



public works

Department:
Public Works
REPUBLIC OF SOUTH AFRICA

Reducing the State's Carbon Footprint



Department Of Public Works
Green Building Unit

The Role of Public Works

The Department of Public Works, is the custodian of all state-owned property and represents the largest property portfolio in the country.

Public Works therefore bears the responsibility of addressing the need to bring the consumption of natural resources to within the 'carrying capacity' of the planet, while stimulating the development of the Green Economy.

Portfolio Overview

Table 1.1 Total portfolio

	Land parcels	Buildings & Improvements	Assets Under Construction	TOTAL
Count	31 146	92 593	-	N/a
Extent (millions)	5.5 hectares	36.9 m ²	-	N/a
Value	R48.9 B	R54.7 B	R8.7 B	R112.3 B

Table 1.2 Land Parcels by Zoning Type

Type	Count	Extent (hectares)	Value R mil
Agriculture	3 387	1.6 million	9 154
Education	5	1 550	4
Industrial	68	2 199	113
Residential	5 107	168 479	3 911
Specialised	22 579	3.7 million	35 763
Total			48 945

Based on 2016-2017 Annual Report

Establishment of the Green Building Unit

The Green Building Unit was established in 2015 to make a significant impact on the sustainability of the State's property portfolio in support of South Africa's NDC's and in terms of the Paris Agreement, the National Development Plan and global Sustainable Development Goals.

Rationale

Through the development of the Green Building Policy and its implementation, the Green Building Unit will:

- Implement resource efficiency across the existing property portfolio
- Support the sustainable development of new buildings and refurbishments in the built environment through Green Building Lifecycle Management.

Principles of the Green Building Policy

- Leadership;
- Energy, water and waste management;
- Indoor environmental quality and comfort;
- Product and materials management;
- Promotion of Indigenous Knowledge Systems (IKS);
- Acceptable horticulture and landscaping construction practices;
- Green Procurement; and
- Monitoring and reporting.

Inter-Governmental Co-operation

- The Green Building Unit works closely with the Departments of Environmental Affairs (DEA), Energy (DoE), Water and Sanitation (DWS) in strategic policy alignment, planning and implementation of Greening initiatives.
- Enterprise Development with Department of Trade and industry (DTI) on an industrialisation potential and localisation program
- Technology innovation discussions with the Department of Science & Technology
- The Unit is supported by entities and international partners i.e. German International Cooperation (GIZ), Danish Cooperation, DBSA, GTAC and others

Short term outputs

- Reduced energy, water and waste usage and cost by at least 10% across DPW property portfolio
- Free Up Capex and Opex Budgets
- Embed sustainable building and refurbishment practice and green facilities management

