



# ASPO PRESENTATION

EXPLORATION NEWS

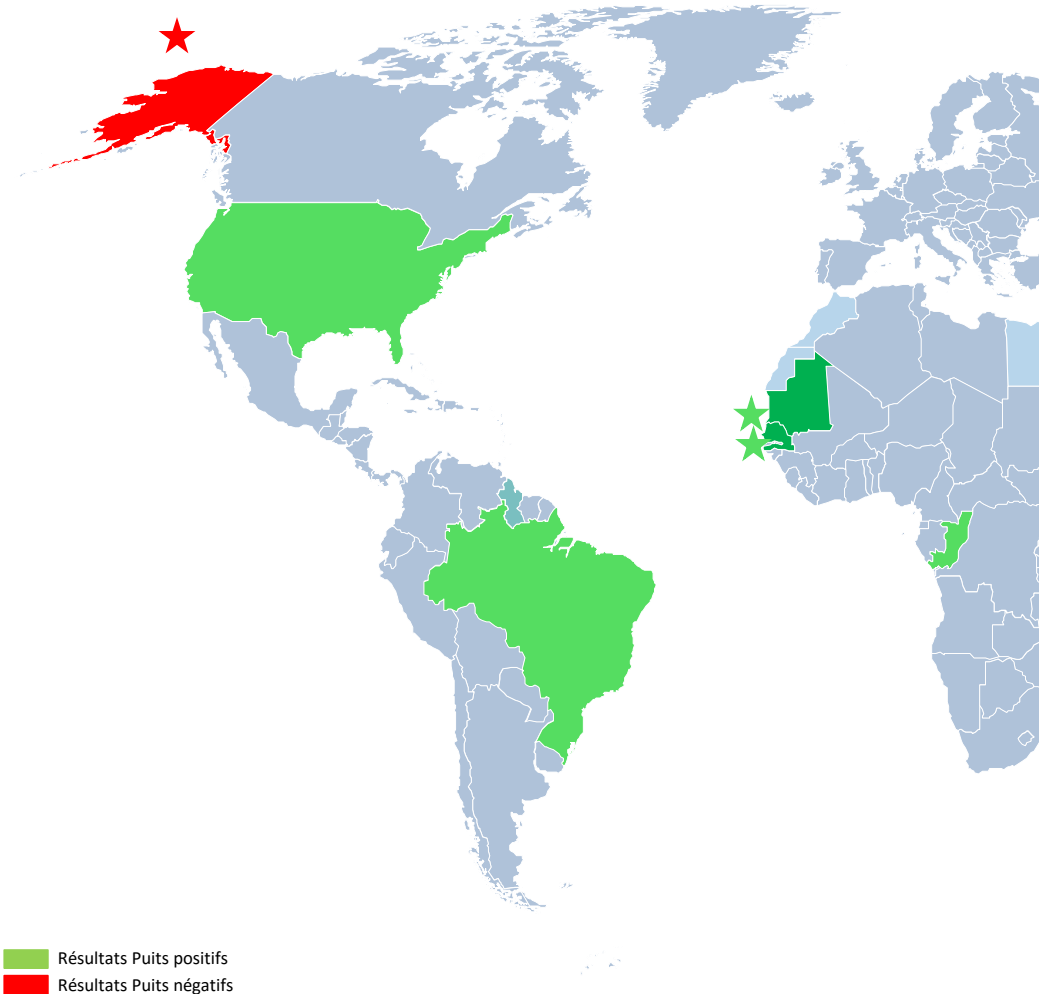
Marc Blaizot

05/04/2016



# FAITS MARQUANTS au 01/03/2016

## Exploration / Appréciation : SENEGAL and US-GOM



### Liste des PUITs

**SENEGAL-CAIRN** (and Conoco)–**Sangomar** appr **SNE-2 and SNE-3** »  
 .WD : 1200m

8000 bopd of 32° API oil at 2800 m at SNE-2 and 5000 bopd at SNE-3. Communication with SNE-1: 2P reserves : 400 Mbo

**SENEGAL- KOSMOS- St Louis Offshore Profond- Guembeul 1 TD** :  
 5200 m with 100 m net gas . Communication with Great Tortue (Mauritanie) field evaluated at 17 Tcf and renamed Ahmehyrm

**CONGO– ENI – MARINE 12 Block- N’Kala 1**

250m column of Gas and Cd in Presalt Buildup ? -350 Mboe

**USA-GOM-STATOIL** (**Yeti** : Miocene sands ! )close to Cascade field and **CHEVRON** (**Sicily** : TD at 10300 m and 350 Mbo) discoveries

**USA –GOM- COBALT** ( and Total 40%) **good Wilcox appraisal at North Platte 3** (550’ net oil pay similar to NP-1 in 2012)

**USA-Alaska- STATOIL and CONOCO** pulls out of **Chuksi Sea-**

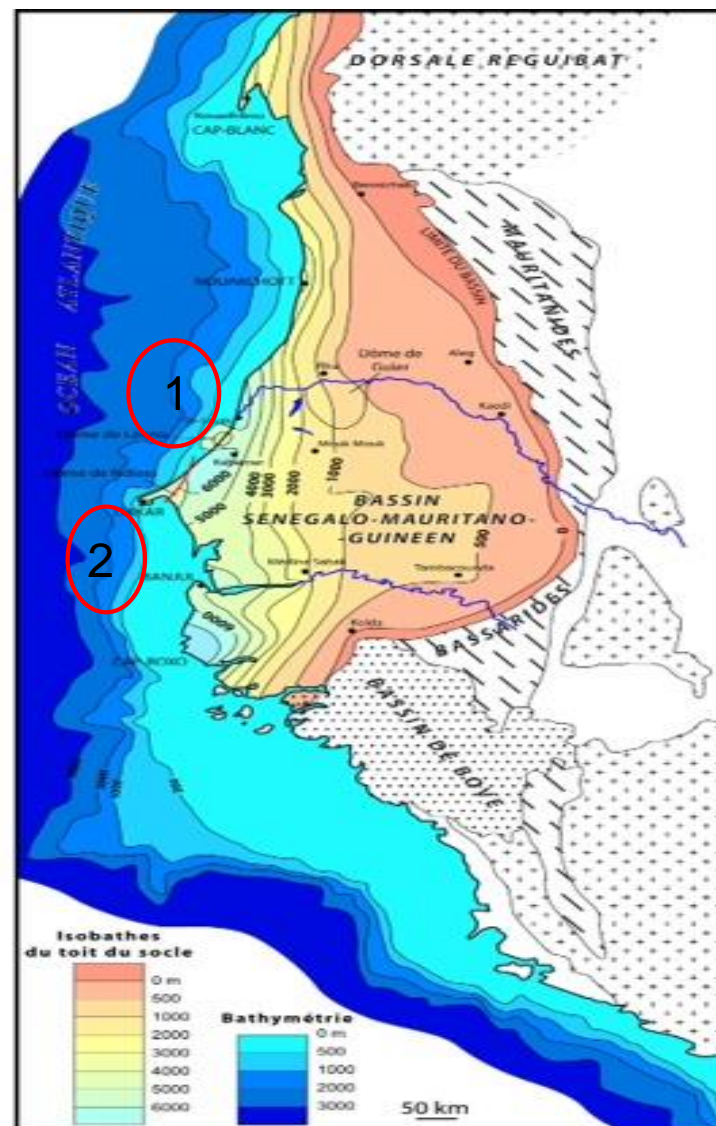
**BRAZIL-PETROBRAS- LIBRA 3 Appraisal** -WD: 1910 m  
 300 m 28°API oil column in presalt Carbonates

