

50 MW Bokpoort CSP Trough & 100 MW CSP Tower

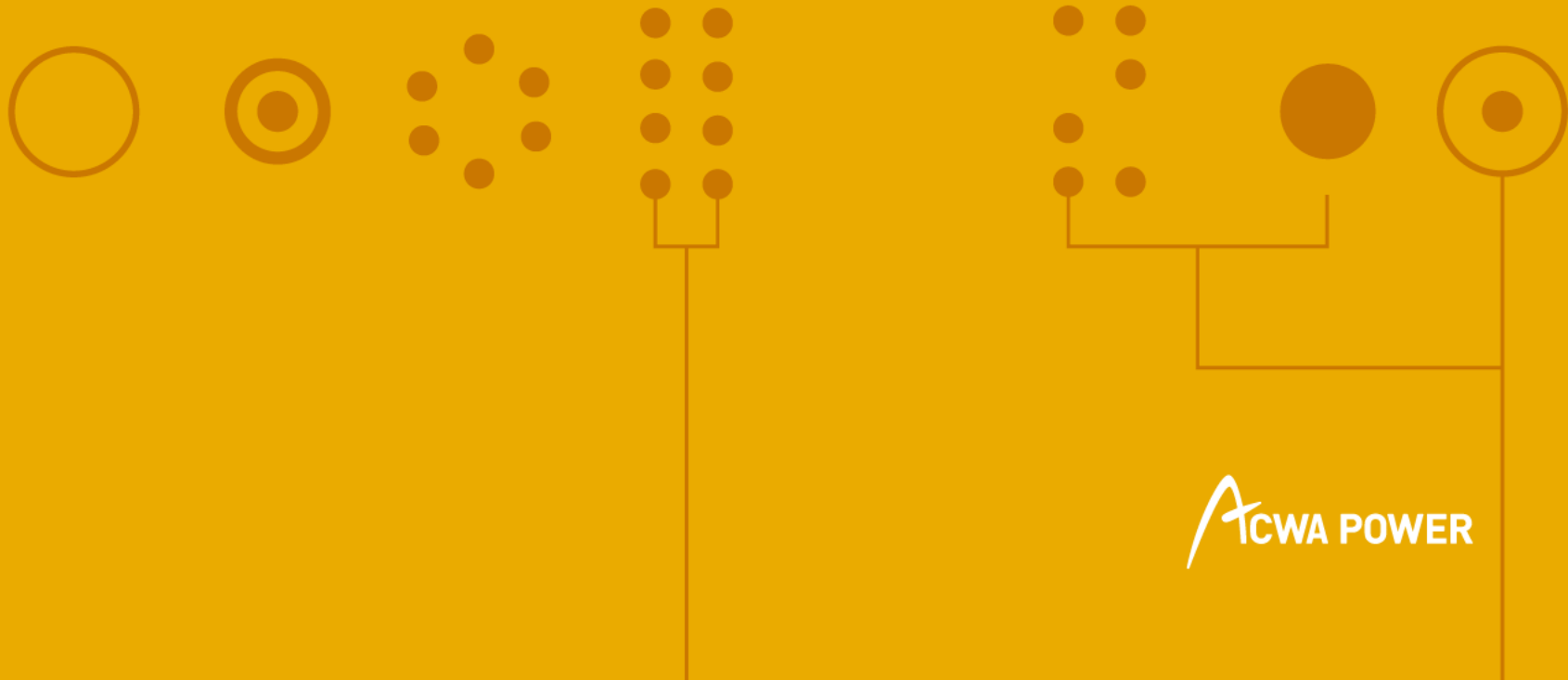


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Business Director Southern Africa

ACWA POWER

Content

1. Who are we....?
2. 50 MW Bokpoort CSP & 100 MW CSP Tower
3. Local Content
4. Local Community



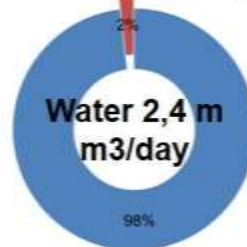
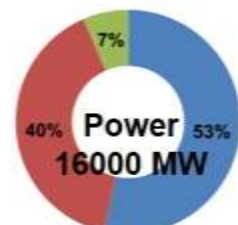
AcWA POWER

1. Who are we?

- emerging market utility company with more than 16,000MW in Operation or Construction
- we develop, own and operate power and water Assets

Our clients are:

- Mostly Investment Grade Sovereign linked Off-Takers
- Commodity Resource based credit worthy Off-Takers



835 MW - Pre & Construction

427 MW - Operation

■ Operational ■ Under-construction ■ Pre-construction



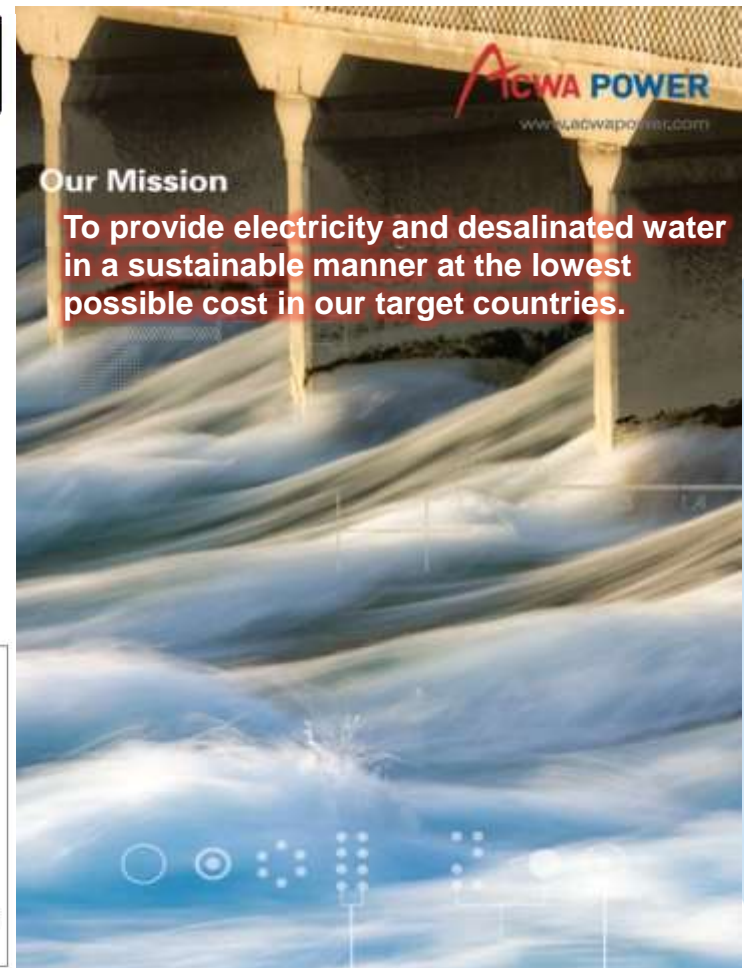
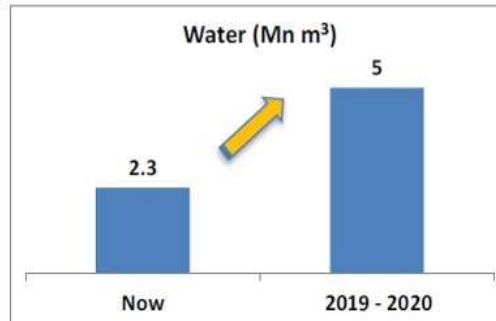
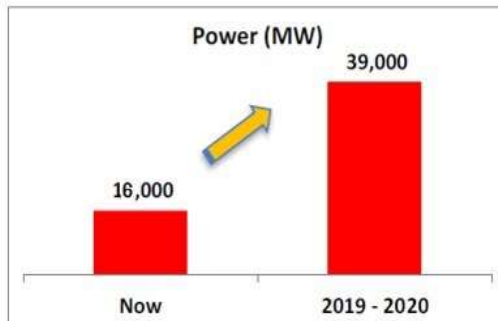
2014

