



MINISTRY OF MINERAL RESOURCE AND ENERGY

NATIONAL PETROLEUM INSTITUTE (INP)

HYDROCARBON POTENTIAL OF MOZAMBIQUE AAPG 2023



Ezequias Matlava
Resource Assessment Manager
Exploration Division

HOUSTON, 2023

WHO WE ARE

Mozambique – At A Glance



- **Republic of Mozambique**
 - President – Filipe Nyusi – 2nd Term
 - Population – 30 million
 - Language – Portuguese (official); 11 native languages
 - Climate – Subtropical

- **GDP (2021)**
 - \$15 billion
 - 1.1% GDP Growth

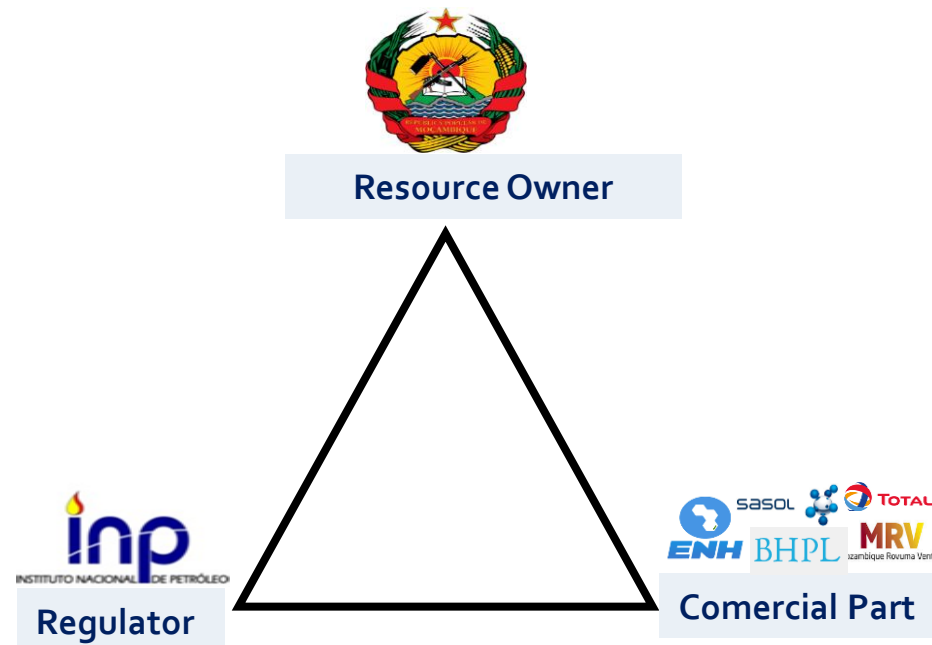
- **Abundant resources**
 - Natural gas
 - Minerals

- **Strategically located**
 - Access to global markets

- **Indian Ocean Coastline**
 - 2.770 km
 - Prime tourism destination

Institutional Framework

The Petroleum Law, Law n.º 21/2014, of August 18, constitutes the legal basis for the attribution of rights to carry out Petroleum Operations by oil companies, also establishing the legal basis that allows the establishment of a governance structure clarifying the roles and interests of each intervening party.



Mission, Vision & Values



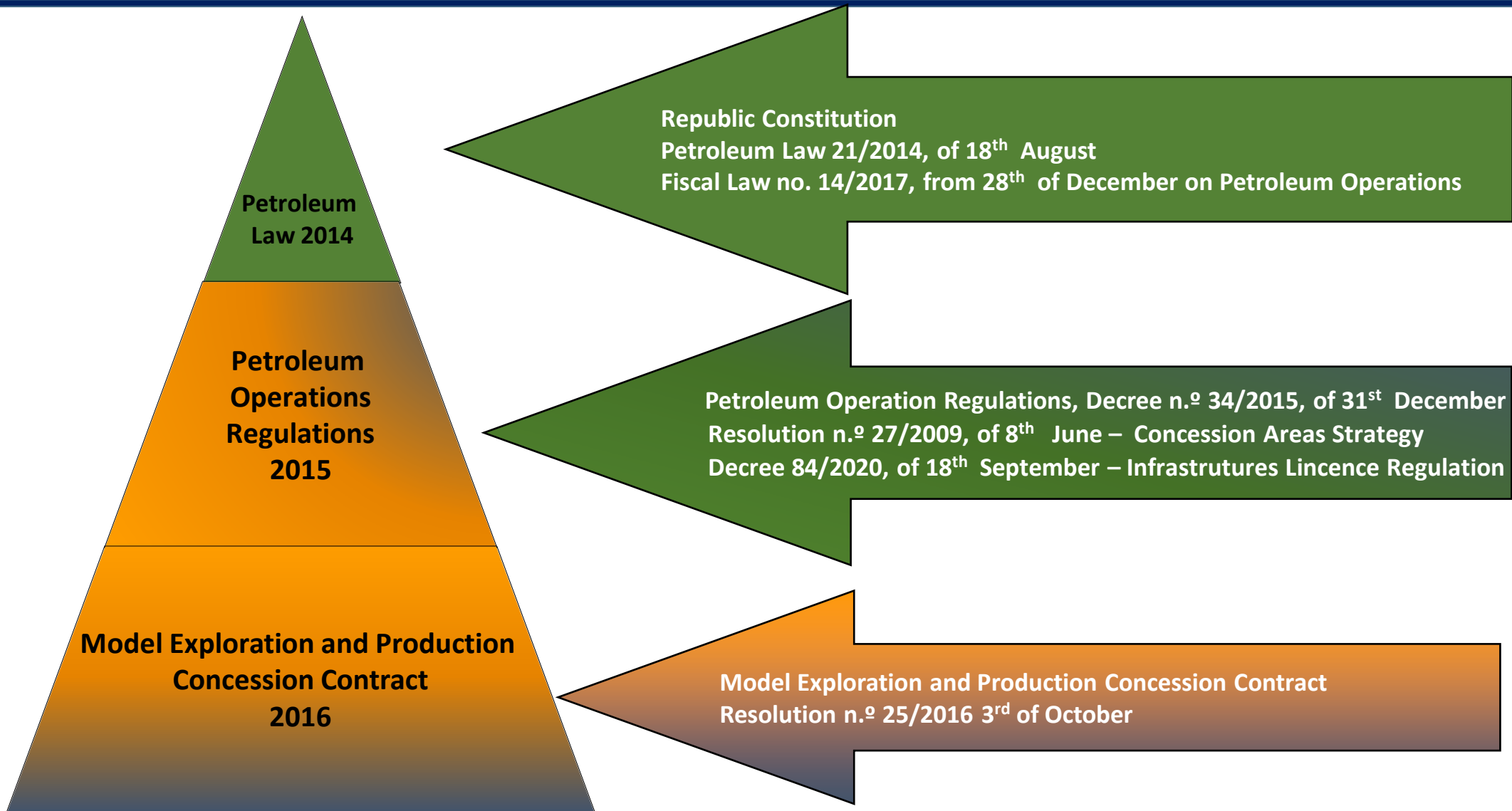
Manage Mozambique's petroleum resources and related operations for the benefit of society, and in accordance with current legislation, Government policies and contractual terms.

Ensure that Petroleum Operations are carried out in accordance with applicable Mozambican legislation and international best practices, with special emphasis on optimized resource management and compliance with Health, Safety and Environment aspects.



Exemption, impartiality, technical capacity, professionalism, responsibility, initiative and creativity, teamwork, mutual respect for the employee.

Mozambique Framework Conditions

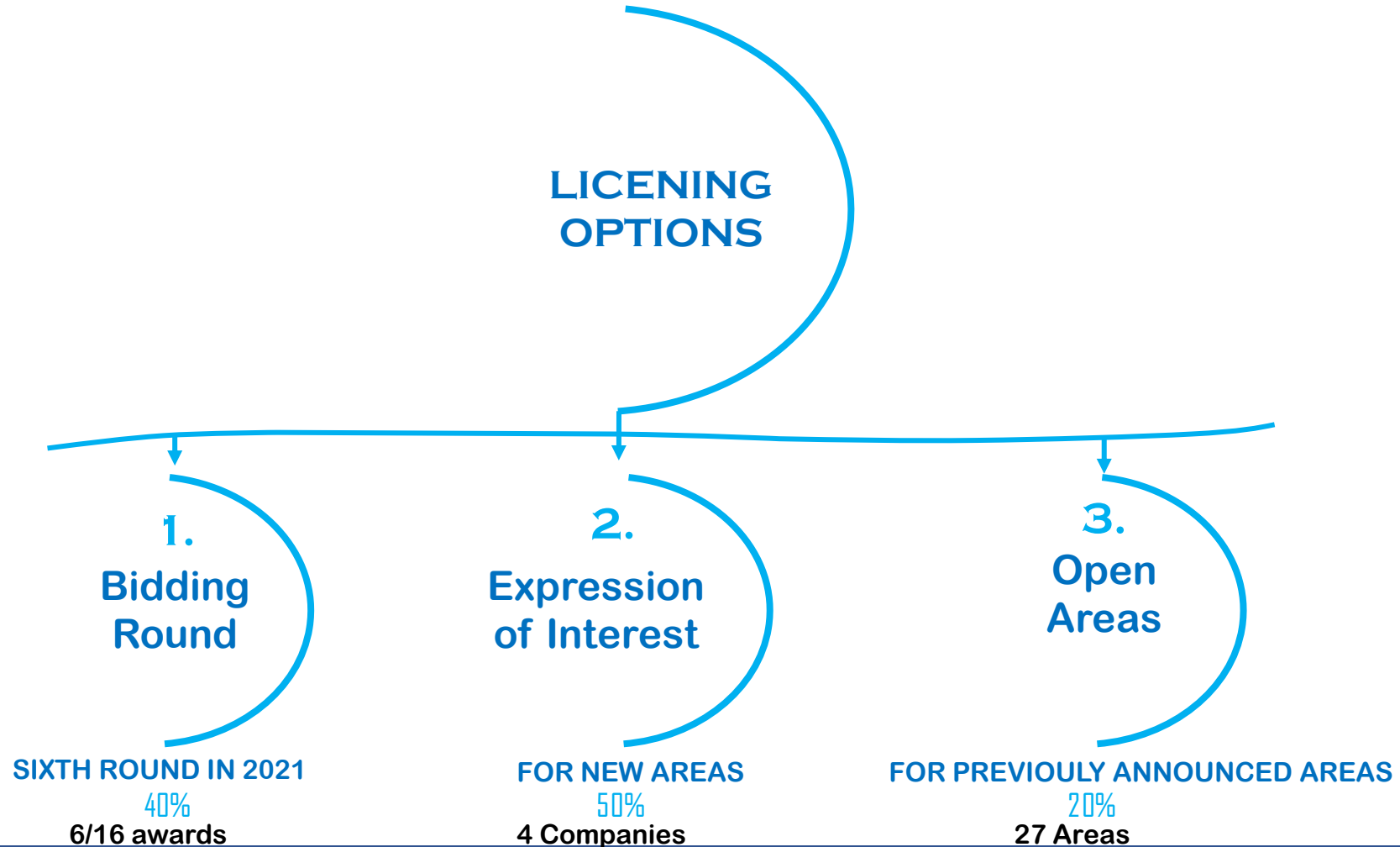


General Fiscal Terms (Commercial)

FISCAL REGIME	
PRODUCTION TAX	Crude Oil: 10%. Natural gas: 6%.
STATE PARTICIPATION	• <u>Minimum 20%</u> , with exceptions.
PRODUCTION SHARING	<u>Between 85% (Concessionarias) -15% (Government), sliding scale up to 60% (Government) e 40%(Concessionaires).</u>
COST RECOVERY	Up to <u>60%</u> .
PRODUCTION BONUS	Non recoverable
INCOME TAX	32% of contractor's gross revenue
OTHER OBLIGATIONS	<ul style="list-style-type: none"> • Social support • Training • Institutional support
FISCAL STABILITY	Stabilized up to 10m years from the production.

Licensing

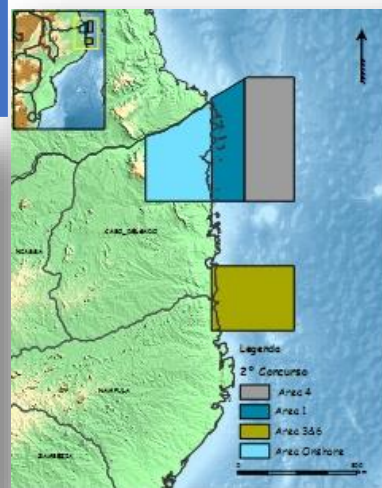
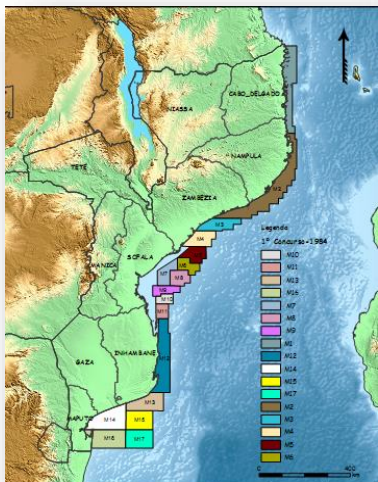
We believe we can accelerate the development of Mozambique's upstream sector, while supporting the drive to net zero carbon by 2050, by attracting best-in-class energy companies.



