Phased Gas Pipeline Network
Strategic Environmental Assessment
Focus Groups and Public Meetings

1-13 November 2017, Neville Ephraim & Thabani Dlamini
Gas Transmission Pipelines

Gas Act

- **Pressure >15 bar** Transmission Main trunk line
- **2 bar < Pressure = or < 15 bar** Distribution Branch Lines to industrial areas & reticulation offtake points
- **Pressure = or < 2 bar** Reticulation To homes and small industry

Pressures compared to a full LPG Tank at room temperature (27ºC)

- LPG pressures depend on the ratio or mixture of Propane to Butane
- 100% Propane 7.0 bar
- 50/50 Propane/Butane 3.9 bar
- 100% Butane 0.8 bar

Typical Dimensions e.g. Rompco Mozambique to Secunda (MSP)

- Length 865 km
- Diameter 26” 660 mm
- Wall Thickness 10 – 17 mm depending on proximity to human settlements
Existing Gas Pipelines in South Africa

- ROMPCO Loop Line 1
- ROMPCO Loop Line 2
- ROMPCO Mozambique to Secunda Pipeline (MSP)
- ROMPCO Komatiepoort Compressor Station
- Transnet Lilly Pipeline
- Sasol Methane Rich Gas Transmission Network (SWM)
- Sasol Gas Transmission Network (GTN)
- Sasol Gauteng Network Pipeline (GNP)
- Sasol Methane Rich Gas Transmission Network (SWM)
- ROMPCO Loop Line 1
- ROMPCO Loop Line 2
- ROMPCO Mozambique to Secunda Pipeline (MSP)
- ROMPCO Komatiepoort Compressor Station
- Transnet Lilly Pipeline
- Sasol Methane Rich Gas Transmission Network (SWM)
- ROMPCO Loop Line 1
- ROMPCO Loop Line 2
- ROMPCO Mozambique to Secunda Pipeline (MSP)
- ROMPCO Komatiepoort Compressor Station
- Transnet Lilly Pipeline
Existing Transnet Liquid Pipelines Network in South Africa

- Also, Chevron crude oil pipeline from Saldanha to Milnerton
Pipelines Industry

- Existing, well established industry in South Africa
- 1000’s of kilometres of both oil and gas pipelines in South Africa
- North America, Europe and Asia have 10’s of 1000’s of kilometres of pipelines
- South America and Australia are building their networks
- Most economical mode of transport overland
  - “Virtual pipelines” may start with trucking or rail
  - Then expand to pipelines as the market grows and volumes increases

- All pipelines are buried, except where they come above ground at Pigging Stations
- Top of pipe is typically 1m below the ground level
- For Rompco these stations are ~130km apart
- New technology may allow that to increase to 250km and possibly 500km
Pipelines Safety Considerations

**Regulations:**
- Piped Gas Regulations of 2007
- Occupational Safety and Health Act
- National Environmental Management Act, etc

**Design and Engineering Best Practices and Standards:**
- ASME B31.3 – Process Piping
- ASME B31.4 – Pipeline Transportation Systems for Liquids and Slurries
- ASME B31.8 – Gas Transmission and Distribution Piping Systems
- API Standard 1104 – Pipeline Designs

**Welding and Coating Standards** – check by AIA

**Gas Pipeline Developers/Operators also:**
- Have to clearly identify the pipeline in the ground with markers
- Markers are to be visible with clear contact numbers in case of emergencies
- Have programs to educate communities in respecting and handling properly of piped gas and gas infrastructure just like other forms of energy
- Have extensive training of workforce personnel and have monitoring room
- Have maintenance plans which include onsite visual inspections
- Have a well thought Emergency Preparedness Plans and Community alerting systems in case of emergencies
The Phased Gas Pipeline Network emerged as an Infrastructure Requirement from Operation Phakisa’s Oceans Lab

**South Africa should ...**

... create an environment that **promotes exploration** ...

... in order to **drill 30 exploration wells** in the next 10 years ...

... while simultaneously **maximising the benefits for South Africa**

August 2014
State of Gas Exploration, Usage & Planning in South Africa (August 2014)

- PetroSA GTLR = 1.0 TCF
- Gourikwa = 0.7 TCF
- Dedisa (IPP) = 0.3 TCF
- Baseload IPP = 1.0 TCF

Potential FSRU:
- South African Gas Reserves
- Neighbouring Gas Reserves
- Potential FSRU
- Potential LNGT

Gas Pipeline: (Route Engineering Completed)

Market can support a gas reserve of at least 1.5 TCF:
- Ankerlig = 1 TCF
- IPP = 0.5 TCF

Market can support a gas reserve of at least 3 TCF:
- Durban & Gauteng = 1.5 TCF

Potential LNGT:
- South African Gas Reserves
- Neighbouring Gas Reserves

Prospective P50 Resources:
- Pande ~4.5 TCF
- Temane P90 ~0.8 TCF
- Kudu P90 ~0.2 TCF
- Ibhubesi P90 ~0.2 TCF

Market can support a gas reserve of at least 3.1 TCF:
- IPP = 1.0 TCF
- Avon = 0.6 TCF
- Durban & Gauteng = 1.5 TCF

Total/CNR drilling to start mid June 2014
Changing Economic Environment

2014
• Uncertainty around the MPRDA to be addressed by the F1 Workgroup
• $100 / bbl – $110 / bbl Brent oil price
• Oil price supported exploration for oil and gas
• Phased Gas Pipeline Network (PGPN) required to take offshore gas to market

2017
• Uncertainty around the MPRDA remains
• $50 / bbl – $60 / bbl oil price may not encourage production for oil and gas, however does not invalidate advancement of exploration activities
• Feedback from the Africa Oil Week (23-27 Oct ‘17)
  • Indications are that oil price will remain lower for longer
  • Companies are reassessing exploration costs and realising between 20% and 40% efficiencies
  • Proceeding with exploration, possibly production on large finds; marginal fields will remain uneconomical
• PGPN is no longer only driven by offshore gas discoveries

Other Drivers
• PGPN driven by imported LNG (via the LNG to Power Program)
• Shale Gas developments in the Karoo Region
• Imported Gas from Mozambique
Phasing

- Phase 1a: Saldanha to Ankerlig
- Phase 1b: Saldanha to Mossel Bay
- Phase 2: Mossel Bay to Coega
- Phase 3: Richards Bay to Secunda
- Phase 4: Mozambique Southern Border to Richards Bay
- Phase 5: Abrahamvilliersbaai to Ankerlig Take-off
- Phase 6: Phase 1 to Oranjemund (Namibia)
- Phase 7: Coega to Richards Bay

Rompeco: Komatiepoort to Secunda
Shalegas: Beaufort West to Phase 2

SEA Phased Gas Pipeline Network Corridors
For further information, kindly contact the Project Team via

gasnetwork@csir.co.za

https://gasnetwork.csir.co.za