STERG SYMPOSSIUM PRESENTATION

Brett de Klerk

CONTENTS

01

ENGIE GROUP

Three expanding businesses

Power

- **No.1** independent power producer (IPP) in the world.
- **No.6** supplier in Europe.
- **117.1 GW*** of installed power-production capacity.
- **21.5 GW** in renewable energy.
- **8.1 GW** of capacity under construction.*

Natural gas

- **No.3** seller of natural gas in Europe.
- **No.3** LNG supply portfolio in the world.
- **No.1** distribution network in Europe.
- **No.2** transport network in Europe.
- A supply portfolio of **1,132 TWh**.

Services

- **No.1** supplier of energy efficiency services in the world.
- **230** district cooling and heating networks throughout the world.
- **140** million m^2 managed in the tertiary sector.

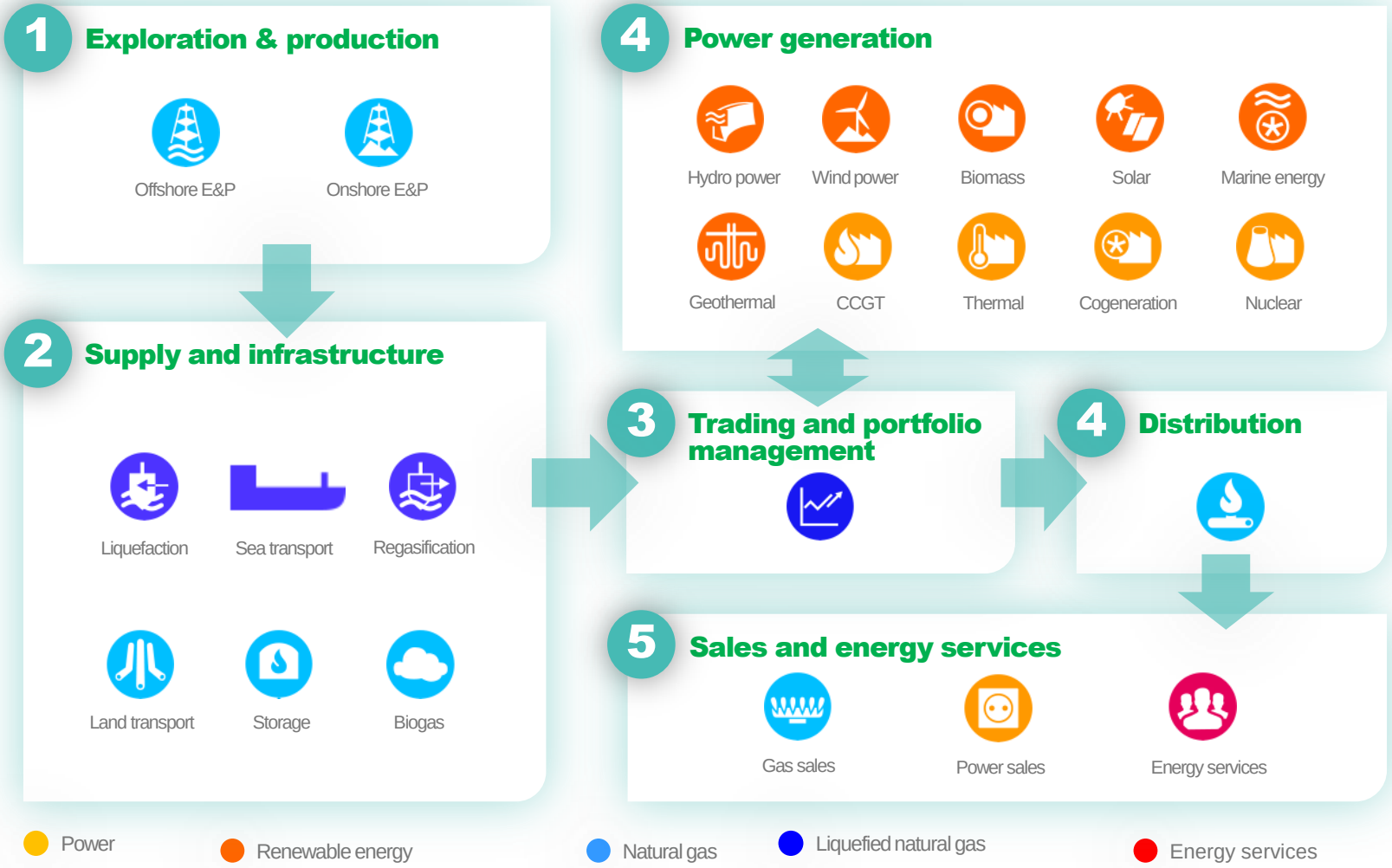
* Including 100% of capacity of assets held by the Group at December 31, 2015, regardless of the actual holding rate.

Key figures

- €69.9 billion in 2015 revenues.
- 154,950 employees throughout the world
  - With 57,750 in power and natural gas
  - and 97,200 in energy services.
- €22 billion of net investment per year over 2016-2018.
- Operations in 70 countries.
- 1000 researchers and experts at 11 R&D centers.

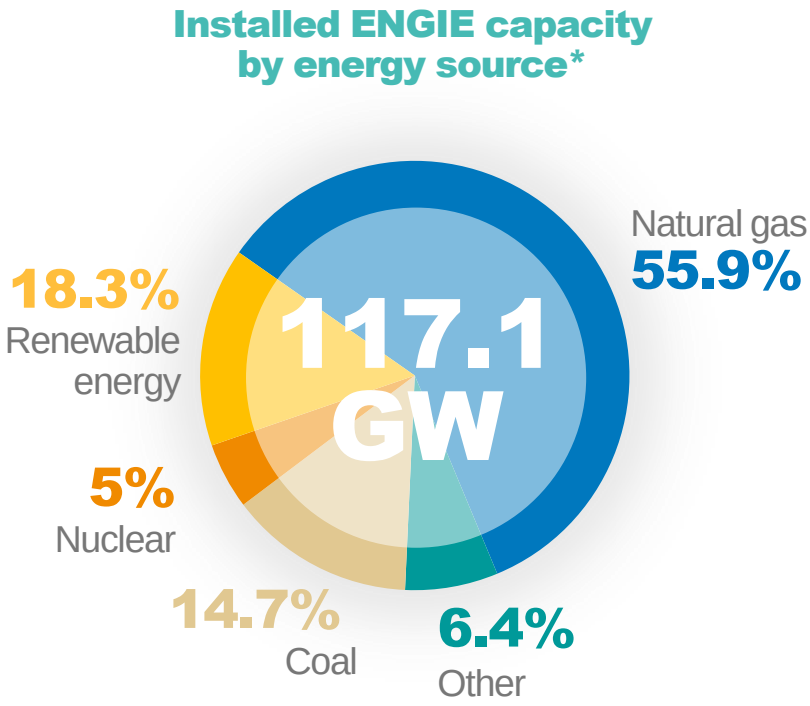
* At December 31, 2015.

Operations across the energy value chain



A carbon-light power-production base

- 117.1 gigawatts
  of total installed power-production capacity.
- 21.5 gigawatts
  of **renewable energy**. 18.3% of total installed power-production capacity.
- 8.1 gigawatts
  of capacity under construction, 97% of which are located in emerging markets.
- 650 plants
  throughout the world.



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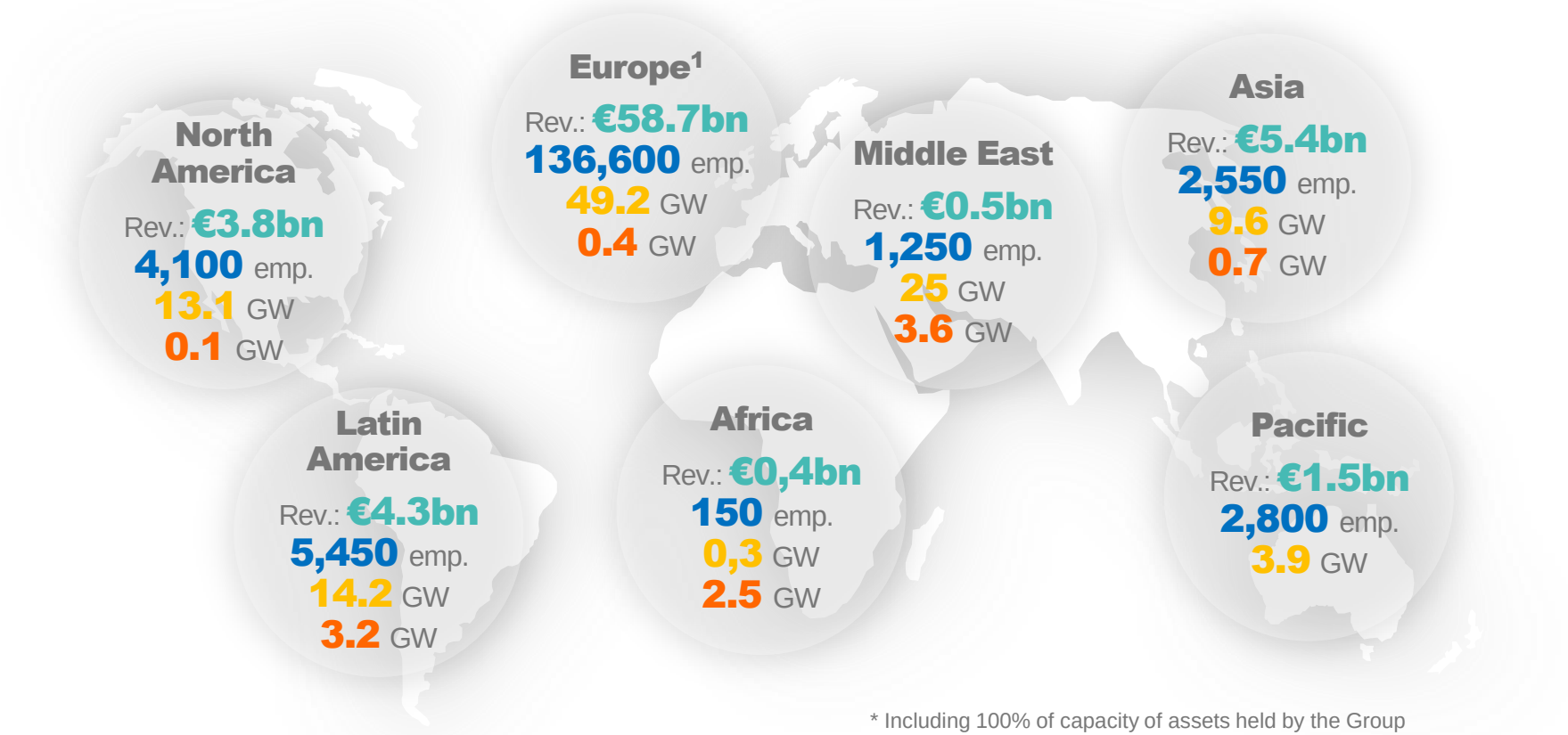
Geographic breakdown of revenues, workforce and capacity

