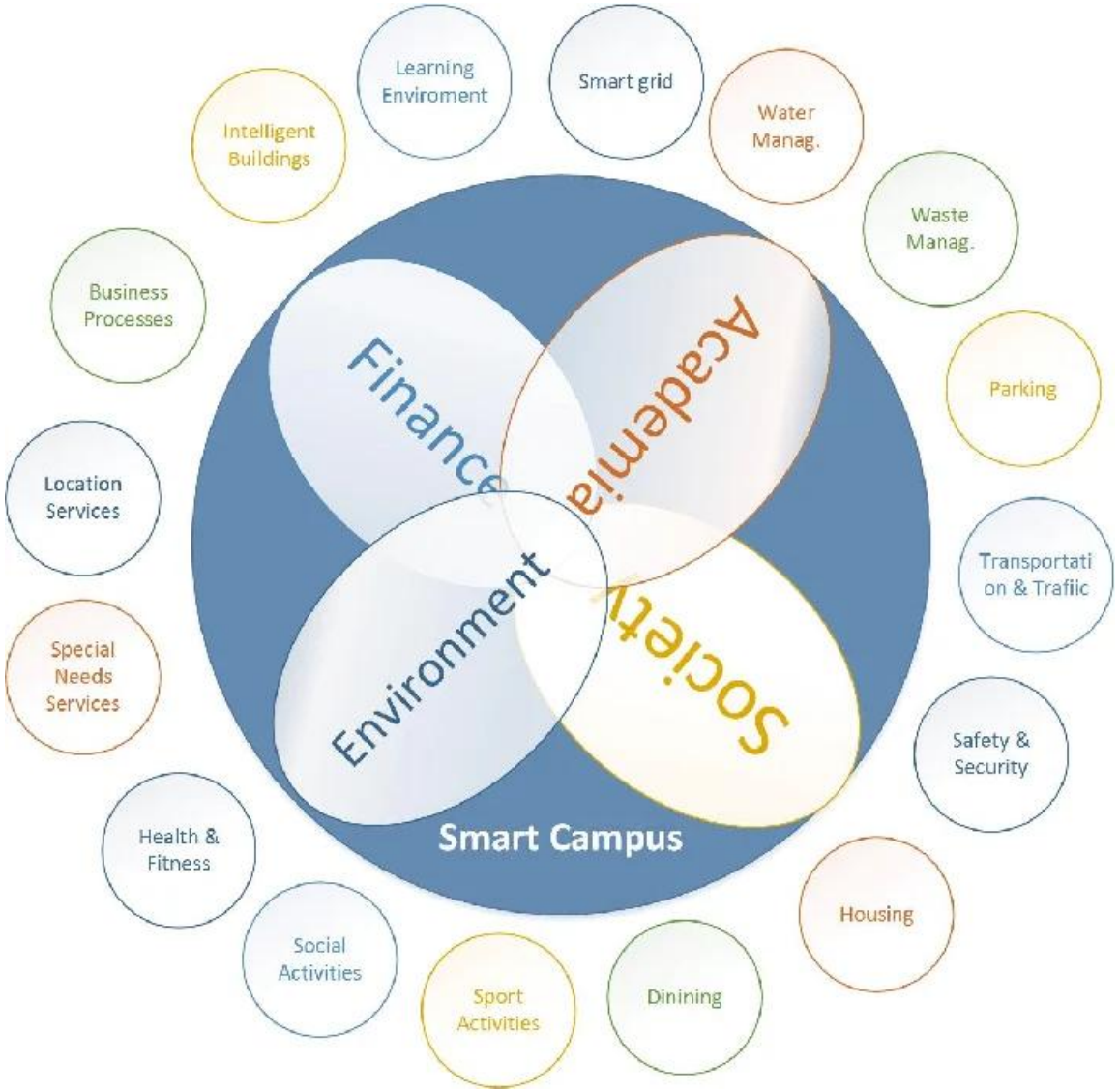
HEFMA Western Cape Chapter - COO Forum 23 - 24 March 2026

Systems Integration, Sustainability Transformation & Water Optimization Strategy

Introduction

- Legislation
- Town and Regional Planning
- FM Strategy – Change System
- Digitization Strategy and Concept
- Case Studies – Environmental impact
- Business Continuity – Resilience
- Q & A – engagement



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Water Infrastructure Challenges in South Africa

Key National Challenges

- Aging water infrastructure networks across major cities
- High levels of non-revenue water due to leaks and pipe failures
- Increasing urban population and demand for water services
- Infrastructure maintenance backlogs in municipalities
- Limited technical capacity to maintain complex infrastructure systems

Joburg disaster: Collapsing water infrastructure in pictures

Failing municipal infrastructure, not water scarcity, driving South Africa's water crisis

rd March 2026

y: Creamer Media Reporter

South Africa's escalating water outages are being driven primarily by failing infrastructure rather than water scarcity, and the country is facing a critical turning point requiring urgent engineering intervention to prevent further service delivery collapse.

Recent national assessments showed that about 47% of treated water was lost before reaching consumers – significantly higher than the global average of about 30% – largely owing to leaks, ageing pipelines,

DELIVERY MANAGEMENT FLAWS HAMSTRING GROWTH AND DEVELOPMENT IN SOUTH AFRICA

Eddie Rakabe[1] and Ramos Mabugu[2]

[1] Mapungubwe Institute of Strategic Reflections
[2] School of Economic and Management Sciences, Sol Plaatje University, South Africa.

Email Machete.rakabe@mistra.org.za or Eddie.rakabe@icloud.com

ABSTRACT

Planning, budgeting, coordinating, managing the lifetime of a project, evaluating it, being transparent and accountable, and adhering to rules on the public availability of infrastructure services are all part of infrastructure delivery management. However, there is a declining local government infrastructure budget in South Africa. Hence, this study evaluates local governments' management and infrastructure delivery chain to pinpoint the obstacles preventing the creation of an efficient, sustainable, and successful infrastructure delivery program through a review approach. The study's findings reveal the institutional and regulatory framework for infrastructure delivery, infrastructure delivery chain, municipal infrastructure delivery performance, and local government infrastructure delivery challenges, such as poorly managed consultations, weak multi-government coordination, political-administrative interface, and monitoring and evaluation. The study concludes that municipal infrastructure has no proper planning or life-cycle management. Therefore, the study recommends a stronger focus on peer learning across municipalities and the complete life-cycle management of municipal infrastructure rather than introducing new infrastructure. The secret to

