



Eskom JET Strategy

PCC Presentation

25 October 2022

Objectives for today's presentation

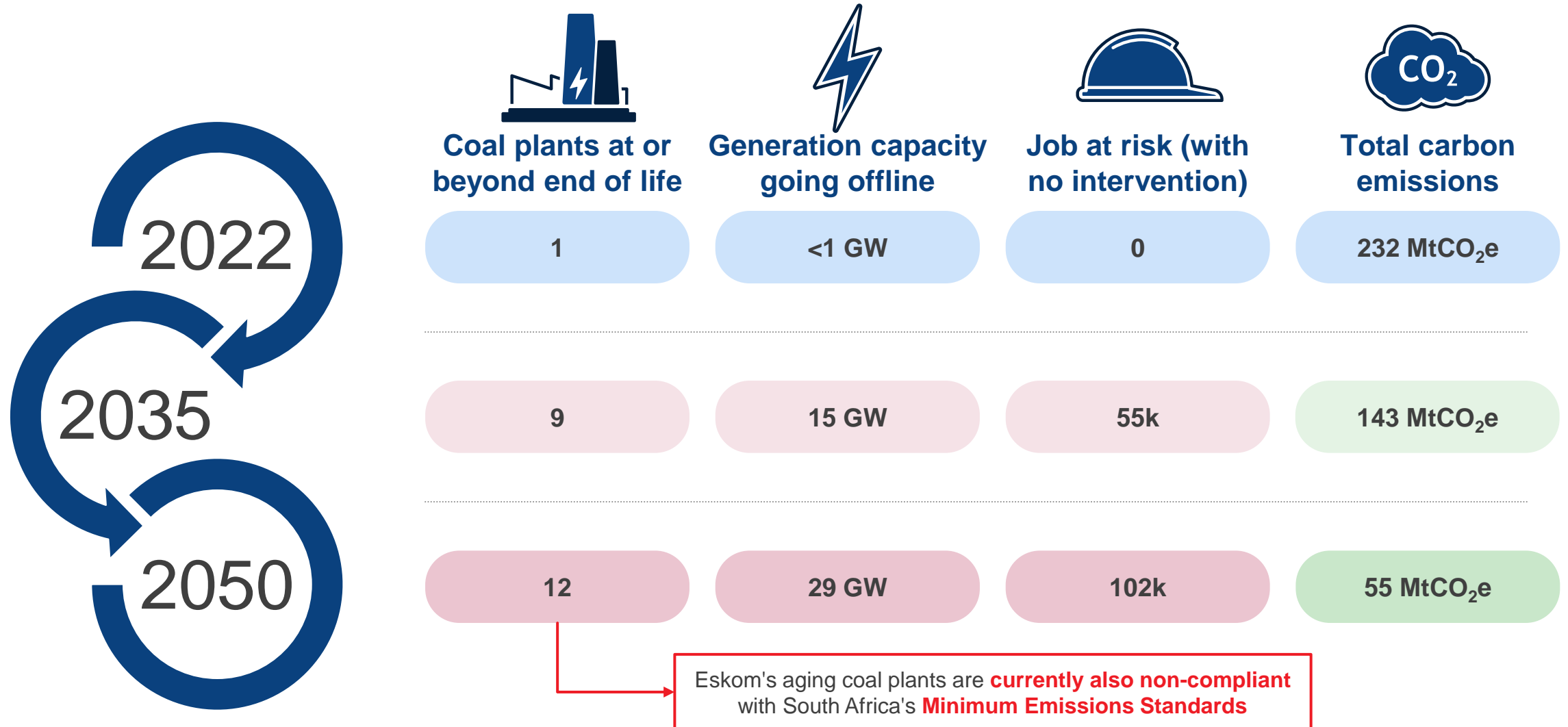


- 1 Eskom's JET strategy
- 2 Komati Repowering and Repurposing
- 3 Socio-economic Impact Studies
- 4 Q&A

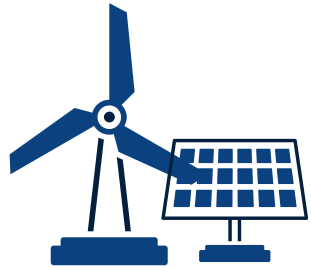


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Most of South Africa's coal fleet is approaching end-of-life, which will reduce CO₂ emissions, but also jobs and power



Large scale renewable power is the most affordable and the fastest solution to South Africa's power needs



Wind and solar

- ✓ **Least cost option** with access to abundant concessional green finance
- ✓ **Less than 2 year build time**, allowing rapid improvements to loadshedding
- ✓ **Ensures South Africa can continue to export** in spite of growing carbon tariffs

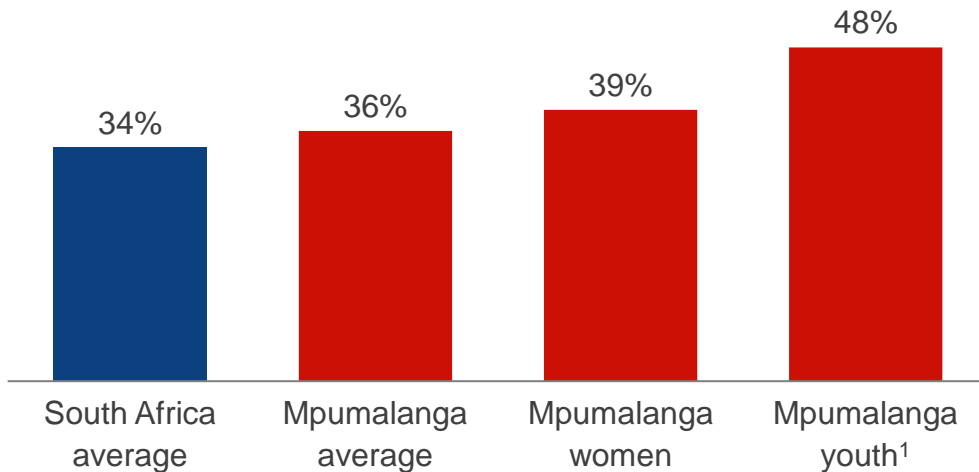
New coal

- ! **2 to 4 times the cost of wind and solar** with no financing options
- ! **10 to 12-year build time**, resulting in more years of loadshedding
- ! **46% of South African exports at risk** if South Africa does not decarbonise



Legitimate concerns of coal value chain stakeholders cannot be disregarded but the status quo has severe challenges

Comparison of % of unemployment rates¹



Unemployment rates in Mpumalanga are higher than national rates especially for vulnerable groups

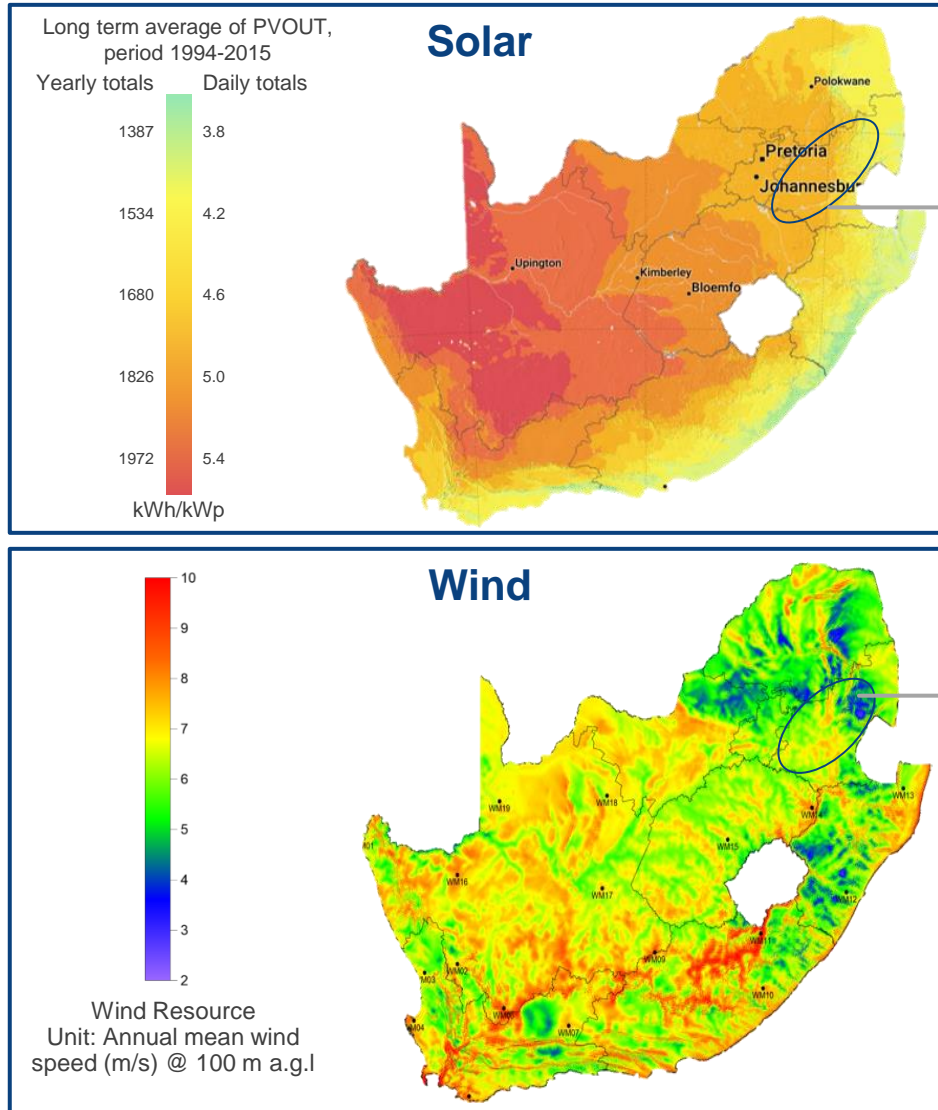
- 2% higher across the labour force
- 3% higher among women
- 2% higher among the youth²

Environmental impact of coal value chain

- Over 29 000 premature deaths in SA every year are caused by ambient and household air pollution³
- Air pollution driven in part by energy poverty, coal beneficiation, and coal power plants
- Extensive environmental degradation due to opencast mining, exacerbated by illegal and poorly regulated mining
- Coal ash dumps can contaminate the air and ground water
- >270 billion litres of water are used by Eskom each year in our coal dominant power system⁴
- Damage to road infrastructure and further air pollution due to transport of coal by trucks



Mpumalanga has what it takes to become a renewable energy hub, more quickly than anywhere else in SA



1 Resources

- Average **~4.4-4.8 kWh/kWp¹** PV potential
- and average wind speed of **~6-7 m/s²**



2 Grid Access

Transformer investments will unlock **~5GW** in grid capacity



3 People

~200 000 people in the labour force that can be reskilled or trained to work in renewables sector



1. Best solar resource in Germany is 3.4kWh/kWp; 2. Best wind resource in Germany is 8.5 m/s
Source: SOLARGIS South Africa Photovoltaic Power Potential; WASA Project – High Resolution Wind Resource Map; SOLARGIS Germany Photovoltaic Power Potential; Global Wind Atlas – Germany; COBENEFITS Study: From coal to renewables in Mpumalanga

Eskom is unlocking investment in Mpumalanga

Land leasing scheme



31 000 hectares of Eskom land with potential PV capacity of **~7 GW** made available

Strategic infrastructure investments



Eskom makes grid investments that will unlock **17 GW** of grid capacity by 2027

Coal station repowering and repurposing



Repower decommissioned coal plans with renewables and **repurposing** facilities, e.g. Komati R&R Project

Virtual LV wheeling agreements



Eskom offers **virtual wheeling** agreements to **link renewables producers to end users**

Eskom is ready to innovate and partner to accelerate the Just Transition

Our renewables-based power system will enable growth, job creation and competitiveness in a 2050 net-zero world

Demand side response

Distribution grid enabled for consumer responses to fluctuations in supply, and for sale of consumer-owned RE back to the grid.