€69,9 billion in 2014 revenues

154,950 employees

117.1 gigawatts of installed power capacity

8.1 gigawatts under construction



* Including 100% of capacity of assets held by the Group at December 31, 2015, regardless of the actual holding rate.

(1) Inc. Turkey.

Long-term industrial strategy

ENGIE has defined 2 strategic ambitions based on the creation of long-term value growth:

1 To be the **leader** of energy transition in Europe :

- by becoming the energy partner of its clients while promoting energy efficiency;
- by being a vector of energy decarbonization through renewable sources;
- by developing new businesses and digitalization.

Long-term industrial strategy

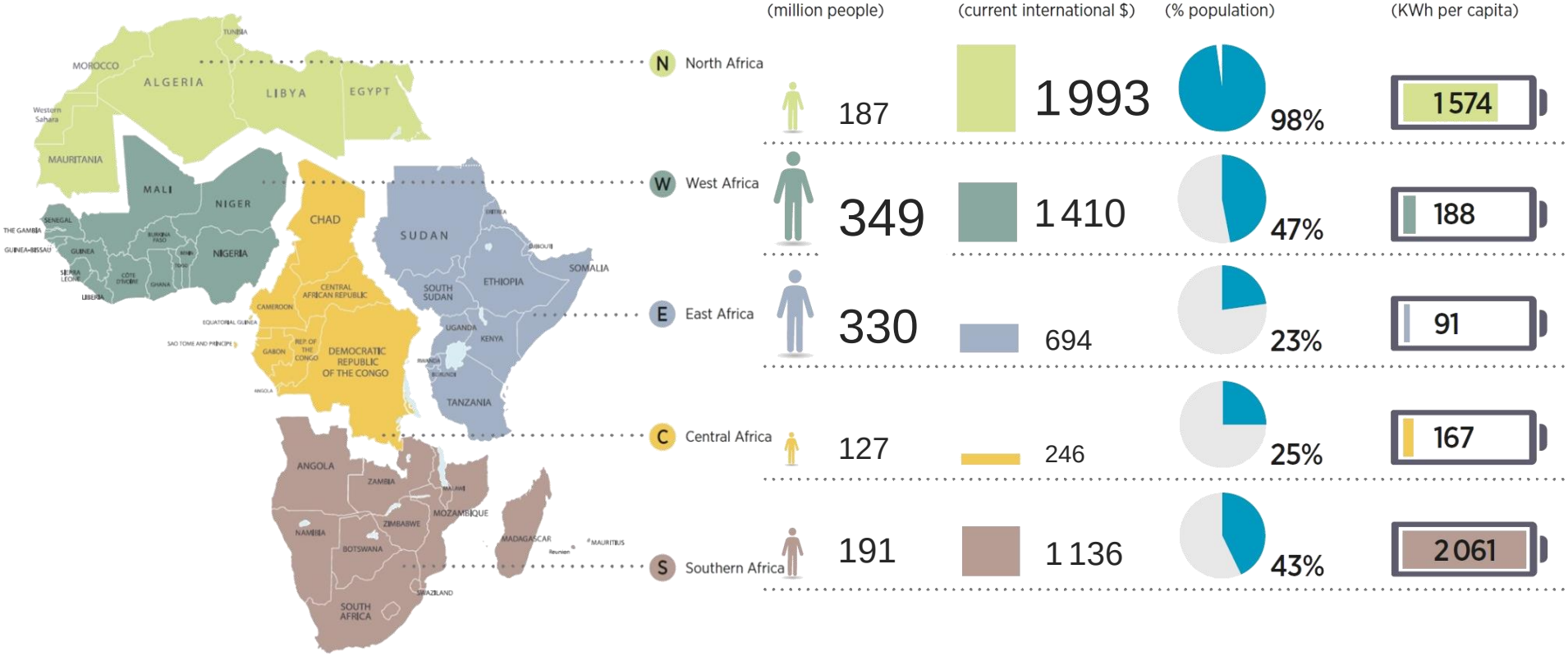
ENGIE has defined 2 strategic ambitions based on the creation of long-term value growth:

2 To become the benchmark energy utility in emerging countries:

- by leveraging on its strong positions in independent power production;
- by developing its presence on the gas value chain;
- by globalizing its leadership position in energy services

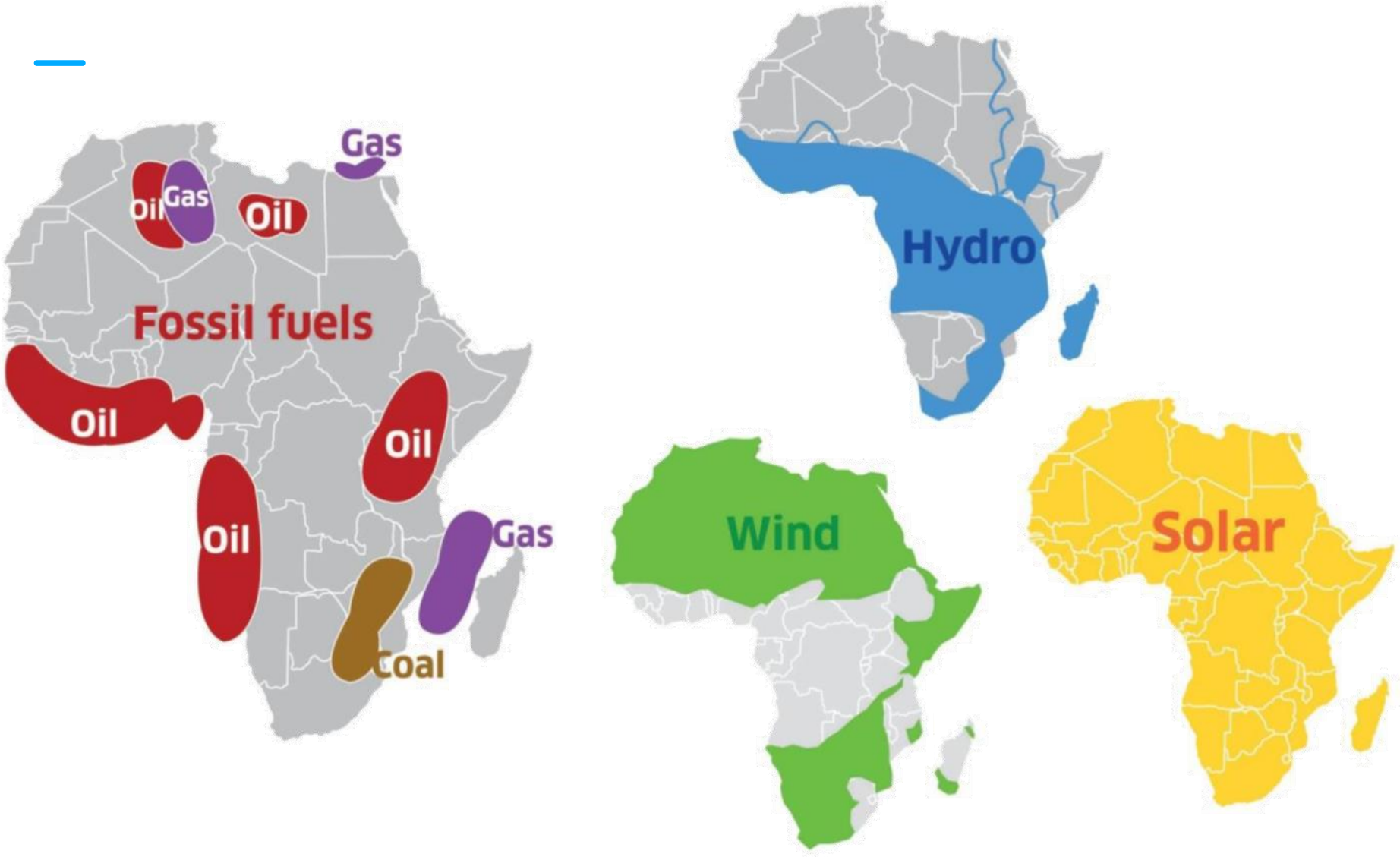

02
AFRICA
ENGIE

Africa is made of 54 countries and they are substantially different from one another