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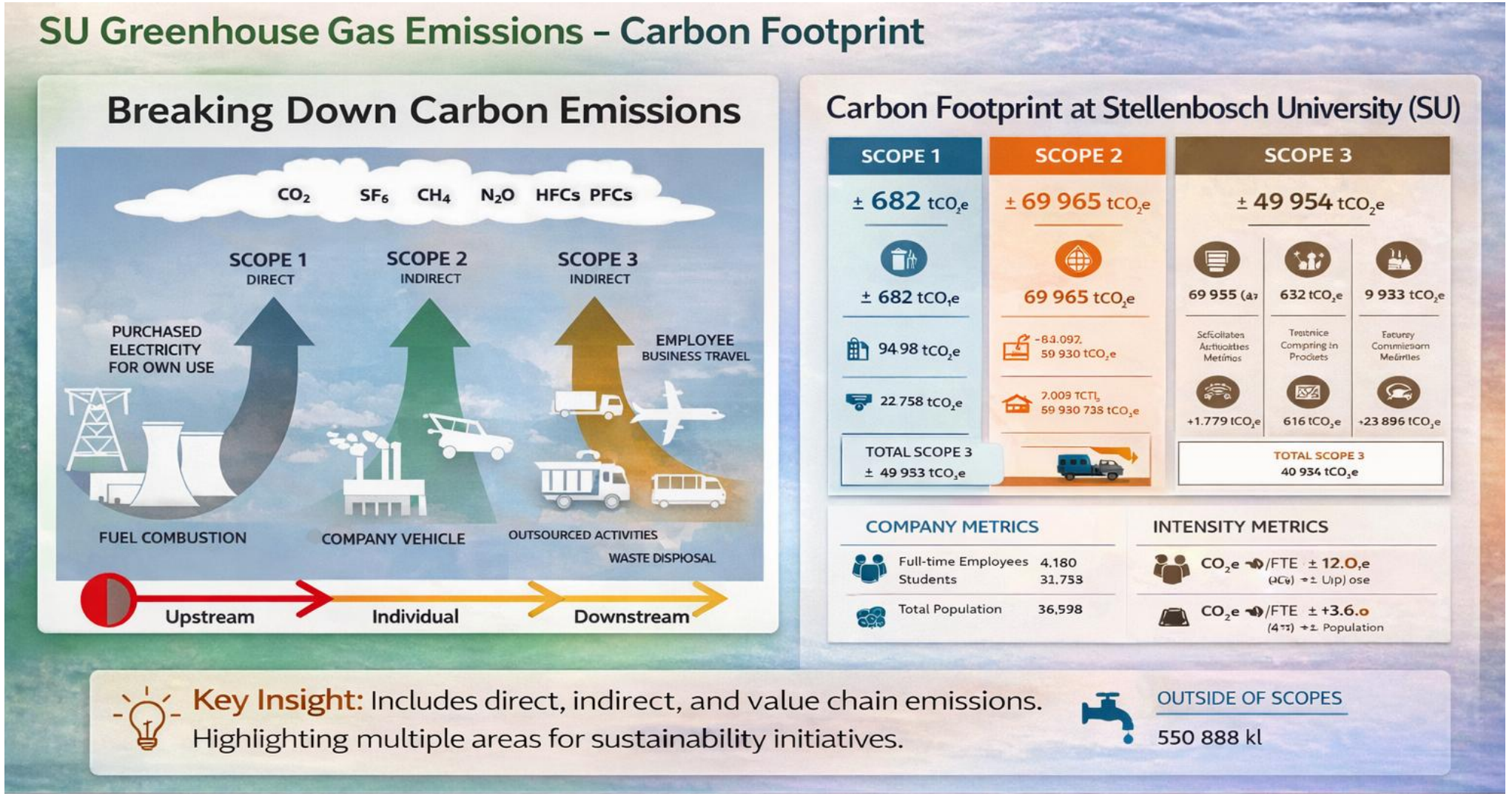
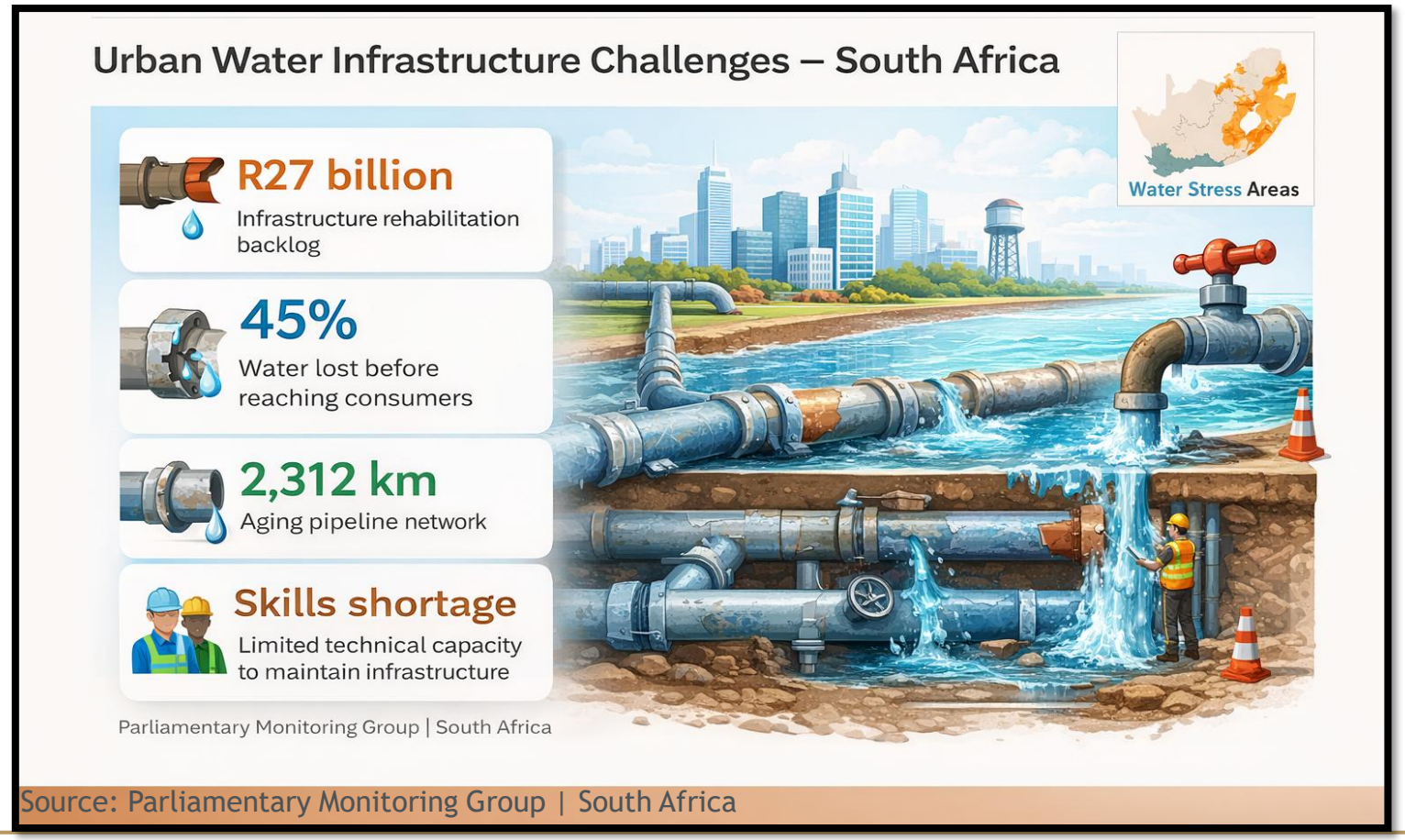
Environmental Sustainability impact:Water has a carbon footprint



