



**TLOU ENERGY**

Africa Oil Gas & Energy Australia Conference  
Presentation – August 2018



**POWERING  
BOTSWANA**

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## COMPETENT PERSONS STATEMENT

The gas reserves and resource estimates for the Lesedi CBM Project provided in this presentation (refer slide 23) were released to the Market on 20 February 2018 (Announcement). Tlou confirms that it is not aware of any new information or data that materially affects the information included in the Announcement and that all of the material assumptions and technical parameters underpinning the estimates in the Announcement continue to apply and have not materially changed. The gas reserve and resource estimates are based on and fairly represents, information and supporting documentation and were determined by Dr. Bruce Alan McConachie of SRK Consulting (Australasia) Pty Ltd, in accordance with Petroleum Resource Management System guidelines. Dr. McConachie is considered to be a qualified person as defined under the ASX Listing Rule 5.42 and has given his consent to the use of the resource figures in the form and context in which they appear in this Presentation.



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**China 2016:**

**1.61 million people died from air pollution**

**India 2016:**

**1.58 million people died from air pollution**

**Globally 2016:**

**6.1 million people died from air pollution**

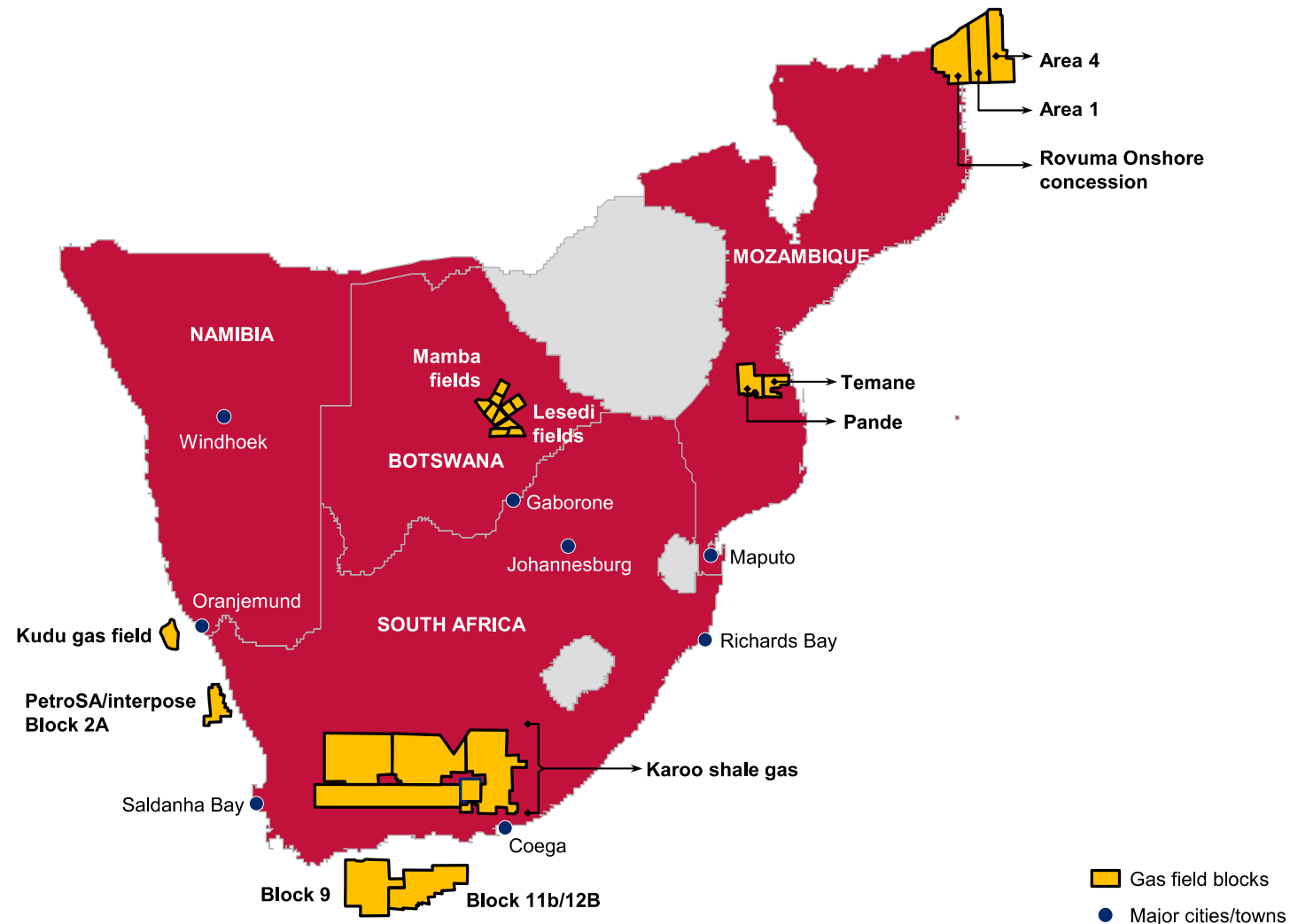




# Tightening gas supply-demand balance

- Multiple levers tightening the Southern African gas supply-demand balance
  - A number of LNG projects about to commence development in Mozambique and Tanzania
  - Regional power sector plans favour gas-to-power as a reliable and lower emissions alternative to coal
  - Some legacy gas resources either uneconomic or technically challenged
  - Lack of inter-regional infrastructure
- Developing gas-to-power becoming a priority of the SADC
  - SADC regional gas roadmap
- Potential for Botswana to develop gas and electricity self-sufficiency

# Regional gas assets



SOURCE: Bowmans, Tlou Energy, Westbridge Energy

- Resources concentrated in a handful of countries
- Mozambique-focused
- Uncertainty over SA shale gas (economic, technical, environmental)
- Offshore Kudu field stalled (Namibia)

# LNG boom emerging

- “LNG boom” starting to emerge
- Tightening east coast gas market.....in Africa
- Large projects starting to move forward
  - Coral FLNG
  - Rovuma LNG
  - Mozambique LNG
  - Tanzania LNG
- Big players have set up for the long haul
- Opens up exposure to LNG net-back pricing