Sources : IRENA (updated with Statistics refer to UN 2015 (Population), 2014 World Bank (GDP, Electrification Rate)

Africa natural resources



ENGIE in Africa

Over
50
years of experience
on the continent

2.8
gigawatts thermal power
and renewable energy
capacity in operation or
under construction

€306
million of turnover in 2015

Power

1st
mover Independent Power
Production in South Africa

Africa's
largest
wind farm in Morocco

758
megawatts of capacity
in operation

2,056
megawatts of capacity
under construction

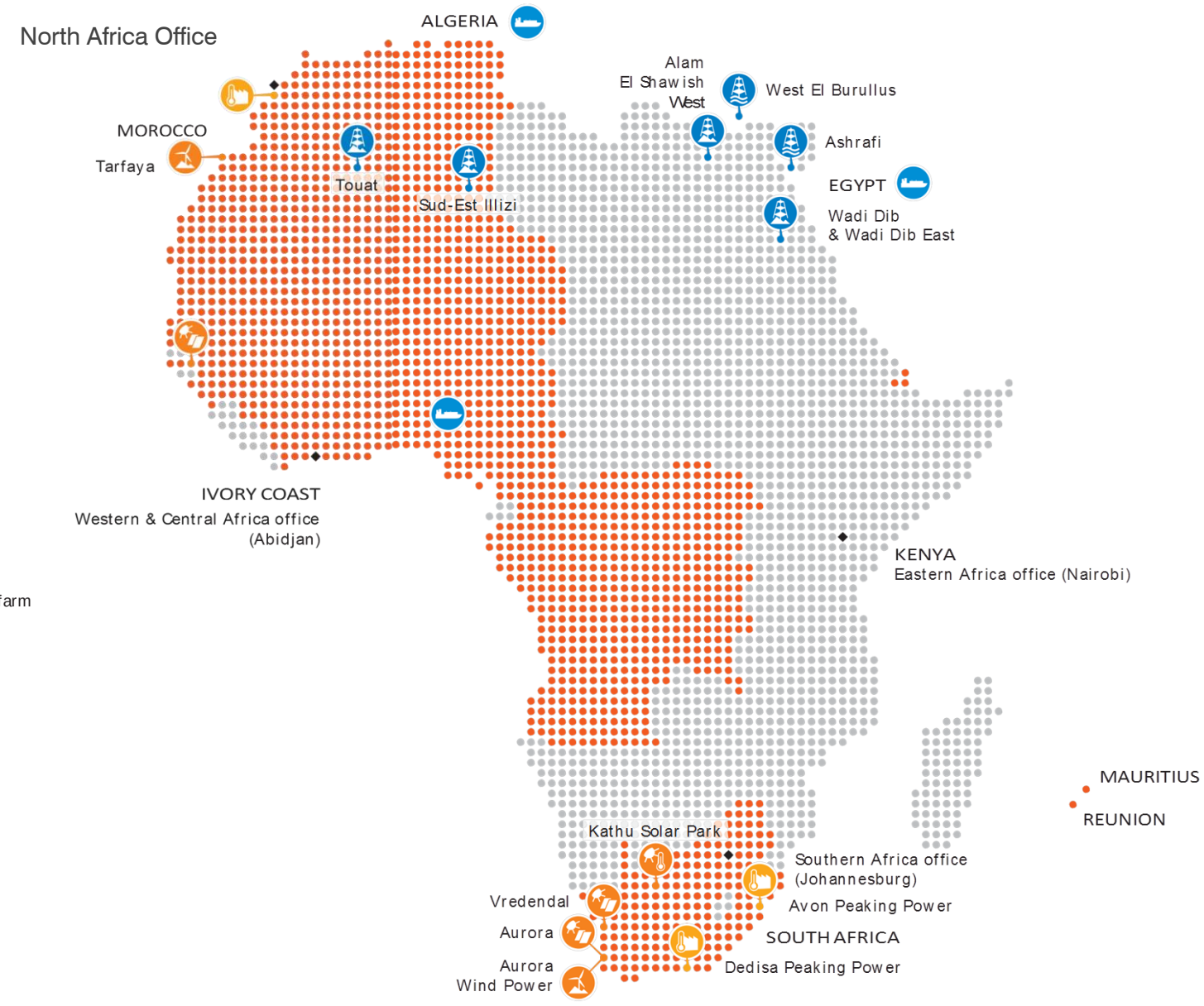
Energy services and efficiency

Over
300
employees

Approximately
80
clients

Present
in more than
17
African countries

Site map



Power

- Thermal plant
- Onshore wind farm
- Solar PV farm
- Concentrated solar power (CSP) farm

Natural gas

- Offshore exploration & production
- Onshore exploration & production
- LNG activity

Energy services

- Presence of ENGIE

Power generation: Morocco

Tarfaya Morocco

- 301 MW wind farm
- Launched: Jan 2015
- Utilization rate of 45%
- 20 year build-own-operate-transfer (BOOT) contract
- 40% of Morocco's total wind capacity

Safi Morocco

- 2 x 693 MW thermal power units
- Ultra-supercritical clean coal technology
- 30 year PPA
- Commissioning : 2017

Commitment

FOUNDATION

ENGIE

by people for people®

VALUED CITIZENS

IKAMVAYOUTH

THE FUTURE IS IN OUR HANDS


03
SOUTHERN AFRICA
ENGIE

Peakers: Dedisa & Avon

1,000MW

of combined installed capacity

335MW

Dedisa- 2015

670MW

Avon-Commercial operation July 2016

15-year

Power Purchase Agreement

4.5Mil

man-hours of employment during construction to date

WEST COAST 1

94MW
of installed capacity

€160Mil
of investment

47
wind turbines

5.6Mil
tonnes estimated reduction of CO_2 over the 20 years

2.5Mil
man-hours employment created during construction

Kathu Solar Park

100MW
of installed capacity

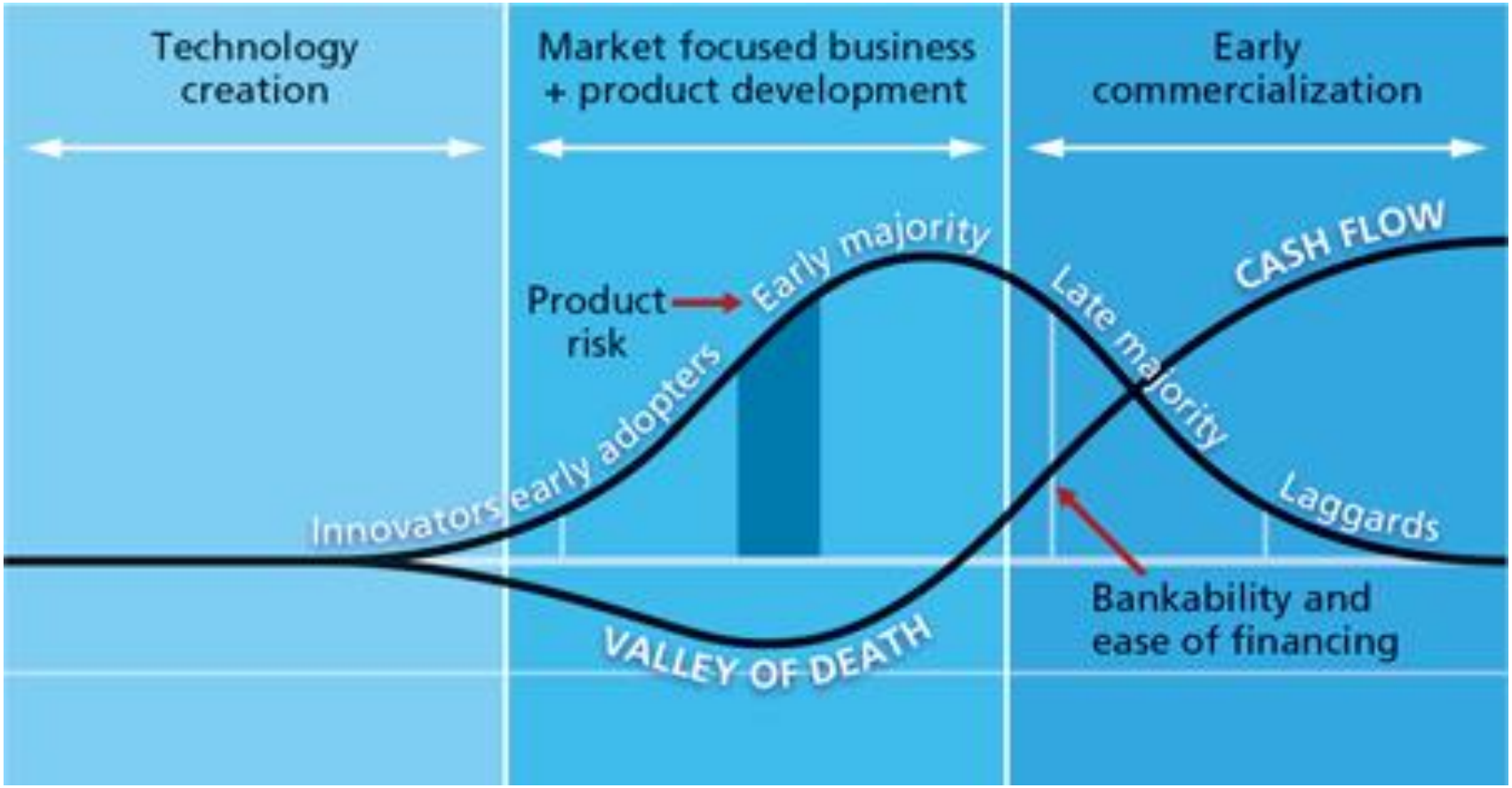
4.5
hours of thermal energy storage

6Mil
tonnes estimated reduction of CO_2 over 20 years

20-year
PPA on a self-dispatch base

2Mil
man-hours of employment to be created during construction

Project Bankability



Offset perceived risk through independent validation and technical due diligence.