Licensing Rounds History

1st – 1984

Direct Award of areas

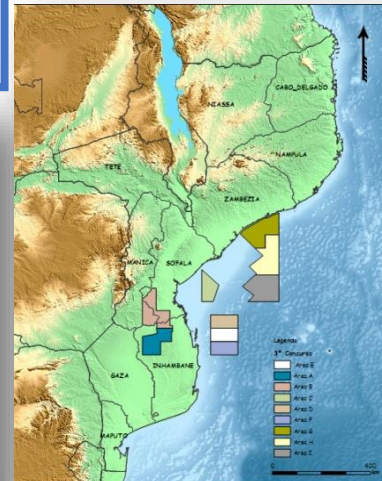


2nd - 2005

4 concession areas were on offer in the Rovuma Basin. Area 1 Anadarko and ENH in 2006; Area 4 Eni and ENH in 2006; Area 3&6 Petronas and ENH in 2008 and Area Onshore- Artumas

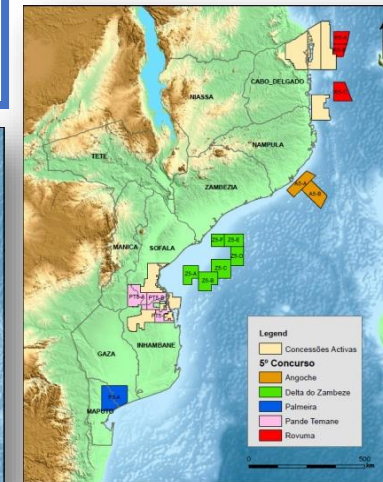
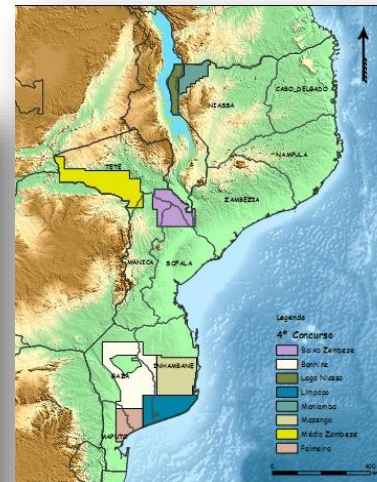
3rd - 2007

9 concession areas were on offer in the Mozambique Basin. These were not granted due to lack of compatible proposals.



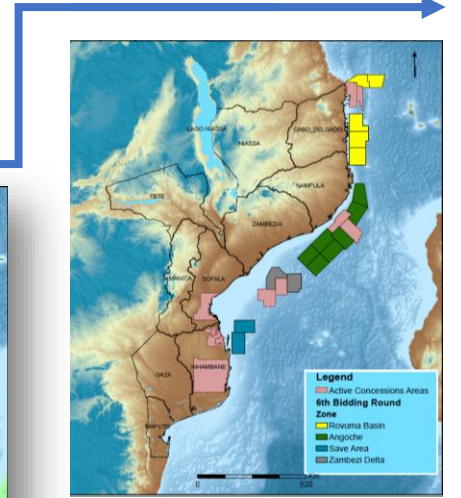
4th - 2009

7 areas were on offer in the Mozambique Basin, all onshore. Middle Zambezi Graben Area - Awarded to DNO, which did not negotiate the contract.



5th – 2014

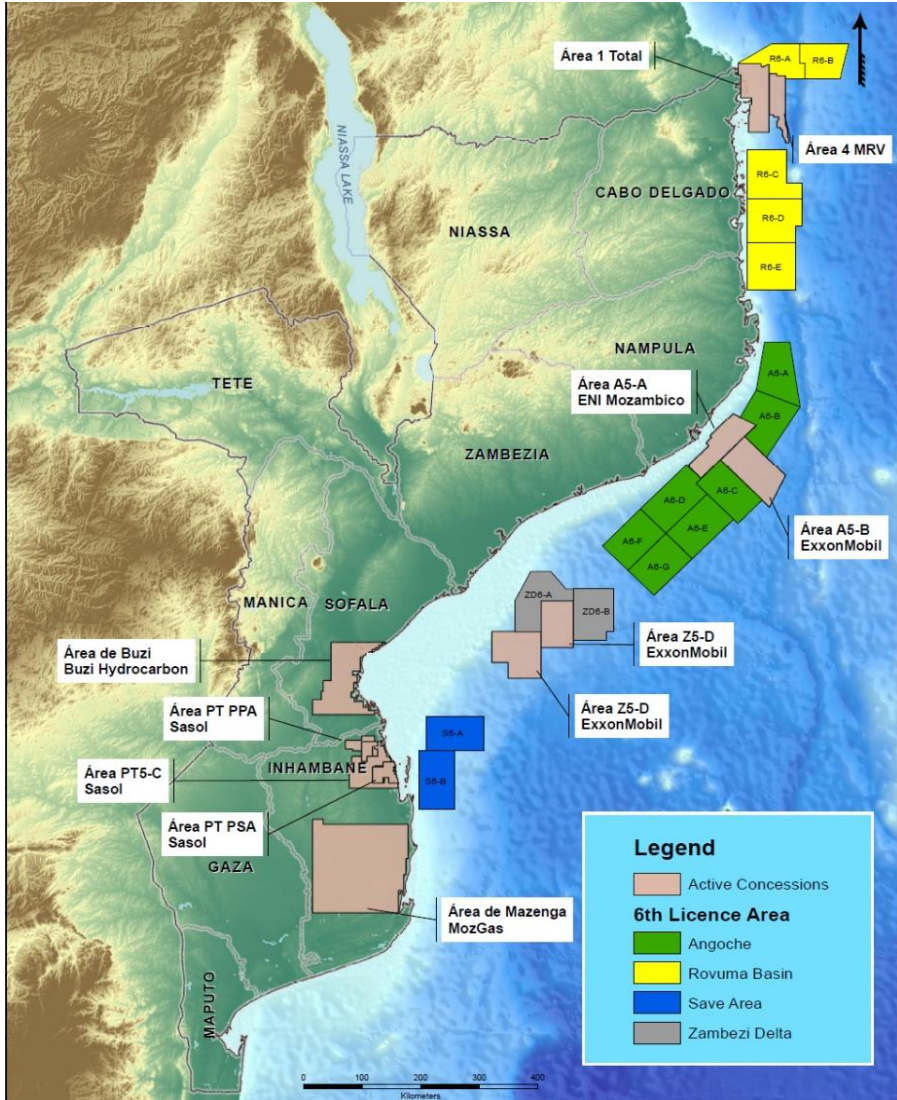
15 areas were on offer in the Mozambique and Rovuma Basins: 4 on land and 11 in shallow to deep sea. Angoche Areas A5-A and A5-B were awarded to Eni and Exxon respectively; Zambezi Delta areas Z5-C and Z5-D to Exxon; Pande-Temane area (PT5-C), awarded to Sasol; and the Palmeira area (P5-A), awarded to Delonex



6th - 2021

16 areas were made available. Angoche Area A6-C awarded to Eni Mozambique S.p.A; Angoche Areas A6-D, A6-E, A6-G, Save Areas S6-A and S6-B awarded to CNOOC Hong Kong Holding Ltd

Sixth Licensing Round



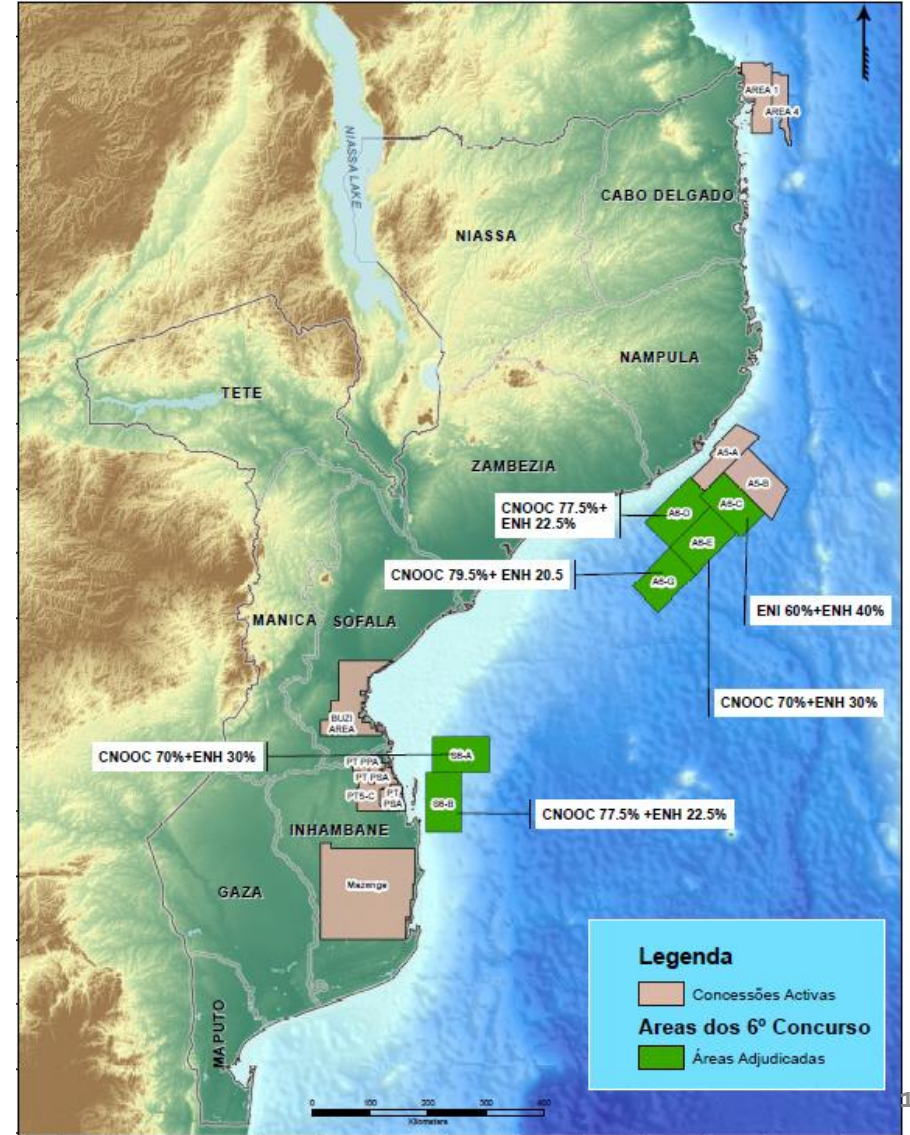
Region	Areas	Dimension Km ²
Rovuma (R6-)	5	28241.01
Angoche (A6-)	7	40420.79
Delta Zambeze (ZD6-)	2	11474.6
Save (S6-)	2	11479.35
TOTAL	16	91615.75

12 Companies were selected

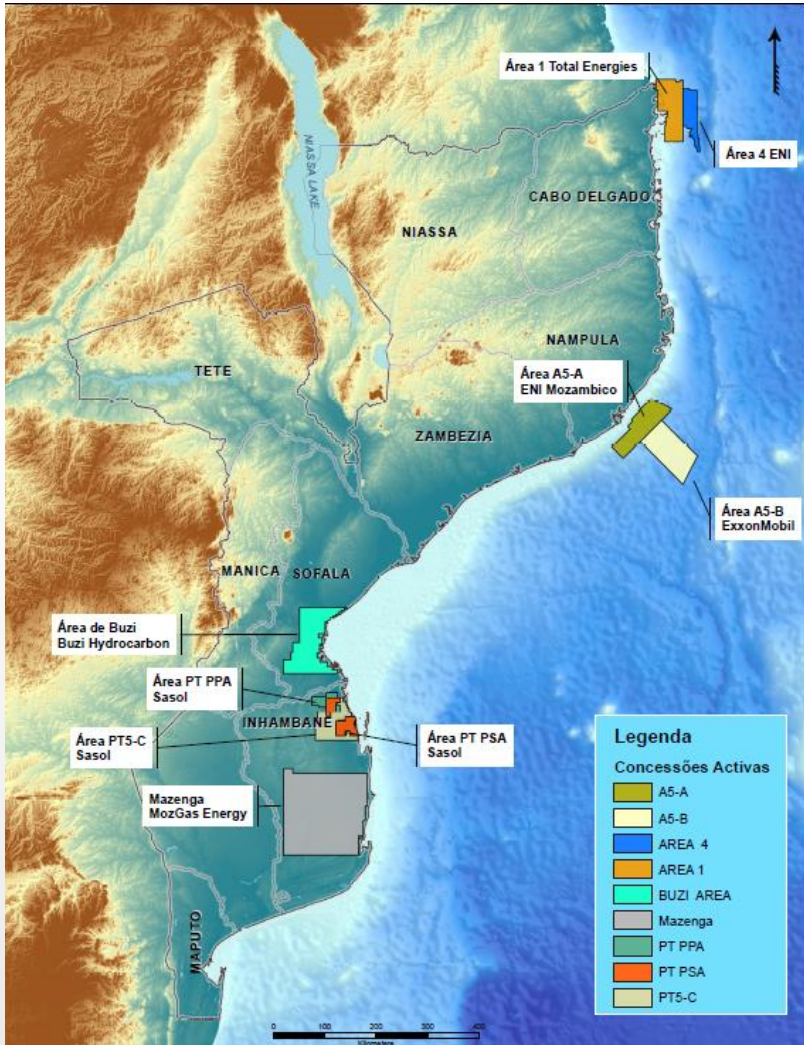
2 Companies submitted a total of 6 Proposals (Bids).










PLANNED INVESTMENTS

- ✓ \$369.8M for work commitment during the first sub-period of Exploration;
- ✓ \$75.45M for training, institutional and social support.