Firm capacity

~115GW wind and PV constructed and grid adapted for stability

Seasonal peaking power

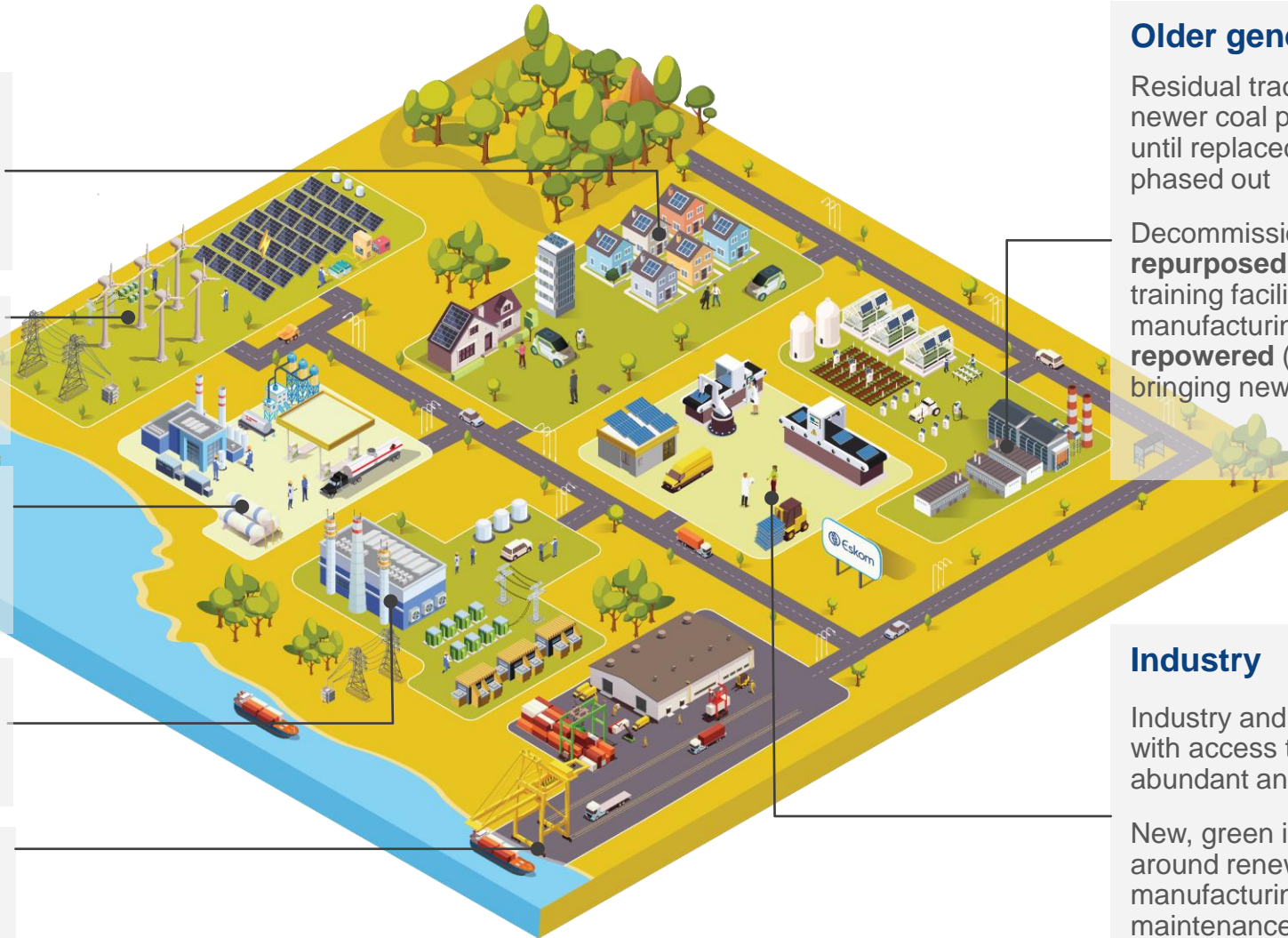
Gas used as transitional peaking fuel until greener techs emerge (e.g. SMR nuclear)

Daily peaking power

~25GW of batteries and pumped hydro for short term power storage

Trade

Export industries receive low-carbon power, allowing them to complete globally despite globally increasing carbon-border taxes



Older generation

Residual traditional nuclear and newer coal plants maintained until replaced, but ultimately phased out

Decommissioned coal plants **repurposed** (e.g. agrivoltaics, training facilities, new manufacturing centres etc.) or **repowered** (into new RE plants) bringing new, jobs to communities

Industry

Industry and commerce grows with access to reliable, abundant and affordable power

New, green industries develop around renewable energy manufacturing, installation and maintenance, producing high quality jobs

Eskom's JET will RE-Ignite South Africa's growth, starting with Mpumalanga, the place of the rising sun



RE-Power



~7 GW firm capacity, ~50 GW renewable capacity and ~10 GW storage added by 2035



RE-Purposing



Existing facilities used to create new industries and new jobs, such as microgrid assemblies and Agrivoltaics at Komati



RE-Skill



First new renewables training facility established at Komati Power Station



RE-Empower



280 000 net new permanent jobs to be created nationally, 25 000¹ – 72 000² new jobs to be created in Mpumalanga



RE-Duce



143 MtCO₂e emissions reduction by 2035, net-zero emissions by 2050 and 40bn litres reduction in water use of by 2050

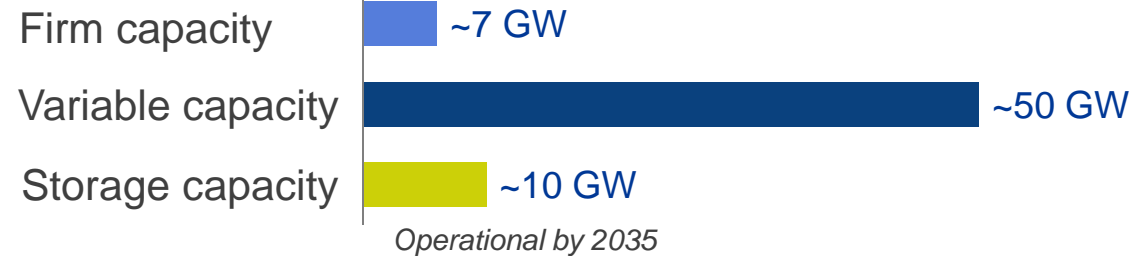
R1.2 trillion investment in infrastructure will be required by 2030 to deliver on a successful power sector JET

Capacity required

Required to mitigate energy crisis

Estimated cost

Generation capacity



~R990bn

Transmission capacity

- Expansion and strengthening of transmission network
 - ~8 000 km new line
 - ~101 substations

~R130bn

Distribution capacity

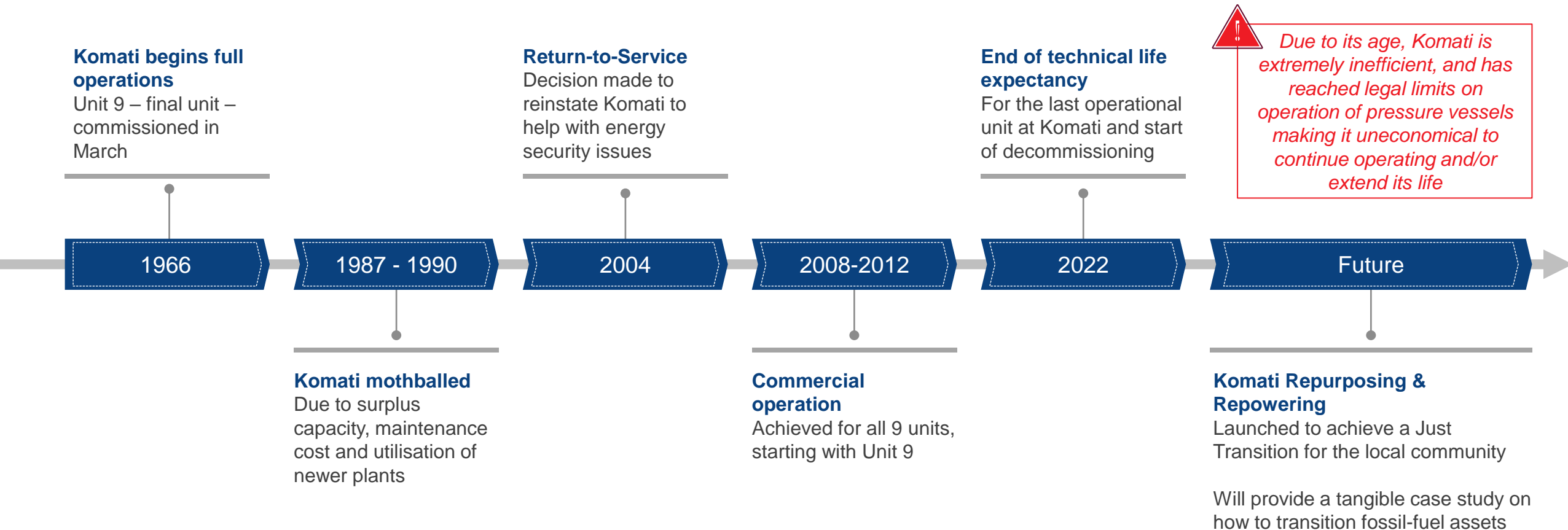
- Strengthening of the distribution network for embedded generation ~7 500 km of line

~R56bn



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Komati is one of Eskom's oldest power plants and has reached the end of its technical life expectancy



