



Oil & Gas Mining Domain of Algeria

Activities

**Opportunities
&
Assessment of Potential**

Algeria Energy Days

Houston, March 7th & 8th, 2019

A.HOCINI

ALNAFT PRESIDENT

AGENDA

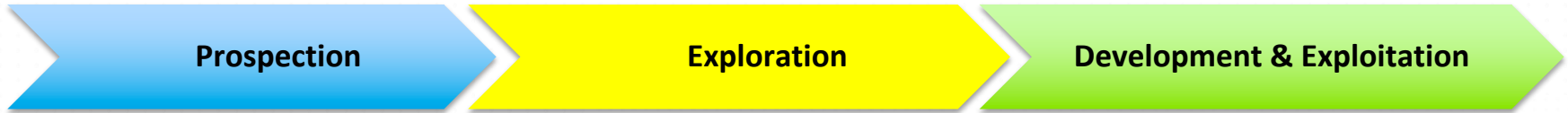
- ABOUT ALNAFT
- HYDROCARBON MINING DOMAIN AND E&P ACTIVITIES
- OPPORTUNITIES
- CONCLUSION

ABOUT ALNAFT

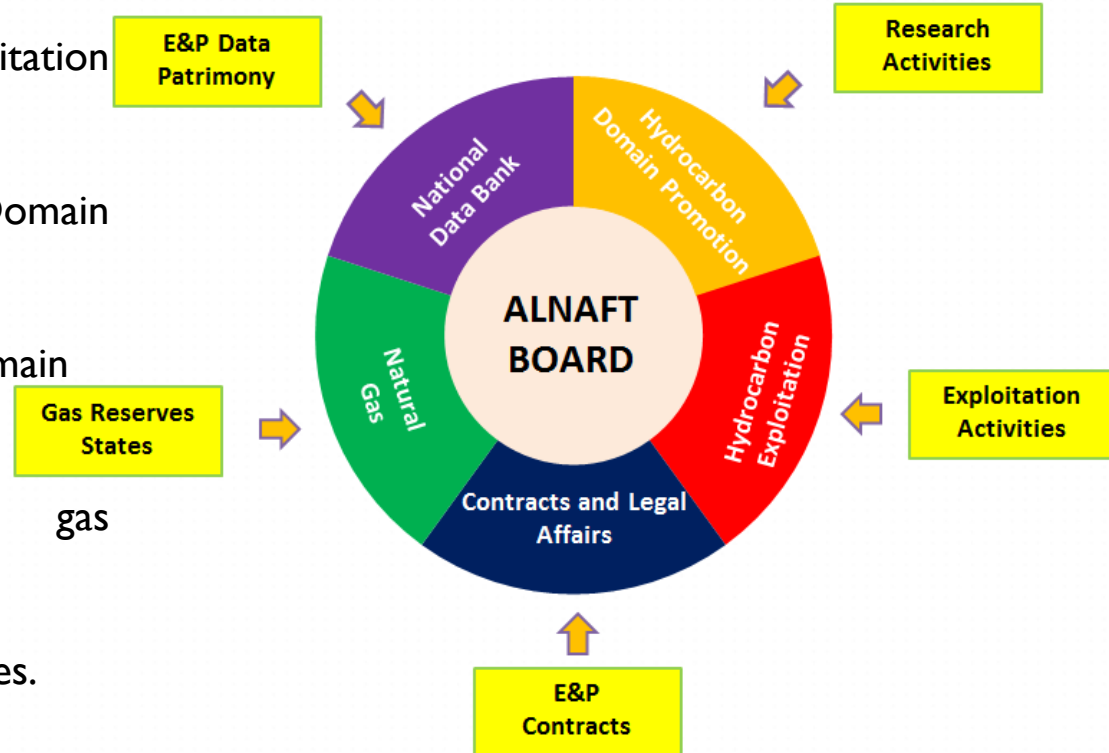
ALNAFT

Main Missions

Oil & Gas Upstream

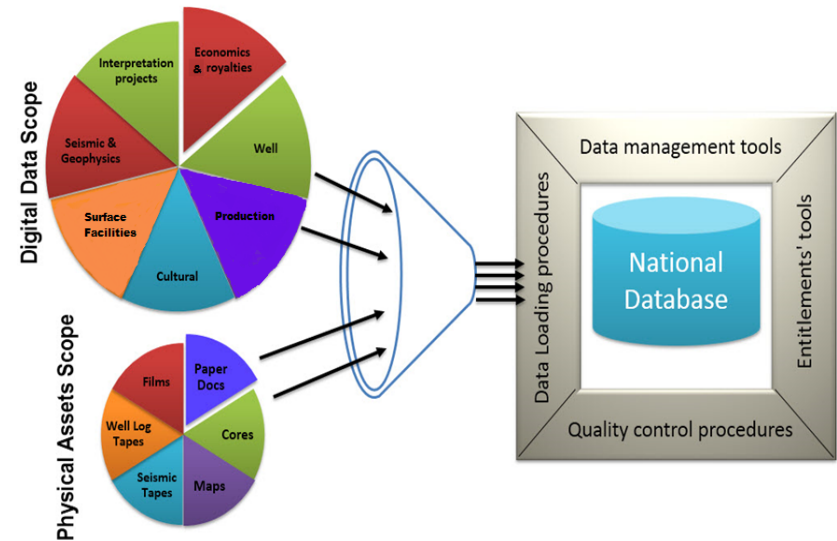



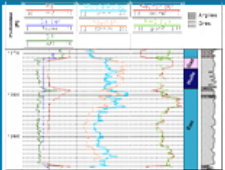
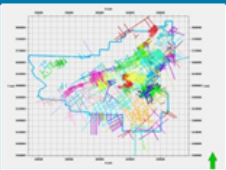
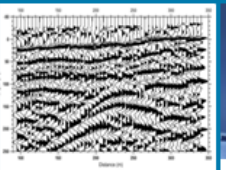




- Concluding Exploration and / or Exploitation contracts.
- Managing the Hydrocarbons Mining Domain according to the Law.
- Promoting the hydrocarbons Mining Domain
- Managing the E&P National Data Bank
- Evaluating and approving oil & gas development plans
- Providing support to Oil & Gas companies.