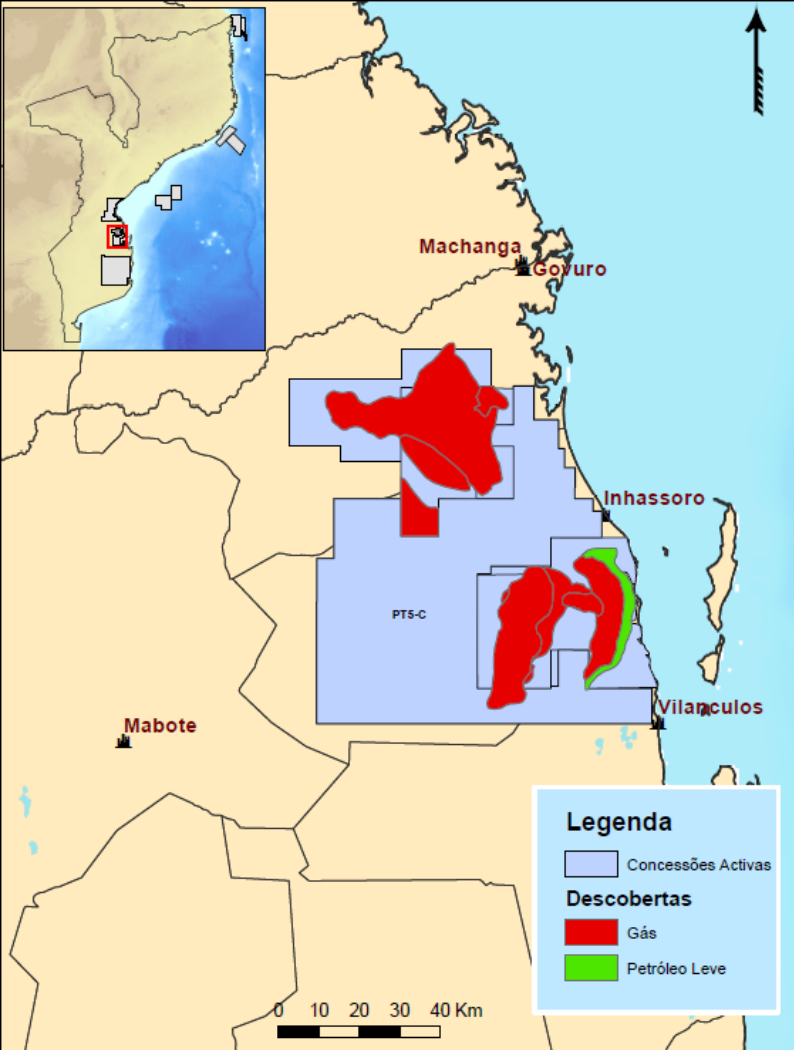


Active Exploration Concessions



Mozambique Basin	PPA		Angoche Region	Area A5-A	
Mozambique Basin	PSA		Angoche Region	Area A5-B	
Rovuma Basin	Area 1		Mozambique Basin	Area PT5-C	
Rovuma Basin	Area 4				
Mozambique Basin	Mazenga				
Mozambique Basin	Buzi				

Mozambique sedimentary basin



Natural Gas

Mozambique Basin

- 8 Tscf of in-situ gas
- 6 Tscf recoverable

Rovuma Basin

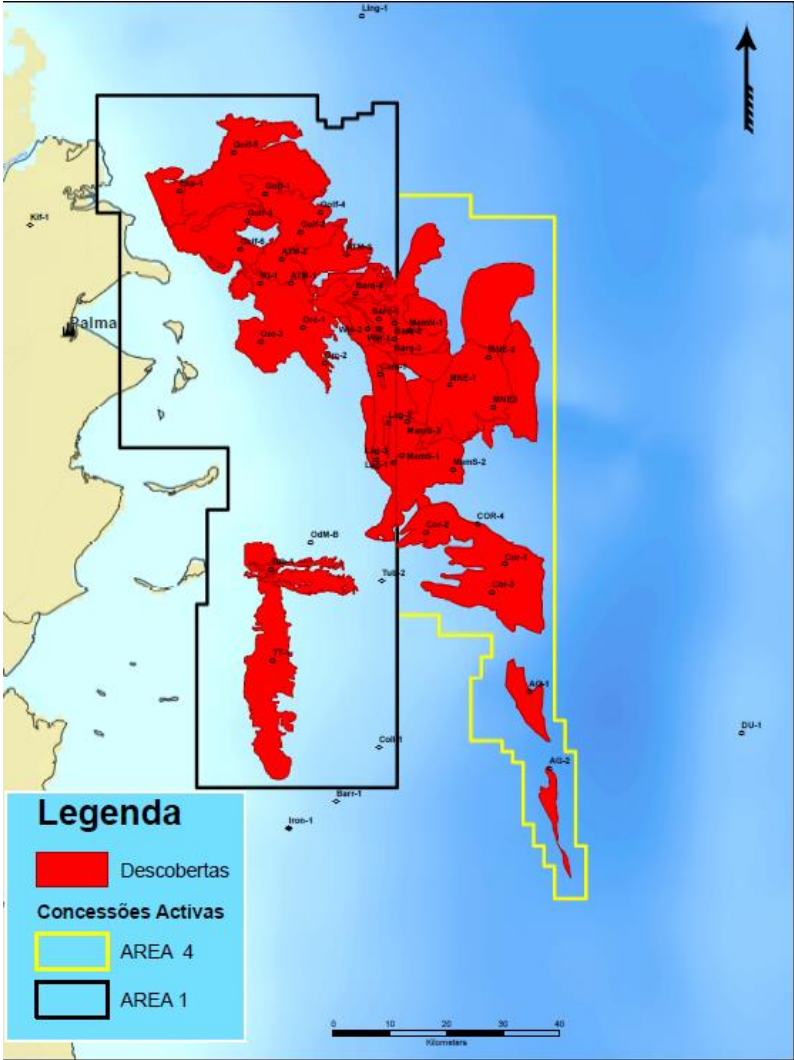
- 172 Tscf of in-situ gas
- 124 Tscf recoverable

