



RPS Energy

RPS Energy

working with

The Ministry of Mines, Industry and Energy,

Equatorial Guinea

Assisting Natural Resource Development



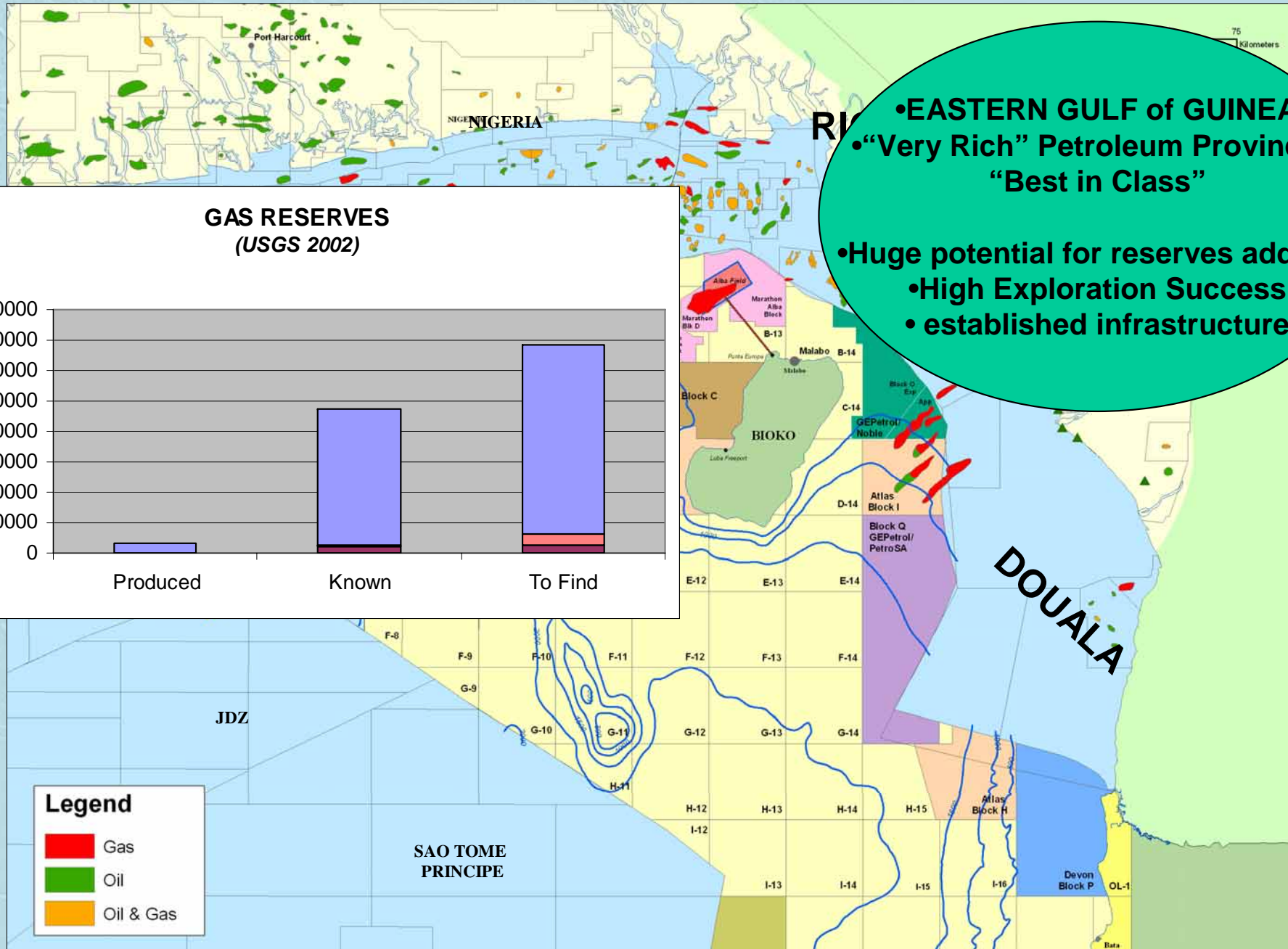
Ministry of Mines,  
Industry and Energy

RPS Energy

# ***Role of RPS (and legacy companies).....***

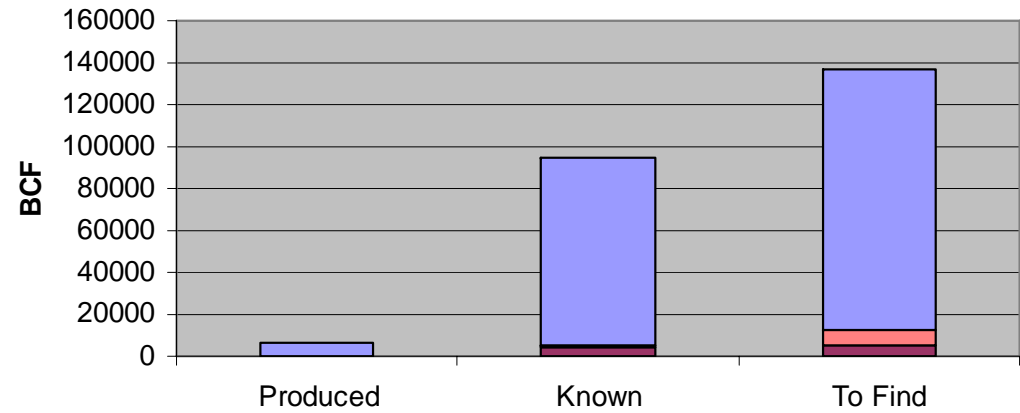
- **Technical advisors to MMIE since 1994**
  - **Monitoring of activities**
  - **Database management**
  - **Resources quantification**
  - **Commercial analysis**
  - **Strategy advice**

# Regional Hydrocarbons & Potential



**• EASTERN GULF of GUINEA**  
**• “Very Rich” Petroleum Province –**  
**“Best in Class”**  
**• Huge potential for reserves addition**  
**• High Exploration Success**  
**• established infrastructure**

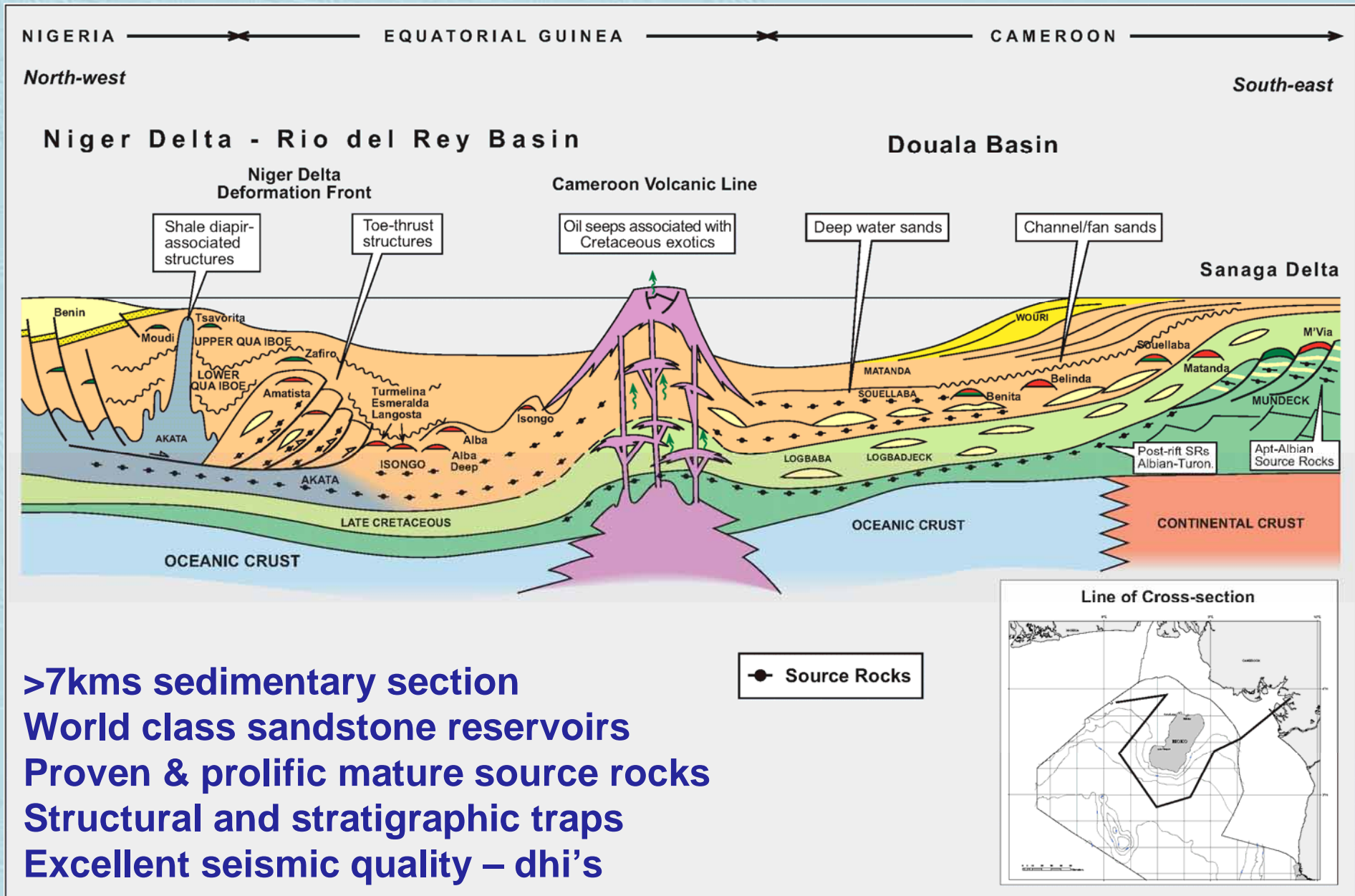
**GAS RESERVES**  
(USGS 2002)



