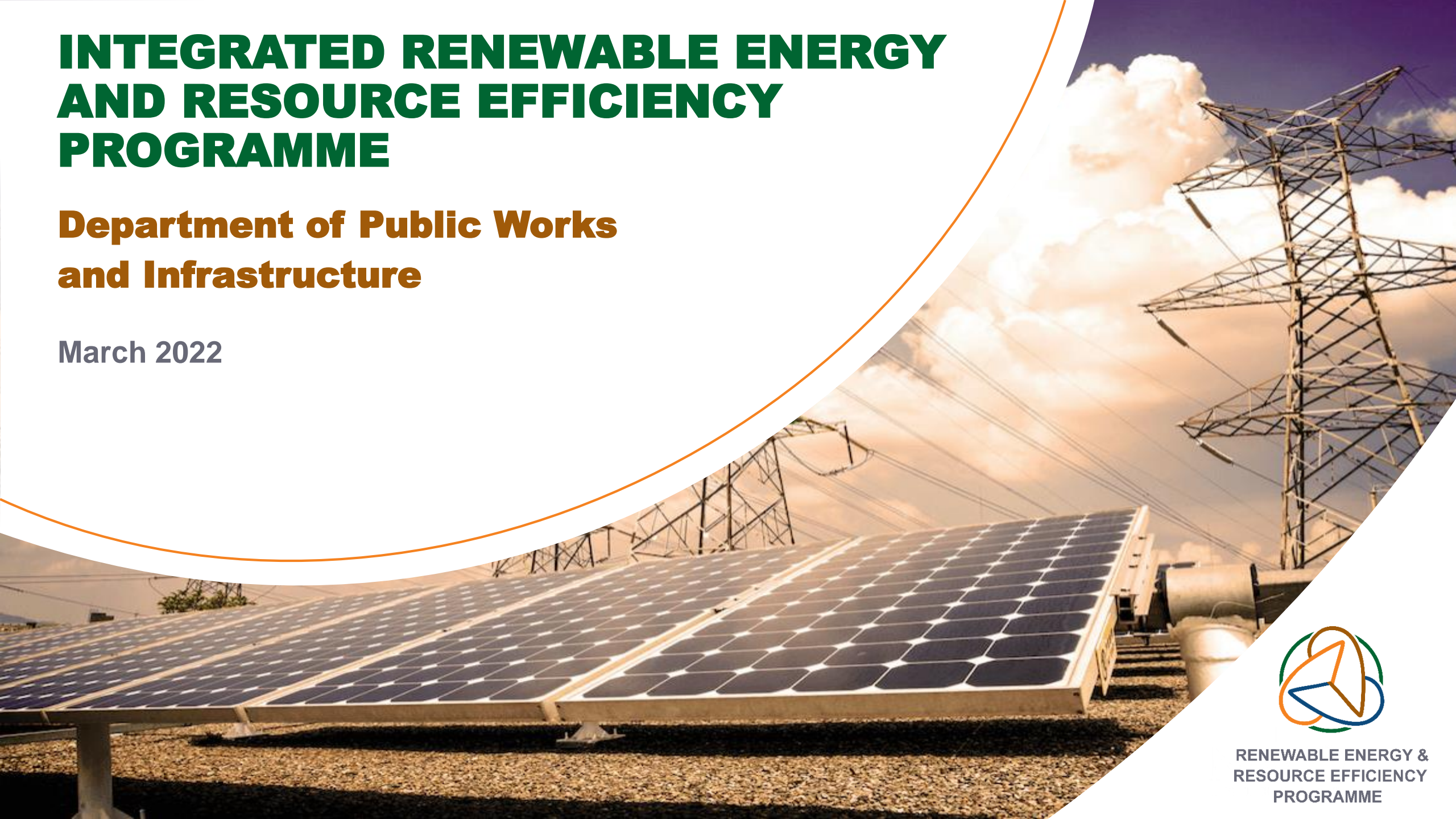


INTEGRATED RENEWABLE ENERGY AND RESOURCE EFFICIENCY PROGRAMME

**Department of Public Works
and Infrastructure**

March 2022



RENEWABLE ENERGY &
RESOURCE EFFICIENCY
PROGRAMME

OVERVIEW OF THE DEPARTMENT AND GOVERNMENTS UTILITIES CONSUMPTION

Context

1. The Department of Public Works and Infrastructure (DPWI) is the **largest property owner** in South Africa covering **37 million square meters** (sqm) over more than **92,000 facilities**.



2. The DPWI's 10.1 million in office space accounts for **35%** of the total **office space** in South Africa.



3. Annually, the DPWI property portfolio consumes / produces approximately:

4 021 Gigawatt hours (GWh) of electricity;



39 million kiloliters of water; and



822 thousand tons of waste.

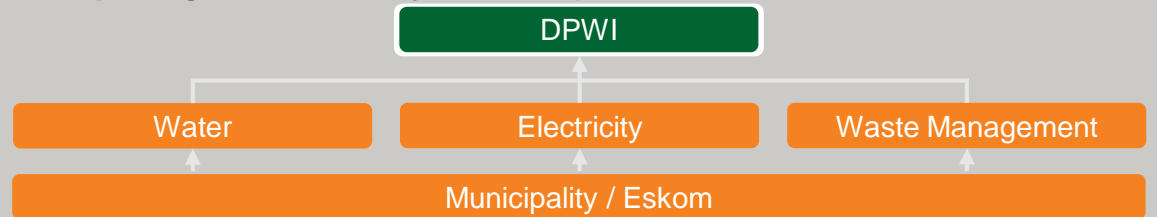


4. This equates annually to between **R6,0 billion** and **R8,0 billion** in water, electricity and waste expenditure.



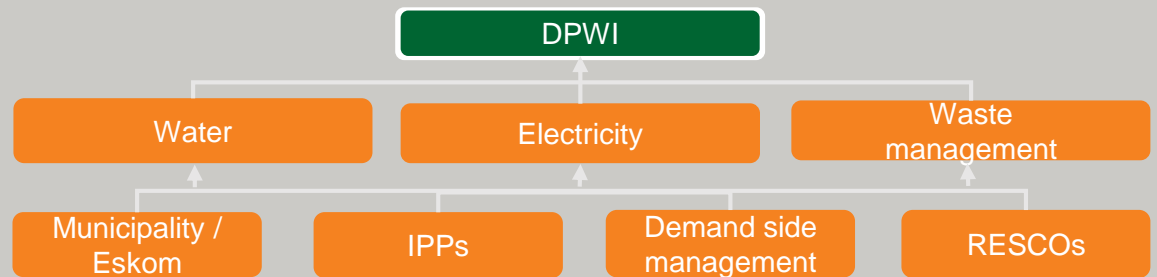
Review of business model

5. **Historically** the DPWI has primarily **sourced** its **utilities** from a **single source** with limited demand side interventions. This has **not always** been the **most economical, environmentally sustainable and secure supply option** – **impacting service delivery** of User Departments