# LNG projects

Country	Project	Capacity (MTPA)	Gas consumption		Start year (3)	Status	Partners
			Lifetime (Tcf) (2)	PJ/a			
Mozambique	Rovuma LNG	15.2 (1)	17.9	827	2024	Development approvals, FID expected 2019	Rovuma LNG (Exxon Mobil, Eni, CNPC 70%, Galp (10%), KOGAS (10%), ENP (10%)
Mozambique	Mozambique LNG	12.88	15.1	701	2023	Approaching FID, targeted later 2018	Anadarko (26.5%), Mitsui (20%), ENH (15%), ONGC (10%), Oil India (10%), BPRL (10%), PTTEP (8.5%)
Mozambique	Coral FLNG	3.4	4.0	185	2021	Under construction	Exxon Mobil (25%), CNODC (20%), ENH (10%), KOGAS (10%), Galp (10%)
Tanzania	Tanzania LNG	10	11.8	544	2027	pre FEED	Shell, Exxon Mobil, Ophir Energy and Statoil
Angola	Angola LNG	5.2	6.11	283	2013	Commissioned/first cargo 2013 (4)	Chevron (36.4%), Sonangol (22.8%), BP (13.6%), Eni (13.6%), Total (13.6%)
Equatorial Guinea	EGLNG 1	3.4	4.0	185	2007	Commissioned/first cargo 2007	Marathon Oil (60%), Sonagas (25%), Mitsui (8.5%), Marubeni (6.5%)
<b>Total</b>		<b>50.1</b>	<b>59</b>	<b>2,724</b>			

(1) Mozambique LNG may be expanded to 50 MTPA  
 (2) Assuming 25 year project life  
 (3) Estimated  
 (4) Project was offline for most of 2014-2016 with technical issues



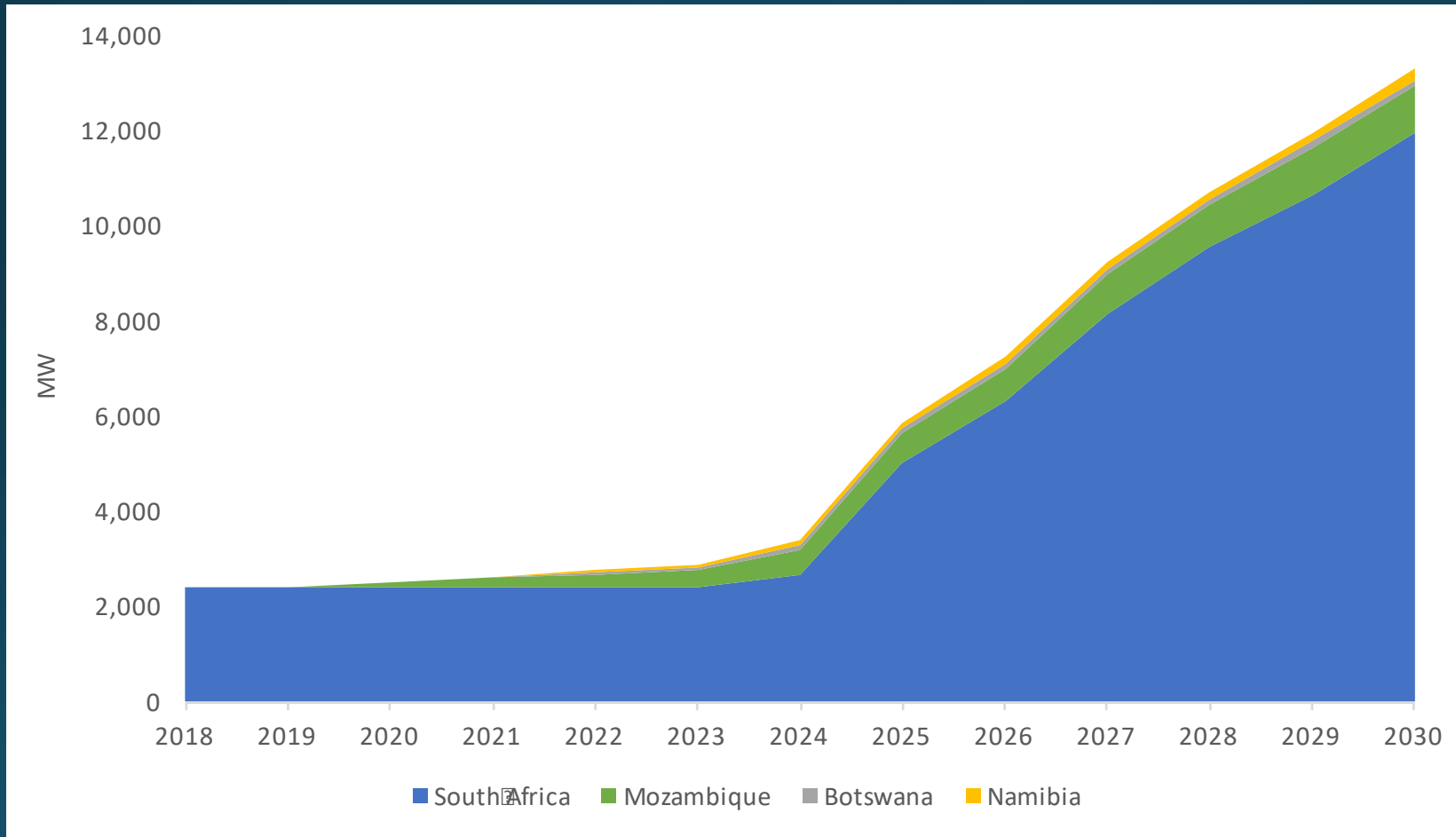
# Gas to electricity push

- Gas is emerging as the fuel of choice alongside renewables (hydro, solar, wind) in regional development plans
- Lower emissions than coal
- Quick start technologies (CCGT and OCGT) provide useful back-up to intermittent renewables
- e.g. the South Africa Draft IRP states that *“Gas and Renewables forms the biggest chunk of installed capacity by 2050”*



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# South Africa's aggressive gas-to-power push



Source: regional government planning documents

# Power sector demands on regional gas

Country	Gas gen capacity estimated by 2030 (1)		Total (MW)	Gas consumption	
	OCGT (MW)	CCGT (MW)		Lifetime (Tcf) (2)	PJ/a
South Africa	6,459	5,490	11,949	4.4	233.8
Mozambique		1,015	1,015	0.8	40.0
Botswana		110	110	0.1	4.3
Namibia		250	250	0.2	9.9
<b>Total</b>	<b>6,459</b>	<b>6,865</b>	<b>13,324</b>	<b>5.5</b>	<b>288</b>

