessing risks in quantitative and/or qualitative terms and are often based on the underlying PPP contracts that often include mechanisms to reward (or penalise) parties in terms of the achievement of their specific contractual obligations.

According to the United Nations ESCAP (Economic and Social Commission for Asia and the Pacific), an example of an indicative risk matrix (from the perspective of the government entity) is shown in the table overleaf. The risk matrix identifies the risks, their magnitudes and possible mitigation measures and serves as a useful tool for the purpose of sharing risks between the parties. **The general principle should be that project risks are allocated to the party that is the best equipped to manage them most cost effectively.** For example, political and regulatory risks are more appropriate to be managed by the public sector while construction and operating risks are inherently more suited to be managed by the private sector.

The allocation of commercial risks are generally more common to the private sector. However, in certain cases, a part of the commercial risks due to lower-than-expected demand for services produced by the project may be shared by the public sector. In such cases normally a provision is also set to share any excess revenue if the demand exceeds the expected level.

Table 3-2 Expected risks and mitigation options

Risk category	Description	Consequence	Mitigation	Preferred allocation
Interest rates pre-completion	The risk that prior to completion interests rates move adversely thereby undermining the bid pricing	Increased project cost	Interest rate hedging may occur including under Project Development Agreement	Government may assume or share
Sponsor Risk	Risk that the private party is unable to provide the required services or becomes insolvent or is later found to be an improper person for involvement in the provision of these services or financial demands on the private party or its sponsors exceed its or their financial capacity causing corporate failure.	Cessation of service to government and possible loss of investment for equity providers	Ensure project is financially remote from external financial liabilities, ensure adequacy of finances under loan facilities or sponsor commitments supported by performance guarantees; also through the use of non-financial evaluation criteria and due diligence on private parties (and their sponsors)	Government
Financing Unavailable	Risk that when debt and/or equity is required by the private party for the project it is not available then and in the amounts and on the conditions anticipated	No funding to progress or complete construction	Government requires all bids to have fully documented financial commitments with minimal and easily achievable conditionality	Private Party
Further Finance	Risk that by reason of a change in law, policy or other event additional funding is needed to rebuild, alter, re-equip etc. the facility which cannot be obtained by the private party	No funding available to complete further works required by government	Private party must assume best endeavours obligation to fund at agreed rate of return with option on government to pay by way of uplift in the services charge over the balance of the term or by a separate capital expenditure payment; government to satisfy itself as to likelihood of this need arising, its likely critically if it does arise, and as to financial capacity of private party to provide required funds and (if appropriate) budget allocation if government itself is required to fund it	Government takes the risk that private finance is unavailable
Change in Ownership	Risk that a change in ownership or control of private party results in a weakening in its financial standing or support or other detriment to the project	Government assurance of the financial robustness of the private party may be diminished and, depending on the type of project, probity and other non-financial risks may arise from a change in ownership or control, which may be unacceptable to government.	Government requirement for its consent prior to any change in control. (Private party will seek to limit this control to circumstances where substantive issues are of concern such as financial capacity and probity).	Government risk as to the adverse consequence of a change if it occurs; private party risk that its commercial objectives may be inhibited by a restrictive requirement for government consent to a change
Tax Changes	Risk that before or after completion the tax imposed on the private party, its assets, or on the project will change	Negative effect on the private party's financial returns and in extreme cases, it may undermine the financial structure of the project so that it cannot proceed in that form	Financial returns of the private party should be sufficient to withstand such change; with respect to specific infrastructure taxation particularly that relating to transactions with government, the private party should obtain a private tax ruling.	Private party

More specifically, a matrix of specific risks typically found in a water-related PPP transaction may include the risks listed below. Of particular importance, in addition to the identification and recognition of these risks, is the structuring of the specific sub-projects to best allocate these risks through the selection of the most appropriate specific delivery model, the development of appropriate performance and output specifications through the underlying contractual documents and the execution of these documents to the satisfaction of all parties involved.

- **LAND AVAILABILITY, ACCESS AND SITE RISK:** The risk associated with selecting land suitable for the project; providing it with good title and free of encumbrances; addressing indigenous rights; obtaining necessary planning approvals; providing access to the site; site security; and site and existing asset condition.
- **SOCIAL RISK:** The risk associated with the project impact on adjacent properties and affected people (including public protest and unrest); resettlement; indigenous land rights; and industrial action.
- **ENVIRONMENTAL RISK:** The risk associated with pre-existing conditions; obtaining consents; compliance with laws; conditions caused by the project; external events; and climate change.
- **DESIGN RISK:** The risk that the project design is not suitable for the purpose required; approval of design; and changes.
- **CONSTRUCTION RISK:** The risk of construction costs exceeding modelled costs; completion delays; project management; interface; quality standards compliance; health and safety; defects; intellectual property rights compliance; industrial action; and vandalism.
- **VARIATIONS RISK:** The risk of changes requested by either party to the service which affect construction or operation.
- **OPERATING RISK:** The risk of events affecting performance or increasing costs beyond modelled costs; performance standards and price; availability of resources; intellectual property rights compliance; health and safety; compliance with maintenance standards; industrial action; and vandalism.
- **DEMAND RISK:** The risk of user levels being different to forecast levels; the consequences for revenue and costs; and government support measures.
- **FINANCIAL MARKETS RISK:** The risk of inflation; exchange rate fluctuation; interest rate fluctuation; unavailability of insurance; and refinancing.
- **STRATEGIC / PARTNERING RISK:** The risk of the Private Partner and/or its sub-contractors not being the right choice to deliver the project; Contracting Authority intervention in the project; ownership changes; and disputes.
- **DISRUPTIVE TECHNOLOGY RISK:** The risk that a new emerging technology unexpectedly displaces an established technology or the risk of obsolescence of equipment or materials used.

- **FORCE MAJEURE RISK:** The risk that unexpected events occur that are beyond the control of the parties and delay or prevent performance.
- **MAGA RISK:** The risk of actions within the public sector’s responsibility having an adverse effect on the project or the Private Partner.
- **CHANGE IN LAW RISK:** The risk of compliance with applicable law; and changes in law affecting performance of the project or the Private Partner’s costs.
- **EARLY TERMINATION RISK:** The risk of a project being terminated before its natural expiry on various grounds; the financial consequences of such termination; and the strength of the Contracting Authority’s payment covenant.
- **CONDITION AT HANDBACK RISK:** The risk of deterioration of the project assets/land during the life of the PPP and the risk that the project assets/land are not in the contractually required condition at the time of hand back to the Contracting Authority.

3.4.3 GCF Concessional Loan Interest Rates

It is envisaged that the GCF will provide concessional loans to both public sector and the private sector project owners (see Section above). In this instance, it applies different terms and conditions for outgoing concessional loans, depending on, among other factors, whether the borrower is public or private.

The WRP will include projects in its portfolio with both public sector and private sector project owner. Whether a project is classified as either publicly owned or privately owned, is based on the majority equity ownership in the underlying project legal form (such as a PPP-SPV, in the case of privately owned projects). Based on the initial proposed portfolio of ten projects, it is estimated that two distinctly priced tranches of GCF concessional loans will be required, comprising 65% public and 35% private, of the total GCF concessional loan amount. As a result, the GCF concessional loans applicable to the WRP, will be differentiated by applying the following proposed interest rates, based on the respective public sector and private sector GCF concessional loan tranches:

Concessional Tranche	Amount (USDm)	Indicative Pricing (in USD terms)
Public sector	130	Interest rate – 75 bps p.a. Service fee – 50 bps p.a. All-in rate = 1.25% , plus Commitment fee – 25 bps
Private sector	70	Interest rate – 100 bps p.a. Service fee – 50 bps p.a. All-in rate = 1.50% p.a. , plus Commitment fee – 25 bps
Total Amount	200	-

It is important to note that the underlying information in the application (and particularly the Programme Financial Model and related financial analyses) is not based on these different rates applied to the public and private concessional loan tranches. Instead, the Programme Financial Model and related financial analyses are based on a single tranche with pricing that is more reflective of privately owned projects. However, the climate adaptation beneficiary impact metrics do reflect this differentiation in GCF concessional loan pricing based on the estimated split of the project portfolio between publicly and privately owned projects.

3.5 Financial Analysis and Economic Assessment

The financial analysis and economic assessment of the WRP aims to determine the financial and economic viability of the WRP at the design stage. This assessment seeks to inform and support the design of the WRP to optimize positive climate impact but also to demonstrate and to justify the prudent use of GCF concessional funding and credit enhancement instruments. This section demonstrates how the financial architecture is based on a viability assessment of a preliminary demonstration portfolio of water reuse projects. This includes weighing up the financial returns, as well as the positive and negative climate and socio-economic impacts of the WRP as a whole, and providing evidence for the commercial and climate rationale of the WRP. Section 4.4 includes (i) an outline of the context and key parameters for the financial and economic assessments, (ii) financial analysis and (iii) economic assessment.

3.5.1 Context for the Financial and Economic Analysis

The financial appraisal incorporates financial flows of the WRP, which comprise (2) components:

- 1a) WPO Core Costs;
- 1b) Project Preparation costs and Transaction Advisory Services costs; and
- 2) Implementation Costs (capex and opex) related to the portfolio of projects (blended finance solutions).

The individual project-level cashflows (Expenditures and Revenues) are assessed over the life of the project to determine the Financial Net Present Value (FNPV) of each project and the Financial Internal Rate of Return (FIRR) on each project investment. The financial analysis demonstrates the financial viability of the WRP with and without GCF funding and credit enhancement, thereby justifying the need for and extent of GCF participation.

The economic appraisal assesses a wider spectrum of costs and benefits when compared to the financial appraisal. All financial costs and revenues are accounted for in the economic assessment using appropriate conversion factors. Economic costs and benefits are then considered alongside financial cashflows to provide quantitative outputs such as the Economic Net Present Value (ENPV), Economic Internal Rate of Return (EIRR), and Economic Benefit-Cost Ratio (BCR) of the project. In addition to these quantitative indicators, qualitative economic impacts are also considered to show the expected net socio-economic impact of the project to society.

The context for programme-level financial and economic analysis is outlined below:

- The financial and economic analysis are based on a number of key inputs and assumptions drawn from high-level preliminary technical, market, economic and financial scoping analysis (comprising reports, publications, established benchmarks, information and discussions), performed by the Consultant. Refer to Annexure A for a detailed list of the key financial and economic inputs and assumptions.
- The financial analysis accounts for the initial set-up costs of the WPO and the annual operating costs associated with running the WPO for 10 years;
- Costs related to project preparation and transaction advisory services costs are also accounted for in the financial analysis;
- At the project level, the financial analysis is based on the proposed implementation of 10 selected water reuse projects in South Africa, with flexibility to increase the number of selected projects to a maximum of 15 projects;
- Four different water reuse project archetype options are accommodated in the financial analysis, which include Direct Potable Reuse (DPR), Indirect Potable Reuse (IPR), Industrial Reuse (INR) and Irrigation Reuse (IR);
- Different project size options are included for the advanced treatment plants (ATP), ranging from 5 Mℓ/d to 100 Mℓ/d plants (note: these sizes represent the output of treated water from the ATP);
- In order to allow for a phased approach to implementing the WRP, the construction start date for the selected water reuse projects can be phased over a five-year period, from 2022 to 2026.
- The investment in water reuse infrastructure under the WRP, necessitates the refurbishment of infrastructure at existing waste water treatment works (WWTW), based on relative condition (i.e., good, poor, very poor);
- Investment in sludge beneficiation (i.e., Sludge-to-Energy, Sludge-to-Gas, Sludge-to-Compost and Sludge-to-Pellets) is currently not included in the financial analysis, although the financial model has the flexibility to include such analysis.
- Two project delivery options are envisaged, comprising (i) Municipal delivery, with private sector SLA or (ii) PPP;
- Financing of the WRP is based on a blended finance solution, comprising a potential combination of Senior Commercial and Concessional Debt, Subordinated Debt, GCF Loans, Equity/Municipal budget contribution, refundable grants and non-refundable grants.
- The default funding mix, at the project level, comprise only Senior Commercial Debt, Subordinated Debt and Equity/Municipal budget contribution.
- The economic analysis identifies key economic impacts of the Programme and assesses these in two scenarios: with and without the WRP.
- The economic rate of return only considers those economic impacts that can be quantitatively measured. Economic impacts that cannot be monetised are considered qualitatively.