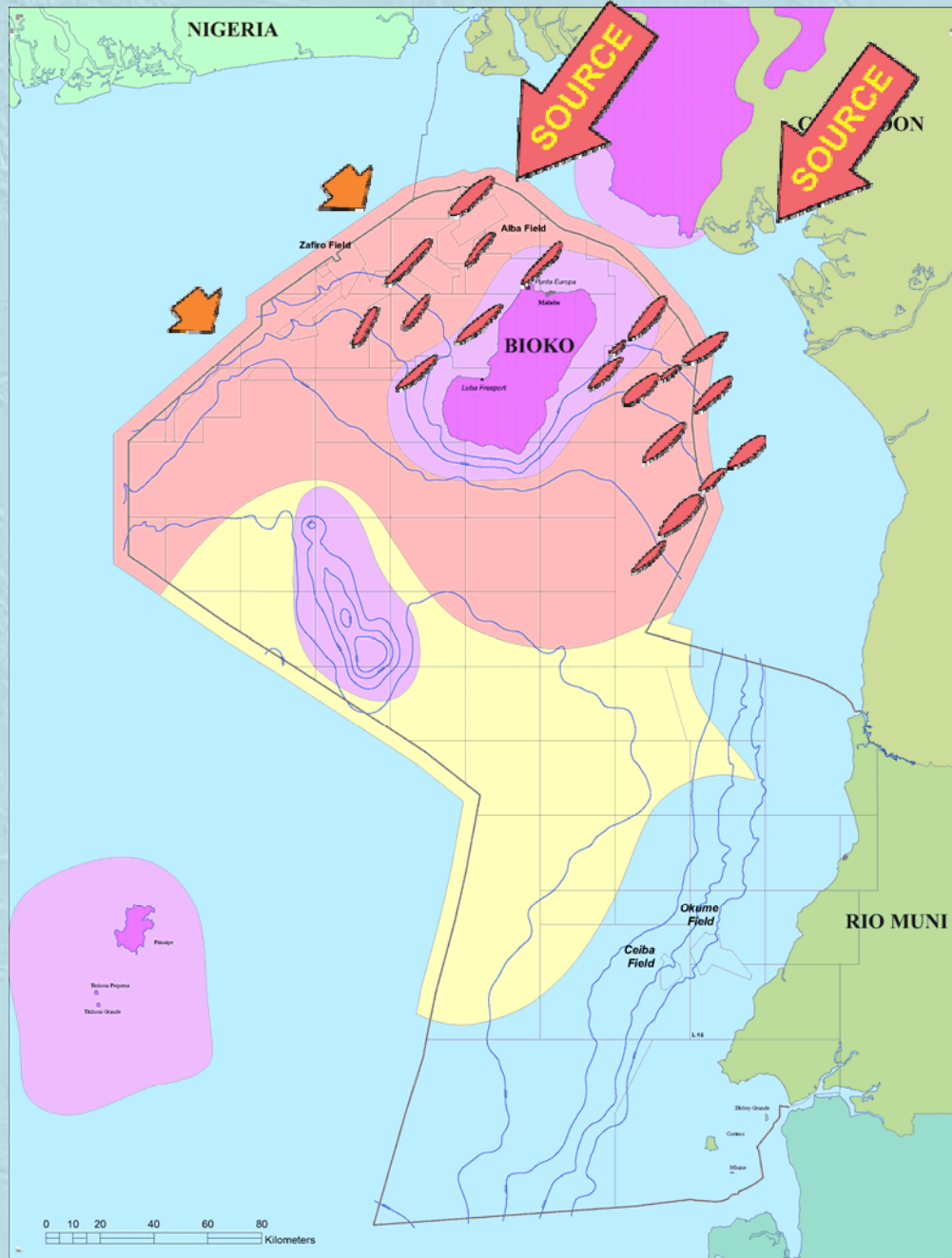
160000  
140000  
120000  
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60000  
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Produced Known To Find

# Northern Equatorial Guinea Petroleum Systems



# Plio-Miocene Gas & Condensate Play Fairway



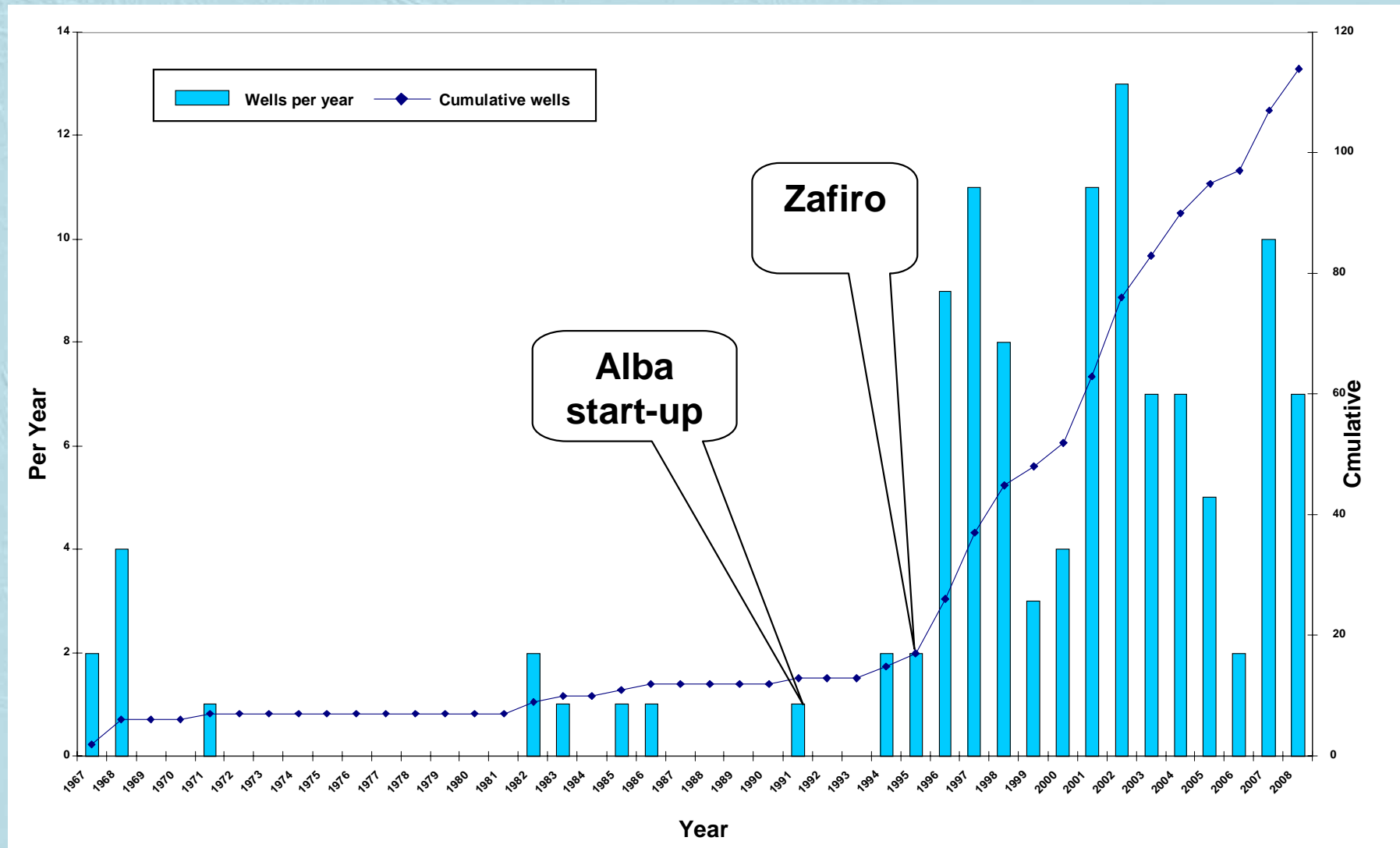
**Oligo-Miocene source mature towards and under Niger Delta thrust front**

**Miocene fan and channel sands provide excellent reservoirs, derived from north-east**

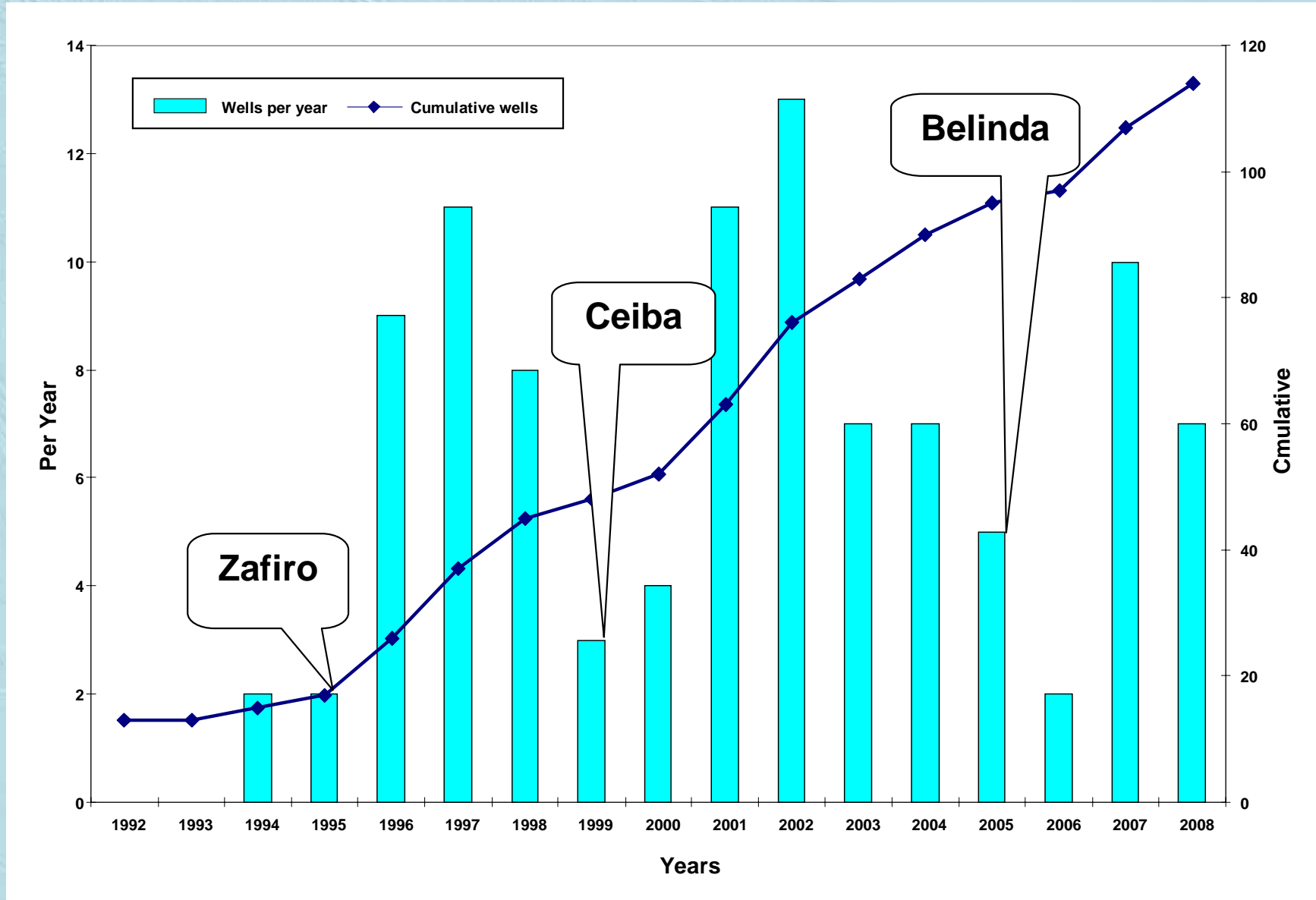
**Pliocene canyon systems sourced from north and north-west**