(1) Based on regional government planning documents

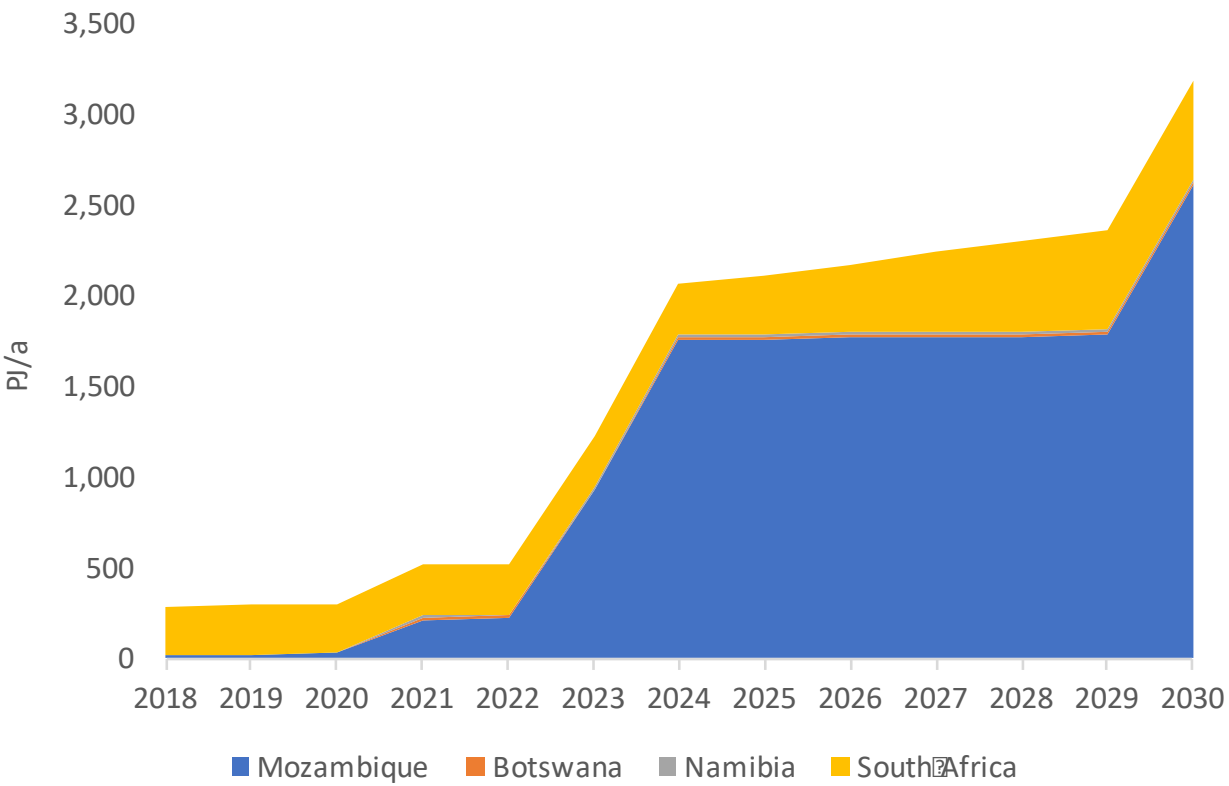
(2) Assuming 20 year project life



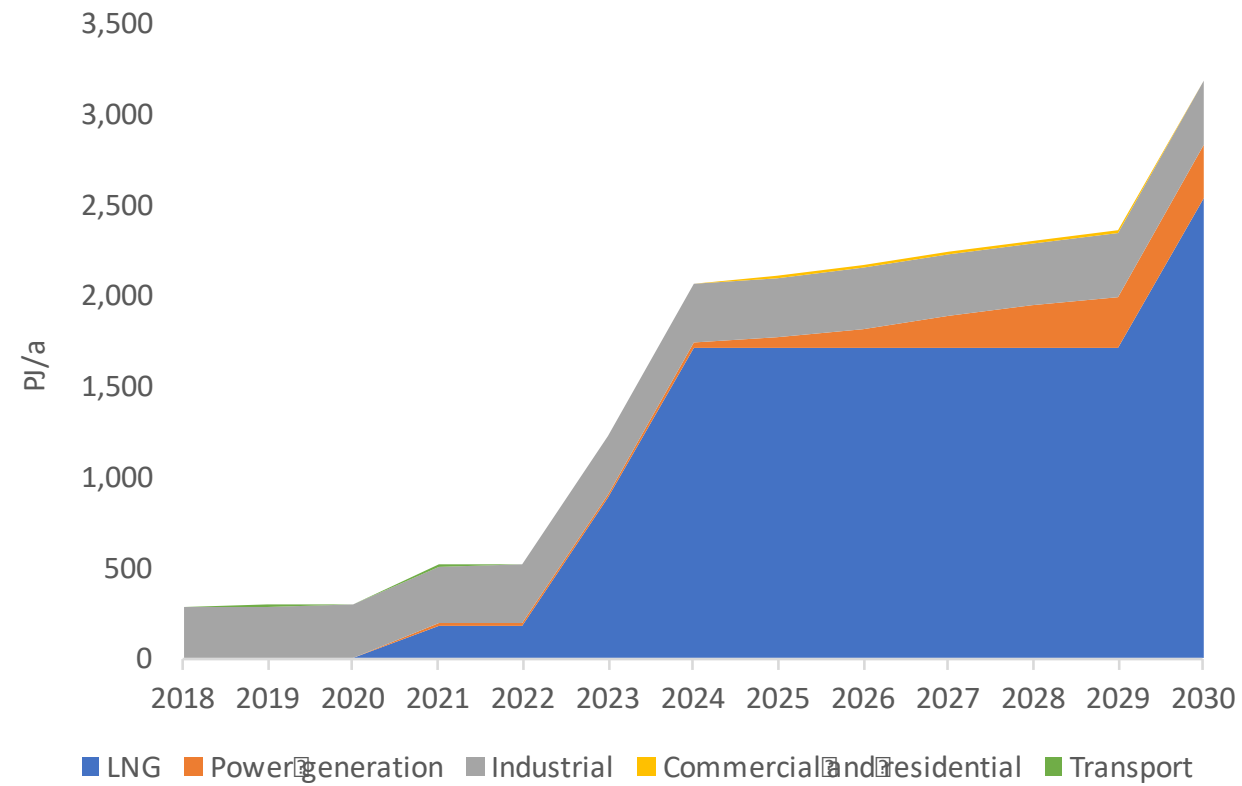
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# ....But Mozambique-LNG the driver

