SAGA

Regional LNG/Gas Update

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Section 1

Sector & Regional Context

BALLPARK GLOBAL ENERGY

1. Renewables comprise 5.7% of global primary energy, Fossil Fuels 83% (BP, 2021). Not many argue that **natural gas** is not cleaner than **coal**.

2. In human history, it is impossible to grow/spread prosperity without access to adequate energy (for electricity, industry, heating (N Hemisphere), mobility).

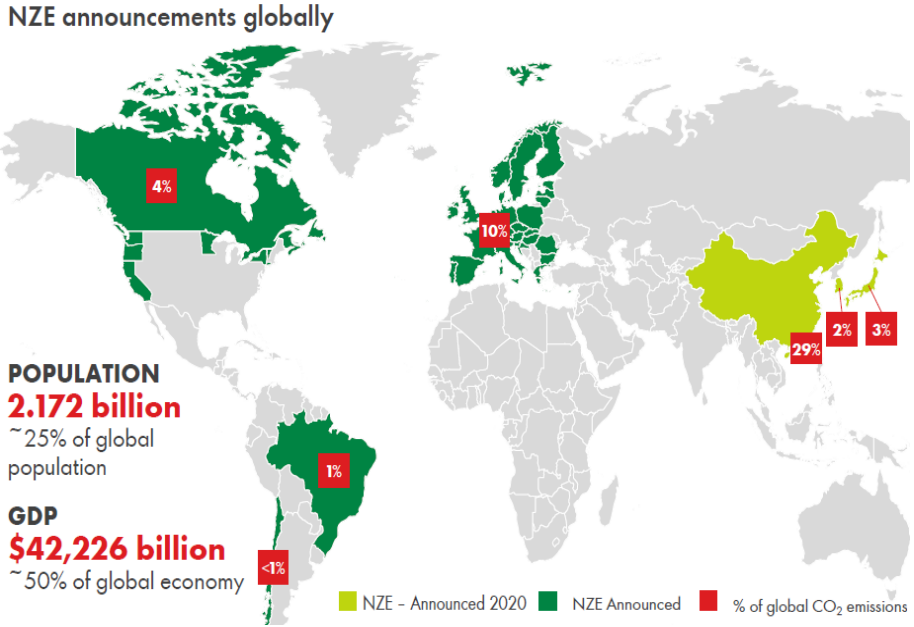
3. Energy's supply side (e.g. fossil fuels) is being scrutinised but its output is sold daily to demand side. **Demand side innovation** is thus crucial to get to **Net Zero**.

4. Innovation is typically only implemented ''**just now**''. Example, the Internet in 2021 is c 25 years old as a commercial proposition. Bear in mind with **Hydrogen**.

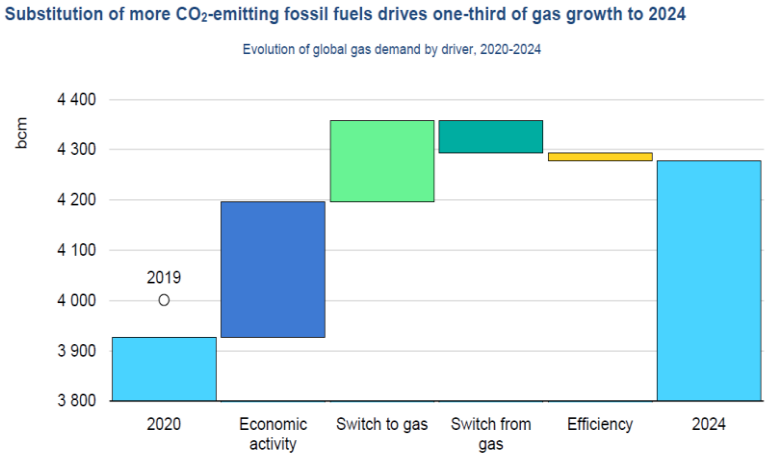
5. Europe's (**#breathless**) ''**Energy Crisis**'' grabs headlines. Globally, billions of people lack energy access (<life chances/choices/health) **#firstworldproblems.**

GAS AS A TRANSITION FUEL

- **Shell's 2021 LNG Outlook** noted key large emitters introduced Net Zero Emission (''**NZE**'') targets in 2020 (by 2050 – 2060). Absent demand side technological innovation and other breakthroughs, only natural gas can easily lead to significant CO2 emission reductions. Breaking news – **India** announced **net zero 2070** on 30th October 2021

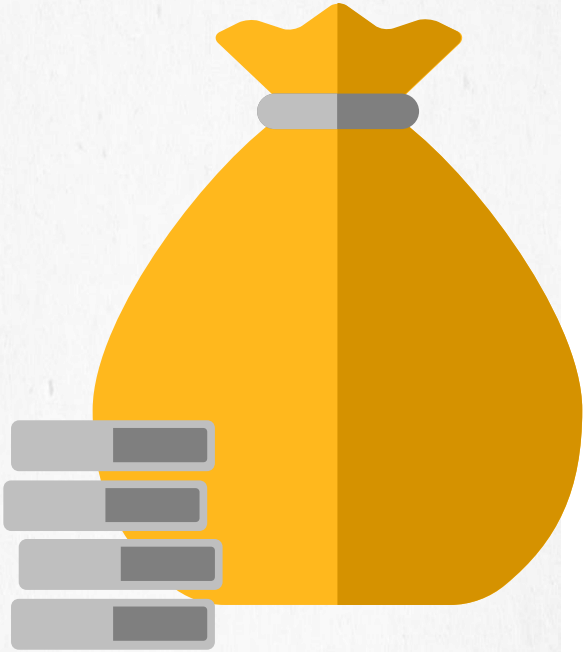


- In advance of game-changing **Green Hydrogen** developments etc (unlikely <2030s), Natural Gas continues to have a bright future, especially in key markets such as **China/India**. Projected gas demand increases crucially include coal/diesel/oil to gas switching



