



# Hydrocarbon Exploration in Morocco: Status & Perspectives

APPEX GLOBAL/11th-13th March 2014/  
London UK





## Outline

- Conventional HC Exploration;
  - Licensing Status;
  - Exploration ancient objectives and New ones
  - Perspectives;
- Objectives in the open blocs;
- Summary



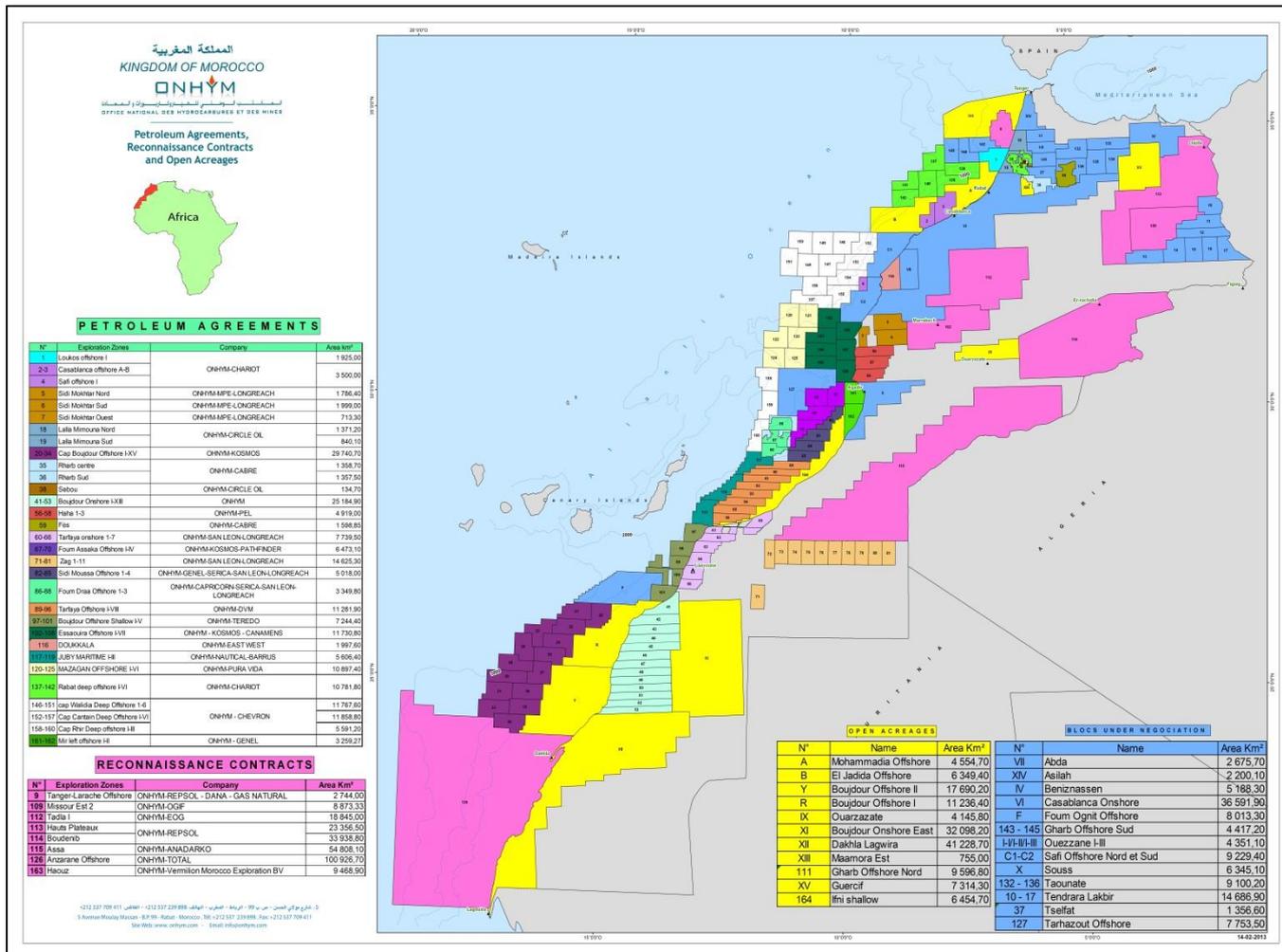


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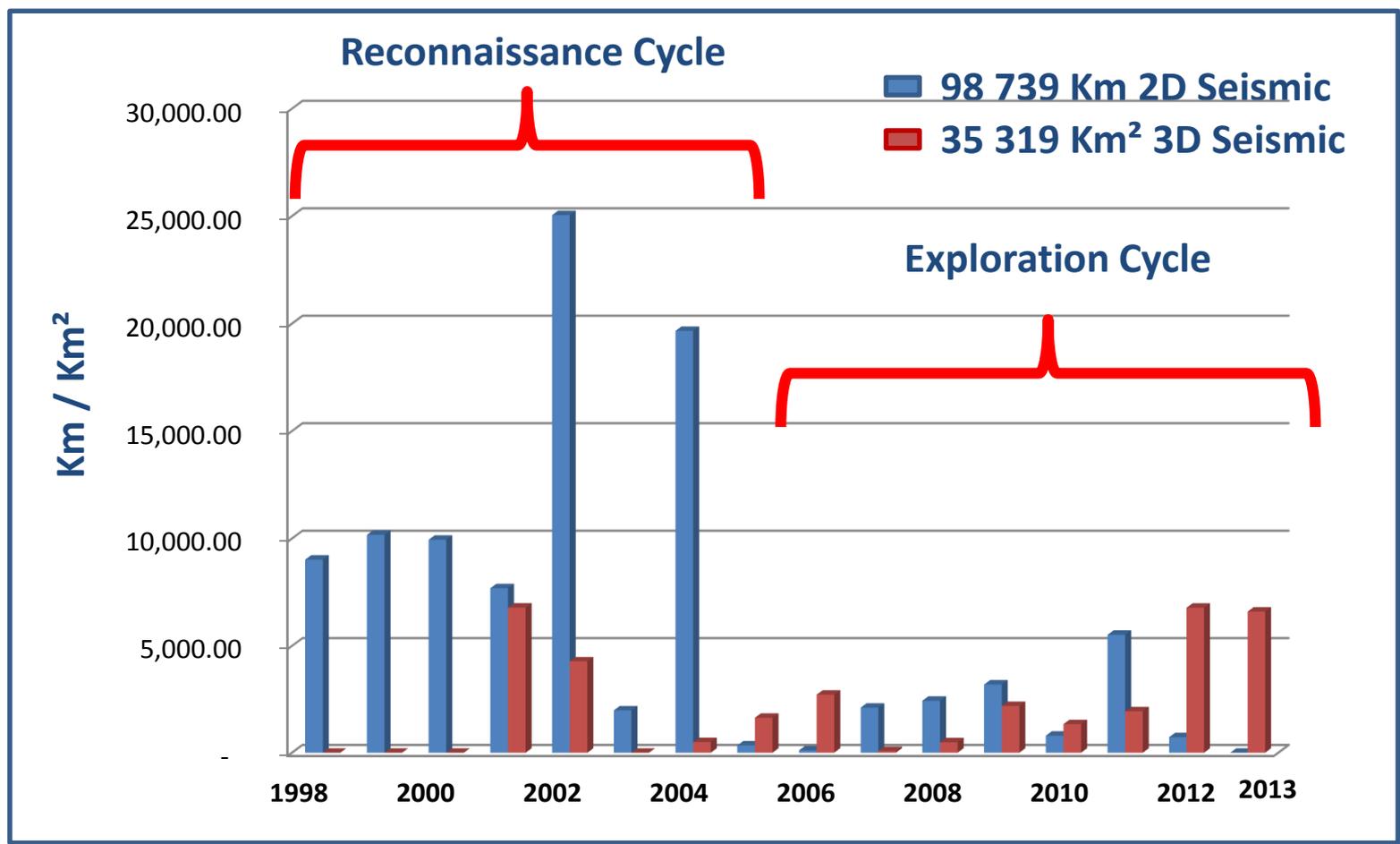
# Conv.H.C. Licensing Status



- Open acreage**
  - 06 blocks offshore
  - 05 blocks onshore
- Under negotiation**
  - 04 blocks offshore
  - 09 blocks onshore
- PA & RL**
  - 31 Petroleum Agreements offshore and onshore
  - 08 Reconnaissance Licenses (6 onshore and 2 offshore)