Aging Infrastructure and High Water Loss

Water service delivery in Johannesburg, South Africa is constrained by:

- R27 billion infrastructure rehabilitation backlog
- High non-revenue water losses (~45%)
- Aging pipeline network (2,312 km of major water mains)
- Demand exceeding licensed supply from Rand Water
- Rapid population growth increasing system pressure
- Financial constraints affecting infrastructure maintenance
- Shortage of technical skills to maintain water systems



Source: Parliamentary Monitoring Group | South Africa

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Legislation Governing Water Services in SA

National Water Act (Act 36 of 1998)

Framework governing water resource manag
and service delivery in South Africa

Water Services Authority (WSA) – Key Roles

- **Responsibility:** Provide access to water services (directly or via Water Service Providers)
- **Monitoring:** Performance monitord by the Department of Water & Sanitation (DWS)
- **Functions:** Set service standards, manage water resources, ensure regulatory compliance
- **Accountability:** Ensure infrastructure delivery and equitable access to water services

Constitutional & Legal Framework

- **Section 27** of the Constitution: Right toaccess sufficient water
- **Compliance** with tariffs, service standards, and contractual obligations
- Monitoring and regulation of Water Service Providers (WSPs)

Key Insight: Legislation requires **accountability, compliance,** and **performance monitoring,** driving the need for **data-driven infrastructure** and **asset management systems.**

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Water Services Intermediaries

Water Services Intermediaries

Intermediaries are entities obligated to provide water services on behalf of an authority or local government, especially for housing complexes, farms, and businesses.

Key Aspects:

- **Compliance:** Must meet water quality standards (SANS 0241)
- **Contractual Basis:** Operate under strict contracts defined by a Model Water Service Contract
- **Oversight:** Municipalities monitor intermediaries closely

Model Contract Enforces Higher Standards

- ✓ Must meet **Water Quality** Standards (SANS 0241)
- ✓ Officials will closely monitor compliance and performance

Key Insight: Intermediaries must **comply** with stricter contractual standards and oversight to ensure water service quality.

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Water Optimization Strategy

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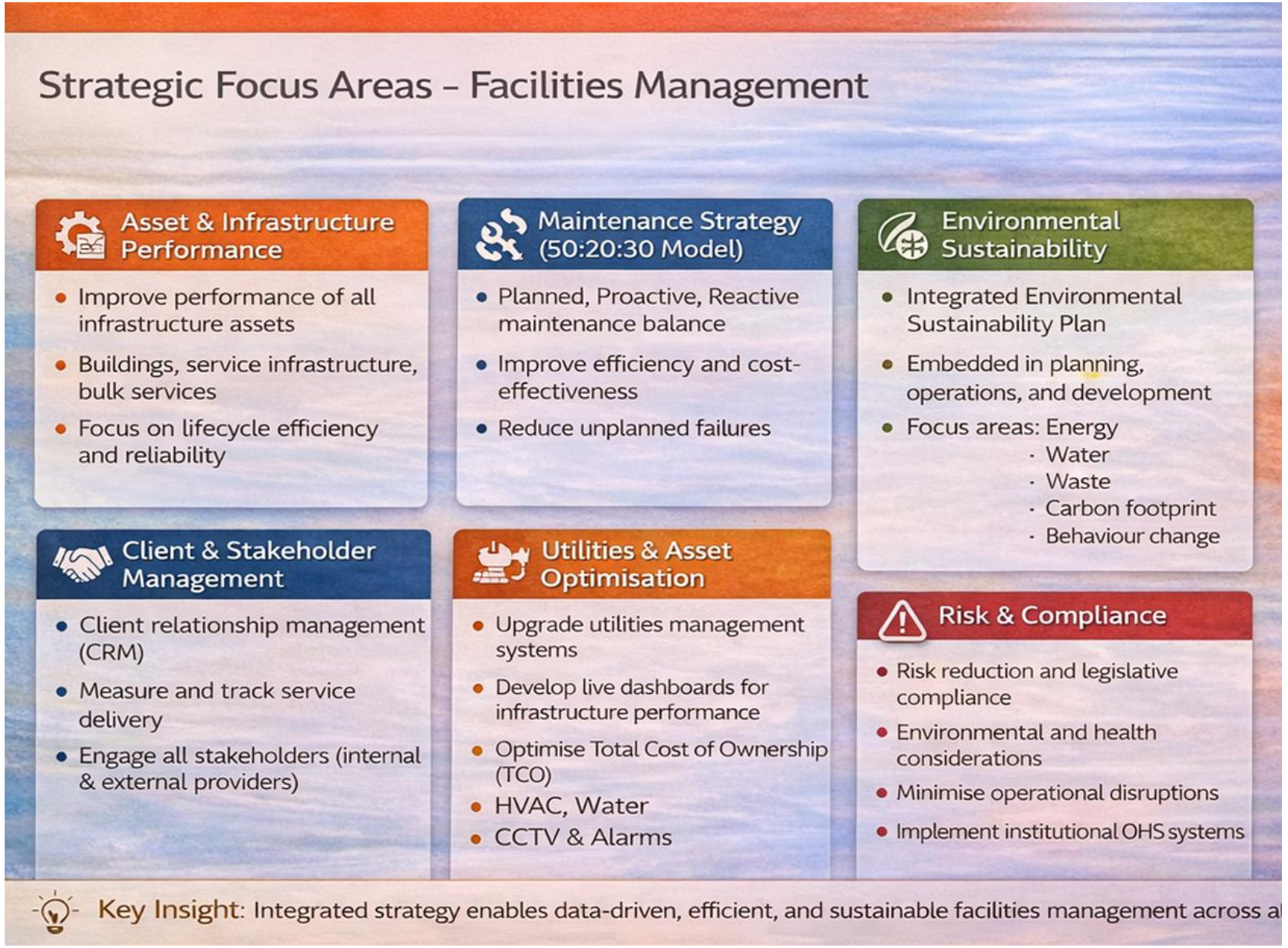

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Paradigm Shift in Institutional Decision Making

- Commitment to Sustainable Development
- Total Cost Ownership - Long Term View (30 – 50 years)
- Installation of a pipe ring main for future developments