### Regional Gas Demand



### Sectoral Gas Demand



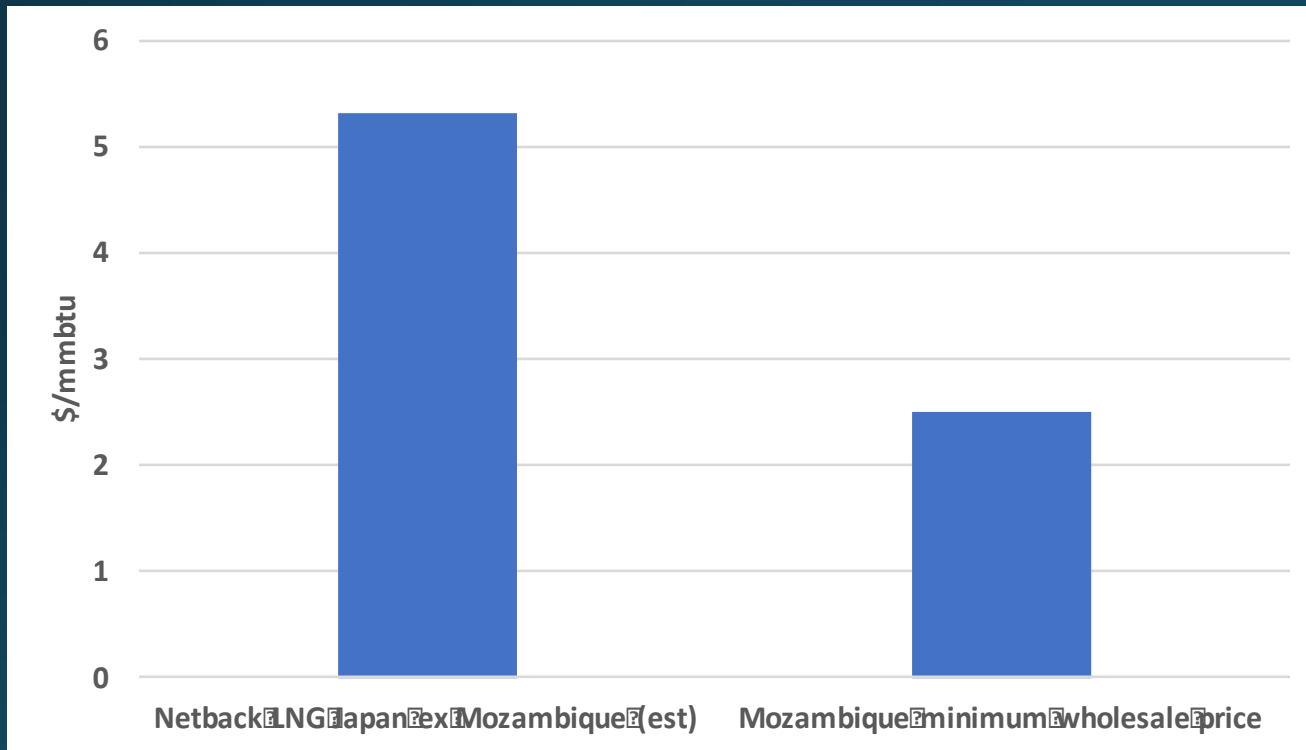
Source: company websites, World Bank, USAID



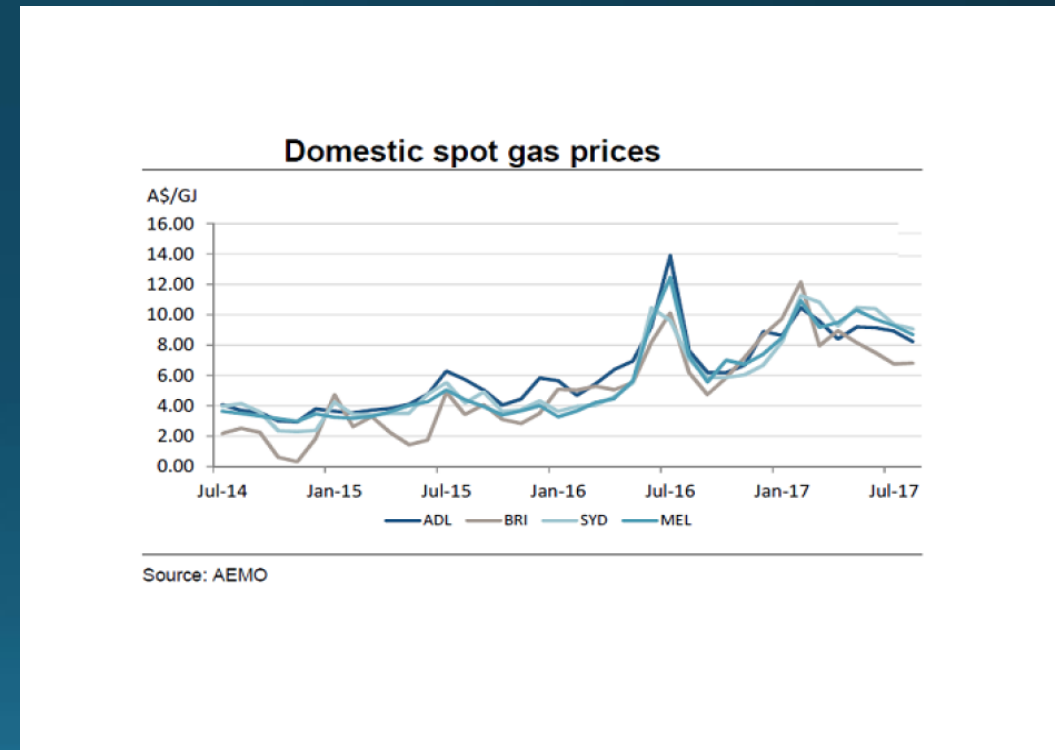
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# LNG likely to change regional pricing economics