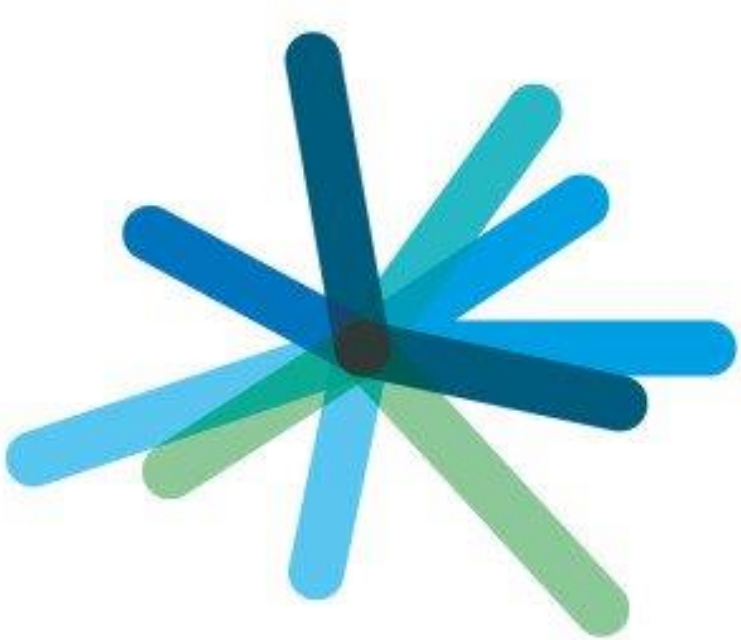
Developing for the Future

- 1000 researchers and experts at 11 R&D centers.

Research from Africa?

Coming soon....