ACWA POWER

2. The Way Ahead

Sustain profitable growth momentum

- With over 50% of its portfolio of about 16,000 MW of Power and 2.3 Mn m³/day (c. 1,400 MWe) of water capacity in commercial operation, ACWA Power is seeking to sustain its growth momentum through a combination of:
 - Green-field development projects
 - Acquiring portfolio of assets through privatization and/or negotiated sales
 - New build expansion at existing assets
 - Increased ownership of existing assets
- Targets:



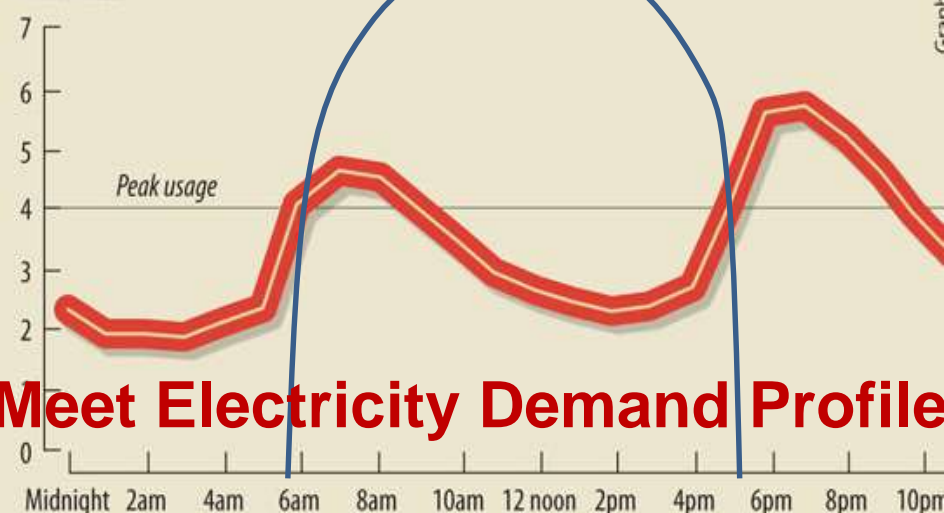
CSP & Energy Storage



Peak electricity usage in 2013

Daily profile of a typical Eskom high-consumption residential customer