Komati Power Station | Eskom's flagship project to Repower and Repurpose Komati in a just transition



Areas suitable for Solar PV, Wind, BESS and Synchronous Condensers



Komati R&R Programme Overview

1. Decommissioning

2. Repowering Initiatives:

- Solar PV (~100MWp) + 50MWp Ash Dam
- Battery Storage (600MWh)
- Gas - not viable
- Biomass – not viable
- Wind (up to 70MW)
- Conversion of Generators (x3) to Synchronous Condensers

3. Repurposing Initiatives:

- Microgrid Assembly
- AgriVoltaics (500kWp)

4. RE Training Facility

- Enabling, Empowering, Reskilling, Upskilling
 - Skills required for long term jobs in the renewables value chain.
 - Collaboration with SARETEC

5. Additional SEIM Initiatives:

- Microgrid Assembly
- Farming (e.g aquaponics)



These projects and initiatives will be replicated at all power station sites

Repurposing and Repowering project consists of 3 main components

A Decommissioning

- Expected to take 4-5 years and will be supported by an Owners Engineer and EPC company
- Will begin within the power plant and ash dam

B Repowering

Consists of 2 phases:

- Phase 1 will be conducted in parallel with decommissioning and includes approximately: 100 MW PV, 50 MW wind, 150 MW batteries and 100 MVAR synchronous condenser
- Phase 2 will be conducted post-decommissioning and includes approximately: 50 MW PV, 20 MW wind, and 2 x 100 MVAR synchronous condensers

C Opportunities for Workers and Communities

Consists of 3 elements:

- Support for permanent workers, contract workers and suppliers
- Development of agrivoltaics, microgrid assembly facility and Komati Training Facility as part of Repurposing activities
- Establishment of Eskom JET Taskforce to drive stakeholder engagement and community empowerment



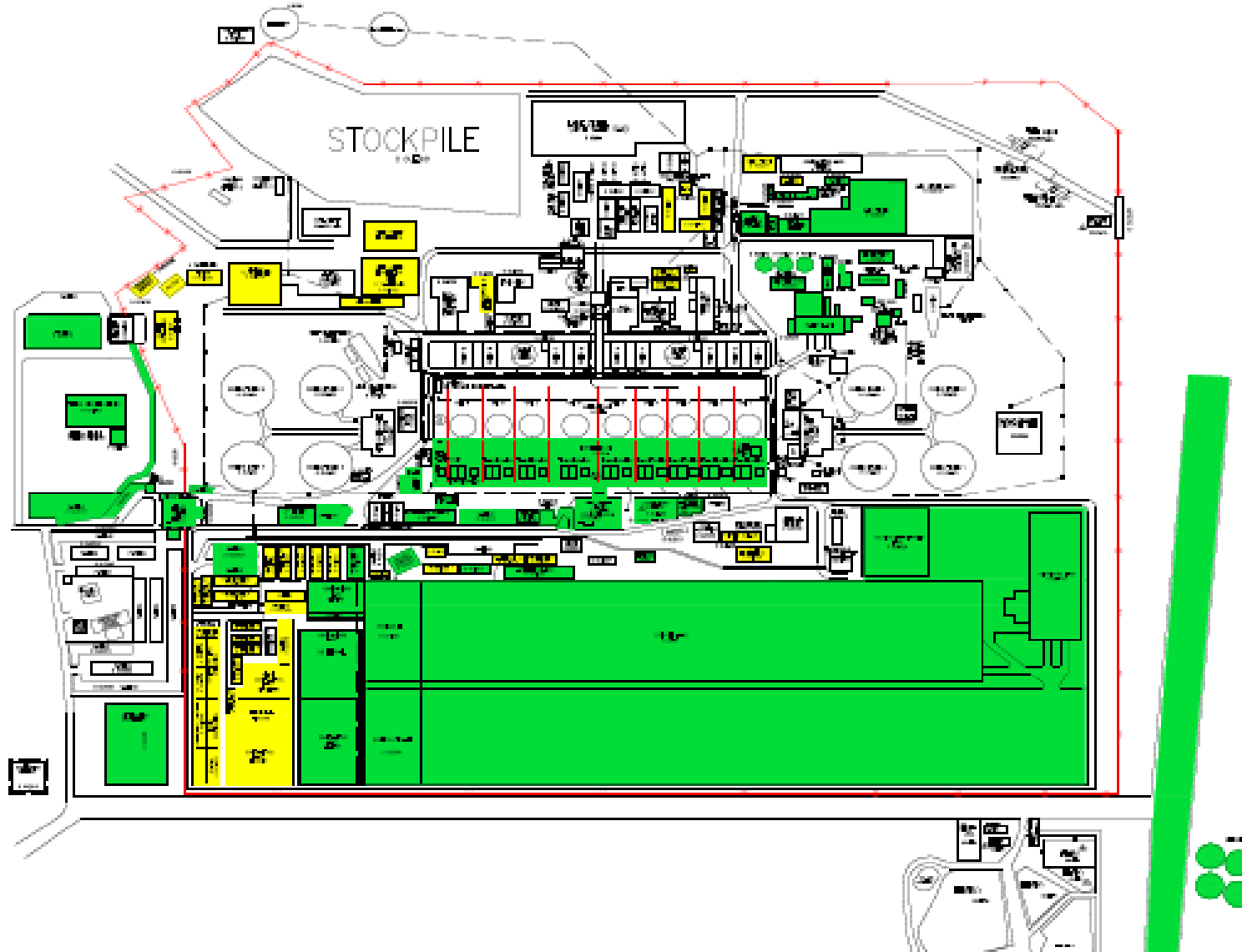
Key Insights

- Decommissioning: shutdown, demolition and rehabilitation.
- JETP Boundary: Eskom Land (687 ha)
- Timing: 4-5 years.
- Two activities are critical and have been prioritised:
 - ✓ Hire Owner Engineer (OE)
 - ✓ Conduct Environmental & Social Impact Assessment (ESIA)

Two Development Areas

- Decommissioning & repurposing activities concentrated around power plant area and ash dam's **yellow**
- Repurposing area includes area outside of the decommissioning area (but will eventually include all Komati land) **red**

