



**PetroSA**

# **Upstream Oil and Gas**

**Everton September  
VP: New Ventures Upstream**

**10<sup>th</sup> August 2010**





# PetroSA Upstream

- **Gas Production**



- **Oil production**

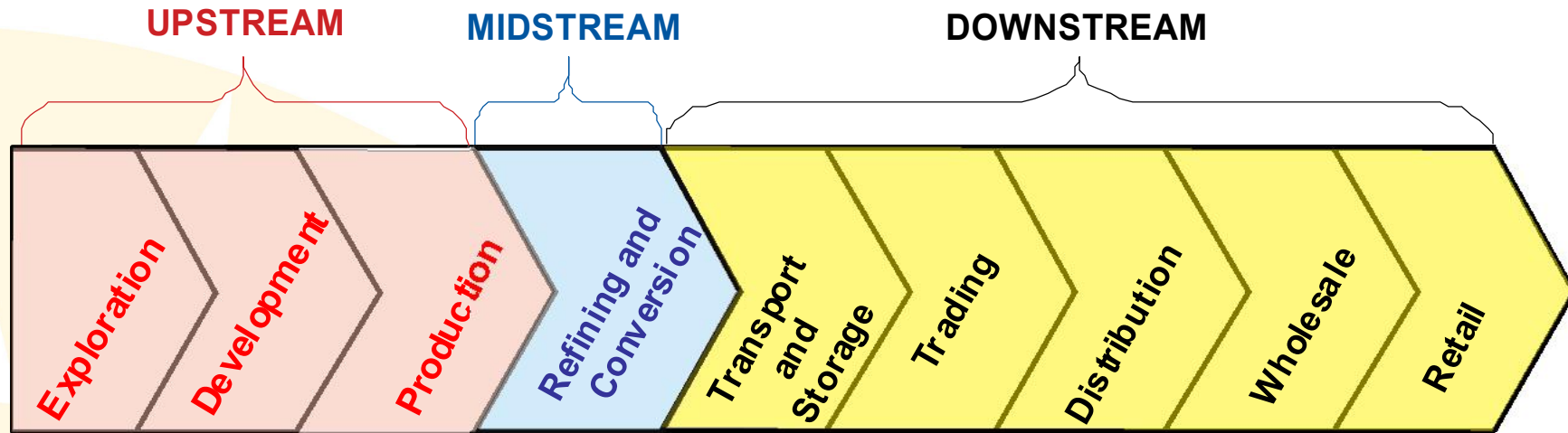


- **International E&P**



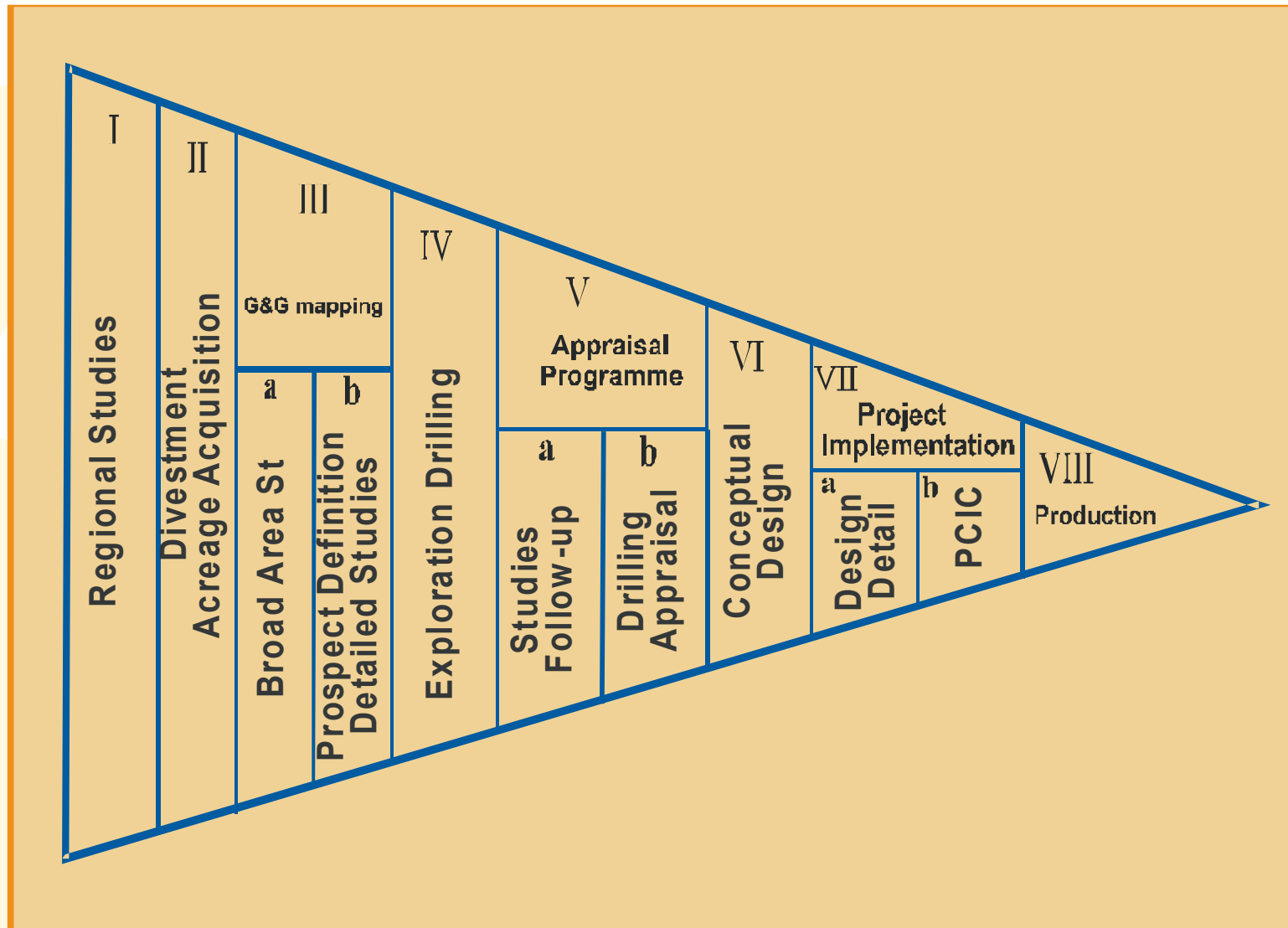
- **South Africa's national oil company,**
- **Established in 2002,**
- **Business spans entire petroleum value chain,**
- **Produced ~70 MMbbl of crude from Oribi, Oryx and Sable,**
- **Produced ~ 1tcf of natural gas,**
- **Employs about 1800 people,**
- **Operates in at least 3 other countries in Africa**
- **Produces 5% of South Africa's fuel needs.**