Average load
in kilowatts



Meet Electricity Demand Profile



Local Content

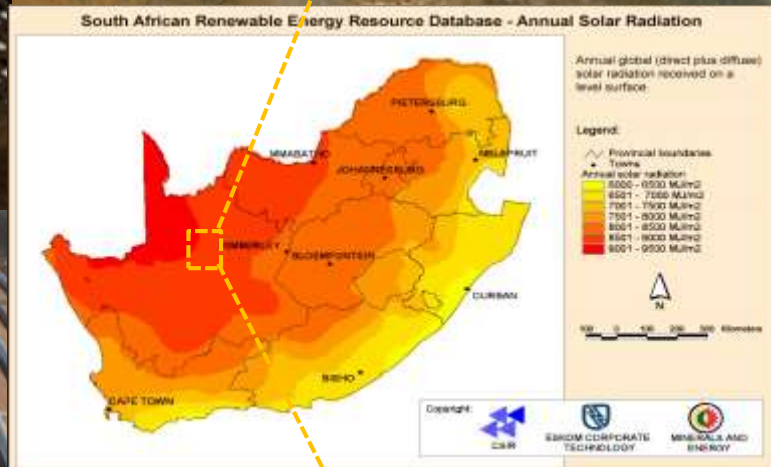


Local Community

100 MW Redstone CSP Tower



50 MW Bokpoort CSP Trough



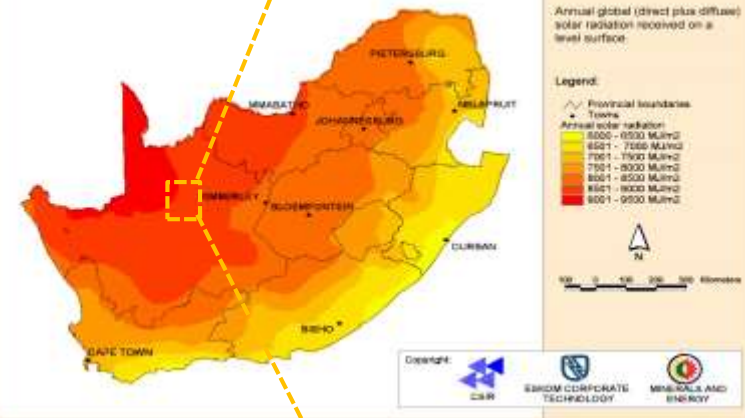
100 MW CSP Tower



50 MW Bokpoort CSP Trough



South African Renewable Energy Resource Database - Annual Solar Radiation



50 MW Bokpoort CSP Trough

Hot Tank

HTF System

HTF Overflow Vessel

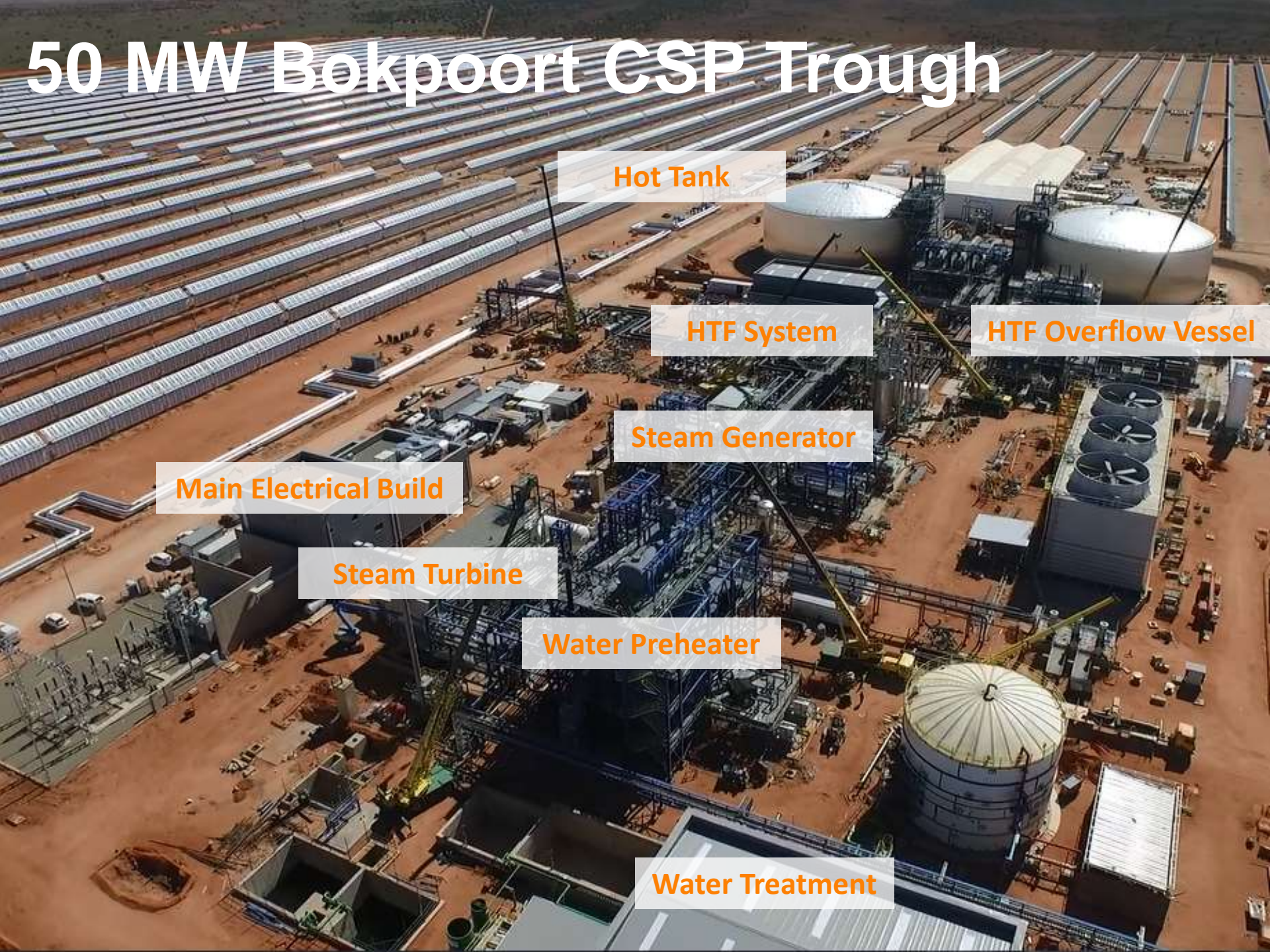
Steam Generator

Main Electrical Build

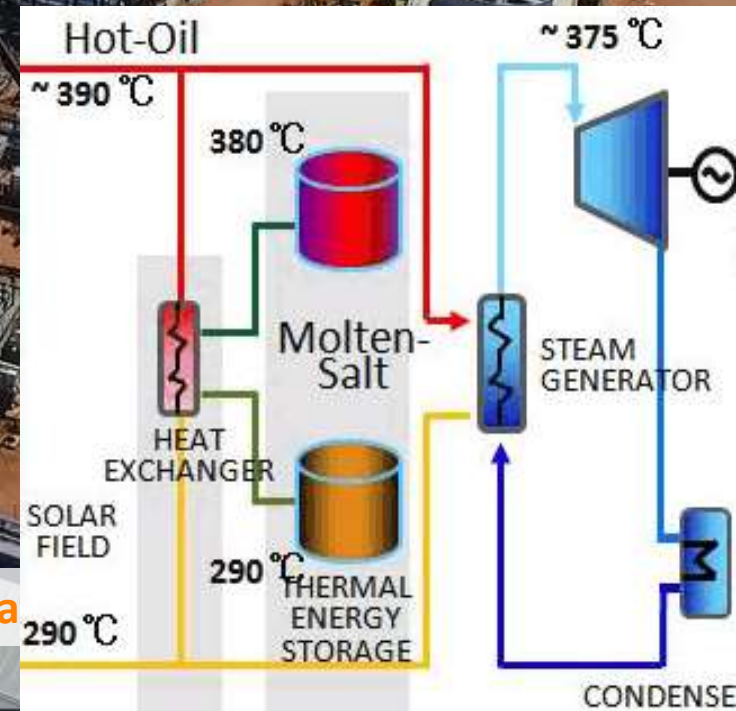
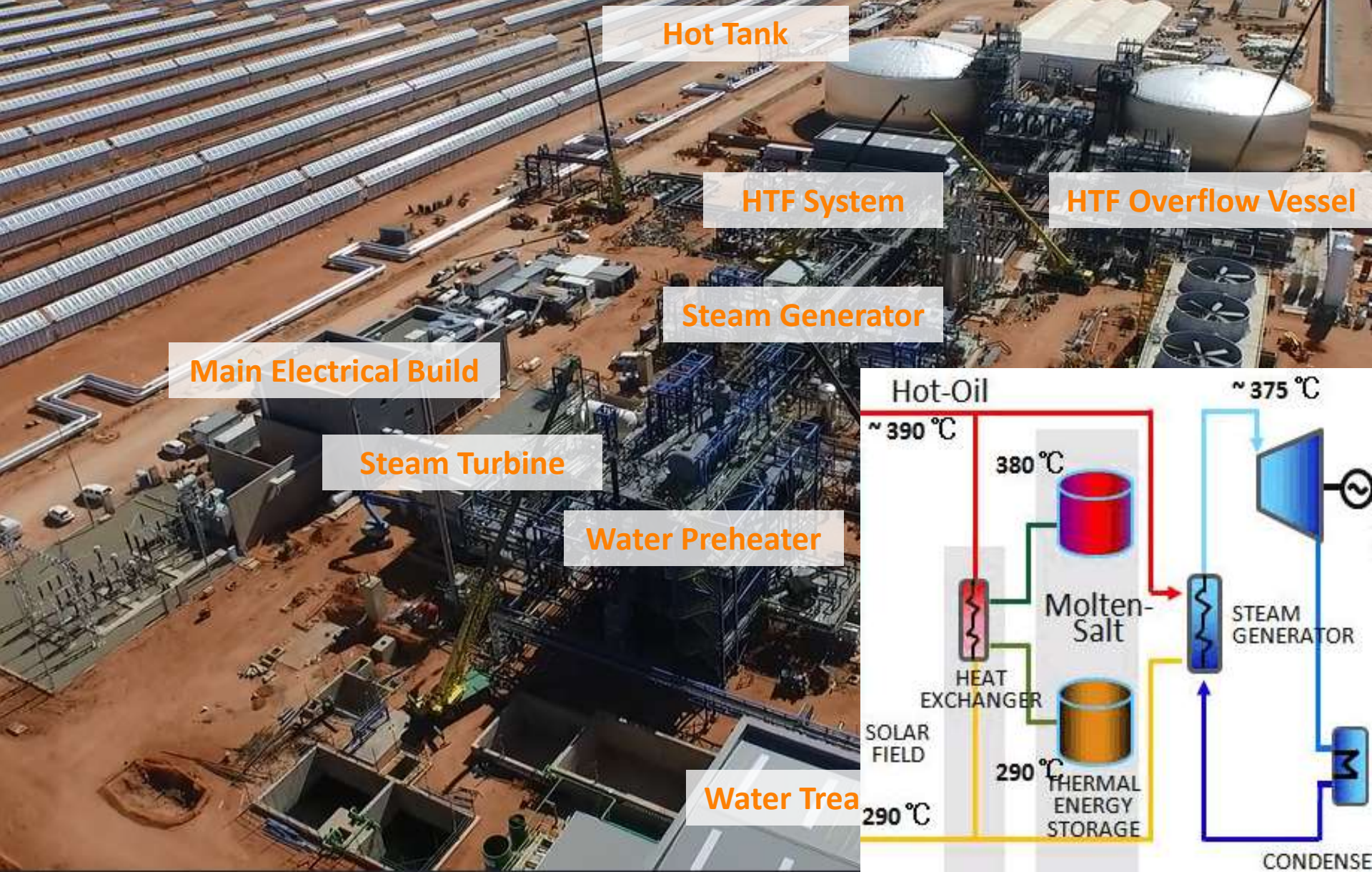
Steam Turbine