The E&P National Data Bank

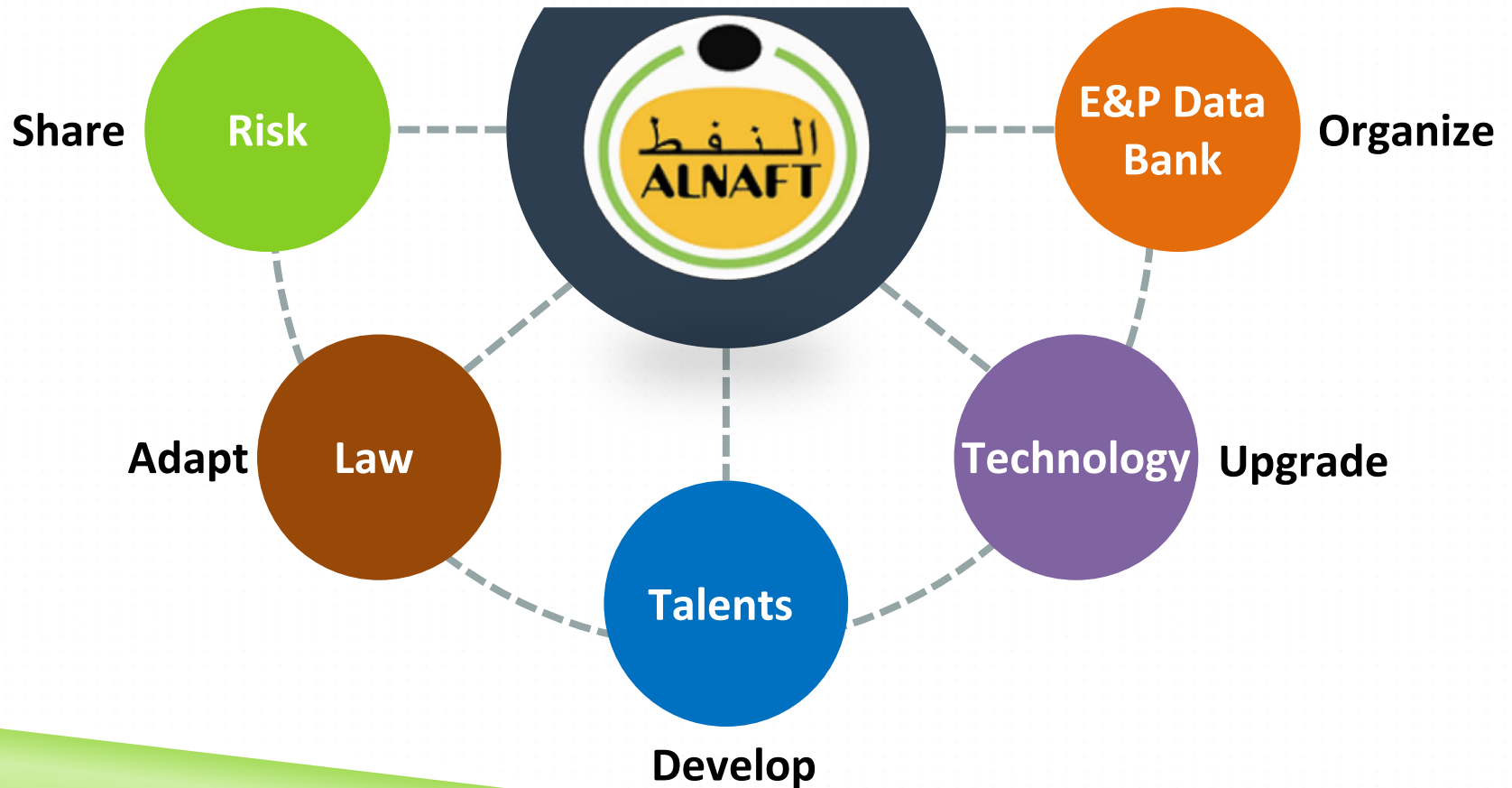
- ✓ Promoting the investment by showcasing the data
- ✓ Preserving and managing the legacy



Wells	Logs	Seismic Navigation	Segy	Production Data	Digitized Documents	Row Seismic	Physical Assets
							
+10 500 Wells	+100 000 Log Files	+24 000 Seismic Profiles	+60 000 2D Stack	Since 2007	+66 000 Digital Documents	+10 000 Tapes	+500 000 Index