A sensitivity analysis will be provided for the full funding proposal. This will be based on changes in selected key financial and economic assumptions, in order to assess the financial and economic sustainability of the WRP under different assumptions. Lastly, we will also provide final conclusions and recommendations based

on a high-level assessment of key risks to the financial and economic viability of the WRP as part of the full funding proposal.

3.5.2 Financial Analysis

The purpose of the financial analysis is to determine the appropriate blend of capital (from different sources) required to fund (i) the establishment and operation of the National Water Reuse Programme Office, (ii) project preparation and transaction advisory services costs and (iii) project implementation costs. The starting point, for financial modelling purposes, is to determine the total projected funding requirement for set-up costs, project preparation costs including transaction advisory costs and total project-related capital costs of the WRP, which includes a portfolio of 10 water reuse projects.

A summary of total WRP capital requirement is outlined in Table 3-3.

Table 3-3 WRP Capital Requirements

Item	Amount (ZARm)	Potential Funding Sources
1a) WPO - Core Costs	146.9	Grants (National Treasury)
1b) WPO - Project Preparation and Transaction Advisory Costs	840	National Treasury Grant, GCF Grant and Municipal budget allocations
Projects Total Implementation Costs, comprising:	18,937.1	Senior Debt,
WWTW refurbishment cost	4,105.4	Sub-ordinated debt,
Advanced treatment Plant	12,475.0	GCF Concessional Loans
Other project specific costs	2,356.7	Equity/Municipal Budget allocations Non-refundable grants
Total capital costs of the WRP	19,930	

The first three years (FY23 to FY25) of the WPO Costs amounts to R30m and is expected to be funded by the National Treasury Grant. These costs consist of staff costs and other office head-office costs and resources.

The total Project Preparation costs consists of the cost of the IBCF (25%) and the Project Preparation Panel (75%). It has been assumed that the project preparation for the first 10 projects takes place over five years (FY23 to FY27, with the project preparation period for each project varying between 1 and 3 years.

Three funding scenarios were considered for WRP Project Implementation costs, as follows:

1. Funding without GCF capital and/or credit enhancement (default scenario)
2. Funding including GCF capitals (concessional loans), without guarantees instruments (Option 1)
3. Funding including GCF capital (concessional loans), with guarantee (Option 2)

The default capital funding scenario for the WRP assumes that GCF funding (grants) is **only earmarked for WPO-related Project Preparation and Transaction Advisory Costs**, while no GCF funding nor GCF credit enhancement instruments (first-loss capital or guarantee) is considered for project implementation under the default funding scenario. The default funding mix and default debt split, for project implementation, are presented in the table below.

Table 3-4 WRP Funding Structure - Default

Funding source	Amount (ZARm)	Percentage of Total Capital	Percentage of Total Debt
Senior Debt - Commercial Term Loan (Nominal)	4,260.9,	22.50%	30.00%
Senior Debt - Inflation-linked Term Loan	5,681.1	30.00%	40.00%
Senior Debt - Concessional Term Loan	2,130.4	11.25%	15.00%
Senior Debt - Commercial Bond Facility	-	0.00%	0.00%
Subordinated Loan	2,130.4	11.25%	15.00%
GCF Concessional Loan	-	0.00%	0.00%
Total debt	14,202.9	75.00%	100.0%
Equity	4,734.3	25.00%	-
Non-refundable grants		0.00%	-
Total	18,937.1	100.00%	-

The funding mix and debt split for Option 1 (at the programme-level), for project implementation, are presented in the table below.

Table 3-5 WRP Funding Structure - Option 1

Funding source	Amount (ZARm)	Percentage of Total Capital	Percentage of Total Debt
Senior Debt - Commercial Term Loan (Nominal)	3,309.6	17.47%	23.30%
Senior Debt - Inflation-linked Term Loan	4,412.8	23.30%	31.07%
Senior Debt - Concessional Term Loan	1,654.8	8.74%	11.65%
Senior Debt - Commercial Bond Facility	-	0.00%	0.00%
Subordinated Loan	1,654.8	8.74%	11.65%
GCF Concessional Loan	3,170.9	16.75%	22.33%
Total debt	14,202.9	75.00%	100.0%
Equity	4,734.3	25.00%	-
Non-refundable grants		0.00%	-
Total	18,937.1	100.00%	-

The funding mix and debt split for Option 2 (at the programme-level), for project implementation, are presented in the table below.

Table 3- WRP Funding Structure – Option 2

Funding source	Amount (ZARm)	Percentage of Total Capital	Percentage of Total Debt
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Senior Debt - Commercial Term Loan (Nominal)	3,375.9	17.83%	23.77%
Senior Debt - Inflation-linked Term Loan	4,501.3	23.77%	31.69%
Senior Debt - Concessional Term Loan	1,688.0	8.91%	11.88%
Senior Debt - Commercial Bond Facility	-	0.00%	0.00%
Subordinated Loan	1,688.0	8.91%	11.88%
GCF Concessional Loan	2,949.7	15.58%	20.77%
Total debt	14,202.9	75.00%	100.0%
Equity	4,734.3	25.00%	-
Non-refundable grants		0.00%	-
Total	18,937.1	100.00%	-

The default funding scenario provides an indication of which projects may require GCF concessional loans and credit enhancements in order to make them financially viable, versus those projects that may not require GCF funding and credit enhancement. This is done by estimating the total forecast net cashflows (Expenditure and Revenues) available for debt service at the individual project level and comparing each project's minimum Senior DSCR against the Target Minimum Senior Debt DSCR for the project. Projects with minimum Senior Debt DSCR that fall below the minimum Target Senior Debt DSCR, indicate a potential funding gap and these projects are considered potentially eligible for GCF concessional loans and possible guarantee in order to improve their financial viability. **Based on the assumptions presented above, and based on the default funding scenario described above, indicative outputs from the WRP Programme Financial Model are provided in Annex B.**

Basis for determining viability funding gap

Based on the default funding scenario above, which excludes GCF funding or Guarantees, the financial analysis indicates a possible viability funding gap as shown by the Minimum Senior Debt DSCR below.

Table 3-6. Minimum Senior Debt DSCR's as a basis for GCF funding

Project #	Municipality	Project Type	Size (Ml/d)	Project IRR (post- tax)	Min DSCR	Target Min DSCR
1	Nelson Mandela Metropolitan Municipality	DPR	40	5.5%	0.47x	1.50x
2	City of Ekurhuleni	DPR	60	17.9%	1.19x	1.50x
3	City of Johannesburg Metropolitan Municipality	DPR	50	24.8%	1.75x	1.50x
4	City of Tshwane Metropolitan Municipality	DPR	30	18.2%	1.24x	1.50x
5	eThekweni Metropolitan Municipality	DPR	100	22.4%	1.59x	1.50x
6	Indicative Project A	INR	75	14.9%	0.85x	1.50x
7	Indicative Project B	DPR	15	14.0%	0.93x	1.50x
8	City of Cape Town Metropolitan Municipality	DPR	40	19.6%	1.35x	1.50x
9	Drakenstein Local Municipality	DPR	10	13.5%	0.95x	1.50x
10	Mangaung Metropolitan Municipality	DPR	25	15.8%	1.06x	1.50x

Based on each project’s forecast cashflow available for debt service (CFADS) and the total senior debt service obligation (interest and capital repayments), the minimum senior DSCR of 8 out of the 10 projects fall below the Target Minimum DSCR of 1.5x, indicating a potential funding shortfall. Refer below for the financial analysis with GCF funding including and excluding credit enhancement.

Financial rate of return (with and without the GCF funding)

As shown above, without GCF funding and GCF credit enhancement, eight of the ten water reuse projects fail to meet the target minimum senior debt DSCR, which not only impacts the financial viability of the individual projects but also the overall viability of WRP.

The financial structuring considered the financial performance of financially vulnerable water reuse projects, if GCF concessional funding and credit enhancement were introduced in the project funding structure on a minimum needs-basis.

For purposes of this financial analysis, two funding scenarios were considered, as follows:

- (i) GCF concessional loans without guarantee; and
- (ii) GCF concessional loans with guarantee.

The assumption is that by introducing GCF concessional loans and credit enhancement, the projects that require viability gap funding would benefit financially, as follows:

- (i) the Senior debt holders would offer a reduction in their cost of debt, due to a reduction in their loan value at risk, as well as a reduction in credit risk due to a partial credit guarantee.
- (ii) the GCF concessional loan would be highly concessional, contributing to an overall lower weighted average cost of debt of the project.

Based on the analysis, the financial returns and minimum GCF funding under the two alternative funding options that include GCF funding, are presented below.

Table 3-7: Option 1 - Minimum GCF Concessional Debt without guarantee

#	Municipality	GCF funding as % of total Debt Capital	Amount of GCF Loan (ZARm)	Project IRR (post-tax)	Min DSCR
1	Nelson Mandela Metropolitan Municipality	67.8% 50.81%	829.2	5.5%	1.51x
2	City of Ekurhuleni	180.0% 13.5%	325.9	18.1%	1.51x
3	City of Johannesburg Metropolitan Municipality	-	-	24.8%	1.75x
4	City of Tshwane Metropolitan Municipality	15.0% 11.3%	157.6	18.3%	1.50x
5	eThekweni Metropolitan Municipality	-	-	22.4%	1.59x
6	Indicative Project A	42.0% 31.5%	1,153.1	15.1%	1.51x
7	Indicative Project B	36.0% 27.0%	216.1	14.1%	1.51x
8	City of Cape Town Metropolitan Municipality	7.5% 5.6%	81.5	19.7%	1.51x
9	Drakenstein Local Municipality	35.0% 26.3%	142.4	13.5%	1.51x
10	Mangaung Metropolitan Municipality	27.5% 20.6%	265.0	15.8%	1.51x

#	Municipality	GCF funding as % of total Debt Capital	Amount of GCF Loan (ZARm)	Project IRR (post-tax)	Min DSCR
Total		22.33% 16.75%	3,170.9		

On the basis of introducing GCF concessional loans into the debt funding mix on a needs-basis, the minimum GCF funding requirement is estimated at R3,171 or US\$ 227 million. This represents 22.33% of total project-related debt funding or 16.75% of total project-related capital at the programme level.

The Target Minimum DSCR ratio of 1.5x was used to approximate the minimum GCF funding requirement. However, the minimum GCF funding amount was determined by adding increments of 0.25% and 1% of GCF concessional loans, therefore resulting in minimum Senior Debt DSCR slightly exceeding the target of 1.5x in certain instances.

The projected cumulative drawdown of total GCF funding under option 1 for project implementation is presented below.