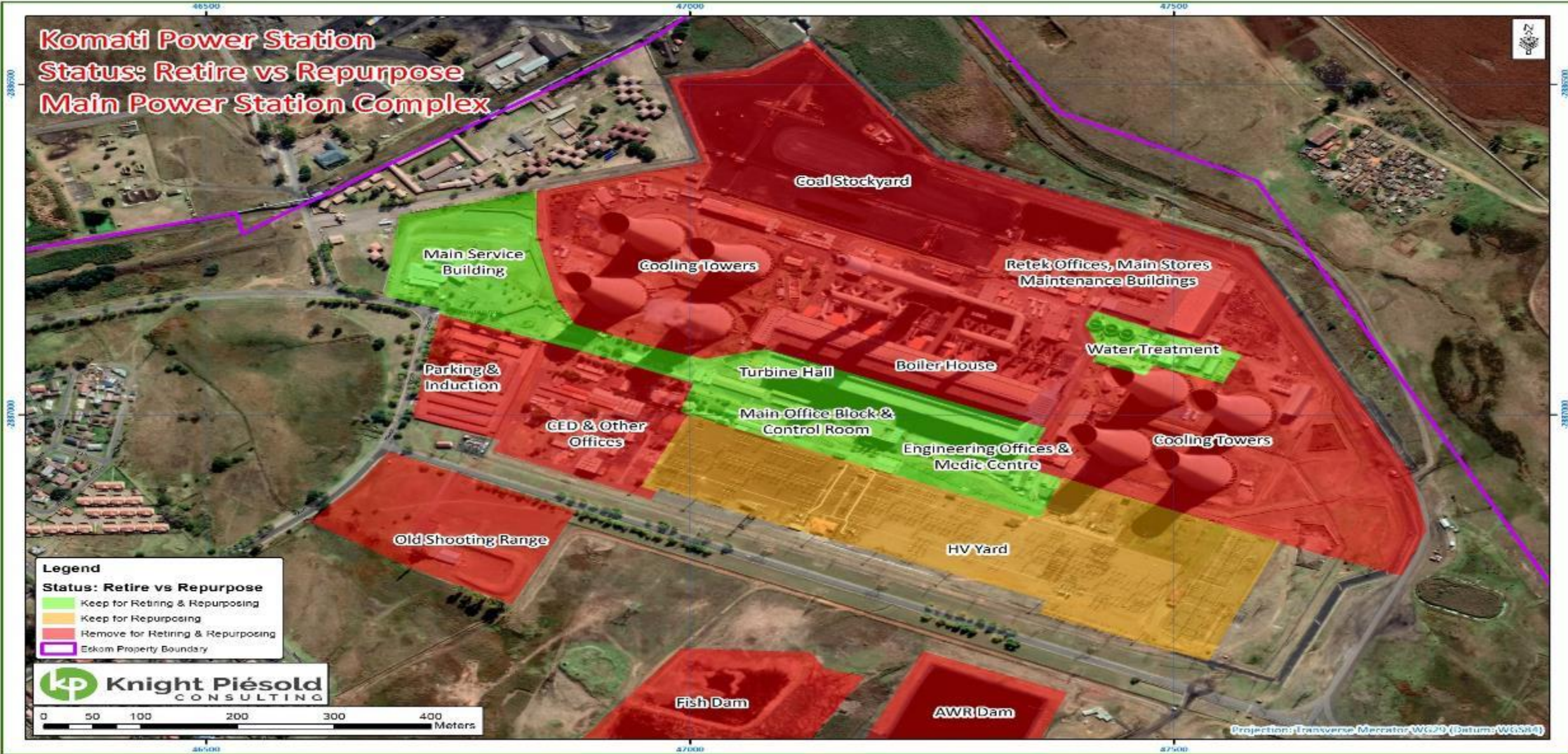


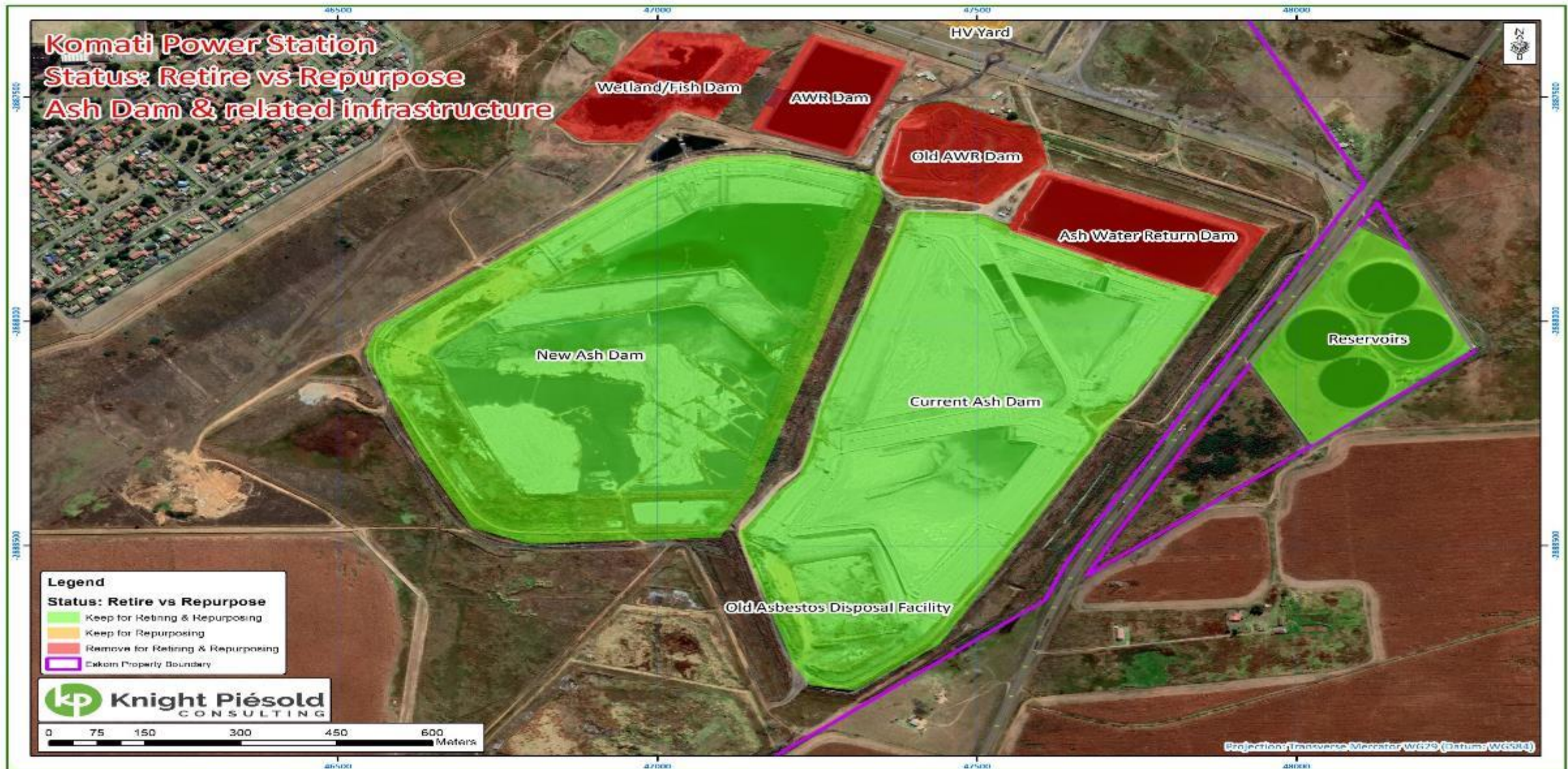


Description

- Yellow Buildings - Temporary Buildings
 - Re-used or Sell
- Green Buildings and Plant
 - Retained
- The Turbine House
 - Retain for Synchronous Condensers
- White Structures
 - Removed and rehabilitate.

NB: detailed engineering work to firm-up decommissioning scope





Component B – Repurposing



- **Solar PV, wind and batteries** - optimal mix of technologies will be used for repurposing (together with synchronous condenser).
- Eskom's objective is to speedily & cost-effectively develop new generation capacity.
- Komati will be repurposed using **'two-phased' approach**.
- Timelines: 2026 (Phase 1)
- Two activities are critical and have been prioritised:
 - ✓ Hire Owner Engineer (OE)
 - ✓ Conduct Environmental & Social Impact Assessment (ESIA)

Component B – Repurposing (Phase 1)



Phase 1: appr. 100MW Solar PV, up to 50MW Wind, 150MW (600MWh) BESS and 1 x Synchronous Condenser.

These sites (arrows) can develop solar PV and wind while power plant area is being decommissioned.

(Arrow) indicate location of Eskom solar PV pilot.

Eskom also plans to advance battery development in Phase 1 and the installation of 1st unit of condensers

NB: detailed engineering work will firm-up final sizes (MWs) of PV and Wind

Component B – Repurposing (Phase 2)



Phase 2: appr. 50MW Solar PV, up to 20MW and 2 x Synchronous Condensers (inside turbine hall)



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Socio Economic Impact Assessment – an overview and framing of the social studies in line with the Eskom JET Programme

The Transition Impacts on:



Workers



Community



Economy

Mitigation for it to be Just:

Stabilise



Develop



Strengthen



Communicate

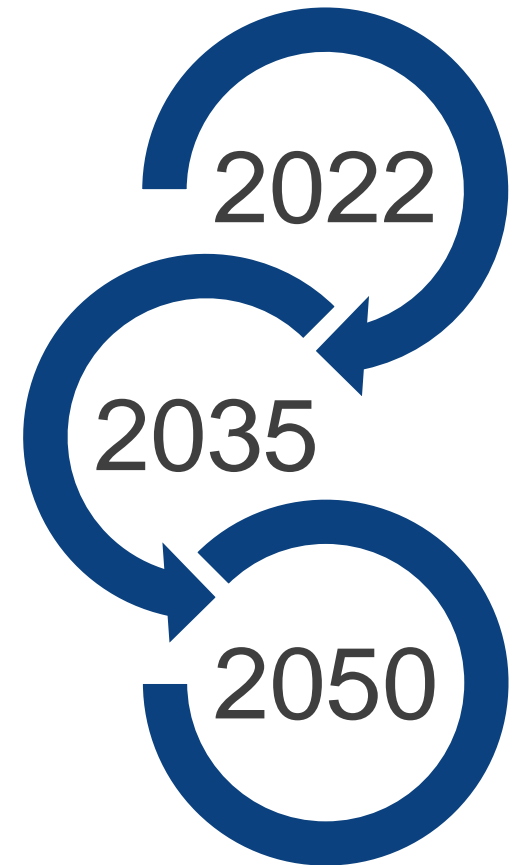


Grow



Socio-economic Impact Studies: three socio-economic impact assessments across ten Coal-Fired Power Stations are being conducted

Station name	Capacity ¹	Shutdown Year	Socio-Economic Impact assessments conducted		
			1 Urban Econ	2 World Bank/VPC	3 NDC
■ Komati	114MW	2022			
■ Hendrina	1 135MW	2025			
■ Camden	1 481MW	2025			
■ Grootvlei	570MW	2027			
■ Arnot	2 100MW	2029			
■ Kriel	2 850MW	2030			
■ Tutuka	3 510MW	2030			
■ Matla	3 450MW	2034			
■ Duvha	2 875MW	2034			
■ Kendal	3 840MW	2044			



Purpose:

To manage and mitigate societal risks and create a basis for to mitigate the economic and societal impacts from the shutdown of Komati, Hendrina and Grootvlei power stations and to create a basis for continued, sustainable livelihoods for the affected communities and local and district municipalities and support a just energy transition



Objective:

- Identify and assess impacts
- Determine risks
- Identify opportunities
- Formulate sustainable mitigation plan

Purpose:

Development of a preliminary socio-economic analysis with the target to establish preliminary socio-economic baseline conditions and potential impacts of the retiring and repurposing of Komati, Grootvlei, Hendrina and Camden power stations



Objective:

- Stakeholder analysis
- Social baseline study and gap analysis
- Assessment of labor issues and staff requirements
- Workshop on alternatives
- Socio-economic analysis and a proposal how to proceed.

Purpose:

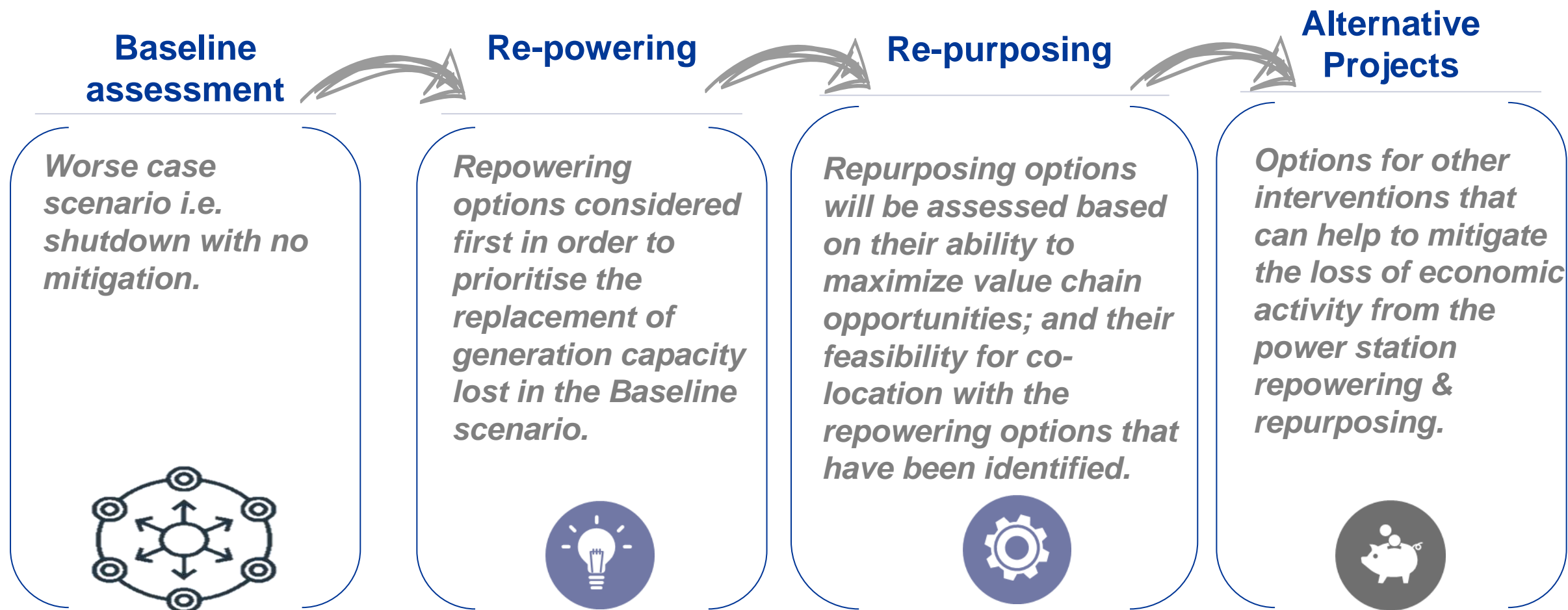
To identify impacts, risks, and opportunities to mitigate the economic and societal impacts from the shut down Camden, Arnot, Kriel, Matla, Duvha, Tutuka and Kendal power stations and to create a basis for continued, sustainable livelihoods for the affected communities and local and district municipalities and support a just energy transition.