ALNAFT Strategy

ALNAFT STRATEGY TO ATTRACT FOREIGN COMPANIES



2018's Achievements

✓ II Field Development Plans

Contracts

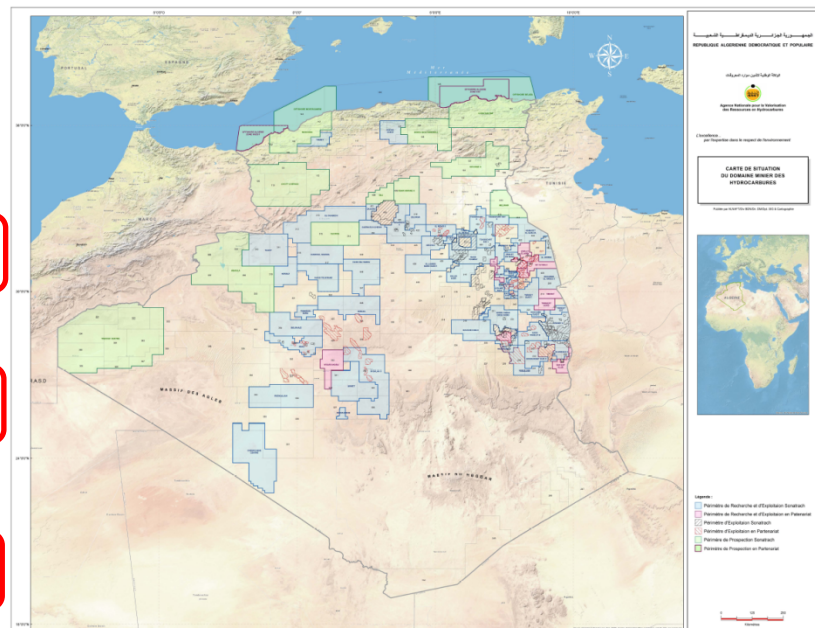
✓ Rhourde El Khrouf. Increase a crude oil production by 24 000 barrels/day and LPG production by 10 000 barrels/day **1,2 Billion \$**

✓ Tin Fouyé Tabankort II . Gas production 9 million m3/day (3 billion m3/year) **324 Million \$**

✓ Tin Fouyé Tabankort Sud. Gas production 3 million m3/day. **406 Million \$**

✓ Farm-in farm-out of 49% stake in three concessions in the North Berkine basin: Sif Fatima II, Zemlet El Arbi and Ourhoud II.

400 Million \$

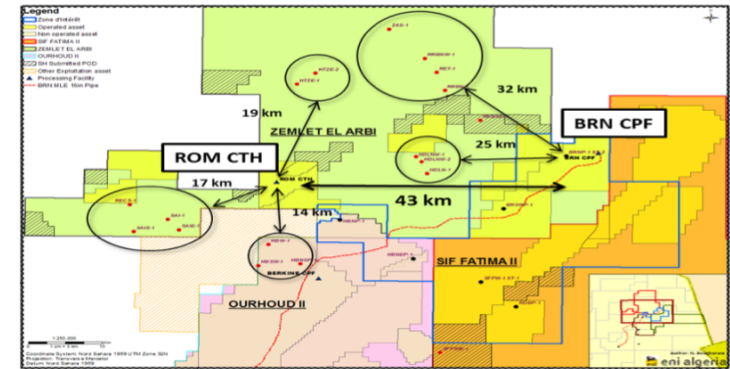
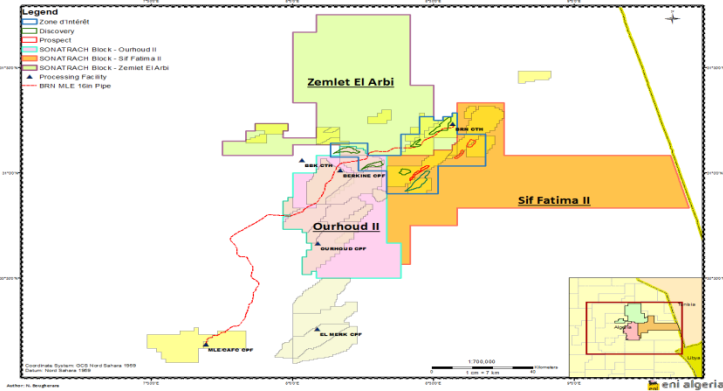


Contracts in partnership

Total Investment = 2,3 Billion \$

2018's Achievements

- ✓ Farm-in farm-out of 49% stake in three concessions in the North Berkine basin: Sif Fatima II, Zemlet El Arbi and Ourhoud II.



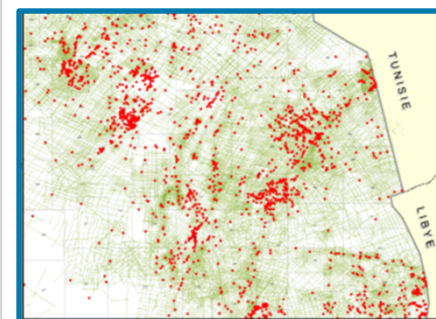
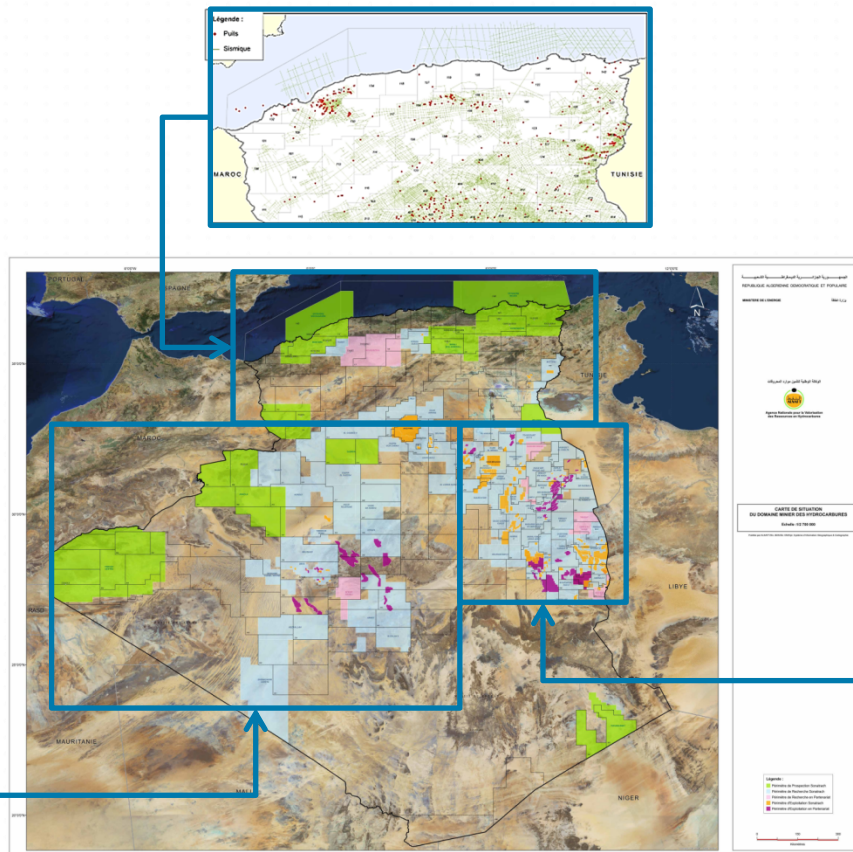
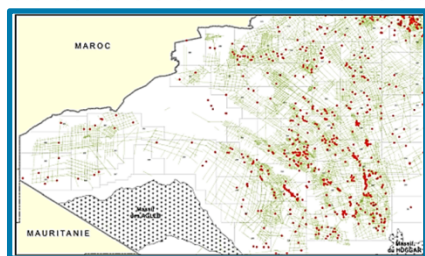
- **January 2018** Start negotiation
- **December 2018** approbation by the authorities
- **August 2019**, start of production, targeted production **60 kboe/day**.
- **The project foresees:**
 - Ongoing pipeline construction from BRN to MLE installations
 - Upgrade of BRN and MLE facilities to treat the additional production