## Mozambique economics



## The east coast Australia experience



Sources: World Bank, Japan Ministry of Economy, Trade and Industry



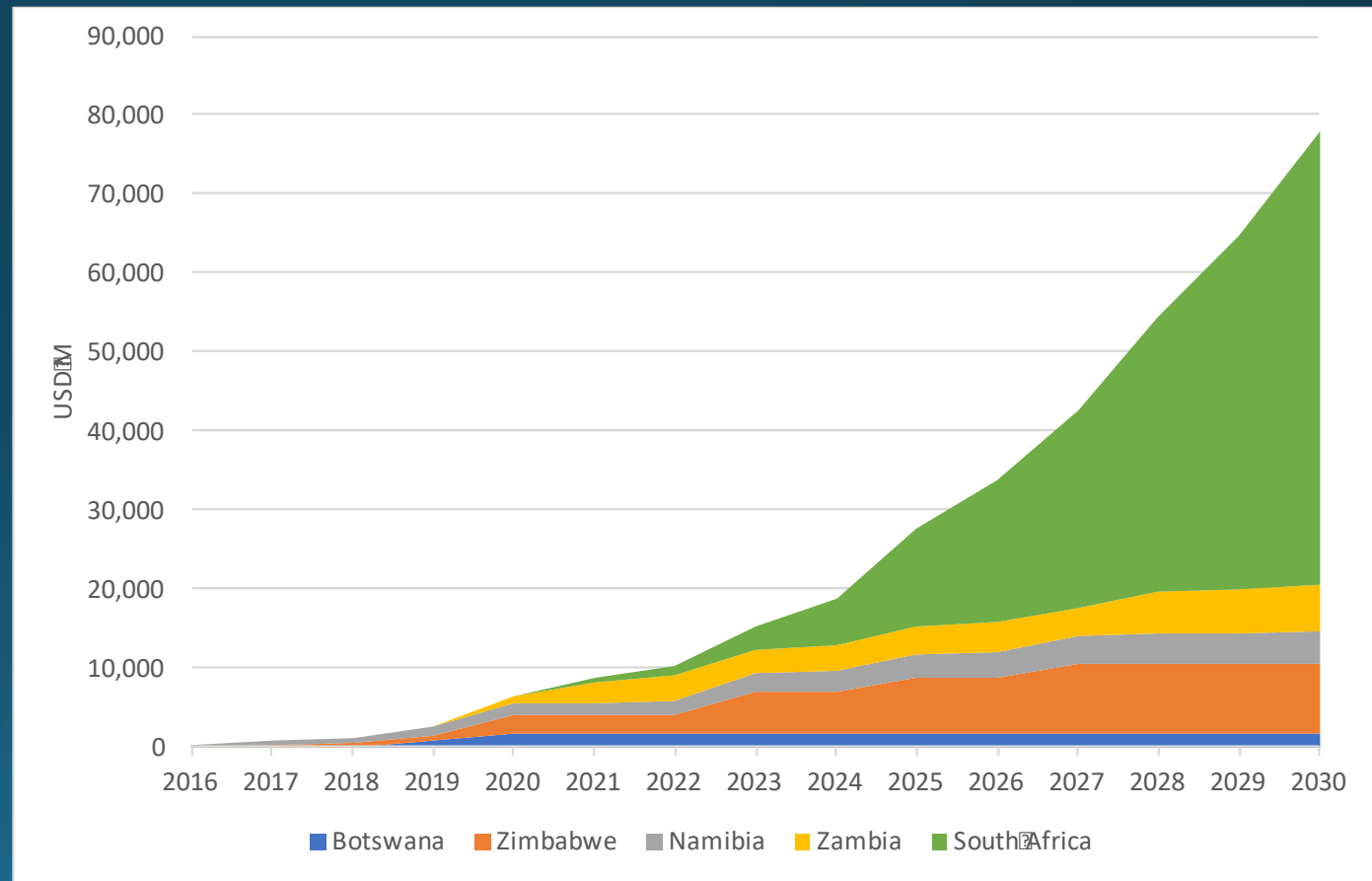
# Uncontracted gas optionality/value

- Competition emerging between gas-LNG and gas-to-power in the region
- Mozambique is the giant, and can supply LNG or pipeline to South Africa
  - This gas is largely accounted for.
- Regional supply solutions reliant on infrastructure
- Domestic market to face internationally-traded LNG spot prices as the opportunity cost
- Uncontracted gas will have value



# Why gas-to-power?

- **US80bn in new generation capacity required across the region by 2030, to keep pace with demand**
- **Zimbabwe USD8.8bn (50% of 2016 GDP)**
- **South Africa USD57.4bn**
- **Namibia USD4.2bn**
- **Zambia USD5.9bn**
- **Botswana USD1.8bn:**
  - *100MW solar w. storage*
  - *Morupule B (5&6)*
  - *100MW gas CCGT*





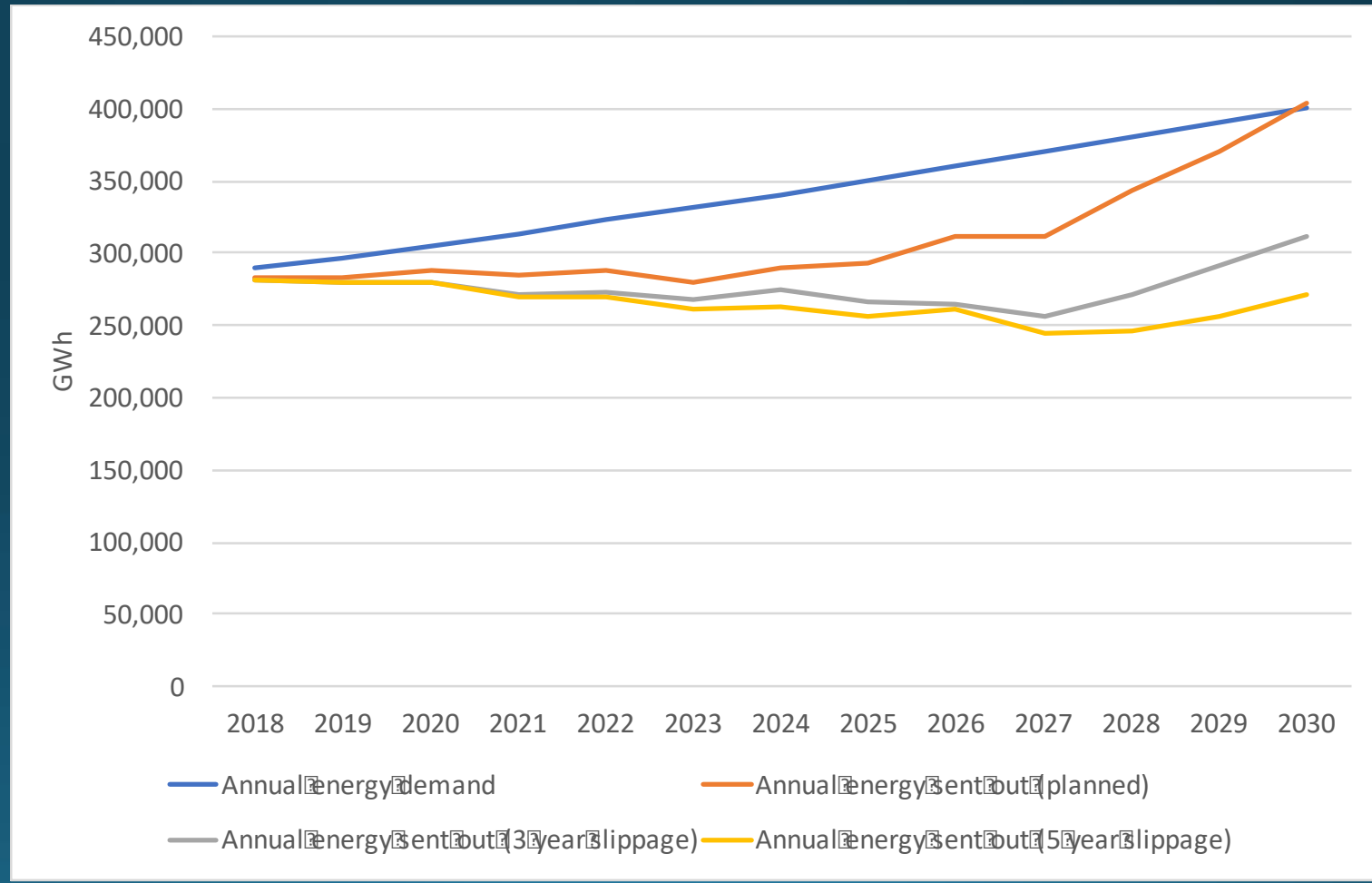
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# Regional supply deficit will likely emerge by mid next decade

We analysed 3- and 5- year delays to new capacity , which could lead to severe power shortages in the next decade

Power markets move in cycles of 1) supply surplus, 2) under-investment, then 3) deficit. The current Eskom supply overhang and cheap tariffs will not last

Eskom was in major supply deficit in 2008 and again in 2014



Source: regional government planning documents, official forecasts, Mott MacDonald analysis

# Reliance on Eskom for long-term supply security is unsustainable



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## South Africa faces power crisis and blackouts

South Africa is facing an electricity crisis as the country's power utility struggles to meet demand.