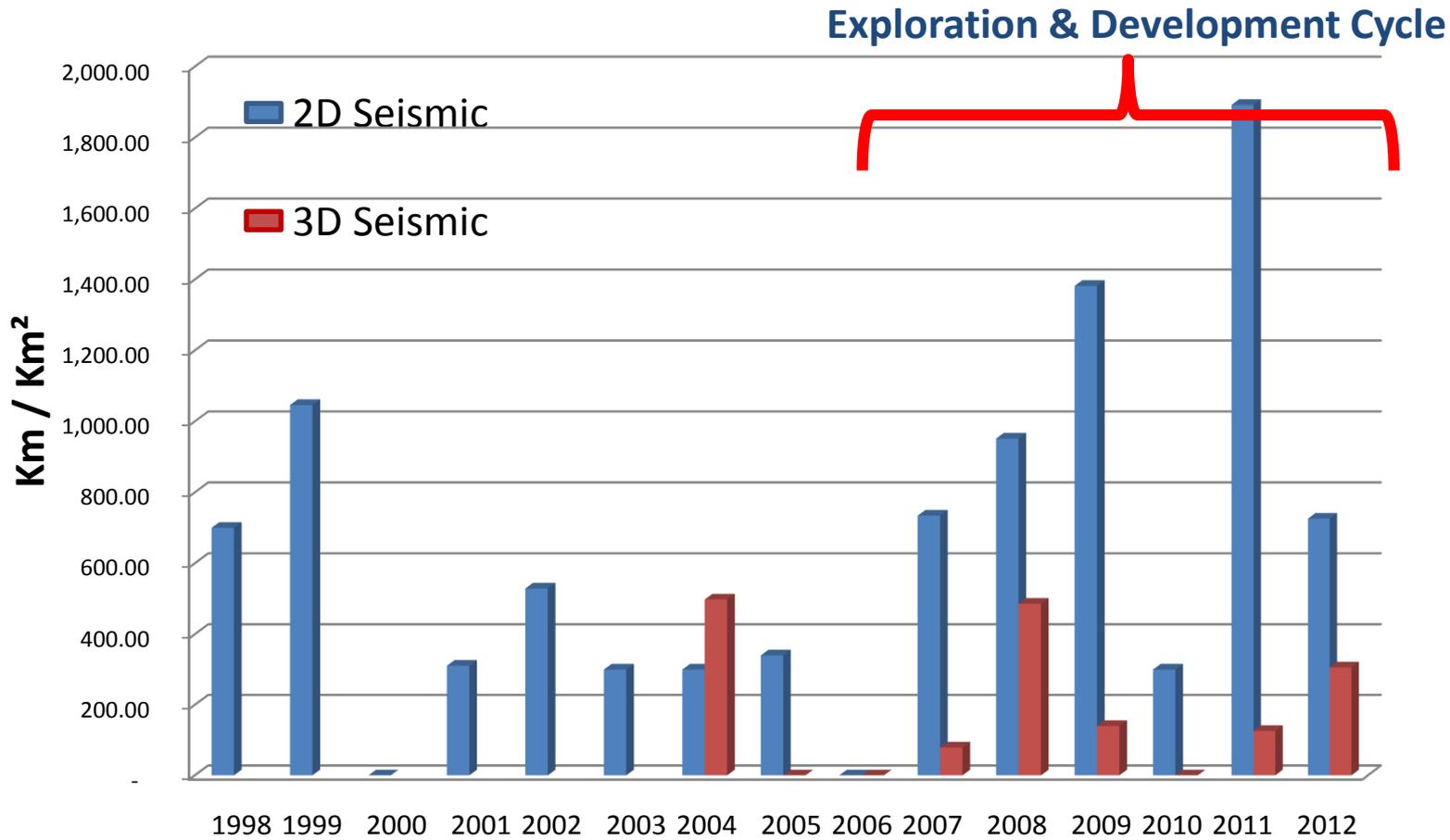
# Conv. H.C. Licensing Status

## 2D and 3D Seismic Acquisitions offshore 1998 - 2013:



# H.C. Licensing Status

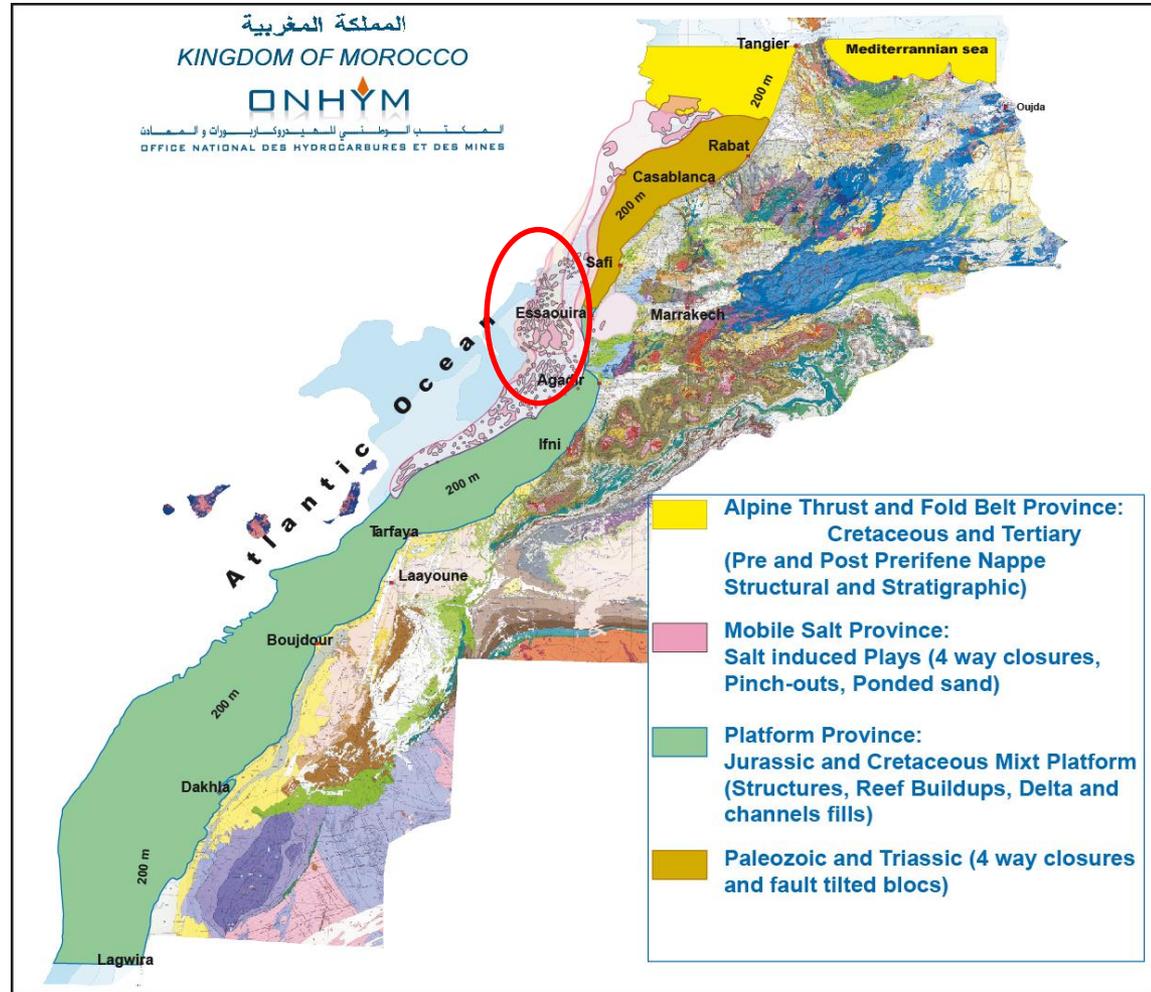
## 2D and 3D Seismic Acquisitions onshore since 1998:



# Ancient Exploration Objectives

## Ancient offshore exploration

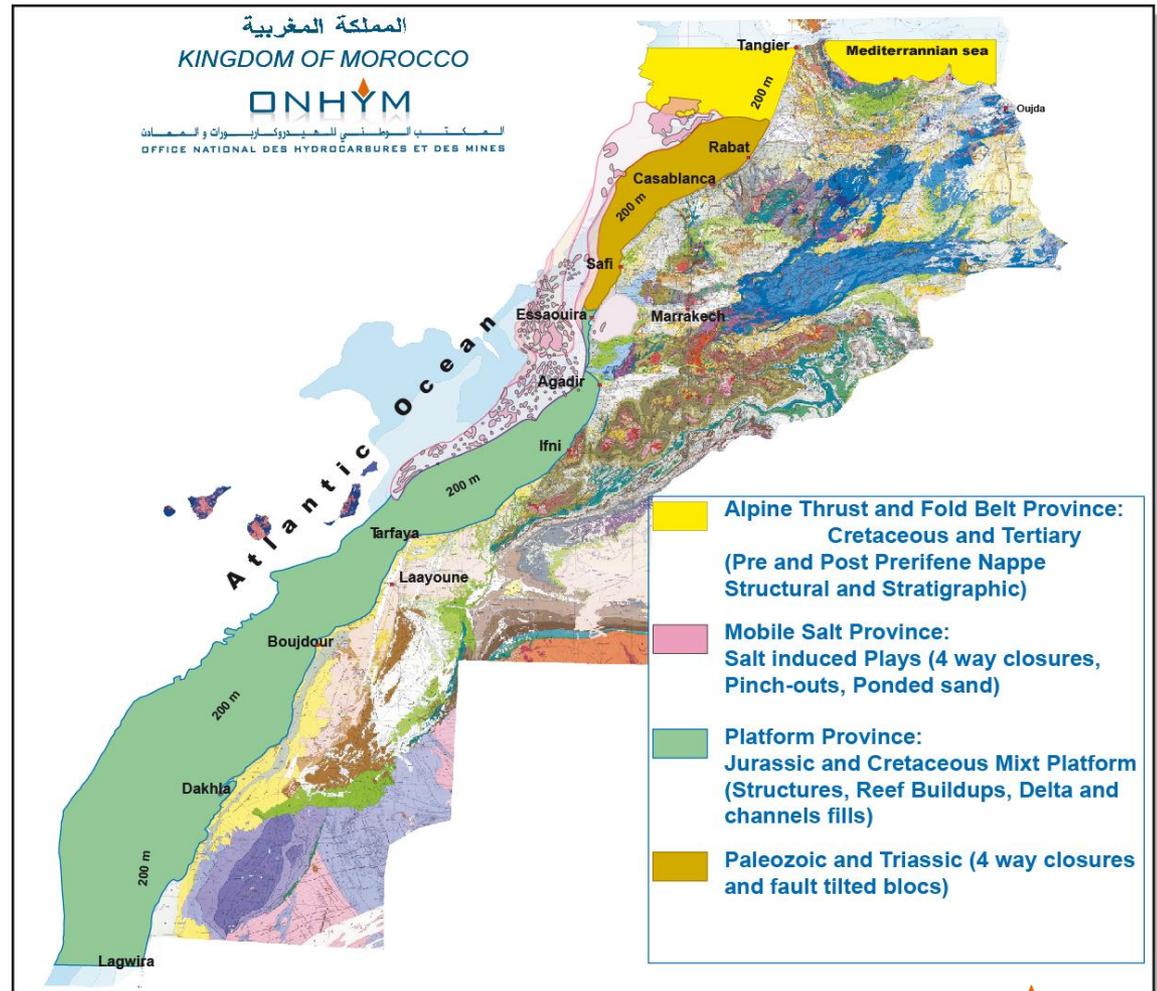
- Reconnaissance Cycle;
- Had set the bases for advanced exploration;
- Identified myriad of prospects and leads (Over 200);
- focused on one unique play,
  - In the Outboard of the central part of the salt province;
  - One unique Source Rock/Reservoir pair (Cenomanian/ Turonian, Tertiary).



# New Offshore Exploration Objectives

## Objectives related to the Main structural domains :

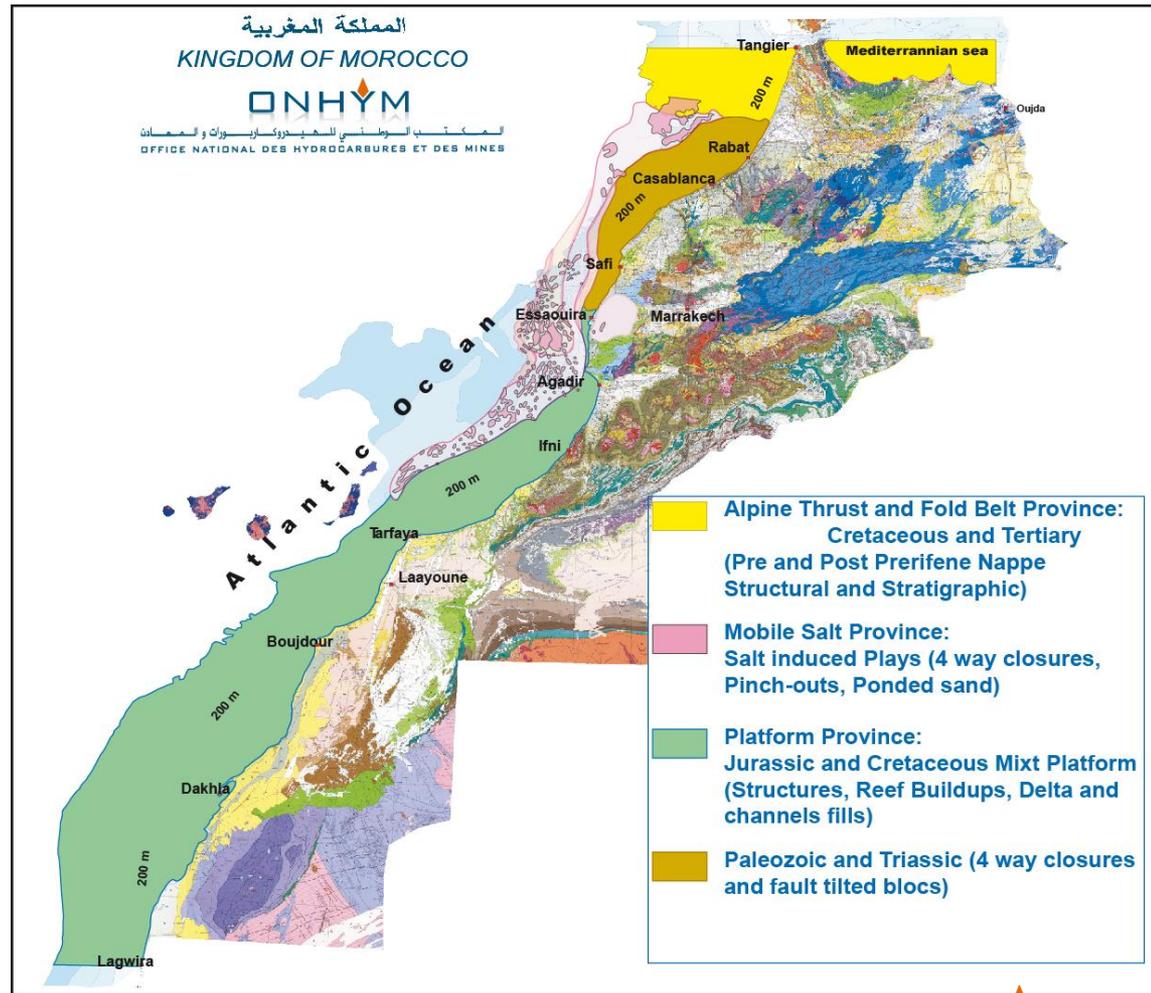
- Alpine thrust and fold belt province (Cretaceous and Tertiary)
- Northern Shallow Offshore Province (Paleozoic and Triassic)
- Mobile salt province (Jurassic, Cretaceous and Tertiary)
- Platform and Deep Offshore Province (Jurassic, Cretaceous and Tertiary)