Source: Shell 2021 LNG Outlook, IEA 3Q 2001 Gas Market Outlook

SSA LENDING ISSUES



International Banks

- Sovereign risk challenges (almost all sub-investment grade).
- Currency risk challenges (Local v USD/EUR/RMB).
- National banks' limited capital bases (e.g. USD 300-400m national SOL, except SA/Nigeria).
- Limited experience of deal / credit officers with small markets.
- Lead time to deal closure and sovereign improvements (e.g. Rwanda).
- Natural focus on Export deals (e.g. mining, oil, LNG) with high USD.

KEY GAS INVESTMENT & FINANCING ISSUES

1. Many IOCs are reducing African investments (e.g. US, some European) and Asian NOCs have not further stepped up

2. Similarly, renewables (especially PV) and Nature Based Solutions are seen as easier wins for Energy companies

3. Africa's massive development returns are likely to ensure large projects can still be funded (especially if clear additionality / pathway to net zero)

4. The crucial ''**golden thread**'' remains national sovereign rating – institutional strength and capacity – NOCs / SOEs – ability/willingness to pay offtake bills

5. Can indigenous players step up to become national / regional energy companies. Example, Dangote building a massive refinery. Other Nigerian players (e.g. SEPLAT) stepping up. Will SA players be next?

Section 2

LNG Outlook

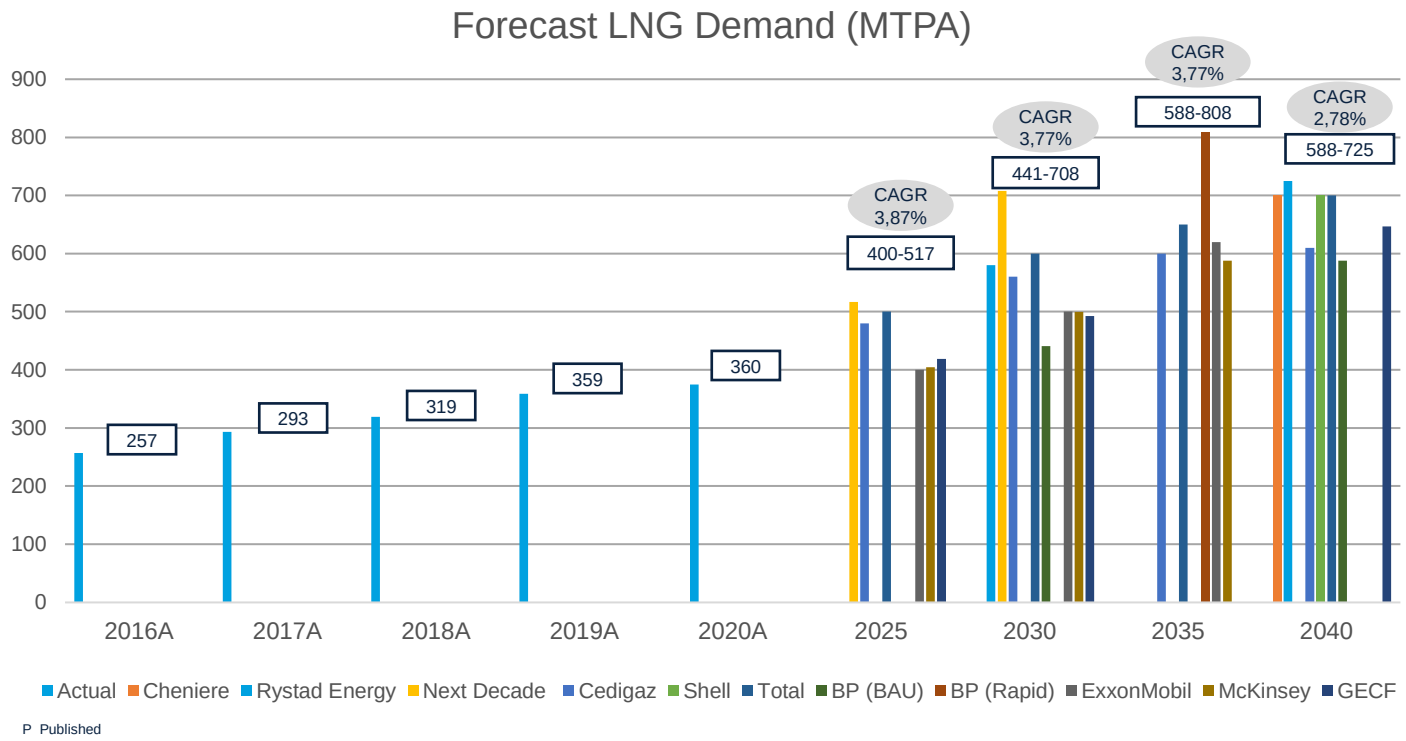
LNG DEMAND COMPARISON

Twelve independent LNG demand forecasts outlined from 2025-2040:

1) 2016,2017,2018: Actual International Gas Union – P 2019 Edition
2) 2019/2020: Shell LNG Outlook (2020 & 2021)
3) Cheniere: Corporate Presentation P (Aug'20)
4) Rystad Energy: Gas Market Yearly Report (Dec'20)
5) Next Decade: Market Fundamentals P (Nov'20)
6) Cedigaz: LNG Outlook 2020
7) Total: Energy Outlook 2020
8) BP: Energy Outlook 2020
9) ExxonMobil: March 2020 Investor Day P
10) McKinsey: Energy Insights – Global Gas & LNG Outlook to 2035 (H1 2019)
11) Gas Exporting Countries Forum (GECF): Global Gas Outlook 2050 Synopsis P (Feb'20)

P - Published

Summarised by Standard Bank



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Demand is expected to increase from 360 MTPA to 655 MTPA (average) from 2020-2040 using leading industry players forecasts. Per Shell (2021), LNG demand was essentially flat in 2020, despite COVID, a superb achievement compared to oil

THE WORLD BY LNG MARKET

Noting the usual Mercator projection, Africa's true scale is hidden. As example, Afungi (the Mozambique LNG site) to Cape Town, South Africa, is 4,338 kms, within 162 kms of the New York - Los Angeles distance…….

INTRODUCING SSA LNG & GAS

1. East SSA is a good postcode. **Non-aligned** Moz/TZ is 7 days sailing to West India and **materially** adds to China's **energy security** options (as well as JKT).

2. West Coast **non-aligned** Africa LNG is an established and reliable European supplier, e.g. Nigeria, EG, future Senegal/Mauritania.

3. Technological developments may allow SSA to bypass some OECD steps per telecoms (e.g. renewables, mini-grids) and facilitate gas (e.g. SSLNG).

4. Completion of Senegal/Mauritania and Moz#1 (Coral FLNG) opens up regional LNG sales **(**ACFTA=ASEAN back then?**). Tema LNG** is SSA's first import terminal.

5. Given **minimal CO2 composition**, future East Coast projects (Moz/TZ) are envisaged to be Scope 1 & 2 Net Zero enabled (**then #netzero**)

LNG IN AFRICA – OPERATING AND ‘’FID” MTPA

Algeria

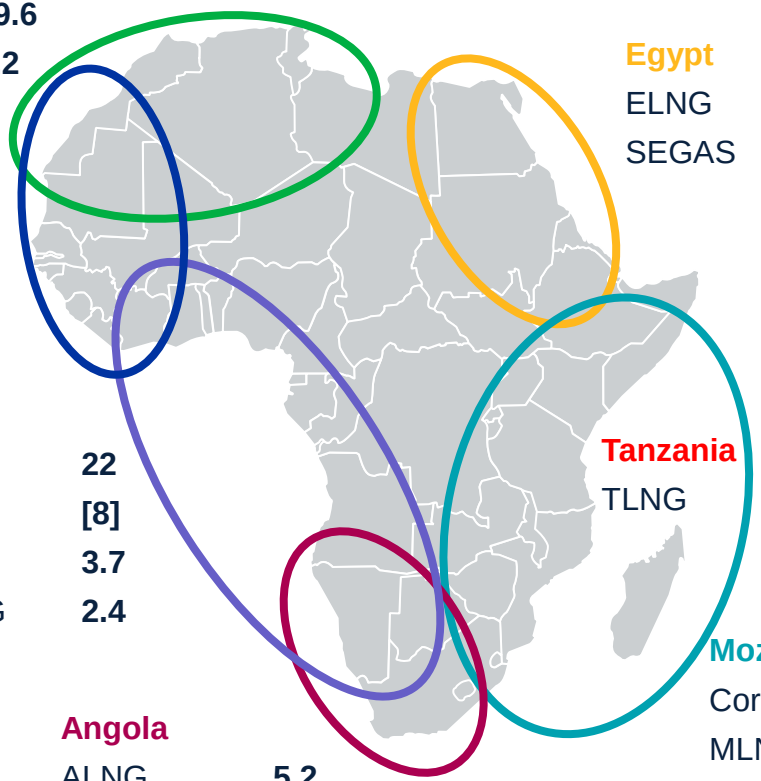
Arzew	**19.6**
Skikda	**9.2**

Senegal/ Mauritania

Tortue	**[2.5]**

West Africa

NLNG	**22**
NLNG T7	**[8]**
EG	**3.7**
Cameroon FLNG	**2.4**



Angola

ALNG	**5.2**

Egypt

ELNG	**7.2**
SEGAS	**5**

Tanzania

TLNG	**??**

Mozambique

Coral FLNG	**[3.4]**
MLNG	**[13.1]**
RLNG	**[15.2]**

Driven by relative shipping costs and logistical convenience, we see natural zones of provision for SSLNG across Africa, with portfolio players and traders likely to drive supply growth

We see the whole African coastline as being able to be served by [2024]

For example, Mozambique should be the dominant provider for Eastern & Southern Africa

West Africa has multiple potential providers of SSLNG, with four operating plants, one under construction and an expansion having taken FID

Who will be the first to market with SSLNG/Gas schemes?