**KOWAIT - KOC- Umm Ruaiss North 1**

**MYANMAR- WOODSIDE** (and Total 40%)-A6- **Shwe Xee Htun 1**  
 130 m gas column but reservoir thickness ?

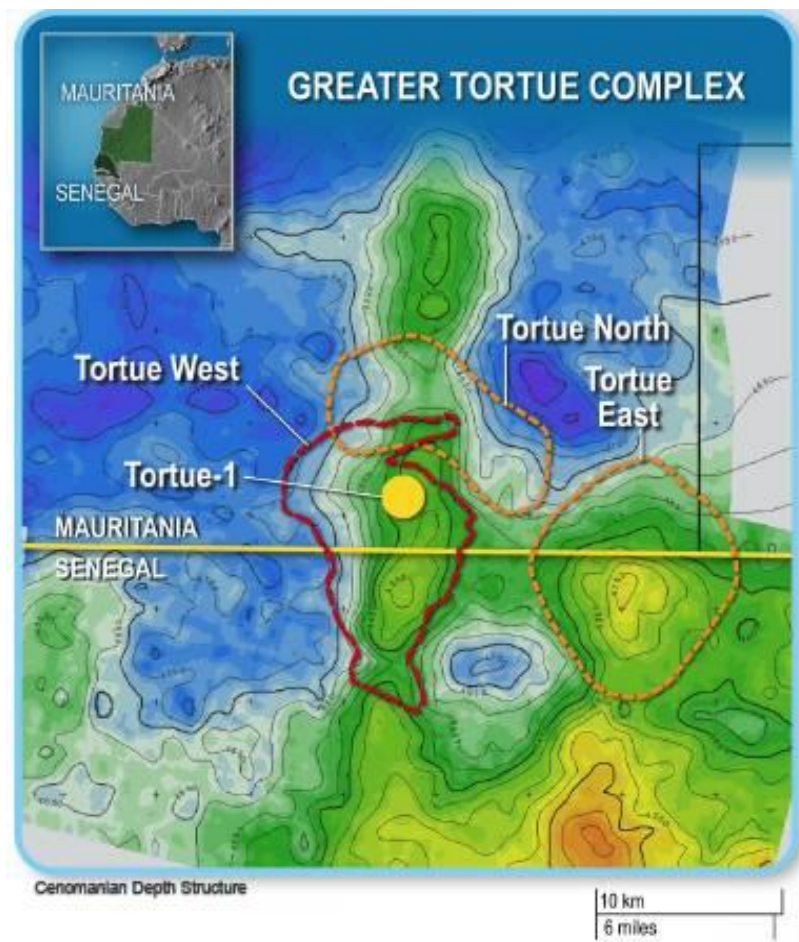
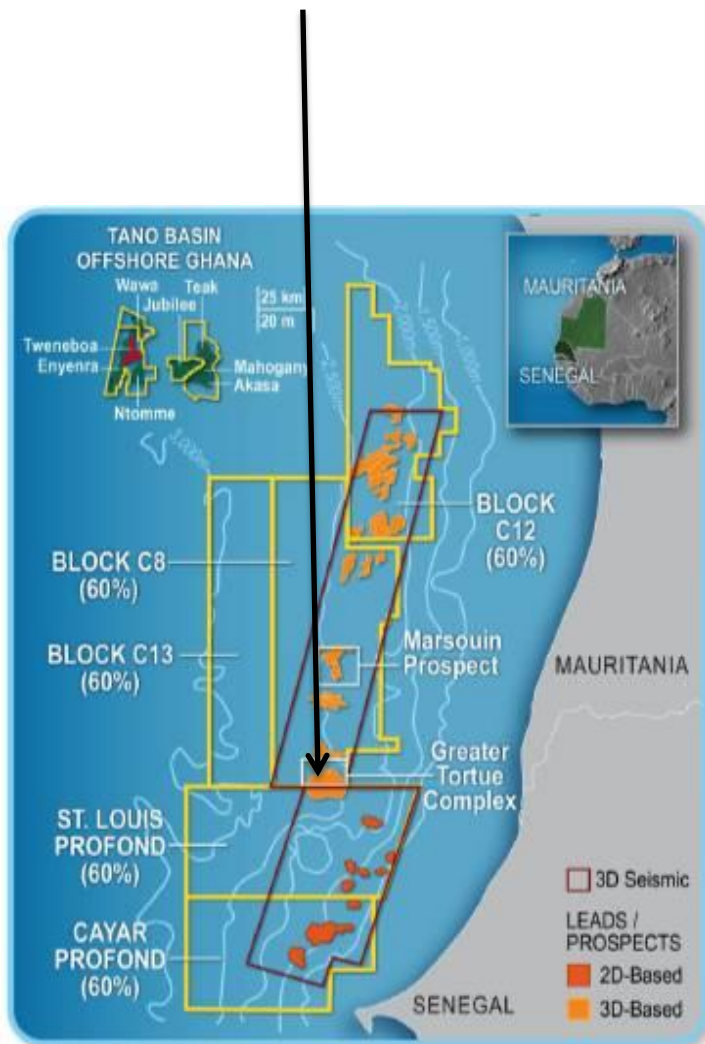
# BASSIN MSGBC : MAURITANO- SENEGALO ...

- Bassin épais : plus de 6000 m
  - Du Jurassique au Tertiaire dont Delta du Sénégal
- RM Jurassique, Crétacé Inf et Sup
- Sel Jurassique au Nord (Mauritanie et Sud Sénégal/Guinée Bissau)
- Carbonates Jurassique et Crétacé Inf.
- Clastiques Crétacé Sup et Tertiaire
- Résultats Explo anté 2014 : Petits champs Gaz (Dakar) et découvertes offshore Huile lourde Dome Flor -Indices Rufisque
- Exploration à gaz par Kosmos (1) et à huile par Cairn (2) depuis 2015



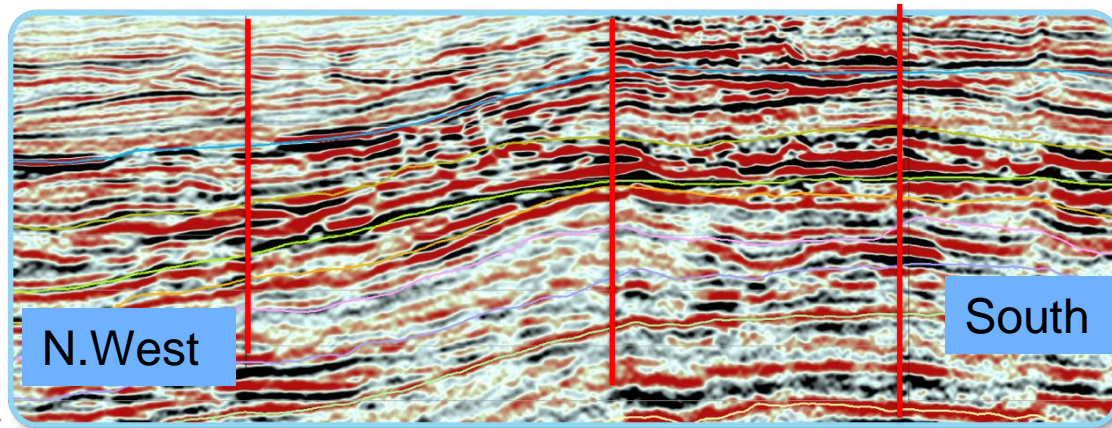
Compilé d'après la carte tectonique internationale de l'Afrique (1968), Liger (1979) et Ly (1985)

SENEGAL- MAURITANIA BASIN : TORTUE 1 discovery (from Kosmos website on 06/06/2015)