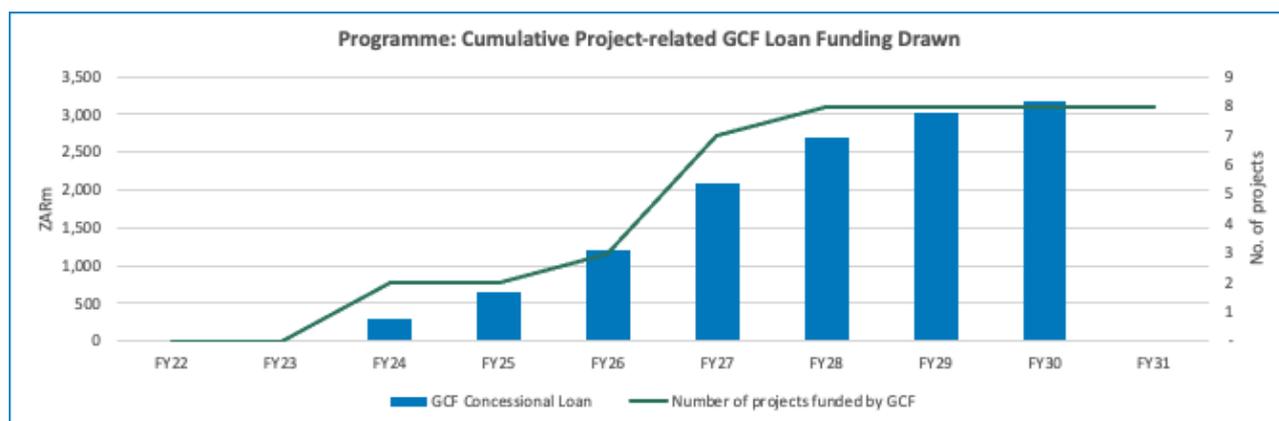


Figure 3-5 Cumulative drawdown of total GCF Funding under Option 1

By combining GCF concessional loans with a partial credit guarantee, the minimum GCF funding requirement decreases by 7.0% to R2,950 or US\$ 211 million, representing 20.77% of total project-related debt funding or 15.58% of total project-related capital at the programme level. We believe this is a low rate of concessionality across the entire programme. The WRP will also be structured in a way that no one project receives more than 30% concessional loans as a proportion of the total implementation capital; however, in exceptional cases, up to 50% will be reviewed where a particular project requires it to ensure the ongoing viability of the entire WRP.

Table 3-8: Option 2 - Minimum GCF Concessional Debt with guarantee

Project #	Municipality	GCF funding as % of total Debt Capital	Amount of GCF Loan (ZARm)	Project IRR (post-tax)	Min DSCR
1	Nelson Mandela Metropolitan Municipality	66.8% 50.1%	817.0	5.5%	1.51x
2	City of Ekurhuleni	15.0% 11.3%	271.6	18.1%	1.51x

3	City of Johannesburg Metropolitan Municipality	-	-	24.8%	1.75x
4	City of Tshwane Metropolitan Municipality	12.5% 9.4%	131.4	18.2%	1.51x
5	eThekweni Metropolitan Municipality	-	-	22.3%	1.59x
6	Indicative Project A	40.0% 30.0%	1,098.2	27.4%	1.51x
7	Indicative Project B	34.0% 25.5%	204.1	14.0%	1.51x
8	City of Cape Town Metropolitan Municipality	5.0% 3.75%	54.3	19.6%	1.52x
9	Drakenstein Local Municipality	32.5% 24.4%	132.2	13.4%	1.50x
10	Mangaung Metropolitan Municipality	25.0% 18.8%	240.9	15.7%	1.51x
Total		20.77% 15.58%	2,949.7		

The projected cumulative drawdown of total GCF funding under option 2 for project implementation is presented below.

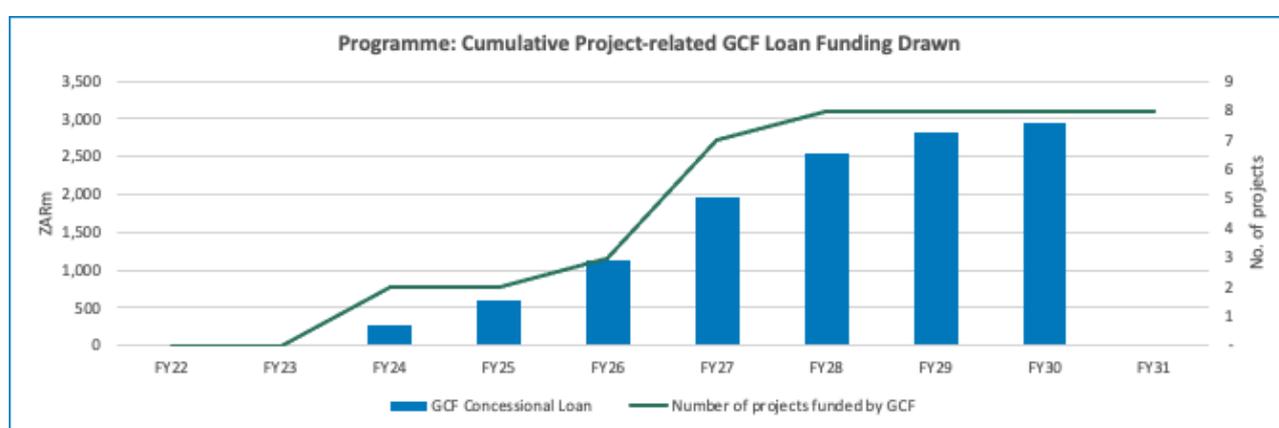


Figure 3-6: Cumulative drawdown of total GCF Funding under Option 2

Impact of GCF funding on Water Reuse charges

The table below provides an indication of the lower Water Reuse charges, made possible by the introduction of GCF funding.

Table 3-9. Potential for lower water charge due to GCF funding.

Project #	Municipality	Water charges with GCF Funding ZAR/Kℓ	Water charges without GCF Funding ZAR/Kℓ	Difference ZAR/Kℓ
1	Nelson Mandela Metropolitan Municipality	13.82	30.28	(16.46)
2	City of Ekurhuleni	26.19	31.32	(5.13)
3	City of Johannesburg Metropolitan Municipality	32.61	32.61	-
4	City of Tshwane Metropolitan Municipality	27.75	32.30	(4.55)
5	eThekweni Metropolitan Municipality	30.87	30.87	-
6	Indicative Project A	24.01	39.85	(15.84)

7	Indicative Project B	25.38	36.59	(11.21)
8	City of Cape Town Metropolitan Municipality	27.76	30.22	(2.46)
9	Drakenstein Local Municipality	25.25	35.62	(10.38)
10	Mangaung Metropolitan Municipality	25.38	33.33	(7.96)

3.5.3 Economic Assessment

The economic assessment supports various components of the full funding proposal to the GCF:

1. **Impact Potential:** Impact is estimated using the GCF's Adaptation Indicator
2. **Sustainable Development Potential:** The economic assessment contributes to articulating the WRP's social, economic, and environmental co-benefits.
3. **Effectiveness and Efficiency:** The assessment will produce an Economic Internal Rate of Return to support the project decision metrics produced by the financial analysis.

The assessment of economic impact is structured at the level of the municipality (i.e. project impact is assessed at municipality level using municipal population data and statistics). For the most part, impact is calculated using inputs and data from the CSIR Green Book, secondary literature (such as Green Cape case studies), and municipal statistics. The WRPs impact is delivered primarily through the additional water which the Programme avails to municipalities, as well as the employment created for the operationalisation of the Programme. The WRP could also contribute to ensuring jobs are not lost due to water shortages.¹³

Direct beneficiaries are counted as people who benefit from the additional water supplied into the municipal systems by the WRP first phase (i.e. the pilot portfolio of reuse projects delivering an additional 445 MI/day to select municipalities). The WRP first phase could reach a total of **3 424 737 direct beneficiaries**. Indirect beneficiaries are counted as those reached with water supply through the full scale WRP (i.e. the full set of 27 water reuse projects delivering 1067 MI of water across the country). At scale the WRP could reach a further **3 877 805 indirect beneficiaries**.

Based on the first phase selection of 10 water reuse projects, the WRPs indicative impact in terms of direct and indirect beneficiaries as well as jobs created and saved is outline in the table below.

Table 3-10 Beneficiaries and Employment Impact of the WRP

PILOT MUNICIPALITIES (Showing Treated Water Output from WRP MI/d)	Number of direct beneficiaries disaggregated by gender		Jobs Created at new ATPs		Jobs Saved through avoided water shortages	
	% Male	% Female	% Male	% Female	% Male	% Female
EC						
Nelson Mandela Metropolitan Municipality (40 MI)	222 069	237 701	41	11	14	4
FS						
Mangaung Metropolitan Municipality (25 MI)	67 837	72 612	26	7	9	2
GP						
City of Ekurhuleni (60 MI)	322 000	344 667	62	17	22	6

¹³ Job losses resulting from water shortages are aggregated across urban and agricultural sectors for the purposes of this assessment. Jobs saved per ML of supply deficit are estimated based on the GreenCape analysis from the Berg Water Management Area (Available at <https://www.greencape.co.za/assets/Uploads/WATER-MIR-2019-WEB-01-04-2019.pdf>)

PILOT MUNICIPALITIES (Showing Treated Water Output from WRP MI/d)	Number of direct beneficiaries disaggregated by gender		Jobs Created at new ATPs		Jobs Saved through avoided water shortages	
	% Male	% Female	% Male	% Female	% Male	% Female
City of Johannesburg Metropolitan Municipality (50 MI)	84 737	90 702	52	14	18	5
City of Tshwane Metropolitan Municipality (30 MI)	60 375	64 625	31	8	11	3
KZN						
eThekweni Metropolitan Municipality (100 MI)	483 000	517 000	103	28	36	10
Indicative Project A (75 MI)	199 038	213 049	78	21	27	7
NC						
Indicative Project B (15 MI)	63 000	67 435	16	4	5	1
WC						
City of Cape Town Metropolitan Municipality (40 MI)	123 846	132 564	41	11	14	4
Drakenstein Local Municipality (10 MI)	28 246	30 234	10	3	4	1
TOTAL	1 654 148	1 770 589	460	125	161	44

Basis for Economic impact of the WRP

Water scarcity resulting from climate vulnerability has an economic cost. The economic case for the WRP is built around how the Programme contributes to alleviating that climate vulnerability cost, as well as the Programme’s broader positive socio-economic impacts. The articulation of impact for the Programme is rooted in its climate rationale and focuses on those municipalities with the strongest climate rationale¹⁴. **The rollout of the water reuse program delivers two key economic benefits to households and businesses connected to local reticulated water distribution networks:**

- **First, it delivers bulk water supply** which (if not readily available from other sources) is of value to households and businesses. This water is valued through a market transaction and is part of the financial case described in Section 4.4.2. Albeit noting that in there is no competitive market for water supply (one cannot choose to connect to an alternative provider at a different price point), we make the (broadly reasonable) assumption that the bulk water supply price is a fair reflection of the value of water delivered.
- **Second, it contributes to security of supply in water-stressed regions**, and reduces the risk of water usage restrictions which may be required if there is a shortfall of supply in the event of a drought.

As this second “value” is not traded, we develop a shadow price based on “willingness to pay” for households and economic output for businesses.¹⁵ There is no market for water resilience – customers connected to a water network cannot choose to pay more (or less) to receive a more (or less) resilient water supply. They face a single tariff, and the local municipality then provides a supply of water accordingly, but one which does not “internalise” the risk of water shortages resulting in water restrictions.

¹⁴ Sol Plaatjie and Mangaung are excluded from the economic analysis given their much lower climate vulnerability than the other municipalities included in the first phase assessment.

¹⁵ In a “perfectly competitive” market, the value of a good or service is its price. For example, the hourly wage would typically be used as the economic value of an hour’s work, assuming there is both a competitive supply of labour and demand for that labour.

Estimating the value of resilient water supply to households

The “willingness to pay” for a more resilient water supply can be estimated based on how much extra households are prepared to pay to reduce the risk of water restrictions. This is a common “stated preference” approach, where values can be elicited by household surveys using either contingent valuation techniques (i.e. asking customers how much extra they would be prepared to be for a defined service), or choice experiments (offering households a hypothetical range of packages of services, each with a different hypothetical price).

A major review of household willingness to pay in the UK estimated a value of up to £80 per day to avoid the most severe usage restrictions. As shown in Table 3-11, households would pay between £0.25 and £1.00 per day to avoid temporary use orders or non-essential use bans,¹⁶ which would include for example hosepipe bans. A much higher value of between £40 and £80 is placed on avoiding emergency drought orders, which at the most extreme would involve no water supply from the reticulated water network and households would have to buy bottled water or receive water from tankers.