# Petroleum Value Chain - PetroSA



**Staff Compliment – Geologists, Geophysicists, Reservoir Engineers, Facilities, Economists**

# Upstream Value Chain - PetroSA





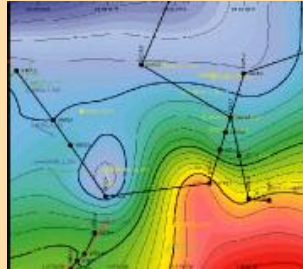


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# WHAT TECHNOLOGY DO WE NEED ?

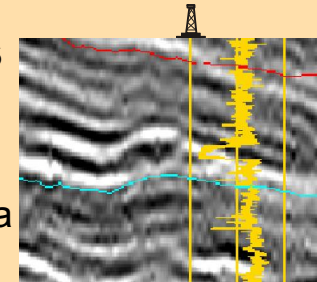
## Geology

Basin Analysis  
Depositional models  
Diagenetic models  
Maps, cross-sections



## Geophysics

Seismic Data  
Borehole logs  
Potential Field Data

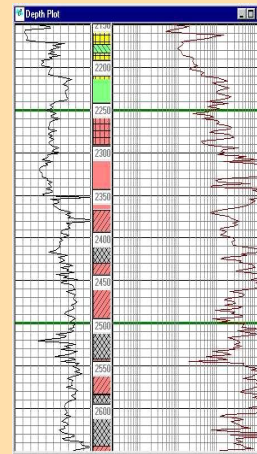


## Production

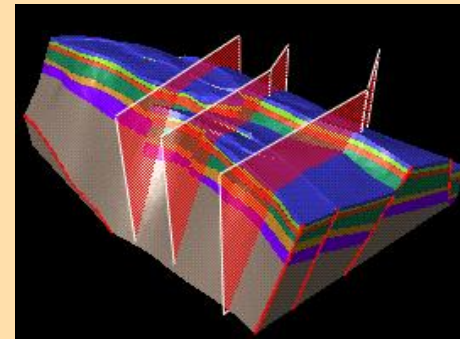


Data acquisition, management  
Well stimulation  
Pipeflow , wellbore simulation  
Nodal analysis  
Facilities

## Drilling



## Reservoir Engineering



Core, fluid, analysis  
Log, decline -curve analysis  
Transient well testing  
Waterflood, EOR technology  
Expert systems, neural networks