# (SR , RR) Pairs: Offshore

## (Source Rocks , Reservoir Rocks) Proven Pairs:

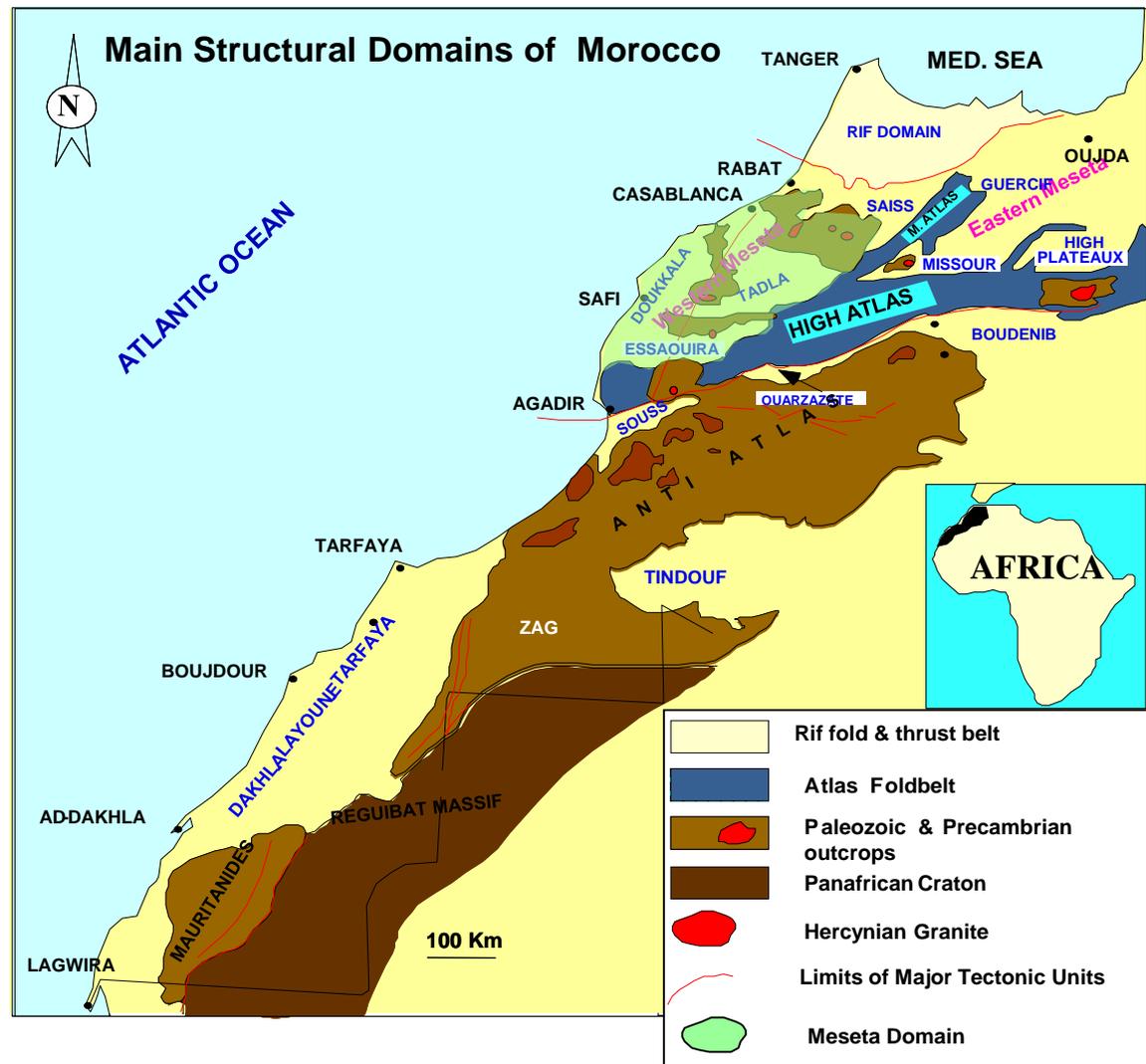
- Alpine thrust and fold belt  
(Cenomanian, Tertiary)
- Northern Shallow Offshore  
(Silurian, Devonian) and  
(Silurian, Triassic)
- Mobile salt province  
(Toarcian, Cretaceous /  
Tertiary)
- Platform and Deep Offshore  
Province  
(Jurassic, Cretaceous /  
Tertiary)