- 14 oil discoveries (20 wells)
- Connections to existing facilities
- Production potential up to 20k b/d

HYDROCARBON MINING DOMAIN AND E&P ACTIVITIES

Fields & Discoveries

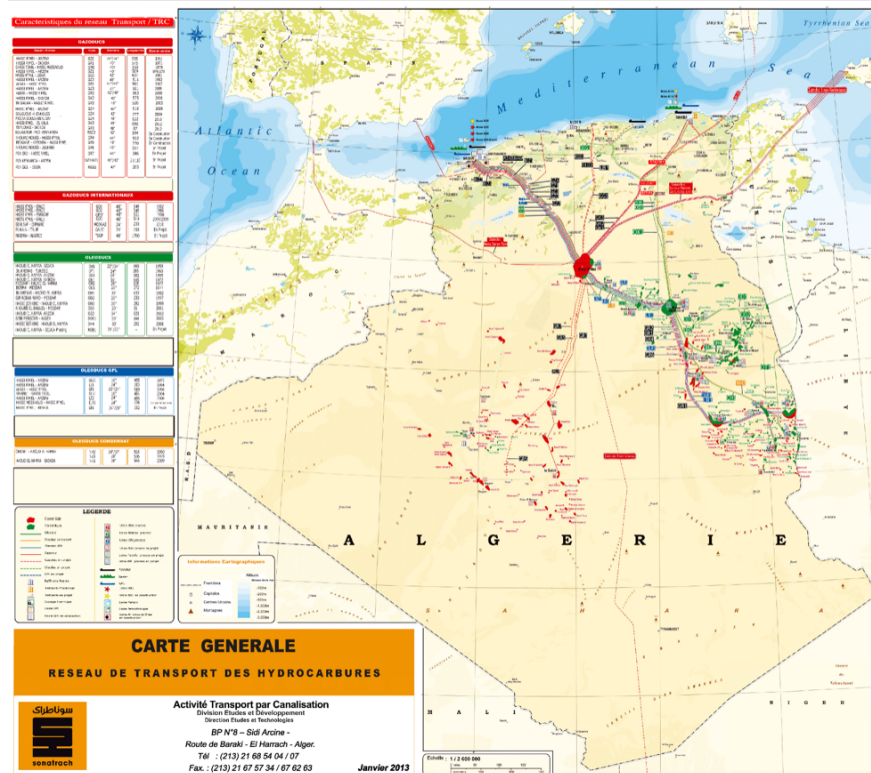
>10 500 Wells
670 000 Km of 2D seismic
180 000 Km² of 3D seismic
550 km of cores



- ✓ Over 150 New discoveries and fields to be developed near the existing facilities
- ✓ 500 oil/ Gas/ condensate fields of which 250 fields in exploitation

Surface Facilities

- ✓ 21 oil pipelines with a length of 10 000 km
- ✓ 18 gas pipelines with a length of 11 000 km
- ✓ 3 international pipelines
- ✓ 37 industrial center (123 Processing facilities)
- ✓ 83 pumping and compressor stations
- ✓ 12 docked loading stations and 5 offshore loading stations of oil (2 in Arzew, 2 in Skikda and one in Bejaia)