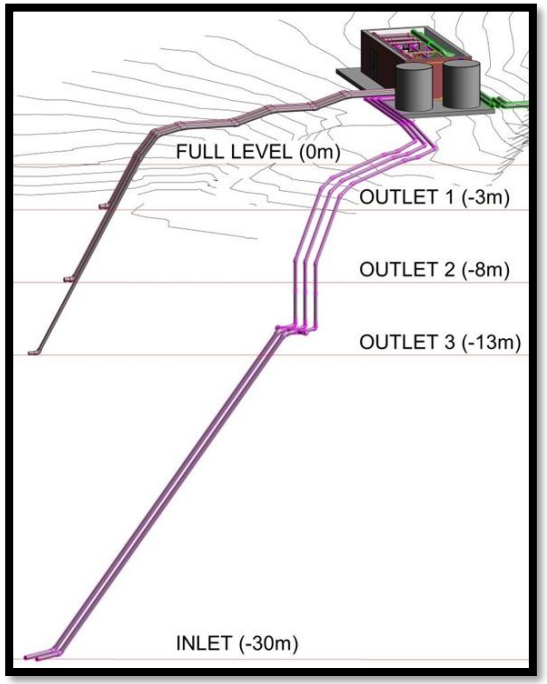
USB: Deep Lake Water Cooling Plant

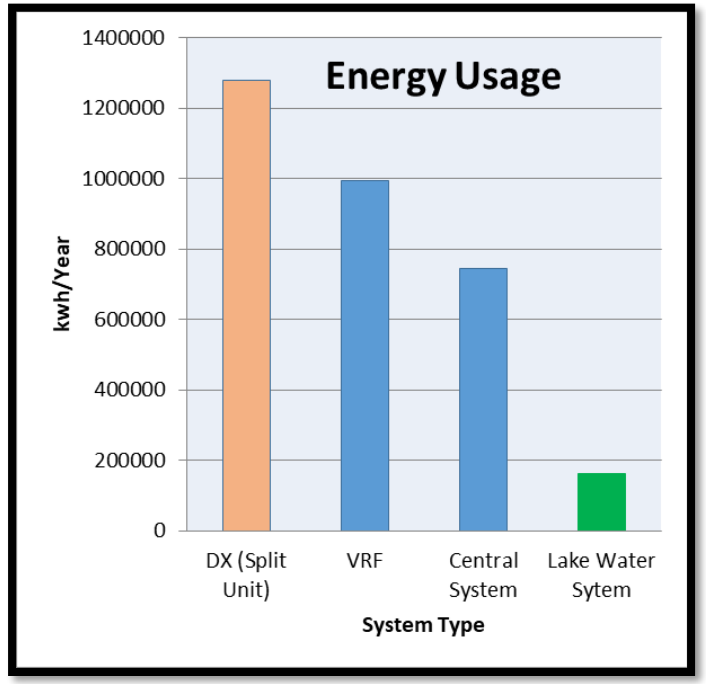
Requirements

- Scope and size of plant
- 4 buildings - 13 000 m² - 2,300 kW cooling / 900 kW heating.

Advantages:

- ✔ Large energy cost saving
- ✔ Reduced Total Cost of Ownership
- ✔ Smaller Chiller Plant (sized on heating)
- ✔ Plant Consolidated in One Space





University of Stellenbosch Business School		
Typical COP and Tons of CO_2 emitted		
13000m2 Complex		
System Type	**COP**	tCO_2e
DX (Split Unit)	2.5 - 3.5	1278
VRF	3.5 - 5.5	994
Central System	4.5 - 7.5	745
Lake Water Sytem	20 - 35	162

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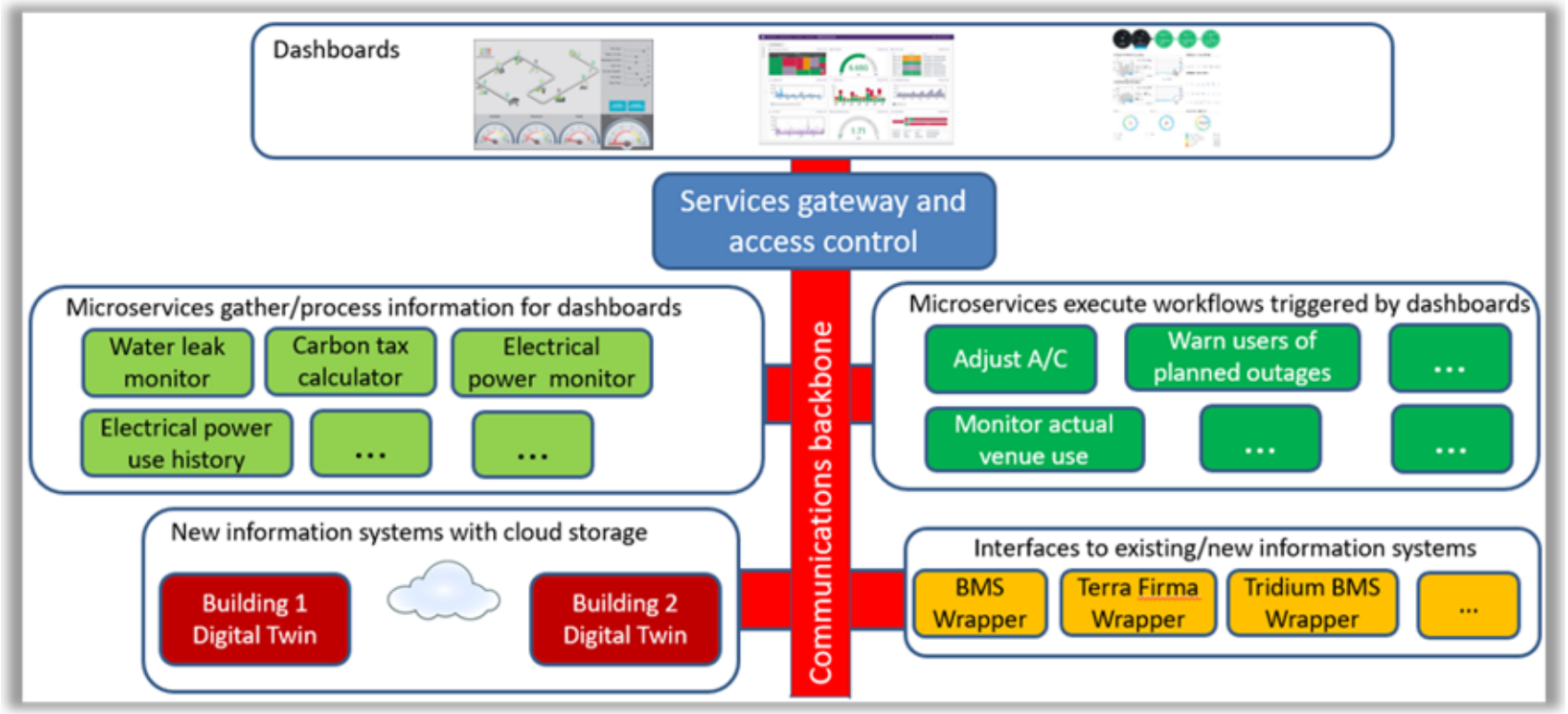
Transition to Digital Twin & Data Management