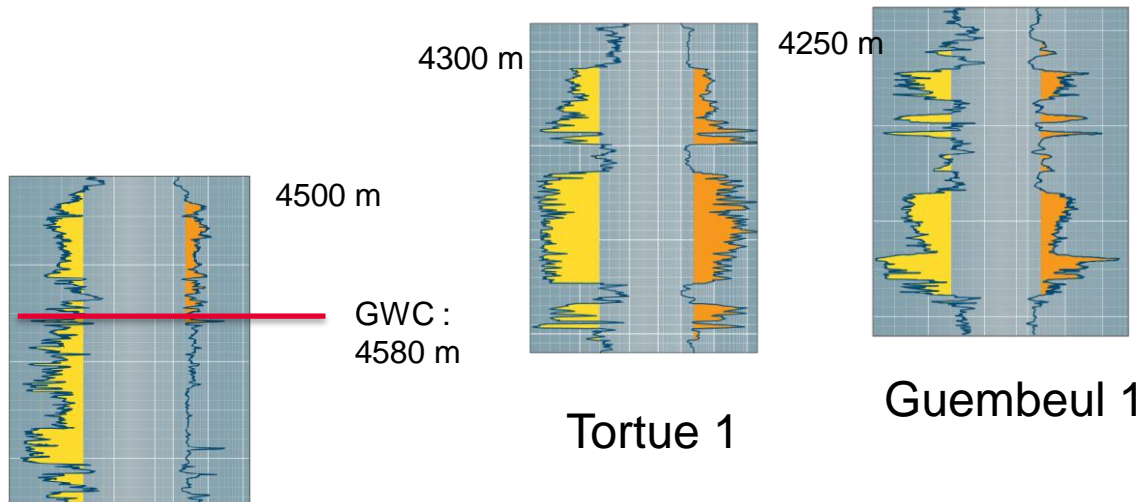




# TORTUE/AHMEYIM COMPLEX : SEISMICS AND LOGS



- 1) 150 m gross thickness Albo-Cenomanian blocky turbidites reservoirs
- 2) Static pressure communications
- 3) GWC encountered at Ahmeyim 2 well
- 4) Probable DHI/Flat-spot on seismics
- 5) 15 to 17 Tcf Tcf 2P reserves



Ahmeyim 2

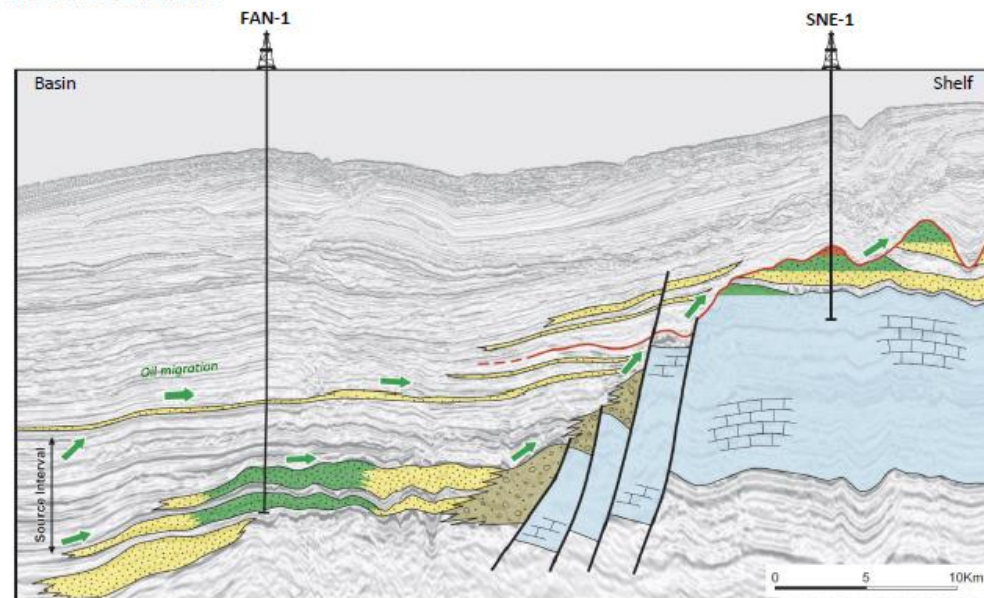
Modified from Kosmos website on March 2016

# Discovery and Appraisal

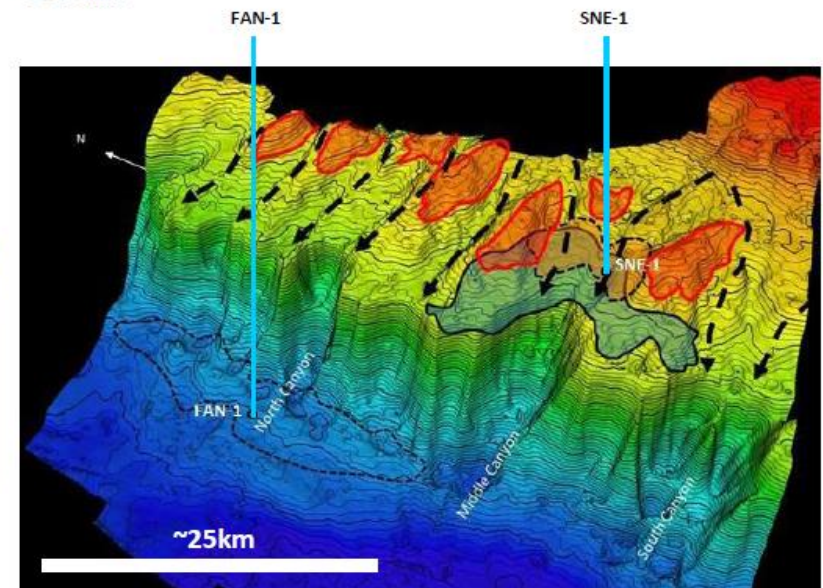
## Discovery Wells Drilling Schematic

- Two wells targeted multiple plays
- FAN – multiple deepwater stacked ‘fans’ of mid-upper Cretaceous and stratigraphic traps
- SNE – Cenomanian – Albian clastics over Aptian Carbonates – predominately structural traps
- SNE on budget, on time, no overpressure and no surprises in drilling