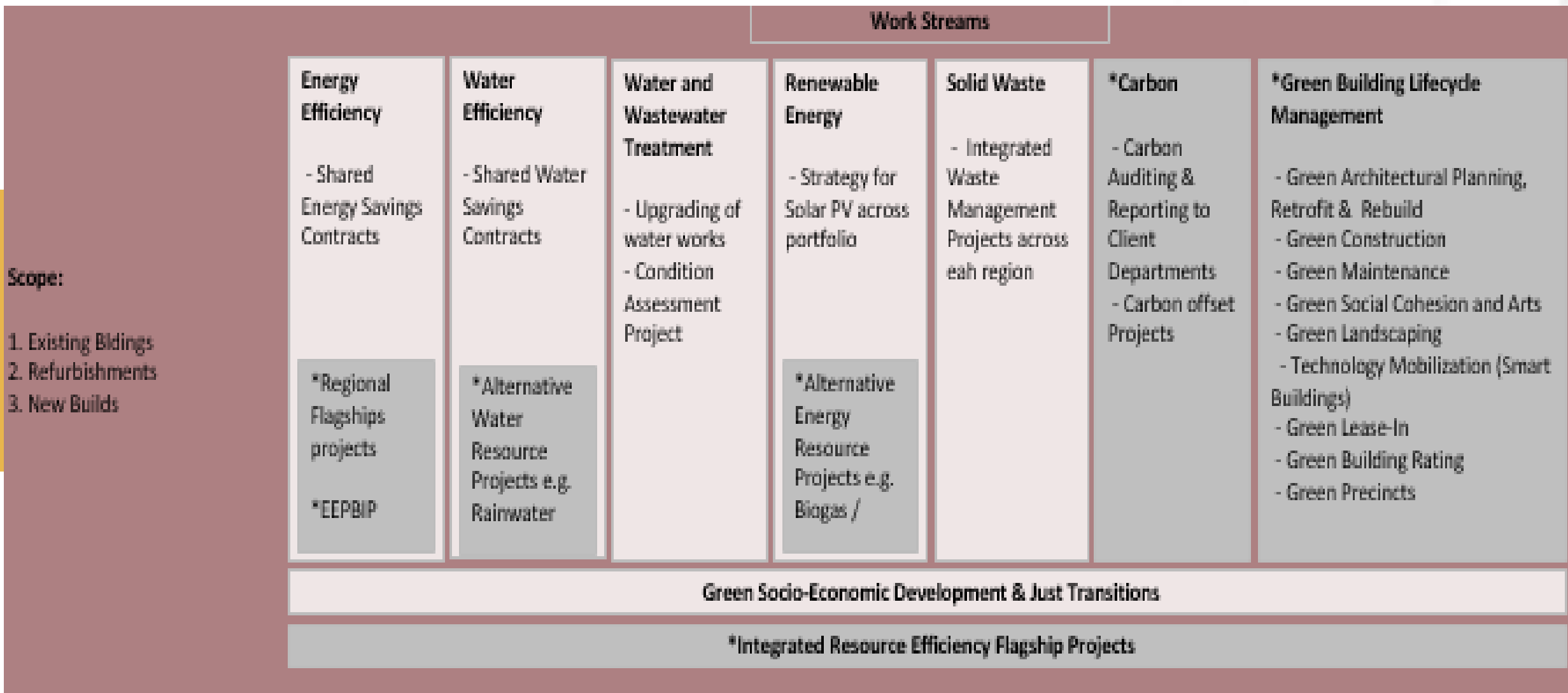
Medium term outcomes

- Reduced resource usage for client departments, communities and the country.
- Reduced financial burden on the national fiscus
- Creation of Green Jobs & stimulation of Green Economic Growth
- Development of new skills
- Climate change awareness and social orientation towards sustainability
- Broad adoption of alternative building technologies and practices
- Establishment of a Super ESCO within the DPW

Long term impacts

- Significant contribution to the reduction in GHG emissions
- Limit the impact of climate change through effective mitigation and adaptation
- Build sustainable communities
- Improved quality of life
- Catalyst for the circular economy
- Public Buildings that have a sense of place, nested in the culture of the region and foster national pride, cultural diversity, respect and reverence.

Workstreams



Snapshot of Achievements

- Green Building Policy and Framework adopted
- Development of Green Building Sector plan and Technical Committee incorporating National and Provincial Public Works
- Roll out of energy, water and waste projects across all regional portfolios
- Over 300 million kWh of energy saved during the 2016-2017 financial year
- Over 4 million kl of water saved in the same period
- Development of Norms and Standards for Construction of Green Buildings
- Solar PV strategy in development with DBSA

Renewable Energy Strategy

- Currently state-owned properties are fully dependent on fossil fuel energy supplied through the traditional electricity grid. This presents a serious risk in terms of maintaining operations at key facilities.
- Traditionally this risk is mitigated through the installation of diesel generators, with a further negative impact on carbon emissions.
- Public Works has commissioned DBSA to develop a renewable energy funding and delivery mechanism as part of creating a diversified energy mix and mitigating the above risks and impacts in state-owned properties
- The purpose of the mechanism is to attract local and international funders for renewable energy projects given the capital intensive nature of renewable energy

Biogas Focus

Recent research by GIZ, in partnership with DoE has revealed that the water supply chain has significant impacts on energy usage.

- The study revealed a number of key energy saving opportunities and viable potential in water and wastewater treatment plants.
- Potential energy savings include:
 - Pumps and pumping (Common potential ranges: 5% to 30%):
 - Waste water treatment (Compressed air and biological treatment up to 50%)
 - Energy and Heat Generation by CHP/Cogeneration; Wind, PV, Mini Gas Turbine (from 55 up to > 100%)
 - Lighting retrofit inside and outside (40 – 70 %)

DPW's Wastewater Treatment Works

- The National Department of Public Works owns and manages an estimate of 178 Wastewater Treatment Works in South Africa. Many of them are situated on, or close to, our borders.
- The Wastewater Treatment technologies range from Activated Sludge Treatment System, Biological Trickling Filtration, Wastewater Stabilisation Ponds, Rotating Biological Contactor, Lilliput Sewage Treatment System and Package Plant treatment system.
- The average sizes of the Wastewater Treatment Works systems are 74% for Micro (<0,5MI/d), 20% for Small (0,5-2MI/d) and 6% for Medium(>2-10MI/d) sizes.

Biogas Focus (continued)

Based on this study significant potential in the DCS portfolio exists as tabulated below;

Site	#	Category	Ave MI/day	Water (KL/month)	Estimated WW Output (KL/month)	Minimum		Maximum		Variance kWh	Variance Rand p.a.
						Estimated kWh per annum	Estimated Energy Cost (R/annum)	Estimated kWh per annum	Estimated Energy Cost (R/annum)		
Micro	132	<5MI/day	0.3	1,201,945	1,081,751	2,596,201	R 3,115,441.44	23,365,811	R 28,038,972.96	20,769,610	R 24,923,531.52
Small	36	0.5 - 2 MI/day	1	1,082,833	974,550	2,338,920	R 2,806,704.00	21,050,280	R 25,260,336.00	18,711,360	R 22,453,632.00
Medium	11	2 - 10 MI/day	5	1,624,250	1,461,825	3,508,380	R 4,210,056.00	31,575,420	R 37,890,504.00	28,067,040	R 33,680,448.00
TOTAL				3,909,028	3,518,126					67,548,010	R 81,057,611.52

Notes

Minimum Wastewater kWh/ML	200
Maximum Wastewater kWh/ML	1800
Estimated R/kWh	R 1.20
Wastewater output	90%

Thank you