Developing for the Future



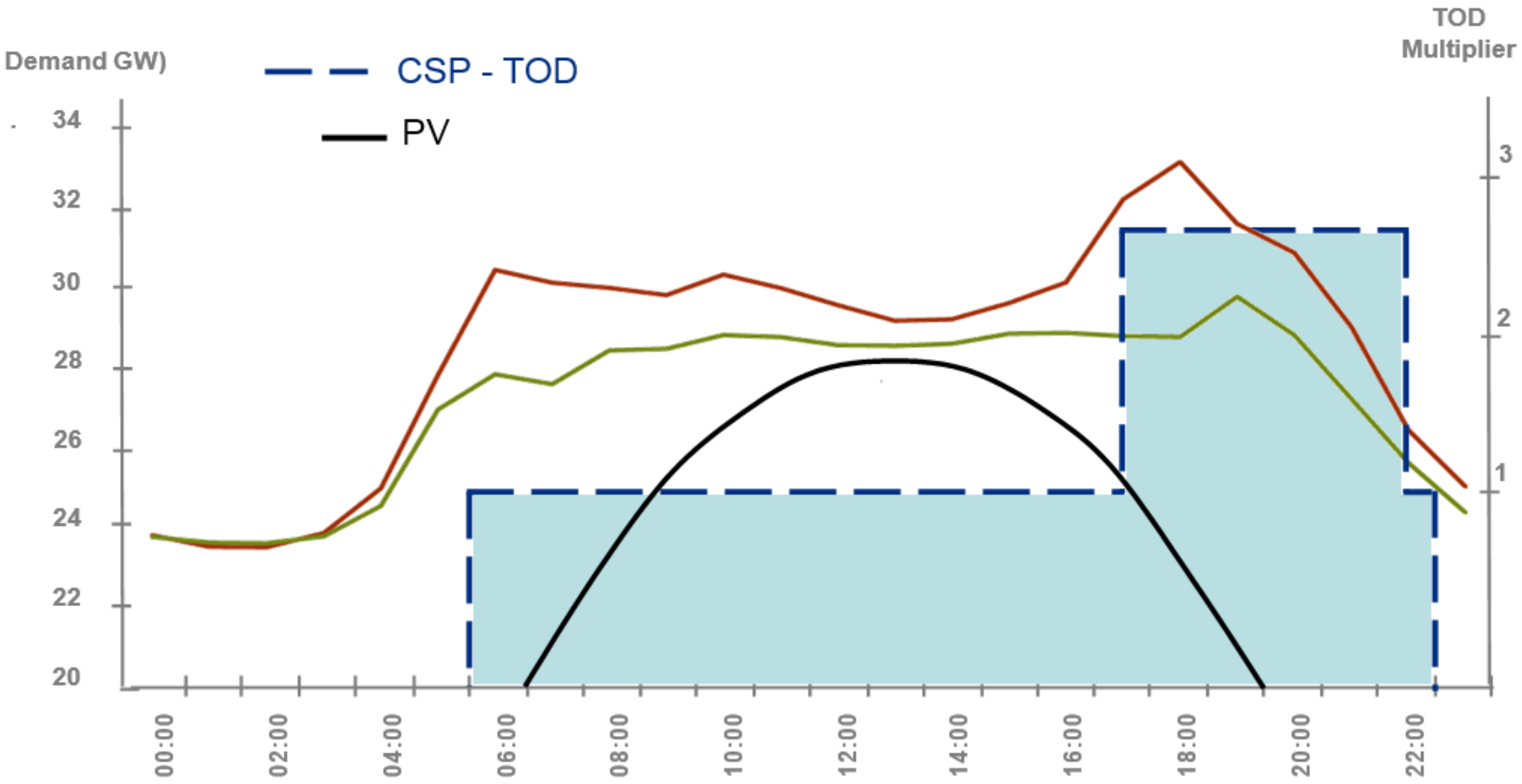
INNOVATION DAY

ENGIE

04

KATHU SOLAR PARK

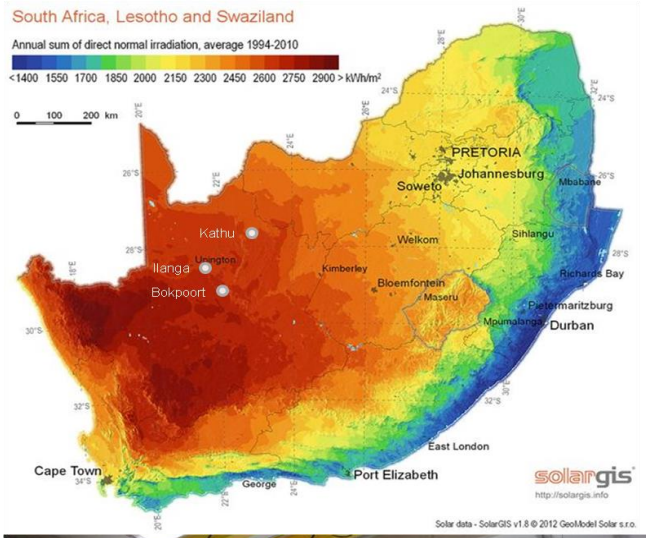
CSP Time-of-Day tariff



Source: Eskom Integrated Report 2015

Project Description - Technical

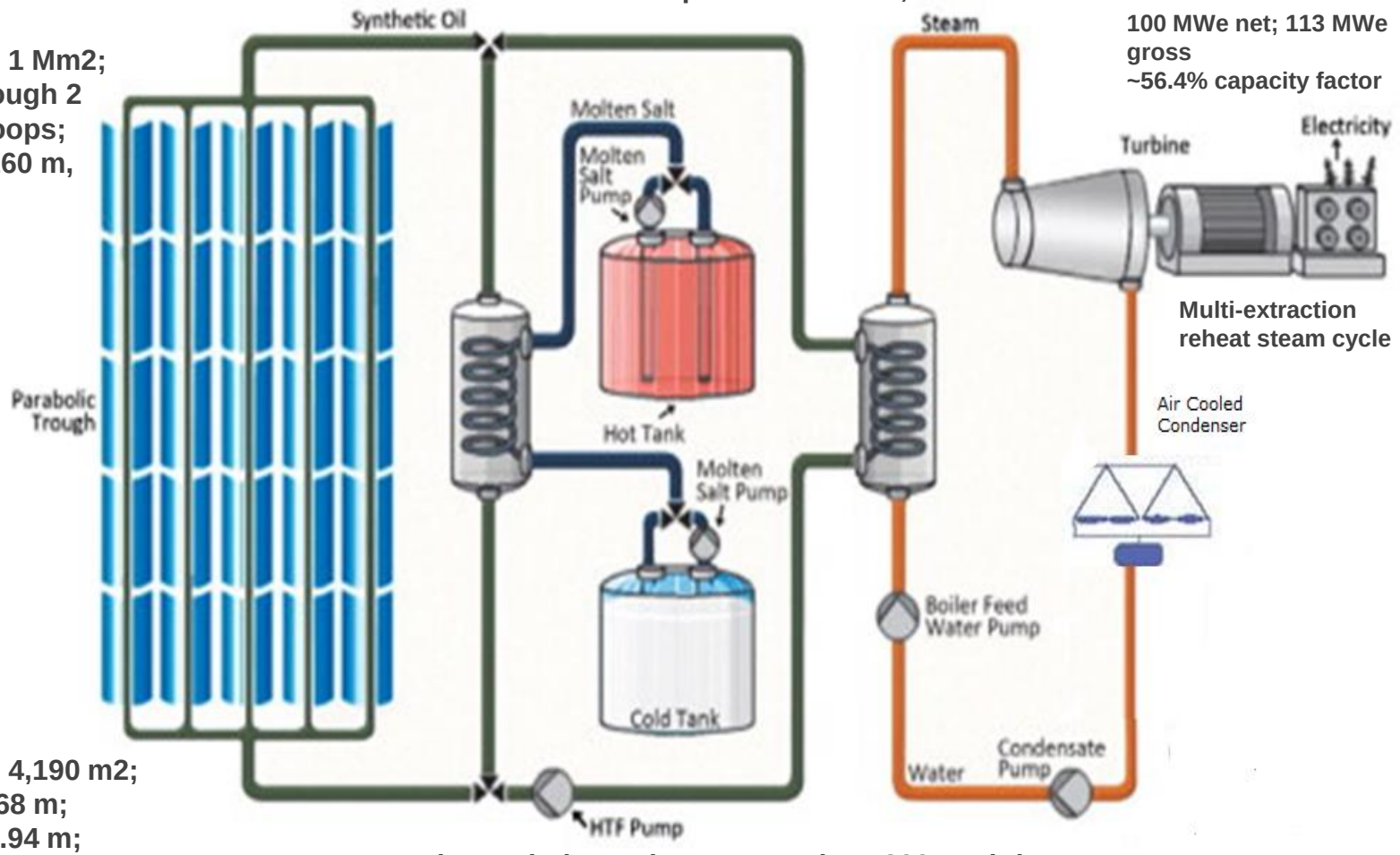
	Kathu
Capacity	• 100 MW, 4.5 hours storage
Location	• Kathu, Northern Cape, RSA
DNI	• 2,715 kWh / m2 / year
Transmission line requirements	• 8 km of new line required to connect to existing 132 kV Eskom line
Cooling	• Dry cooling
EPC Contractor	• Sener + Acciona
Collector type	• Sener Trough 2
Annual Consumption Guarantees	• Water; • Fuel; • Nitrogen; • Electricity from the Grid.



Technology Overview

Solar field temp: 297^{0}C / 393^{0}C;

Total Aperture area: 1 Mm2;
Collector: Sener Trough 2
No. of Loops: 250 loops;
1 Loop = 4 SCA of 160 m,



100 MWe net; 113 MWe gross
~56.4% capacity factor

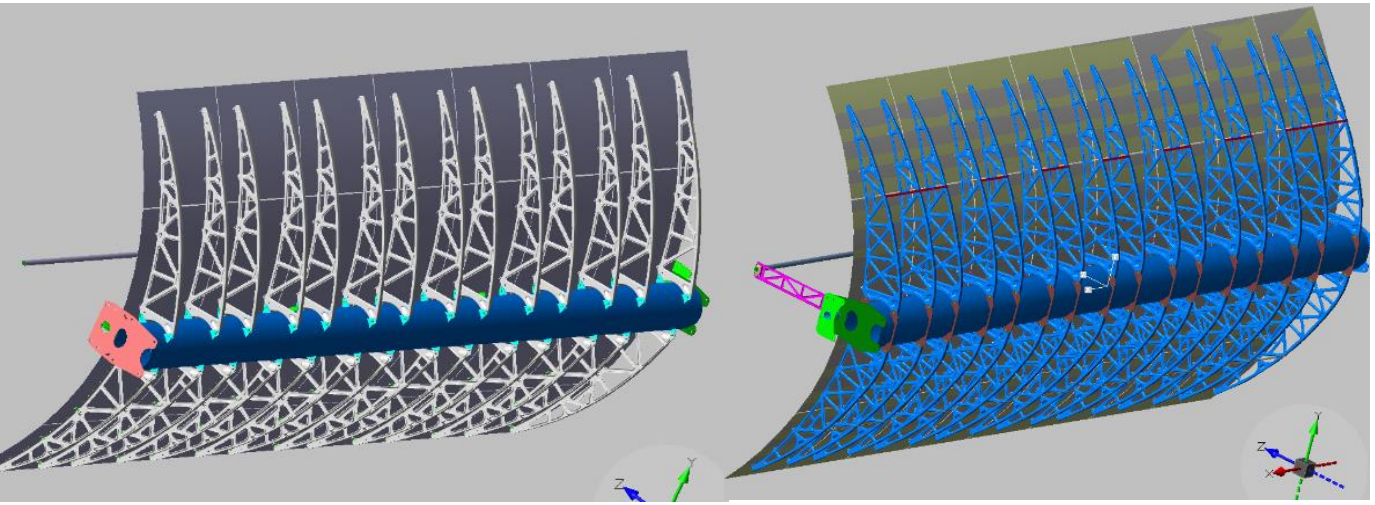
Multi-extraction reheat steam cycle

Kathu DNI:
2,754 kWh/m2/year

Loop aperture area: 4,190 m2;
Mirror aperture: 6.868 m;
Collector length: 12.94 m;
HCE absorber tube: 80 mm;

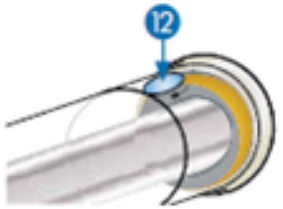
Molten salt thermal storage tanks 1,300 MWhth requiring c.45,000 tonnes salt inventory.

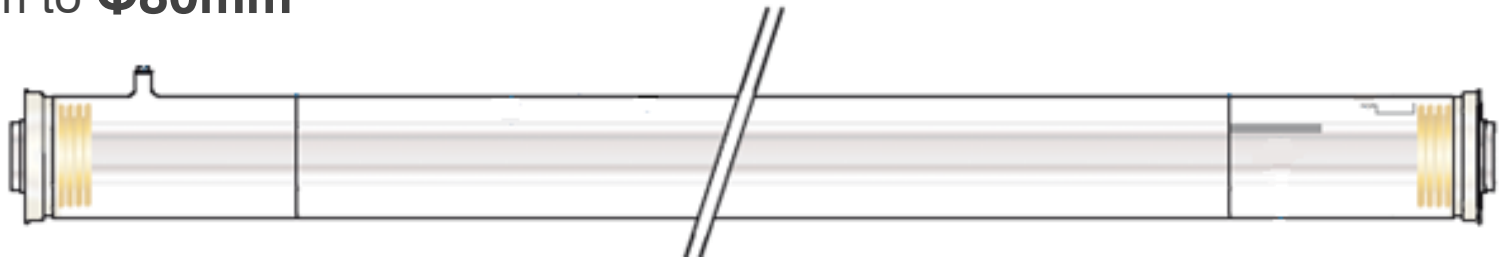
Key Differences SNT0-1 and SNT2



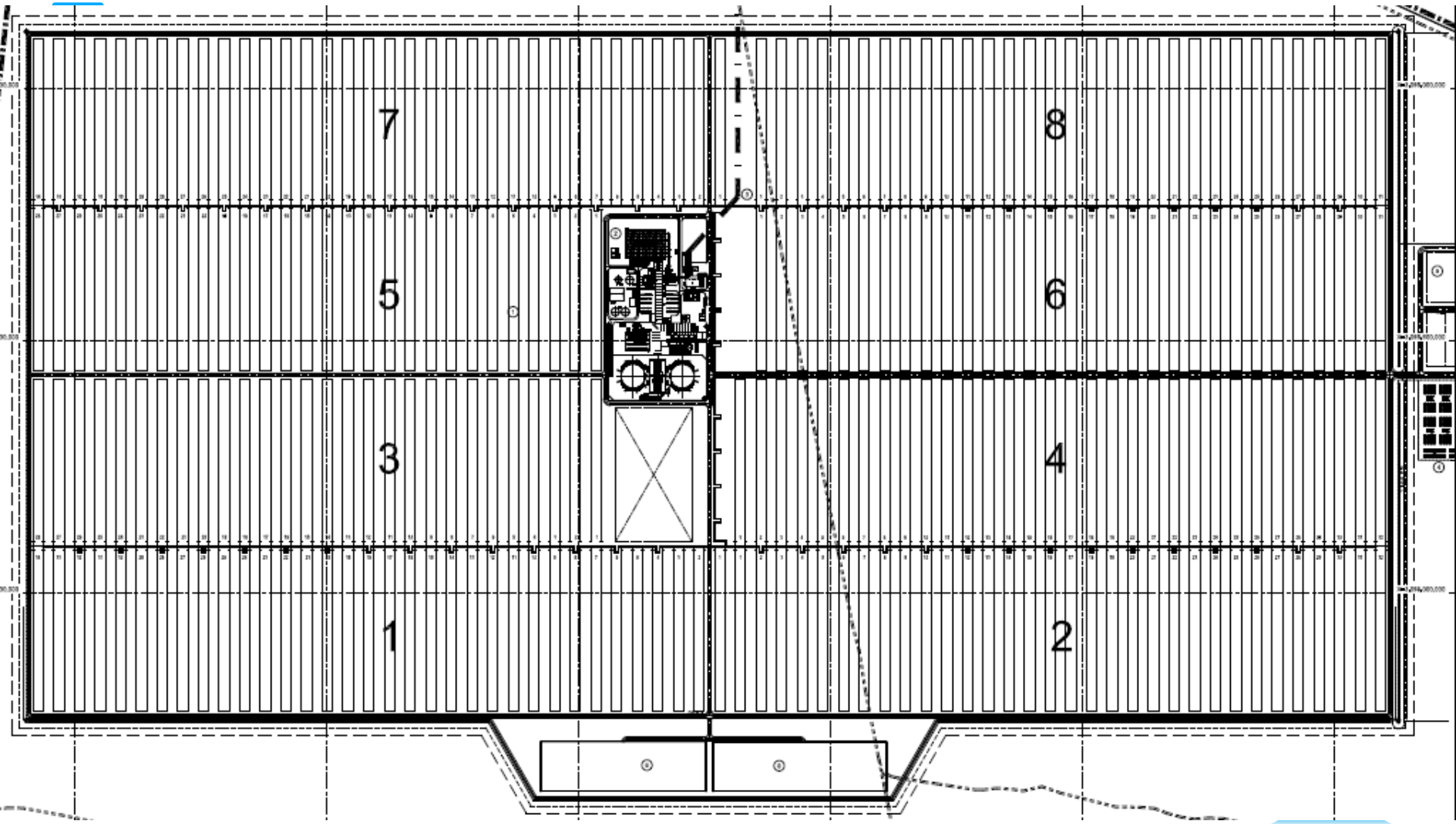
8% Longer
16% Larger App.
17% Taller
32 vs. 28 Mirrors