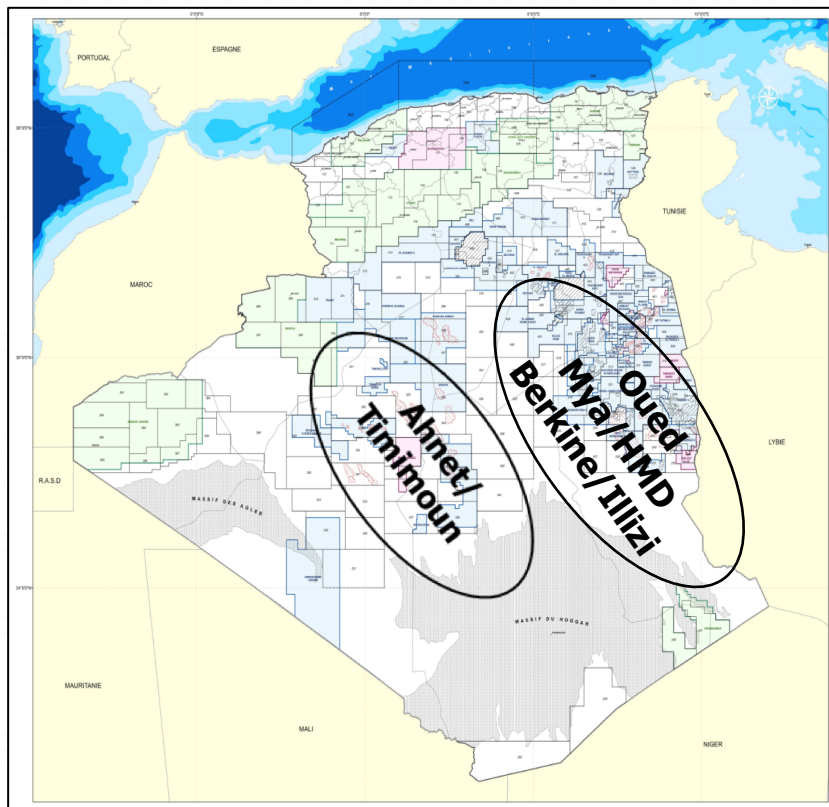
E&P Activities

SONATRACH operates :

- ✓ 13 Prospecting perimeters
- ✓ 56 Research perimeters
- ✓ 122 Exploitation perimeters

In Partnership:

- ✓ 2 prospecting perimeters
- ✓ 8 Research perimeters
- ✓ 49 Exploitation perimeters



**E&P activities are concentrated mainly in two regions (mature basins)
29% of mining domain**

**Large free domain (71%) open to partnership
And underexplored**

1.1 MM bbls / day

3.6 Tcf / year (+100 BCM / year)

Oil 20 Gbbbls

Gas 6100 BCM (215 Tcf)

Oil : 329 Gbbbls

Gas : 4456 Tcf



OPPORTUNITIES

Opportunities

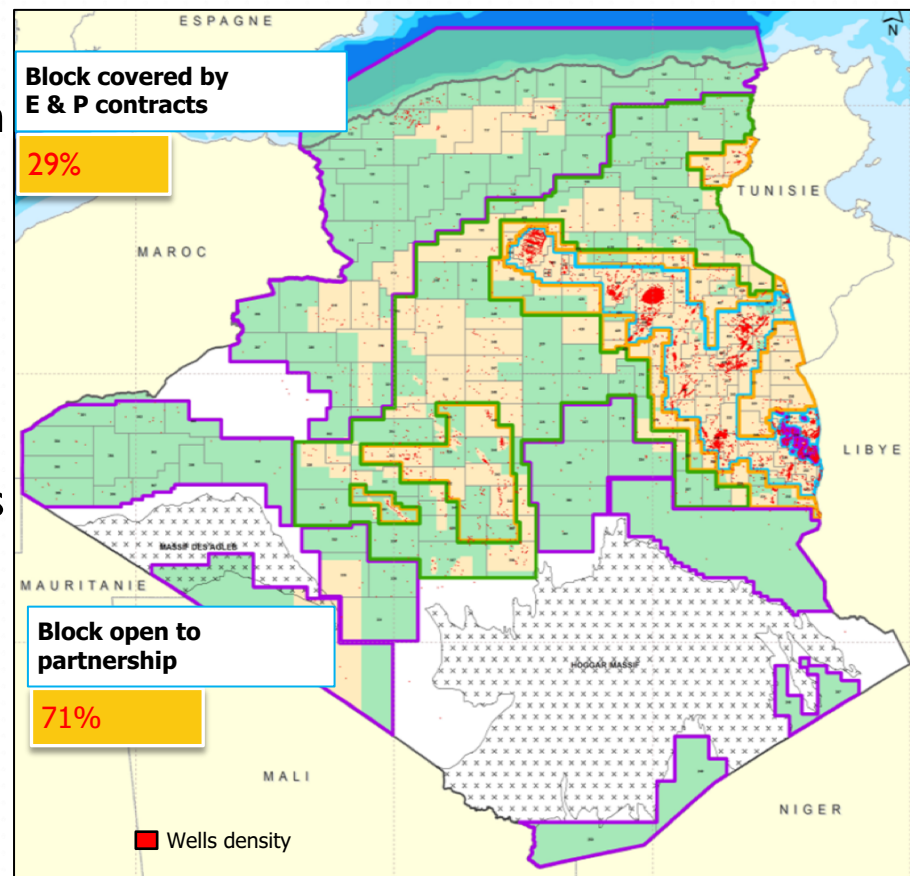
6 Areas

- ✓ Prospection and research in frontiers zones
- ✓ Exploration of deep horizons, stratigraphic and mixed traps,
- ✓ Enhance Oil Recovery in mature basins,
- ✓ Prospection and Exploration in the Algerian offshore,
- ✓ Assessment and Exploration of shale & tight plays
- ✓ Evaluation of a zone by conducting G&G studies.