**Around 3.5 billion boe discovered**

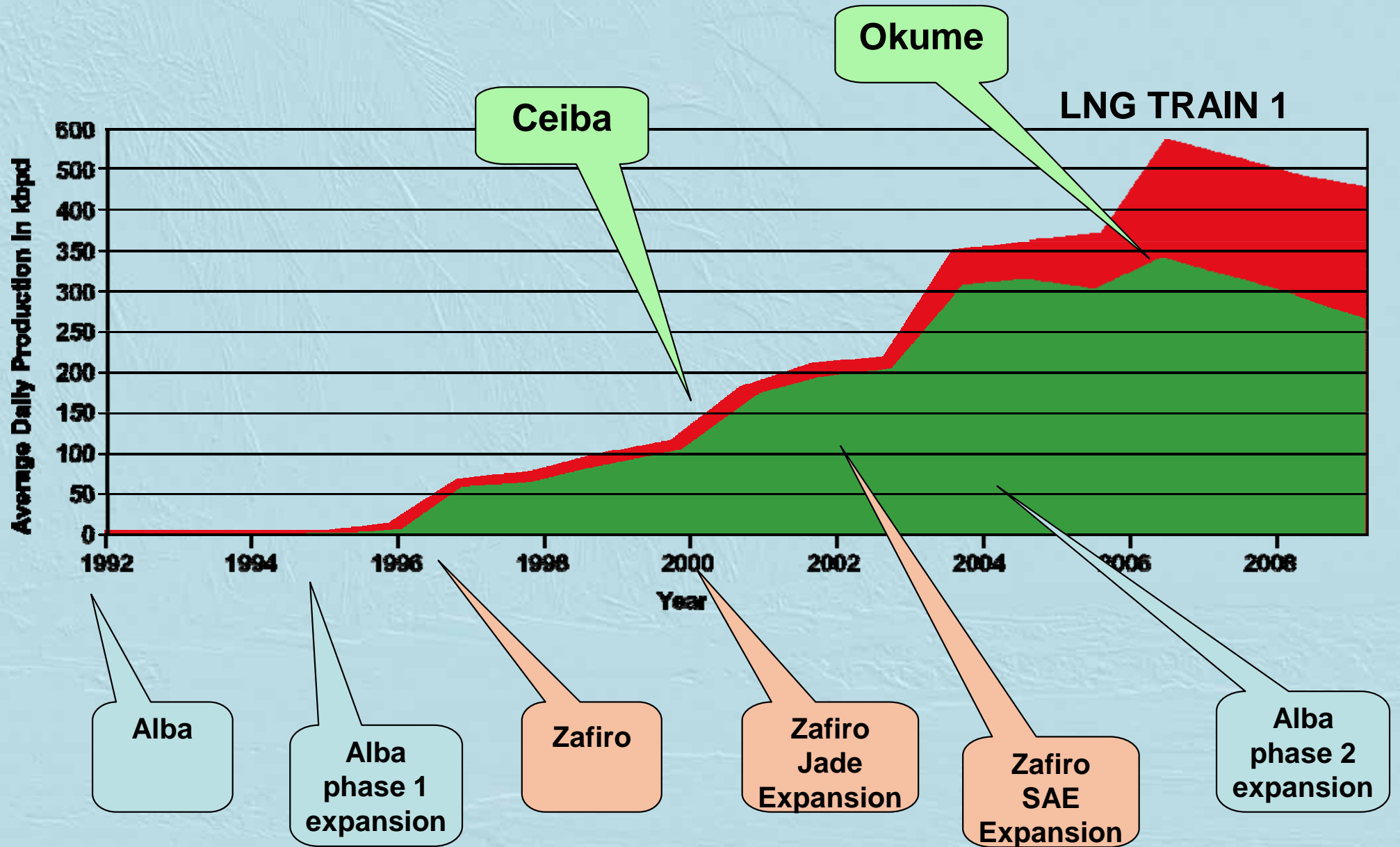
# Exploration Drilling History



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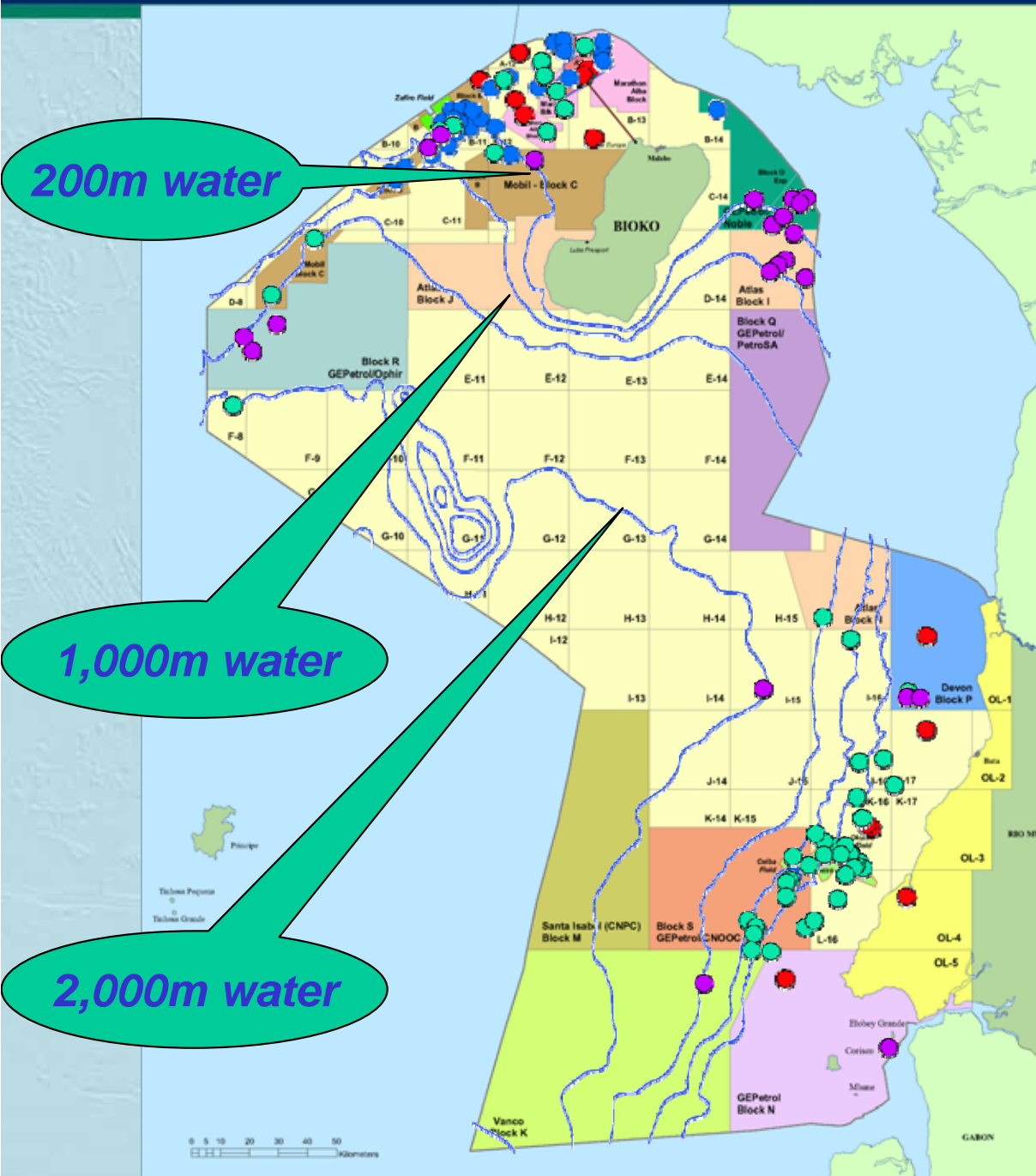


# Oil & Gas Production History





# Well Drilled



## **TO 1992.....**

Drilling from 1967 within the 200m isobath found the Alba condensate discovery which was deemed non-commercial. 13 wells in Niger Delta, 6 wells in Rio Muni

## **1992-99.....**

Exploration on Zafiro trend to the 1,000m isobath (33 wells). Ceiba Field discovered 1999.