# New Onshore Exploration Objectives

## Objectives related to the Main structural domains :

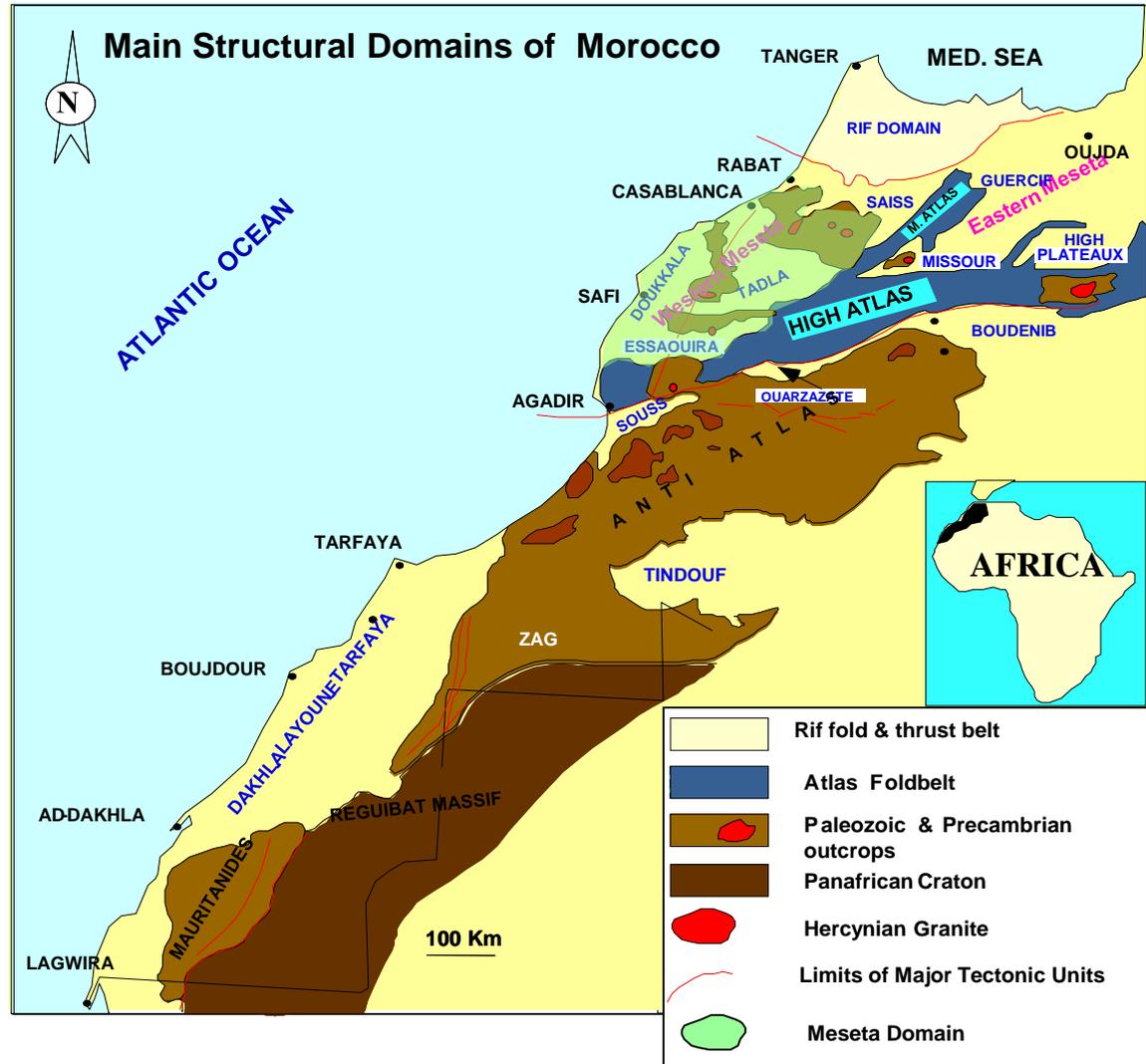
- The Rif fold and thrust belt (Mesozoic and Tertiary)
- The Meseta domain (Paleozoic, Triassic and Jurassic)
- The Atlas fold belt (Triassic and Jurassic)
- The Anti Atlas and Zag Hercynian domain (Paleozoic )
- The Saharian Coastal basins (Triassic, Jurassic, Cretaceous and Tertiary)



# (SR , RR) Pairs: Onshore

## Source Rocks-Reservoir Rocks Proven Pairs

- The Rif fold and thrust belt  
(Toarcian , Domairian)  
(Cenomanian , Tertiary)
- The Meseta domain  
(Silurian, Paleozoic)  
(Silurian, Triassic)  
(Oxfordian, Upper Jurassic)
- The Atlas fold belt  
(Silurian, Triassic) and  
(Toarcian, Jurassic)
- The Anti Atlas and Zag basin  
(Silurian , Cambro Ordovician)  
(Silurian, Devonian)
- The Saharian Coastal basins  
(Triassic, Triassic)  
(Toarcian, Jurassic)  
(Cenomanian, Coniancian)