Water Preheater

Water Treatment



50 MW Bokpoort CSP Trough



50 MW Bokpoort CSP Trough

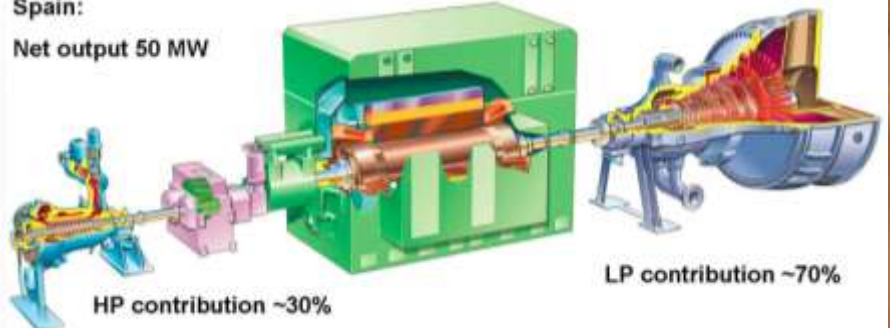
- Two Trains of Steam Generation
 - Steam Supply 103.6 bara @380°C (@ Turbine Inlet)
 - Enthalpy 3028.7kJ/kg, Steam Flow 60.0 kg/s
- Siemens Steam Turbine SST-700
 - Single Reheat (HP, LP)
 - Siemens Generator