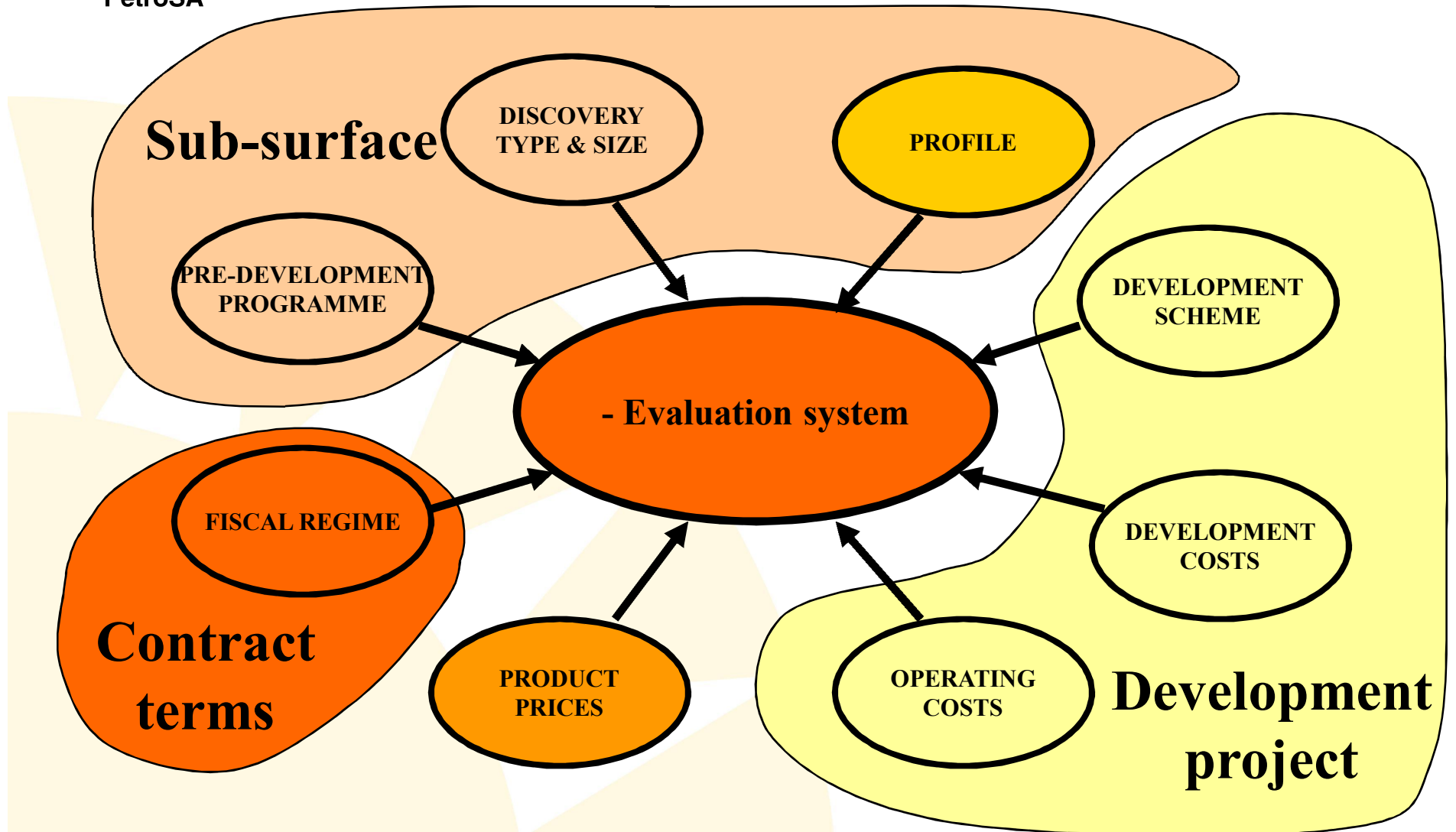
## Economics

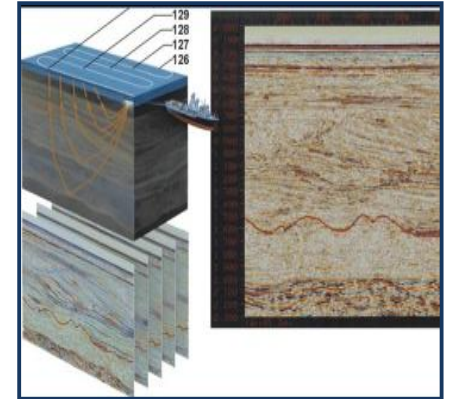
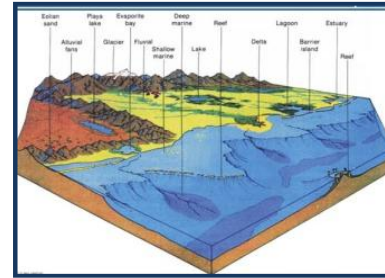
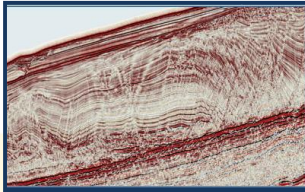
Fiscal regimes  
Commercial models



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# The Upstream Evaluation Process