## **1999-2004.....**

Exploration westwards along the Niger Delta Deformation Front (3 wells) beyond 2,000m isobath and around Alba (10 wells) but mostly along and inboard of the Ceiba Trend (31 wells)

## **2005-2009.....**

Rio Muni outstep drilling (5 wells)  
Distal Niger Delta Gas fairway (6 wells)  
and opening of Douala Basin (11 wells)



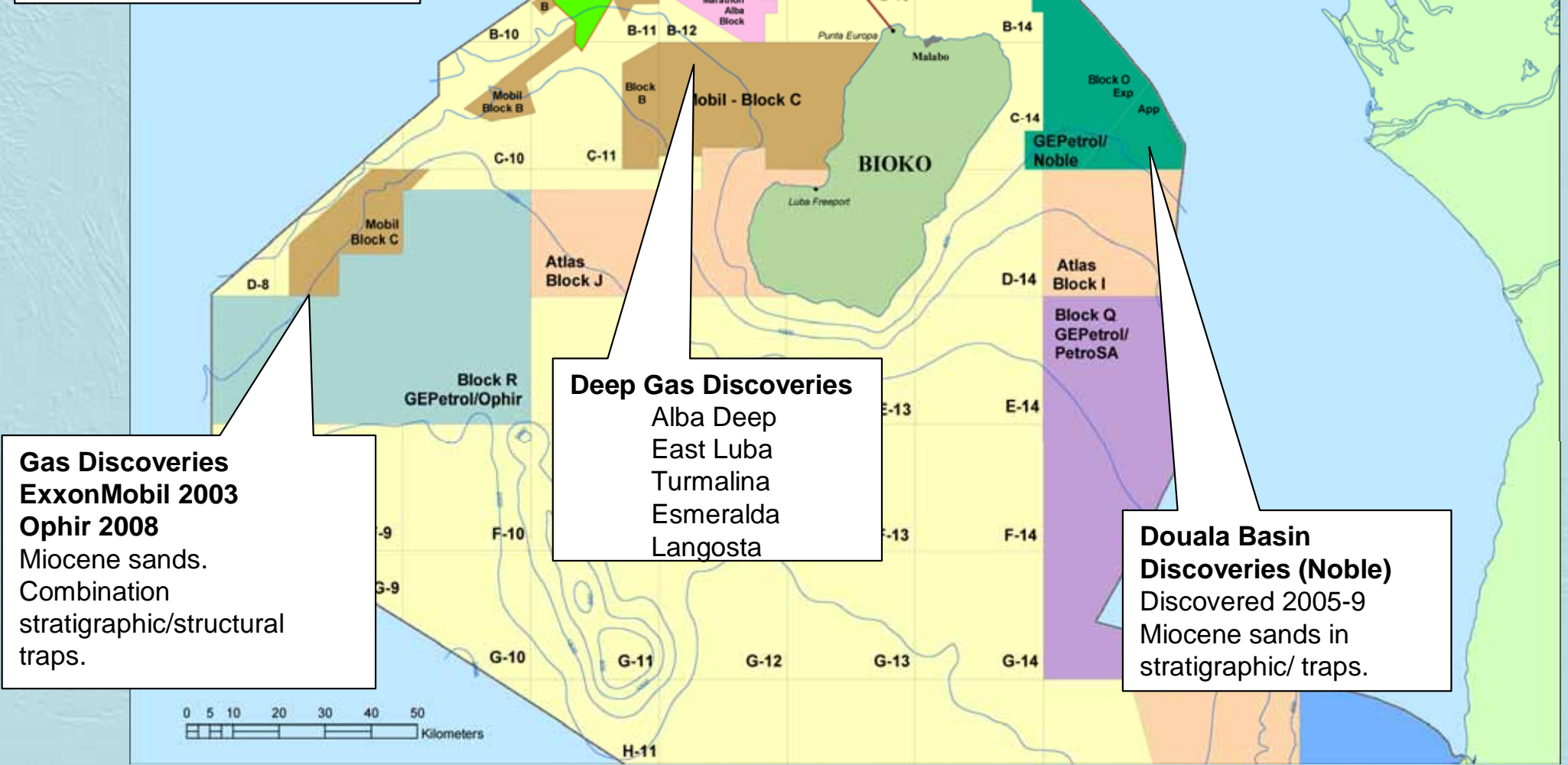
# Upstream Gas Activity in Northern Equatorial Guinea

## Zafiro Field (ExxonMobil)

Discovered 1995, developed Pliocene sands.  
Combination stratigraphic/structural trap associated gas & gas caps

## Alba Field (Marathon)

Discovered 1983, developed Miocene (Isongo) sands in structural closure.



## Gas Discoveries

**ExxonMobil 2003**

**Ophir 2008**

Miocene sands.

Combination stratigraphic/structural traps.

## Deep Gas Discoveries

Alba Deep  
East Luba  
Turmalina  
Esmeralda  
Langosta

## Doula Basin Discoveries (Noble)

Discovered 2005-9

Miocene sands in stratigraphic/ traps.



# Active Regional Gas Monetisation Projects

## Main Flare Centers:

- Nigeria 700 Bcf/y
- Cameroon 45 Bcf/y
- Equatorial Guinea 70 Bcf/y

**EGLNG**  
1 train operational  
2 trains considered

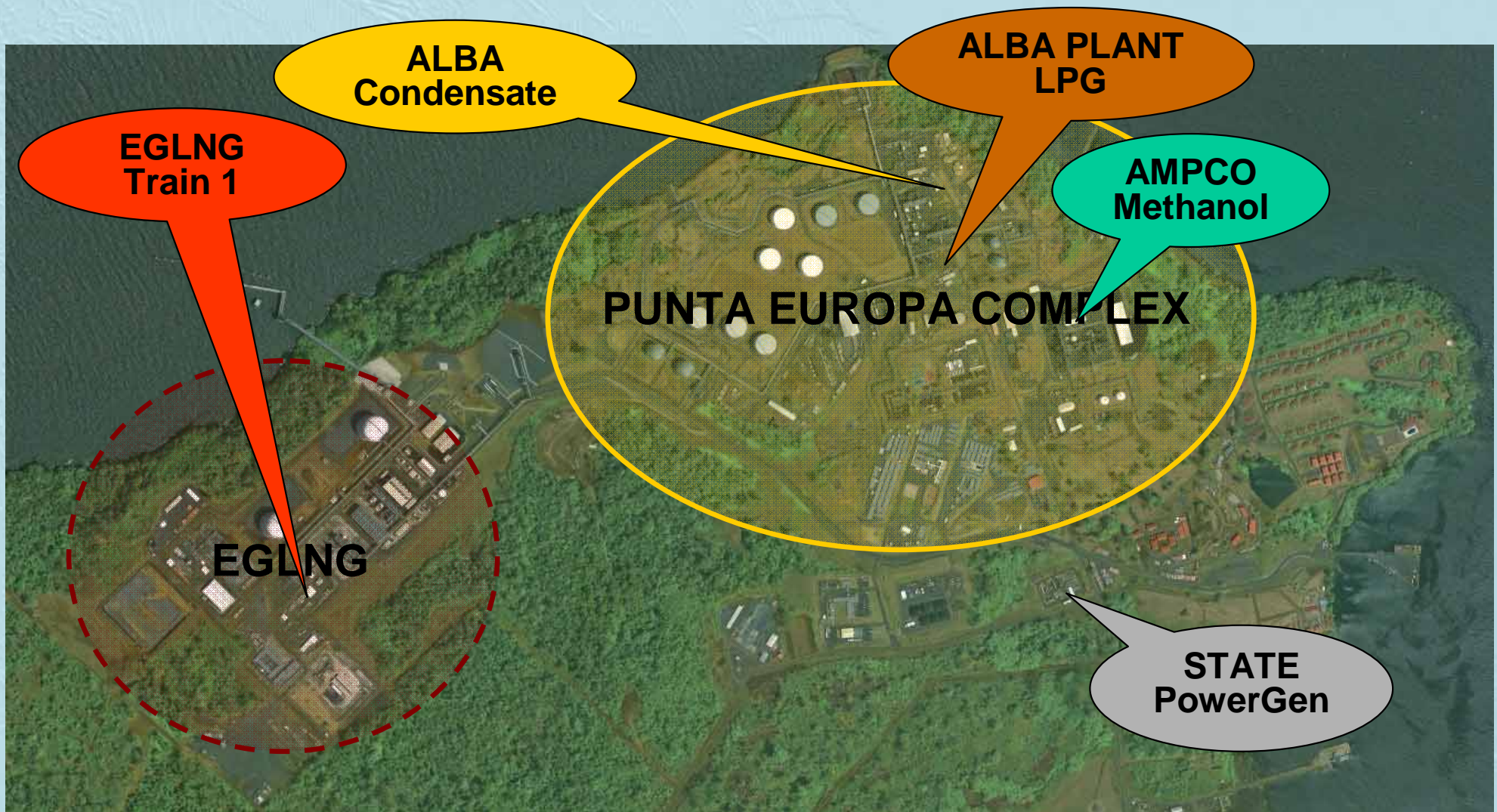
**Nigeria LNG**  
4 trains operational  
6 trains committed  
8 trains considered