2D Seismic schematic



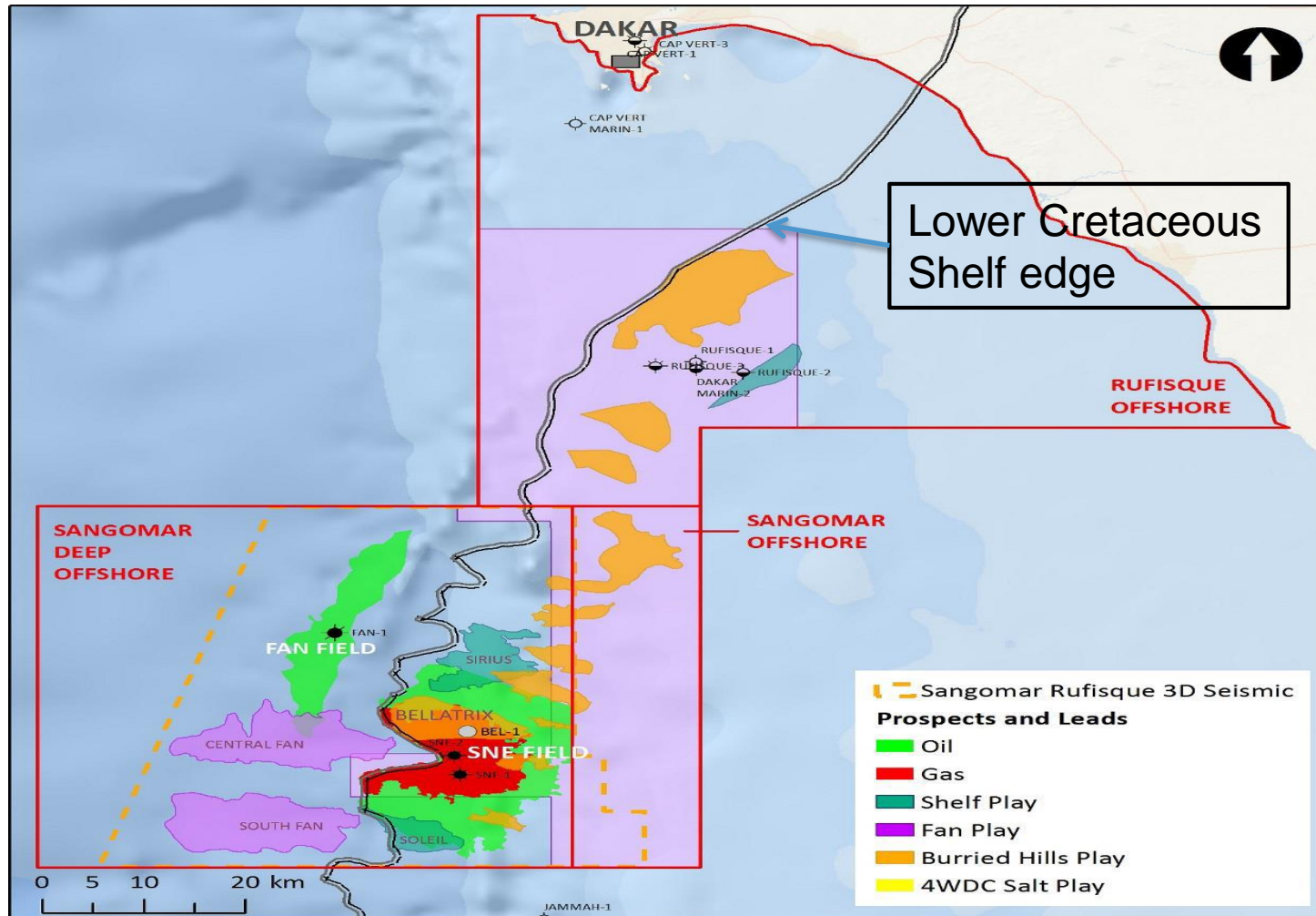
3D Seismic



Delivering value from



# SOUTH DAKAR BASIN



# SENEGAL : SANGOMAR OIL DISCOVERY : APPRAISAL DRILLING RESULTS

BEL-1

SNE-2

SNE-1

SNE-3

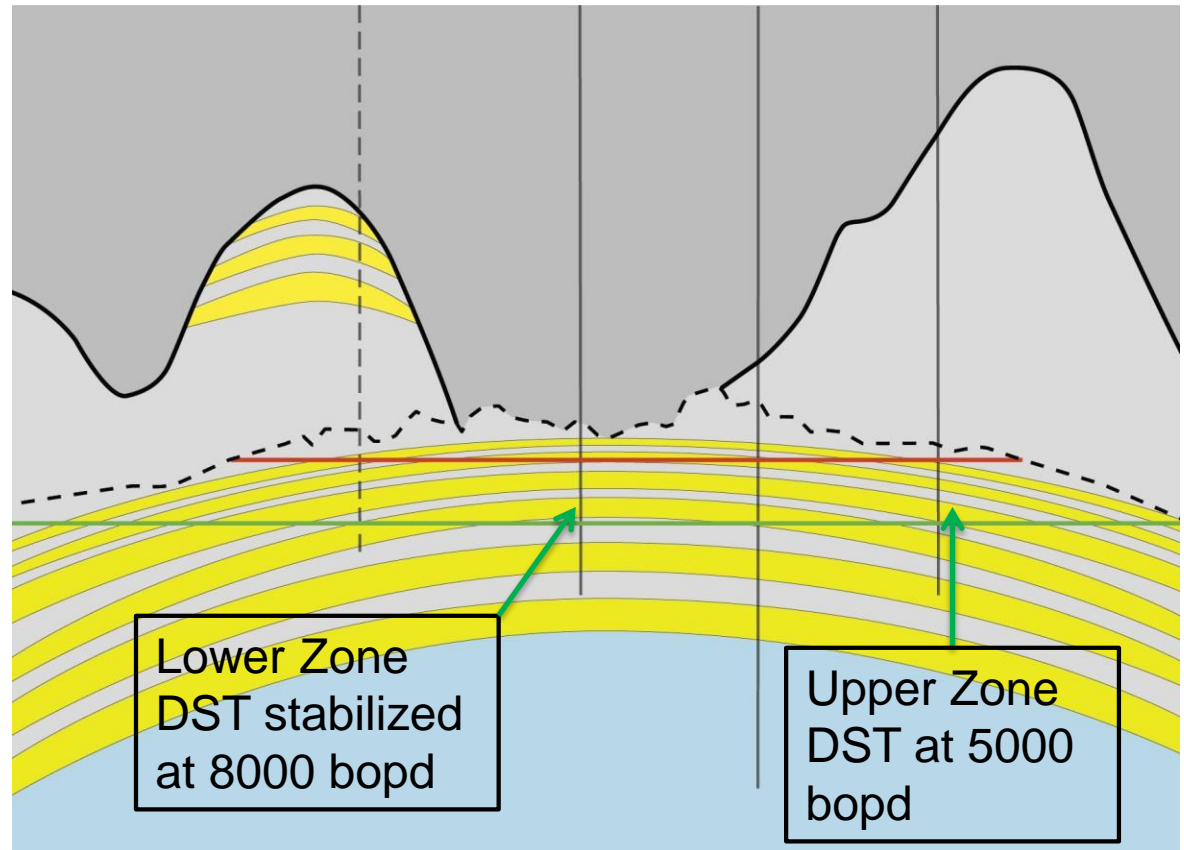
## Next Step :

### Bellatrix Exploration : BEL-1

Combined Exploration and  
Appraisal targets

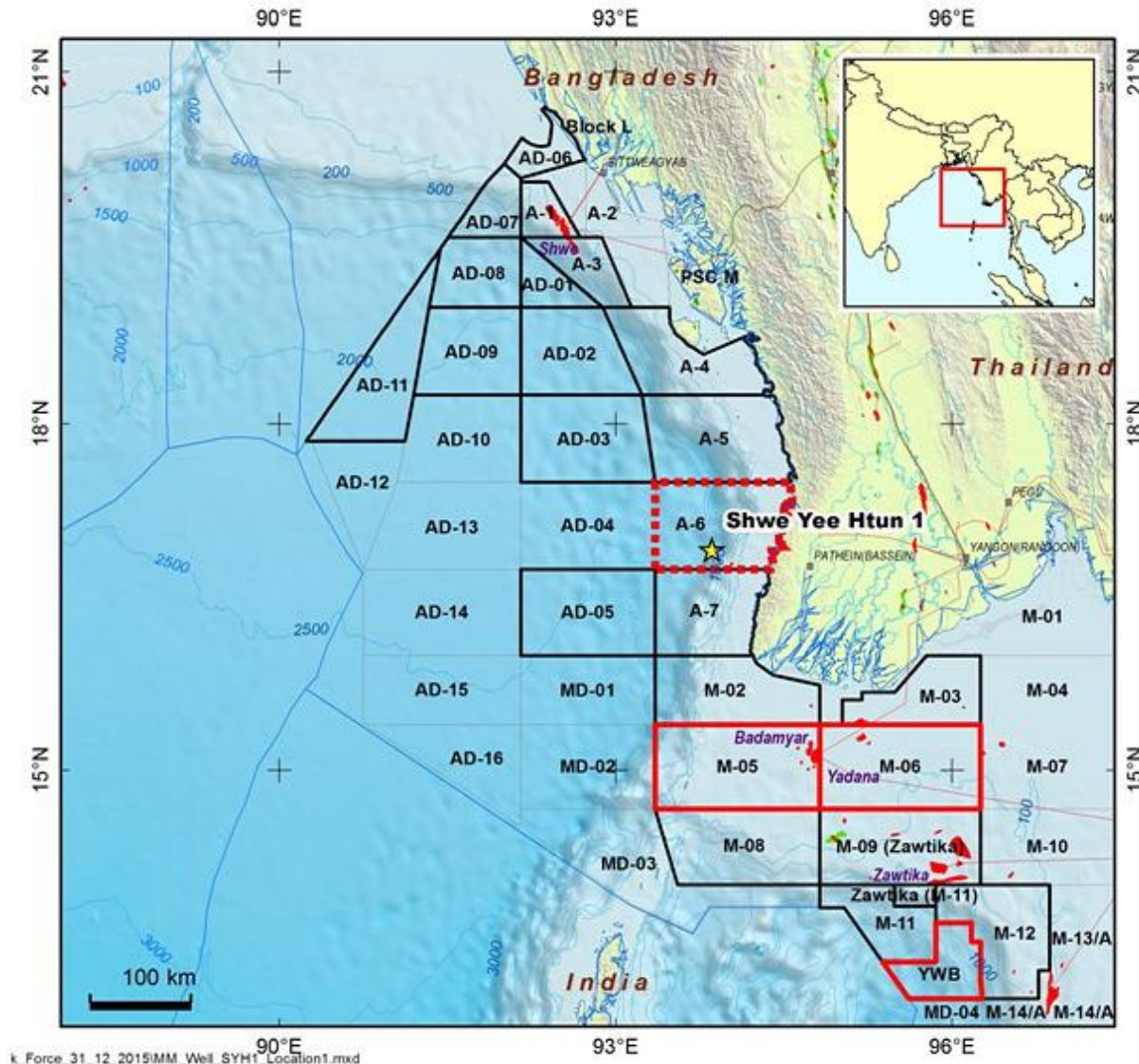
Primary objective shallower targets

- Ø Mean prospective resource 157 mmbbls
- Ø Appraisal in SNE field 3 km north of SNE-2
- Ø SNE reservoir section will be cored