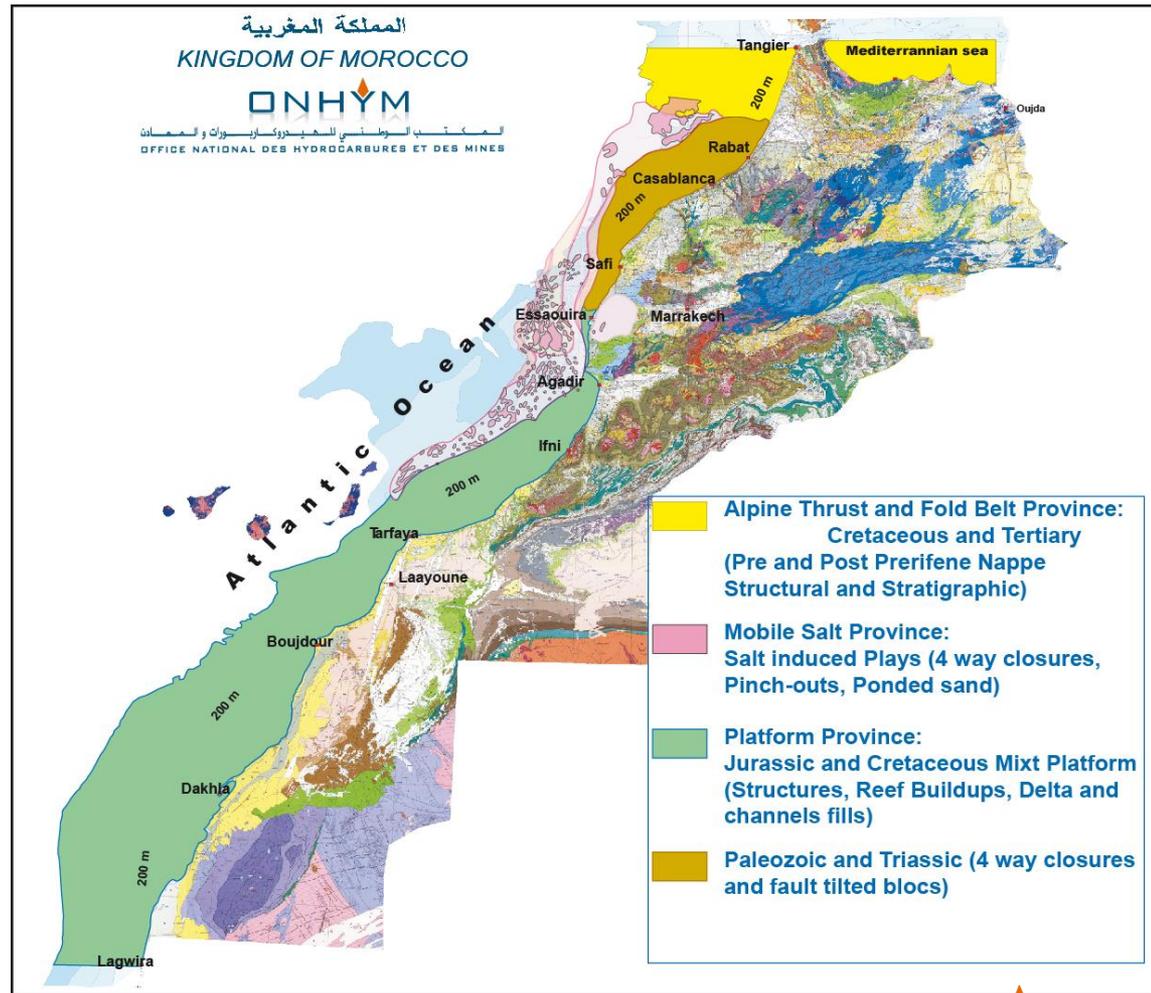
# Perspectives

## Upgrading of the Leads

- Additional seismic (2D and 3D)
- Special studies (geological, AVO, inversion etc...);
- Reconsideration of old plays (Upper Cretaceous and Tertiary) in other zones.
- Considering Paleozoic and Triassic Plays in shallow offshore