Table 3-11. Household willingness to pay to avoid usage restrictions (per day) – UK 2016

	Temporary use ban / Non-essential use	Emergency drought order
Low	£0.27	£44
Medium	£1.09	£87
High	£2.72	£174

Source: Water UK (2016) “Water resources long term planning framework (2015-2065)”, Appendix F3

Using a cautious “benefits transfer” approach, these values can be translated to provide a reasonable benchmark for the value to South African households of avoiding similar usage restrictions. The main adjustment we make is to (1) bring the values from the 2016 UK study into present value by inflating up to 2021 price base, (2) converting this into South African Rand value using the average purchasing power parity exchange rate over the past 12 months, and (3) adjusting downwards using the ratio of GNI per capita of South Africa relative to the GNI per capita of the UK (USD 12,640 in SA, and USD 47,620 in the UK in 2019 according to World Bank data).

There are many other reasons that the willingness to pay of a South African household may be different from that of a UK household. not least (1) different household size and composition, (2) a greater or lesser ability to adapt to water shortages, (3) different expectations on the baseline level of service. These caveats notwithstanding, we translate the UK evidence into a reasonable valuation for avoiding water outages in the event of severe drought events as described below.

Table 3-12 Household willingness to pay to avoid usage restrictions (per day) – South Africa 2021 (est.)

¹⁶ Note we do not take the “high” end of these estimates to ensure we err on the side of caution and avoid the risk of “overstating” the value of resilience.

	Non-essential use (NEU)	Emergency drought order (EDO)
Low	R0.72	R115.68
Medium	R2.89	R231.36
High	R7.23	R462.71

Source: Water UK (2016) "Water resources long term planning framework (2015-2065)", Appendix F3

The potential value at risk for households by municipality per day of restrictions is then estimated as shown in Table 3-13. The first step is to multiply the number of households connected to the reticulated water system in each municipality by the estimated willingness to pay to avoid water usage restrictions as described above. This gives the value at risk per day of water usage restrictions at a lower (NEU) and upper (EDO) estimate.

Table 3-13 Value at risk for households in each municipality

Municipality	Households (#)	ZAR Value at risk per day (NEU)	ZAR Value at risk per day (EDO)
Nelson Mandela Metropolitan Municipality (40 MI)	89 721	R259 470	R20 757 626
City of Ekurhuleni (60 MI)	1 034 797	R2 992 601	R239 408 043
City of Johannesburg Metropolitan Municipality (50 MI)	1 414 768	R4 091 465	R327 317 182
City of Tshwane Metropolitan Municipality (30 MI)	957 917	R2 770 266	R221 621 278
eThekweni Metropolitan Municipality (100 MI)	360 000	R1 041 109	R83 288 699
Indicative Project A (75 MI)	110 937	R320 826	R25 666 107
City of Cape Town Metropolitan Municipality (40 MI)	1 312 500	R3 795 709	R303 656 713
Drakenstein Local Municipality (10 MI)	66 575	R192 533	R154 026 25
Indicative Project B (15 MI)	72 012	R208 256	R16 660 516
Mangaung Metropolitan Municipality (25 MI)	297916	R861 564	R68 925 100
Total	5 717 143	R16 533 799	R1 322 703 888

Estimating the value of resilient water supply to businesses

The value of water resilience to businesses can instead be proxied by the vulnerability of economic output to a curtailment in water supply. That is, the value to a business from reducing the risk of interruptions to water supply is a function of its reliance on water supply to produce economic output, defined here by gross value added. The economic value of each sector varies from one municipality to another, while the exposure of economic value to water restrictions varies from one sector to another, in function of the climate stress in each municipality. The estimated value in GVA reduction is provided in Table 3-14.

The next step in estimating the potential value at risk from water outages in the event of a drought or water restrictions is to multiply these values through by the share of economic activity by sector in South Africa. GVA per sector per municipality was assessed using output from the CSIR Greenbook (Ngepah, et al., 2019). Economic sectors were summarised to include the following categories:

- Agriculture, Forestry and Fishing
- Mining and quarrying
- Manufacturing

- Electricity, gas and water
- Wholesale and retail trade, catering and accommodation
- Transport storage and communication
- Finance, insurance, real estate and business services
- Government and community, social and personal services

Table 3-14 Value at risk for businesses in each municipality

Municipality	Contribution to National GDP (%)	Value at risk per day (NEU)	Value at risk per day (EDO)
Nelson Mandela Metropolitan Municipality (40 MI)	3.35%	R7 508 475	R77 631 110
City of Ekurhuleni (60 MI)	6.21%	R12 521 860	R140 879 848
City of Johannesburg Metropolitan Municipality (50 MI)	16.71%	R27 970 588	R359 231 426
City of Tshwane Metropolitan Municipality (30 MI)	10.03%	R14 680 229	R212 351 709
eThekweni Metropolitan Municipality (100 MI)	10.71%	R22 481 098	R250 707 047
Indicative Project A (75 MI)	0.57%	R1 431 665	R13 792 625
City of Cape Town Metropolitan Municipality (40 MI)	11.18%	R21 055 711	R246 045 531
Drakenstein Local Municipality (10 MI)	0.45%	R1 114 327	R9 597 779
Indicative Project B (15 MI)	0.68%	R1 348 854	R13 700 637
Mangaung Metropolitan Municipality (25 MI)	1.72%	R3 279 009	R33 392 419
Total	61.61%	R113 391 816	R1 357 330 133

Estimating the Economic Internal Rate of Return (EIRR)

The EIRR is then a function of the contribution of the WRP program to reducing the risk of water shortages in the event of a drought. Ideally, this would be based on a hydro-economic analysis of climate stress and drought risk in each municipality with and without the additional capacity provided by the WRP (and which would/could not be provided by other water supply options). However, the sophisticated technical hydrological models to underpin this analysis do not exist (certainly not consistently and on a comparable basis) in all municipalities. These assessments will be undertaken during the feasibility studies as part of project preparation under Component 1 of the programme. Instead, we use a “stylised” drought event consisting of four months of temporary use bans, two months of non-essential use restrictions, and two-weeks of emergency restrictions (at the most extreme resulting in rota cuts with no water available from the reticulated distribution network). The EIRR of the WRP is then estimated by adding in this “resilience” value to improving the resilience to water shortages resulting from climate stress (and worsened by climate change), by comparing the security of supply with and without the WRP¹⁷.

¹⁷ Note we do not project changes to the underlying household or business values of water resilience over time. This is to err on the side of caution, and given the significant macroeconomic uncertainty in the current climate (including the as yet unknown impact of Omicron and other future COVID-19 variants). Specifically, we use the same number of households connected to the municipal reticulated water systems in future, the same willingness to pay (which for example would increase if incomes rise), the same economic output (GVA) and the same sector composition of the economy as in present day.

This forecasted contribution of the WRP is applied to the value at risk to households and businesses across all municipalities to generate an indication of the value of the WRP in terms of the avoided cost of water shortages. This is summarised in the figure below.

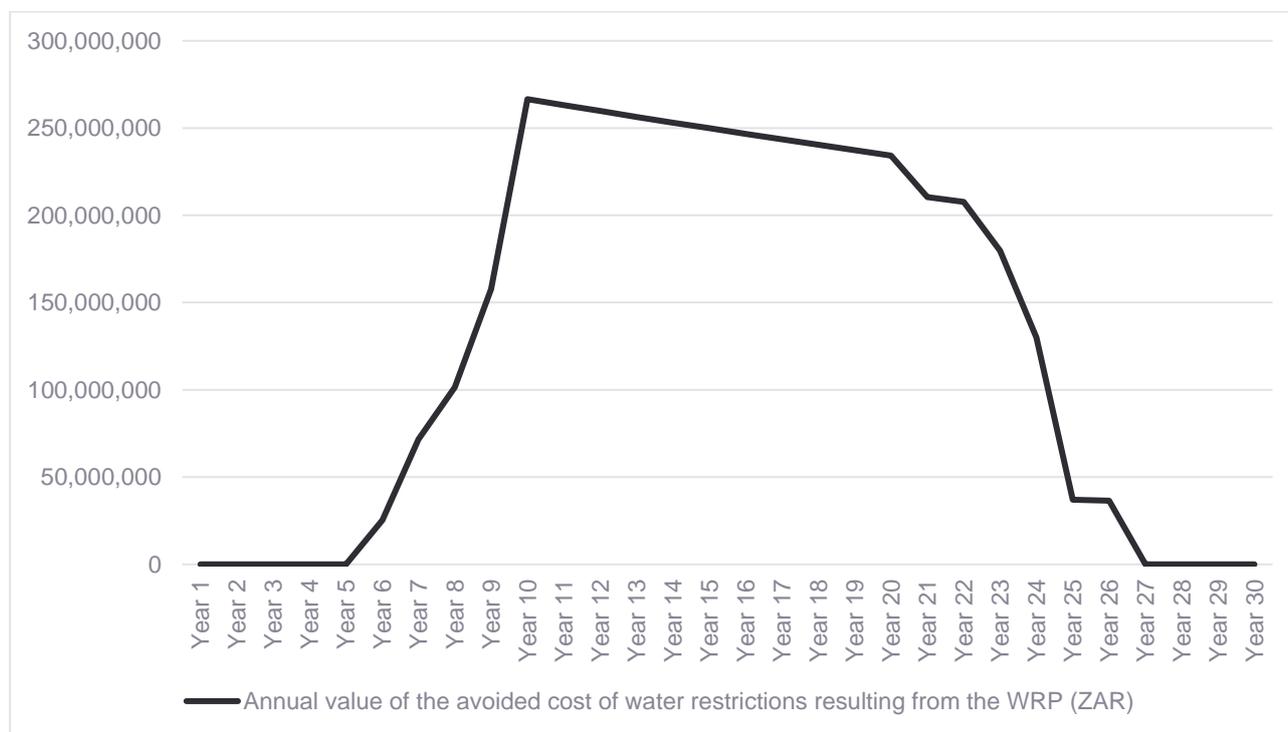


Figure 3-7 Annual value of the avoided cost of water restrictions resulting from the WRP (ZAR)

The average annual avoided cost to households and businesses that would have resulted from water restrictions in the absence of the WRP is over ZAR 130 million (approx.. USD 8.1 million). The annual value of avoided water restrictions to households and businesses is summed with the net financial cashflows for the programme and discounted over the period to 2050.¹⁸

- **The Economic IRR for the WRP as a whole is 28%, where the Financial IRR for the programme as a whole is around 26%.**
- **The Net Present Value for the programme as a whole factoring in economic co-benefits ranges from ZAR 13 billion to ZAR 34 billion (USD 817 million to USD 2.1 billion), justifying the investment from an economic perspective.**

Economic impacts of the Western Cape Drought (Case Study)

Understanding the way in which drought induced water shortages flowed through and affected different parts of the Western Cape economy during the 2017/2018 drought provides a practical example that further defends the statements made in the economic assessment above. A snapshot of the economic impacts in selected sectors is outlined below.

¹⁸ This study tests the impact of two social discount rates. The first is a slightly lower social discount rate (3.66%) which is in the range generally applied in the context of interventions responding to the impacts of climate change. The second is slightly higher (8.35%) and is more aligned with observable market interest rates. Please see Appendix A for more information.

Agriculture

The most comprehensive study by Pienaar & Boonzaaier (2018) found that the Western Cape agricultural sector was set to lose an estimated R6.44 billion (adjusted to 2021) in the 2017/18 season due to the drought. The 2019 Provincial Economic Review and Outlook (WCG Provincial Treasury, 2019) analysing net farm income found that the sectors Gross Value Added declined by R12 billion between 2017 and 2018 (adjusted to 2021).

Construction

The SAM analysis undertaken forecast the Buildings and Other Construction industry would contribute R1.4 billion (2021 adjusted) less between 2017 – 2020 due to the drought, representing approximately 2% of sector output (WCG DEDAT, 2019).