Power utility Eskom has been rationing supplies for the first time since 2008 in order to ease the pressure on the national grid.

The power cuts are being blamed on poor maintenance practices stretching back many years.

Nomsa Maseko reports.

04 Feb 2015

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### Business

## What Is South Africa Doing to Tackle Its Electricity Crisis?

By [Michael Cohen](#) and [Paul Burkhardt](#)  
8 September 2015, 2:00 pm AEST  
*Updated on 8 September 2015, 6:50 pm AEST*

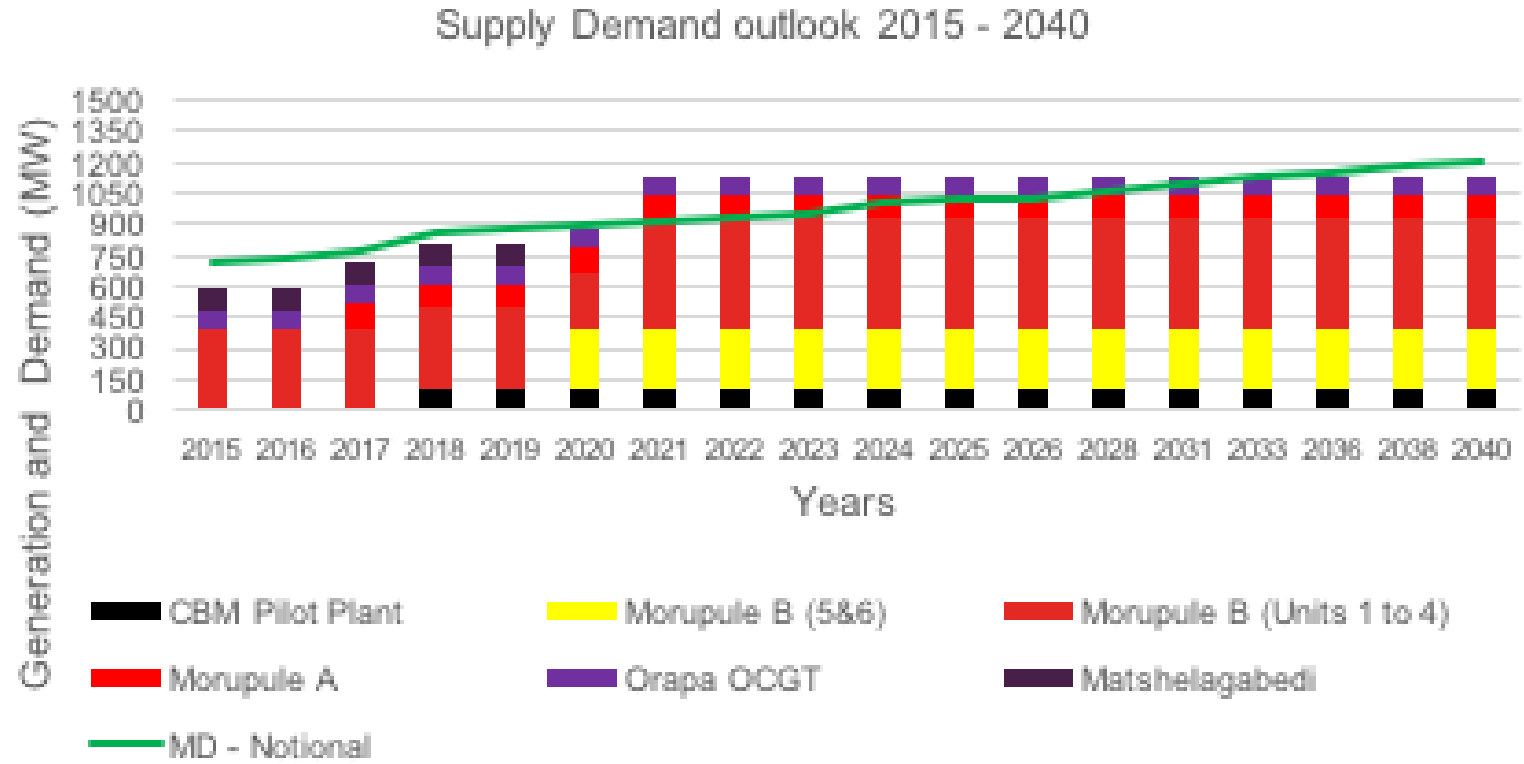
- ▶ Two coal-fired plants being built, third under consideration
- ▶ Energy mix includes nuclear, hydropower, wind, solar



# Botswana plans to be self-sufficient

Traditional capacity planning approach (dispatchable power only)

- Botswana currently relies on imports from Eskom (SA)
- Plans to become self-sufficient
- Match long-term growth in peak demand against committed dispatchable capacity
- Demand-supply balance grows tight, even assuming new projects are delivered