Light Oil

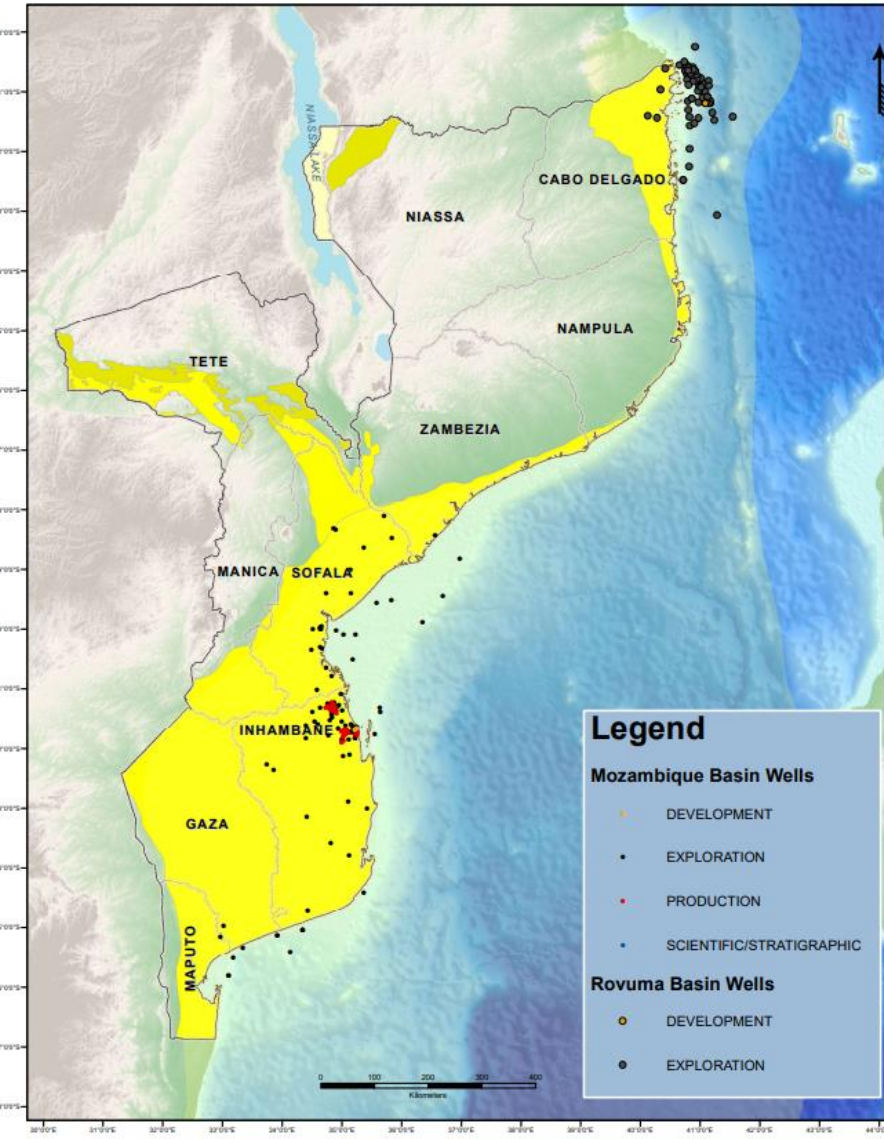
Mozambique Basin

- 158 MMbbl of in-situ Oil
- 11 MMbbl recoverable

Rovuma Sedimentary Basin

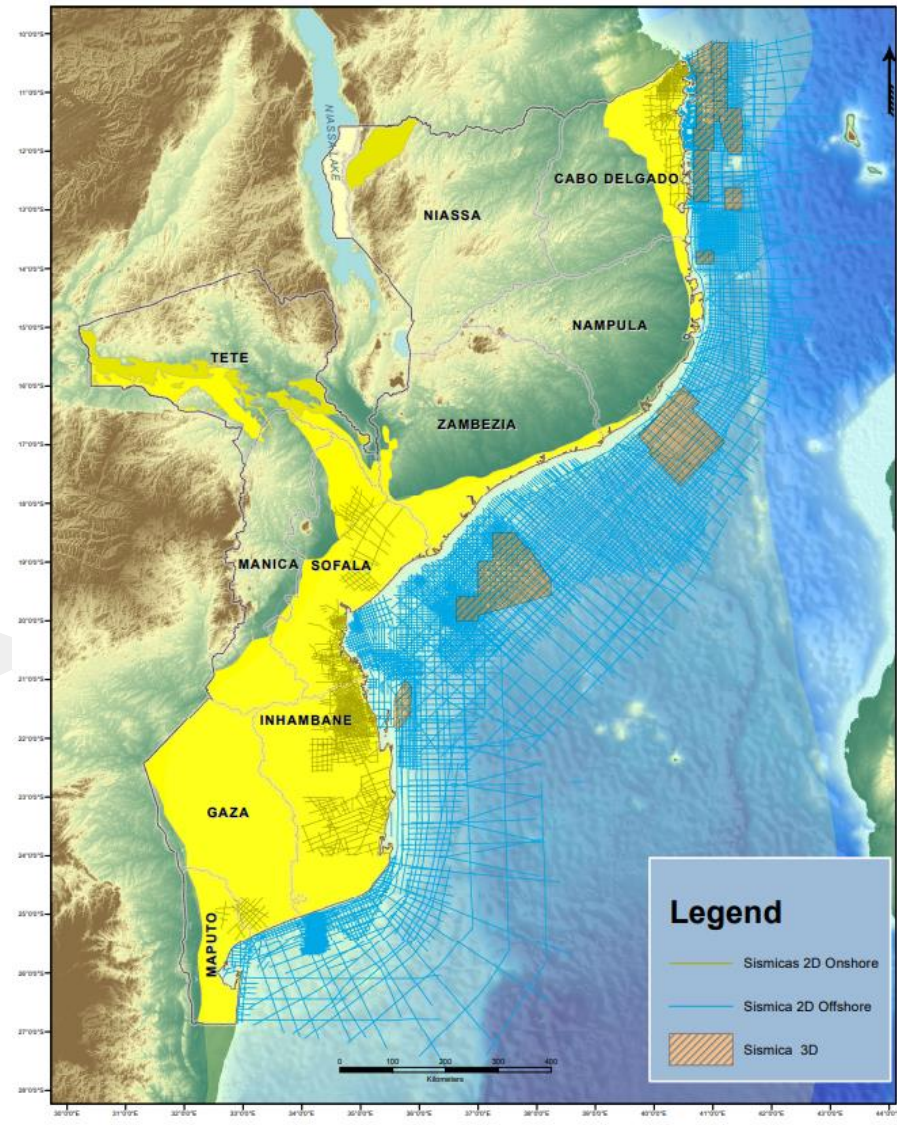


Seismic And Well Data



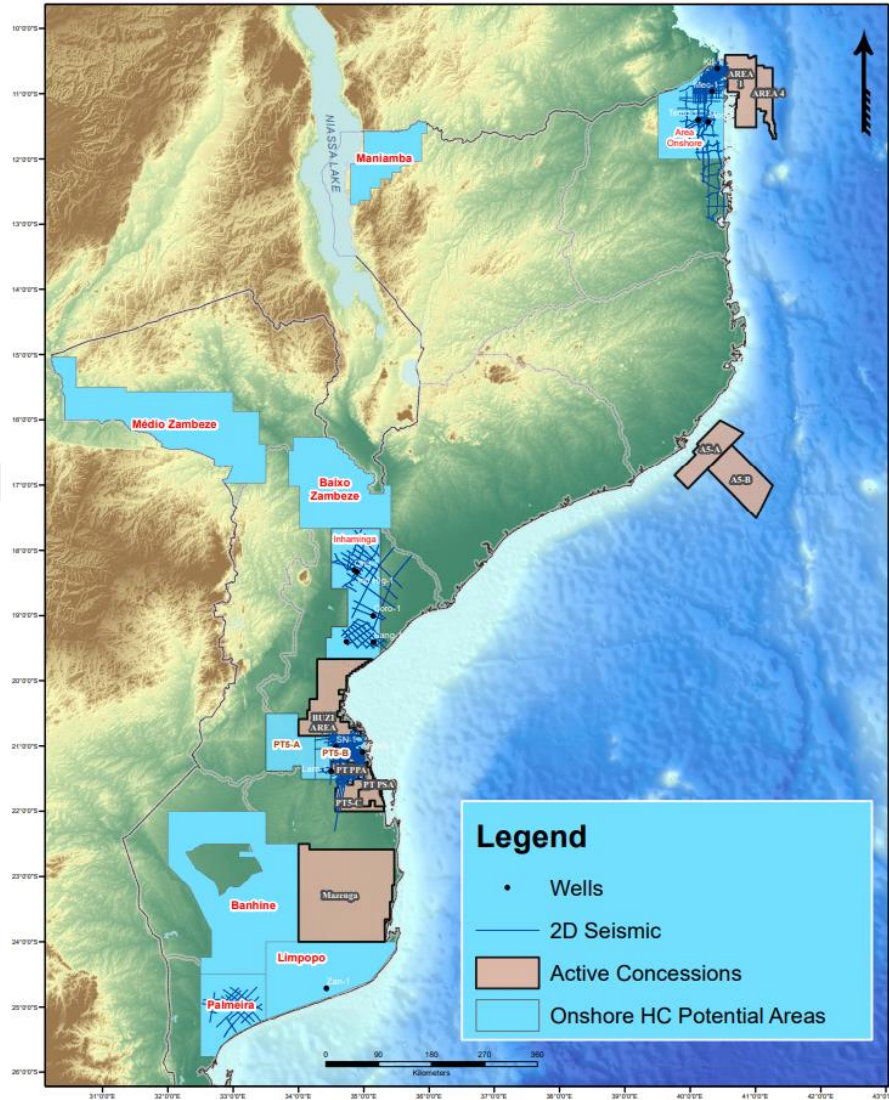
Drilled Wells 1953 - 2023	
Wells Types	Number
Exploration	183
Scientific	05
Development	09
Production	50
TOTAL	247

2D and 3D Seismic Data, Acquired	
Seismic Types	Extension
2D	208.500 km
3D	24.425 km ²

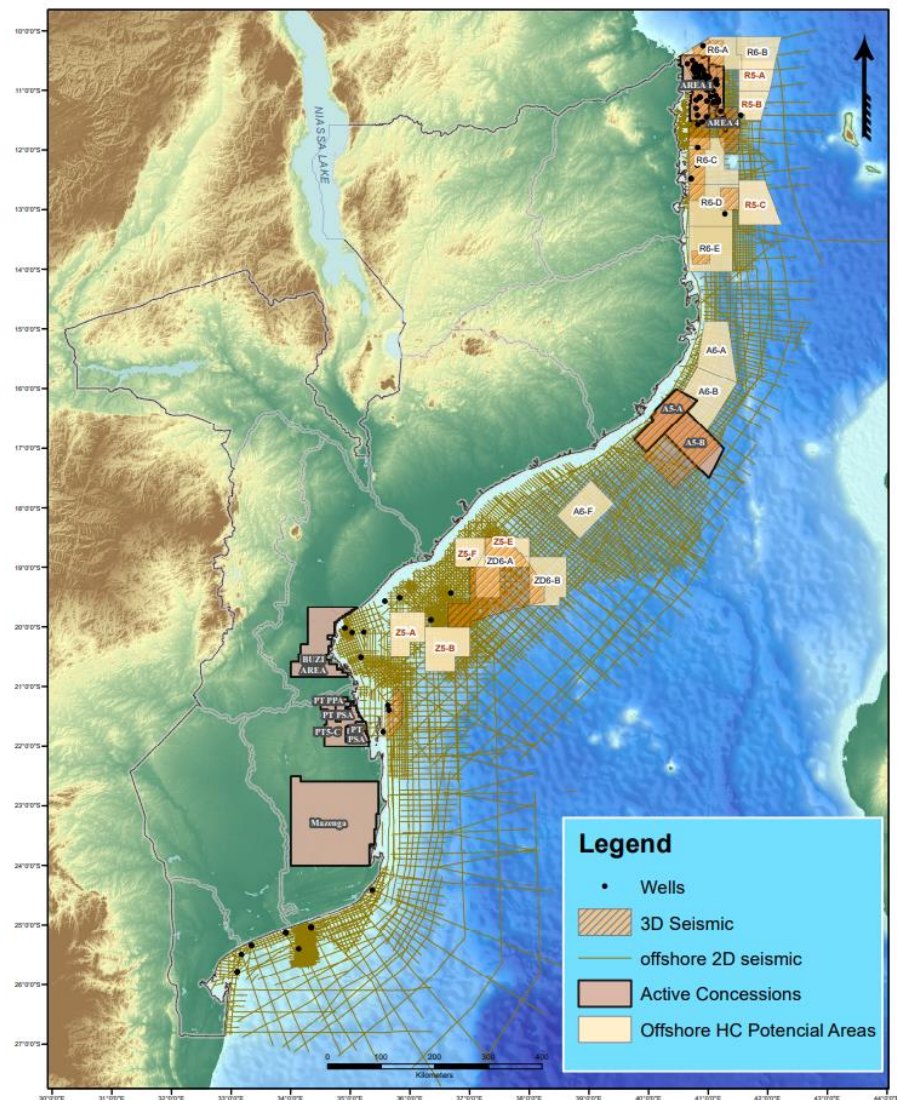


Available Areas For Hydrocarbon Exploration

ONSHORE



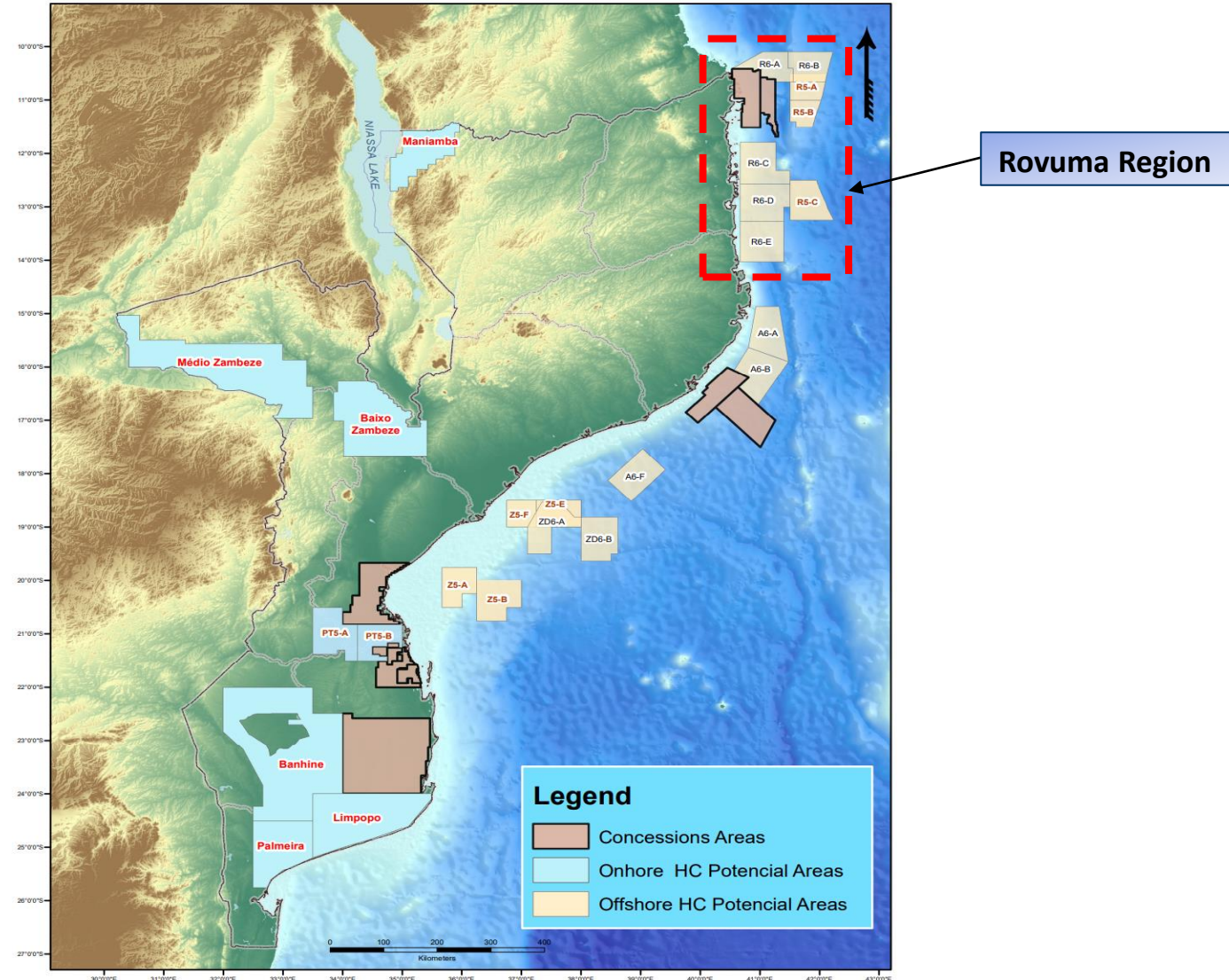
OFFSHORE



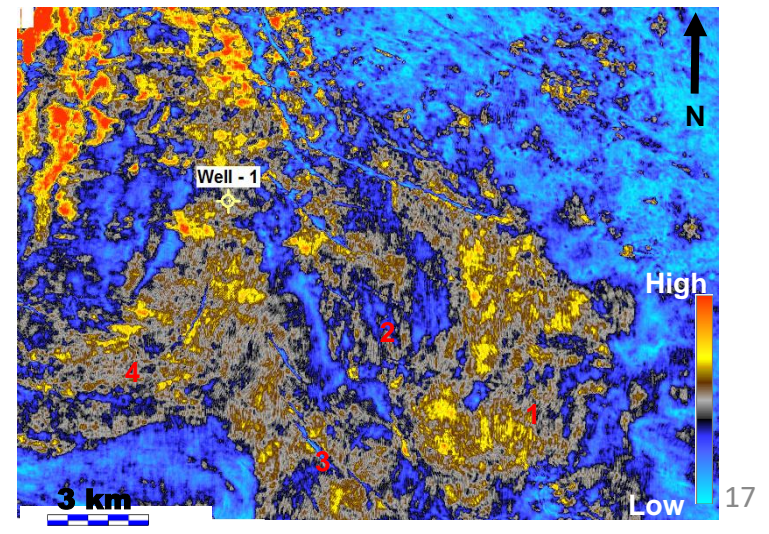
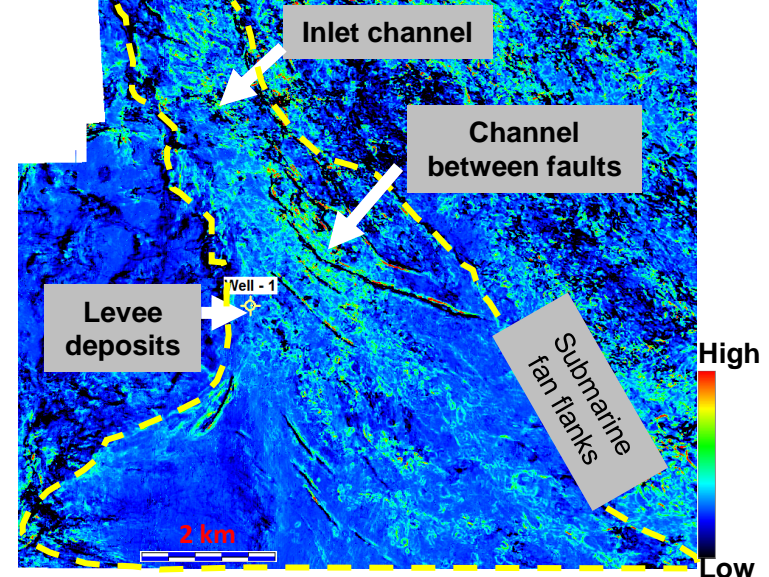
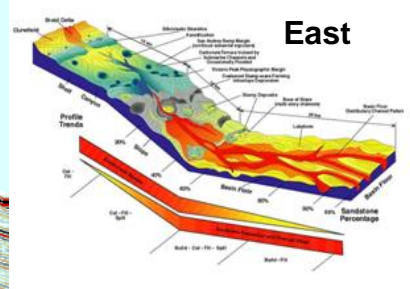
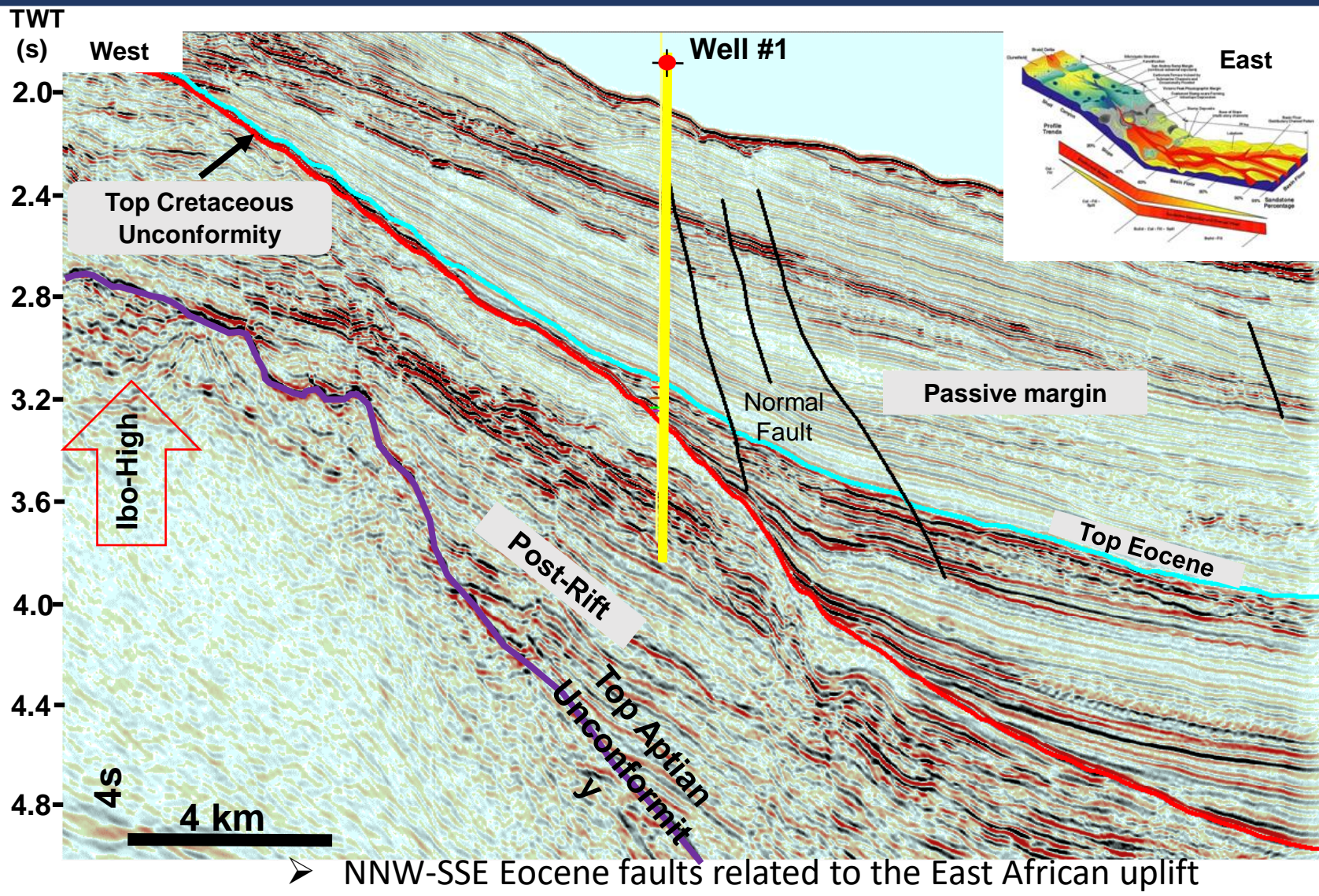
ROVUMA BASIN AREA