# Geology is the Science

## Exploration and Production is a Business



# Project Rewards Must Compensate for Project Risk

**Gambling**

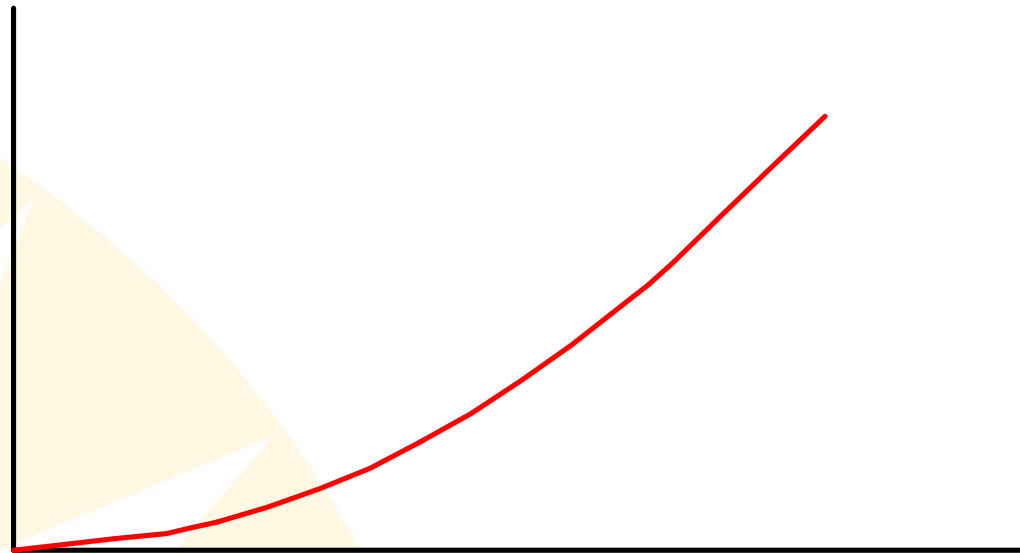
**Government  
Bonds**

**Rates of Return**

**Risk**

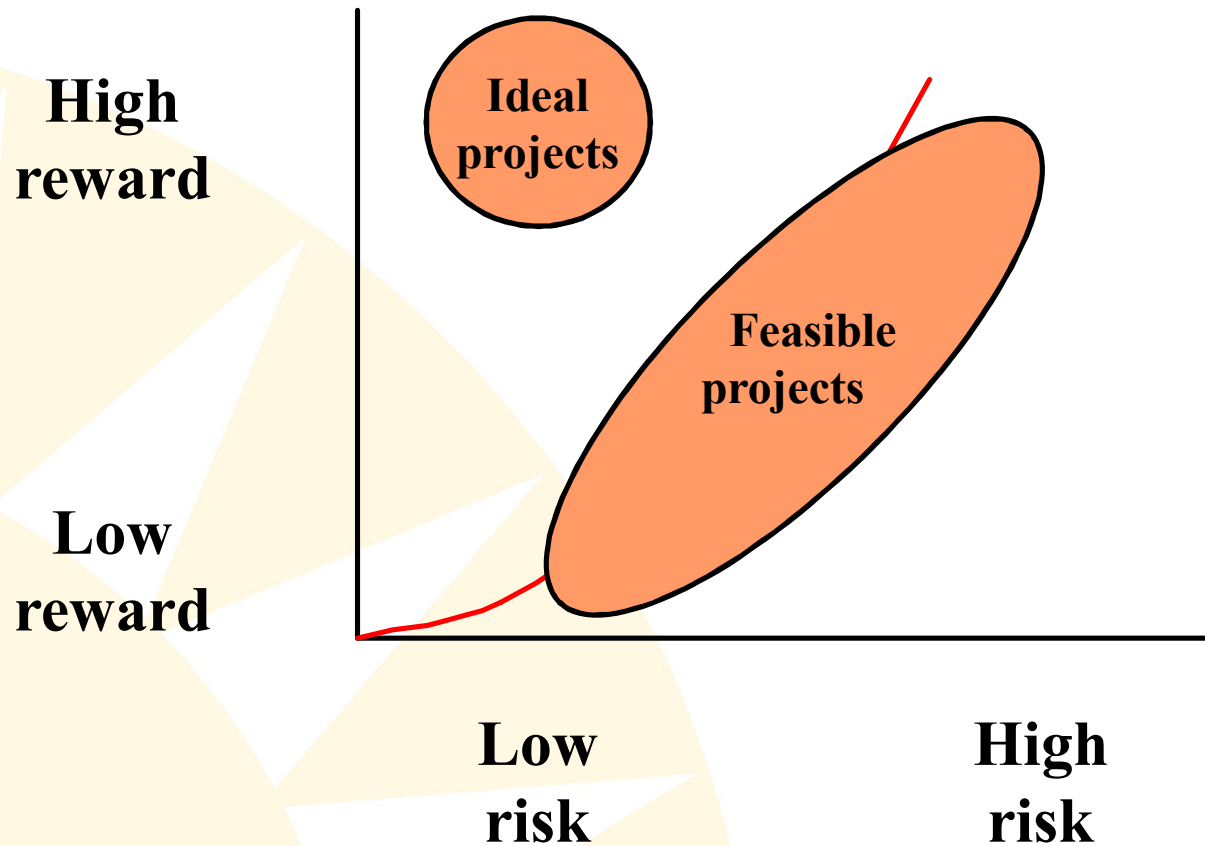
**Producing Field**

**Exploration**

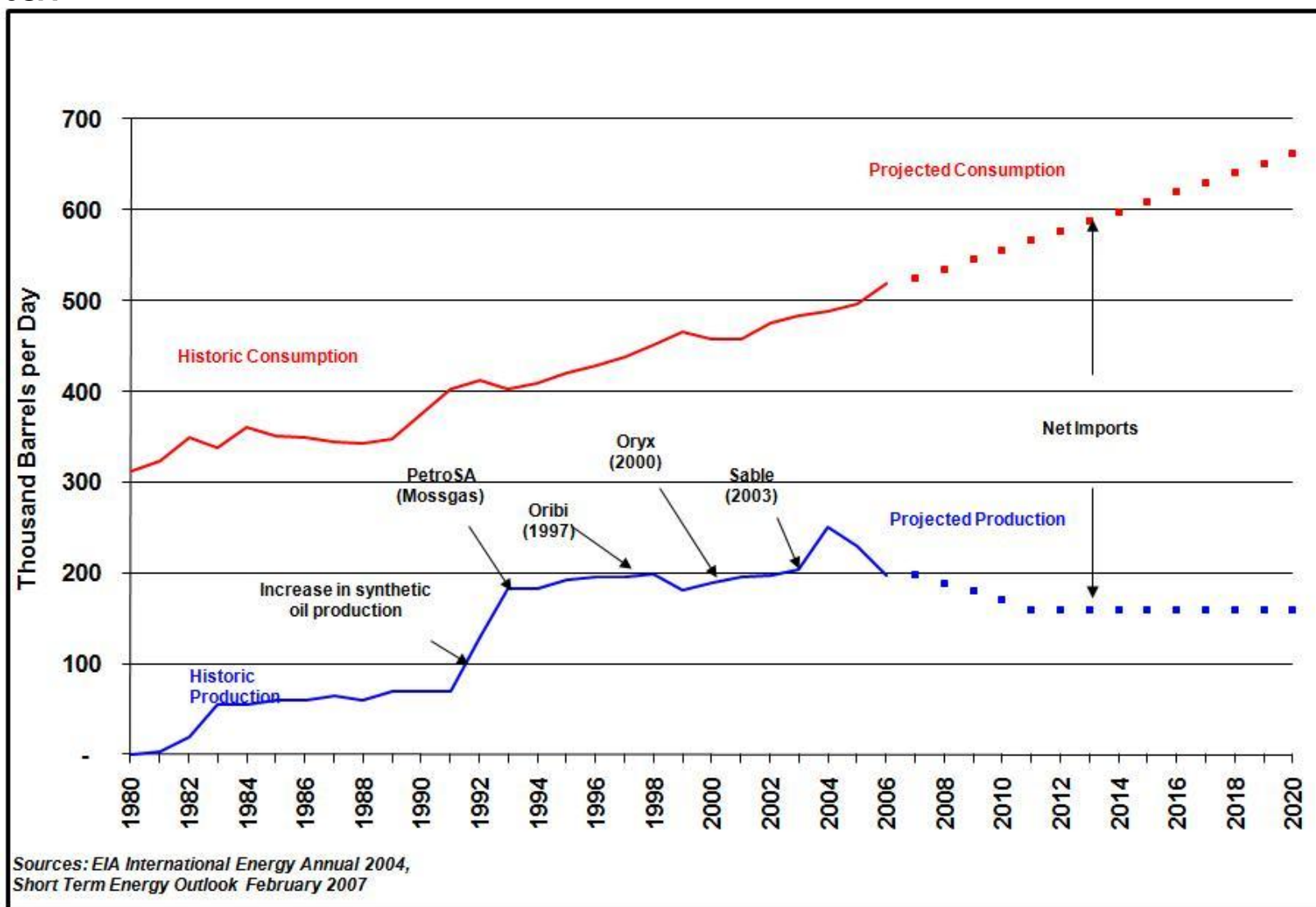




# Project Suitability



# South Africa's Oil Production and Consumption, 1986 - 2006



[illegible]





# Domestic gas produced via the FA platform

- 100 km south of Mossel Bay
- 220 m high
- 105 m water depth
- 9 platform wells, 14 subsea wells
- 7 wells by remote control through EM buoy