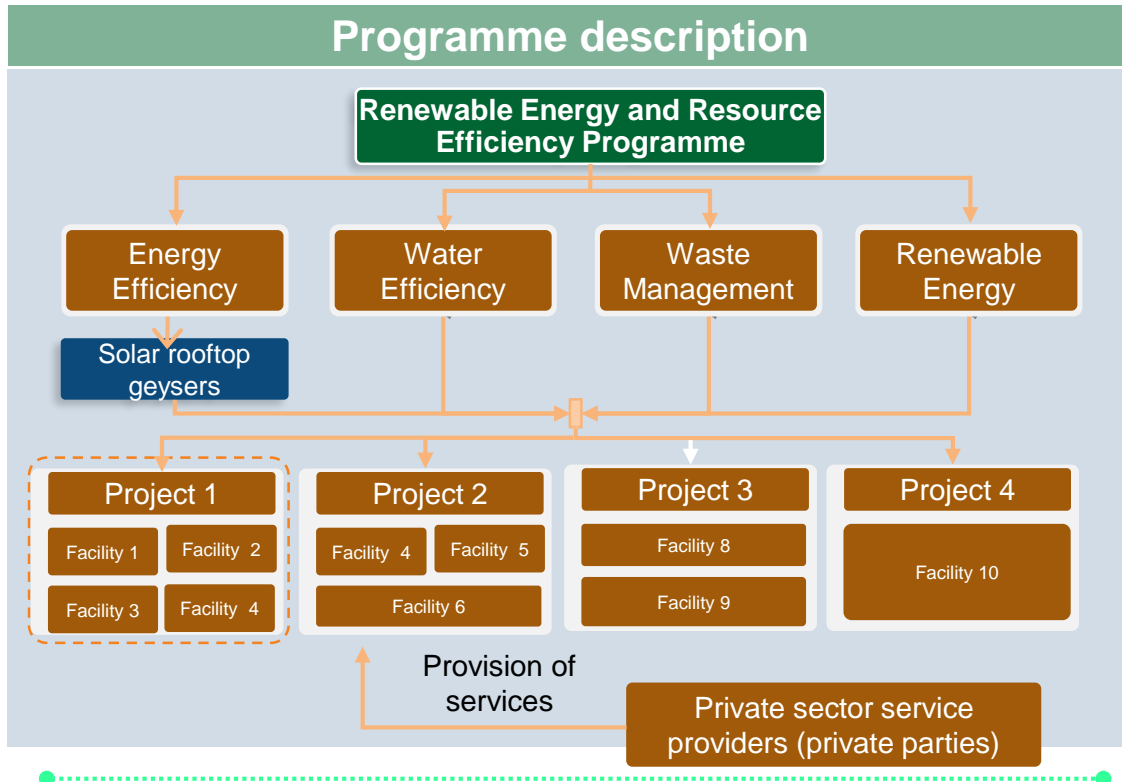


6. A number of factors have resulted in the DPWI reviewing the current approach to utilities consumption and utilities management including the

- **Decrease in the cost of renewable energy and resource efficiency options,**
- **Security of electricity and water supply** concerns
- **Pressure on waste landfills,**
- South Africa's aims to be a **net zero** society by 2050
- South Africa's overall **green economy strategy**, etc.



OVERVIEW OF THE INTEGRATED RENEWABLE ENERGY AND RESOURCE EFFICIENCY PROGRAMME (iREREP)



1. The DPWI, supported by the Government Technical Advisory Centre (GTAC) has developed a programme that is aimed at rolling out **energy efficiency (including solar geysers), water efficiency, alternative waste management and embedded solar PV, and other renewable energy options** at its property portfolio.