# MYANMAR ; SHWE YEE HTUN DISCOVERY BY WOODSIDE AND TOTAL

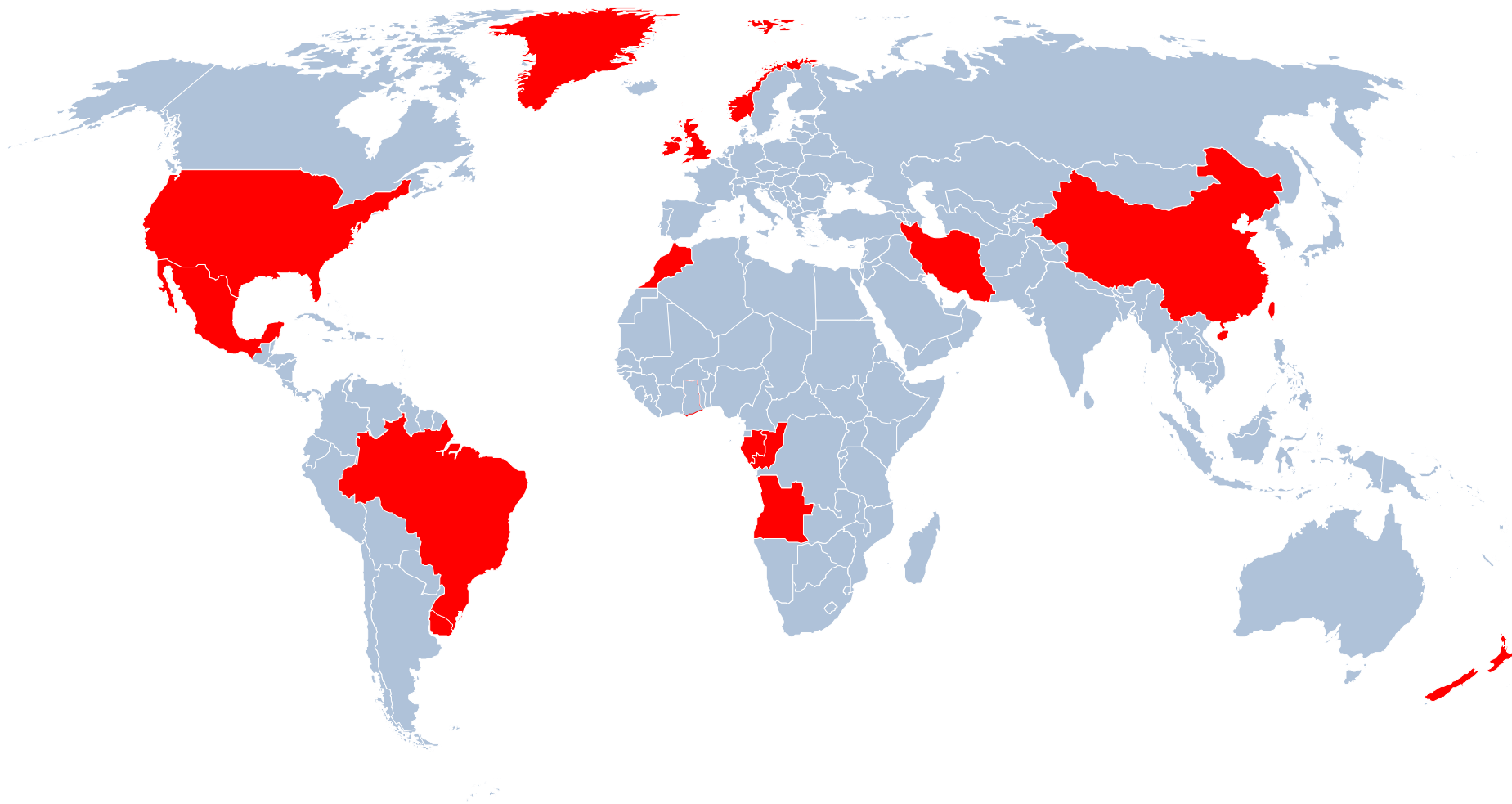


150 m gas column Thin sandstones ; anticlinal structure below thrust 1 Tcf ?

A new foothill province ?  
Key Question ; sands provenience ?

# NEW AREAS (rounds) for EXPLORATION in 2015/2016

(Main Opportunities)



# NEW AREAS IN 2015 : AMERICAS

- GREENLAND

- Disko and Nussuaq Onshores : 3 blocks 13000 km<sup>2</sup> December 2016
- Baffin Bay offshore 84000 km<sup>2</sup> december 2017
- David Strait 88 000 km<sup>2</sup> December 2018

- USA : March 2016, the 23th with a crowd of...protesters !

- Sale 241 (Central) 148 bids submitted on 128 blocks (8349 offered or 44 Millions acres) by 30 companies for 156 Mus\$ (4th lowest since 1983)
- Sale 226 (Eastern) : no bids submitted !

- MEXICO : first ever deep waters Round !

- 4th part of Round 1 will be launched in 2016 for 10 deep waters 4 Blocks in Perdido Cinturon for 8000 sqkm and 6 blocks in Cuenca Salina for 16000 sqkm . Data Rooms open until May .Application dossiers for July 2016 6 1à Y exploration period.