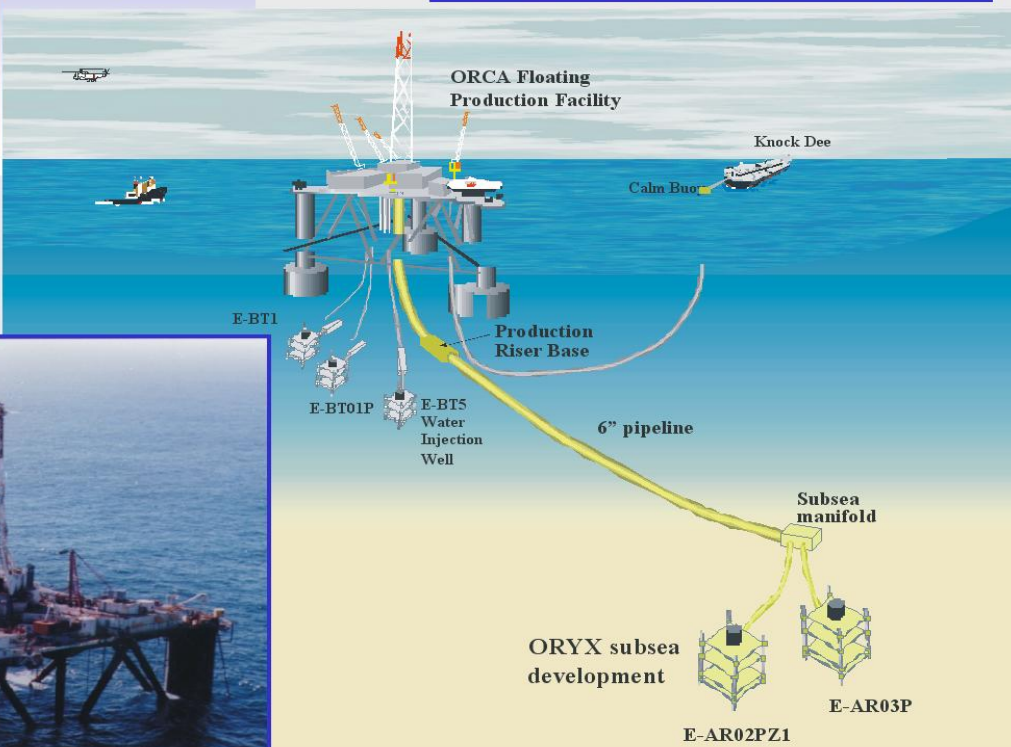
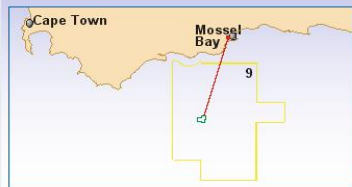