LNG STRUCTURE – IMPORTS THROUGH FSRU

PURCHASE

- Egypt first African market to have FSRUs (now handed back), **Ghana** next
- SB expects **Kenya**, **Mozambique**, **Namibia**, **South Africa** and possibly also **Cote D'Ivoire, Benin** and **Nigeria** to take FSRUs
- Growth of medium-term LNG market works well with FSRU technology, given ability to lease and hand back FSRUs (e.g. after 2-3 years)

FSRU

- Floating Storage & Regasification Units ("**FSRUs**") are a major LNG innovation, helping unlock demand in new, second tier or remote markets.
- They are bespoke ships which are either converted LNG carriers or new built ships. Major advantage is they are moveable; require limited marine infrastructure (e.g. USD 250m investment) and can process between 1 - 4 MTPA efficiently.
- Disadvantage is FSRUs are more suited to base load demand and harder to have open / third party access to LNG sales and gas purchases

MARKETS

- Power sector usually the core of natural gas demand. However, SSA utilities are often weak
- Likely supplemented by industrial demand. Africa will not have demand for residential heating and cooking (Northern Hemisphere only)
- Question whether LNG/natural gas will start to erode the market share of diesel in transportation

FSRUs offer a lower cost entry point for new markets to buy LNG. They appear highly suited to emerging market buyers with the only real challenge being **creditworthy NOCs and / or power utilities**

Section 3

LNG Projects

UNDERLYING DOCUMENTATION

The Government of Mozambique (''**GOM**'') launched the 2nd Licensing Round on **15th July 2005** and applications were submitted on **31st January 2006**

The core document is the Exploration and Production Concession Contract (''**EPCC**''). Key provisions:

5 year Exploration Period (extendable) and (up to) 5 year Appraisal Period (for non-associated gas)

30 year

Development & Production Concession granted to Concessionaire (from Plan Of Development (''**POD**'') approval), per Discovery Area.

2% PPT/Royalty

Note there is no other EPCC Domgas, Domestic Market Obligation or Regional Obligation.

Cost Gas

Concessionaire entitled to recover Cost Gas of up to **[65%/70]%** Disposable Petroleum (net of PPT) (depending on Area)

Profit Petroleum

Sliding scale allocation depending on cumulative returns and can be taken in cash or kind by GOM.

The EPCC was supplemented by the ''Decree Law'' in 2014 which in essence allows a ''world-scale LNG project financing'' along typical LNG industry norms to fit within Mozambican law.

In addition, various other Agreements are required. For example, Profit Petroleum cannot be taken in kind by GOM if it would impede LNG Sale & Purchase Agreements (''**SPAs**'')

COUNTRY LNG HYPOTHESIS (MID 2019)

FLNG

- Coral FLNG (3.4 MTPA)
  - FID June 2017, **First Gas June 2022**

Onshore

- Mozambique LNG (12.9 MTPA)
  - FID 18 June 2019,
    Fully Commissioned 2024
- Rovuma LNG (15.2 MTPA)
  - FID 1Q 2020
    Fully Commissioned 2025
- Unitised Trains (15.2 MTPA)
  - FID 2023 (?)
    Fully Commissioned 2028
- Prosperidade LNG (12.9 or 15.2 MTPA)
  - FID 2023 (?)
    Fully Commissioned 2028

Domgas Projects

- Envisaged - Gas to Liquids (''**GTL**''), Fertiliser, Independent Power Projects (''**IPPs**''), Small-Scale LNG (''**SSLNG**''), LNG Bunkering, Methanol to Olefins (''**MTO**'')

The 30 year EPCC term is limited and includes, through the Decree Law, a tight interim deadline (all PODs must be submitted by December 2023, 10th anniversary of EPCC Commercial Assessment Period). This means Sponsors must use it or lose it. Can the country's execution capacity match this market obligation?

COUNTRY LNG HYPOTHESIS (NOV 2021 – POST COVID & INSURGENCY)

FLNG

- Coral FLNG (3.4 MTPA)
  - FID June 2017, **First Gas June 2022** **(N.B. Coral FLNG sails today !!)**

Onshore

- Mozambique LNG (13.1 MTPA)
  - FID 18 June 2019,
    Fully Commissioned 2026?
- Rovuma LNG (15.2 MTPA)
  - FID [2023]
    Fully Commissioned 2028?

- **Currently impacted by Force Majeure before start of major site works**
- MLNG 2 / Prosperidade (13.1/15.2 MTPA)
  - FID 2025 (?)
    Fully Commissioned 2029
- RLNG Unitised Trains (15.2 MTPA)
  - FID 2027 (?)
    Fully Commissioned 2030

Domgas Projects

- Envisaged - Gas to Liquids (‘’**GTL**’’), Fertiliser, Independent Power Projects (‘’**IPPs**’’), Small-Scale LNG (‘’**SSLNG**’’), LNG Bunkering, Methanol to Olefins (‘’**MTO**’’)

The 30 year EPCC term is limited and includes, through the Decree Law, a tight interim deadline (all PODs must be submitted by December 2023). This is expected to be extended by 12 months due to Force Majeure