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Case Study : Stellenbosch University

505
Total Buildings

5392 ha
Total Land owned

805005m²
Total Space Managed

Transitioning to a Smart Campus

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Stellenbosch Campus	Tygerberg Campus
	
Bellville Campus	**Worcester Campus**
	

Campus	Erf Size (ha)	Building Size (SQM)
Stellenbosch & Mariendahl	796	634030
Bellville Business School	69	15169
Tygerberg	25	146293
Worcester	4	5757
Saldanha Military Academy	N/A	N/A
Brakkekuil	4498	3756

We cannot solve our problems with the same thinking we used when we created them."
Alber Einstein

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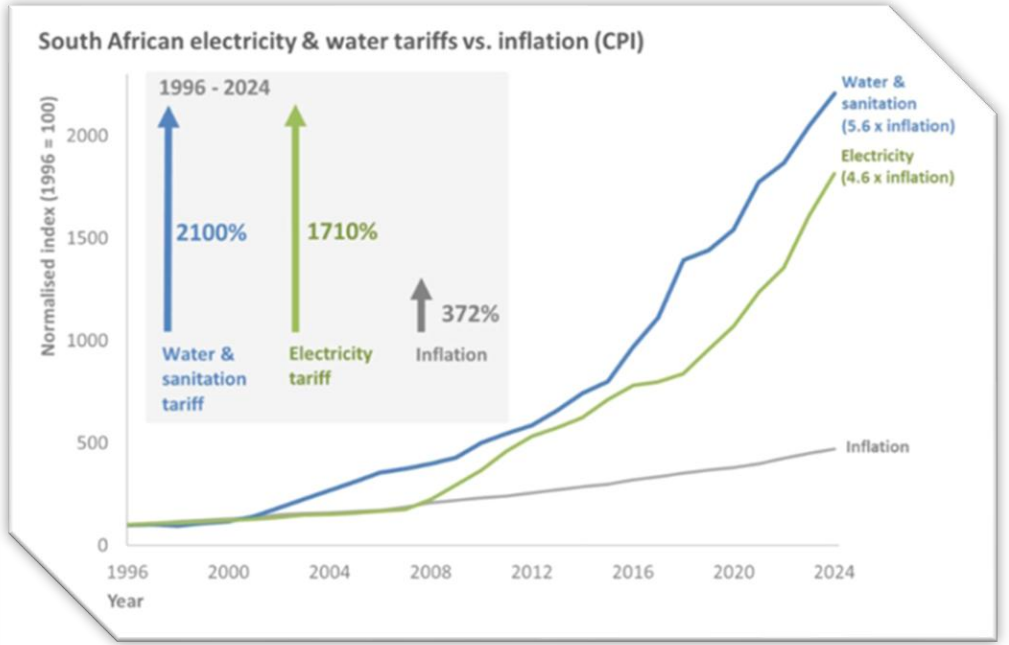
Water

Potable water usage despite of interventions that were implemented during the drought-resilience measures of the water crisis and thereafter