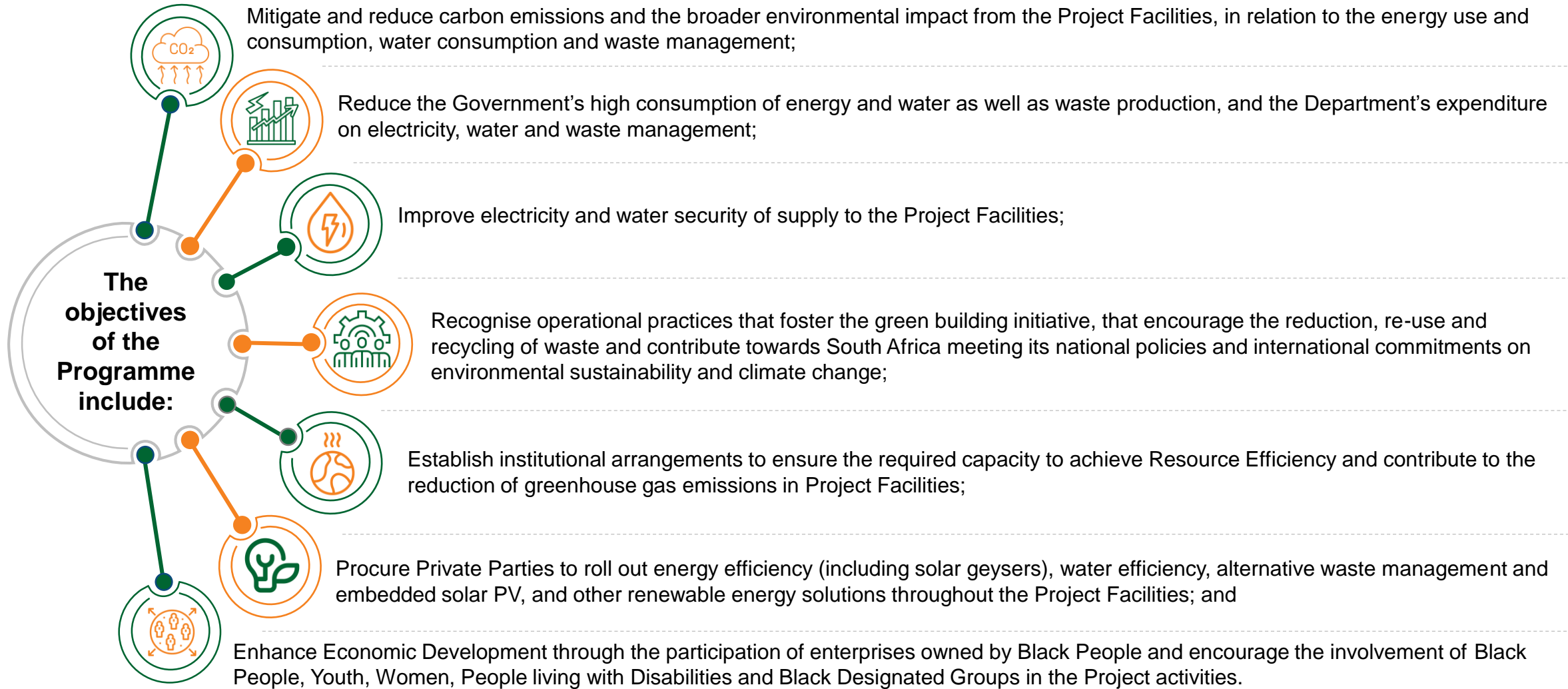
Programme value and impact

2. The Programme will be the **largest programme for the procurement of renewable energy and resource efficiency** for public facilities, with **up to 320MW** of renewable energy procured per annum, attracting private sector capital investment of between an **initial R120 – 253bn in the period to 2050**.

3. The Programme will create a **high number of green jobs** over the **30-year period**, with an estimated **146 000 jobs**, as well as:

- **Upskilling 117 000** people
- Mobilising **R120 – 253bn** in funding
- Reducing **GHG emissions** by **2,8Mt** per annum

PROGRAMME OBJECTIVES



The contract entities of the Project Agreement are indicated as the Department and the Private Party.

ELEMENTS OF THE PROGRAMME



Overview and Elements of the Programme include:

Renewable Energy and Energy Security

- Solutions involving:
 - Solar PV (roof-top, carport, ground-mounted and building-integrated)
 - Solar Thermal Energy
 - Biomass
 - Wind Energy
 - Hydropower
 - Geothermal Energy
 - Ocean Energy
 - Fuel Cell
 - Energy Storage
 - Electric Vehicle Charging Infrastructure.

Energy Efficiency

- Solution to:
 - Improve thermal performances of building envelope
 - Improve HVAC and refrigeration system performance
 - Reduce energy consumption to produce hot water
 - Improve lighting system efficiency
 - Improve pumps and motors efficiency
 - Reduce electricity consumption via monitoring and control systems
 - Improve efficiency of electric system
 - Improve performance of steam production and steam network
 - Improvement of general process equipment
 - Improvement of special process equipment
 - Improve energy efficiency through integrated design
 - Utilization of waste heat.

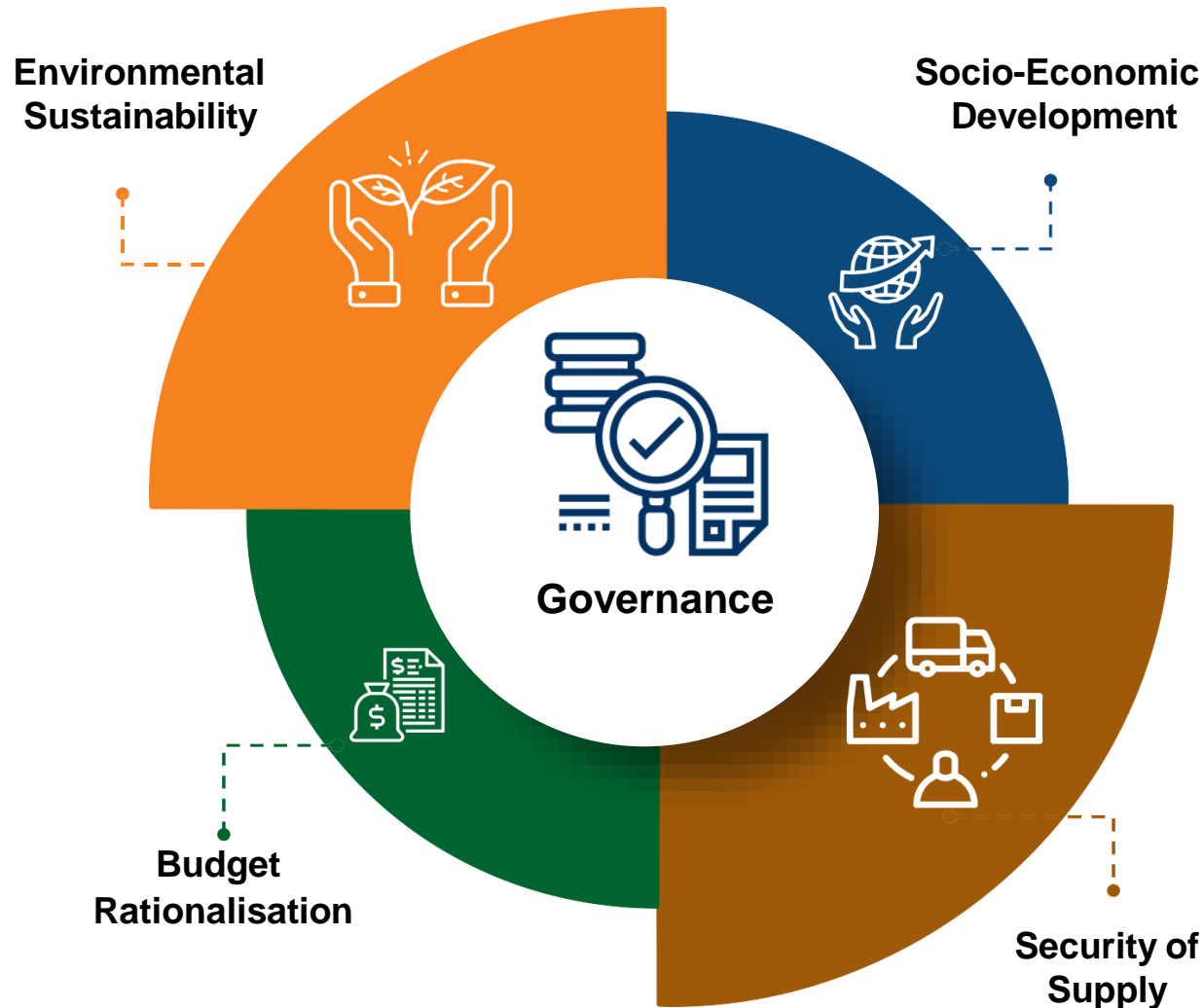
Water Efficiency

- Solutions offering
 - Leak detection
 - Water Efficiency systems
 - Water efficient appliances
 - Low-flow and water efficient dispenser
 - Water harvesting
 - Water treatment
 - Automatic control and sensor systems
 - Steam system retrofits
 - Improved landscaping and irrigation

Alternative Waste Management

- The basic principles of Waste Reduction, Re-use and Recycling will be introduced.
- Solutions may include:
 - Awareness campaigns to reduce waste
 - Sorting of waste
 - Recycling
 - Waste-to-energy initiatives (anaerobic digestion; composting/organic waste, pyrolysis, gasification).
- These principles have to be introduced through Waste Management training and awareness to change the attitude of the User Department staff and will assist in the minimising of waste volumes to be disposed of at landfills, thereby diverting waste from landfilling.