COUNTRY HYPOTHESIS AT NOV 21 (YEAR-ENDING)

2021

20: MLNG Loan Signing;
21: Sasol PSA FID; MLNG Financial Close/Force Majeure;

2023

22: MLNG Construction Restart; Coral FLNG COD (= **3.4 MTPA**); Matola FSRU FID
23: RLNG FID and first Domgas FIDs

2025

24: Matola FSRU COD; Sasol PSA COD; Overall LNG PODs submitted
25: MLNG Train 1 COD (= **9.9 MTPA**); MLNG 2 FID; Initial Domgas COD

2027

26: MLNG Train 2 COD (= **16.5 MTPA**)
27: Domgas projects online; RLNG 2 FID

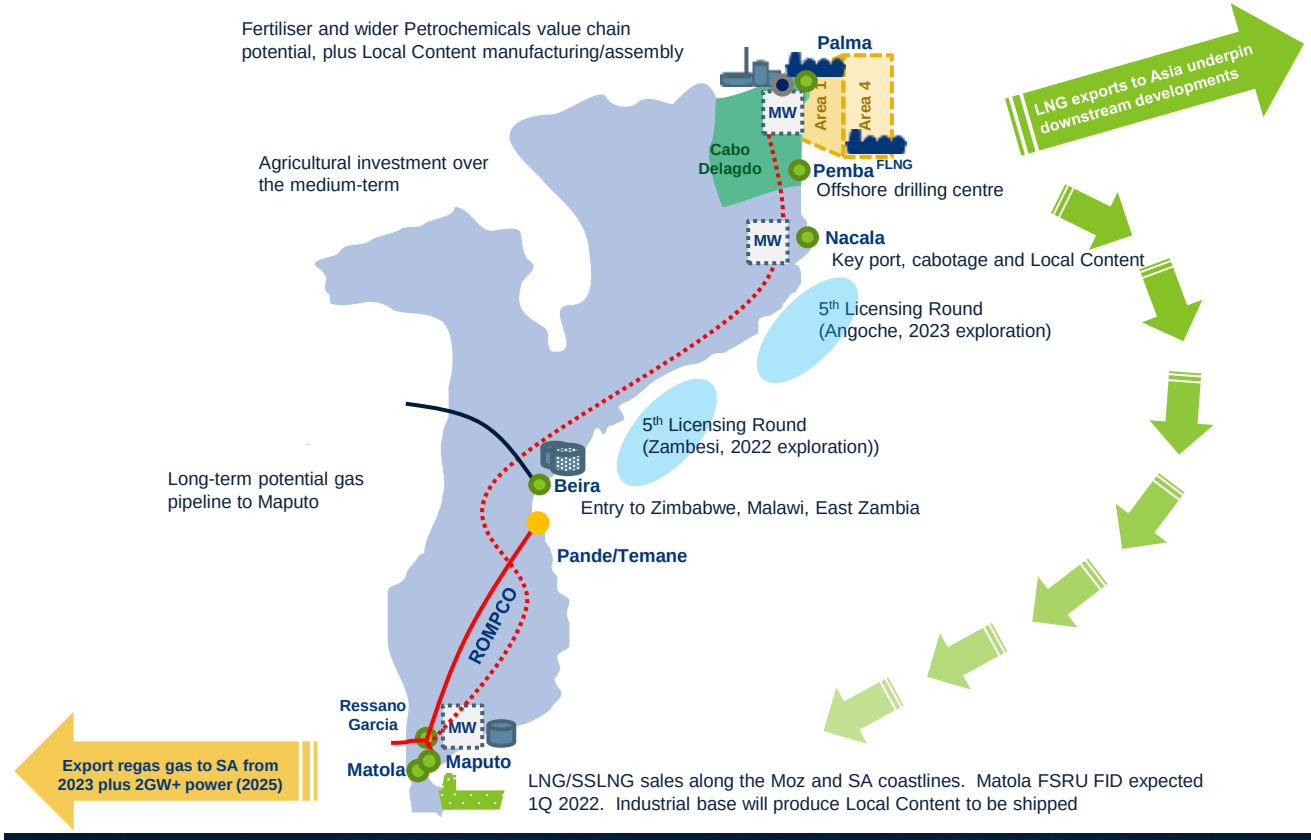
2029

28: RLNG Trains 1 & 2 COD (= **31.7 MTPA**);
29: MLNG Train 1 COD (= **38.2 MTPA**)

Section 4

ROMPCO & Matola FSRU

POTENTIAL DEVELOPMENTS FUELLED BY LNG & DOMGAS



- Key centres
- Storage
- LNG
- Potential FSRU
- Gas-to-Liquids
- PetroChemical Plant
- Planned Power Station
- Gas Pipeline
- Potential Gas Pipeline
- Refined Product Pipeline
- Cabo Delgado
- Producing gas fields
- Offshore 5th Licencing Round
- Offshore Developments

On 14th May 2021, Sasol announced a sale of 30% of ROMPCO. This will grow the SA market by connecting ROMPCO to the Matola FSRU, and facilitate two major growth nodes in Mozambique

GAUTENG (GP) & KWAZULU NATAL (KZN) - MOZAMBIQUE LINKS

1 We expect falling **PT** output by c.10%p.a. from 2025, to c.**118 MGJA** by 2028. As output declines, so will Sasol's allocation, thus securing alternative supplies is critical.