Steam Generator

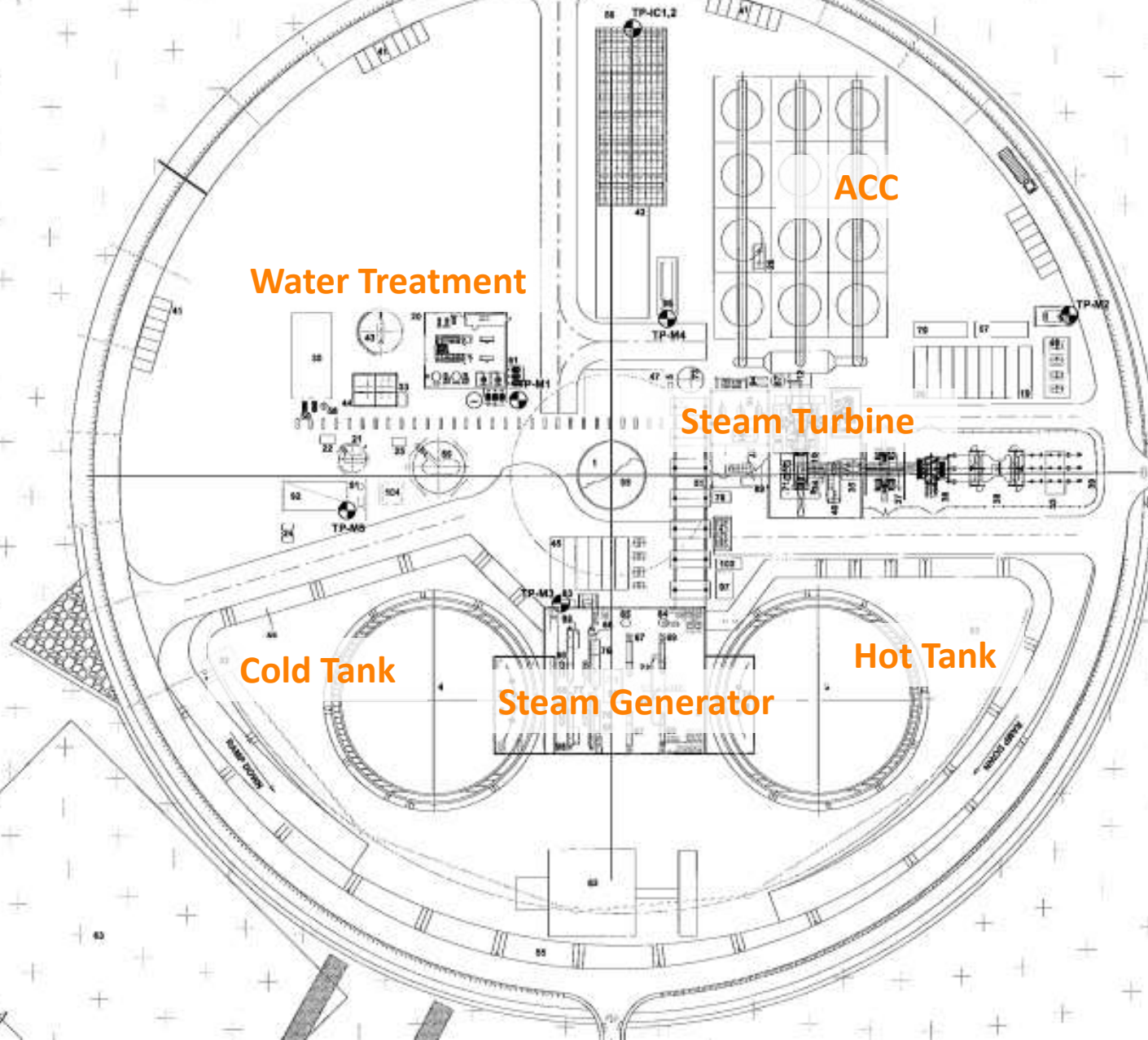
Steam Turbine

Spain:

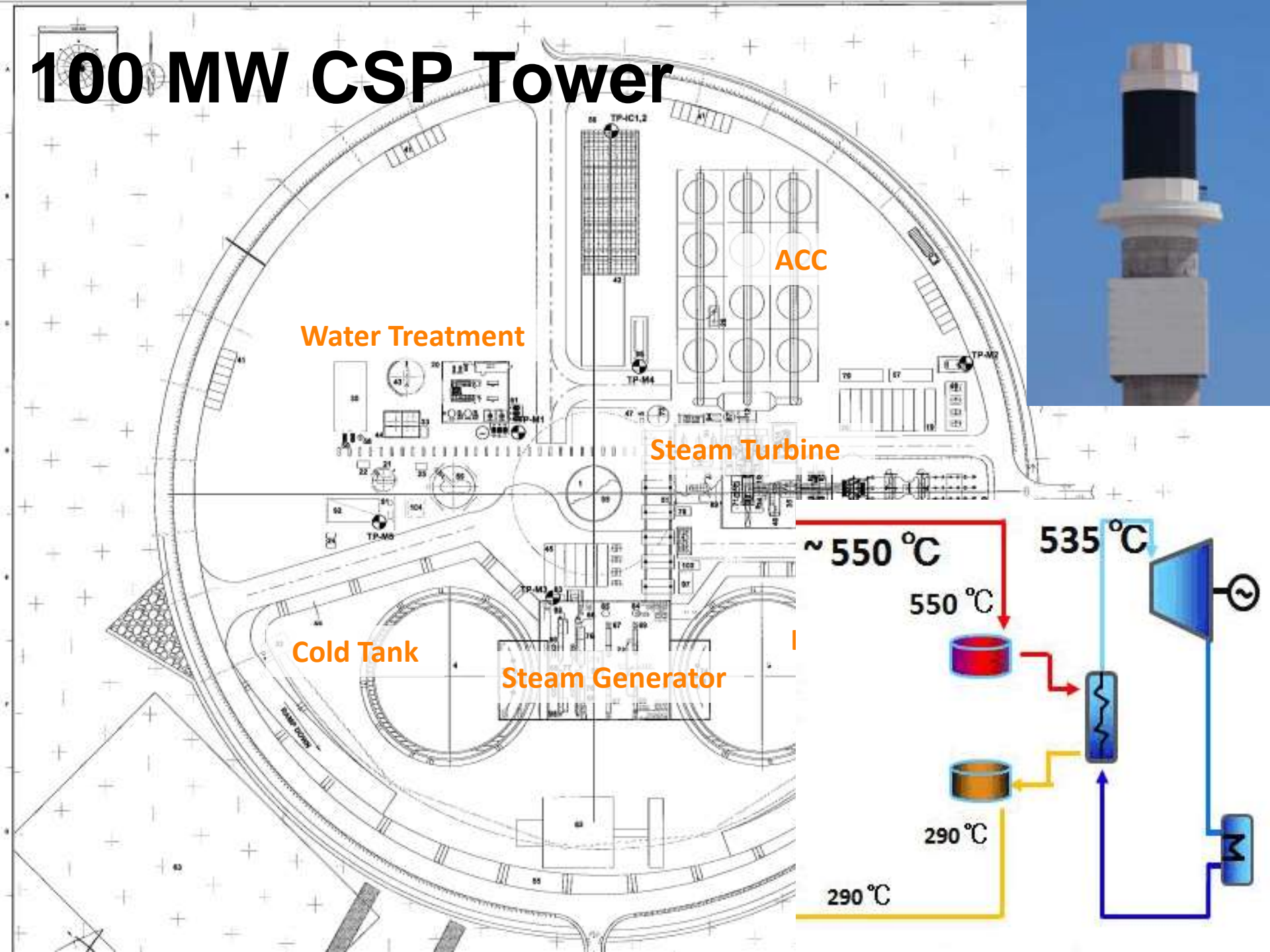
Net output 50 MW



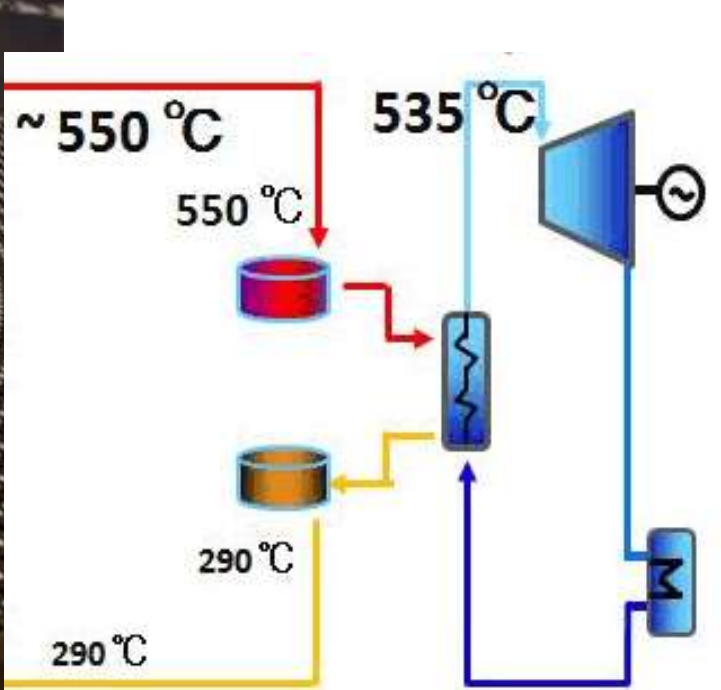
100 MW CSP Tower



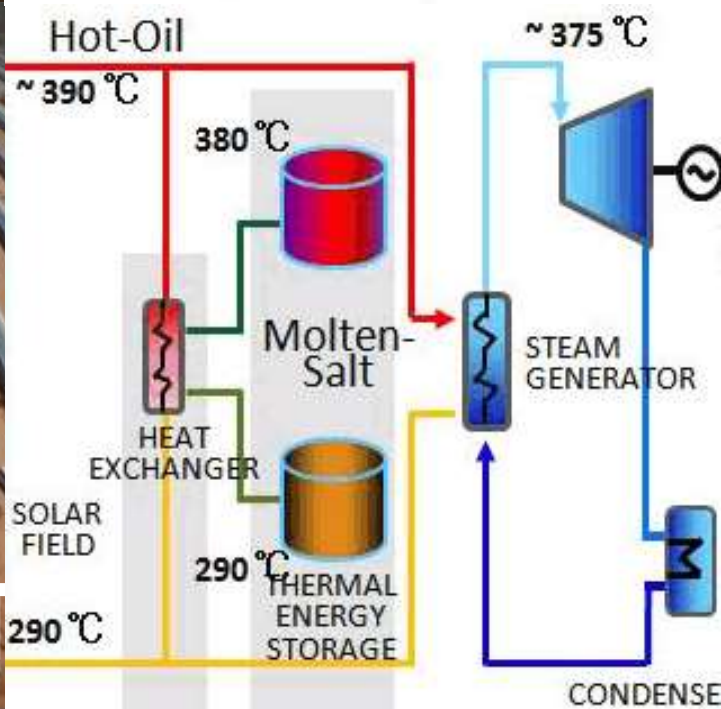
100 MW CSP Tower



100 MW CSP Tower



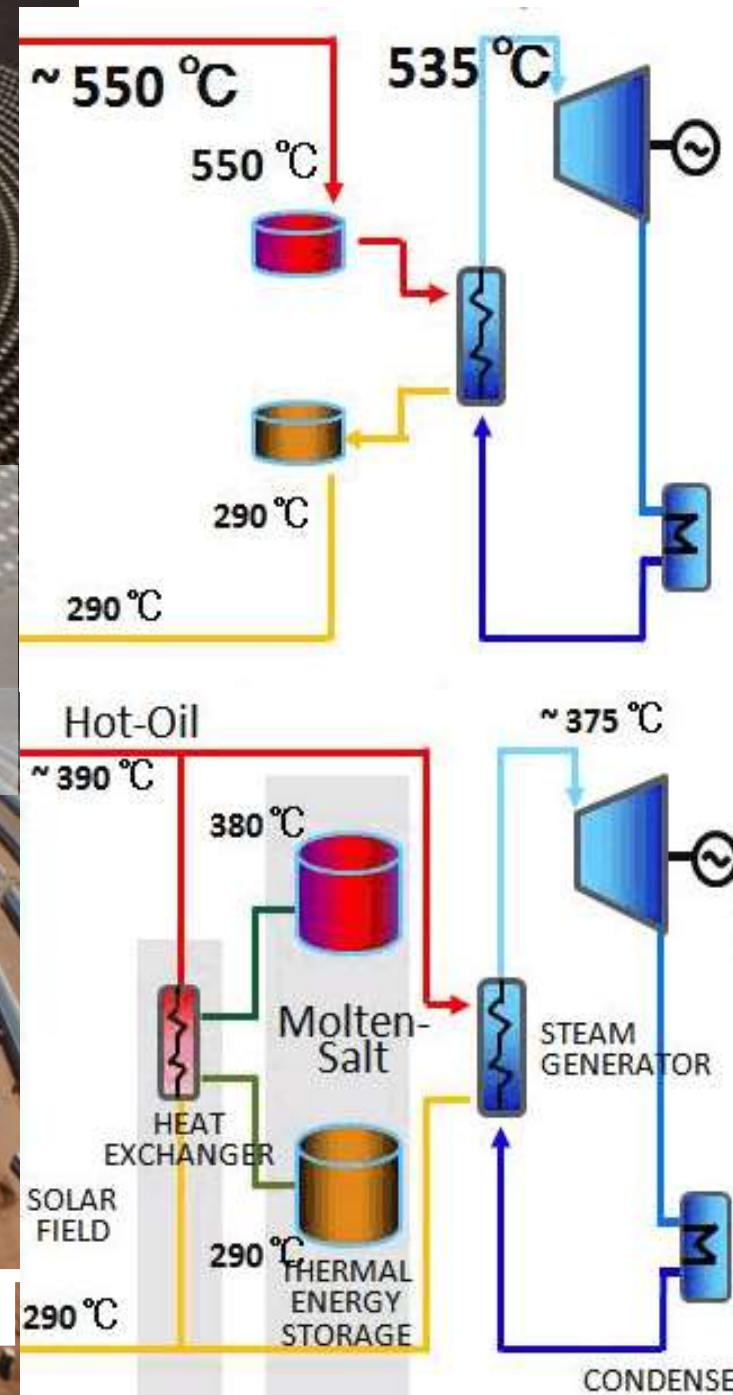
50 MW Bokpoort CSP T



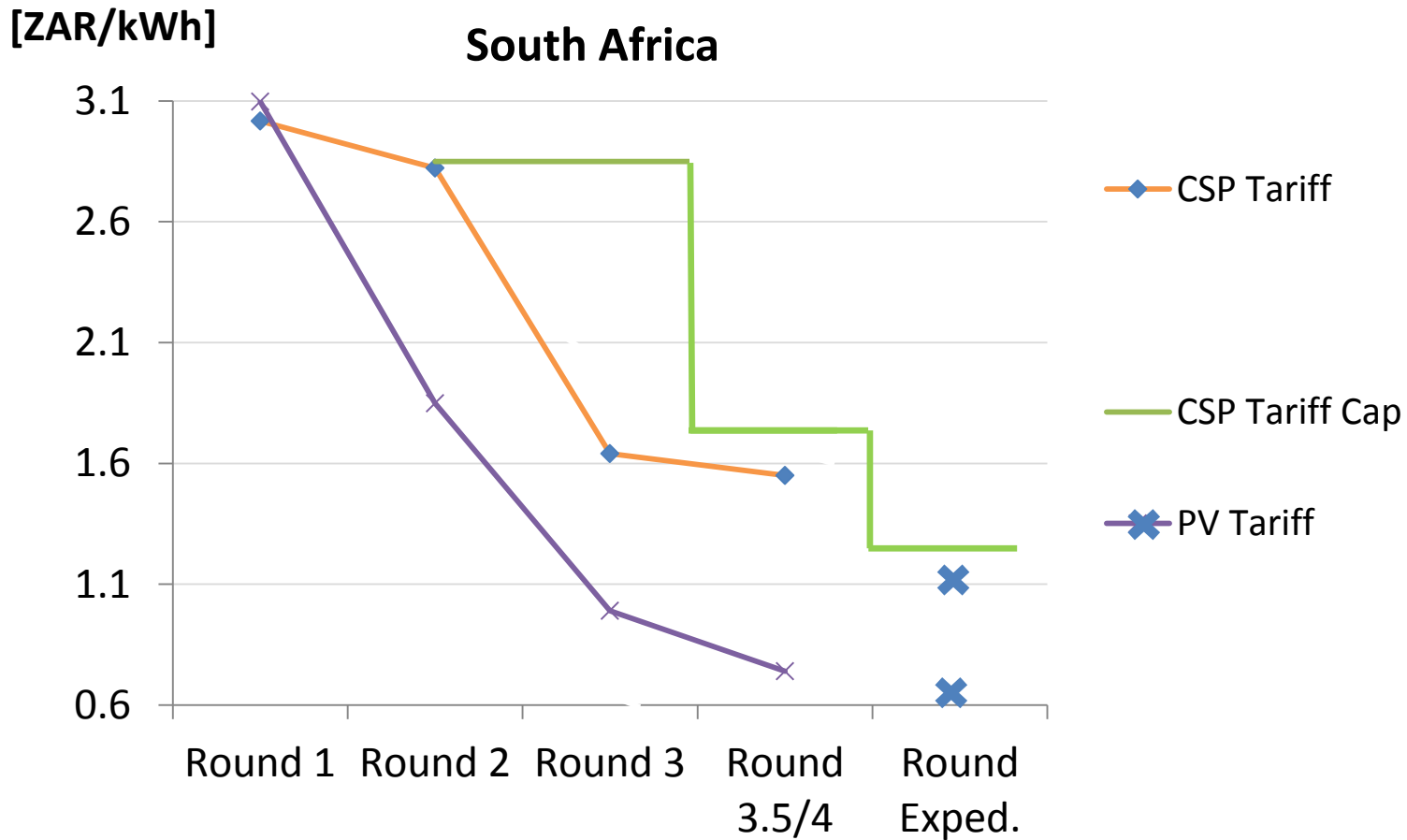