**Zafiro Flare Gas**  
Capture project –  
Afgas/Sonaf JV  
for Sonagas

**Punta Europa**  
Methanol  
Propane,  
Butane  
Power

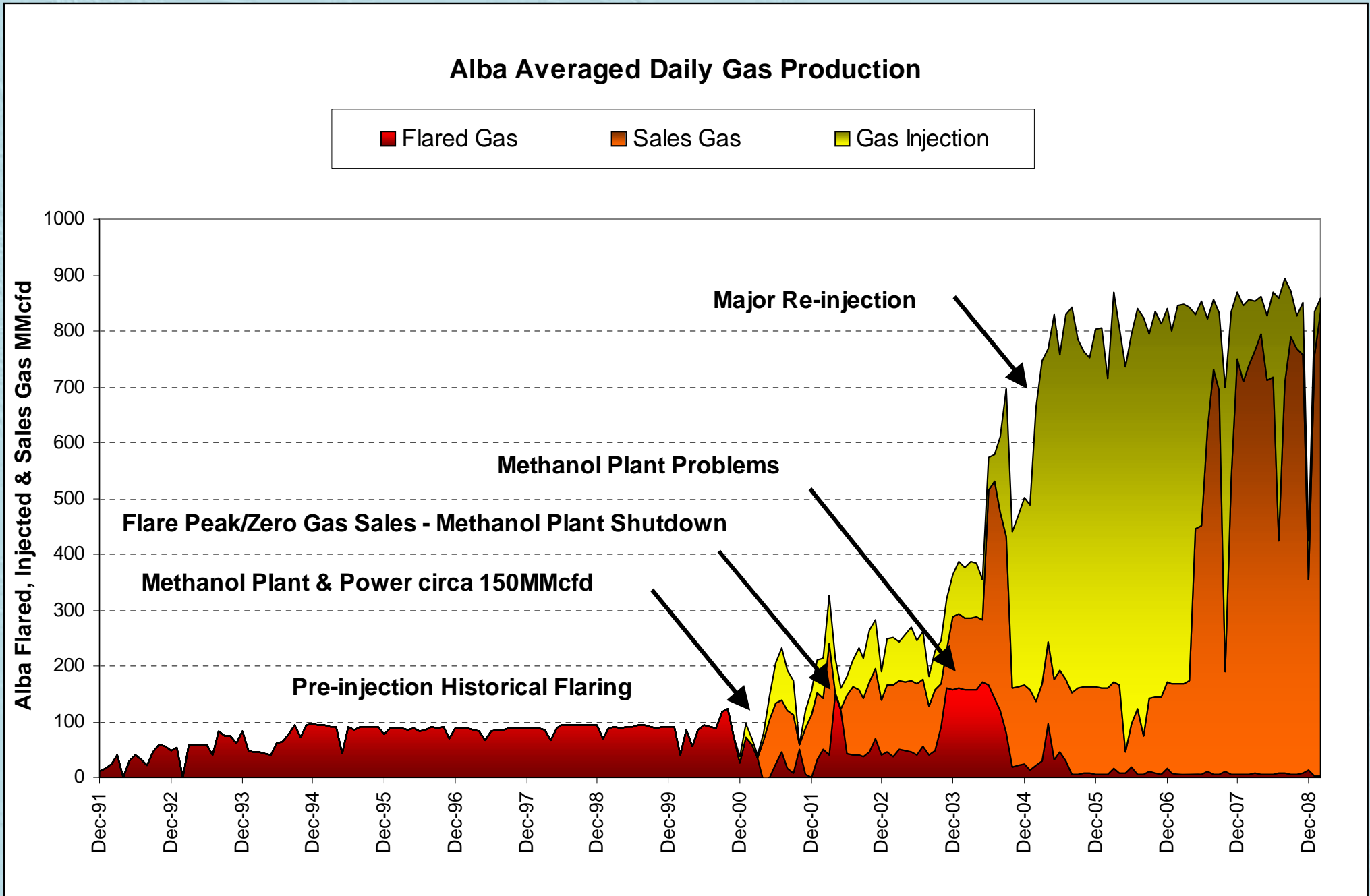


# Punta Europa and EGLNG Today

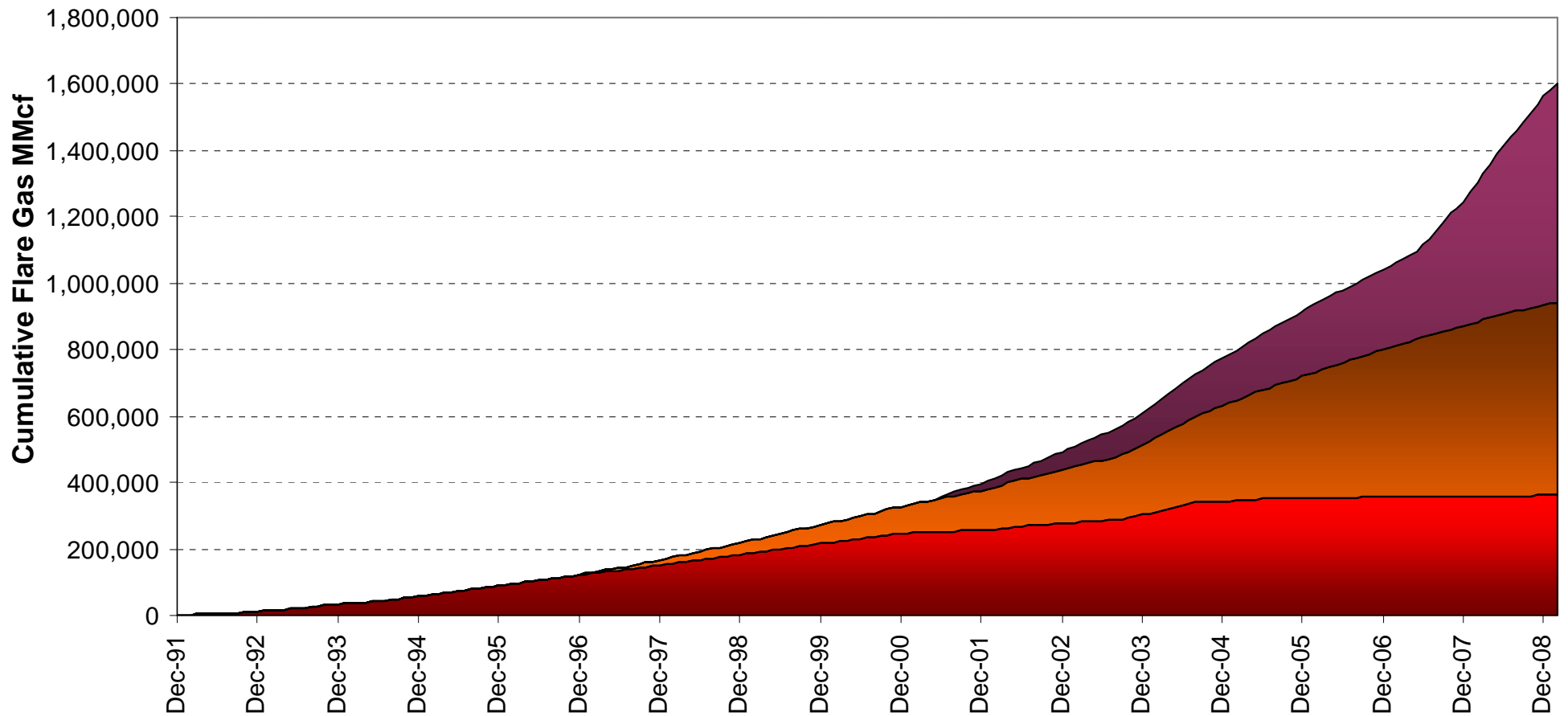


- large potential for expansion
- good deepwater loading facilities

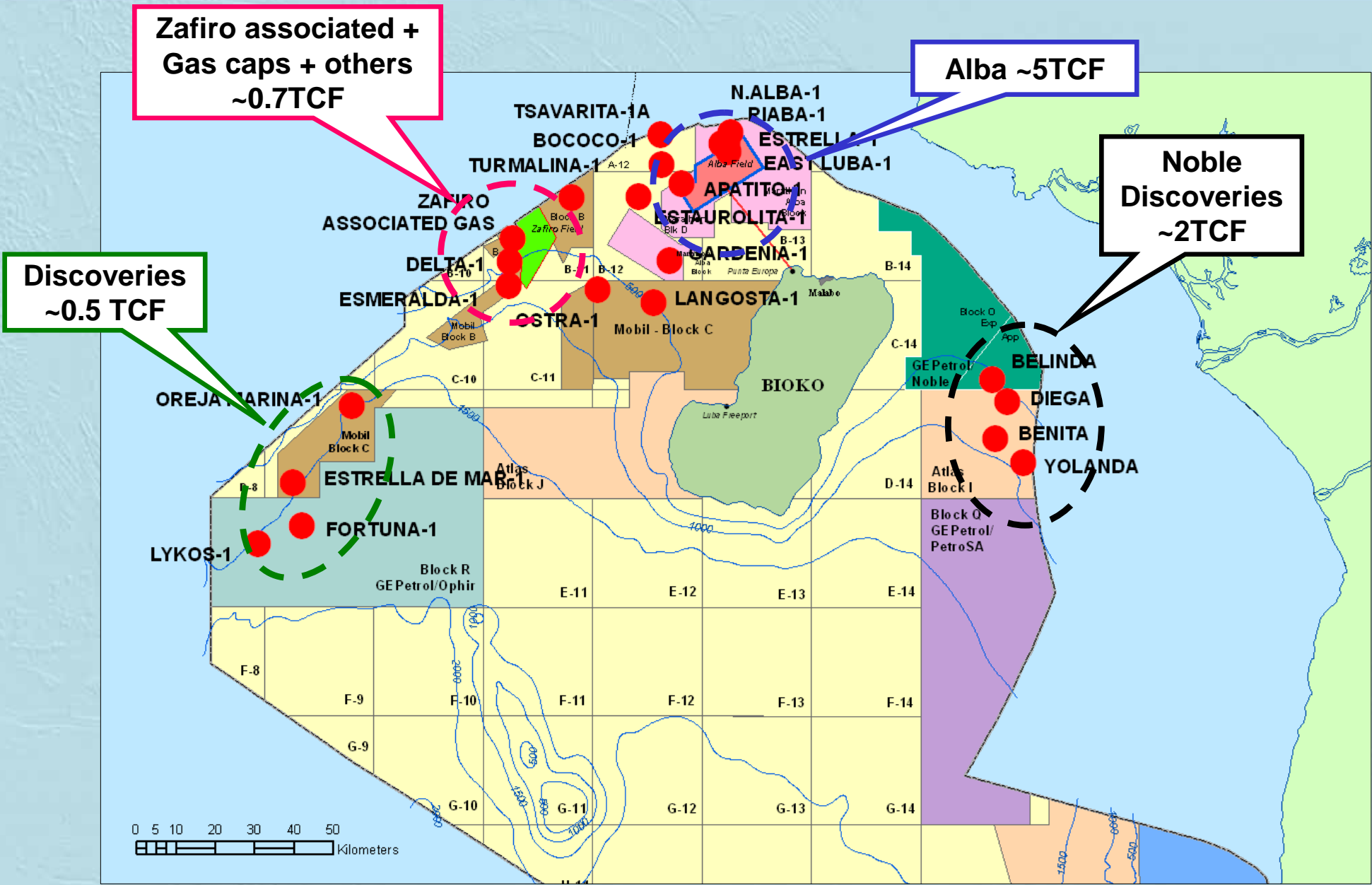
# Alba Historical Gas Production Profile



# Alba & Zafiro Fields Cumulative Sales & Flare Gas MMcf



# Discovered Gas Volumes



# Remaining Reserves and Contingent Resources

*as at Sept 2008*

- Compression on Alba and gas gathering on Zafiro are taken as reasonably certain
- Blocks B & D discoveries could be relatively easily developed through Zafiro and Alba respectively. The large P10/ 3C resources in block B implies more appraisal is needed
- Blocks I&O will need new stand-alone developments

field	P90/1P	P50/ 2P	P10/ 3P	Mean	bcf
Alba	4049	4162	4275	4162	
Zafiro	180	202	250	214	
	4259	4376	4494	4376	