KEY IREREP PROGRAMMATIC THEMES



- The programme is intended to be a large contributor to the governments National Economic recovery plan.

- The Programme is based on 5 Key Themes:

Centralised Governance

- Programme implemented through centralised office in accordance with international best practice.

Security of Supply

- Through lowering resource demand, improving resource efficiency and promoting alternative sources of utilities governance.

Budget Rationalisation

- Reduction in government spending towards utilities.

Socio-Economic Development

- Contribution to small business development, job creation and GDP.

Environmental Sustainability

- Reduction of energy and water consumption intensity and emissions reduction.

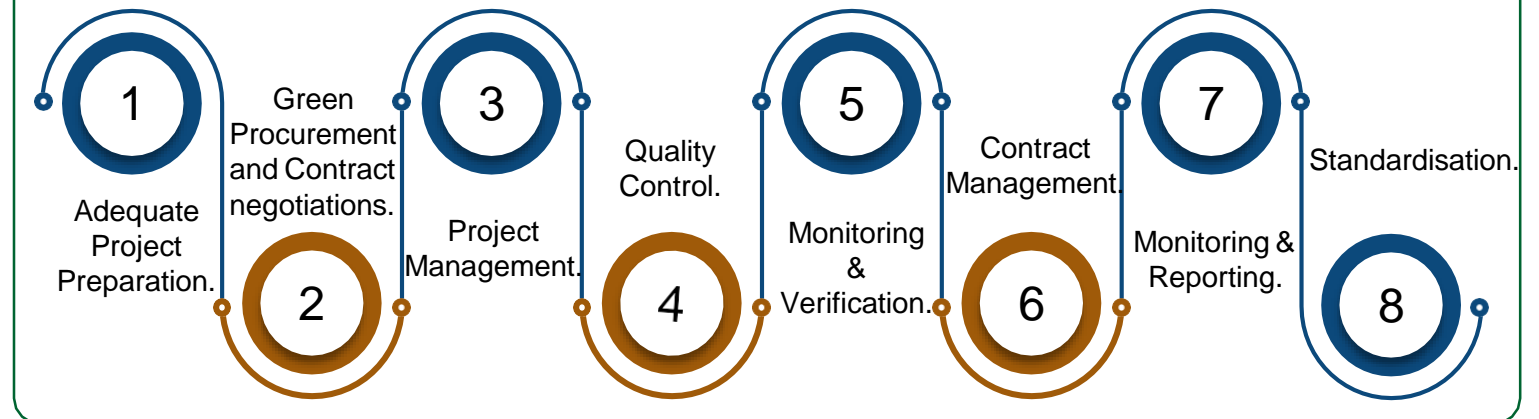
KEY THEME 1: GOVERNANCE

- Programme will be implemented through a dedicated institutional mechanism, the Innovation, Project Preparation and Deliver Office (IPPDO).
- The IPPDO will:
 - Facilitate easy access to public sector facilities.
 - Reduce transaction costs for small projects through bundling them.
 - Standardise guidelines for EPC and M&V templates.
 - Improve the contractual frameworks and reliability of the project implementation process.
 - Create an enabling environment for tailored and affordable project financing.
- The institutional model is based on international best practice.
- The IPPDO will bundle specific projects and leverage private sector expertise in delivering renewable energy and resource efficiency.

Project delivery based on a bundled approach for:



Institutional functions:



KEY THEME 2 : SECURITY OF SUPPLY



Resource efficiency

- Lowering resource demand and improving resource efficiency.
- Promoting alternative sources of water and energy.



Energy security

- Improved building design and system specification.
- Standard and deep retrofits.
- Existing Building Commissioning.



Water security

- Reduction in potable water demand.
- Provision of efficient sanitary fitting, rainwater collection and water recycling systems.
- Water leak detection and prevention.
- Improved water usage monitoring.



Alternative supply sources

- Generating energy from renewable sources.
- Demand-side management as the first source of supply.
- Rainwater harvesting.
- Reuse of materials.

KEY THEME 3 : BUDGET RATIONALISATION



Budget sustainability

- Elimination of current government utilities overdraft.
- Savings for government in excess of R401bn by 2050.
- Government savings can be reallocated to other government priorities.



Self funding

- No additional budget commitments by User Departments.
- Current utility budgets used to procure affordable and value for money utilities.
- Self funding mechanism.



Unlock private sector funding

- PPP procurement method where private party is paid on outcomes.
- Unlock private sector funding.
- narrowing the funding gap.



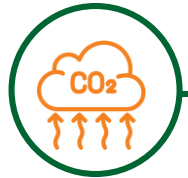
Risk shifting

- Improved risk allocation framework.
- Risks transferred/retained by the party best suited to manage risks through PPP.
- Allow DPWI and User Departments to focus on its core mandate of service delivery.

KEY THEME 4 : ENVIRONMENTAL SUSTAINABILITY



Reduction of energy use intensity of between **22%** and **45%**.



CO₂ and other GHG emission reduced **54.5Mt** by 2050.



Water use intensity reduction of between **30%** and **55%**.