EXPLORATION OPPORTUNITIES

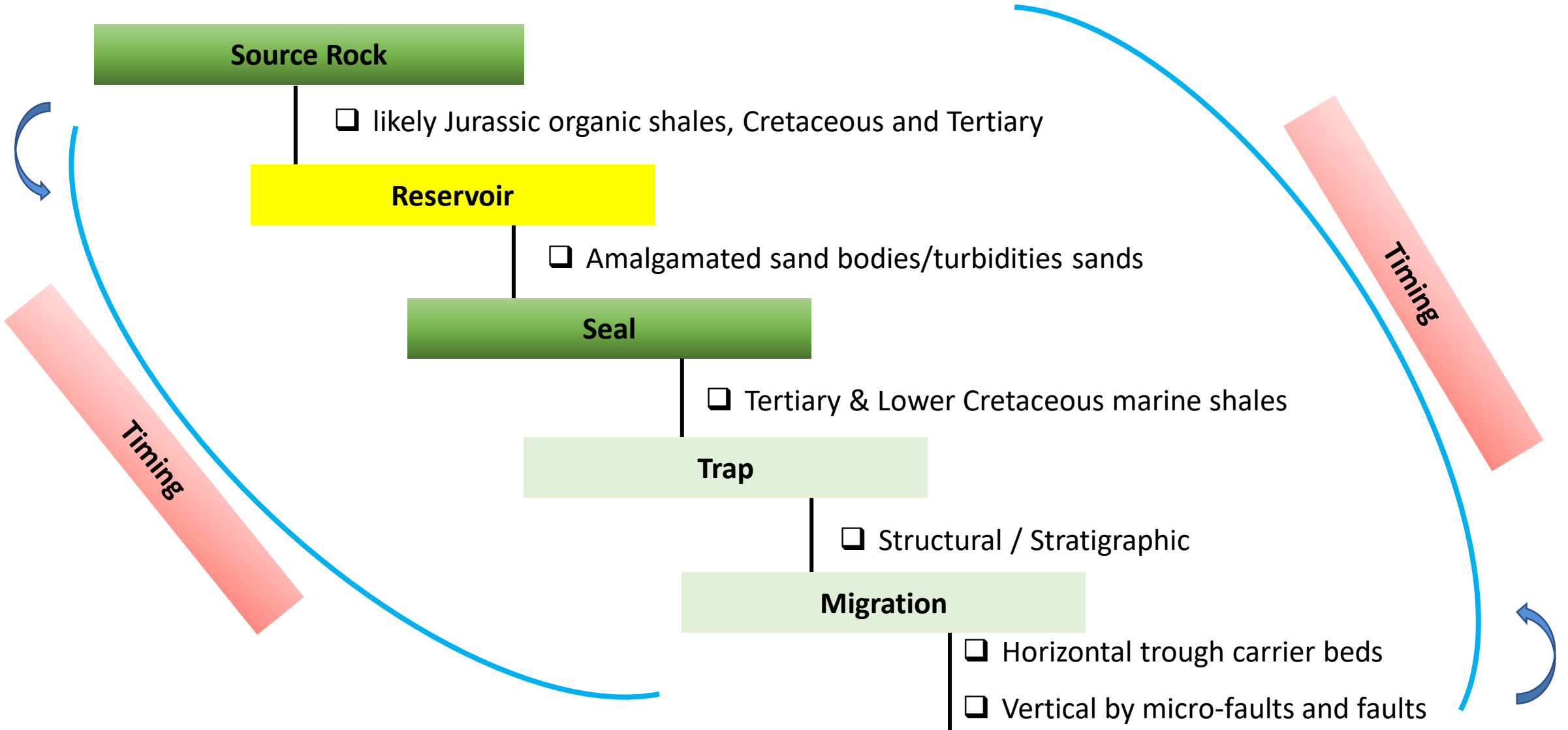
Available Areas For Hydrocarbon Exploration