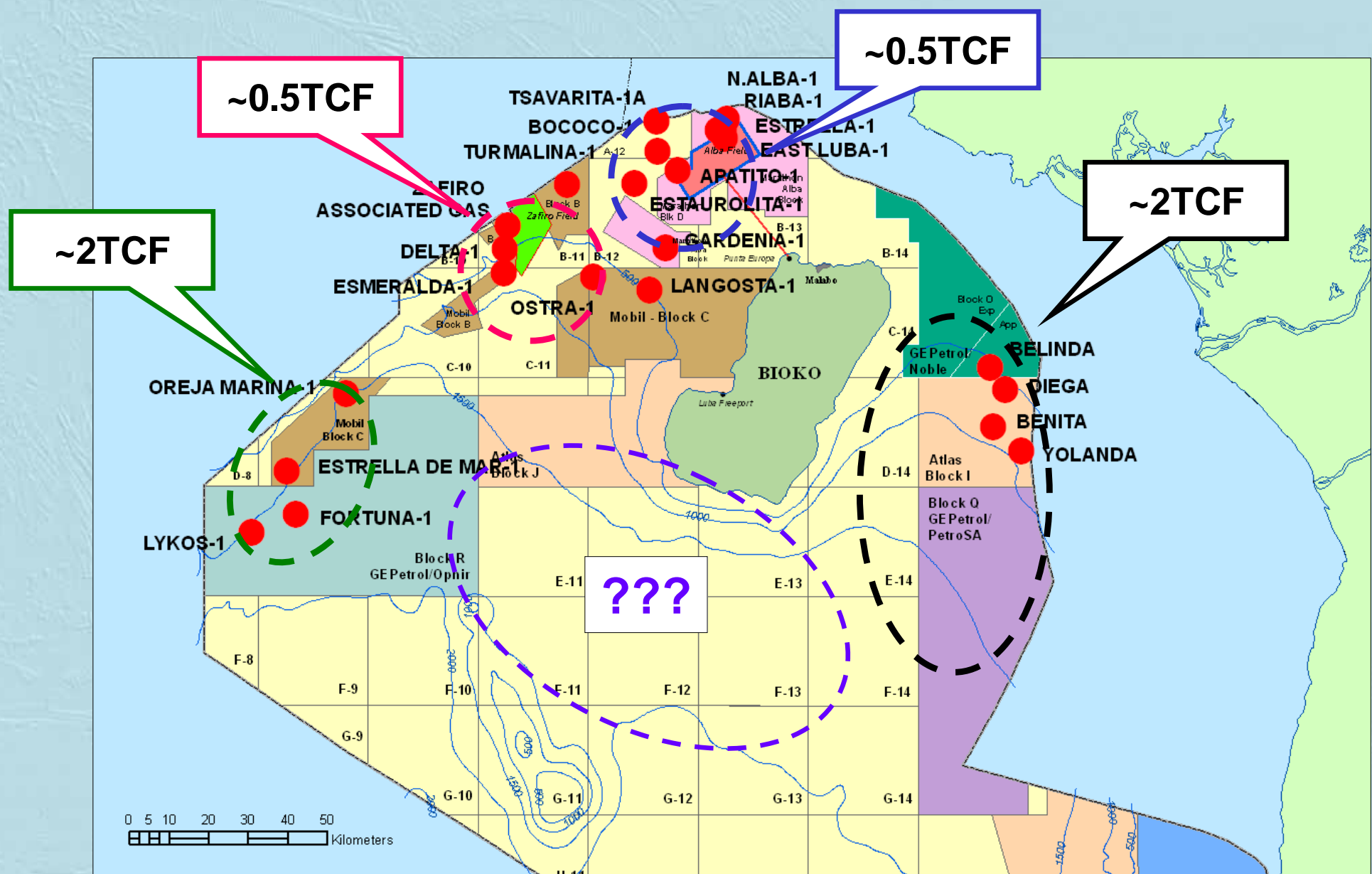
**RESERVES 4376 BCF**

block	P90/1C	P50/ 2C	P10/ 3C	Mean	bcf risked
Alba	169	294	513	323	
C	0	84	225	91	
D	111	494	1250	624	
I	729	996	1234	983	
O	668	877	1122	872	
B	291	1653	5691	2599	
	3021	4630	8619	5460	