Opportunities

Prospection and Research in Frontiers Zones

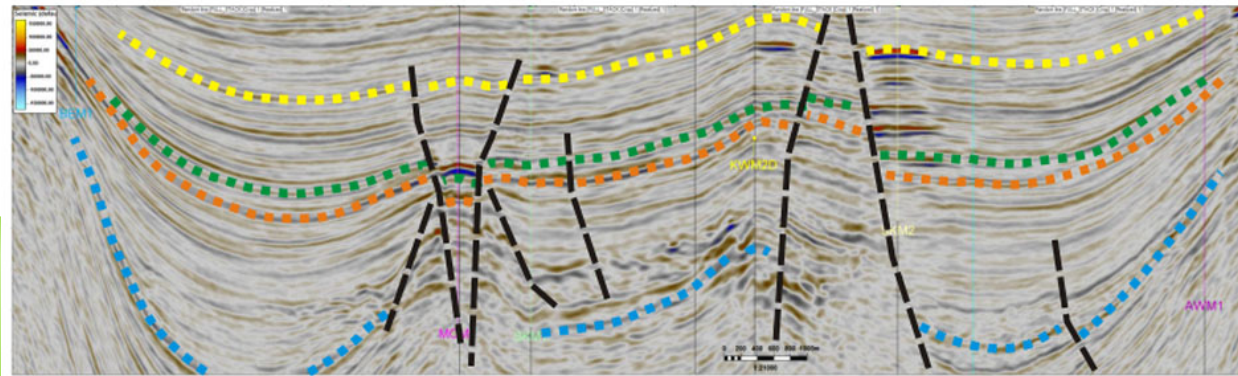
- Large mining domain 1,5 Million Km²
- 1 Million Km² Open to Partnership (green color)
- Underexplored areas:
 - ❖ To the North:
 - Atlas domain
 - Thrust belts (Tellian autochthonous /allochthonous)
 - ❖ To the West:
 - Reggane
 - Tindouf
 - Mouydir



Opportunities

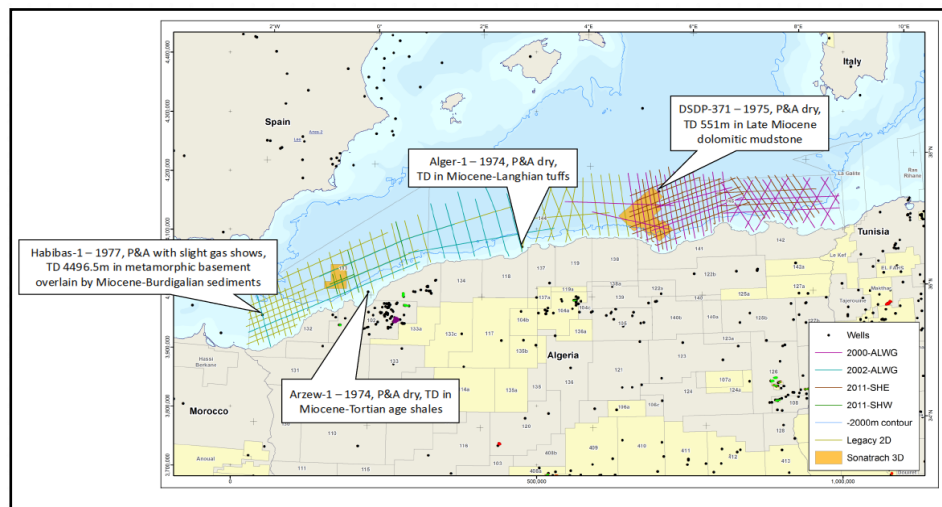
Explore Deep Horizon, Stratigraphic & Mixed Traps, EOR in Mature Basins

- A successful exploration strategy requires a high quality of regional studies that could increase the reserves
- Increasing reserves of mature fields
- Exploration of Deep horizons, Stratigraphic & mixed traps
- Using tertiary recuperation technics (EOR)
 - 54 Gbbls OOIP in Cambro-Ordovician
 - 9,7 Gbbls have been produced till now in Cambro-Ordovician (<20%)



Prospection and Exploration in the Algerian Offshore

- Several ongoing studies
- Prospects & Leads that can reach an area of 400 Km² already identified
- Two types of reservoirs: Clastic and Carbonate
- The main Lead is a Carbonate Build-Up (East area) which presents similarity to Zohr discovery
- Two types of hydrocarbon generated Thermogenic and Biogenic



Situation of the main interest area already identified

Estimated volumes per prospect/lead:
200 to 500 mmbbl of oil
0,5 to 2 Tcf of gas

Available Data	
2D Seismic	3 surveys
3D Seismic	2 surveys
Wells	3 wells
Aeromagnetism	2 surveys
Gravimetry	2 surveys

Opportunities

Prospection and Exploration in the Algerian offshore



Seismic Ship "RAMFORM TITAN"

- **March 2019**, Start seismic acquisition
- **May 2019**, 3D Final PSTM
- **July 2019**, Seismic interpretation
- **November 2019**, Start drilling

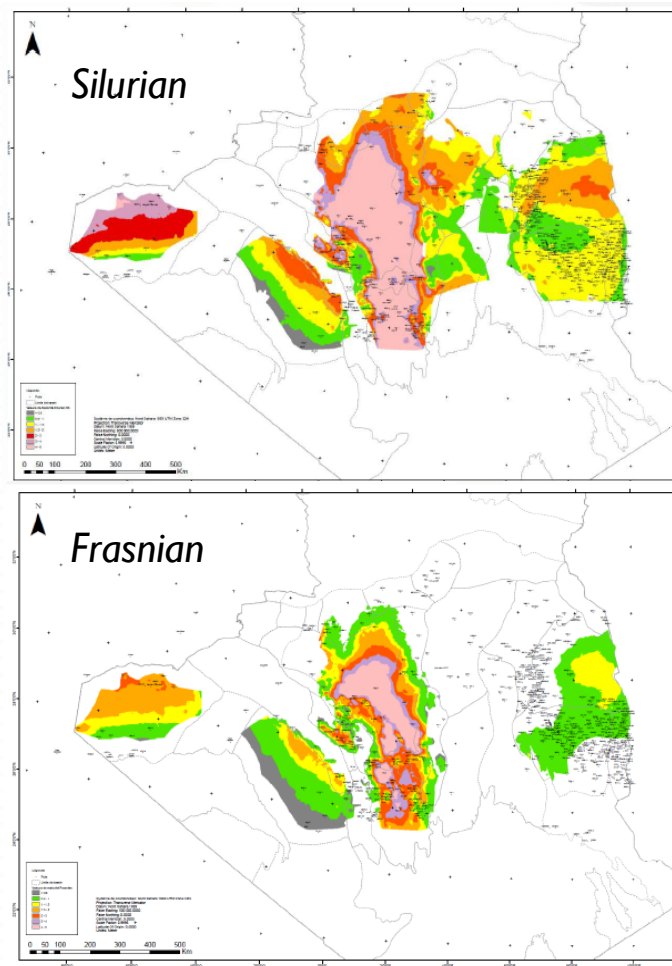
ACTIVITY	ACTION	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2D/3D SEISMIC	Start Seismic Acquisition				Mob	3D	2D							
	3D Fast Track Processing													
	3D Final PSTM													
	Seismic Interpretation (Fast Track) & Well Program													
Well	Moving & Drilling													