Objective:

- Determine the status quo
- Socio-economic impact assessment of the baseline – shutting down
- Assessing the mitigation options – repowering, repurposing and other
- Implementation plan

The general approach to identify repowering and repurposing mitigation actions

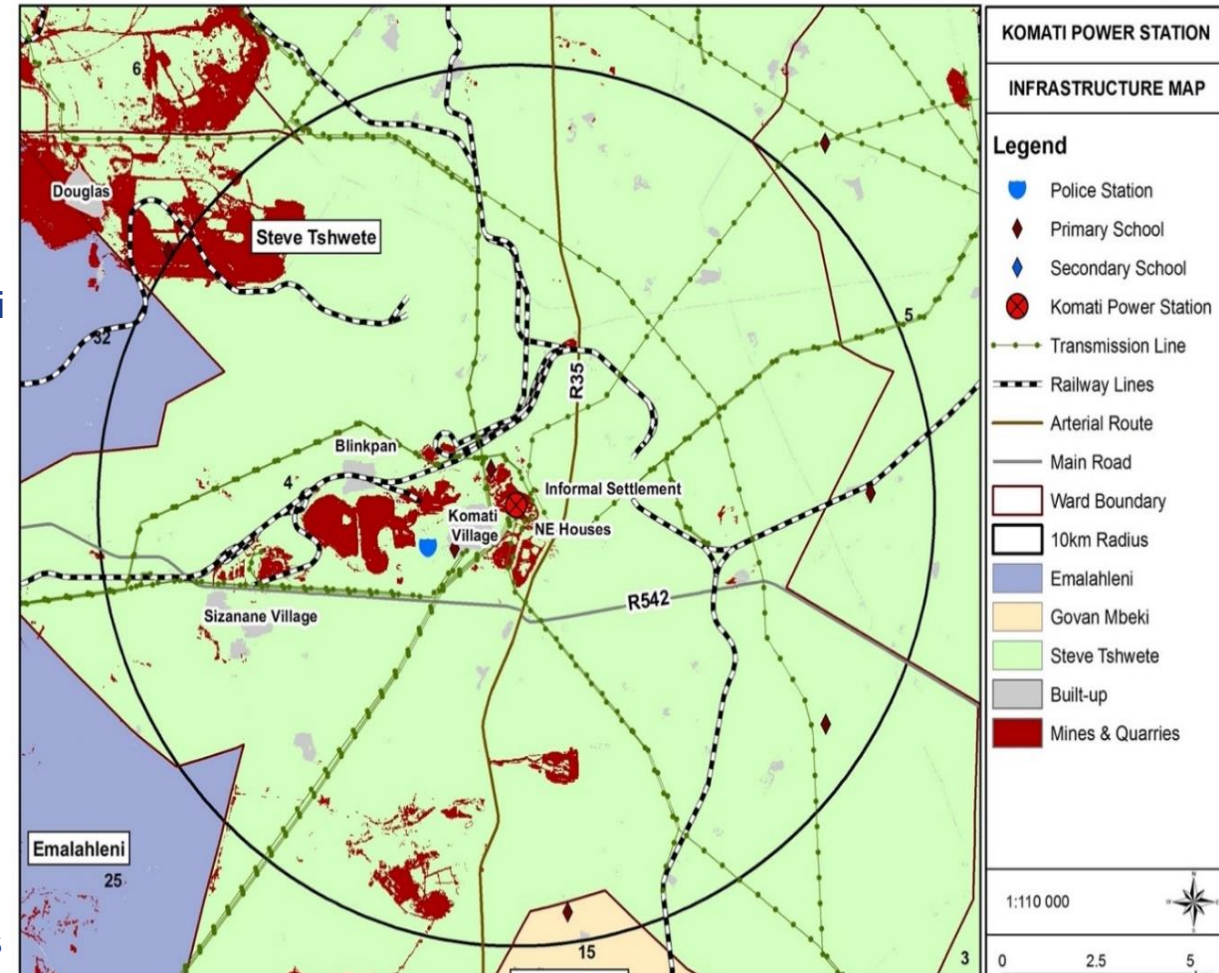


It is important to note that the loss from the power station shutdown may not be fully mitigated even with a combination of repowering, repurposing options and alternative projects. In this instance the gap will need to be addressed as part of the Department of Mineral Resources and Energy's (DMRE's) Integrated Resource Plan (IRP)

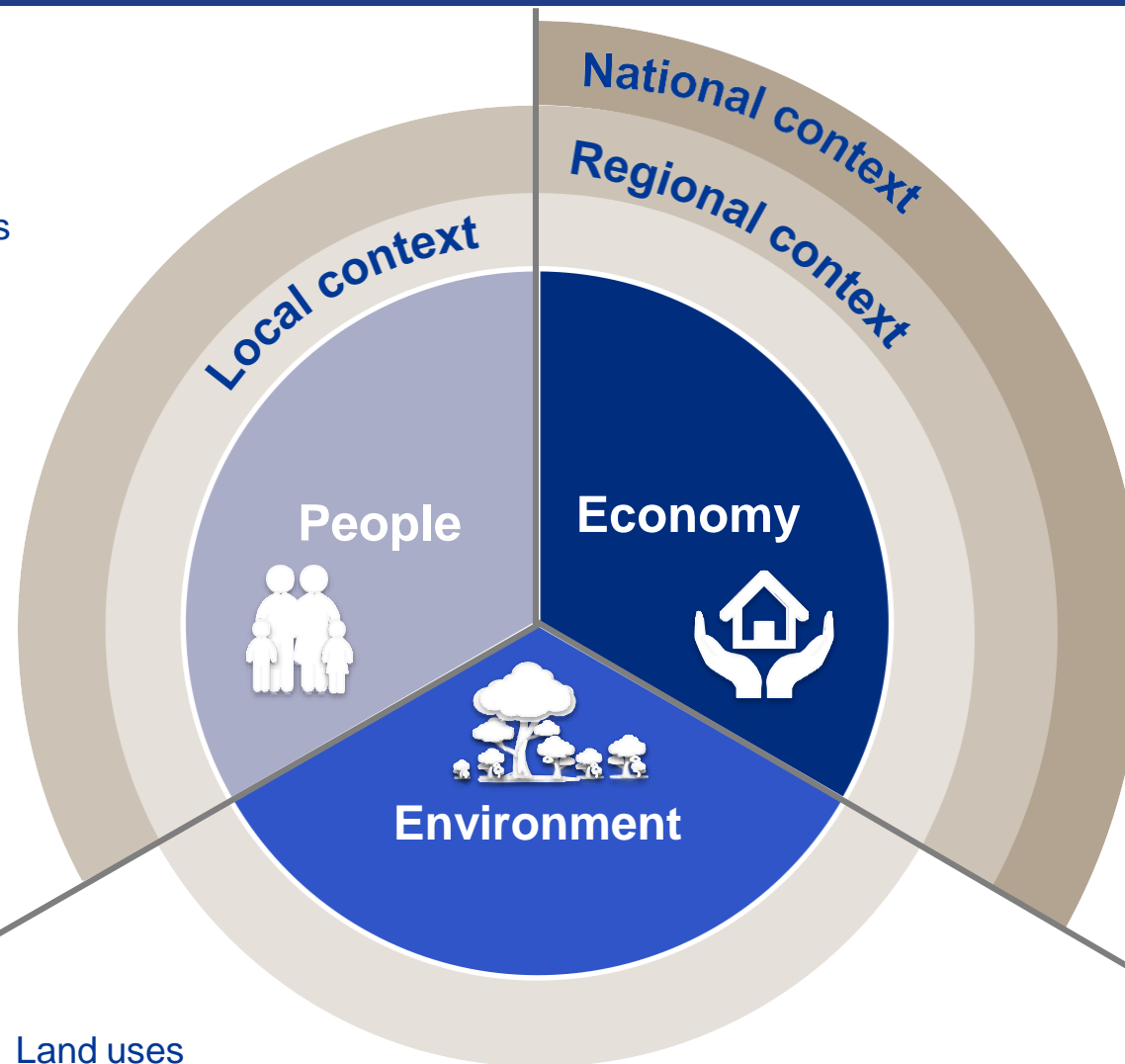
Komati Socio-Economic impact assessment

Snapshot of Socio-Economic environment:

- Mpumalanga's economy is **highly reliant on the coal value chain**.
- Coal accounts 35% of GVA in Steve Tshwete LM
- Population in primary study area:
 - Under 4 200 people (1 904 HHs) lived in 2011
 - Since 2011, **Sizanane closed** and **population in Banks reduced**; Komati Village – remained the same
- **Large proportion of males** in the PSA – in 2011, 60.8% of population was male
- Most residents are aged between 35 and 44 years
- **Below average education** – majority no schooling or some schooling
- Largest **employers** – mining, utility and agriculture
- High levels of unemployment
- Below average access to basic services (esp. water)
- Social ills: drug and alcohol abuse, and health-related problems
- Most community members have **resided in the region for at least 16 years**
- Vulnerable people – youth, farm dwellers, women, retrenched mine workers –SASSA grants



- Quality of life
- Out-migration
- Living conditions
- Family ties
- Access to services
- Social ills
- Income levels



- Employment
- Skills
- Community sustainability
- Economic sustainability
- Business impact
- Government revenue
- Property



- Land uses
- Quality of the environment
- Access to natural resources

- Assessment of social and economic impacts considers the aspects of community development that they affect, which are called “community capitals”.
- Community capitals interacts with each other and create assets, resources and capabilities; thus, a combination of strong community capitals is required to ensure sustainable development of a community.