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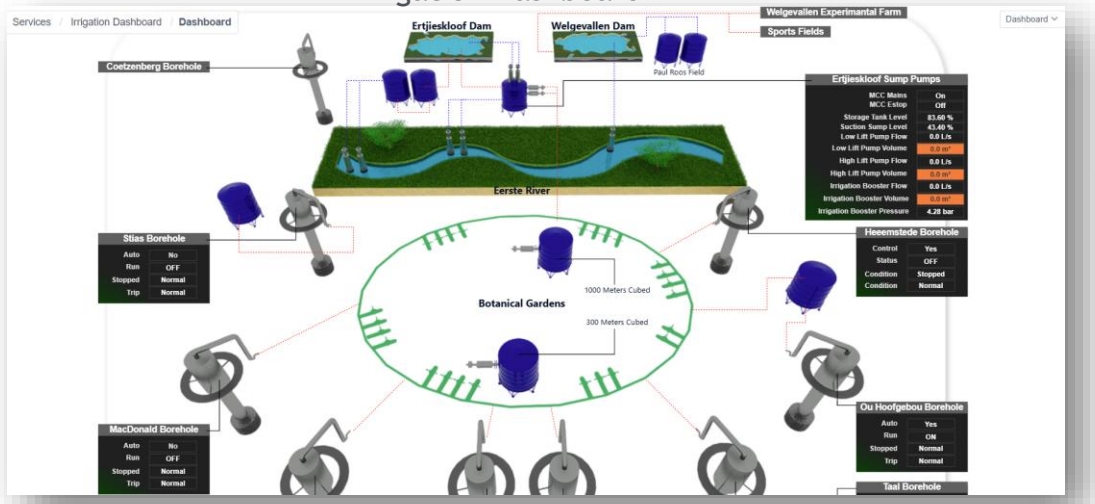
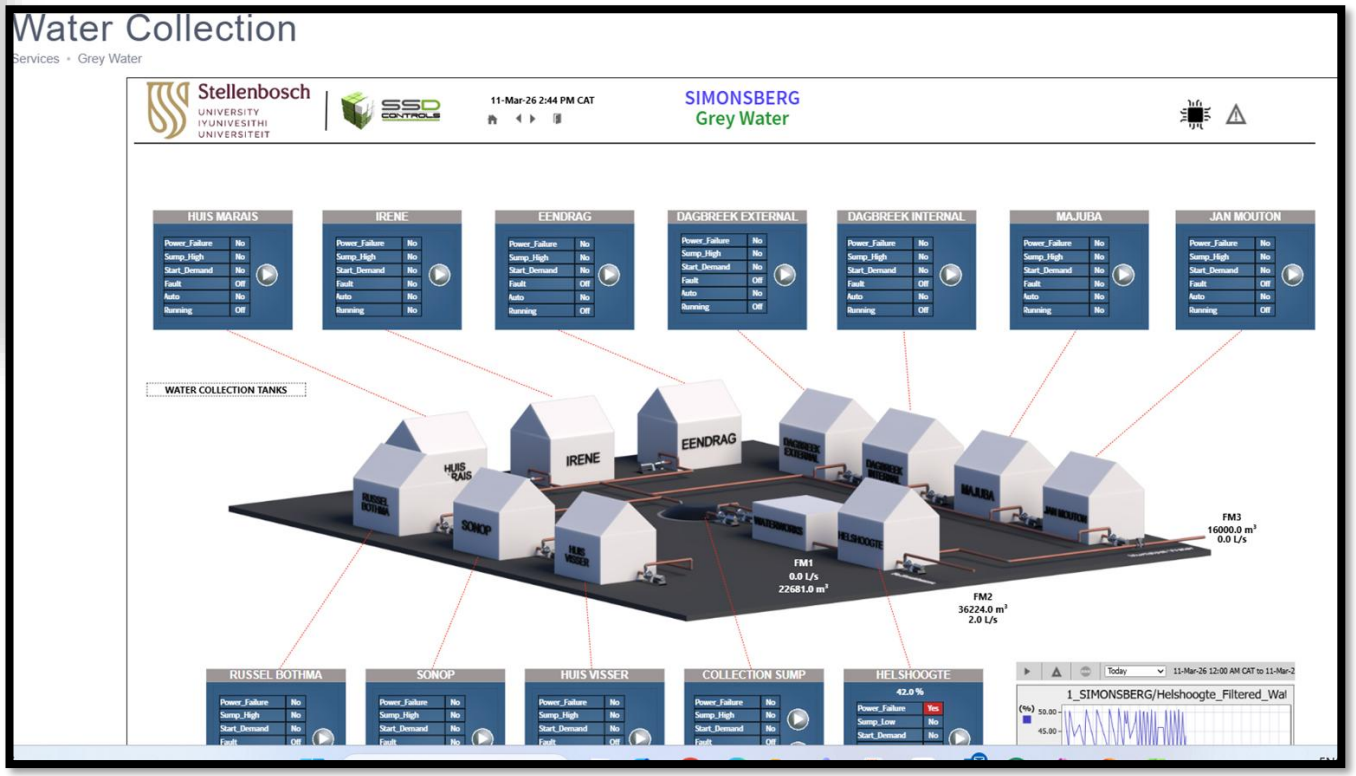
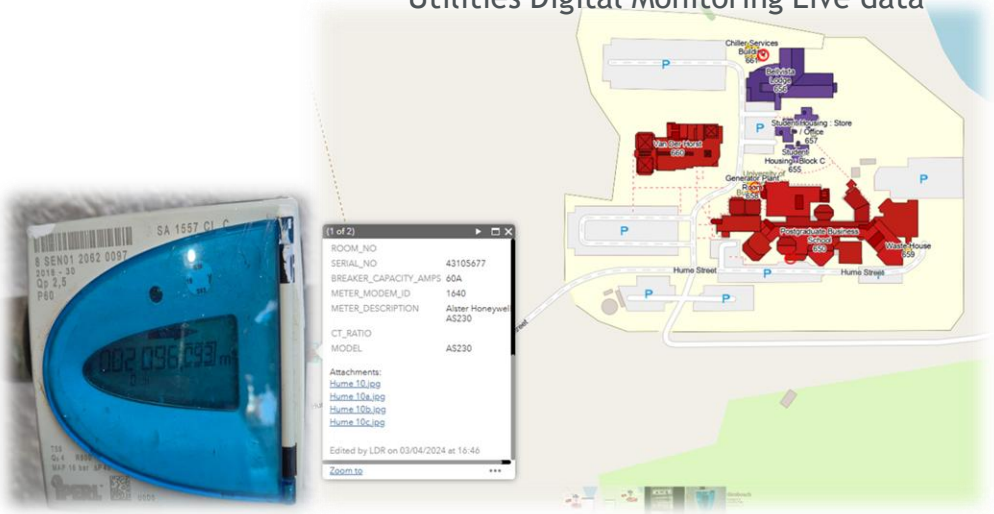
Irrigation Dashboard



Grey water System



Utilities Digital Monitoring Live data



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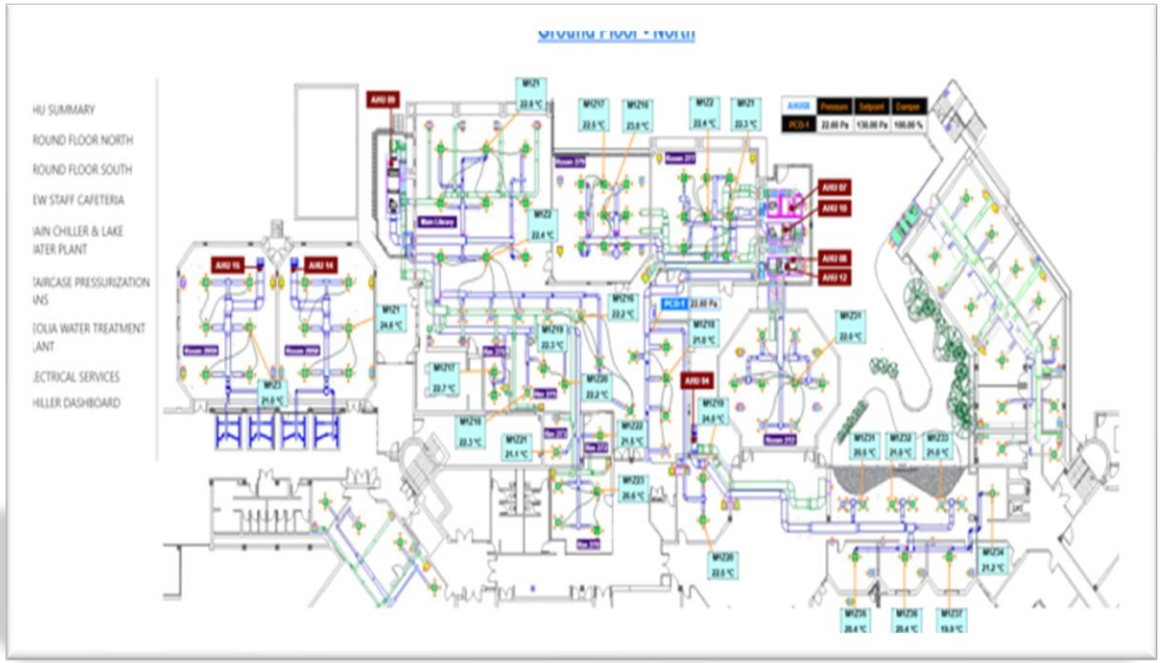
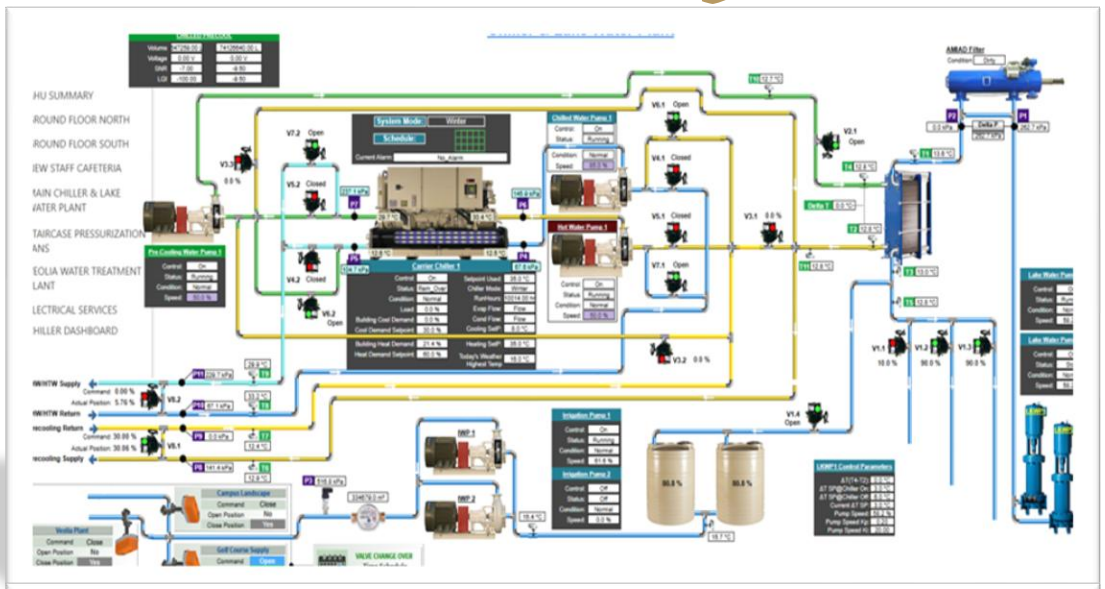
Building Management System (BMS) : Tridium
Monitoring and management of HVAC & Water systems