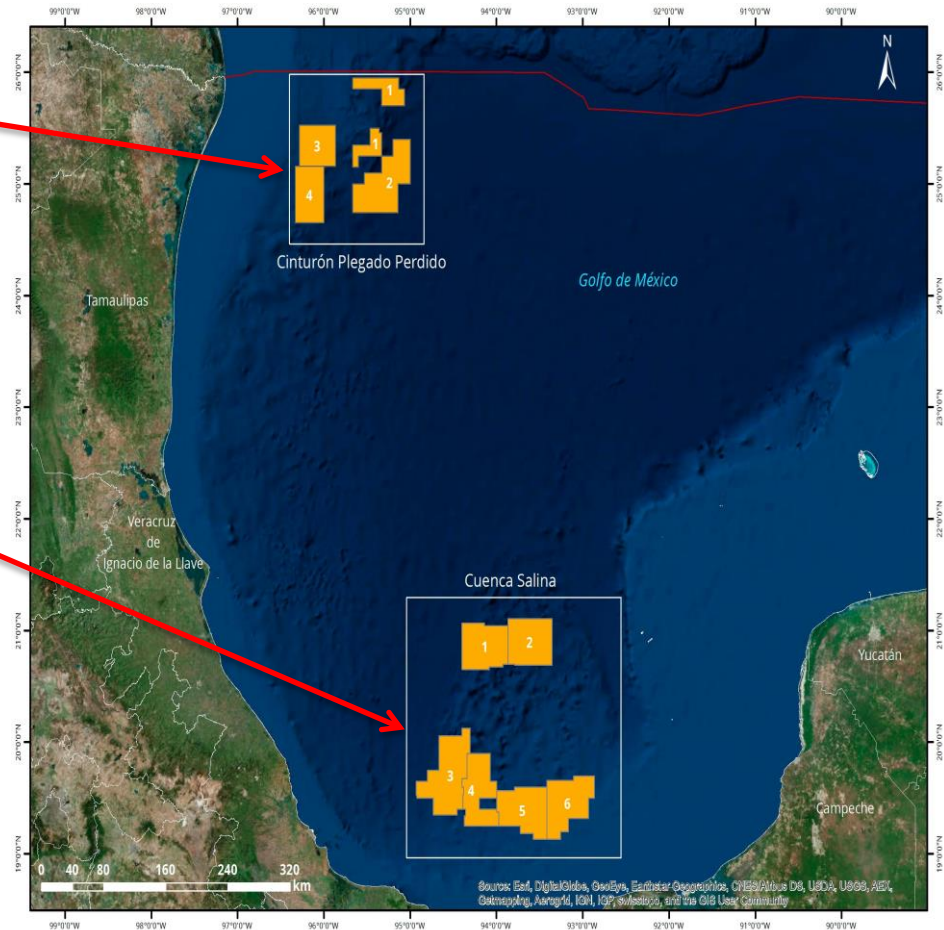
- URUGUAY

- 3rd DO Round planned for 2016/2017

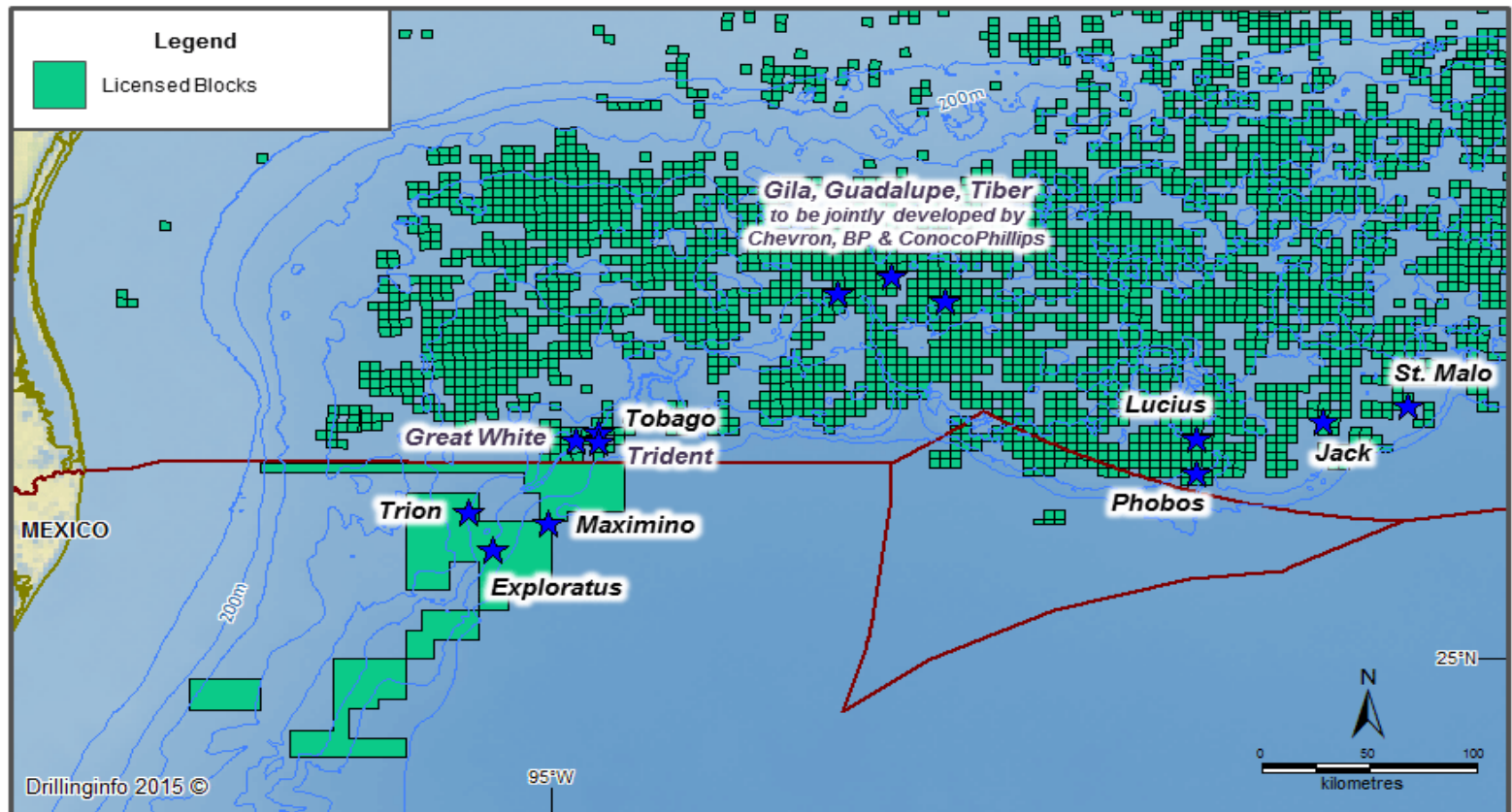


# MEXICO RONDA 1 – LO-4 : DEEP OFFSHORES

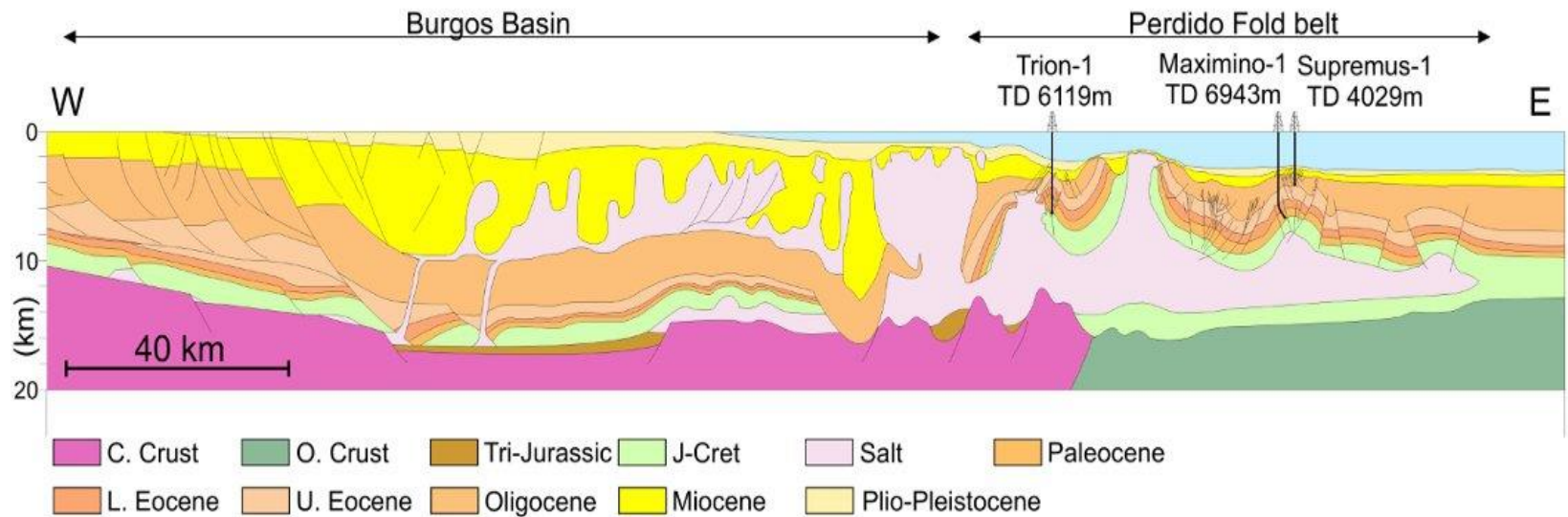
- 1) Perdido Fold Belt  
1000 to 3600 m WD  
Eocene /oligocene Turbidites  
Miocene salt cored SW-NE  
Folds  
P50 unrisked : 2.5 Gboe  
Gas or VL oil
- 1) Cuenca Salina  
500 to 3000 m WD  
Neogene/Paleogene Sands  
Oolitic or Fractured Carbonates  
SSE-NNW Salt related folds and  
Canopies  
P 50 unrisked : 4 Gboe  
Gas to Normal Oil