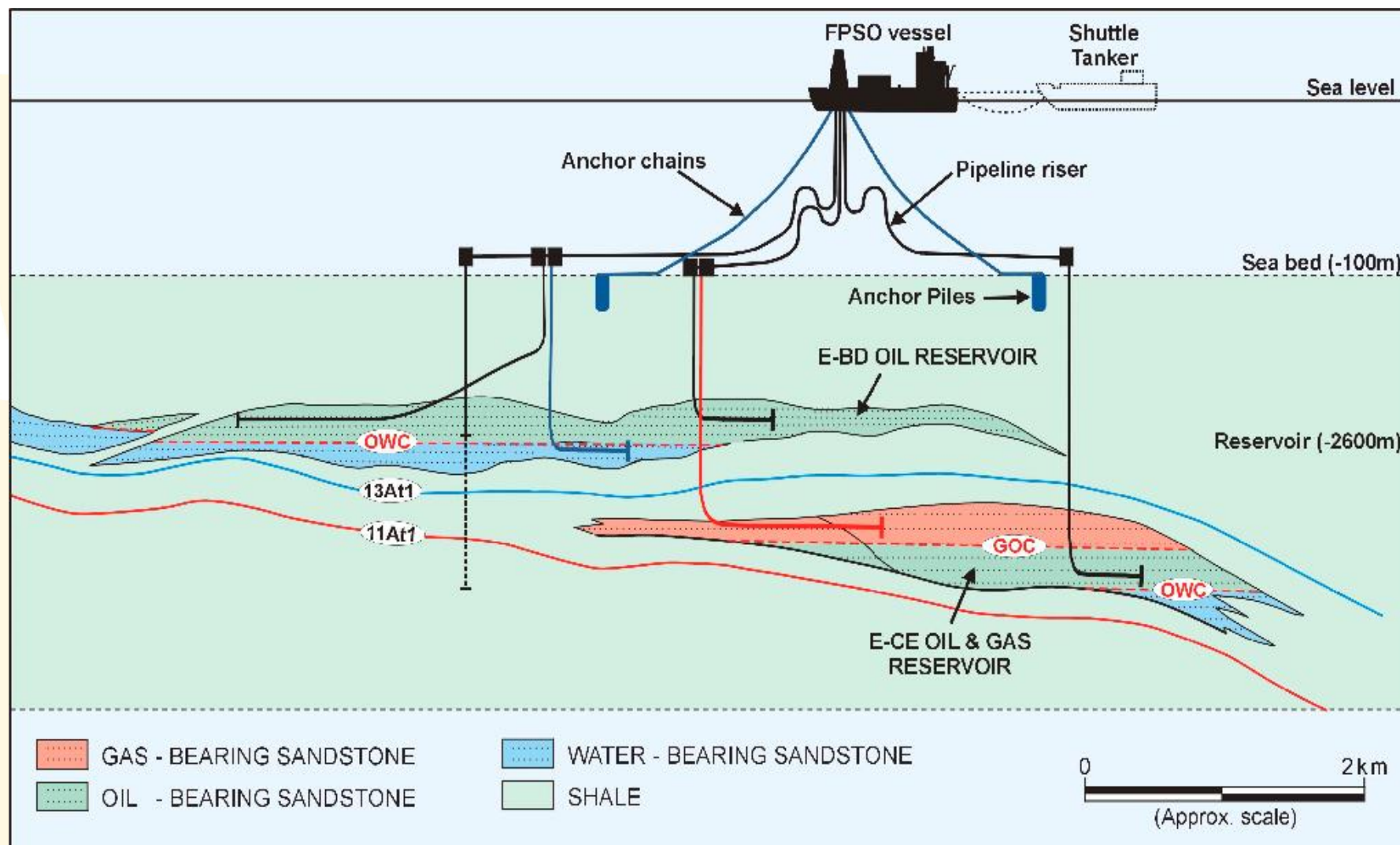
# Oil development and production

# Oribi/Oryx Oil fields





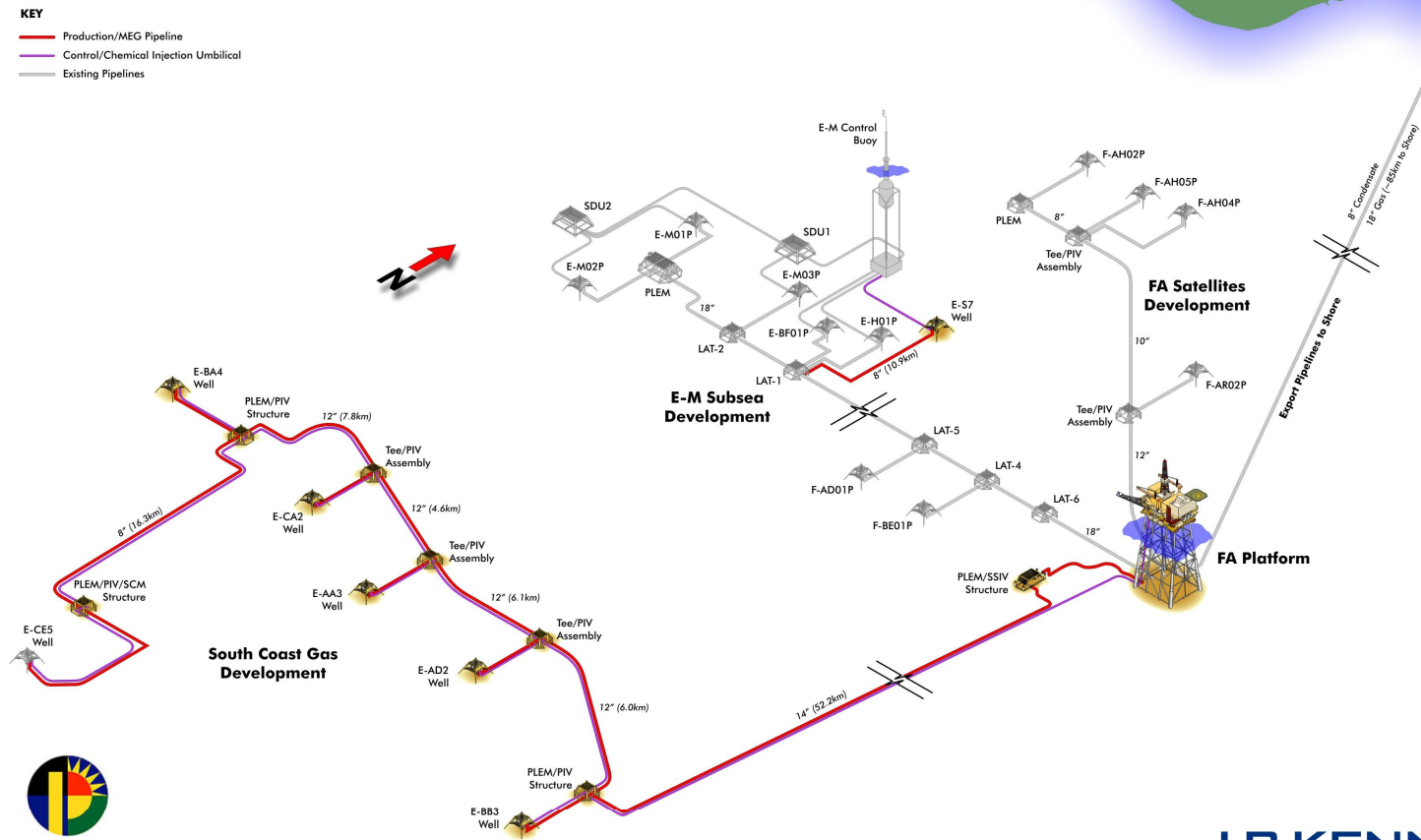
# Sable Oil field (2003-2008), now producing gas to F-A platform