Tourism

In 2017 domestic arrivals to the province declined by 25% and further declined by 18.8% in 2018. Total foreign direct spend from foreign tourists in 2018 reduced by R6.8 billion in 2018 (R7.4 billion adjusted to 2021). Total direct domestic spend declined by approximately R1 billion and 2017 and recovered slightly increasing by R300 million in 2018. This direct spend reduction would in turn have multiplier effects on the economy, and was lost on account of the drought. The economic impact projected in the SAM modelling process ranged, under a middle case scenario, from R400 million to R1.2 billion, however only accounted for supply side constraints.

Employment

The SAM analysis projections (WCG DEDAT, 2019) forecast job losses ranging from 36 000 in the best case low compliance scenario to 126 000 in the middle case high compliance scenario. The impact of the drought on job creation has not been systematically assessed and inferred across sectors, however estimates have been produced with the most recent being that the drought cost the province 37 000 employment opportunities. 30 000 of these were estimated to have come from the agricultural sector.

Impacts on Municipal Revenue and Expenditure (case: City of Cape Town)

The City of Cape Town experienced a reduction in water sales by almost 50% between 2015/16 and 2018/19, from 1.1 billion litres per day to about 600 million litres per day. The City of Cape Town increased expenditure in numerous ways to manage social and economic risks, primarily through increasing supply augmentation:

- Operational expenditure for water and sanitation increased by 2.6% over the two-year period of 2015/16 – 2017/18 and therefore an operational surplus was achieved.
- Capital expenditure on water infrastructure declined by 5 percent year-over-year (Y-o-Y) in 2016/17 before dramatically increasing year on year by 47% or R285 million in 2017/18, and thereafter stabilised.

3.6 Efficiency and Effectiveness

3.6.1 Background

GCF intervention into this Programme is critical, as outlined above in Section 4.1. While it is apparent that there will be government and other private co-funding that will be made available, current municipal level appetite and budget for a programme of this nature appears to be limited. This municipal-level budget is insufficient to capacitate existing WWTW's and develop new ATP plants to enable the potable reuse of water. According to the IMF, as of end-2020, the Government of South Africa had a total gross government debt of *circa* 80% of GDP, increased steadily every year from 2014 onwards.

Therefore, the Government of South Africa is unable to increase investments into climate resilient water programmes, which not only impacts growth and resilience, but could also hamper or constraint future economic growth prospects.

3.6.2 Value for Money

The efficiency of the WRP can be assessed using several Value for Money metrics. The GCF traditionally seeks to understand how the programme under consideration might perform against similar programmes in the region, and for which the GCF has provided funding. To this end the financial architecture can provide preliminary Value for Money metrics outlined in the table below.

Table 3-15: Summary of Value for Money Metrics

Value for Money Metric	Cost/Beneficiary
GCF Cost per Beneficiary (Public Sector Project)	USD 58.54
GCF Cost per Beneficiary (Private Sector Project)	USD 57.59
Total cost per beneficiary	USD 411.05

These metrics demonstrate that the WRP supports adaptation impact with more efficient use of GCF capital than other similar programmes. For example, the recently awarded Programme in Jordan - Building resilience to cope with climate change in Jordan through improving water use efficiency in the agriculture sector (BRCCJ) – represented a GCF cost per beneficiary of USD 117.70.

3.6.3 Least Concessionality

The scenarios in which debt funding cost implications for GCF support show that Option 2 (GCF concessional loan with a guarantee) enable the WRP to be viable with the least amount of concessional finance. The table below summarises the assessment of the cost of debt against the three scenarios.

Table 3-16: Debt Funding Options for the WRP¹⁹

¹⁹ Option 1 and 2 allows for min GCF capital to meet min Target DSCR of 1.5x. The credit margin is reduced by 50 bps for option 1 and a further 50 bps for Option 2. GCF Guarantee only applies to Senior Debt holders (1 - 4) and this is likely to be a partial guarantee

Debt Funding Options		Default: No GCF Funding/ guarantee)	Option 1: With GCF Concessional Loan only	Option 2: With GCF Concessional Loan + guarantee
1	Senior Debt - Commercial Term Loan (Nominal)			
	Indicative Debt Terms			
	Term Loan Tenor	years	10.0	10.0
	Grace period	years	3.0	3.0
	Cost of Debt			
	Base rate (Fixed rate swap)	per annum	7.18%	7.18%
	Liquidity cost	per annum	1.00%	1.00%
	Statutory cost	per annum	1.00%	1.00%
	Credit margin	per annum	4.10%	3.50%
	Total cost of Debt	per annum	13.28%	12.68%
	Finance Fees			
	Upfront fees	Once off	1.00%	1.00%
	Commitment Fees	per annum	0.75%	0.75%
2	Senior Debt - Inflation-linked Term Loan			
	Indicative Debt Terms			
	Loan Tenor	years	10.0	10.0
	Grace period	years	3.0	3.0
	Cost of Debt			
	Base rate (Real)	per annum	3.97%	3.97%
	Liquidity cost	per annum	1.00%	1.00%
	Statutory cost	per annum	1.00%	1.00%
	Credit margin	per annum	2.25%	1.65%
	Total cost of Debt	per annum	8.22%	7.62%
	Finance Fees			
	Upfront fees	Once off	1.00%	1.00%
	Commitment Fees	per annum	0.75%	0.75%
3	Senior Debt - Concessional Term Loan			
	Indicative Debt Terms			
	Loan Tenor	years	13.0	13.0
	Grace period	years	3.0	3.0
	Cost of Debt			
	Base rate (Fixed rate swap)	per annum	7.20%	7.20%
	Liquidity cost	per annum	1.00%	1.00%
	Statutory cost	per annum	1.00%	1.00%
	Credit margin	per annum	4.10%	3.50%
	Total cost of Debt	per annum	13.28%	12.68%
	Finance Fees			
	Upfront fees	Once off	1.00%	1.00%
	Commitment Fees	per annum	0.75%	0.75%
4	Senior Debt - Commercial Bond Facility			
	Indicative Debt Terms			
	Loan Tenor	years	10.0	10.0
	Grace period	years	3.0	3.0
	Cost of Debt			
	Base rate (Fixed rate swap))	per annum	7.18%	7.18%
	Liquidity cost	per annum		
	Statutory cost	per annum		
	Credit margin	per annum	5.60%	5.00%
				4.40%

Debt Funding Options		Default: No GCF Funding/ guarantee)	Option 1: With GCF Concessional Loan only	Option 2: With GCF Concessional Loan + guarantee
Total cost of Debt	<i>per annum</i>	12.78%	12.18%	11.58%
Finance Fees				
Upfront fees	<i>Once off</i>	1.00%	1.00%	1.00%
Commitment Fees	<i>per annum</i>	0.75%	0.75%	0.75%
5	Subordinated Loan			
Indicative Debt Terms				
Loan Tenor	<i>years</i>	10.0	10.0	10.0
Grace period	<i>years</i>	3.0	3.0	3.0
Cost of Debt				
Base rate (Fixed rate swap)	<i>per annum</i>	7.18%	7.18%	7.18%
Liquidity cost	<i>per annum</i>	1.00%	1.00%	1.00%
Statutory cost	<i>per annum</i>	1.00%	1.00%	1.00%
Credit margin	<i>per annum</i>	4.85%	4.25%	3.65%
Total cost of Debt	<i>per annum</i>	14.03%	13.43%	12.83%
Finance Fees				
Upfront fees	<i>Once off</i>	1.00%	1.00%	1.00%
Commitment Fees	<i>per annum</i>	0.75%	0.75%	0.75%
6	GCF Concessional Loan			
Indicative Debt Terms				
Loan Tenor	<i>years</i>	10.0	10.0	10.0
Grace period	<i>years</i>	3.0	3.0	3.0
Cost of Debt				
Base swap rate	<i>per annum</i>	6.73%	6.73%	6.73%
Liquidity cost	<i>per annum</i>			
Statutory cost	<i>per annum</i>			
Credit margin	<i>per annum</i>	1.27%	1.27%	1.27%
Currency swap (USD-ZAR)		0.45%	0.45%	0.45%
Transaction Cost		0.15%	0.15%	0.15%
Total cost of Debt	<i>per annum</i>	8.60%	8.60%	8.60%
Finance Fees				
Upfront fees	<i>Once off</i>	1.00%	1.00%	1.00%
Commitment Fees	<i>per annum</i>	0.75%	0.75%	0.75%

It is noted that the grace periods for the different instruments for underlying projects vary between 2 and 4 years, based on the construction period. The table above reflects the mid-point for illustrative purposes only. The credit margin for senior debt instruments decreases by roughly 50-60 bps when GCF funding, without a partial credit guarantee, is introduced into the funding mix and a further 50-60 bps, when GCF funding is accompanied by a partial credit guarantee.

3.6.4 Best Available Technology

The Programme will require the use of the latest international best practice in water reuse design approaches and technology selection. By ensuring that the reuse treatment train designs are vetted by a panel of experts, the Programme will hold the individual projects to the strictest reuse practices, follow the WHO Potable Reuse guidelines (as well as SANS 241), achieve a minimum pathogen log reduction across the treatment train and have sufficient micropollutant removal. This can only be achieved if the latest technologies are selected for each of the projects.

For Direct and Indirect potable reuse, the selection and agreement of the treatment train will be a key component of the project vetting process and a clear Hazard Analysis Critical Control Point (HACCP) will be required for the selected treatment technologies to ensure a minimum pathogen log reduction and micropollutant removal. South Africa doesn't have a regulated potable reuse minimum standard and it is proposed that the programme adopts the California State Department of Health potable reuse standards for pathogen reduction (12/10/10) and micropollutant (Chemicals of Emerging Concern) removal. Thus, latest technologies with respect to treatment steps such as UV/AOP, Reverse Osmosis and Ozone/BAC will need to be implemented in order to achieve these output parameters.

For industrial reuse project, the end use quality will dictate the level of treatment and the panel of experts will scrutinize the proposed treatment train against best available technology before approving funding. Irrigation reuse technology is well established in South Africa and existing technologies will continue to be implemented to adhere to the Department of Water and Sanitation's irrigation quality standards as well as best practices with respect with human health.

3.7 Budget Plan

The budget plan considers the initial set-up costs of the WPO and the annual operating costs associated with running the WPO for 10 years (from FY23 – FY32). The operating costs include:

1. The core costs of the WPO (staffing and other office costs); and
2. Project Preparation and Transaction Advisory costs.

It is envisaged that the National Treasury grant contributions to the WRP will cover the WPOs core costs for the first three years of operation. The tables below detail the base unit costs for the WPO's staffing and other office costs respectively.

Table 3-17 Base Unit Costs for the WPO Staffing

Number of staff	Designation	Function	Level & Affiliation	Contract Type	Cost Type	Base Unit Cost (ZAR starting FY22)
1	Head of WPO	Management	Executive - WPO	FTEP	Core	1 800 000
1	Office Administration Manager	Management	Middle - WPO	FTEP	Core	500 000
2	Financial Manager	Financial	Senior - WPO	FTEP	Core	1 200 000
3	Monitoring & Reporting Manager	Impact	Senior - WPO	FTEP	Core	850 000
4	Technical Manager	Technical	Senior - WPO	FTEP	Core	1 200 000
4	Project Officer	Technical	Middle - WPO	FTEP	Core	650 000
5	Contracts Manager	Contracting	Senior - WPO	FTEP	Core	1 000 000
5	Procurement Officer	Contracting	Middle - WPO	FTEP	Core	650 000
6	Communications Officer	Communications	Middle - WPO	FTEP	Core	500 000

Table 3-18 Base Unit Costs for the WPO's office and other costs

Cost description	Cost Type	Costing Unit	Base Unit Cost (ZAR starting FY22)
WPO establishment Costs	Contract	ZAR / Contract	3 000 000
Office Rental (incl. cleaning)	Rental	ZAR / FTEP	84 000
ICT Hardware & Software	Rental	ZAR / FTEP	30 000
Telecoms & Mobile	Rental	ZAR / FTEP	10 000
Rates & Utilities	Rental	ZAR / FTEP	7 000
Travel (Prep)	Once-off	ZAR / Prep	55 000
Travel (Construction)	Once-off	ZAR / Constr.	20 000
Travel (Operations)	Once-off	ZAR / Operat.	15 000
Auditor	Rental	ZAR	600 000
Brand & website development	Rental	ZAR	15 000
Oversight Committee Reimbursables	Once-off	ZAR	45 000
Technical workshops	Once-off	ZAR	55 000
Sub-Total			3 586 000

The WRP's project preparation and transaction advisory costs are estimated as a percentage of capex requirements, in line with the Engineering Council of South Africa (ECSA) capital works fee scales. This is done at each key stage of project development, namely through pre-feasibility, feasibility, transaction advisory and financial close. This is detailed in the table below.