Opportunities

Assessment of Shale and tight Plays

Maturity Maps

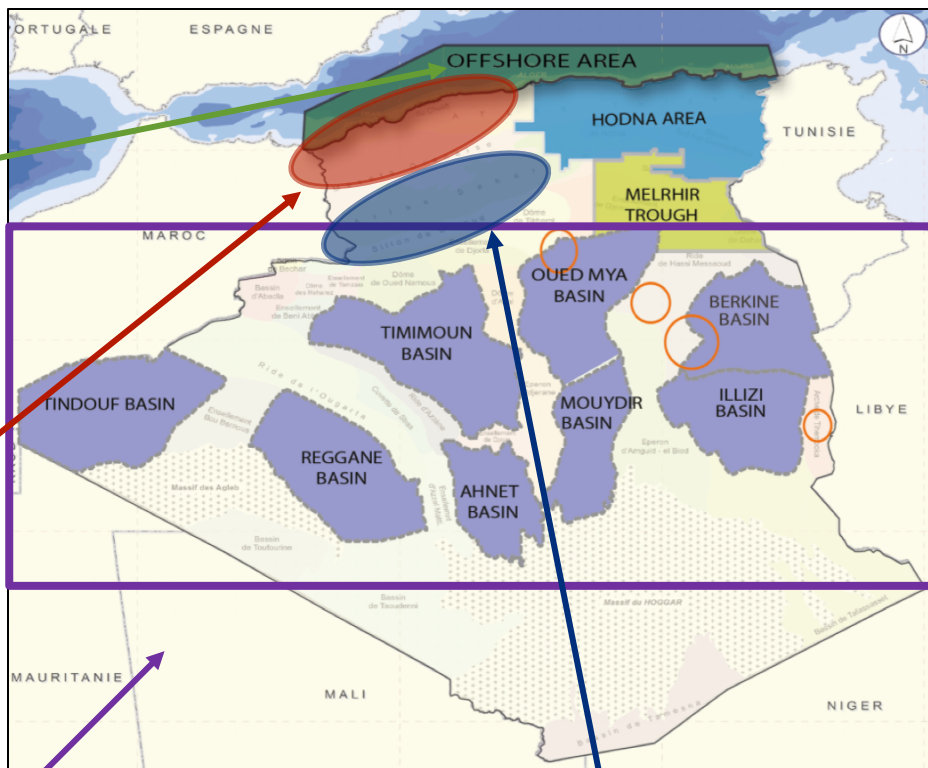
- The main source rocks identified Silurian and Frasnian
- Resources confirmed by a study launched by ALNAFT
- Possibility of producing particularly gas (Western basins); and liquids (Eastern basins): wide range of maturity
- The evaluation's results of the two (2) wells confirm the very good productivities and the fracabilities of those shales (6 to 9 Bcf, may reach 18 Bcf in P3, recovery per well)