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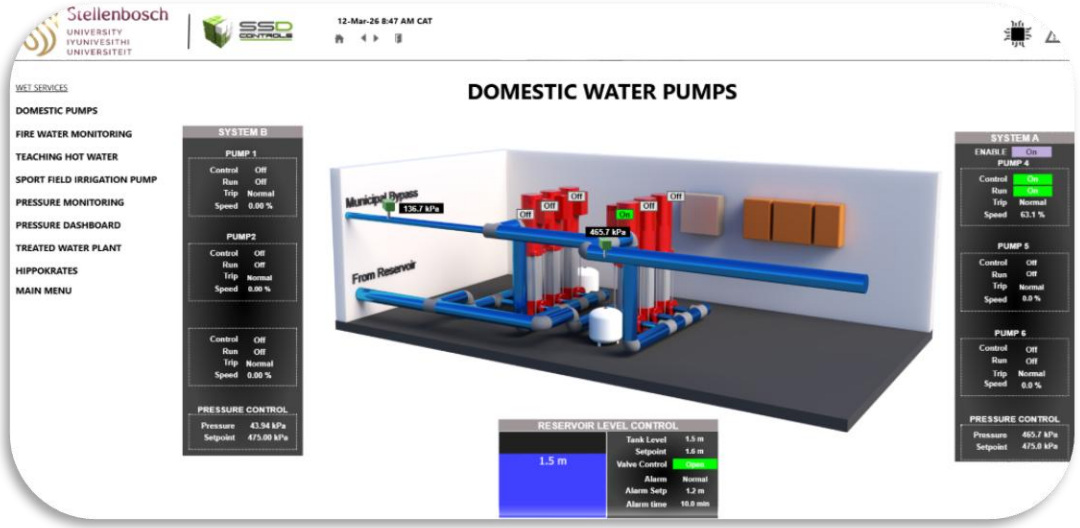