Southern Rovuma Basin_ Reservoir Potential



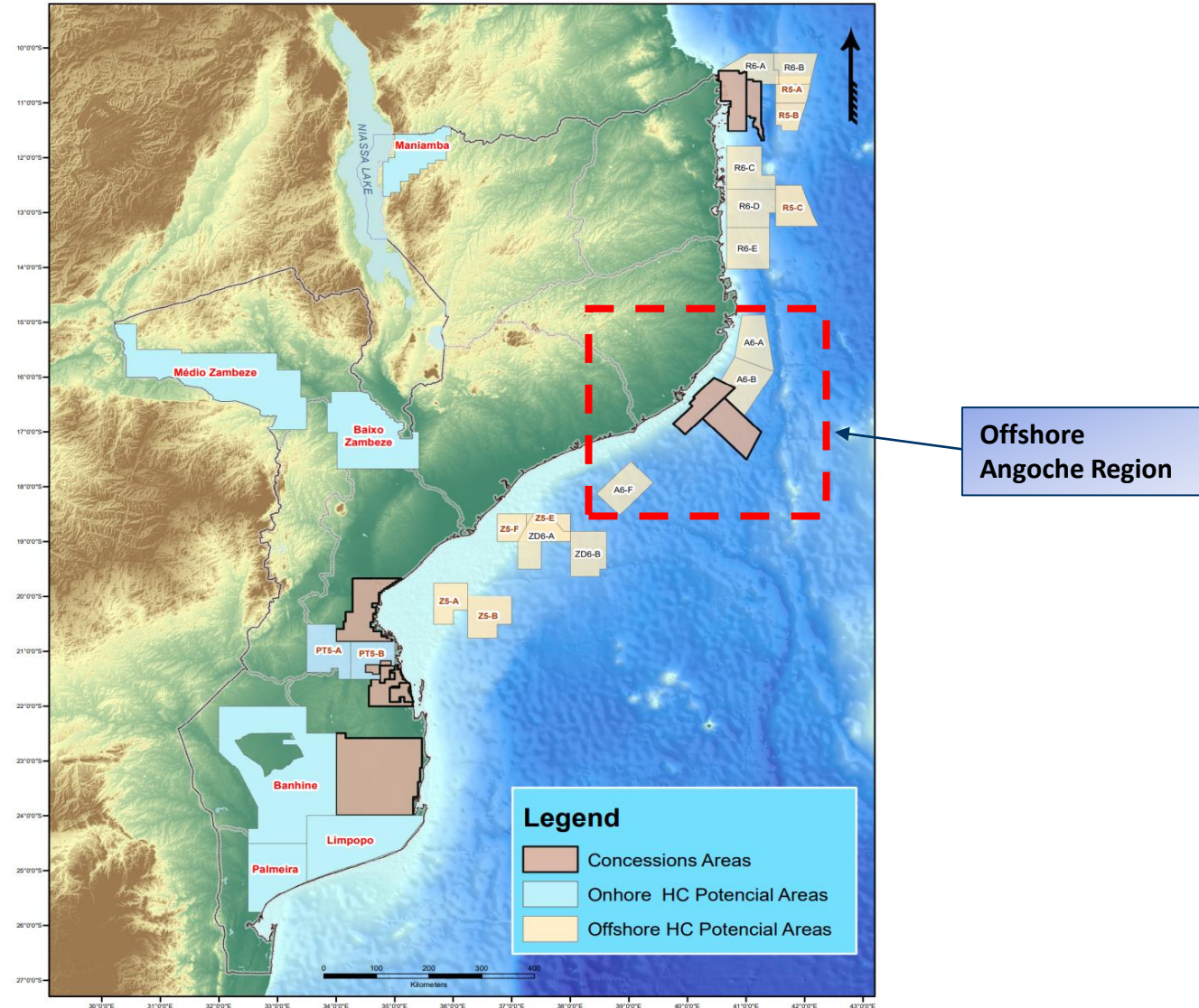
Petroleum System Elements



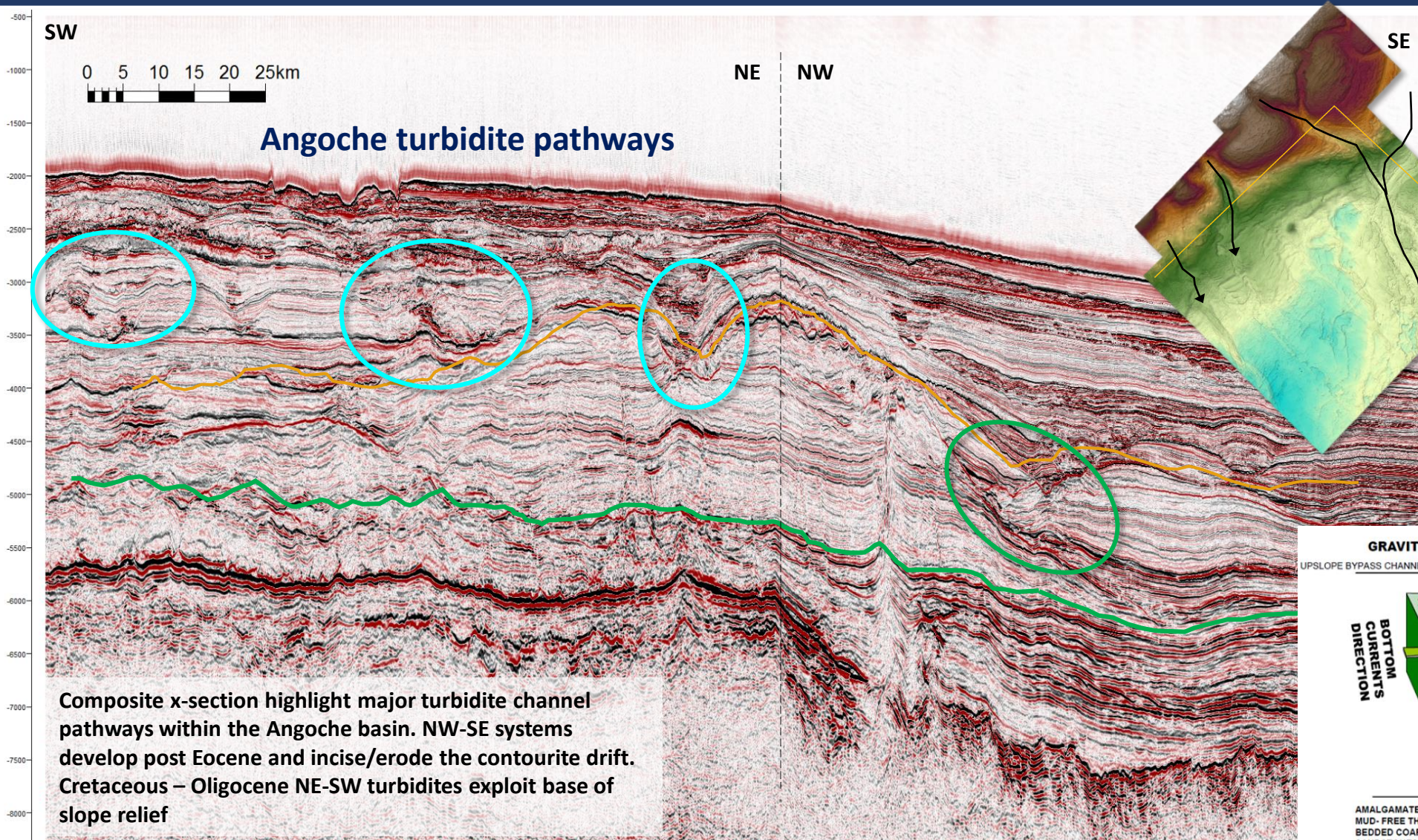
MOZAMBIQUE BASIN - ANGOICHE AREA

EXPLORATION OPPORTUNITIES

Available Areas For Hydrocarbon Exploration

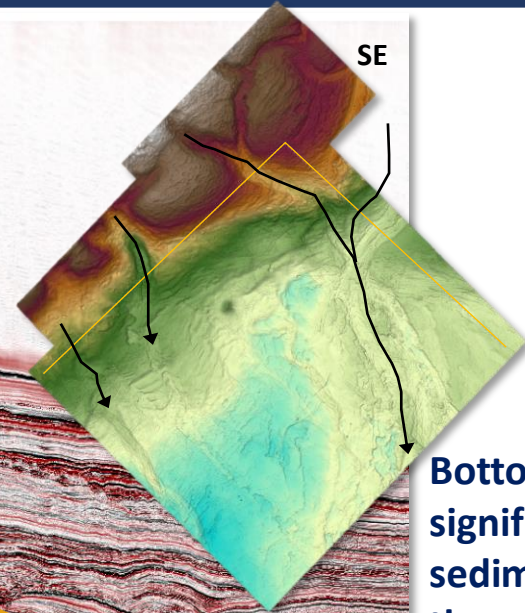


Offshore Mozambique Basin Angoche Region_Reservoir Potential

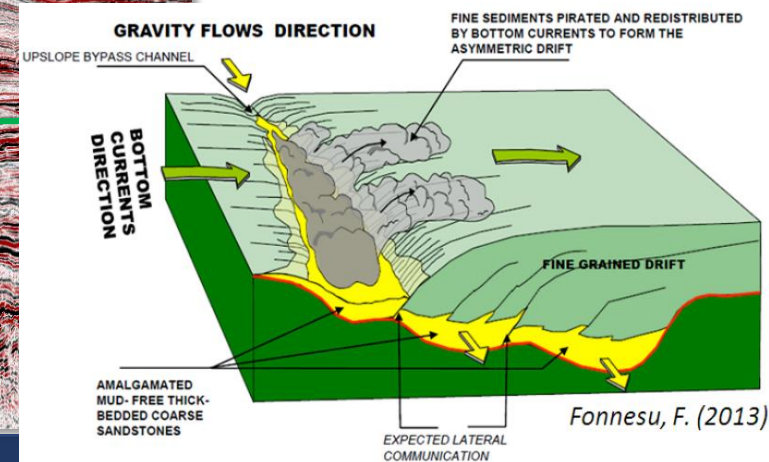


Angoche turbidite pathways

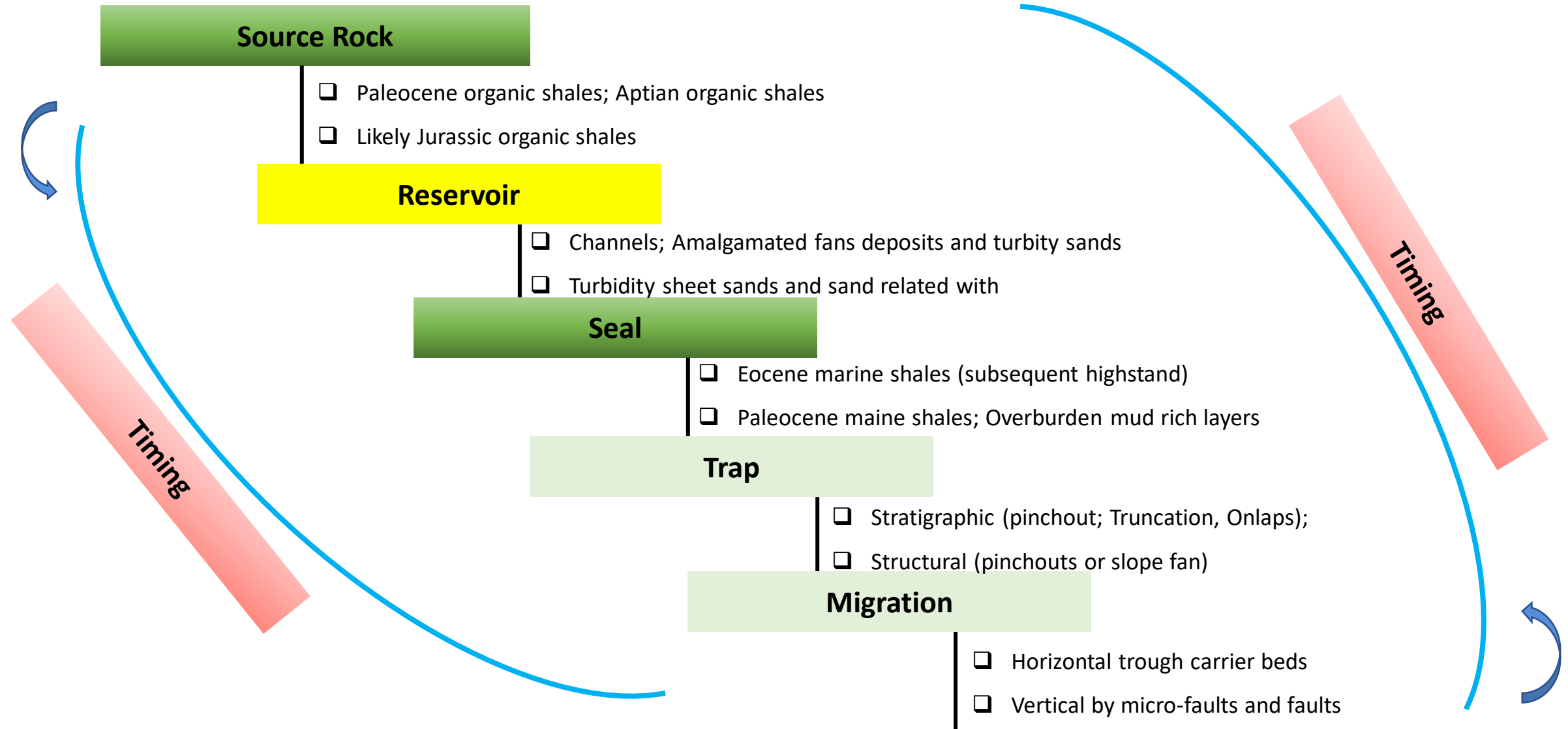
Composite x-section highlight major turbidite channel pathways within the Angoche basin. NW-SE systems develop post Eocene and incise/erode the contourite drift. Cretaceous – Oligocene NE-SW turbidites exploit base of slope relief



Bottom currents have had significant influence over sediment distribution through the late Cretaceous, early Cenozoic.