# South Coast Gas fields (2008) pipelined 100km to F-A Platform

## South Coast Gas Development Overall Field Layout



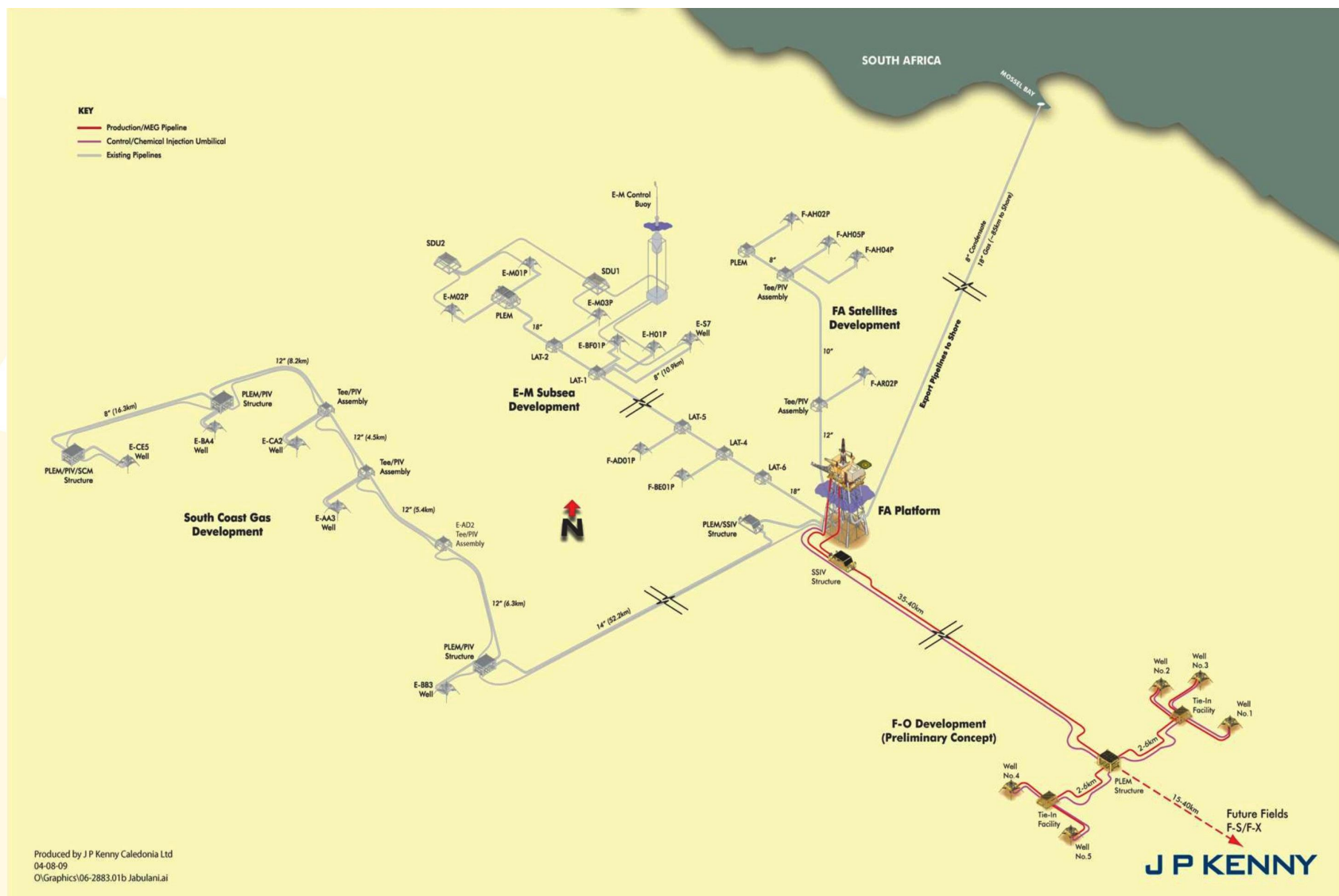
J P KENNY

U:\062374.1\South Coast Field Layout.cdr



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# F-O Gas Field Development

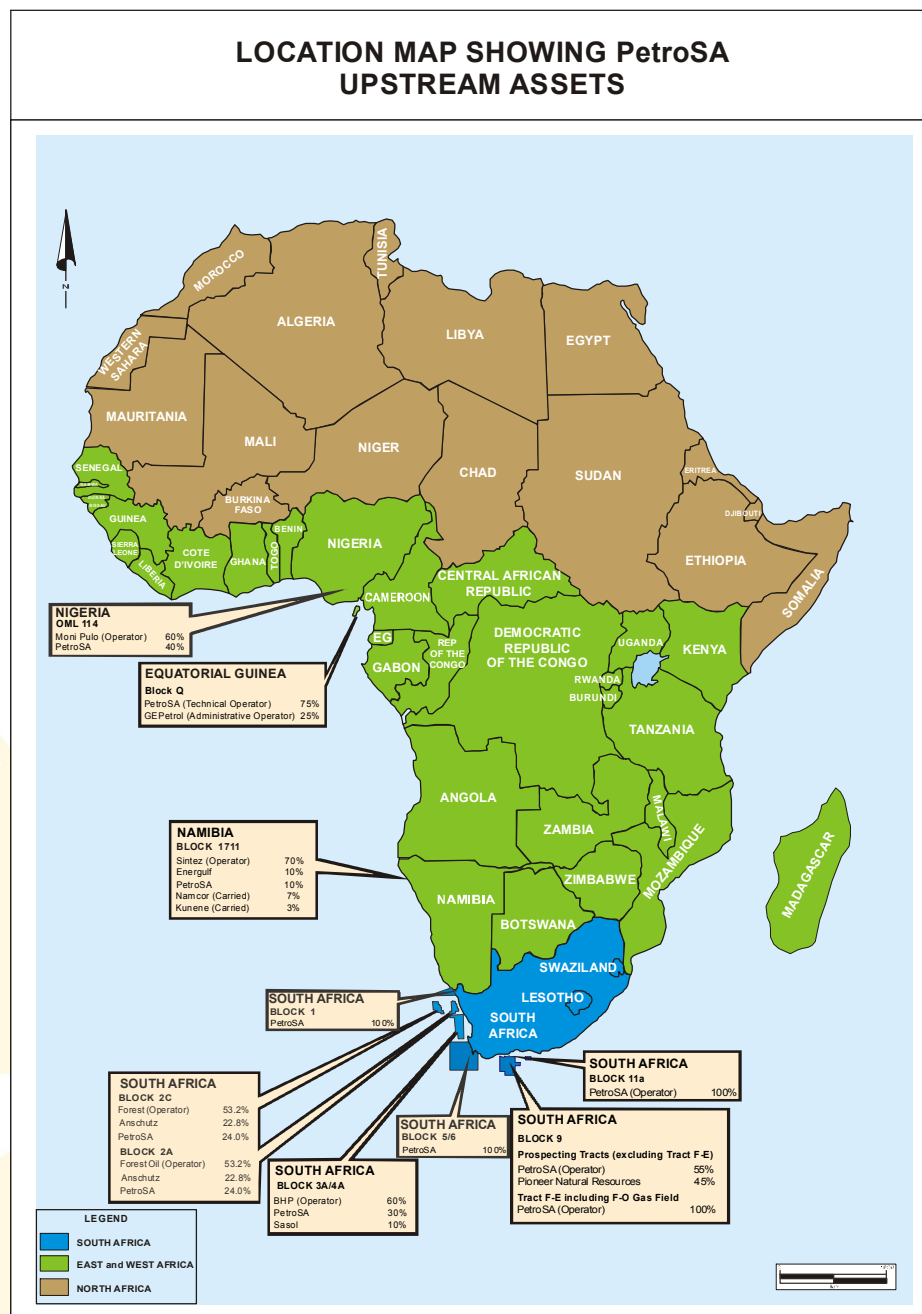






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# PetroSA's Current Exploration and Production Projects in Africa





# Typical Upstream Project Services

## Opportunities for Local Contractors



- FPSO Upgrade
- Drilling Rig repairs
- Drilling – multiple contracts for materials and services
- Fabrication of subsea structures
- Line Pipe Coating and Logistics
- Platform modifications – multiple contracts for materials and services