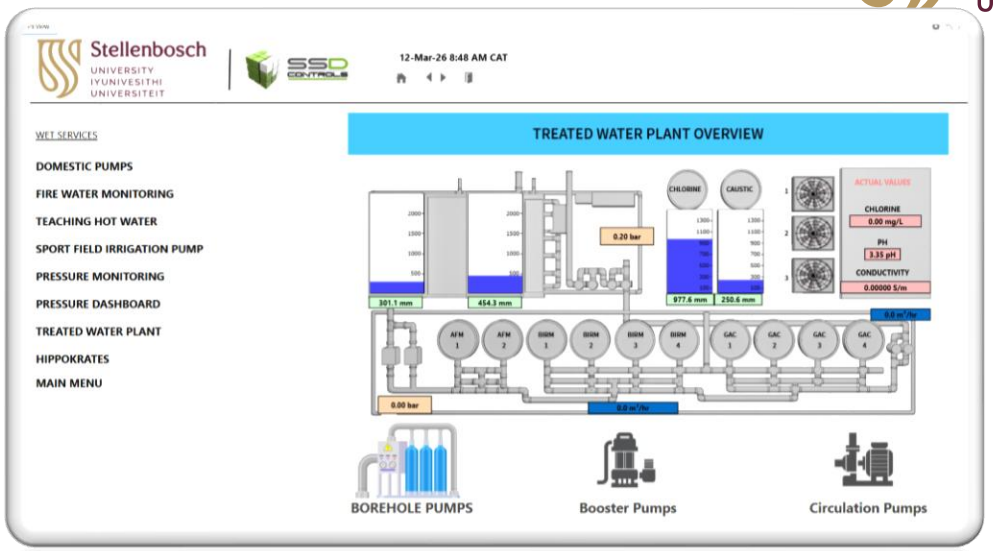

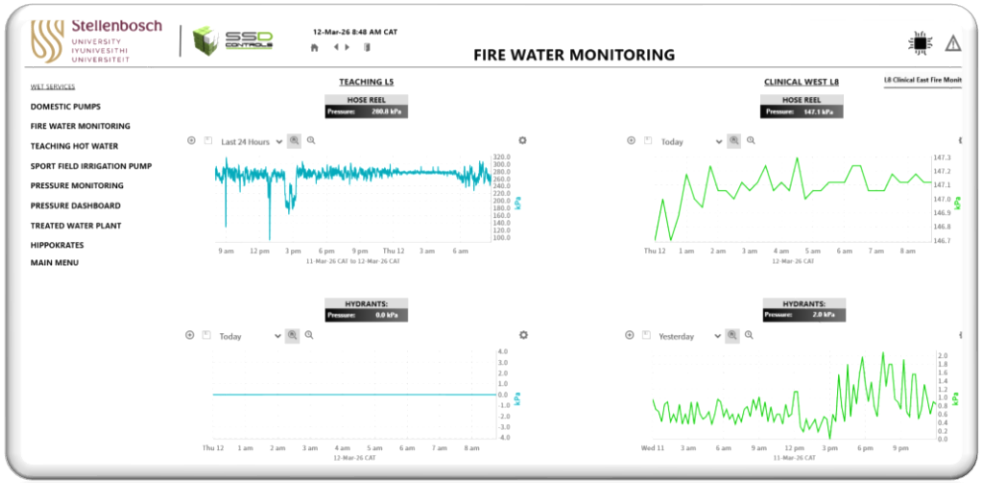

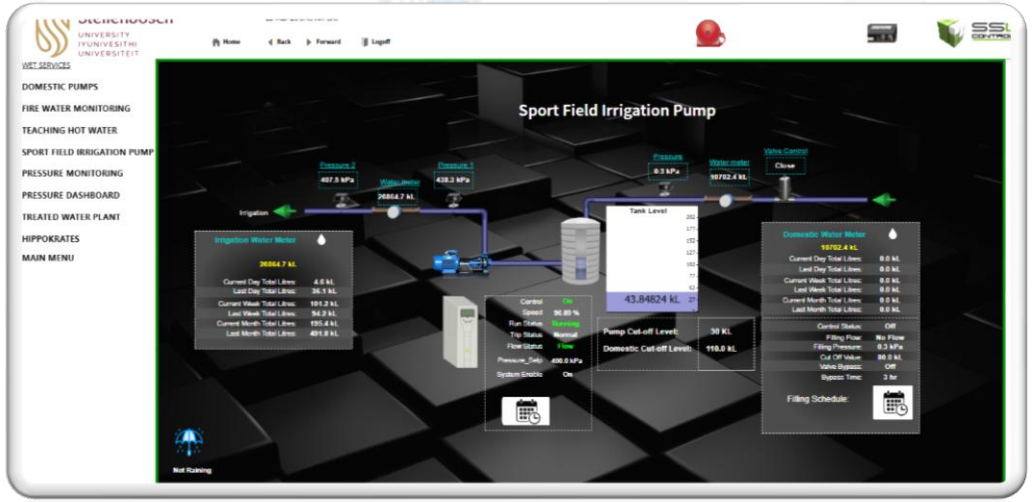

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Institutional Intervention

Build resilience against present and future environmental shocks

Optimise existing sources and reduce dependence on Municipal supply

UWC:
Installed new borehole systems with tanks to supply water to campus

NWU:
Digital live metering system
New tanks to build

CPUT:
On site grey water retention and irrigation system'

UFS:
Digital live metering system
Grey water system

- Grey water supply from treated wastewater pipe linked for irrigation water. (off potable and reduced cost)

Optimising Sustainable Water Supply Resources Across Western Cape Universities

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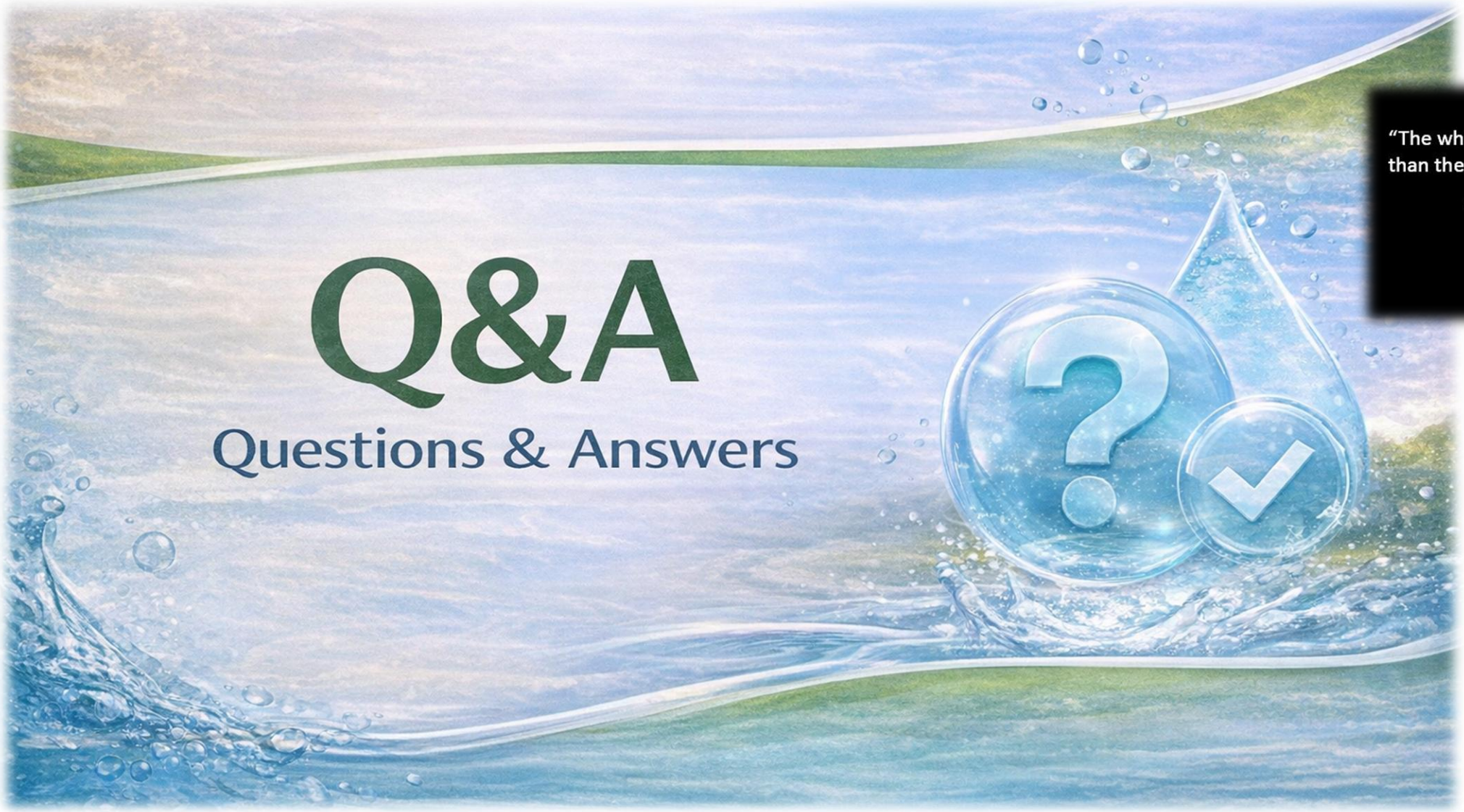

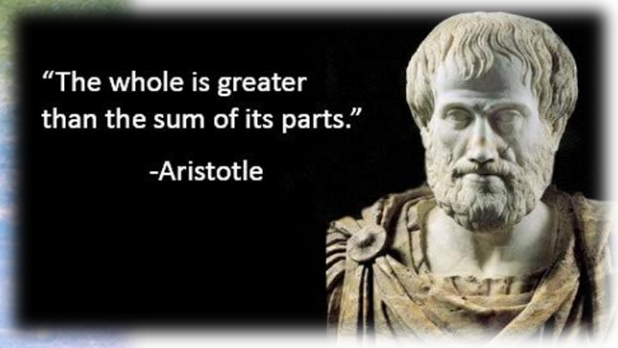

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Thank you
Enkosi
Dankie

Photo by Stefan Els