Heat Collection Element (HCE) TUBES → Increased from Φ70mm to **Φ80mm**

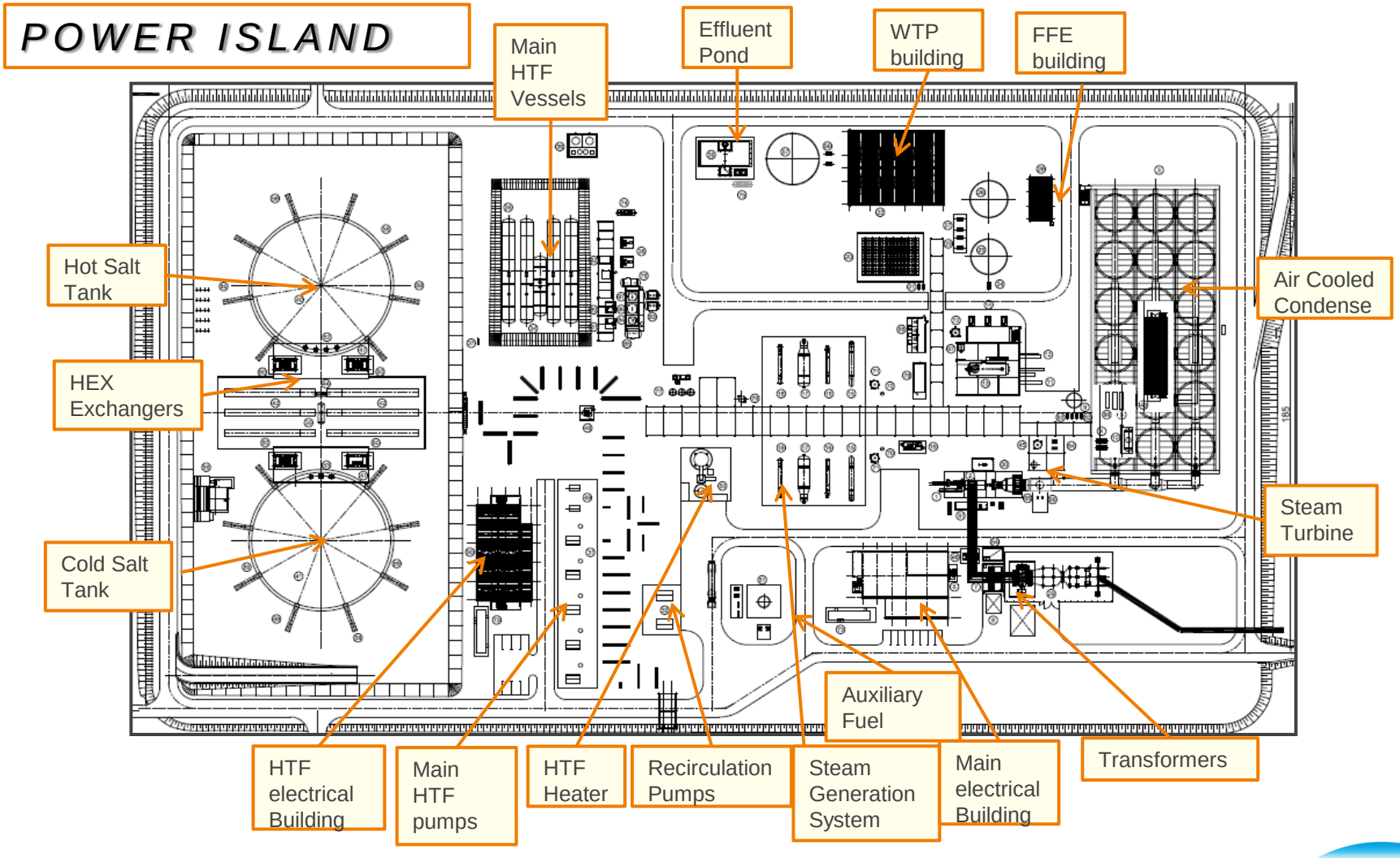




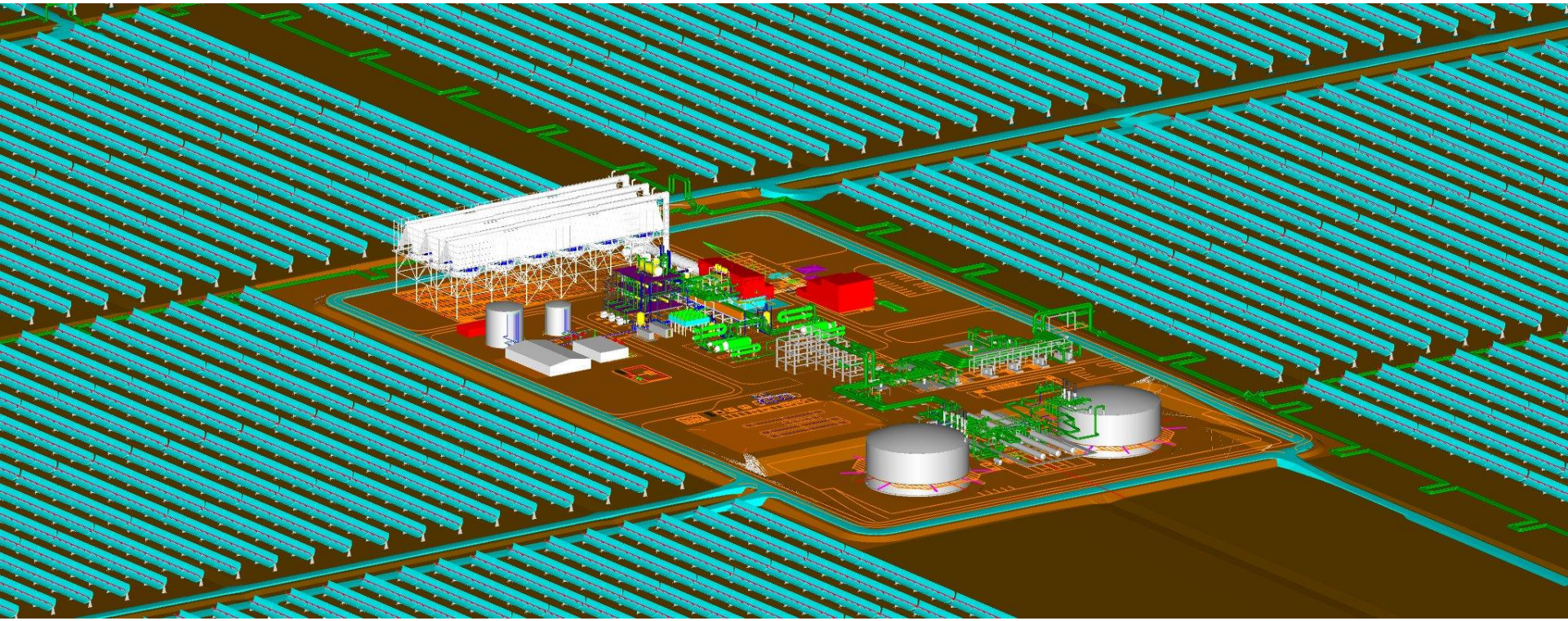
Project Layout – General Arrangement (1/2)



Project Layout – General Arrangement (2/2)