Table 3-19 Project preparation fee percentages for the WRP

Project preparation fee percentages	% Capex <ZAR 1bn	% Capex ZAR 1-2bn	% Capex >ZAR 2bn
Pre-feasibility	1.50%	1.25%	1.00%
Feasibility	3.25%	2.75%	2.50%
Transaction Advisory	1.50%	1.25%	1.25%
Financial Close	1.50%	1.50%	1.25%
Total	7.75%	6.75%	6.00%

The resulting breakdown of project preparation costs per municipality included in the budget plan is outlined in the following table.

Table 3-20 Project Preparation Costs per Municipality

Municipality	Project#	Project Prep Fee %	Project Prep. Fees on base cost of Capex
Nelson Mandela Metropolitan Municipality	Project 1	6.75%	ZAR 81.67m
City of Ekurhuleni	Project 2	6.75%	ZAR 111.04m
City of Johannesburg Metropolitan Municipality	Project 3	6.75%	ZAR 94.06m
City of Tshwane Metropolitan Municipality	Project 4	7.75%	ZAR 75.85m
eThekweni Metropolitan Municipality	Project 5	6.00%	ZAR 153.61m
Indicative Project A	Project 6	6.00%	ZAR 178.97m
Indicative Project B	Project 7	7.75%	ZAR 43.32m
City of Cape Town Metropolitan Municipality	Project 8	6.75%	ZAR 81.67m

Drakenstein Local Municipality	Project 9	7.75%	ZAR 30.64m
Mangaung Metropolitan Municipality	Project 10	7.75%	ZAR 65.51m

It is anticipated that the project preparation and transaction advisory costs will be split between the Project Preparation and Independent Blended Capital Facilitator in a 75% and 25% proportion respectively.

Overall, the projected cost profile for the budget plan is demonstrated in the graphs that follow.

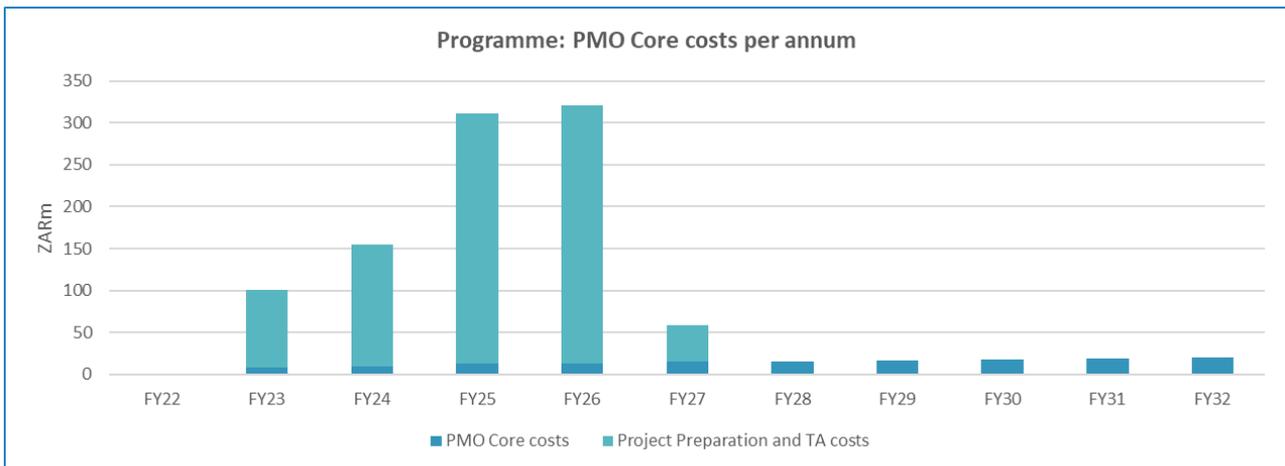


Figure 3-8 Programme: WPO Core Costs per annum

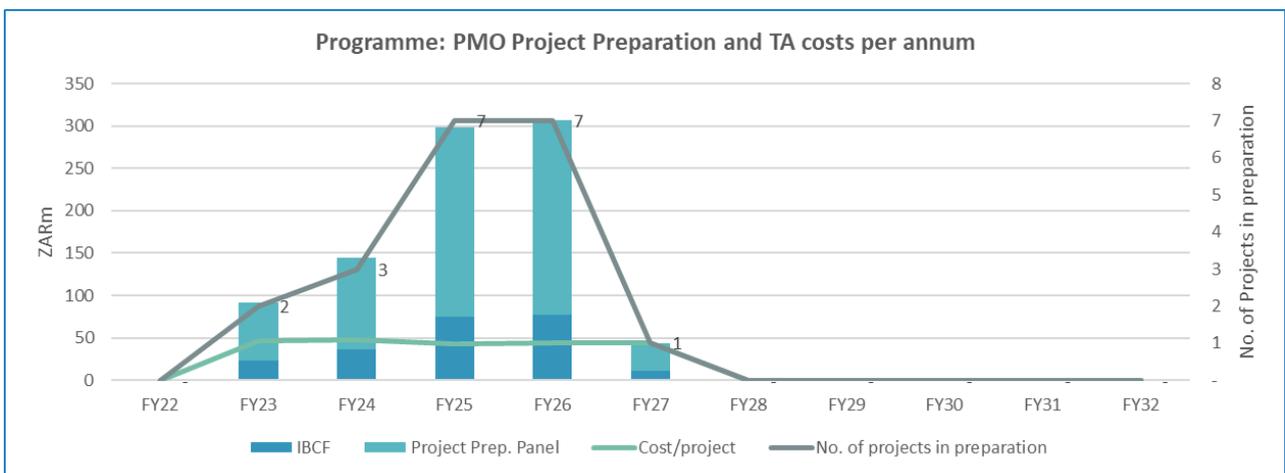


Figure 3-9 Programme: WPO Project Preparation and Transaction Advisory Costs per annum

3.8 Financial Management

Pricing and Credit Assessment

All funding from the DBSA will be competitively priced and take the following into account:

- The risk of the Project;
- The market pricing for similar transactions;

- The market pricing for similar products offered; and
- The facilities provided by GCF.

Know Your Client Procedures

Know your client procedures are completed during the due diligence stage. This will include:

- Compliance with the Financial Intelligence Control Act (“FICA”);
- Credit checks on the borrower;
- Identification of sanctioned persons and entities; and
- Identification of Politically Exposed Persons (“PEPs”).

Financial Management

The program will apply the AE’s financial management policies and guidelines for capital provided through loans from the DBSA itself (provided from GCF concessional capital). The Independent Blended Capital Facilitator would manage other capital in alignment with DBSA processes.

The financial management of disbursements is primarily managed under the DBSA Loan Management Unit (LMU). Loan Management forms part of the broader discipline of portfolio management. The primary objective of portfolio management is to ensure that the DBSA’s assets perform at the level required to ensure the sustainability of the organisation. Its purpose is to ensure the continuous monitoring of all relevant covenants throughout the lifetime of the facility. This relates to both financial and non-financial covenants.

Once the Loan or Facility has been disbursed in full, LMU becomes the first point of contact and is accountable for the administration of the loan; and also monitors borrower compliance and performance. Loan Management may if necessary, also consult with Legal, to ensure that the full implications of any deviation from conditions or breach of covenant are understood by the DBSA and appropriate mitigation measures are initiated.

Disbursement

Conditions Precedent (CPs) stipulated in the legal agreements must be fulfilled by the borrower before disbursement. If and when CPs have been fulfilled, the borrower will commence drawdown. Disbursement of funds will take place either through one drawdown or on a staged basis, depending inter alia on considerations such as the project timetable and achievement of construction milestones.

Supervision and Portfolio management

Over the life of the loan, the responsible Investment Officer, Credit Analyst and Loan Monitoring Specialist are all required to be involved in monitoring the operational and financial performance and position of the borrower and the project. There may also be continued or ad hoc involvement by the relevant sector specialist(s) on a needs basis. This is a continuous process, but also requires an annual review, carried out by the responsible Credit Analyst, in consultation with the Investment Officer and Loan Monitoring Specialist. The LMU together with the Operation Evaluations Unit falls under portfolio and credit management of the DBSA.

The role of the LMU is to maintain financial sustainability through effective financial administration and management of the DBSA portfolio. This is achieved through:

- Accurate and relevant financial data of agreements on SAP
- Obtaining required documentation from clients as and when required
- Registering and processing disbursements with correct checks and balances within the specified timeframe
- Managing repayments and defaulters
- Closing off the loan book on a monthly basis with balanced transactions
- Assisting with impairment/mark-to-market valuation calculations and posting.

Audit

The responsibility for providing assurance to the DBSA Audit and Risk Committee is assigned to line management, as well as to internal and external assurance providers, in accordance with the Bank's combined assurance model. Assurance activities must include self-assessments of the effectiveness of the internal controls that are in place to manage operational risks inherent in their day-to-day activities. The implementation of the combined assurance activities will be coordinated by DBSA's Internal Audit and facilitated through the institution of a combined assurance working group. The projects funded under the Programme will thus be subject to the DBSA's normal internal audit policies and procedures and will also be included as part of the annually audit conducted by DBSA's external auditors. The individual funded project companies will also be subject to an annual external audit, and this requirement would be written into the Conditions Precedent. The cost of audit services shall be incorporated into the cost estimates for each approved project. The WRP will be audited as part of the general DBSA annual audit. The DBSA as a state-owned entity is audited by the Auditor-General of South Africa. The sub-projects will be audited by their own appointed auditors who must be a reputable and duly registered with the appropriate body.

Financial Reporting

The funds to be received from GCF under the Programme will be treated similar to other lines of credit until disbursed to individual projects. When the funds are disbursed to a project, a financial asset will be recognized and accounted for as a development loan. This follows the reporting framework of existing of lines of credit within DBSA. The monitoring and accounting system recording will be carried by the LMU.

Procurement

Sub projects will be procured through their own internal procurement departments based on own procurement policies. The DBSA will ensure that their procurement policies are aligned to DBSA. Procurement at DBSA level to comply with DBSA procurement policy. The custodian of procurement is the Supply Chain Management Department of the DBSA.

DBSA undertakes procurement in line with applicable regulatory requirements and best practice that is fair, equitable, transparent, cost-effective and competitive. DBSA will use its own procurement policies for Projects that receive financing from this Programme.

A general DBSA sourcing process is summarized below as an example:

- The DBSA procurement process is subject to the DBSA's Procurement Policy and Procedure document and code of conduct.
- Specifications are requested when a business need arises by internal business units.
- An appointment Specification Committee compiles the specification or scope of service covering the specific requirement by drafting a Terms of Reference Document.
- Once approval have been granted by the Procurement Committee the tender is published on the DBSA website or advertised in a National newspaper.
- The Procurement Unit or business unit (For professional services only) will obtain the necessary requests for bid/proposal/information or quotation.
- All responses are subject to the DBSA's:
 - o Tender conditions
 - o Responses to be aligned to the Terms of Reference
 - o The DBSA's purchase order and quotation/bid terms of conditions
 - o The Procurement Unit or business unit (For professional services only) will obtain the necessary requests for bid/proposal/information or quotation.
- On the closing time all responses are opened verified for compliance.
- The next step is for the appointed evaluation team to evaluate the proposals received.
- Once the successful vendor/ supplier have been evaluated, rated and ranked the evaluation committee will obtain the necessary approval from the Procurement Committee to award and appoint the successful vendor/supplier.
- The successful vendor/supplier provider will then be registered as a DBSA vendor.
- Either a contract or SLA will be entered into between the DBSA and the successful vendor/supplier.
- A purchase order will be faxed or emailed to confirm the DBSA's requirements.