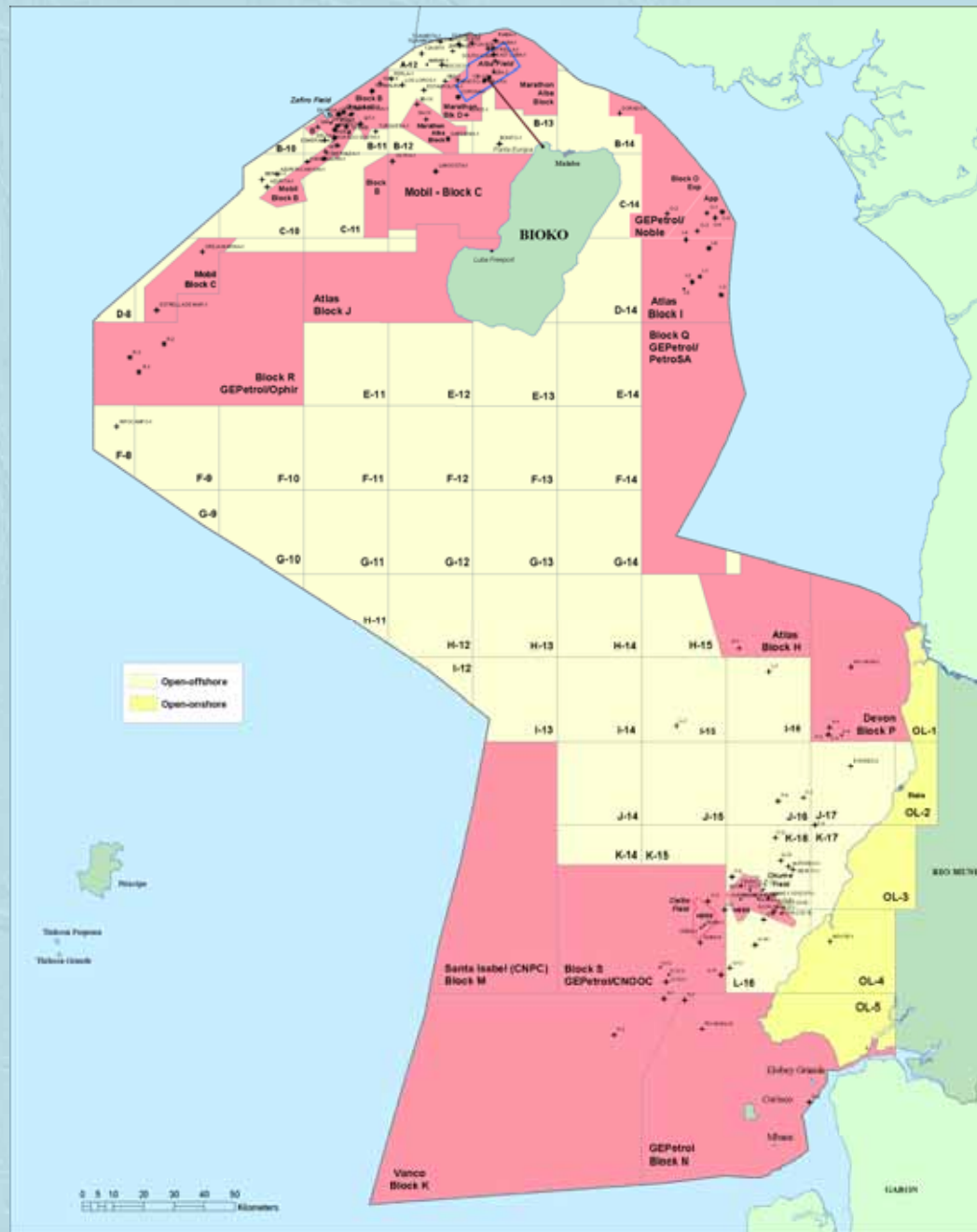
**CONTINGENT RESOURCES 5460 BCF**



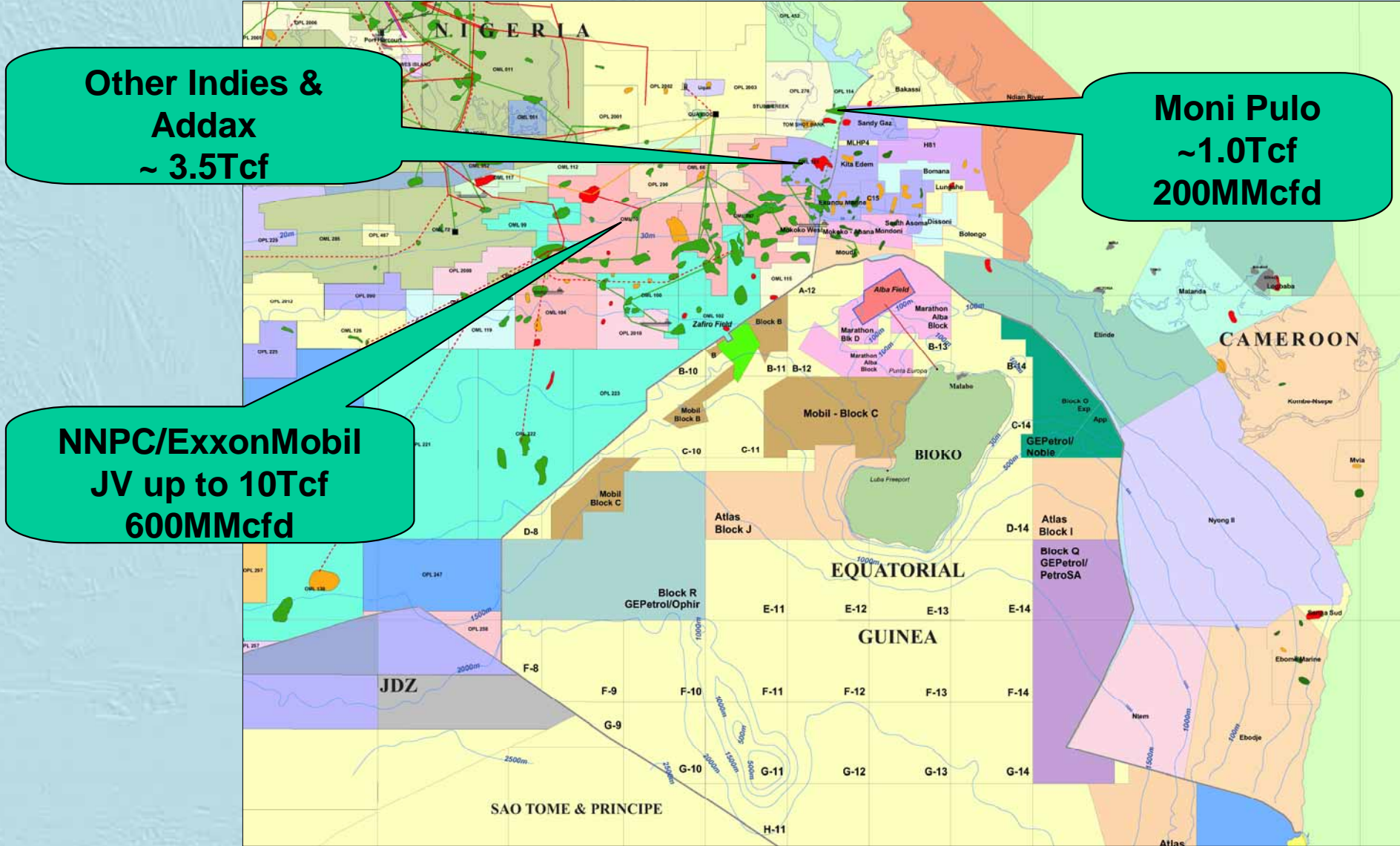
# Prospective Gas Volumes



# Equatorial Guinea – Licensed Acreage



# Gas Supply Options - *Nigeria imports*



**easily enough gas for Train2..... & for Train 3**

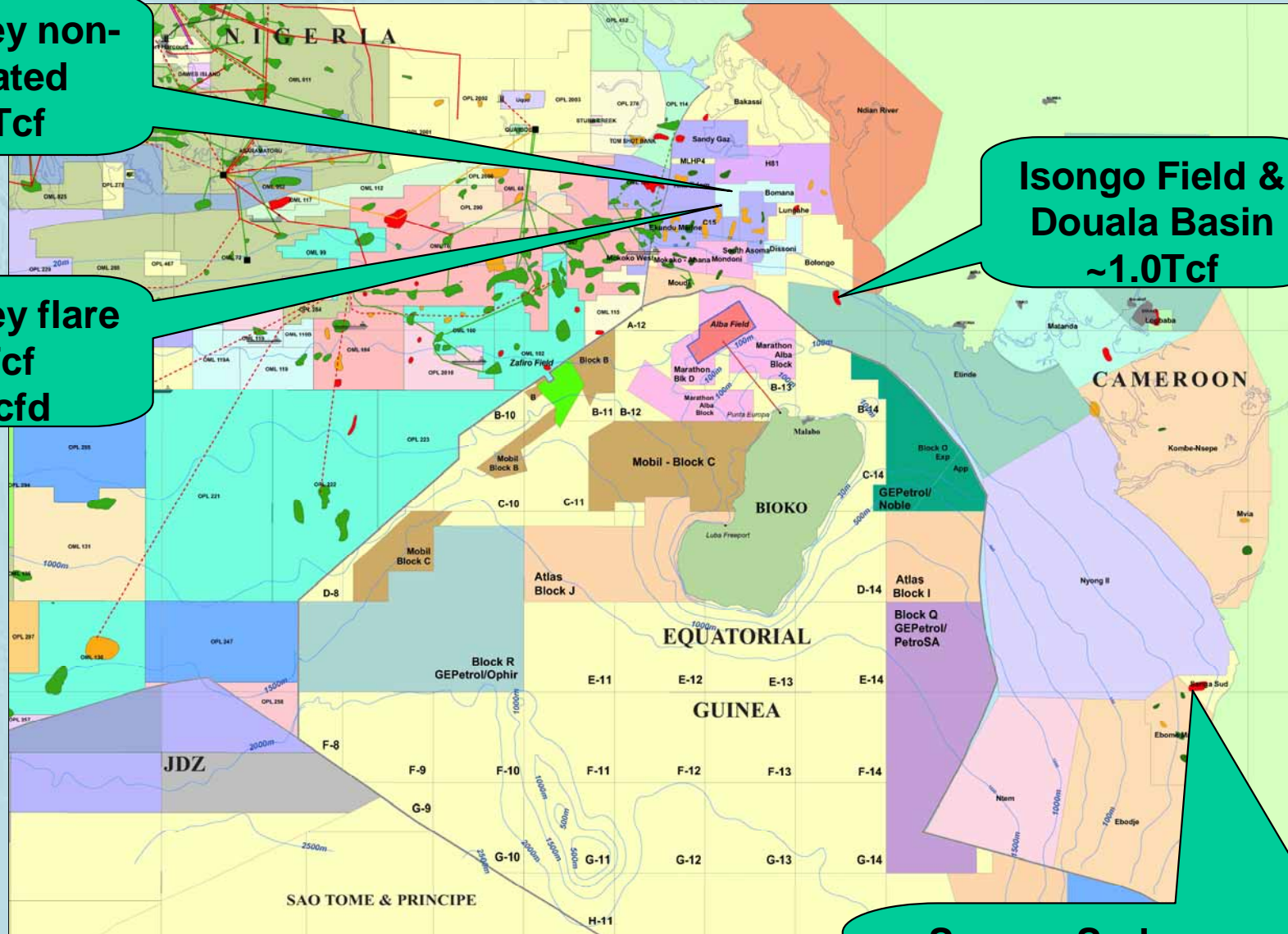
# Gas Supply Options - Cameroon imports

Rio del Rey non-associated  
~1.7Tcf

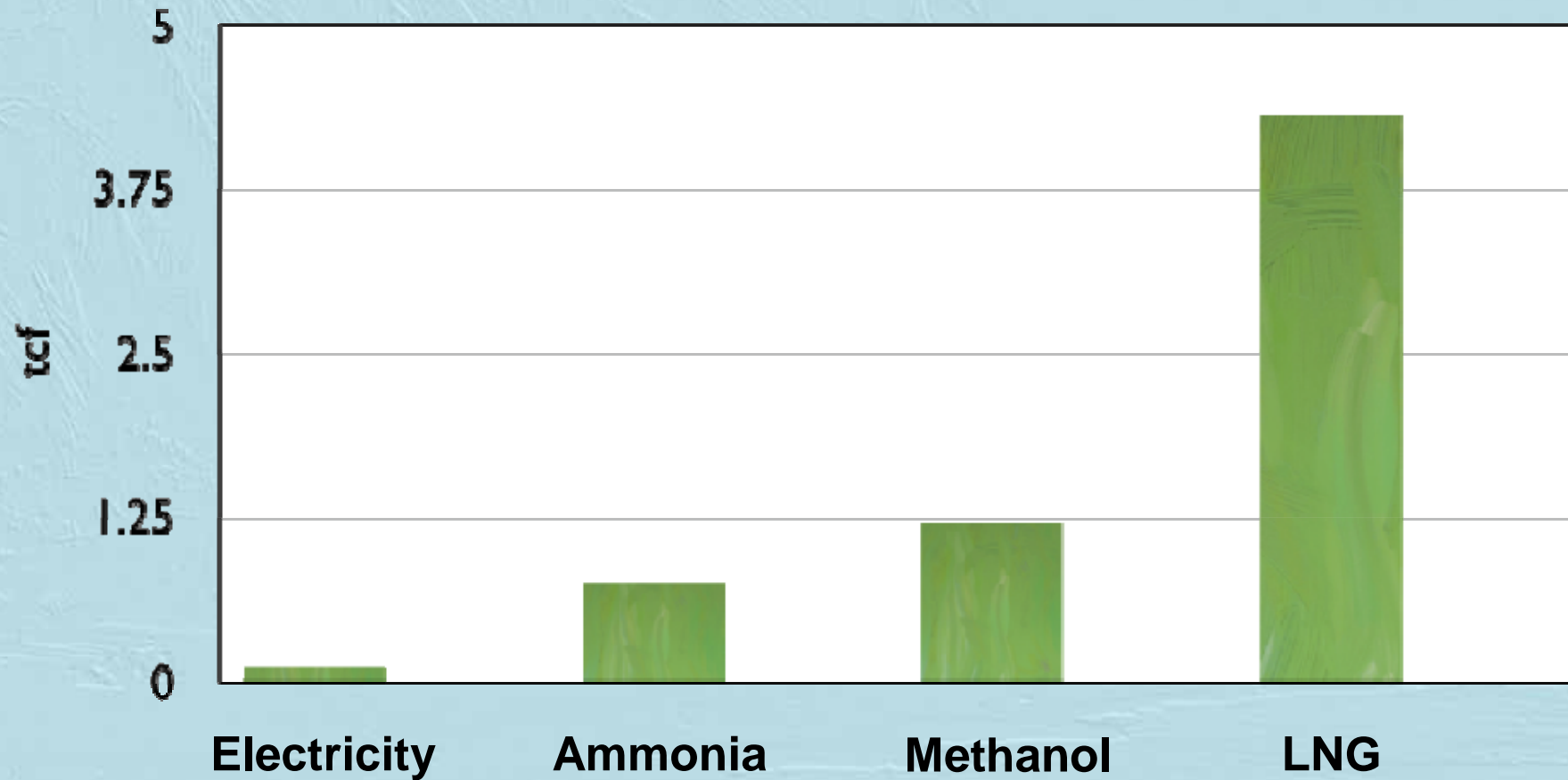
Rio del Rey flare  
~0.7Tcf  
65MMcfd

Isongo Field & Douala Basin  
~1.0Tcf

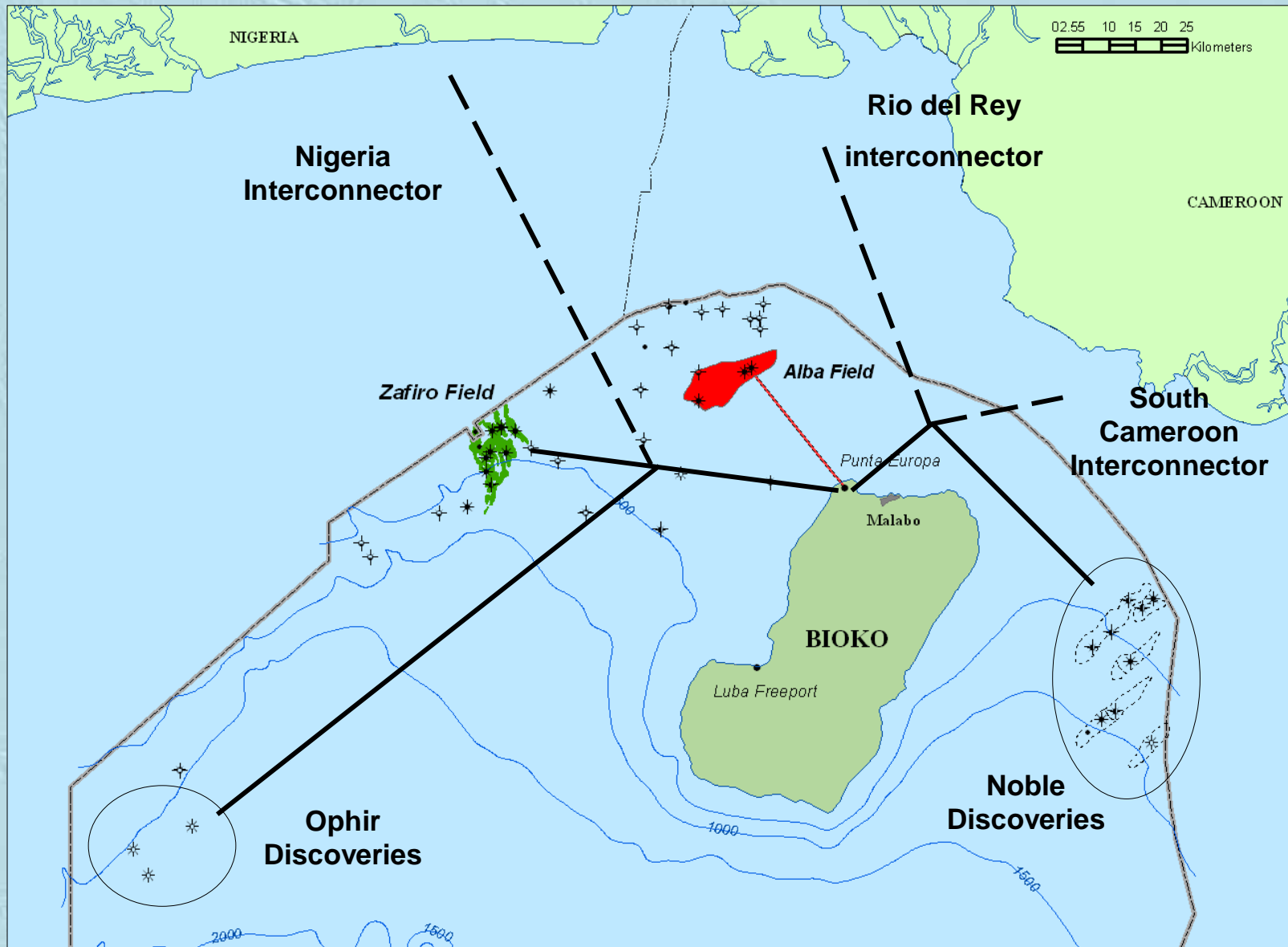
Sanaga Sud excess & Kribi  
~ 0.75Tcf



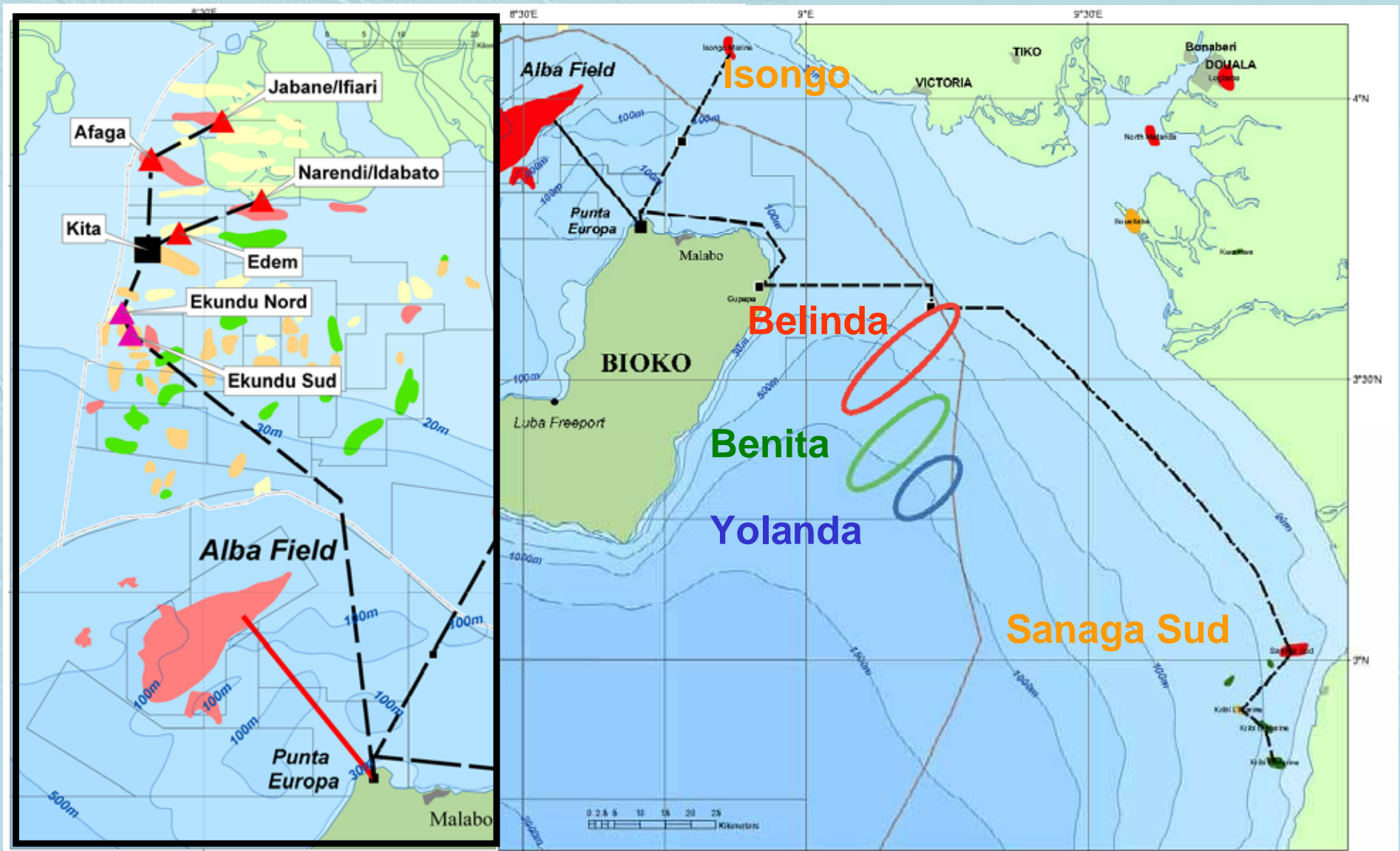