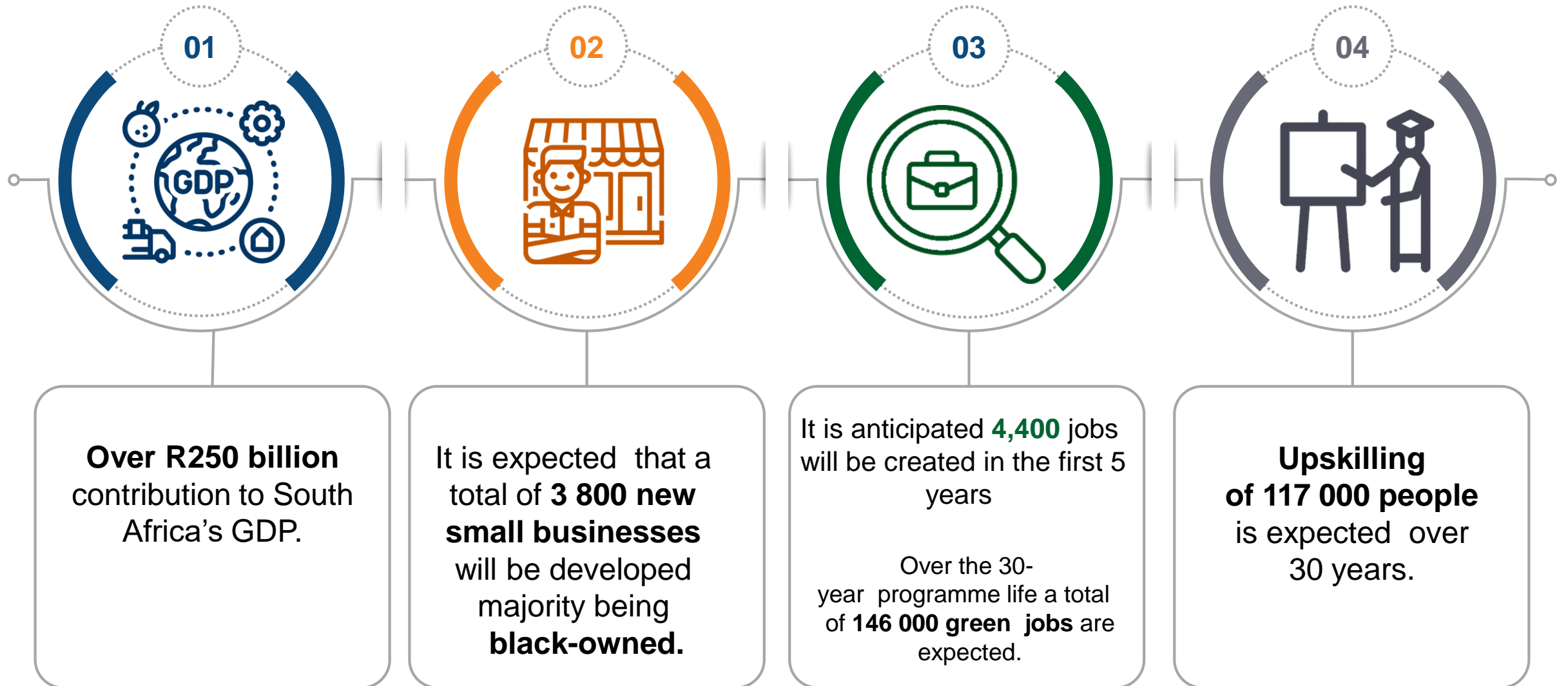
Reduce waste and divert **50%** of current waste from landfill sites. Save 12m tons by **2050**.



Reduce waste costs by **50%**.





KEY THEME 5 : SOCIO-ECONOMIC DEVELOPMENT





SOCIO ECONOMIC DEVELOPMENT ELEMENTS


The Department has recognised the following economic development elements, which will be used in shaping the design of the programme from time to time.


 Local Content, which requires the utilisation of South African resources in the development, completion and implementation of Projects under the programme. It is imperative to the Department that enterprises participating in the programme use materials and equipment that are sourced and/or manufactured from South Africa. In addition, to stimulating economic activity in the manufacturing sector, Local Content offers the added benefits of job creation, skills improvement and has a positive impact on the country's balance of payments.


 Job creation, which places emphasis on jobs for citizens, black people, youth, women, people with disabilities and those who reside in the local communities surrounding the project sites.

 Ownership, which requires the meaningful participation of historically disadvantaged citizens and marginalised regions in the shareholding of project companies.

 Management control, which seeks to encourage the participation of black people in the management of the project companies.

 Skills development, which seeks to ensure skills development for black people, youth, women and people with disabilities and skills transfer and upskilling of existing department staff and the staff of user departments.

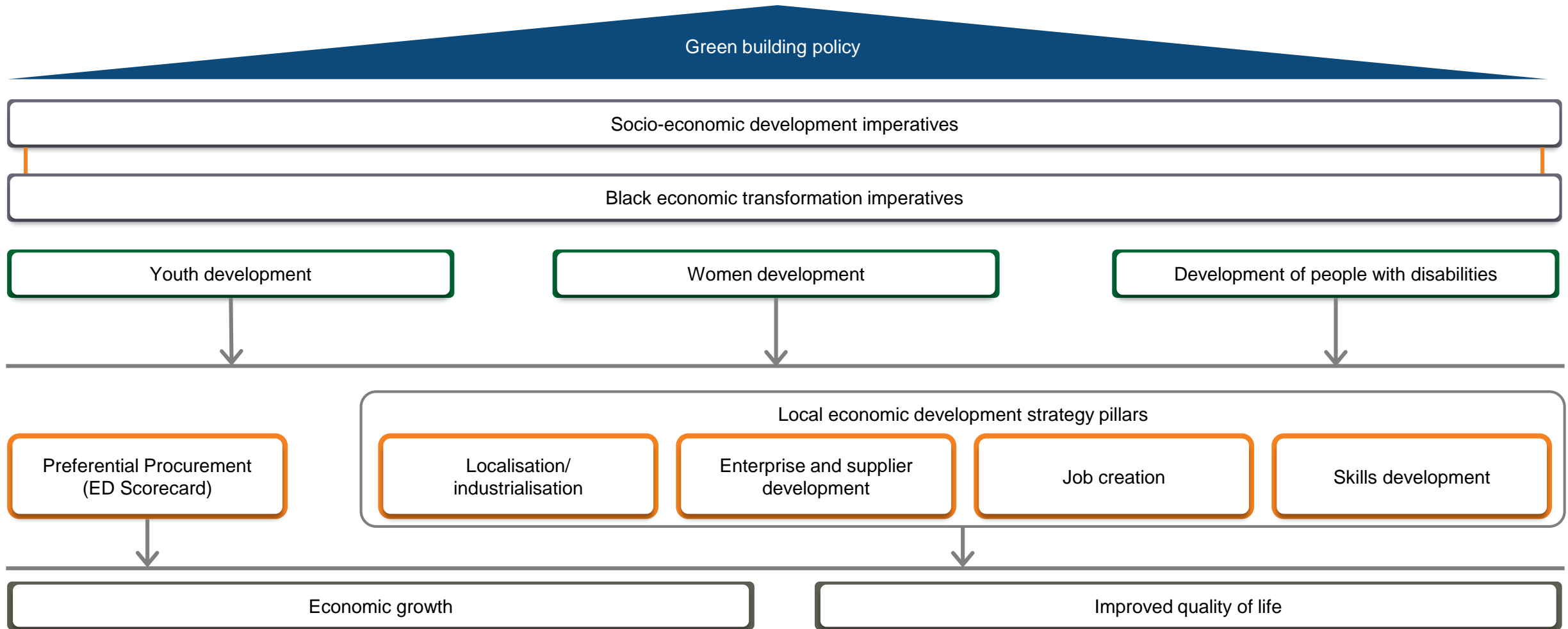
 Enterprise and Supplier Development, which seeks to ensure that in the development, completion and implementation of Projects under the programme, there is development of and the provision of opportunities for SMMEs and enterprises owned by Women and Black Designated Groups. This element will include the sub-elements Preferential Procurement, Enterprise Development and Supplier Development.