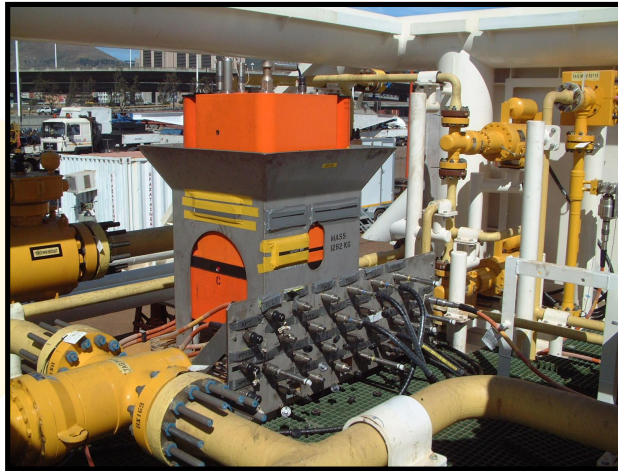
e.g Sable FPSO Upgrade - \$60 million local content and BEE

# South Coast Gas Manifolds - I



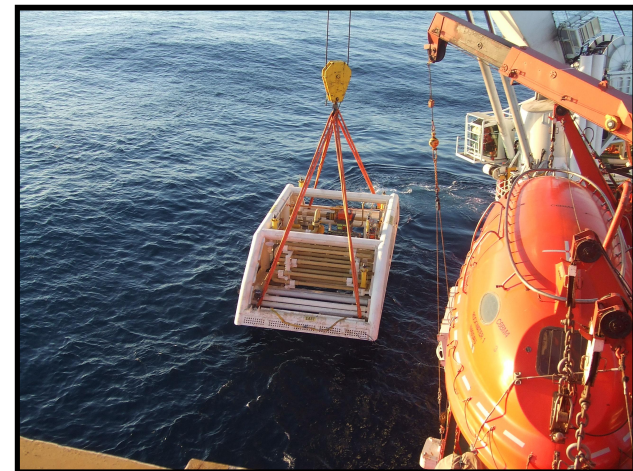


## South Coast Gas Manifolds - II

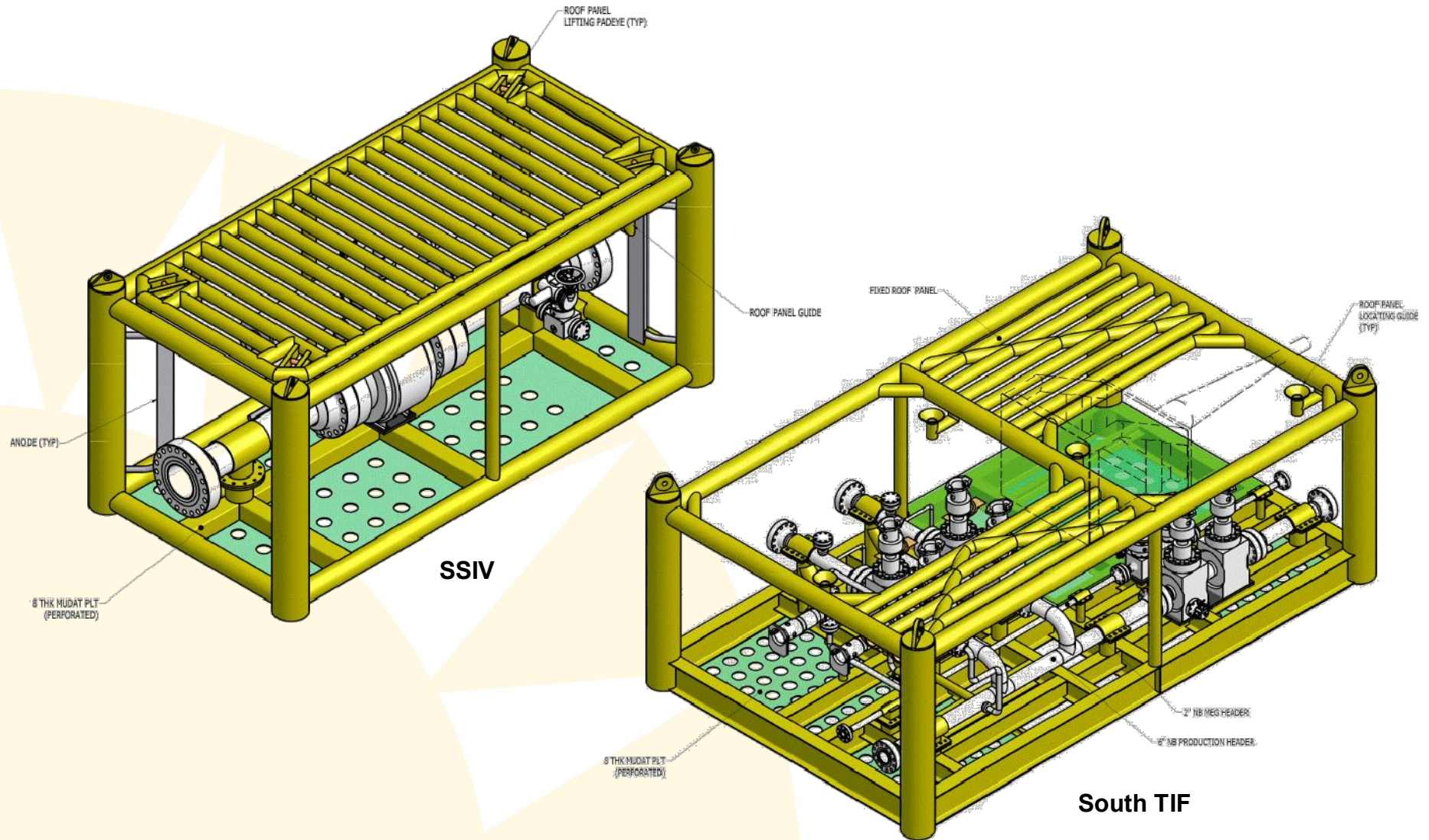




## South Coast Gas Manifolds - III



# Current F-O Development Manifolds - I SSIV Structure And South Tie-In Facility





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# Our focus is on assisting Government meet security of supply, as well as facilitating skills development in the energy sector