# Commercialisation Options



# Gas Gathering System



# Pipeline Scenario, Cameroon to EG

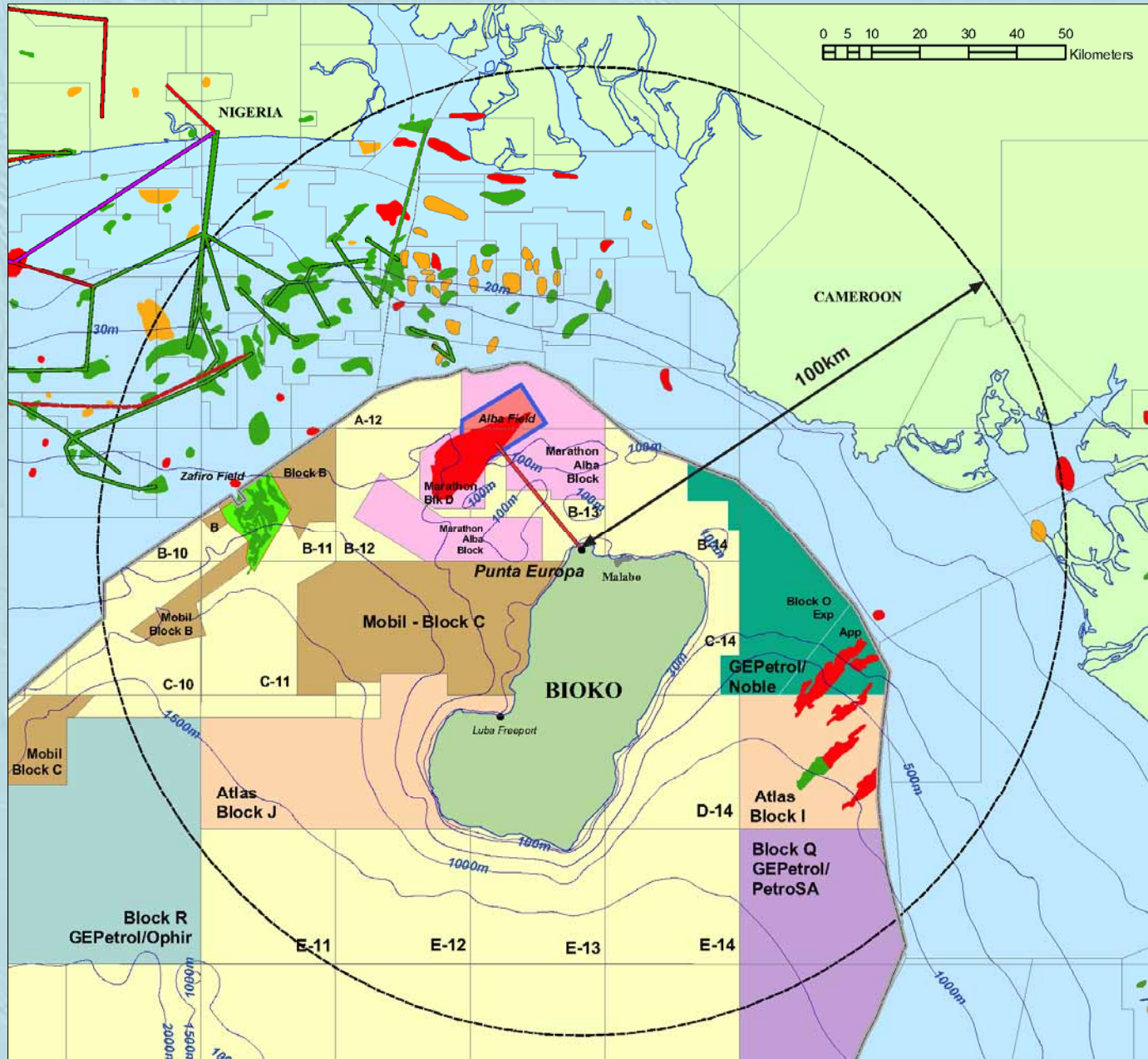


100 MCFD potential from Rio del Rey fields

Undefined potential from Douala Basins



# Bioko - Hub of the Gulf of Guinea





- **8 YEARS OF SUCCESSFUL GAS BUSINESS DEVELOPMENT TO DATE**
  - exploration
  - development
  - gas commercialisation through Bioko Island as a natural hub
- ***much more still to do***
  - further exploration and development
  - further gas commercialisation
- **now is the time to study development of a gas gathering system**
- **Government support for creation of 3G**