 Socio-economic development, which aims to ensure that the programme invests in the empowerment of people living in the communities surrounding the various project sites and that the programme has a positive socio-economic impact in communities in South Africa.

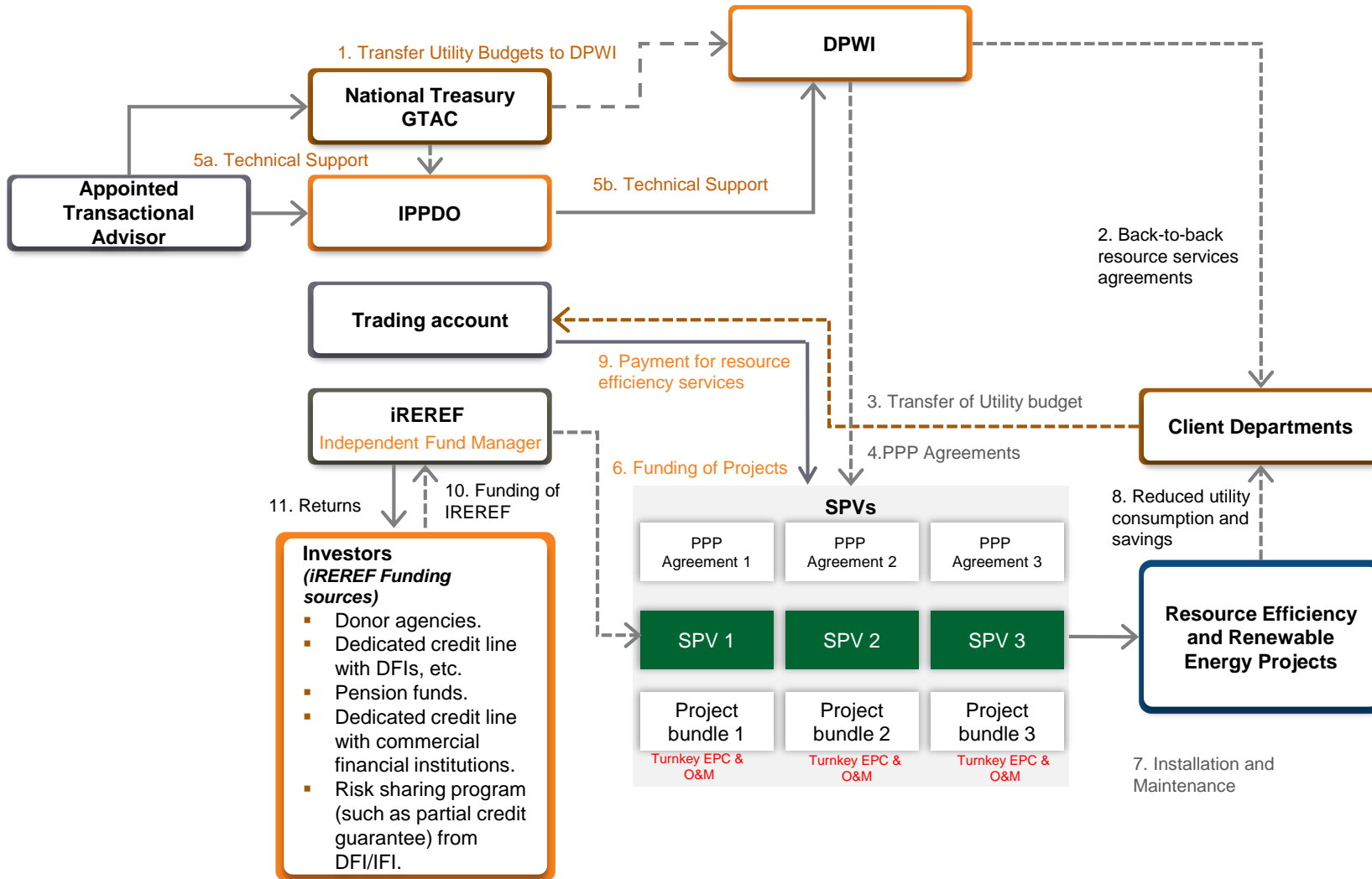
SOCIO ECONOMIC TRANSFORMATION FRAMEWORK



The following diagram provides an overview of the iREREP economic transformation framework:



IREREP OPERATING MODEL



Contracting Structure:

- DPWI will enter into Back-to-Back Agreements with User Departments for implementation of Renewable Energy and Resource Efficiency Projects by DPWI at User Department sites
- DPWI has a MoGA and MoPA in place with GTAC for a 5-year period for support in implementation of the Programme
- DPWI has set up a dedicated institutional function, the IPPDO, to support the rollout of the Programme
- GTAC has an SLA in place with a Transaction Advisor to provide financial and technical implementation support to the DPWI.

Payment Mechanism:

- The User Departments will pay their utility budget into a Trading Account (escrow account) at the start of each financial year.
- The Trading Account is ring-fenced for utilisation in the Programme whereby financing is provided to RESCO's/ successful bidders
- The Trading Account will be administered by DPWI
- A unitary payment mechanism will be utilised to compensate the Project SPV's and it will include appropriate indexation based on Consumer Price Index (CPIX) as well as a penalty regime for performance standards not met

Terms: DFIs – Development Finance Institution; DPWI – Department of Public Works and Infrastructure; EPC – Engineering, Procurement and Construction; GTAC – Government Technical Advisory Centre; IPPDO – Innovation, Project Preparation and Delivery Office; MoGA – Memorandum of General Agreement; MoPA – Memorandum of Particular Agreement; O&M – Operations and Maintenance; PPP – Public Private Partnership; REREF - Resource Efficiency and Renewable Energy Fund; RESCO – Resources Services Company; SPV – Special Purpose Vehicle

