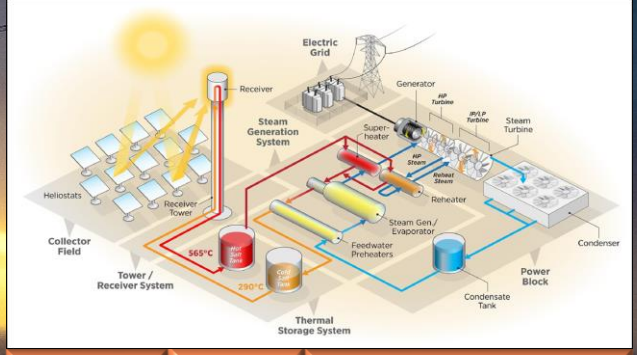
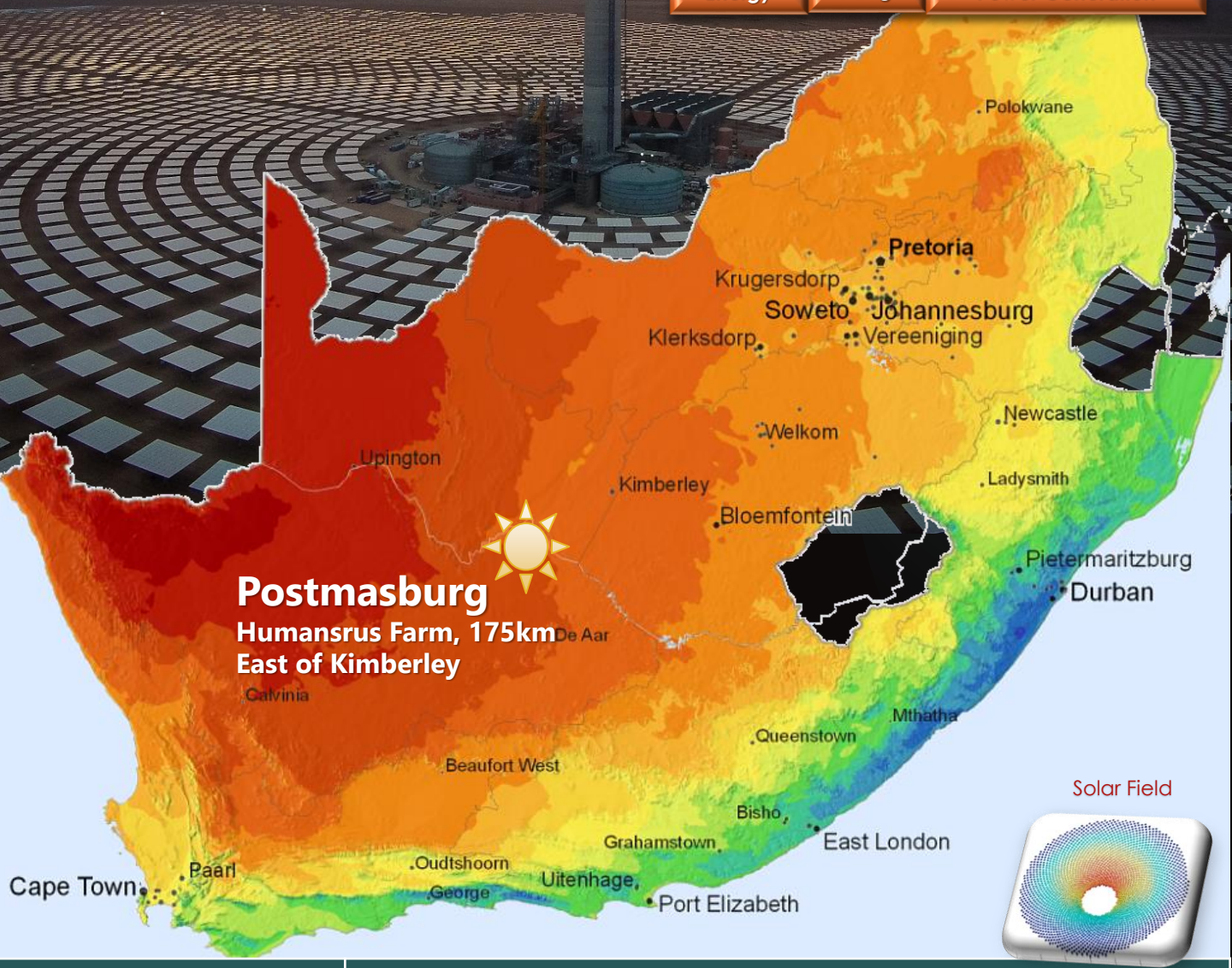
REDSTONE