3D Drawings



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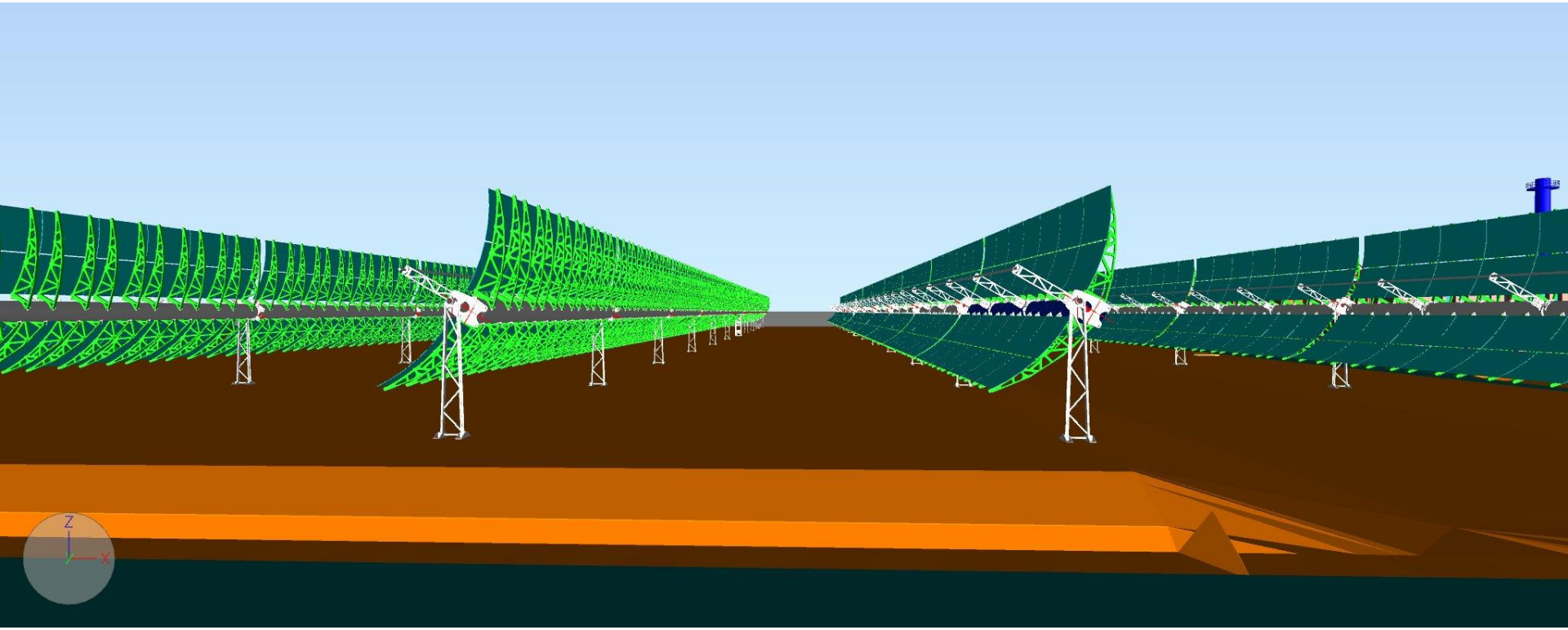

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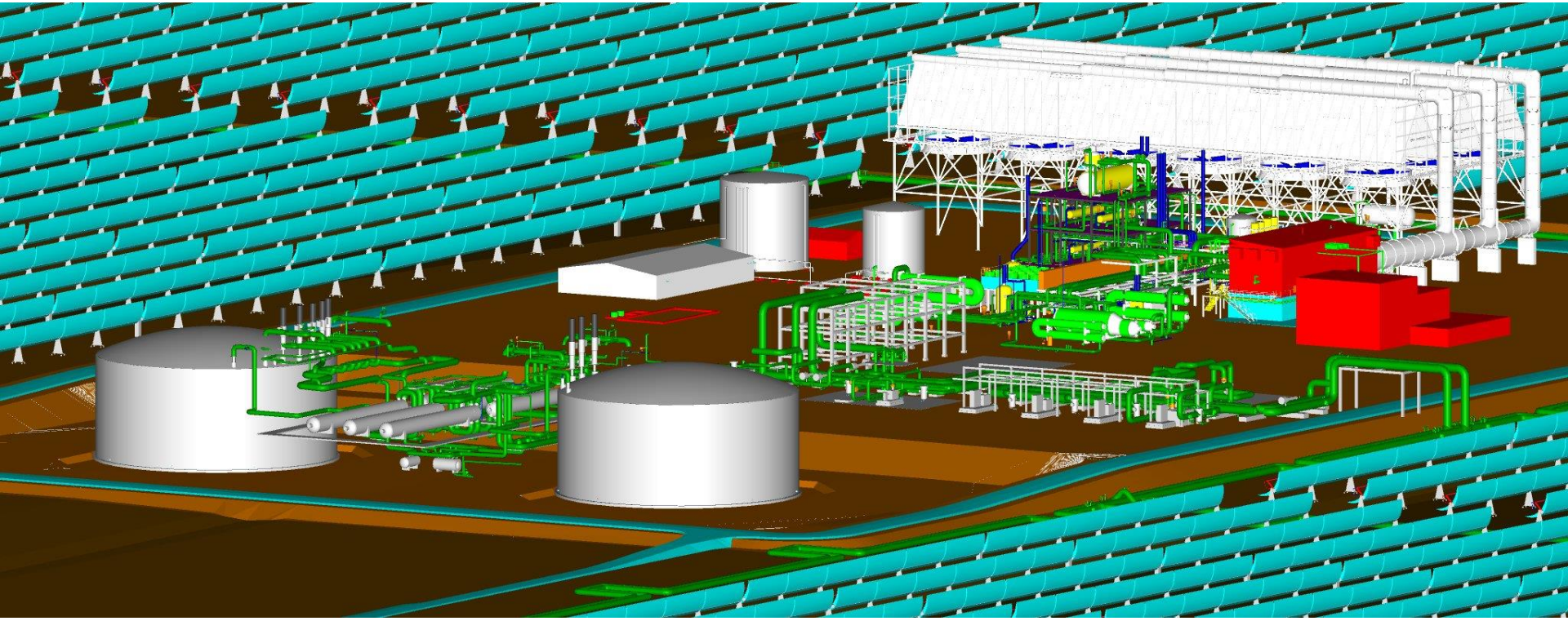

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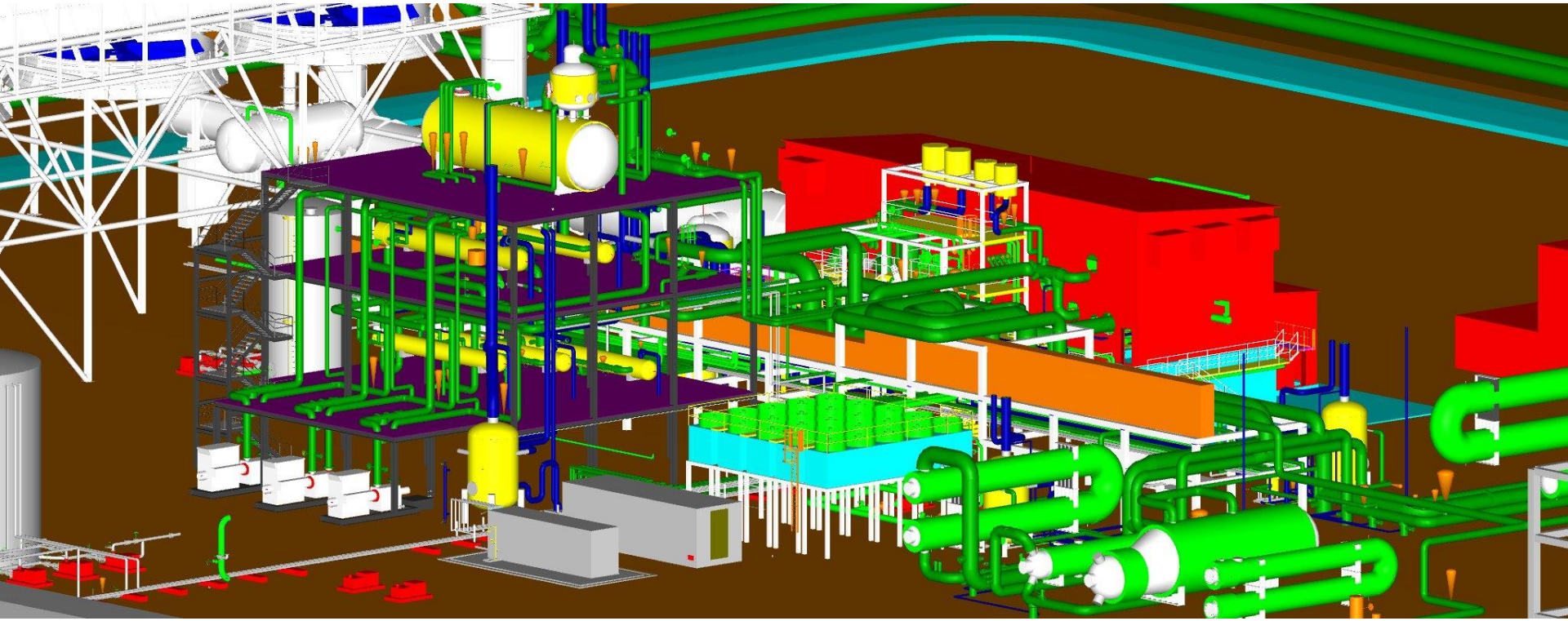