## Drilling (ongoing)

- Testing the new and deeper (Lower Cretaceous and Jurassic) plays.





## Outline

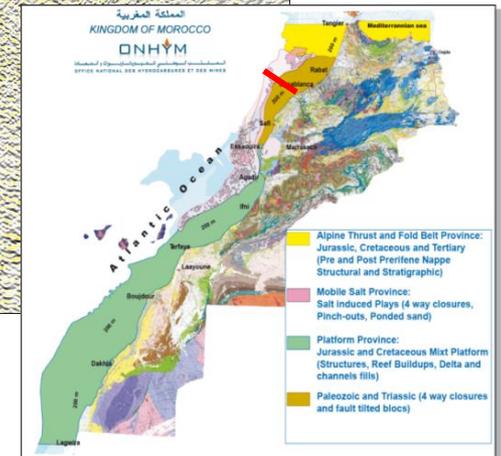
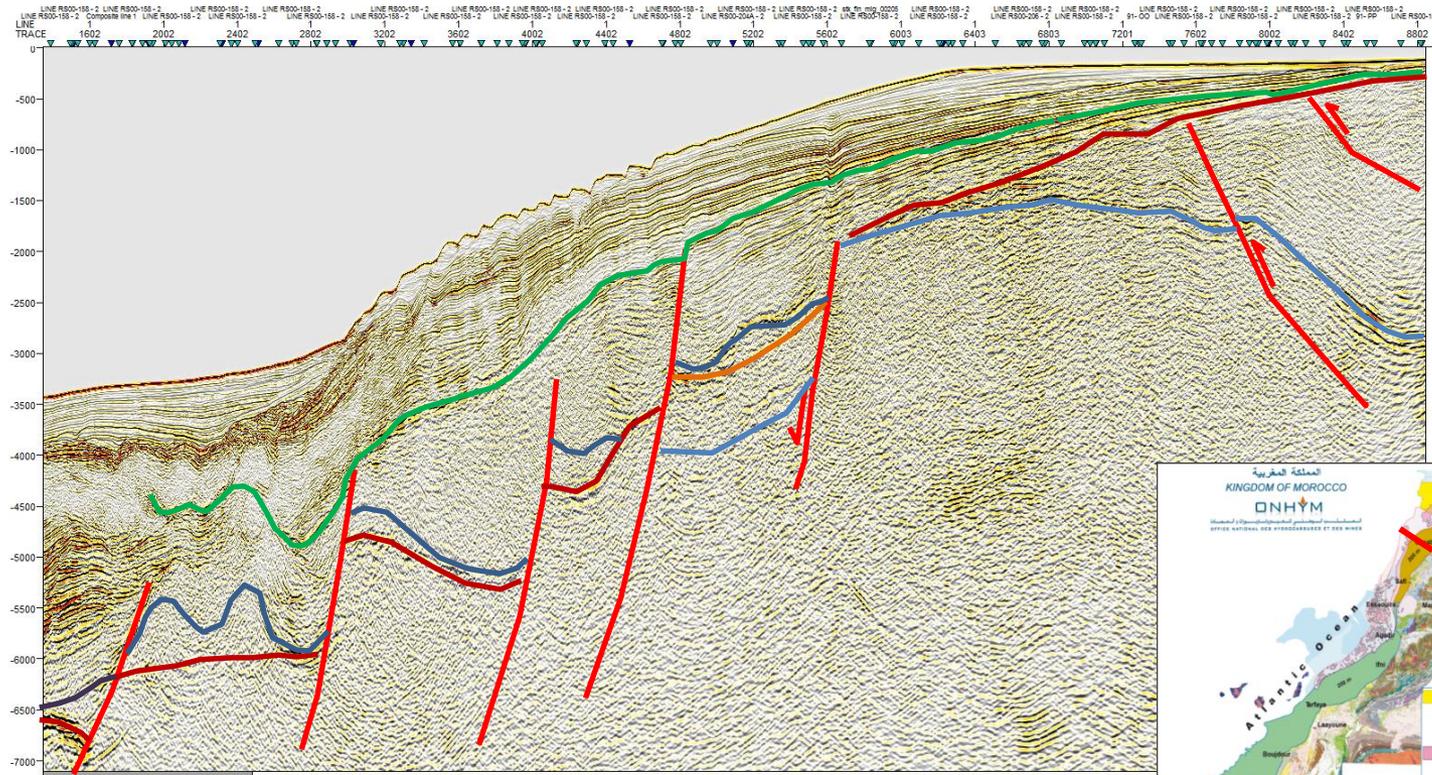
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# Conventional Hydrocarbon Resources