Solar Thermal Power Plant



Energy | **Storage** | **Power Generation**



Solar Field

Sponsors/ Shareholders:	ACWA Power Redstone Holdings, Central Energy Fund, Pele Green Energy, Humansrus Community Trust
Project Lenders/Funders	ABSA, AfDB, BII, DBSA, FMO, Futuregrowth, IDC, Investec, KFW DEG, Nedbank, Prescient, Sanlam
EPC Consortium:	SEPCO III in joint & several, arrangement with Power China with Local BEE shareholder
O&M Contractor:	O&M Co: Nomac / Local Partner
Off-taker (PPA)	Eskom Holdings SOC Ltd, SCOD + 20 years, Parties: Eskom and Project Company
Implementation Agreement:	SCOD + 20 years, Parties: Dept. of Minerals, Resources & Energy & Project Company
Transmission. Agreement:	SCOD + 20 years, Parties: Eskom and Project Company

ACWA Power Redstone CSP Tower Plant

The 100 MW Redstone Concentrated Solar Power (CSP) Tower project forms part of South Africa's Renewable Energy Independent Power Producer Programme (REIPPP). The project was awarded the preferred bidder status in 2015, First synchronisation is expected Q4 2023.

Key Project Information

Location: Tsanstabane & Kgatelopele Local Municipalities, Northern Cape Province

Clean Energy supply: Supplies more than 400 000 people per day

Technology:

- Over 1 million m^2 mirrors in the Heliostat Field surrounding a CSP Tower with Molten Salt Thermal Receiver reaching 250m height
- Molten Salt Storage Capacity that enables the plant to generate an additional 12 hours after sunset at full load (will be largest storage on the African Continent)

Environmental:

- Eliminates the emission of more than 480 ktons of CO_2 each year
- Zero harmful emissions
- Zero liquid effluent discharge
- Uses less than 200 000m^3 of water per year (dry-cooled condenser)

Job Creation:

- Expected to create over 1500 jobs during construction and commissioning phases at peak (20 jobs/MW installed incl. indirect jobs over 31 months period)
- About 100 permanent jobs created in operations and maintenance phase; 1.0 jobs/MW installed over 20 year PPA term
- A further 1.8 jobs/MW Indirect & Induced employment
- 37% local content procurement during construction (non-financing spend)

Technical Overview

Technology used: 100MW Concentrated solar thermal trough, with dry cooling and molten salt thermal energy storage (12hrs at full load)

Solar Field

- **Solar Field consists of a circumferential field of sun tracking Heliostats**
- **Heliostats collect the solar radiation and concentrate it onto the solar receiver**
  - Heliostats with about 1.1 million m^2 of reflective surface
  - A fully integrated Heliostat Control System for targeting accuracy