- PERDIDO FOLDED BELT : Discoveries



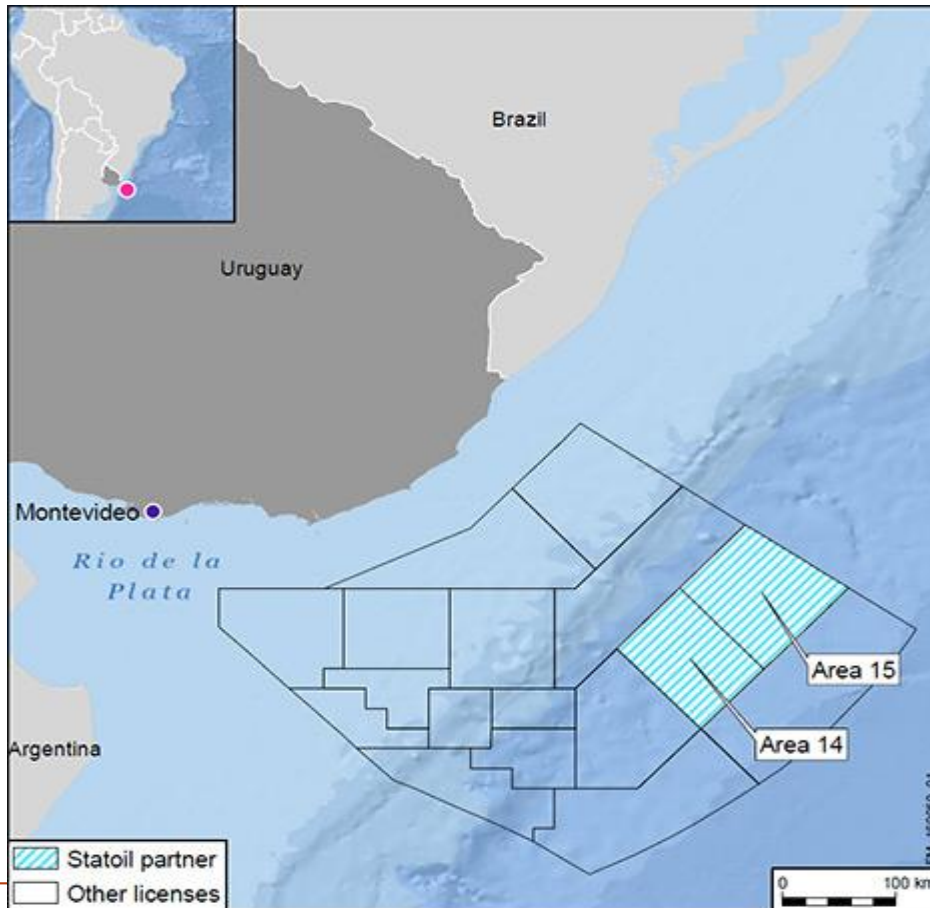
# PERDIDO FOLDED BELT





# URUGUAY : NEXT HC BEARING ? ATLANTIC ABRUPT MARGIN BASIN (PELOTAS BASIN)

- Raya 1 : first DO well in Uruguay in block 14 operated by TOTAL (40%) after farm-in from EXXON (35%) and Statoil (15 %) which enters also block 15 (35%) operated by Tullow (35%) and Inpex



Raya spudded on March, the 30<sup>th</sup> 2016,

**WD ~3,400m ! World record !**

PTD ca. 7,000m, target  
Cretaceous fan, seismically-  
defined prospect,  
Mærsk Venturer DS.

Several Gboe evaluated

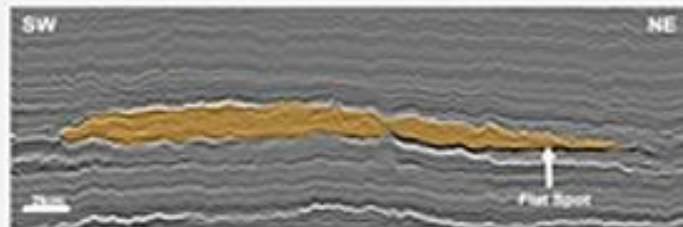
# URUGUAY : RAYA PROSPECT

## Frontier exploration with strong value creation potential

Uruguay Atlantic Margin, Block 14



Raya seismic section



\* CRI: direct hydrocarbon indication

Total 65%, operator

Successful farm-out completed

High-potential **frontier** prospects  
de-risked with 3D and DHIs\*

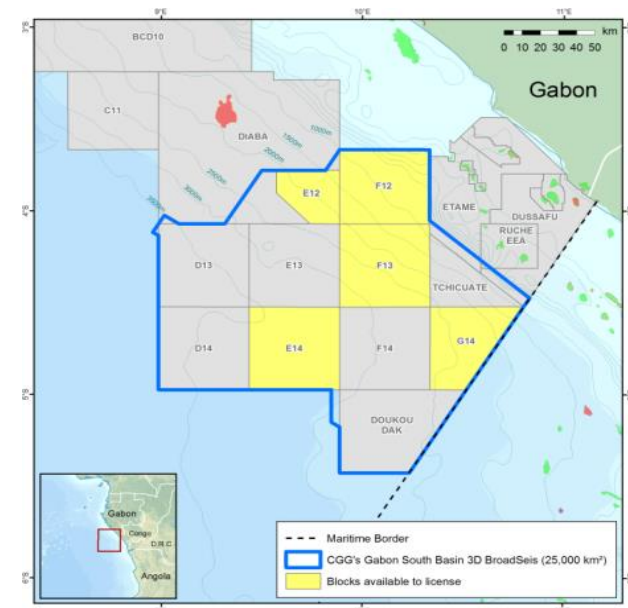
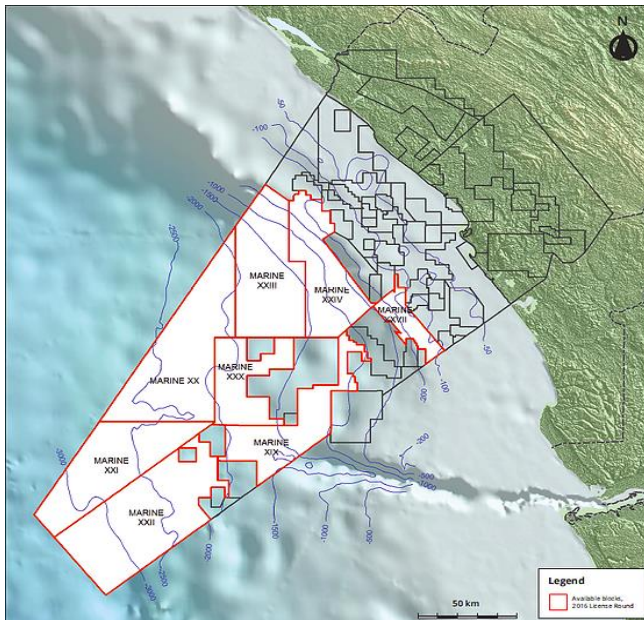
**Raya, a giant ultra-deep offshore prospect**

- **Exploration well in 2016**
- Success to de-risk several other targets

From Total's Investors Day, Sept 23, 2015  
<http://www.total.com/en/investors/institutional-investors/presentations/totals-investors-day-september-2015>

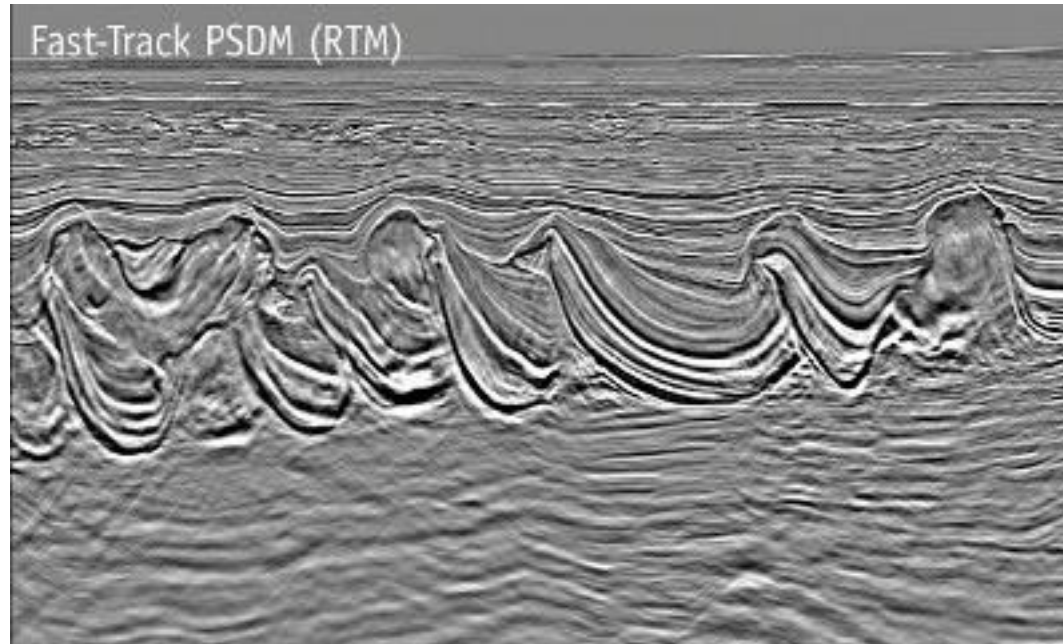
# NEW AREAS IN 2016 : AFRICA

- CONGO B. : 13 blocks , 8 VDO, DO and offshore (2/3 of the Congolese offshore !) and 5 onshore (Cuvette) ; submission date to be... announced after elections.
  - GABON: 11 th round, April 2016
    - 5 blocks (30000 sqkm) DO offshore south of the country , presalt targets
- 16 applications received : ONGC, Tullow, Sasol, Oranto, Tatneft**