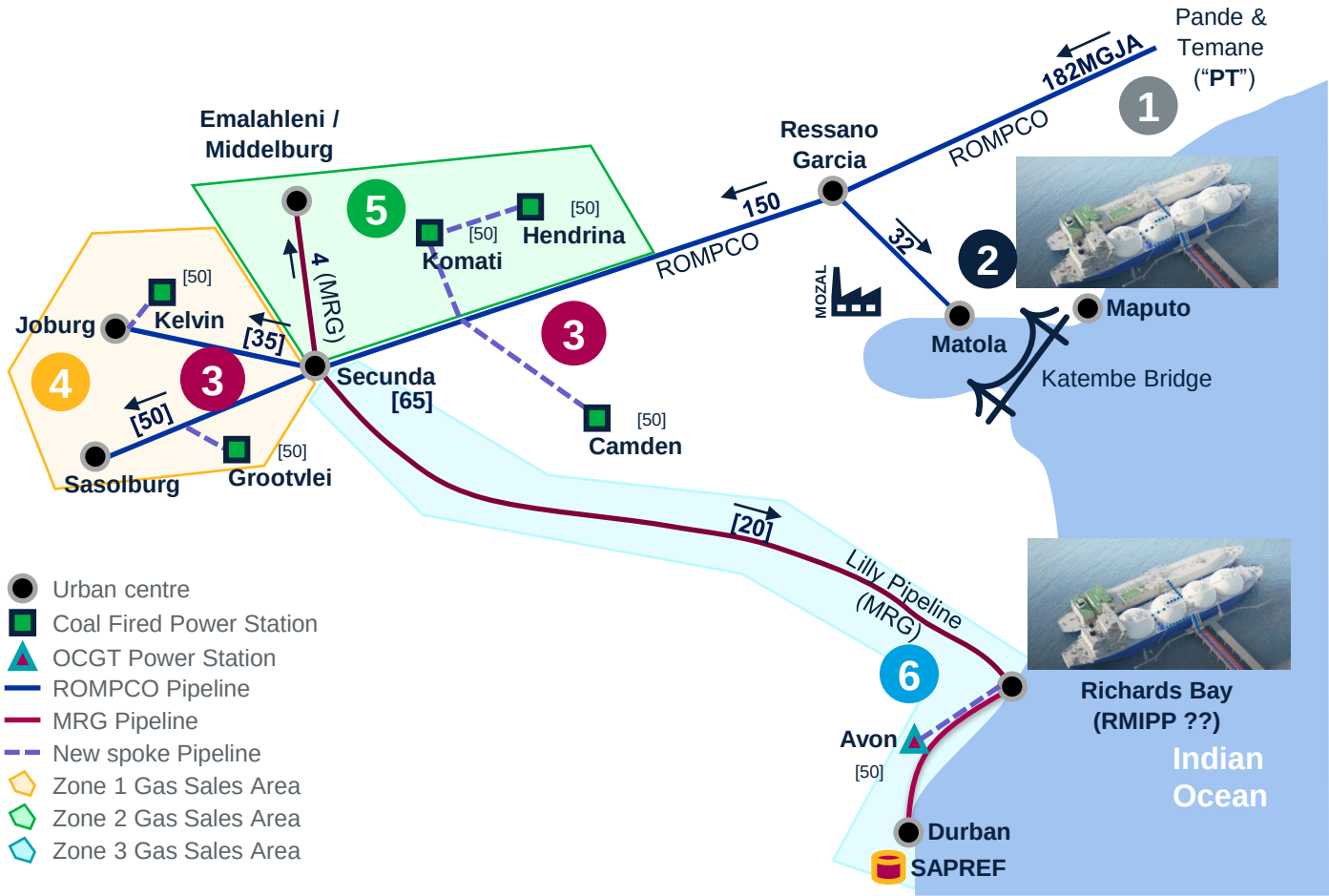
2 **Matola FSRU**
From [2024], c 212 MGJA throughput, subject to free ROMPCO capacity (current 212 MGJA, post debottleneck 325 MGJA?), c 62 MGJA free in ROMPCO today

3 **New Gas-to-Power (GTP)**
New CCGT at indicated brownfield sites, can be connected to Pipeline Network and/or ROMPCO

4 **Zone 1**
Gauteng area major demand potential for GTP and industrial users

5 **Zone 2**
Reasonable GTP demand potential

6 **Zone 3**
With LNG entering Richards Bay or Durban, real opportunity to increase GTP demand (e.g. Avon) and / or industrial users. Main issue is need to involve Transnet on reverse flow and debottleneck of Lilly line (capacity c 0.5 MTPA)