Thermal Energy Storage

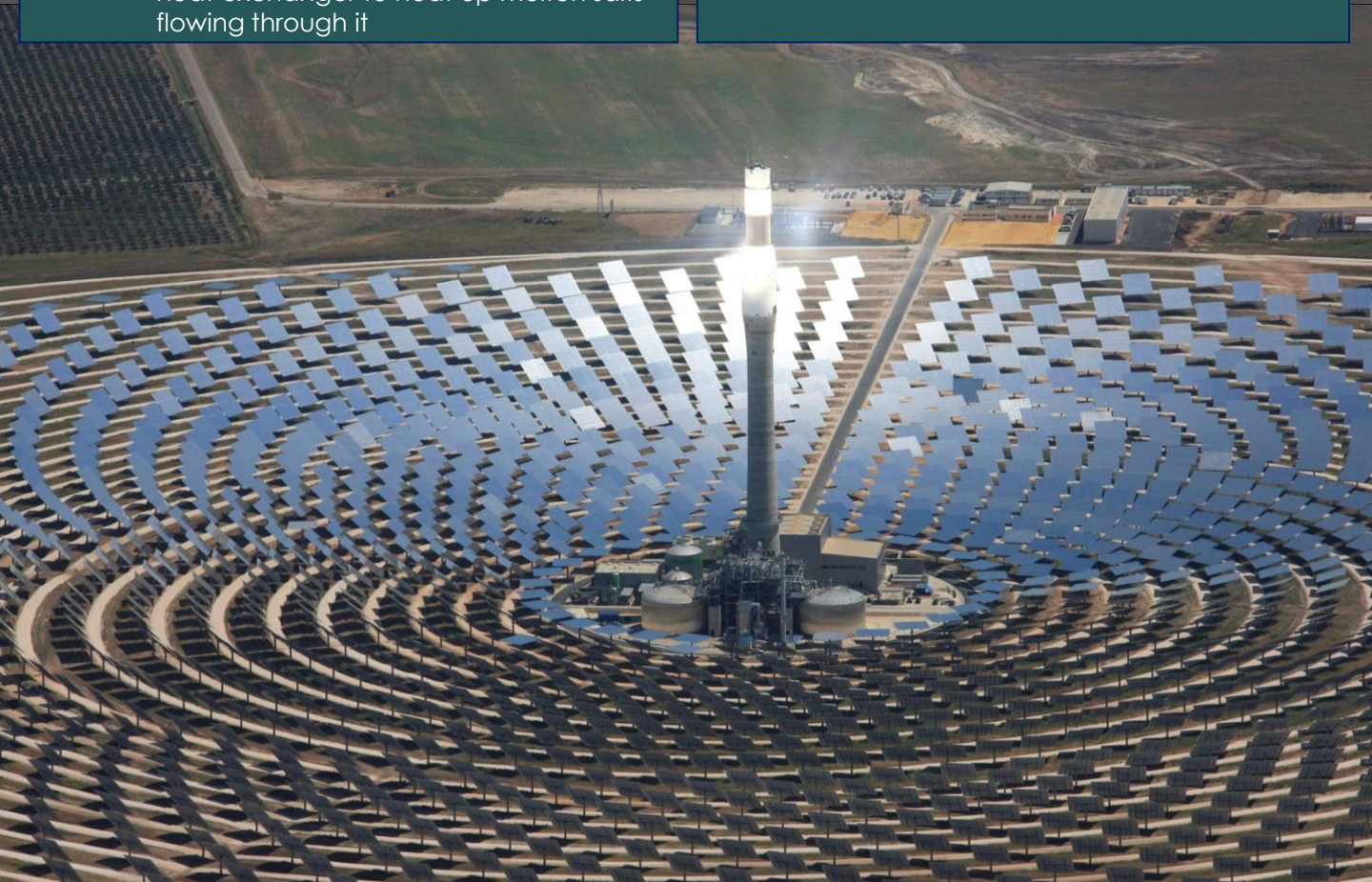
- **30,500 Tons of Salt (Potassium and Sodium Nitrate)**
- **Two Tanks – Hot & Cold**
  - Hot Tank Temperature 566°C
  - Cold Tank Temperature 290°C
- **Bank Solar Energy during the day and release it at night or as needed**

Molten Salt Receiver

- **The Receiver Assembly installed on the top of the Tower**
- **Converts solar radiation reflected onto it into thermal energy**
  - Consists of Cylindrical tubes that act as a heat exchanger to heat up molten salts flowing through it

Grid Connection

- **Grid connection involves construction of the following:**
  - A new 132 kV switching station called "Noko" is to be constructed and
  - 32km transmission line connecting to Eskom's Olien Substation



Responsible corporate citizenship:

During the lifetime of the project, **~R575 million** will be spent towards **socio-economic development programmes**

	Construction phase	Commissioning phase	Operational phase
Duration	**25 months**	**6 months**	**20 years**

Direct benefits will accrue from the Redstone CSP including job creation and local procurement, both during the construction and operations phases and benefits will be realized through the Socio-Economic Development programme, comprising a three-pronged focus on:

Skills development	Scarce and critical skills have been mapped against a learning matrix for bursary and workplace training opportunities, supported by learnerships, internships, apprenticeships and mentorships as appropriate.
Enterprise development	Preferential procurement policy will seek to maximise opportunities to procure from BEE, EME/QSE, women-owned businesses.
Social infrastructure	Following a needs assessment and considering Redstone's business activities, communities will benefit from infrastructure linked to energy (e.g. decentralised renewables), education (targeting science and maths) and health (e.g. mobile clinics and medicine availability) etc