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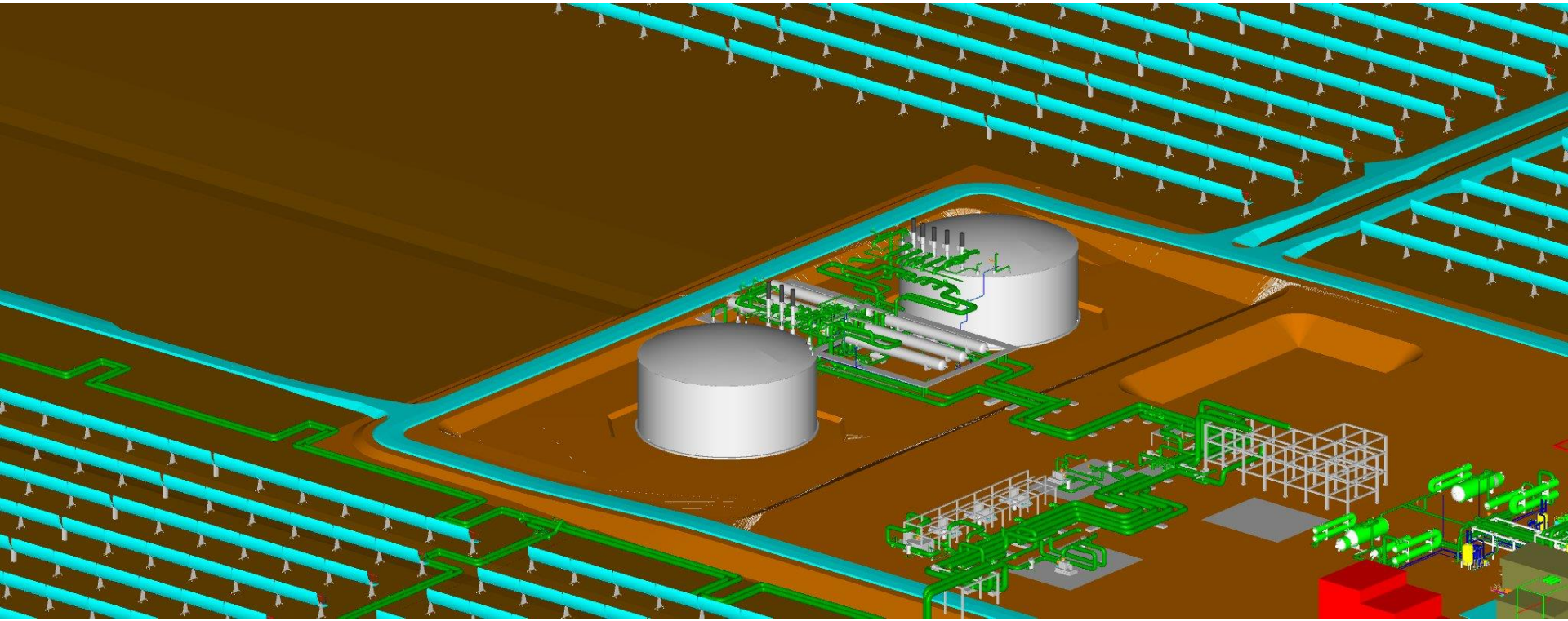

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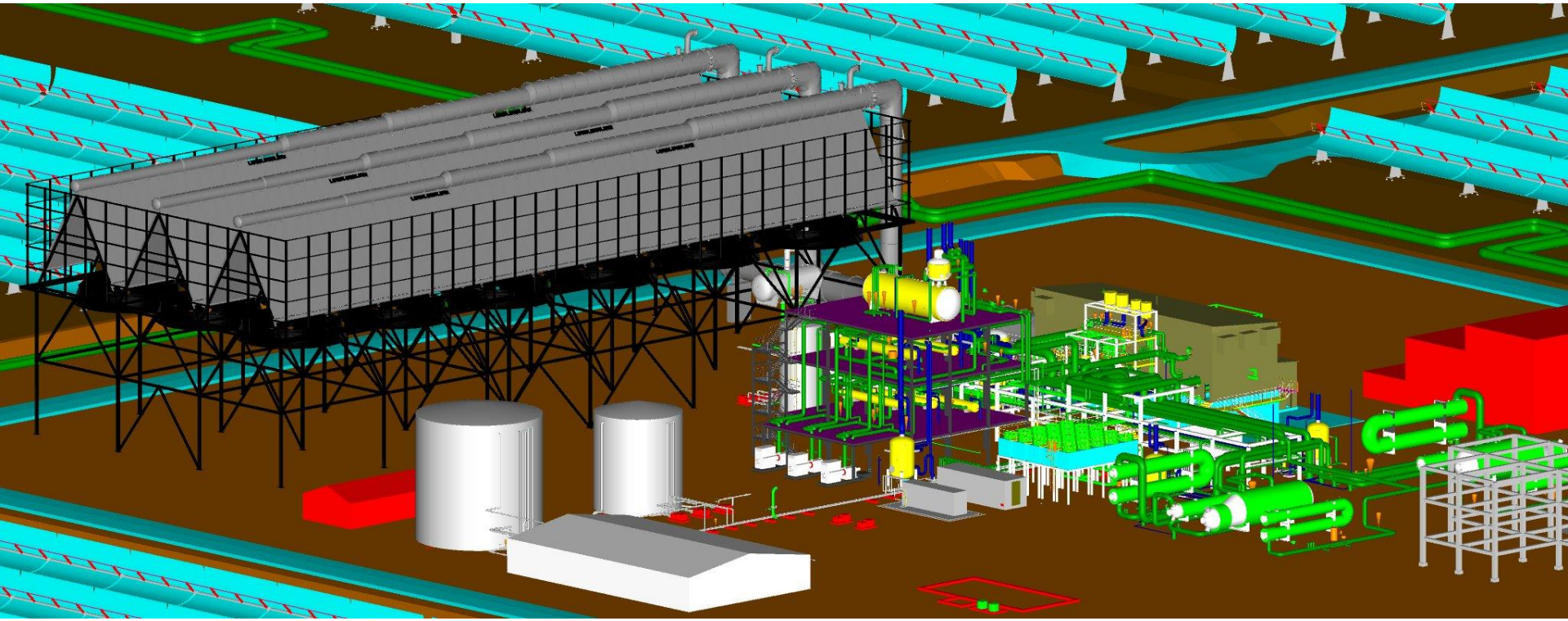

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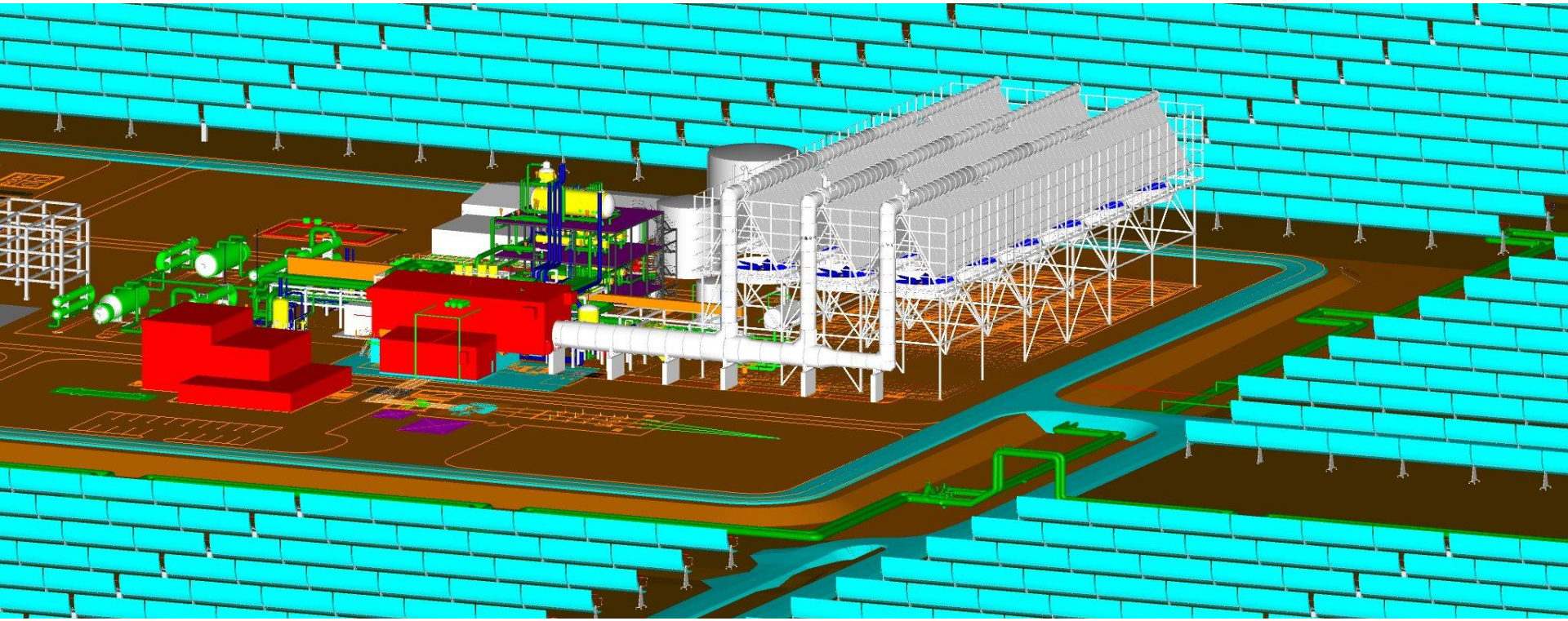


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