PROCUREMENT PLAN TO IMPLEMENT iREREP



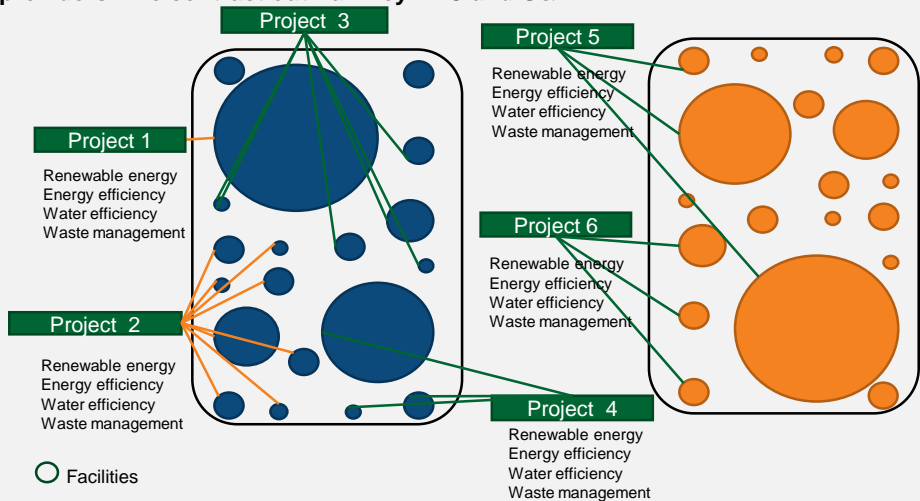
Procurement will be centred around the bundled procurement of various facilities by private sector service providers to manage utilities and implement resource efficiencies. The office set up for procurement will be the Innovation, Project Preparation and Development Office (IPPDO)

Bundled facilities means two or more Project Facilities that have been amalgamated into a single Project, based on bundling criteria determined by the Department to create commercially feasible Projects that reduce technical risks and facilitate financing.

- ▶▶ Expedited Project Delivery:
- ▶▶ Reduced Project Costs:
- ▶▶ Contracting efficiency:
- ▶▶ Increased opportunity for Socio-Economic Development

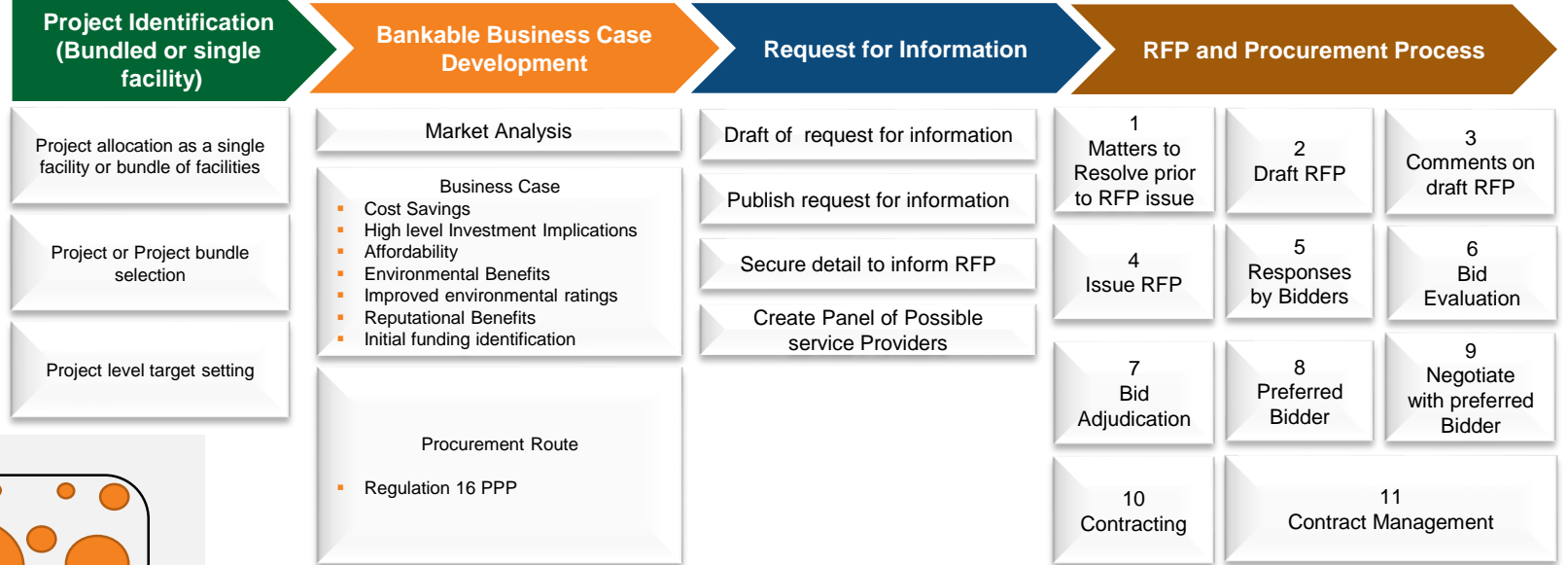
Buildings with **similar characteristics will be bundled** together in order to **maximise on the ability to scale up** the programme and ensure **procurement cost reductions** due to bulk purchasing

Outsourced Services:
Procurement will be for 3rd party private sector utility service providers who contract out Turnkey EPC and O&M



Projects procured on an integrated basis and includes full design, finance, build/install, operate/maintenance and repairs

A robust procurement framework is in place



Project bundling criteria:

- Geographical Location:
- Project Category
- Building/Project Characteristics and Functionality
- Baseline Approach and Results
- Refurbishment Requirements
- O&M and M&V Approach
- Prior participation in related programs
- End User Characteristics
- Funding and Investment Requirements
- Preparedness of management for implementation

Potential bidder selection criteria:

- Proposed solution with highest potential savings
- Baseline Audit Methodology
- Proposed Cost Savings against baseline
- Proposed potential CO2e Emissions Saved
- Economic Development Policy requirements (B-BBEE, Job Creation, SMME Development, Youth and Women Development, Skills Development, localization)
- Track record, experience and proof thereof
- Proposed pricing strategy

INTERNATIONAL EXAMPLES

01 United States of America

The **Federal Energy Management Program (FEMP)** is a U.S. Department of Energy (DOE) program focused on reducing the federal government's energy consumption by providing federal agencies with information, tools, and assistance toward tracking and meeting energy related requirements and goals.



The largest U.S. energy consumer is the federal government with more than **350,000 buildings** totalling more than **250 million square metres**.



FEMP contracts with ESCO to aid in this effort via Energy Savings Performance Contracts



FEMP has achieved a **46.2%** reduction in energy usage in federal buildings since **1975** and a **20.6%** reduction since **2003**.



FEMP provides free **training** that can be attended as on-demand eTrainings /live webinars/monthly seminars or in **energy efficiency, renewable energy and water efficiency**.