Source: Mott MacDonald, Botswana Power Corporation

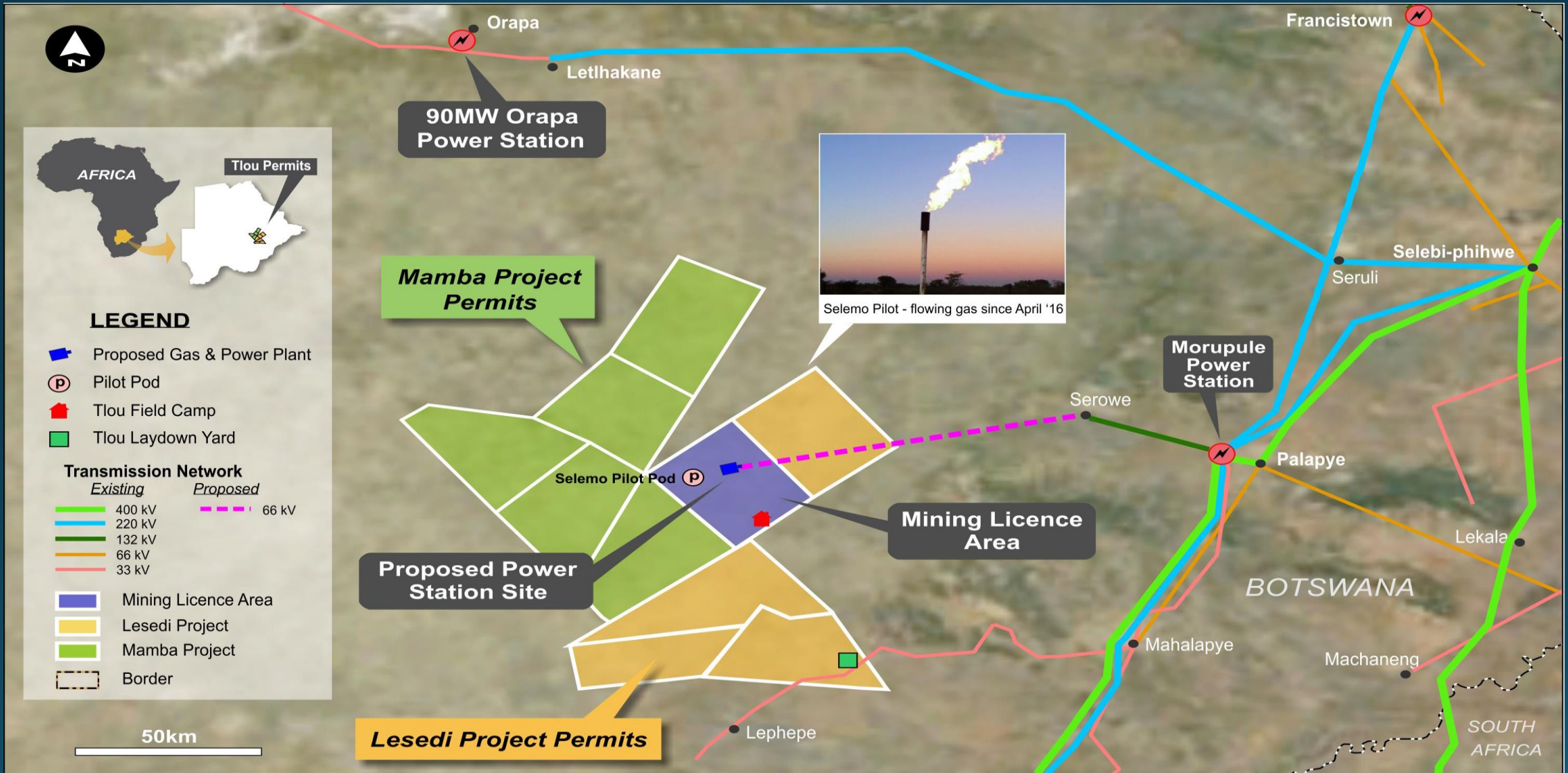


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# Tlou Energy Ltd

- CBM proven around the world to be a reliable and economical supply for power and LNG
- CBM Gas Reserves & Resources Booked and still growing
- Environmental and Mining Approvals already in place
- One of two companies which are pre-qualified to tender for CBM to power offtake agreement with the Botswana Government
- Experienced geological and drilling personal and equipment owned in house

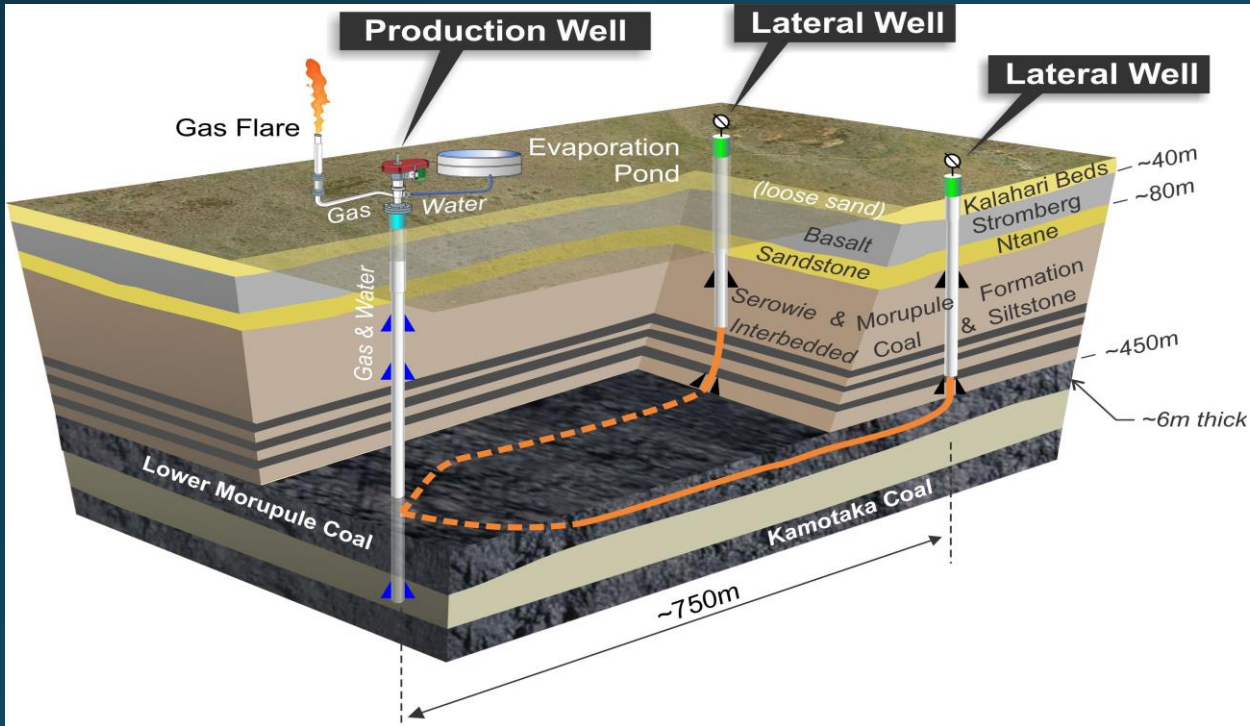
# Botswana Project Map





# What does Tlou Energy do?

The Company extracts CBM natural gas from coal, using horizontal drilling techniques. This CBM gas can then be used for electricity generation.