Natural capital

- Air, soil, water, landscape, biodiversity



Human capital

- Self-esteem, education, skills, health



Built capital

- Infrastructure - water systems, sewerage, utilities, health system



Cultural and social capital

- Language, rituals, traditions
- Leadership, groups, networks, trust



Political capital

- Inclusion, voice, power



Financial and economic capital

- Income, wealth, security, credit, investment

Data collection: Community , household and small business surveys

Community Surveys



Community interviews

4 meetings
attended by community
representatives



Employee households' survey

80 HHs were surveyed in
the immediate
communities:
Komati/Koornfontein
Village



OK Foods



Lakama Guest House

Small Business Surveys

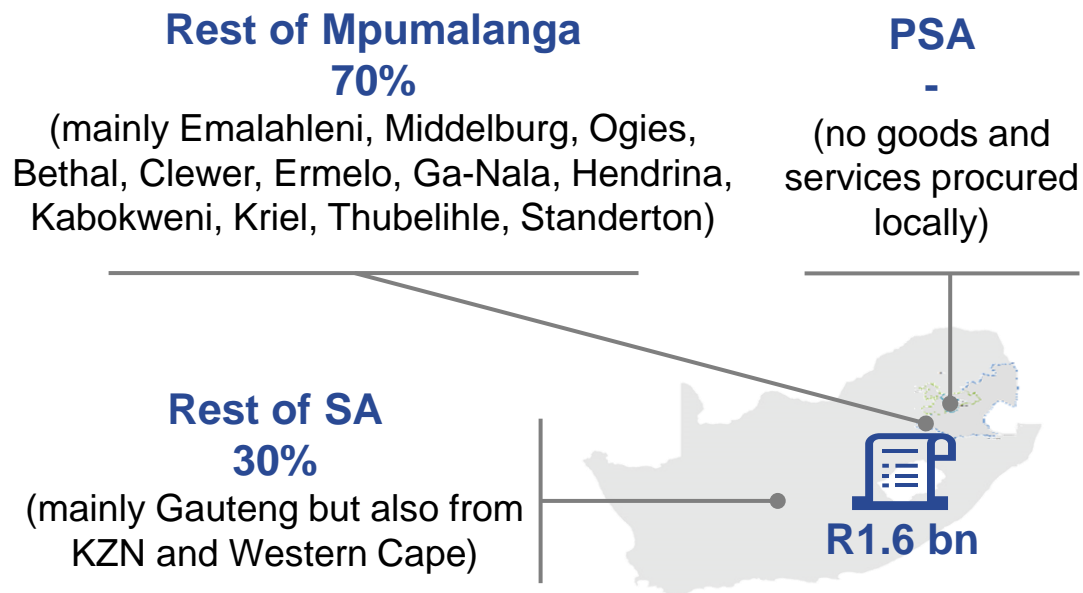


**Business and
social facilities** **7 local businesses**
31 business along
the supply chain

Business Name
Mechanic (Flamingo Street)
Cafè Butchery
Sasol Petroleum
Igwababa Supermarket
OK Foods
Food Zone
Lakama Guest House

KPS primarily sourced goods and services from Mpumalanga and supplied water to the local communities in 2020

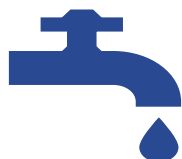
Where are goods and services procured from (excluding labour)?



What sectors do the operations of KPS contribute towards?



What services are provided by the PS directly and to who?



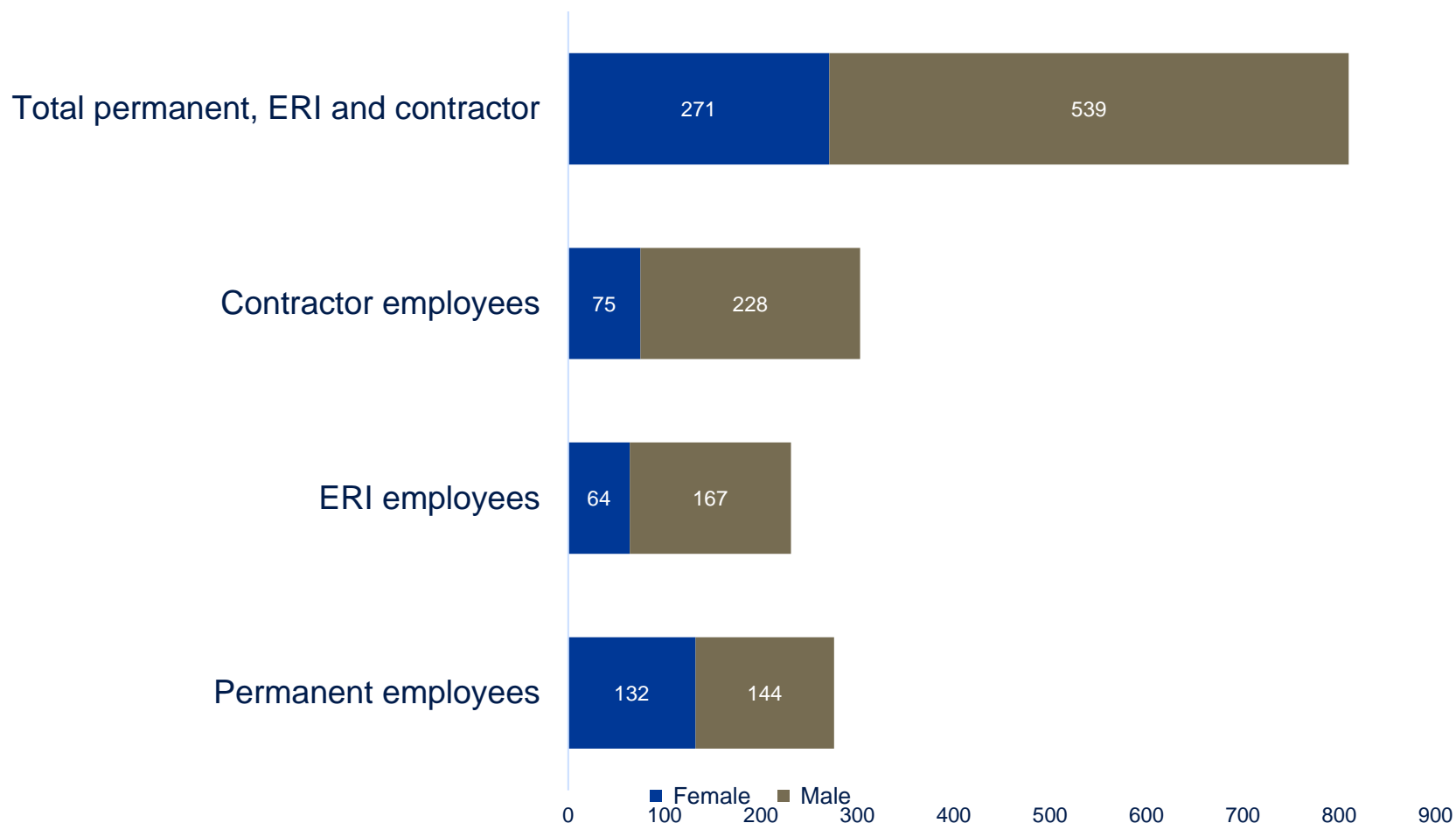
KPS supplies water to:

- Komati Village: 45 ML/month
- Lakama Group (Komati Village): 1.5 ML/month
- Koornfontein mine: 8 ML/month



Owens 2 properties in Komati village

KPS Direct Employment in 2020



Permanent employees

- **Majority aged below 45 y/o**, and minority (5.2%) close to or at pension age
- Fairly young, productive and experienced population with flexibility and mobility
- Many skills sets (technicians, engineers, operators) are reusable allowing for shifts to different technologies

ERI employees

- Mostly work as operators (33%), utilityman (14%), general workers (12%) and artisans (10%)
- ERI permanent employees **can be transferred to other sites/operations**

Contractors

- 190 contractors to remain on site
- Alternatives will need to be considered through engaging external contractors

- 810 employees (276 permanent, 303 contract, 231 ERI)
- 2/3 of employees are male and 1/3 are female.

Stakeholder engagements

▪ Extensive stakeholder engagement has been undertaken as part of the study

- Local community involvement, and empowerment - through collective and participative approaches to solving the problem
- Engagement and inclusion of stakeholders, DTI, DPE, DMRE, Mpumalanga, District and Local government, Munics, NGO's, CBO's, local communities, DFI, funders, etc.

▪ Partnerships



Collaboration between public and private sector has played a critical role in enabling this project



MoU between Eskom and the Mpumalanga Provincial Government for collaboration in achieving a Just Transition in the province



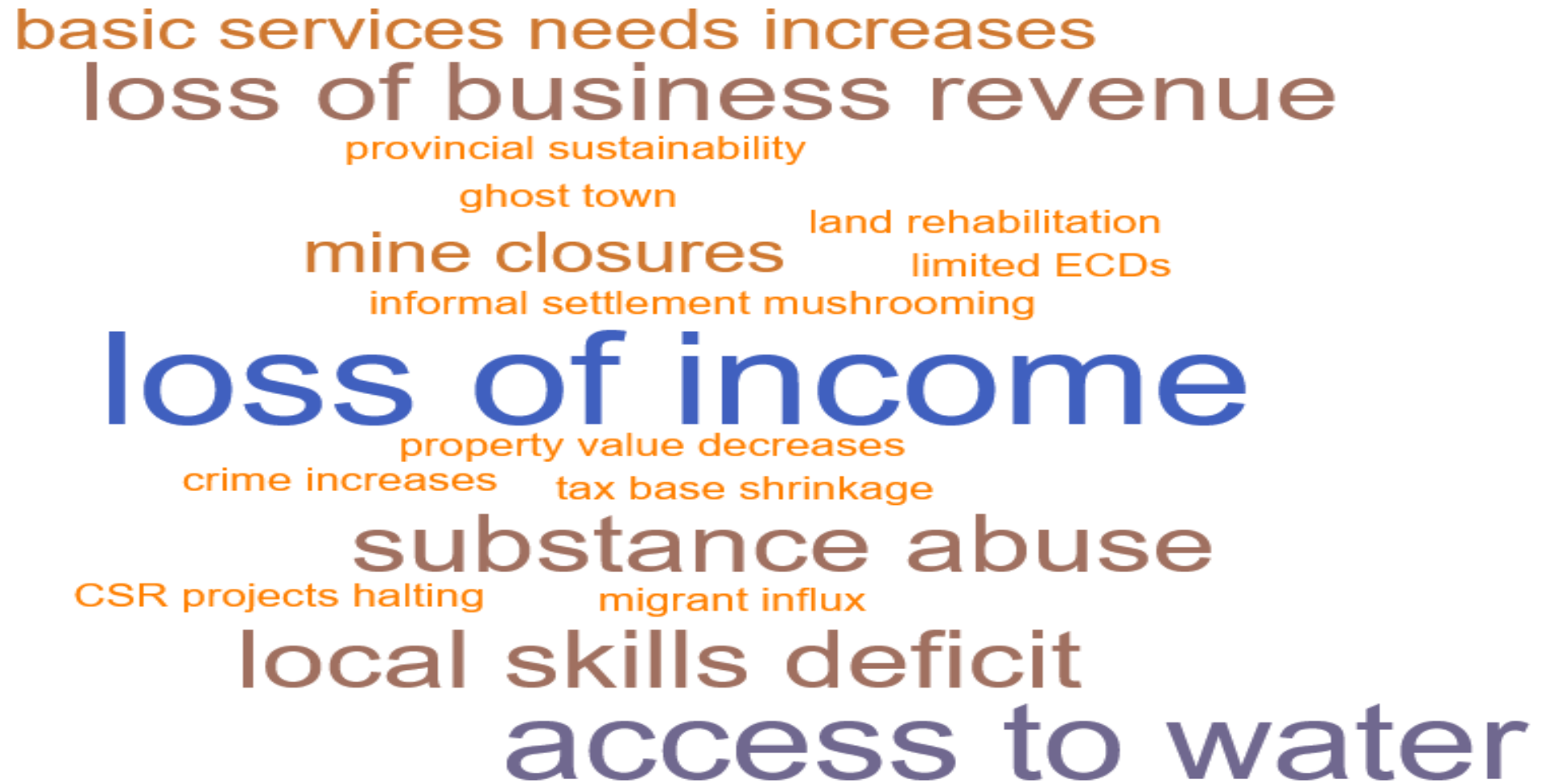
Provision of funding for the 3 components of the Komati Repowering and Repurposing project excluding the Komati Training Facility