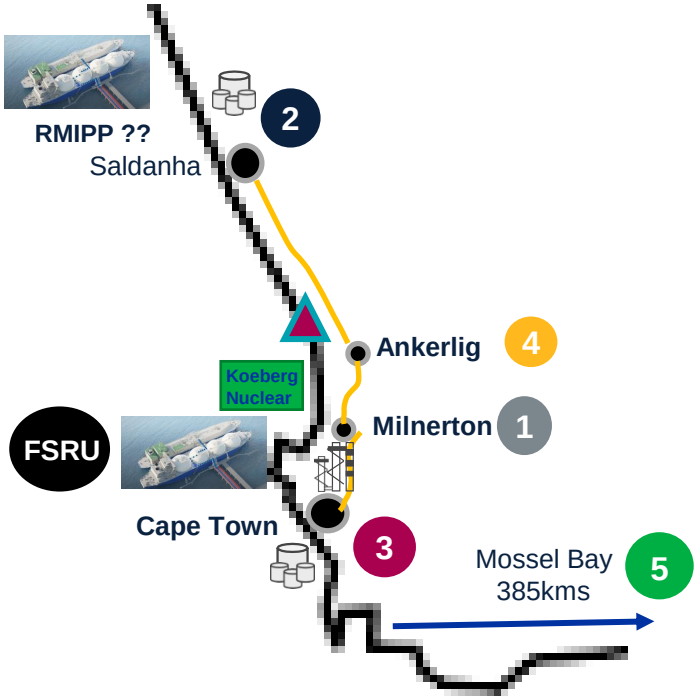


Section 5

Wider Discussion

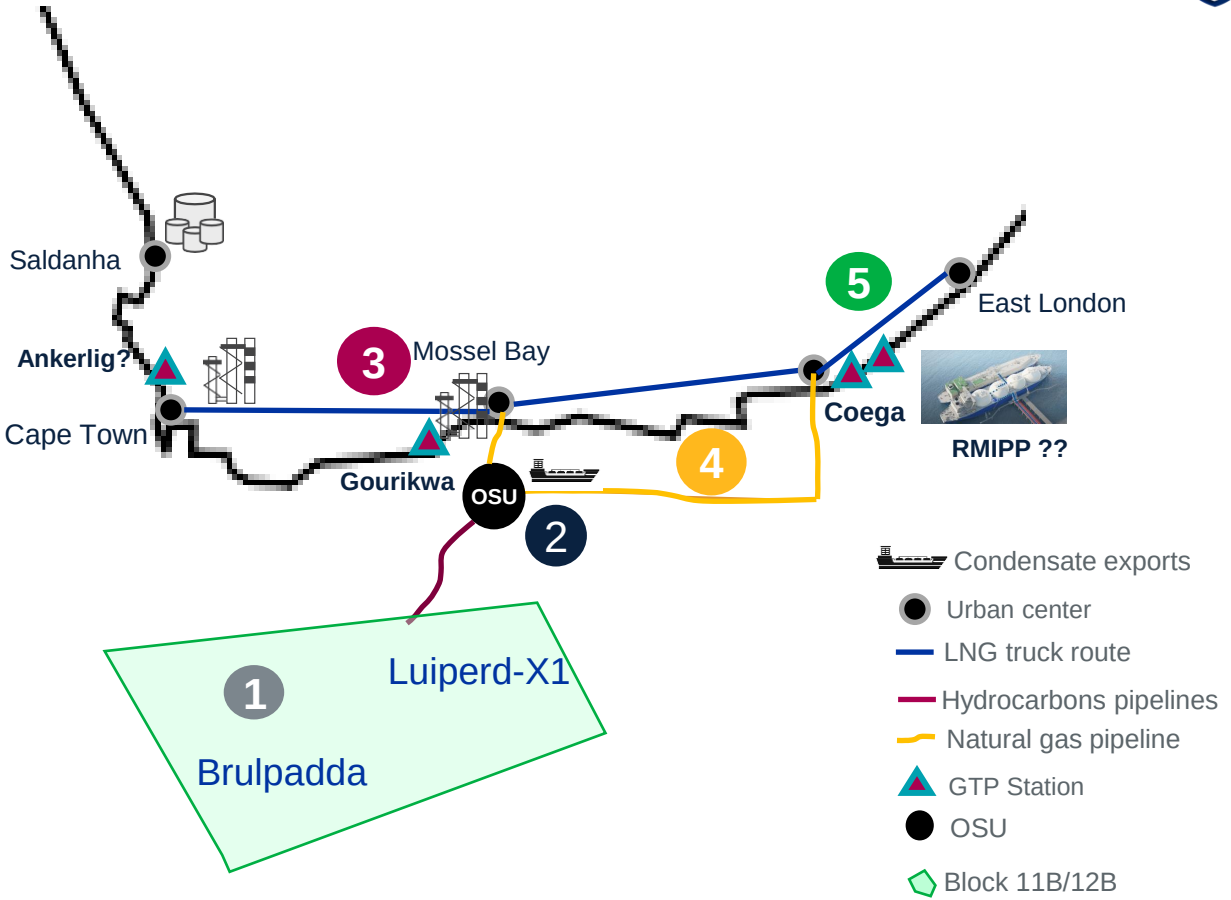
WESTERN CAPE (WC) - CAPE TOWN / SALDANHA SCHEMATIC?

1. **Medium Term** Milnerton Refinery LNG import / Product storage terminal conversion?
2. Saldanha. RMIPP options? LPG to power options? Long-term GTP options (after Coega/Richards Bay)? Existing crude line converted to gas?
3. Existing crude pipeline from CPT harbour to Milnerton converted to gas pipeline (i.e. CPT gas supply). Existing VTTI terminal feeds product line.
4. New gas pipeline from Milnerton to Ankerlig, with existing site repurposing to CCGT (pipe conversion to Saldanha?).
5. Long Term links to Mossell Bay / Luiperd / Brulpadda, for example, SSLNG Trucks (**see next slide**).