Exposure Limits

The exposure limits will be tested every time the DBSA's Investment Committees make a binding commitment to a Project.

Annex A: Key Financial & Economic Assumptions

Financial inputs and assumptions:

Item	Input or assumption						
General							
Financial period and computation periods	1 July to 30 June; annual						
Economic							
Target discount rate for Equity NPV calculations - Private	20.0%						
Target discount rate for Project NPV calculations - Municipal	Weighted Average Cost of Capital (WACC), ranging between 10.1% and 11.2%						
Date of NPV calculation	1 July 2022						
Exchange rate (USD/ZAR)	14.0						
Exchange rate (EUR/ZAR)	17.0						
Exchange rate devaluation (EUR/ZAR)	5 % per annum						
European inflation	1.5 per annum						
Corporate tax rate	27%						
South African prime lending rate	7.0% per annum						
JiBAR (12-month)	4.59% per annum						
Average yield on RSA bond (proxy for 15-year bond)	9.75% per annum						
Project preparation							
Project preparation Cost and TA Cost as % of Capex Base cost	<table border="1"> <tr> <td><ZAR1bn</td> <td>ZAR1 – 2bn</td> <td>>ZAR2bn</td> </tr> <tr> <td>7.75%</td> <td>6.75%</td> <td>6.00%</td> </tr> </table>	<ZAR1bn	ZAR1 – 2bn	>ZAR2bn	7.75%	6.75%	6.00%
<ZAR1bn	ZAR1 – 2bn	>ZAR2bn					
7.75%	6.75%	6.00%					
Construction – Capex							
Base date of pricing	1 July 2021						
Start date of escalations	1 July 2022						
Escalation rate (SA)	6.0% per annum						
Escalation rate (Europe)	1.5% per annum						
WWTW refurbishment – Base cost	Good – R1.0 million /MI/d Poor – R5.0 million /MI/d Very Poor – R8.0 million /MI/d						

Item		Input or assumption			
Advanced Treatment Plant (20 MI/d) - Base cost	DPR - R27.0 million /MI/d IPR - R24.5 million /MI/d INR - R9.0 million /MI/d IR - R1.4 million /MI/d				
Other capital costs	DPR - RNil million /MI/d IPR - RNil million /MI/d INR - RNil million /MI/d IR - RNil million /MI/d				
Percentage of Capex imported	DPR	IPR	INR	IR	
	25.0%	25.0%	25.0%	10.0%	
Construction period (yrs)		1- 10 MI/d	11 - 50 MI/d	50+ MI/d	
	DPR, IPR and INR	2.00	3.00	4.00	
	IR	1.00	2.00	2.00	
Capex profile during Construction period	DPR, IPR, INR	1-10 MI/d	11 - 50 MI/d	50+ MI/d	
	Year 1	70.00%	30.00%	25.00%	
	Year 2	30.00%	40.00%	30.00%	
	Year 3	0.00%	30.00%	25.00%	
	Year 4	0.00%	0.00%	20.00%	
	Year 5	0.00%	0.00%	0.00%	
	IR	1- 10 MI/d	11 - 50 MI/d	50+ MI/d	
	Year 1	100.00%	70.00%	60.00%	
	Year 2	0.00%	30.00%	40.00%	
	Year 3	0.00%	0.00%	0.00%	
	Year 4	0.00%	0.00%	0.00%	
	Year 5	0.00%	0.00%	0.00%	
Revenue					
Plant availability	DPR	IPR	INR	IR	
	95.0%	95.0%	95.0%	98.0%	
Base date of tariff	1 July 2021				
Start date of tariff escalation	1 July 2022				
Base Tariff (ZAR/KI) per municipality – Municipal off-taker	Base charge	DPR	IPR	INR	IR
	Buffalo City Local Municipality	25.38	22.95	20.52	14.44
	Nelson Mandela Metropolitan Municipality	13.82	12.89	11.96	9.63
	Mangaung Metropolitan Municipality	25.38	22.95	20.52	14.44
	City of Ekurhuleni	26.19	23.79	21.40	15.40
	City of Johannesburg Metropolitan Municipality	32.61	29.30	25.98	17.69
	City of Tshwane Metropolitan Municipality	27.75	25.13	22.51	15.95
	Emfuleni Local Municipality	25.38	22.95	20.52	14.44
	eThekweni Metropolitan Municipality	30.87	27.94	25.01	17.69
	The Msunduzi Local Municipality	25.38	22.95	20.52	14.44
	City of uMhlathuze	18.90	17.04	17.15	10.56
	Polokwane Local Municipality	25.38	22.95	20.52	14.44
	Mbombela/Umjindi	25.38	22.95	20.52	14.44
	Emalahleni Local Municipality	25.38	22.95	20.52	14.44
	Sol Plaatjie Local Municipality	25.38	22.95	20.52	14.44
	Rustenburg Local Municipality	25.38	22.95	20.52	14.44
	Breede Valley Local Municipality	25.38	22.95	20.52	14.44
	City of Cape Town Metropolitan Municipality	27.76	24.52	21.28	13.18
Drakenstein Local Municipality	25.25	23.08	20.91	15.48	
Stellenbosch Local Municipality	25.38	22.95	20.52	14.44	

Item	Input or assumption				
Base Tariff (ZAR/KI) per municipality – End-User	Base charge	DPR	IPR	INR	IR
	Buffalo City Local Municipality	35.53	29.83	28.72	17.33
	Nelson Mandela Metropolitan Municipality	19.34	16.75	16.74	11.56
	Mangaung Metropolitan Municipality	35.53	29.83	28.72	17.33
	City of Ekurhuleni	36.67	30.93	29.95	18.48
	City of Johannesburg Metropolitan Municipality	45.66	38.08	36.37	21.23
	City of Tshwane Metropolitan Municipality	38.85	32.66	31.51	19.14
	Emfuleni Local Municipality	35.53	29.83	28.72	17.33
	eThekweni Metropolitan Municipality	43.21	36.32	35.01	21.23
	The Msunduzi Local Municipality	35.53	29.83	28.72	17.33
	City of uMhlatuze	26.46	22.16	24.01	12.67
	Polokwane Local Municipality	35.53	29.83	28.72	17.33
	Mbombela/Umjindi	35.53	29.83	28.72	17.33
	Emalahleni Local Municipality	35.53	29.83	28.72	17.33
	Sol Plaatje Local Municipality	35.53	29.83	28.72	17.33
	Rustenburg Local Municipality	35.53	29.83	28.72	17.33
	Breede Valley Local Municipality	35.53	29.83	28.72	17.33
	City of Cape Town Metropolitan Municipality	38.86	31.88	29.79	15.82
	Drakenstein Local Municipality	35.35	30.00	29.27	18.57
	Stellenbosch Local Municipality	35.53	29.83	28.72	17.33
Tariff Escalation rate	6% (i.e., South African inflation rate + 1%)				
Operating costs					
ATP operating costs (ZAR/ KI) (Based on 20 MI/d plant)	DPR	IPR	INR	IR	
	6.50	5.50	5.0	1.8	
Base date of costs	1 July 2021				
Start date of escalation	1 July 2022				
Opex escalation	6% (i.e., South African inflation rate + 1%)				
Percentage of Capex subject to Depreciation	DPR	IPR	INR	IR	
	50.0%	50.0%	50.0%	50.0%	
Useful life (Yrs) for Depreciation	DPR	IPR	INR	IR	
	15.0	15.0	15.0	15.0	

Economic inputs and assumptions:

Item	Input or assumption
Social discount rate	3.66% ²⁰ and 8.35% ²¹
Tradeable Goods Conversion Factor	0.8 ²²
Unskilled Labour Conversion Factor	0.5 ²³
Skilled Labour Conversion Factor	1
Non-tradable Goods Conversion Factor	1
Employment gender split	21.40% female
Jobs per ML treated	1.315
Jobs at risk from water supply deficit	0.46
Proportion of women in South Africa	51.70%

²⁰ Even the Representative Agent Must Die: Using demographics to inform long-term social discount rates, Fenichel et al., 2017, Appendix Table 1

²¹ Conningarth Economists (2014). A manual for cost benefit analysis in South Africa with specific reference to water resource development. Water Research Commission. Available at: <http://www.wrc.org.za/wp-content/uploads/mdocs/TT%20598-14.pdf>

²² UNECA (2012). Cost-Benefit Analysis for Regional Infrastructure in Water and Power Sectors in Southern Africa. Online: https://www.uneca.org/sites/default/files/PublicationFiles/cost-benefit-analysis-for-regional-infrastructure-in-water-and-power-sectors_0.pdf

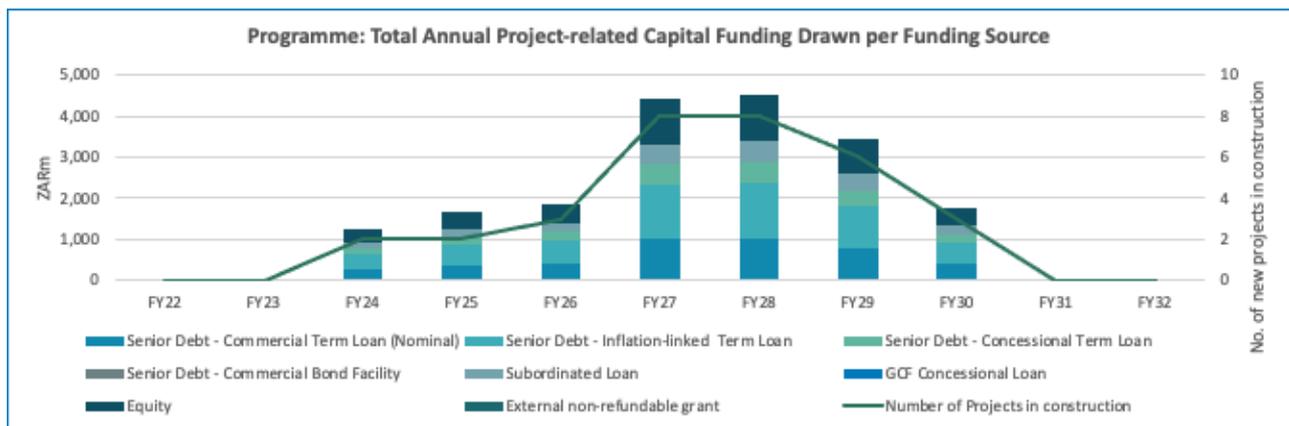
²³ Asian Development Bank (2011). Financial / Economic Analysis and Shadow Pricing. Online: <http://www.adb.org/sites/default/files/page/149401/financial-economic-analysis-shadow-pricing-mar2012.pdf>

Annex B: Programme Financial Model Outputs

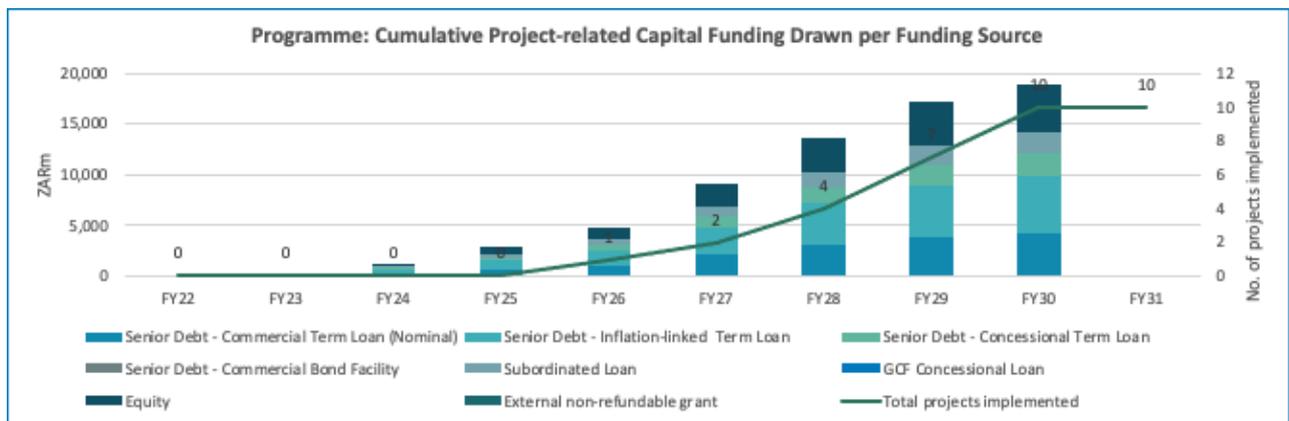
The below outputs are provided for illustrative purposes and based on the default funding scenario, i.e. no GCF funding is included in the funding structure for any of the projects.