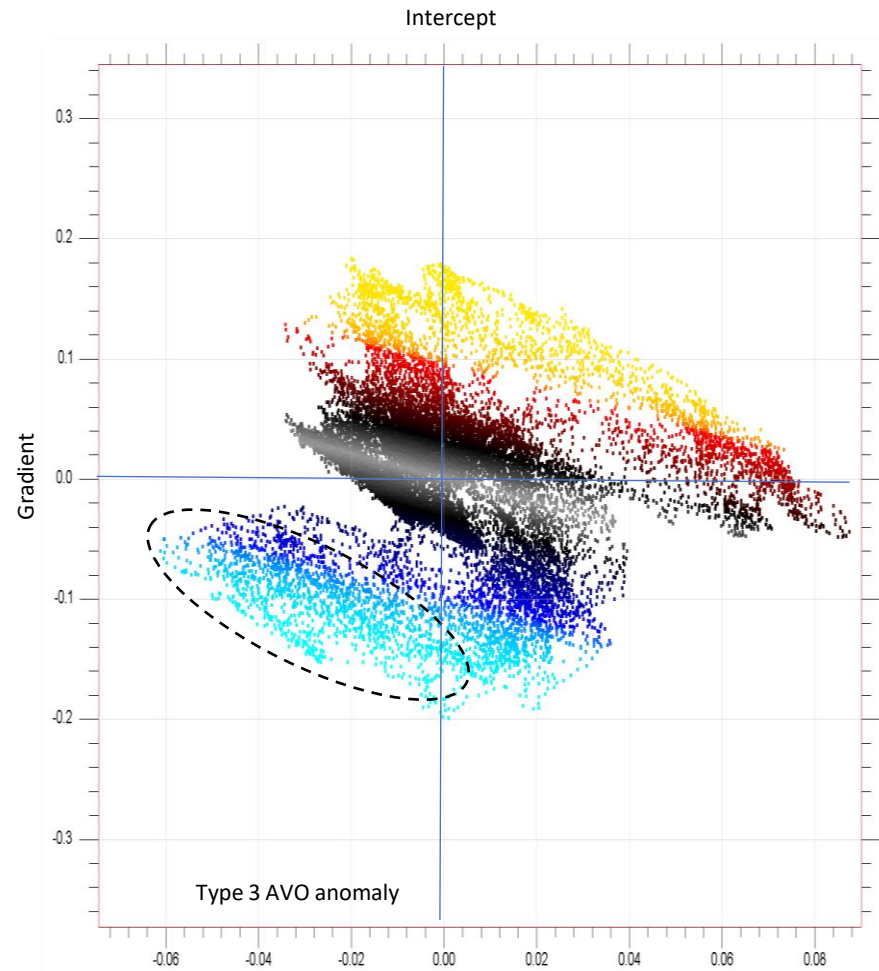
Petroleum System Elements



Hydrocarbon Potential

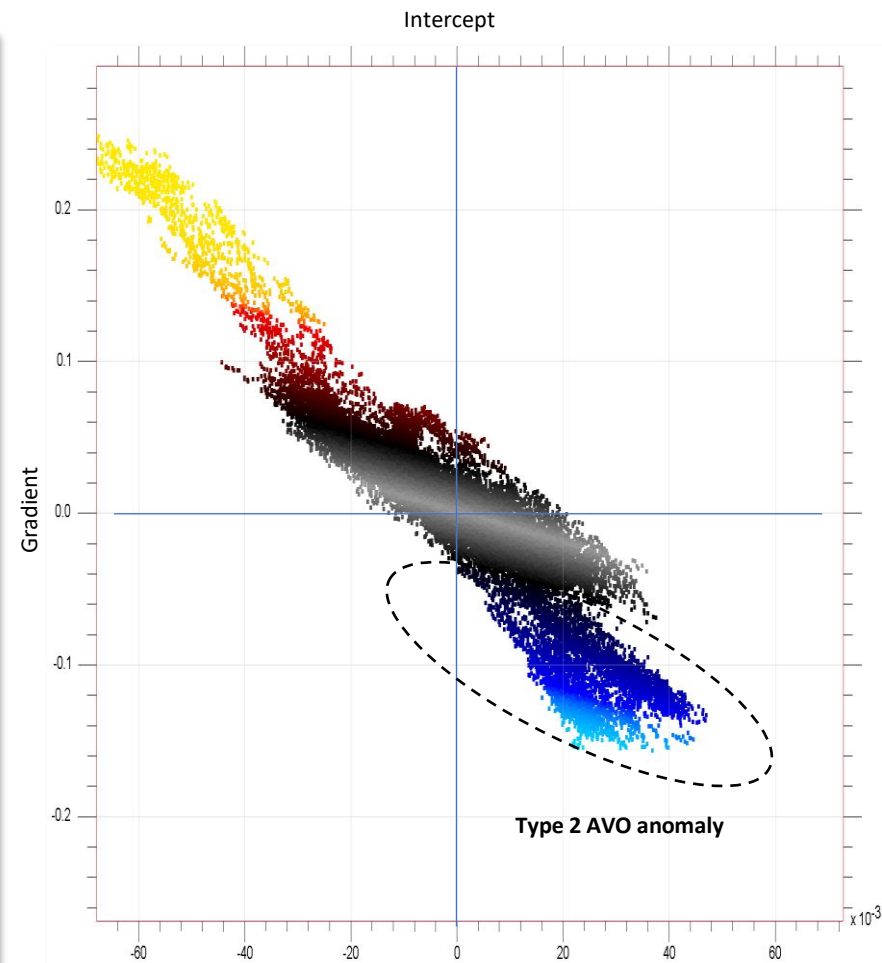
Eocene AVO Analysis

AVO analysis indicates Eocene shelf fan is a Type 3 AVO anomaly



Cretaceous AVO Analysis

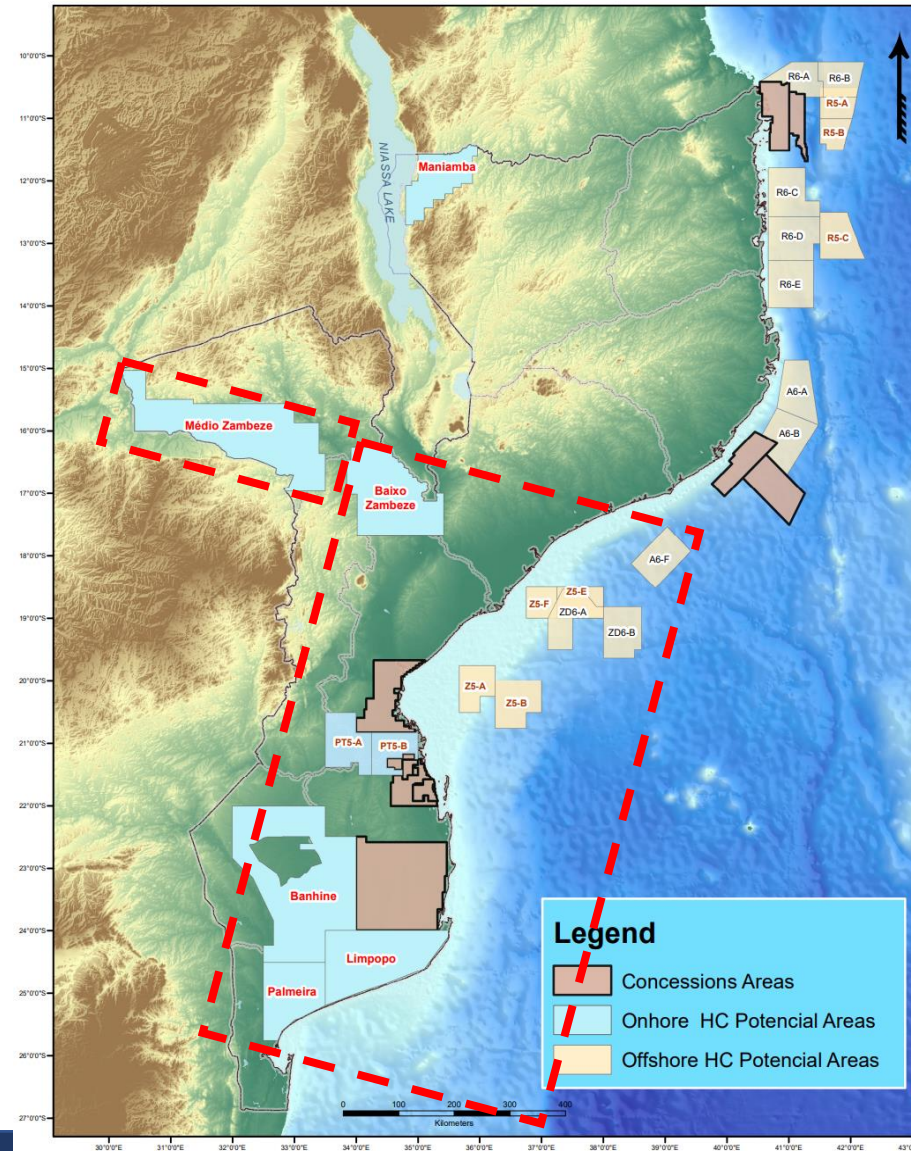
AVO analysis indicates Upper Cretaceous fan is a Type 2 AVO anomaly



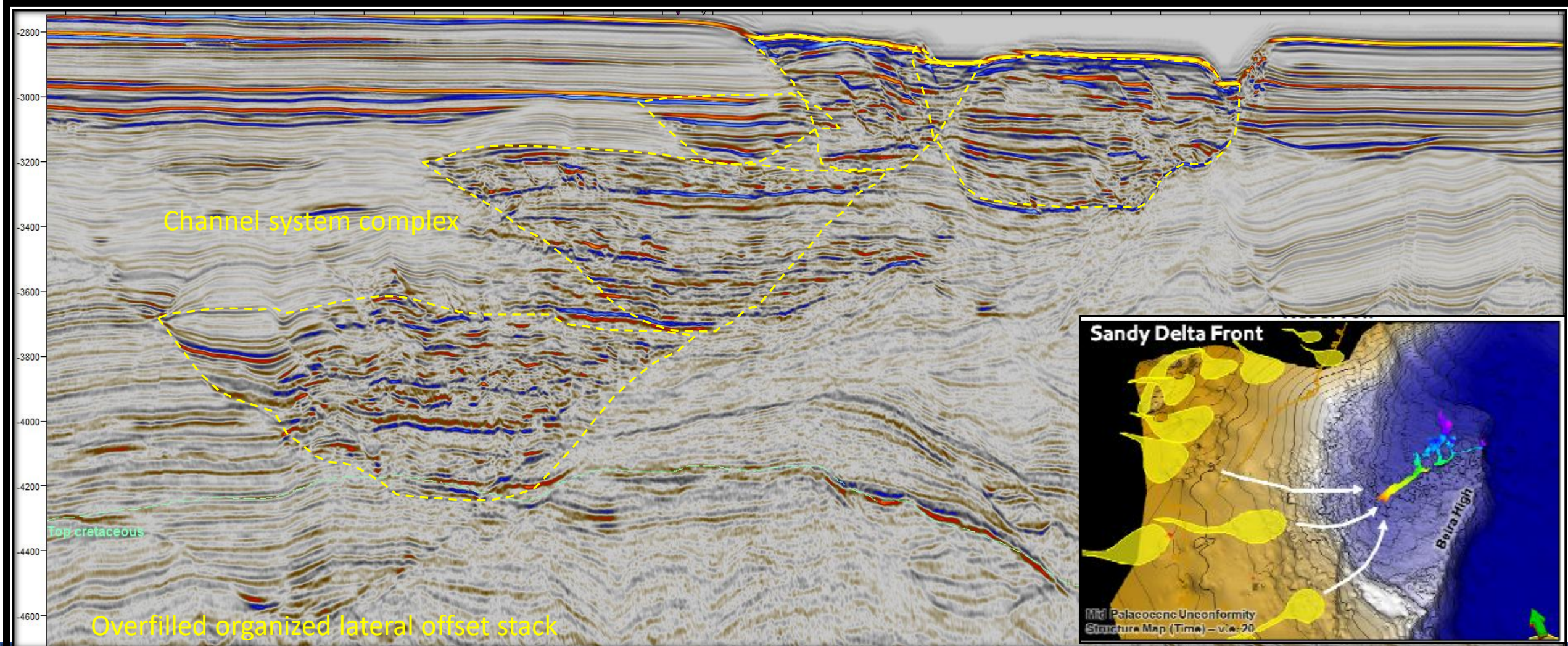
MOZAMBIQUE BASIN

EXPLORATION OPPORTUNITIES

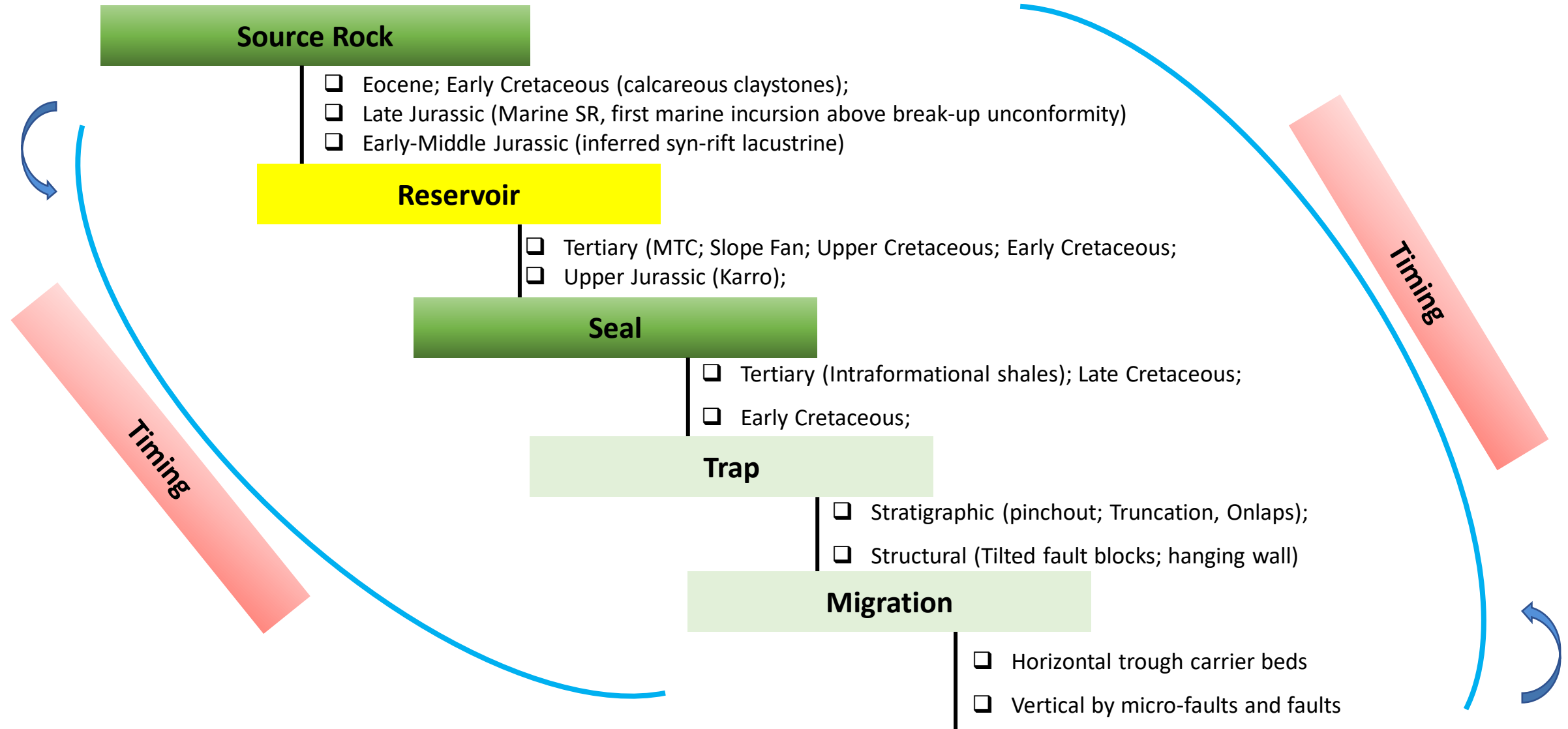
Available Areas For Hydrocarbon Exploration



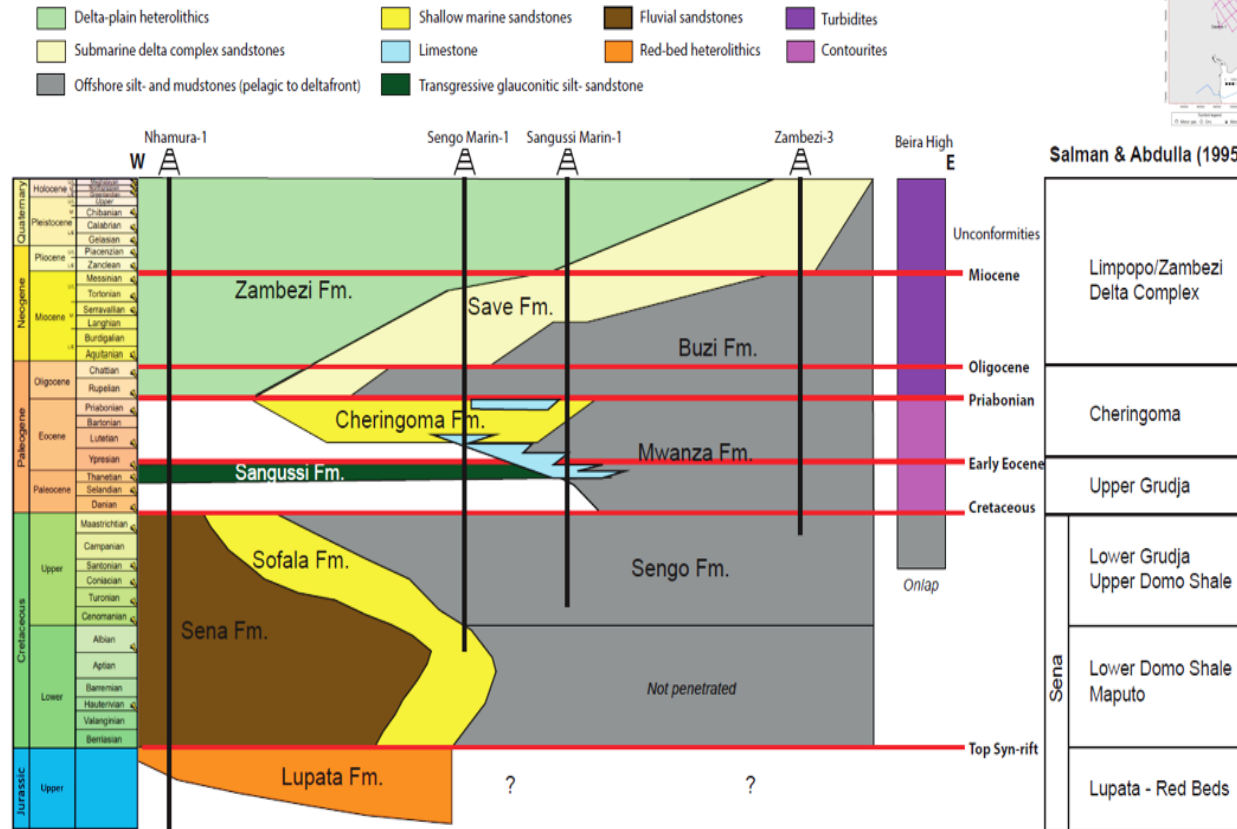
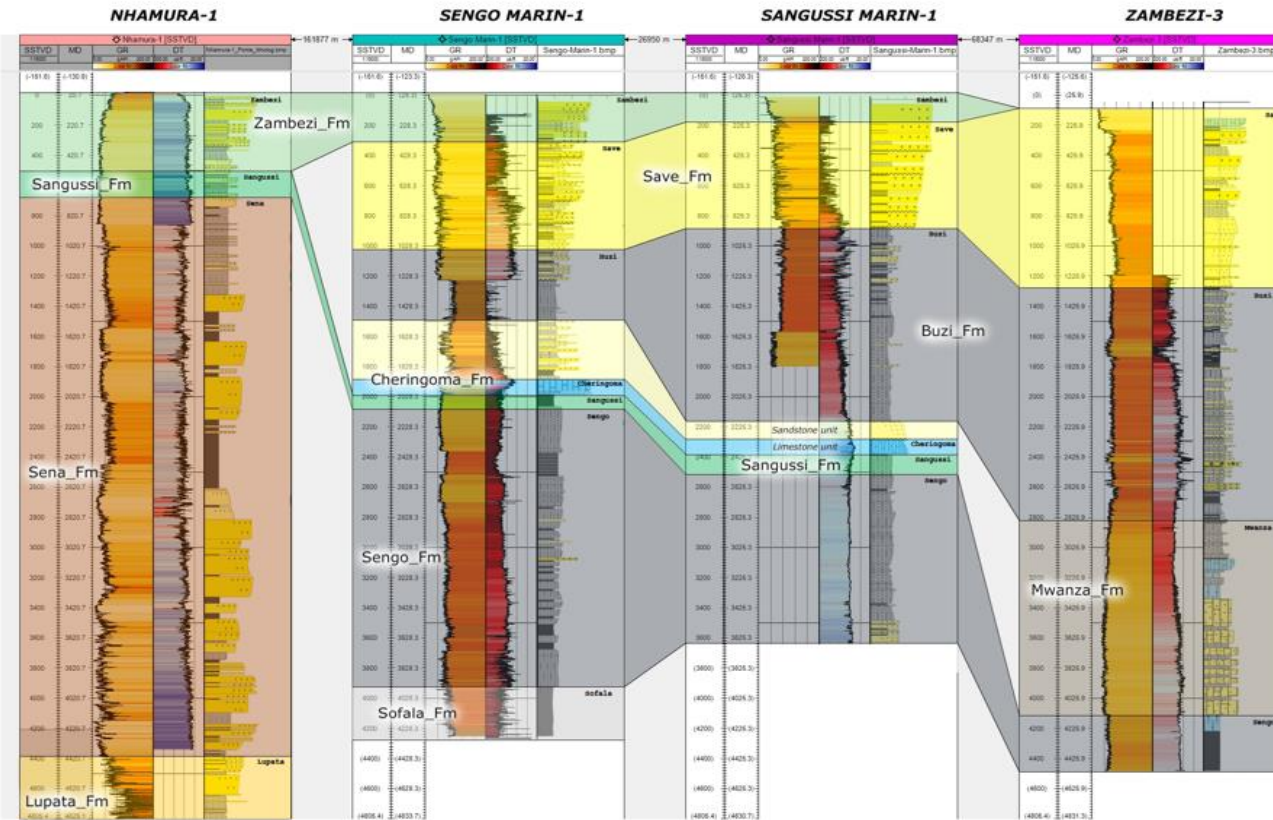
Offshore Mozambique Basin Zambezi Delta Area_Reservoir Potential