## ➤ Tlou's CBM extraction method

- ✓ Dual Lateral Pods, each comprising one vertical and two horizontal wells
- ✓ Proven technology
- ✓ Minimum footprint allowing agricultural use of land to continue
- ✓ No fracking required
- ✓ CBM can replace high carbon producing power generation such as diesel and coal fired power



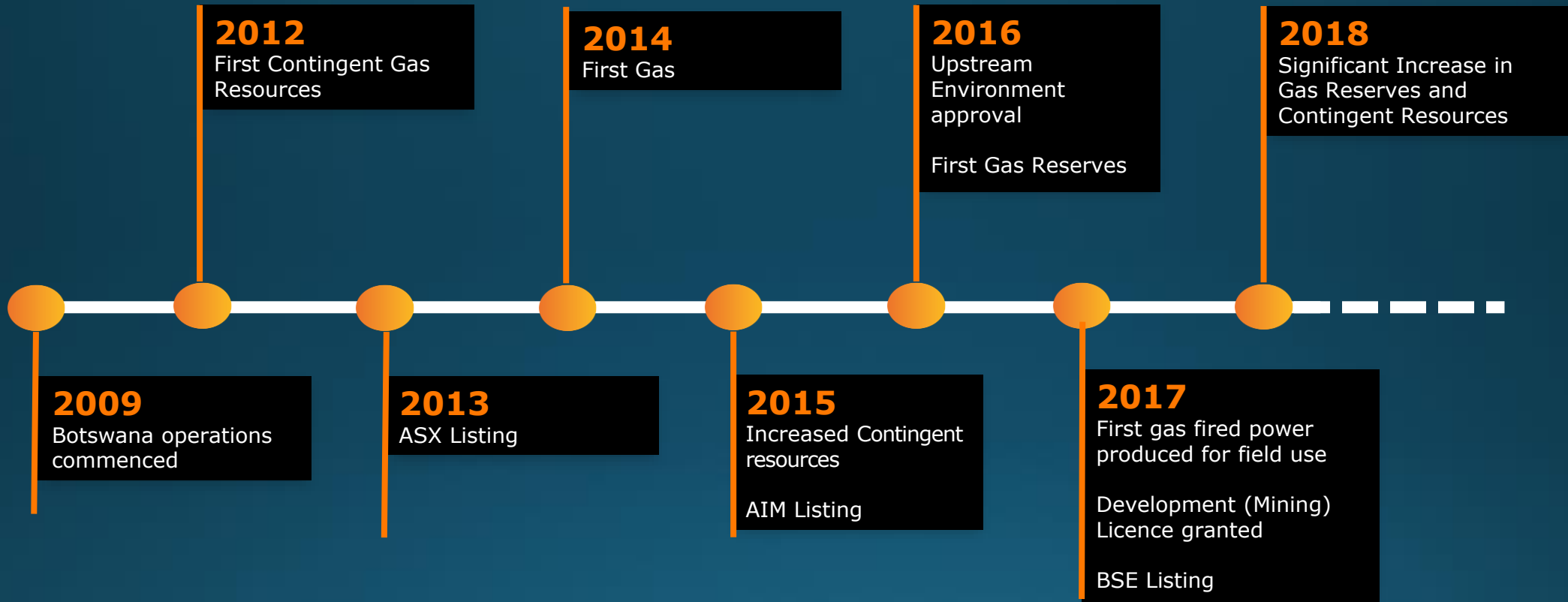
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*... generating power from CBM in  
Botswana*





# How Have We Got Here?





# Reserves & Contingent Resources

Independent Gas Reserves Certification <sup>(1)</sup>		
<b>0.35</b> <b>BCF</b> <b>(1P)</b>	<b>40.8</b> <b>BCF</b> <b>(2P)</b>	<b>426.6</b> <b>BCF</b> <b>(3P)</b>

Technical Fundamentals	
Coal Depth	~350-800m
Gas Contents (Average)	~6 m <sup>3</sup> /t (DAF)
Gas compositions	~90% methane

Location	Project	Tlou Interest	Gas Reserves <sup>(1)</sup>			Gas Contingent Resources <sup>(2)</sup>			Gas Prospective Resource (BCF) <sup>3</sup>
			1P (BCF)	2P (BCF)	3P (BCF)	1C (BCF)	2C (BCF)	3C (BCF)	
Karoo Basin Botswana	Lesedi CBM (Lower Morupule coal) (ML 2018/18L, PL001/2004)	100%	0.34	25.2	252	4.6	45.6	331	-
Karoo Basin Botswana	<b>Lesedi CBM (all coal seams) (ML 2018/18L, PL001/2004)<sup>4</sup></b>	<b>100%</b>	<b>0.34</b>	<b>25.2</b>	<b>252</b>	<b>4.6</b>	<b>214</b>	<b>3,043</b>	-
Karoo Basin Botswana	Mamba CBM (Lower Morupule coal) (PL238/2014-PL241/2014)	100%	0.01	15.5	175	n/a	n/a	n/a	-
Karoo Basin Botswana	PL003/2004, PL035/2000, PL037/2000	100%	-	-	-	-	-	-	8,596 <sup>6</sup>

**Notes:**

Gas Resource numbers have been rounded to the nearest tenth for amounts less than 100 BCF, otherwise to the nearest whole number. Refer to Competent Persons Statement in the disclaimer slide of this presentation.

1) Tlou's Gas Reserves have not been adjusted for fuel or shrinkage and have been calculated at the wellhead (which is the reference point for the purposes of Listing Rule 5.26.5).

2) Contingent Gas Resources are (100%) Unrisked Gross and are derived from the SRK certification at 31 March 2015 for all coal seams (as previously announced by Tlou on 9 April 2015) with adjustment for the gas volumes which have now been certified by SRK in the Gas Reserves category.

3) ASX Listing Rule 5.28.2 Statement relating to Prospective Resources:

The estimated quantities of petroleum gas that may potentially be recovered by the application of a future development project(s) relate to undiscovered accumulations. These estimates have both an associated risk of discovery and a risk of development. Further exploration appraisal and evaluation is required to determine the existence of a significant quantity of potentially moveable hydrocarbons.

4) The Gas Reserves and Contingent Gas Resources for all coal seams in PL001/2004 and ML 2018/18L shown in the table above includes the numbers for the Lower Morupule coal seam which are shown in the first row of the table.

5) The most recent Reserves assessment by SRK did not include a review and assessment of additional Contingent Resources in the Lesedi Project Area or Contingent Resources in the Mamba Project area.

6) Prospective Gas Resources are (100%) Unrisked Gross and are derived from a report to Tlou from Netherland, Sewell and Associates Inc (NSAI) dated 16th February 2012 regarding certification for all coal seams located in the remaining prospecting licences (as previously announced by Tlou in its prospectus dated 20 February 2013).



# Ongoing and Planned Workstreams

**PPA Negotiations**

**Downstream EIA**

**Core-hole drilling**

**Drilling Rig acquisition\***

**Pilot Well Drilling**

**Seismic Surveys\***

**Expanded Reserves**

**Project Development\***

*\* Subject to funding.*



# Investment Case



## Independently Certified Gas Reserves & Contingent Resources



**Huge market**



**Supportive government**



**Low cost drilling**



**Significant CBM experience**



**High Impact drill program set to commence**



## Aiming to provide power for Botswana and Southern Africa



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Thankyou

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