100 MW CSP Tower

- No HTF system (5% efficiency gain @ TES operation)
- Less molten salt
- Higher w/s cycle efficiency (>15%)

50 MW Bokpoort CSP T



3. CSP Tariff Development Scenarios



Fully Indexed, April 2013

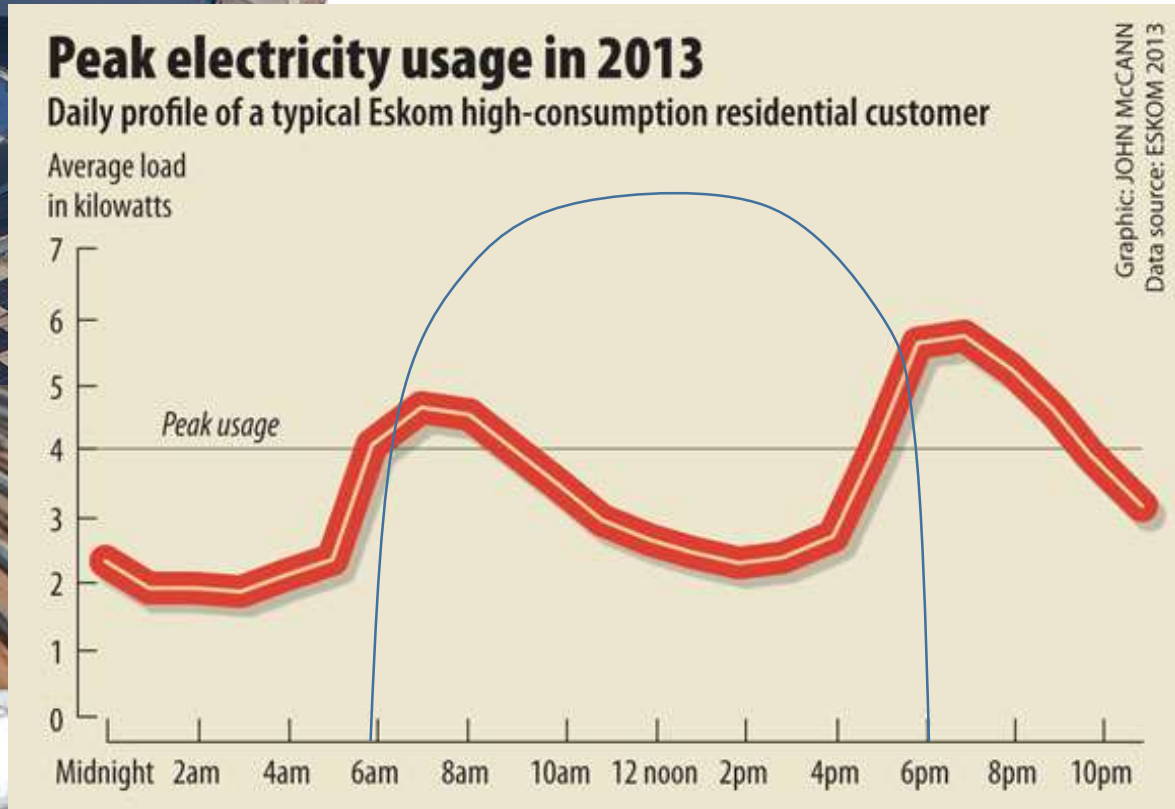
Source: Scenarios based on GTM Research.