WC / EASTERN CAPE (EC) - MOSSEL BAY & COEGA SCHEMATIC ?

1. Block 11B/12B producing gas/condensate mix.
2. Offshore Separation Unit (OSU), from where majority condensate exported by ship.
3. Existing PetroSA GTL/Condensate refinery to be supplemented by SSLNG (into trucks) **?**
4. Offshore gas pipeline to Coega from OSU (<ESIA impact).
5. CCGT **base load** Gas to Power (GTP) at Coega/ Gourikwa fed by offshore piped gas (e.g. base load). Piped gas replaces imported LNG at Coega.

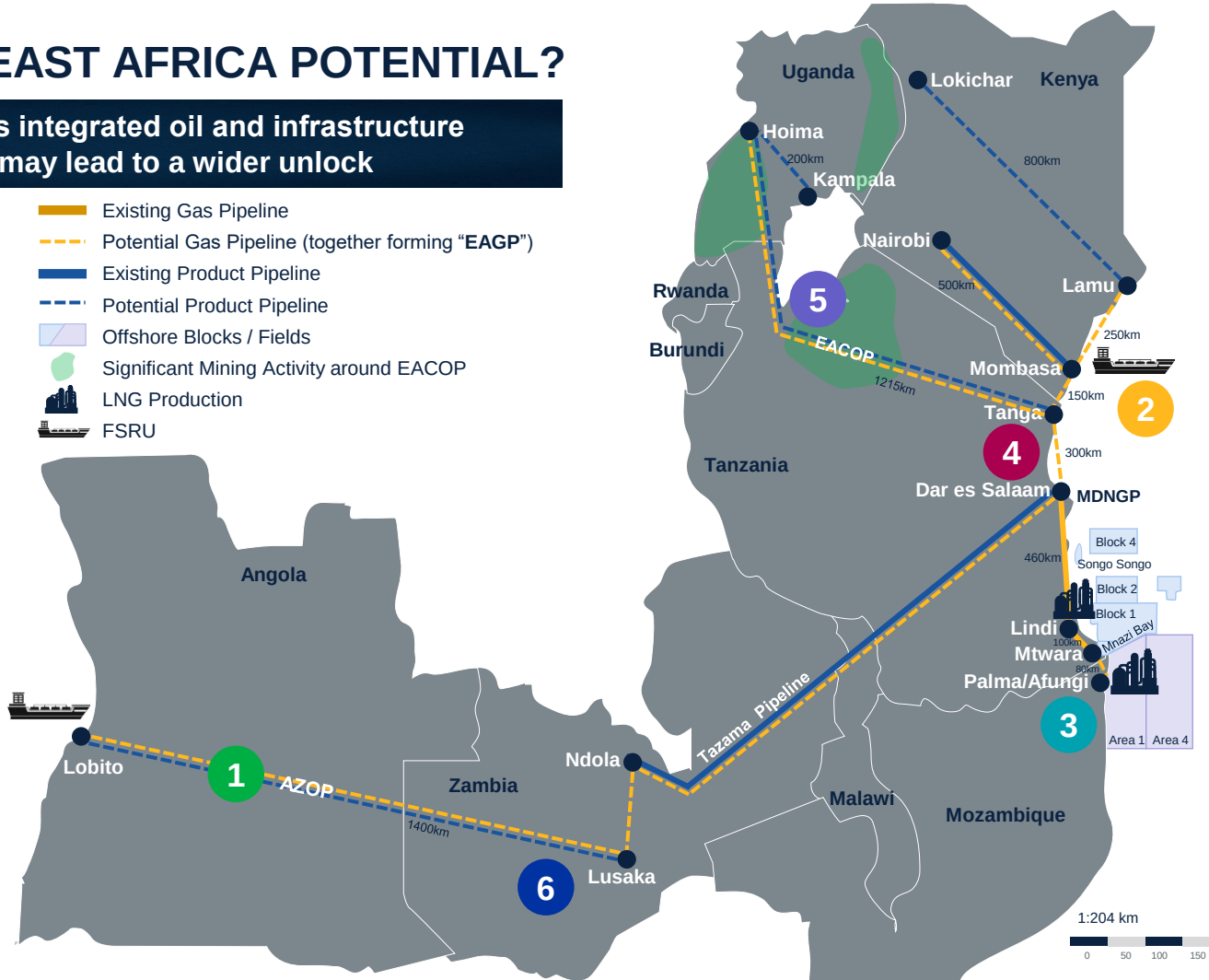


CASE STUDY - EAST AFRICA POTENTIAL?

Uganda & Tanzania's integrated oil and infrastructure development may lead to a wider unlock

Infrastructure Options

1. Potential AZOP gas/product line to ZM (**lower**)
2. Potential Mombasa FSRU, supplemented in time by EA Gas Pipeline (EAGP)
3. Spur to connect Afungi site to MDNGP (core of EAGP), bridging TZ gas supply
4. EAGP Hub, with branches to KE, UG, ZM (?), with supply bridged by MZ
5. Parallel gas pipeline to EACOP (**lower**)
6. ZM has options of either AZOP or link to TZ (adjacent to TAZAMA)



Thank You

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