## Offshore Basins

Example of play concepts in Casablanca Offshore



- **Traps :** Structural (anticlines, fault tilted blocs and salt related) (Amalgamated Channels)
- **Reservoirs:** Paleozoic SS, Up. Triassic SS, Jurassic Carbonates
- **Source rocks:** Paleozoic (Silurian and Up. Devonian) and Jurassic (Toarcian)
- **Seals:** Triassic salt and Cretaceous shale

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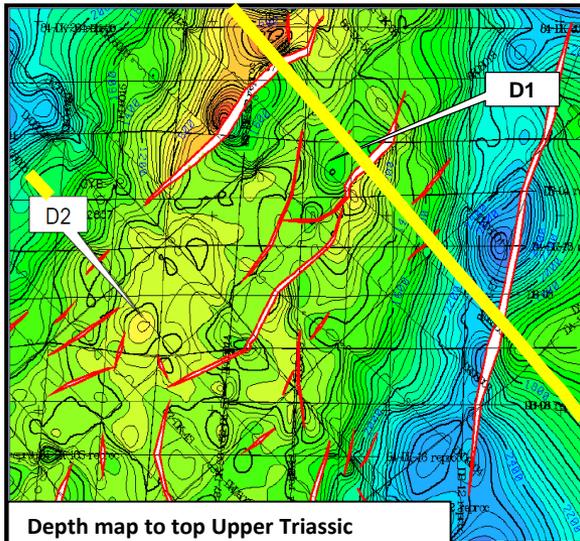
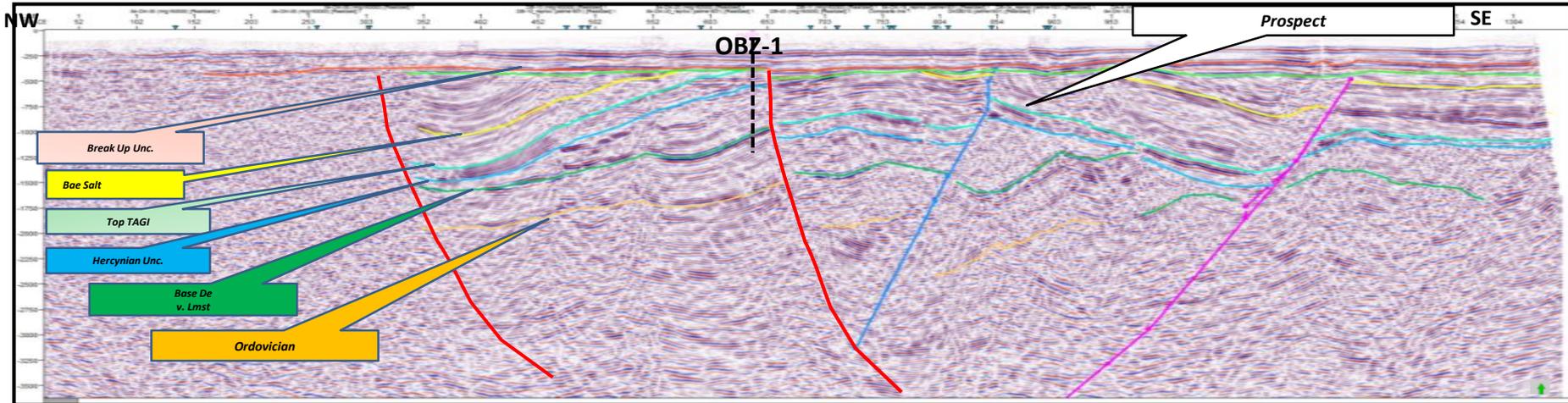


# Conventional Hydrocarbon Resources

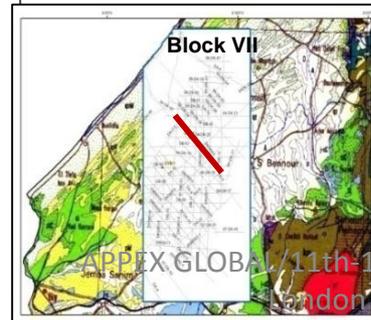
## Onshore Basins

Example of play concepts : Triassic prospect in Onshore (Abda block)

Line DA-05, through the OBZ-1 Well to the D1 Structure



- Traps : Faulted blocks and accommodation anticlines
- Reservoirs: Triassic sandstones (TAGI)
- Source rocks: Silurian hot shales & Frasnian shales
- Seals: Triassic and Liassic interbedded shales & salt





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# Summary

- ❖ Between 1998 and 2005,
  - hydrocarbon exploration in offshore Morocco had focused on one and unique play concept in deep offshore, but it had set the bases for advanced exploration in frontier areas;
  - Exploration drilling activity, although limited, had contributed to a better assessment of the Petroleum Systems;
- ❖ Since 2005,
  - exploration has concerned the entire offshore and onshore, looking for various HC play types associated with proven (SR,RR) pairs and ranging in age from Paleozoic to Tertiary.
  - Drilling activity is ongoing accordingly with the partner's commitments.



Thank you

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