12 hours storage

> 3000 MWth



9.3 hours storage



1300 MWth

12 hours storage

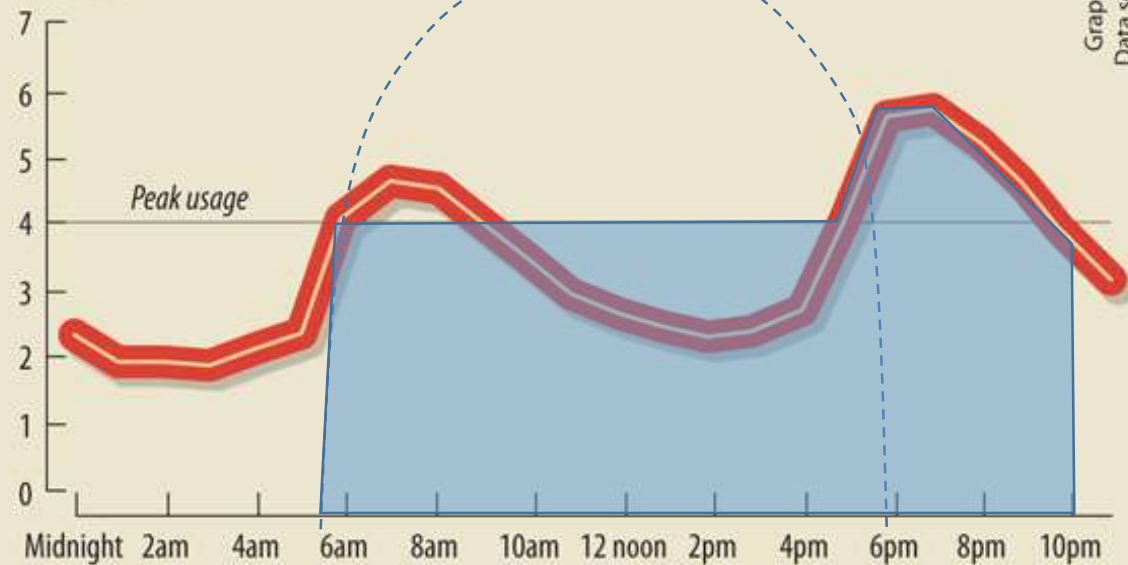
> 3000 MWth



Peak electricity usage in 2013

Daily profile of a typical Eskom high-consumption residential customer

Average load
in kilowatts



Graphic: JOHN McCANN
Data source: ESKOM 2013

9.3 hours storage

1300 MWth

Local Content

Local Content is driven by:

- Competitiveness (country specific cost)
- Existing manufacturing infrastructure and capabilities
- Future market size
- Productivity at work place (incl. industrial action)



Local Content: Competence & Knowledge

Local Spend Analysis

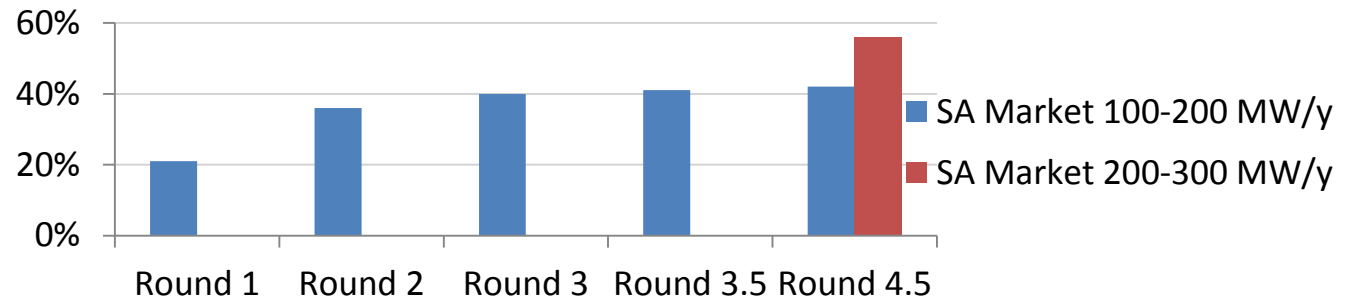
- Total Estimated local value add (in ZAR) - Approx R1.6 Billion
- **Main SA manufacturers**
 - Gauteng – HTF Expansion/Overflow Vessels
 - Uptington – Salt Tanks (Thermal Storage)
 - Gauteng / Cape Town – Torque Tubes, Pylons for Solar Field
 - Approx. 8160 tonnes of steel for all Torque Tubes
 - Approx. 1200 tonnes of steel for all Pylons
- **Main SA Pre-Assemblers and On-site Assemblers**
 - Uptington – HTF Solar field piping
 - Uptington – HCE Stainless steal piping
 - Northern Cape – HP Power Block Piping
 - On Site – Solar Collector Elements
- **Total Estimated training performed 50,000 hours**
 - Safety Training – 20%
 - Small Tools Use – 20%
 - On Job Training & Skills Specific Training – 60%
 - Scaffold Use, Foundation Erection, Welding Setup, Electrical Cable Pulling & Termination,

SA Manufacturing and Pre-Assembly



HTF - Heat Transfer Fluid, HCE – Heat Collector Element, SCE – Solar Collector Element

Local Content: the next phase



SA Manufacturing Infrastructure

- Civil / Cooling Tower
- Valves & Actuators
- Pressure Vessels
- Collector Structure
- Storage Tanks
- Piping
- Cabling
- Other

35-40%

CSP specific

- Parabolic Mirrors / Heliostats
- Collector Structure
- Precision Tracking Systems
- Receiver Pipes / System
- Heat Transfer Fluid
- W/S Cycle
- Engineering

~60%

If CSP Market is + 300MW/year

CSP Market Size means Economies of Scale

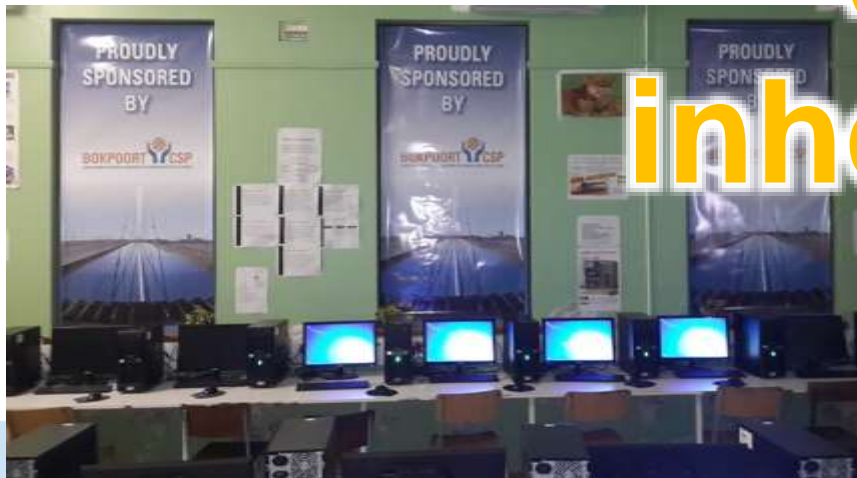
- Repeatability (e.g. collector structure)

Local Community

Developing a Talent Pipeline



Focussing on Community Well Being



Outsourcing
vs
inhouse

Thank You!