02 United Arab Emirates

The Etihad ESCO is a venture of the **Dubai Electricity and Water Authority (DEWA)**. It was established in 2013 to make the Dubai built environment a leading example of energy efficiency for the region and the world by targeting investments in more than **30 000 public buildings**.





The Etihad ESCO aims to reduce energy intensity by **20% in 2020, 30% in 2030**; save **5,3BIG** of water by 2030 and reduce CO2 emissions by **1M tons** by 2030.



Etihad ESCO handles everything from finding **financing solutions** that save on capital budgets, to **evaluation of building performance**, organisation of competitive tendering, selection of the best ESCO contractor, contractor management, and savings guarantee.



The Etihad ESCO has adopted a framework with four main elements:

-  An ESCO Accreditation Scheme.
-  Standard Contracts for Energy Performance Contracting.
-  Measurement & Verification Guidelines.
-  A dispute resolution mechanism.

03 India

The Bureau of Energy Efficiency (BEE) was established in 2001 to encourage and promote ESCOs and to create a market for ESCO services. BEE working with other agencies established a national organization called **Energy Efficiency Services Limited (EESL)** which is the **world's largest Public ESCO**.



EESL plans and implements EE and performs demand-side management in the municipal and agricultural sectors **while assisting with the growth and development of private sector ESCOs**.



EESL **grew the ESCO** market to grow the ESCO market in India from single digits to more than **25 by 2008** when the GEF project was closed.



BEE and EESL have managed to attract total **GEF** funding in ESCO project financing in India of over **US\$27 million**, and this funding mobilized at total of **US\$659 million co-financing**.



The projects implemented will reduce CO2 emissions by approximately **100 million tonnes** in their project lifetime.



04 China

Recognising that implementation of EE projects needed to be substantially increased a number of public-owned Chinese firms established wholly-owned **Super ESCOs** to encourage, promote and implement EE and DSM projects using ESPC and assist other ESCOs operations to grow their business and undertake more ESPC projects. One of the most prominent Super ESCOs is **Fakai** established by **Hebei Province DMS Center**.



Fakai leveraged **US\$3.7 million** in grants from the GEF and **US\$181.5million** from the **ADB, Hebei Banks, Hebei Province and Subproject Proponents**.



Prior to Fakai, Hebei, the 2nd most energy intensive Province in China relied mostly on administrative mechanisms for energy efficiency with **market mechanism** which have major economic advantages **needing development**. The ESCO market was **underdeveloped** with limited financing.



The Fakai Super ESCO focussed on **EE and ER technology identification and dissemination**, and design of market-based incentives: **capacity building and development of ESCO industry and M&V agents**, capacity building for FI and energy users and **mobilising finance**.



The ESCO industry in China has created over 430,000 jobs for the Chinese market and helped to save 17.7 million tonnes of coal equivalent, the equivalent of reducing 49 million tonnes of CO2 emissions per year.



KEY POTENTIAL BENEFITS FOR PARTICIPATING IN THE PROGRAMME

Key Benefits

- Reduction in costs due to leveraging the current dedicated institution and experts set up to support the rollout of the Programme
- Reducing costs by bundling up facilities with DPWI facilities that are spread across the country. Improving feasibility of projects through reduced costs through bundled procurements
- Access to scarce renewable energy and resource efficiency (energy efficiency, water efficiency, waste management) expertise in the public and private sector
- Lower cost of utilities through reductions in costs
- Accessing funding that has been mobilized by the DPWI for the Programme to implement projects
- Access to standardised contracts (EPC contracts, O&M contracts, Offtake Contracts, etc.) that have been developed for the Programme to improve contractual frameworks and reliability of renewable energy and resource efficiency projects implementation process
- Access to best practice standardized approach, templates, tools and guidelines that have been developed for the Programme
- Immediate capability to start rolling out projects as a large part of the project development and enabling mechanisms have already been setup
- The DPWI has invested the initial funds to capacitate and operationalize the Programme, considerably de-risking the Programme for any additional Programme participants

THE PROGRAMME HAS MADE A NUMBER OF ACHIEVEMENTS TO DATE

Milestone/Activity	Status	Date
User Department Framework Agreement to National User Departments	DoD, DCS and DOJCD have been engaged. Engagements with other user departments are underway.	Ongoing
Framework Agreement issued to the Department of Defence	Completed	6 October 2021
Drafts of the ED Policy, Localisation Strategy, Skills Development Strategy	Presented and issued to the iREREP Project Steering Committee	19 October 2021
Project Site Selection	A project site selection strategy and a list of recommended sites has been presented and issued to the iREREP Project Steering Committee for approval. Awaiting User Department input and approval	25 October 2021
Critical boilers	The desktop concept report on the critical boilers and how to incorporate scope into the project selection and bundling strategy was presented to the iREREP Project Steering Committee on 16 November 2021. DPWI to revert with a decision.	30 November 2021
National Treasury Clarification Questions	A draft submission in respect of NT Clarification responses has been made and received by NT. The DPWI (ADDG's office) provided a formal and signed response on 09 December 2021	09 December 2021
RFI Process	The RFI submission process was concluded on 27 October 2021, with 58 responses received. The evaluation of the RFI responses was completed and a formal Evaluation Report was submitted to the Programme Steering Committee (PSC).	15 December 2021

THE PROGRAMME HAS MADE A NUMBER OF ACHIEVEMENTS TO DATE

Milestone/Activity	Status	Date
Provincial Framework Agreements	A framework for Institutional Arrangements for the participation of provinces in the Programme was submitted to the Programme Steering Committee on 15 December 2021.	15 December 2021
Cabinet Memo	The Cabinet Memo was approved by the Programme Steering Committee on 18 January 2022.	18 January 2022
PPPFA Exemption Application	The PPPFA Exemption Application was submitted to the Department for consideration	18 January 2022
Climate Initiative Policy - The Global Innovation Lab for Climate Finance call for ideas looks for innovative finance solutions that can unlock investment to tackle some of the most challenging climate and sustainable development challenges and investment opportunities for a net-zero economy.	The Integrated Resource Efficiency & Renewable Energy Fund (iRERERF) has been shortlisted and is among the top 5 ideas for the Lab Southern Africa Program submitted this year (2022).	28 January 2022
National Pathway Management Network Innovation Fund	The Programme has been shortlisted by the National Pathway Management Network Innovation Fund (A Programme of the Presidential Youth Employment Intervention) as one of the projects that is being considered for funding based on its great potential to upskill youth and create jobs	5 January 2022
Project Resource Audits	Project site selection is being finalised for the various regions and resource audits are commencing at the various project	2 February 2022



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