Provision of funding for the Komati Training Facility



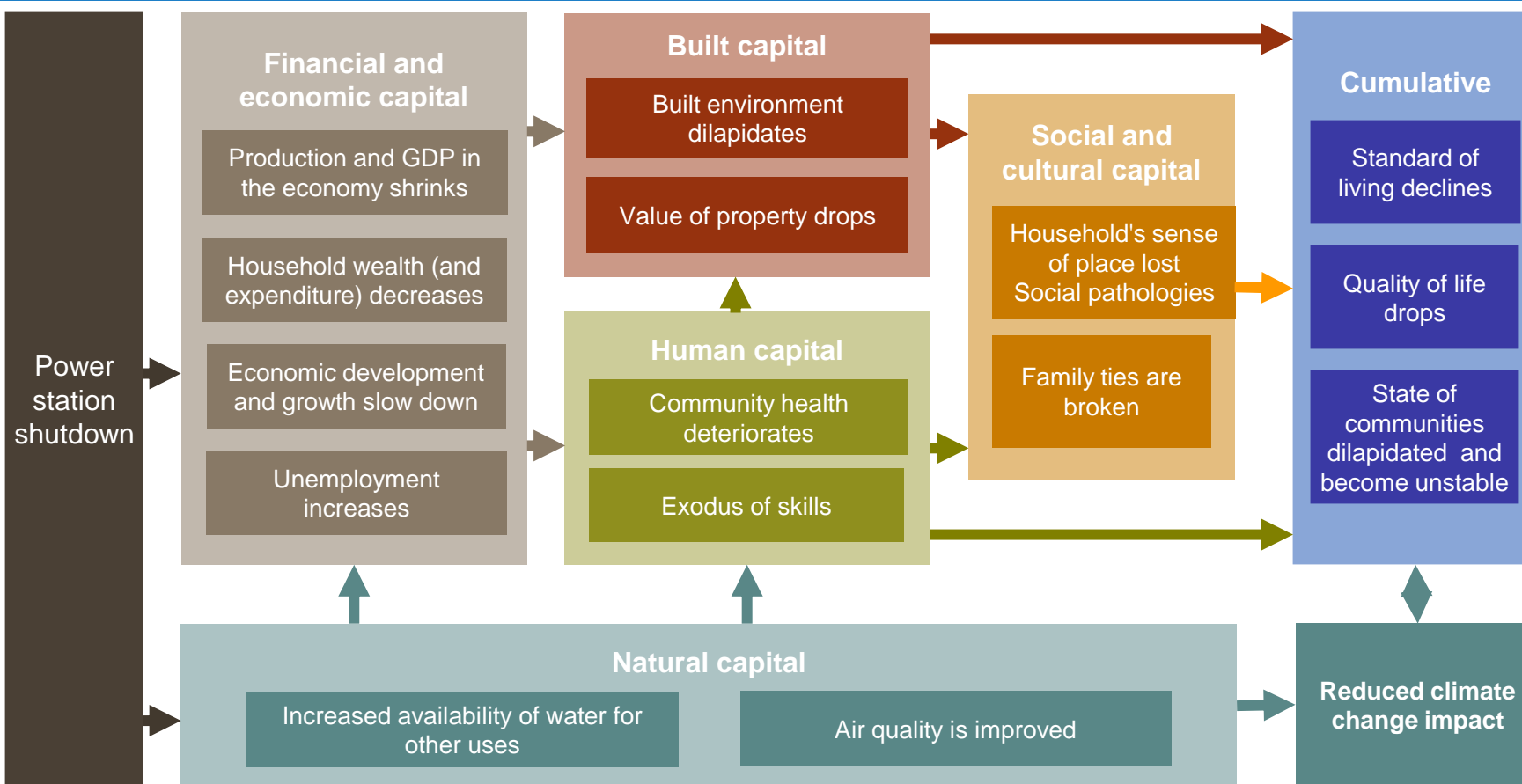
Partnership for the development of the Komati Training Facility and assisting Eskom Academy of Learning to receive accreditation, enabling Eskom to replicate at other locations. SARETEC only accredited entity in SA offering this type of training



A word cloud of stakeholder concerns. The words are arranged in a roughly circular pattern, with 'loss of income' being the largest and most central. Other prominent words include 'access to water', 'substance abuse', 'local skills deficit', 'mine closures', 'loss of business revenue', and 'basic services needs increases'. Smaller words include 'provincial sustainability', 'ghost town', 'land rehabilitation', 'limited ECDs', 'informal settlement mushrooming', 'property value decreases', 'crime increases', 'tax base shrinkage', 'CSR projects halting', and 'migrant influx'.

basic services needs increases
loss of business revenue
provincial sustainability
ghost town
mine closures
land rehabilitation
limited ECDs
informal settlement mushrooming
loss of income
property value decreases
crime increases
tax base shrinkage
substance abuse
CSR projects halting
migrant influx
local skills deficit
access to water

No mitigation scenario: The root cause of impacts on communities is linked to financial and economic capital



Impacts

- KPS has been mothballed in the past,
- 2020 already shutdown most of its units have been shut down
- The closure of Kroonfontein mine and other activities in the area have eroded the social fabric
- Negative impact on the regional economy in Mpumalanga due to financial and economic capital
- Reduced production and employment (production induced impacts)
- Potential exodus of skilled people from the local area
- Negative effect on the health of communities and reduction of standard of living

Opportunities:

- Local population invested and eager to see the area turnaround
- Environmentally friendly and sustainable economic activities on site
- Collaboration and partnership to exploit medium and high potential arable land

A “Theory of Change” principal was applied to develop a causal chain of events and impacts that would be triggered by the shutdown. This allowed identification of “root causes” of impacts that need to be prioritised for mitigation.

Eskom Komati PS mitigation strategy comprises of five pillars and is driven by repurposing and repowering initiatives

Stabilise



Stabilise the local economy by setting up new economic activities and creating new jobs in the community through

Focus:

- Repurposing and repowering (R&R) projects focus
- Economic opportunities in the community

Enable, support and realise

Focus:

- PS's permanent employees
- ERI employees
- Contractors
- PSA workforce

Reskill, upskill and develop new skills among power station employees and local community workforce

Develop



Strengthen



Focus:

- Basic services infrastructure
- Health and education
- Communication
- Sports and leisure facilities

Strengthen the communities by addressing the existing gaps and challenges in the community

Communicate



Communicate plans and engage with stakeholders throughout project life cycle

Facilitate growth of SMMEs and economy through localisation of supply chains and other business opportunities created by R&R

Grow



Stabilise and grow the local economy by setting up new economic activities and creating new jobs


Projects are grouped into three phases in terms of their implementation timeframe:

Phase 1: Incremental

Transition (maintenance and support of existing) 



 Decommissioning station 

 Containerised Microgrids 

 AgriVoltaics Pilot Project 

Phase 2: Quick win

 100 MW Solar PV plant 

 Battery Energy Storage System (BESS) 

 Alien Veg. Removal & Beneficiation

 Crop Farming with Mine Affected Water

Phase 3: Leap (permanent)


 50 MW Solar PV plant 


 70 MW Wind Energy Facility 


 Synchronous condenser 


Stabilise


Grow


 Business opportunities, skilling and jobs from R&R

 Business opportunities, skilling and jobs from R&R

 Solar PV components assembly/manufacturing plants

 Microgrid components manufacturing/assembly plants

 BESS cell manufacturing and/or assembly plant

 RE component recycling facility

Mitigation: Opportunities for Workers & Communities



Objectives

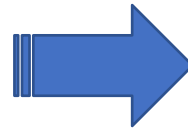
Minimizing and mitigating the risks and impacts of the project on workers

Managing social and economic risks to the community

Addressing distributional impacts of transition

Supporting communities during transition through community/local development opportunities

Engaging with stakeholders and enabling communities to participate in transition planning and decision-making



Transition Support for Komati Permanent Workers, Suppliers and Contract Workers



Community Development and Economic Diversification



Stakeholder Engagement

Transition Support for Komati Permanent Workers, Suppliers and Contract Workers



- Workforce transition of Eskom and ERI employees
- Based on Eskom HR Plan (under consultation with staff and unions)
- Transfer to other power stations
- Reskilling / upskilling to deploy in repurposed RE plants
- Secondments to other Eskom operations / projects



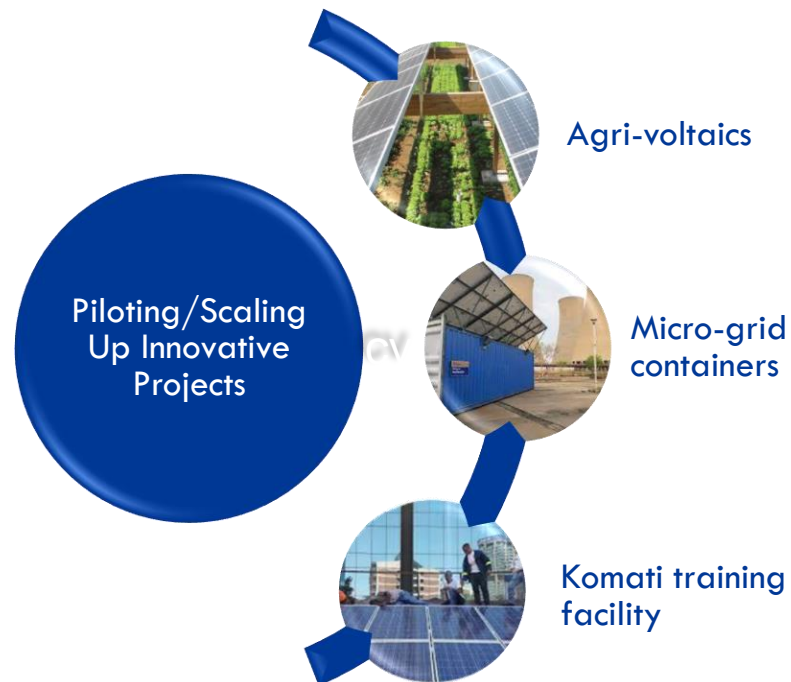
Support for suppliers and contract workers