Project capital expenditure and funding sources

The project-related forecast capital expenditure and funding drawdown profile is show below.



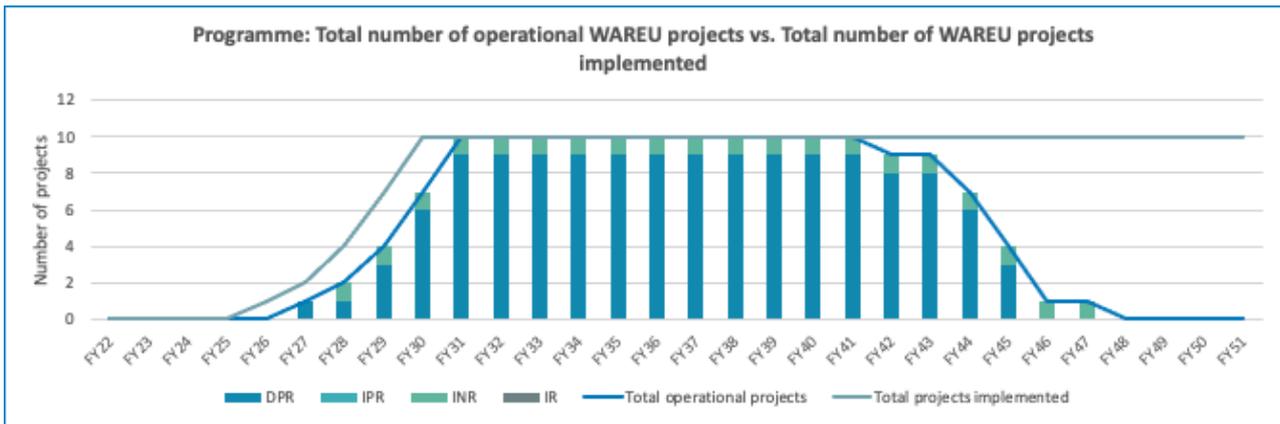
The cumulative project-related capital expenditure and funding drawdown is presented below.



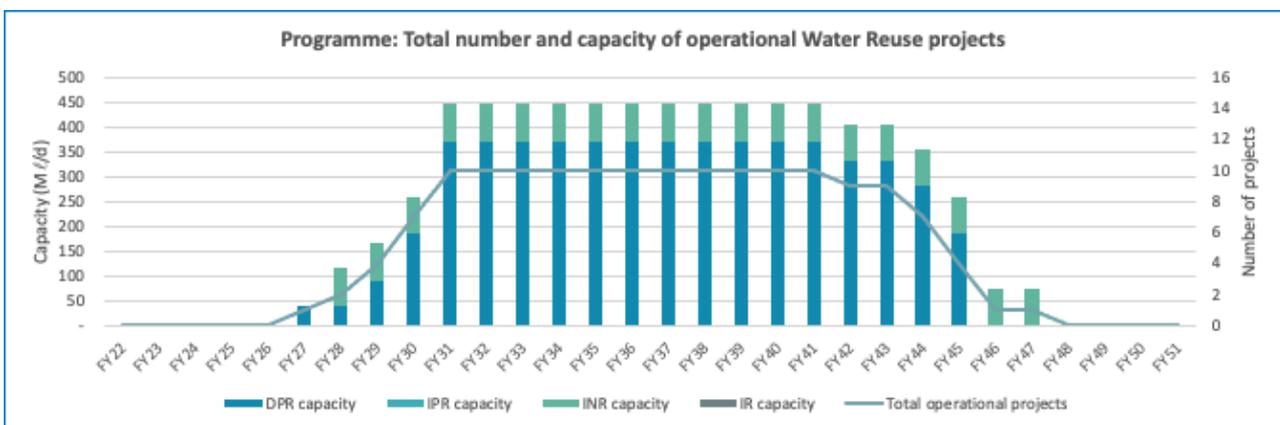
Over the 10-year period 2022 to 2031, a total of 10 water reuse projects are expected to be implemented in a phased manner as shown above. The total funding drawdowns reach R18.9 billion by 2030.

Project types implemented and operational

The total number of projects implemented and operational per project archetype are shown below.



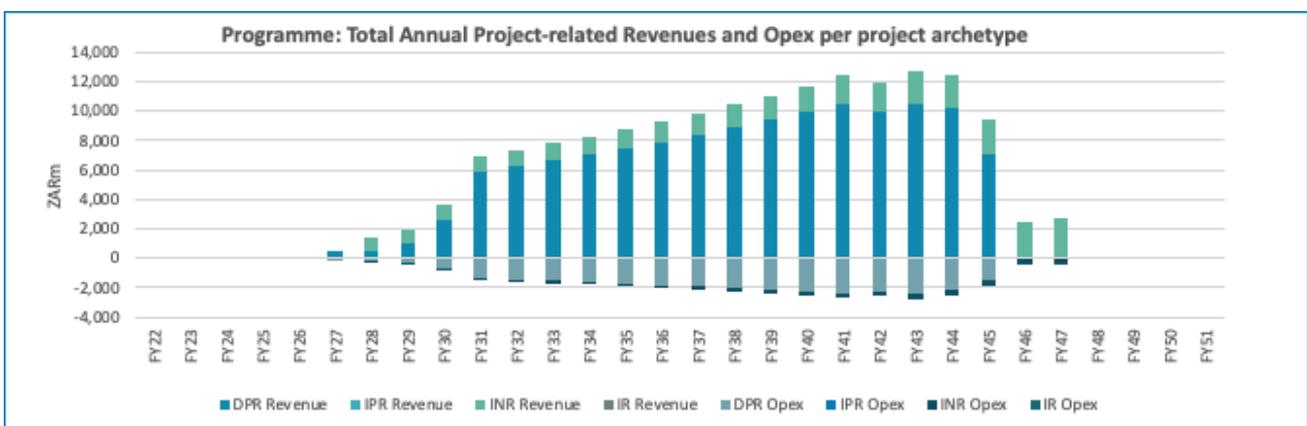
A total of nine DPR projects and one INR project are expected to be implemented and operational.



The total projected maximum capacity of Water Reuse projects implemented as part of the first phase of the WRP, amounts to 450 Mℓ per day.

Revenue and Opex

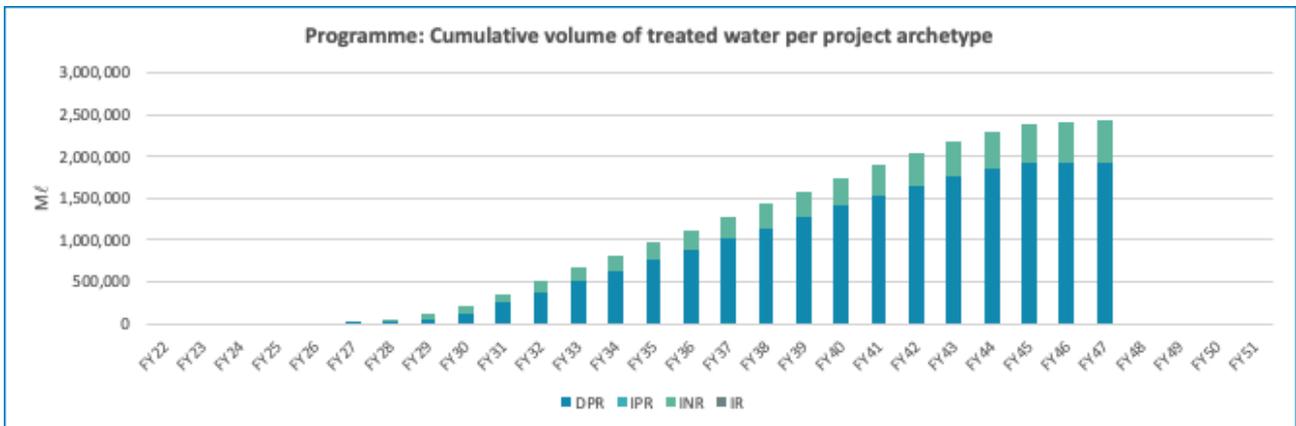
The total annual Revenues and Operating expenses over the respective 15-year operating periods, aggregated per project archetype, is shown below.



Project revenues comprise sales of treated water for potable reuse and industrial reuse. Operating expenditure relates to the direct operating expenditure to operate the advanced treatment plant (including routine

maintenance) and excludes operating costs related to collection and/or distribution activities. Depreciation is accounted for separately and is not included in direct operating expenses.

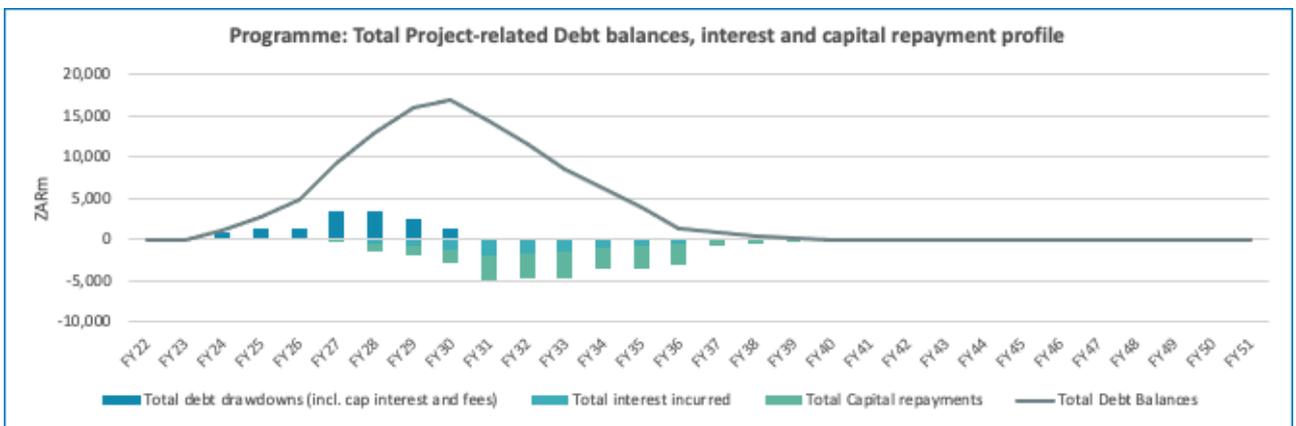
The projected cumulative volume of treated water per annum per project archetype is presented below.



Based on the 10 operational projects, the total projected cumulative volume of treated water for reuse amounts to 2.3 million Mℓ by 2045.

Debt Balances and Debt Service

The annual aggregated total debt drawdowns, including capitalised interest, total debt service (interest and capital repayments) and total debt balances are depicted below.



All debt is projected to be repaid by 2040.



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