# PRESALT EXPLORATION IN CONGO-GABON AT A GLANCE



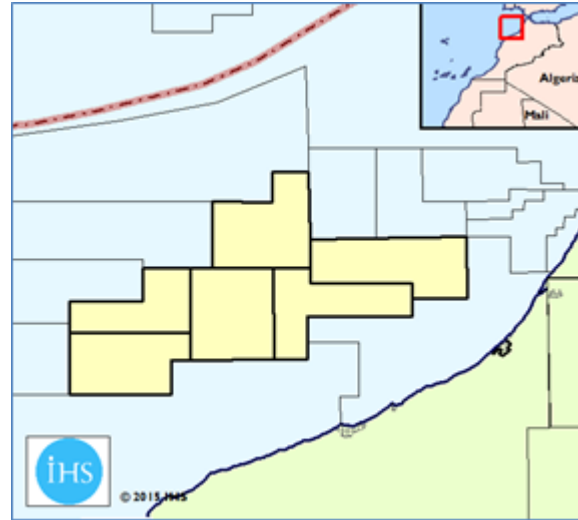
Seismic line : Courtesy from CGG

Looking for large  
simple presalt structure  
AND RESERVOIRS

Uncertainty : Could  
carbonates could  
develop ?

Pros : good SR in  
Lower Cretaceous  
Cons : gas risk as in  
Leopard (Shell) and  
Diamant (Total)

# MOROCCO : ENI ENTERS DO RABAT PERMITS



## Petroleum Rights / Company deals : Rabat Deep farm out

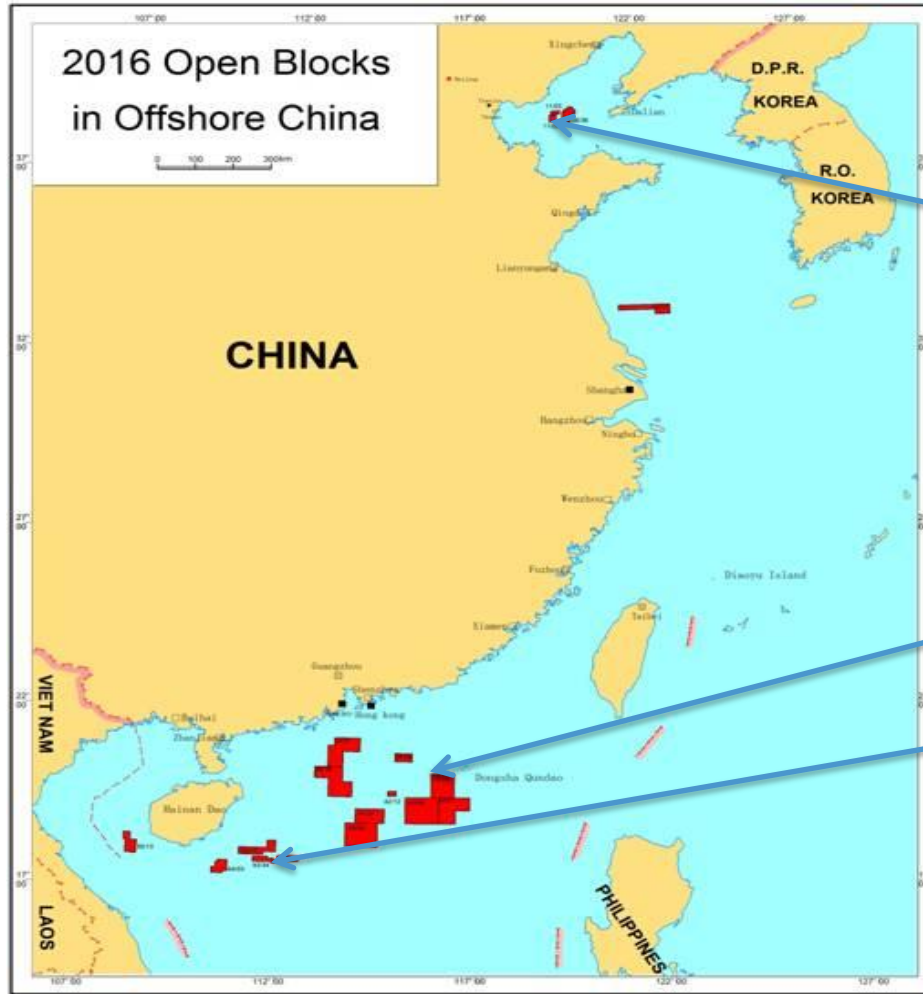
Eni has acquired a 40% operated interest from Chariot O&G in the Rabat Deep I-VI offshore blocks, 10,782 sq km in the Doukkala Basin. In its first foray into Morocco's upstream, the Italian co will carry Chariot through the JP-1 deepwater well (to an agreed cap) and other geological and admin costs, as well as pay a contribution to Chariot's investment. Deal pending approval from Moroccan authorities and partners. Following completion: Eni (op), Woodside, ONHYM (carried) and Chariot

# NEW AREAS IN 2015 : EUROPE AND ASIA

- NORWAY :
  - APA 2016 Awards : 56 blocks to 36 companies : NS, NWS and BS Applications due on Sept. 6, 2016 in NS, NWS and BS
  - 23rd Round applications: 26 companies (Statoil, Shell,bp, Chevron , Lukoil, Lundin, etc.. But not TOTAL, Exxon and ENI) for :34 blocks in SE Barents Sea (Western part of the Fedynski High) and 20 blocks in remaining Barents and 3 in Norwegian Seas
- UK 14th Onshore Round : Shle Gas and Oil ! 80 licenses allocated to mainly Cuadrilla, Igas, Celtique and GDF.
- IRELAND :Atlantic Margins Round mainly Porcupine Basin received 43 applications ; main offers from Exxon-Statoil (6 licenses) , ENI-bp, Nexen
- NEW ZEALAND : Huge acreage on sale : Northland (182 Ksqkm), Taranaki ( 60 Ksqkm), Pagasus ( 69 Ksqkm), Great South-Canterbury ( 208 Ksqkm) for September 2016
- IRAN :52 New ? Petroleum contracts on existing O&G fields ( 4 in Caspian Sea) to be offered as said on 11/28/2015 Tehran Conference
- CHINA: CNOOC operator issued a tender on 18 blocks offshore (52000 sqkm) for foreign companies participations; from Bohai Bay to Yinnggehai Basin through Pearl river Basin : some blocks disputed with Vietnam or Taiwan. Technological challenges : VDO, HP/HT, CO2 ...Closing Bids on October the 30th, 2016.



# 2016 OFFSHORE ROUND



- 1) Bohay Bay Basin  
Still possible small discoveries in shallow waters as Caofeiden 6-4-1 dilled in 02/2016 by Cnooc with a 6000 bopd
- 2) Pearl river Basin :  
VDO starting ?
- 3) Yinggehai graben :  
HP/HT context with CO2 risk

# IRAN : POSSIBLE ROUND ? 52 BLOCKS ANNOUNCED



May be different as rumors say TOTAL entered in negotiation four south Azadegan not presented in the « open » blocks