- Localization strategy to develop local content and examine workforce requirements
- Supplier development for decommission and repurposing based on localization strategy
- Support to local suppliers with a focus on development contributions and shareholding by local communities
- Linkages with existing social assistance and active labor market policies



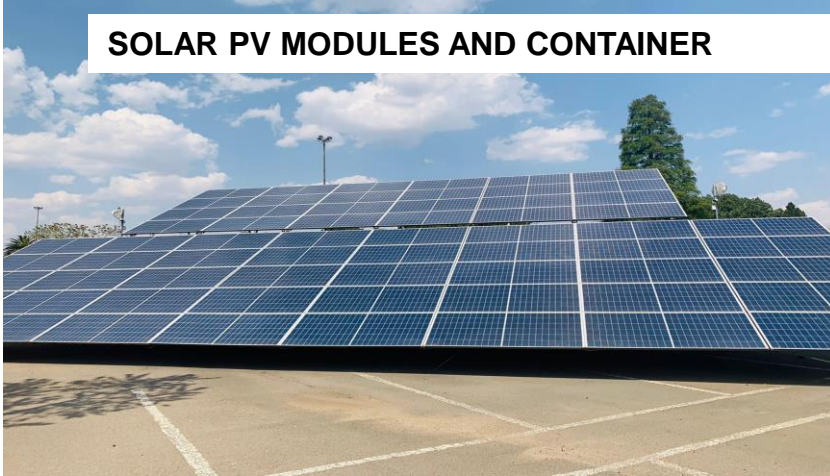
Establishment of Komati Training Facility (KTF)

- Facilitate skilling of Eskom workers and local community in renewables and other skills
- Upstream skilling/upskilling of workers from other power plants
- Operated in partnership with relevant industry associations.

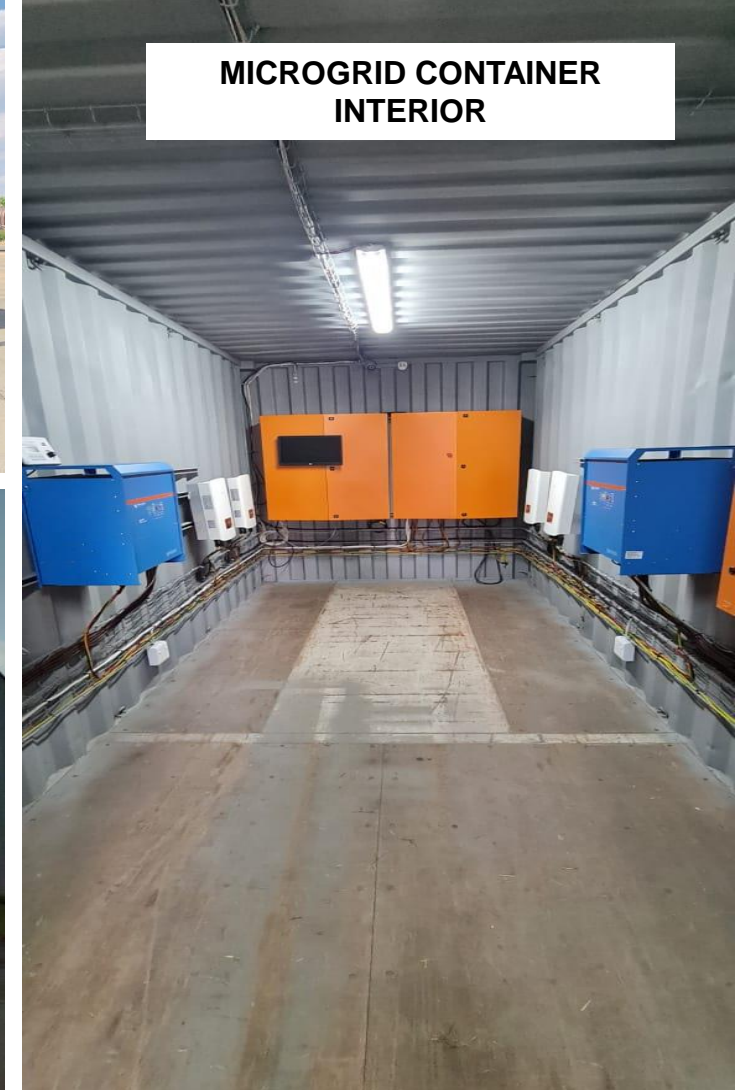


Containerised Microgrids and Workshop

SOLAR PV MODULES AND CONTAINER



**MICROGRID CONTAINER
INTERIOR**



MICROGRID WORKSHOP AT KPS

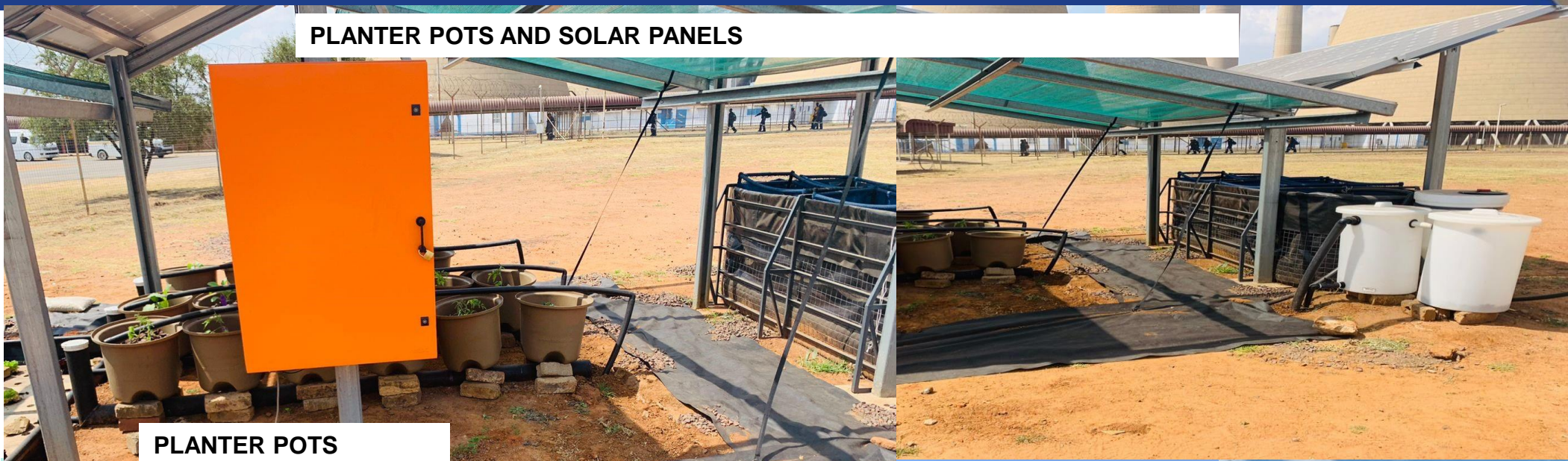


Agrivoltaics Demonstration Facility



Aquaponics farming
MushMag dome

PLANTER POTS AND SOLAR PANELS



PLANTER POTS

SOLAR PANELS



Establishment of Komati training facility



Eskom and SARATEC MoU signing ceremony in Cape Town at CPUT 22 August 2022

GCE André de Ruyter and CPUT vice-chancellor
Prof Chris Nhlapo



Joseph Nganga (GEAPP), Mandy Rambharos and Prof Chris Nhlapo



GCE André de Ruyter at CPUT



GEAPP, Eskom and CPUT team



Investing in Viable Local Area Development Projects

- Over 500+ potential interventions assessed based on provincial strategies, local development plans, feasibility studies, stakeholder consultations
- Final identification and implementation
- Indicative projects: **Agricultural & Agro-processing, Alien Vegetation Removal, Crop Farming with Mine Affected Water Irrigation and Winter Wheat Farming, Digital Hubs and Digital Connection of Communities**



Strengthening the Livelihoods of Affected Communities

- Establishment of entrepreneurial hub and support to SMMEs
- Seed financing facility
- Incubation and business development services



Reskilling and Upskilling of Community Members

- Trainings to enhance employability (targeting youth, women and vulnerable groups)
- Trainings imparted in collaboration with public/private providers
- Training modules aligned to planned investments in Komati



Community Support – Government driven

- Early Childhood Dev. (ECD) centers, health center, recreational facilities

Approach:

Demand driven and consultative approach

- Community development activities aligned with local development plans
- Collaboration and partnership with local government, community groups
- **Target groups:** women, youth and vulnerable groups

By 2030, the project will have significant positive impact for the local communities

~430

Net direct, Full Time Employee jobs created through repurposing and repowering of Komati Power Station

~7,700

Additional temporary jobs created mainly in construction and decommissioning

~370

MW generation capacity added, which will replace Komati's current capacity of 100 MW

~200

People trained annually through Komati Training Facility, accredited by CPUT's SARETEC

Numbers could be higher depending based on experience as we roll-out

~\$490m

Potential funding in advanced-stage discussions with World Bank for Komati Repowering and Repurposing

- Social dialogues is important for the transition
- The impact of KPS closure will be significant and will affect the economy and the lives of the people; however, it also offers an opportunity to change the lives of people for better and re-build the company's reputation
- The proposed R&R projects can make a significant contribution to mitigating the impacts of the shutdown by creating sustainable employment opportunities and supporting jobs during construction, while stimulating the local economy
- Procurement strategy for R&R (ESD, job, skills development) are crucial to the economic recovery
- Achieving the above results will require commitment and leadership not only from Eskom but from government and other stakeholders, including business, labour and civil society
- A broader integrated plan for the local area and region is required to support the shutdown of coal-fired power stations in Mpumalanga



- 1 Eskom's JET strategy
- 2 Komati Repowering and Repurposing
- 3 Socio-economic Impact Studies
- 4 Q&A**

Thank you



Shutdown of KPS may have impacts on coal mining and transportation industry

The shutdown of KPS may reduce demand for goods and services, negatively impacting business along its supply chain



Coal is diverted to KPS under existing contracts with other PSs



Coal supply to KPS supported employment – shutdown may affect employment in the industry



KPS receives coal supplies via road transportation



Road transportation of coal supports employment opportunities

2020 figures

873 kt

supplied to KPS (0.7% of coal purchased by Eskom during the year)

321

jobs supported by coal supply operations at KPS (0.4% of industry total)

45

truck trips per day to supply KPS with coal

41

jobs supported by delivery of coal to KPS