Petroleum System Elements



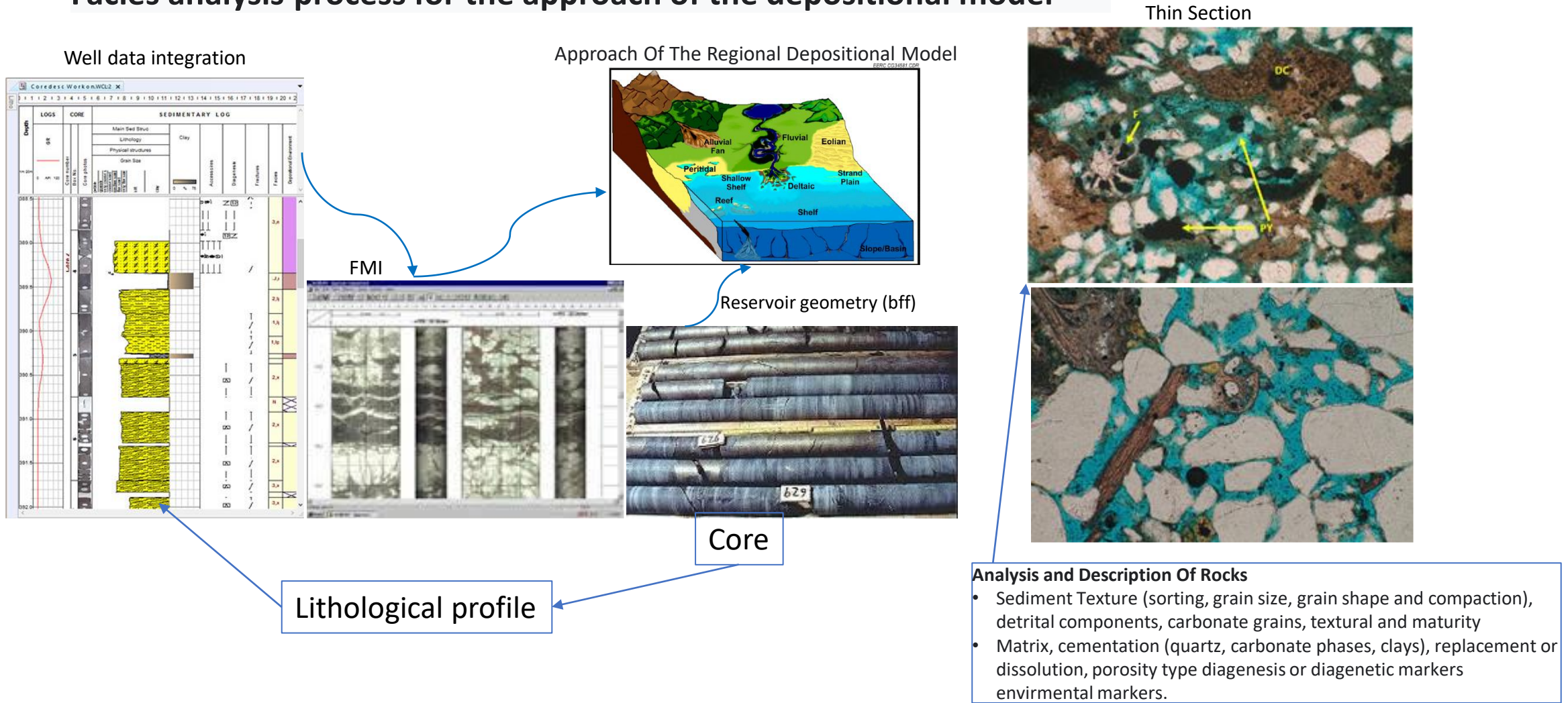
Mozambique Stratigraphic Nomenclature



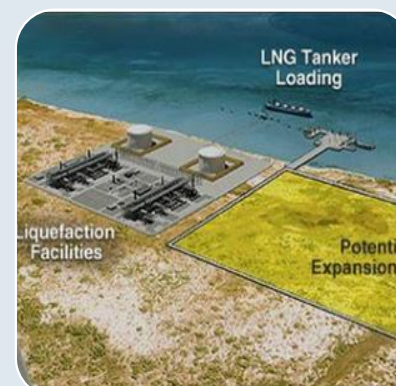
- The stratigraphic sequence is subdivided into 5 periods which correlate with the tectonic phases that form the framework of the geological history of Eastern Africa.
- **Pre-rift** volcanic basement(Lupata Fm.), **Syn-rift** phase (Middle Jurassic to Early Cretaceous) Sena Fm., Sengo Fm., **Post-rift** sequence (Early Cretaceous Paleocene and Eocene) and final Oligocene to Present.

Regional Study Of Reservoirs And Seals Of Mozambique, Phase-II

Facies analysis process for the approach of the depositional model



Projects - Current Situation



PPA (Pande/Temane)

- Contract signed in 2000
- Development Plan approved in 2001
- Production started in 2004
- Amendments approved in 2007 and 2015
- CPF **Capacity:** 197 MGJ/a
- Average annual production of 190 MGJ/a

Area-4 (Coral South Field)

- PoD approved February 2016
- Gas Monetization by means of FLNG;
- FID - Jun 2017
Production of 3,4 MTPA
GIIP of 15.67 TCF
- 6 production wells
- Liquefaction Platform arrived in January 2022 (At Cabo Delgado)
- First production in 2S 2022
- Investment of 7 billions USD

PSA (Inhassoro, Temane fields)

- Contract Signed in 2000
- Development Plan approved in 2016
- Amendment approved in 2020
- First production expected in 2023
- Expected to produce:
4 000 bbl/d of light oil for export
Natural gas for power generation
LPG-30 000 ton/a for domestic use
- Drilling activities and construction ongoing

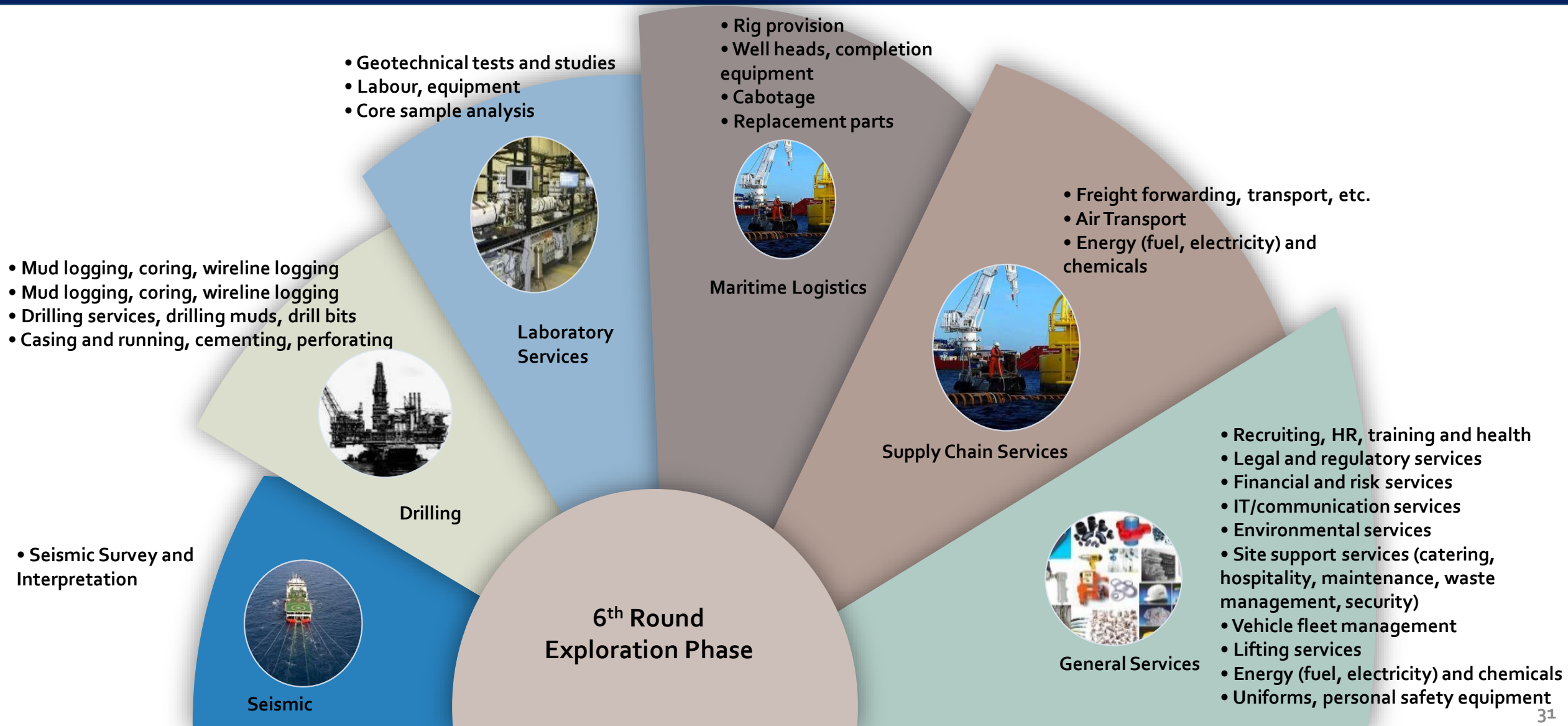
Area-1 (Golfinho/Atum field)

- PoD approved in February 2018
- Two LNG trains with 6,56 • MTPA each
- GIIP of 31.3 TCF
- FID reached on June 18, 2019
- 18 *production wells*
- *Declared Force Major In May 2021*
- *Investment of 20 billions USD*

Area-4 (Mamba Field+Oligocene 385E)

- * PoD approved in May 2019
- Two trains with 7,6MTPA each
- GIIP of 53,1 TCF
- 24 *production wells*
- Pre-FID reached on October 2019
- Investment of 23,6 billions USD

PROJECTS OPPORTUNITIES



Energy Transition - Challenges And Perspectives

Challenges

- Include aspects related to the Energy Transition in the legislation of the Petroleum sector;
- Ensure the existence of tools for monitoring GHG emission data;
- Create and improve technical capacity to monitor, evaluate and report on sector emissions;
- Create a Decarbonization Plan for the sector.

Perspectives

- Define, in the tender phase for the Concession of new areas, requirements relating to the commitments assumed by the companies regarding the reduction of GHG emissions;
- Encourage Operators to share their emissions data;
- Encourage Operators to introduce new decarbonization technologies and implement projects to reduce emissions (e.g. CCUS).

Final Remarks

- Mozambique offers countless opportunities for investment throughout the value chain (upstream, midstream and downstream), as well as, competitive fiscal regime and welcome all investors.
- Despite the overcoming of energy global disruption, it is forecasted natural gas demand growth for at least the next decade, and Mozambique projects have a good potential due to their strategic location.
- The global energy matrix will continue to be dominated by fossil fuels over the next few decades, however, it is important that the country continues to prepare for the energy transition.



THANK YOU

OBRIGADO