Opportunities

Evaluation of a zone by conducting **G&G** studies

10 Studies Launched on the Petroleum Potential



1 on the N-E part

1 on the Melrhir trough

1 on recoverable resources of 4 main areas

1 on western Saharian Atlas

4 on the offshore

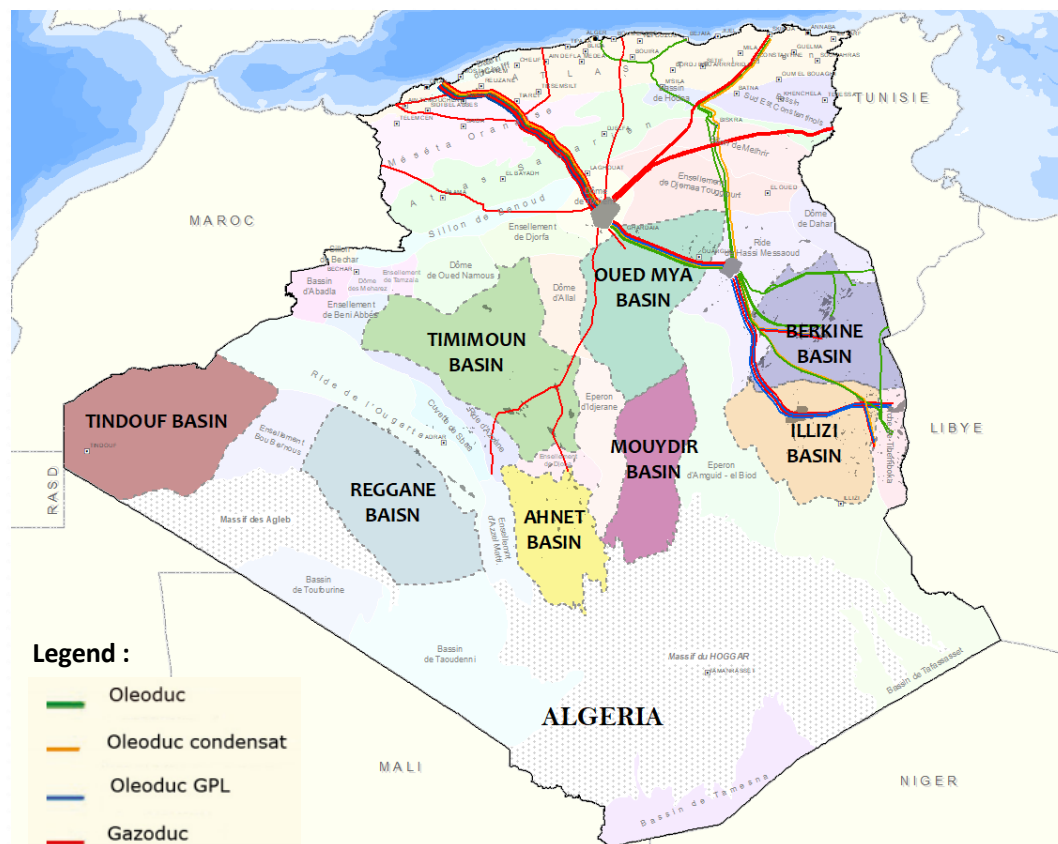
1 on Chelif, Tiaret & Bougezoul

1 on UNC on 8 Saharian basins

Opportunities

Unconventional Resources The Study

- ✓ Area of more than 1 millions km²
- ✓ More than 1600 wells correlated across the platform
- ✓ 400 wells evaluated
- ✓ 2 km of core described exclusively on targeted intervals
- ✓ Thousands of analytical geochemical data (TOC, Rock-Eval) gathered in a single data base



Location of the Study

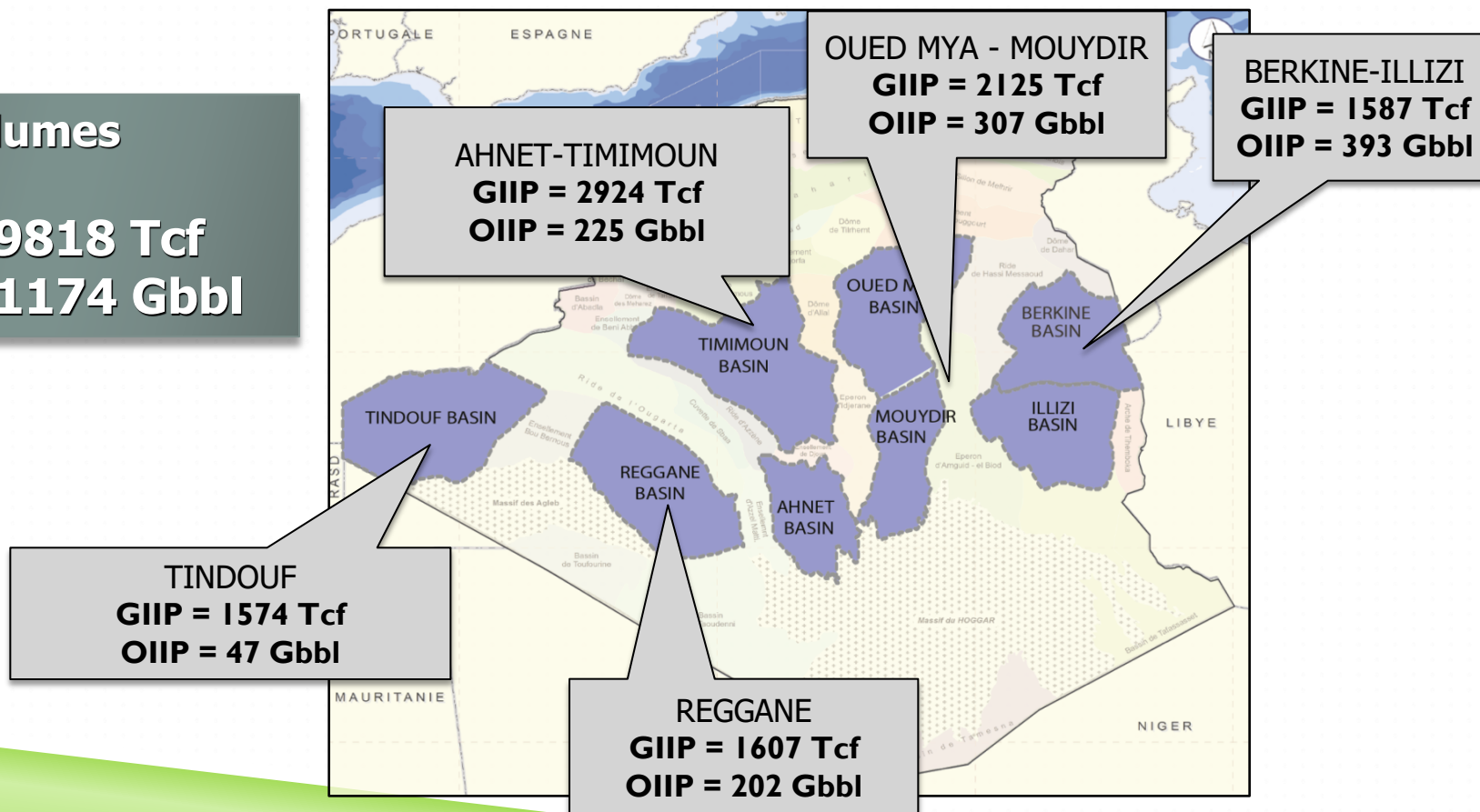
Opportunities

Unconventional Resources

REGIONAL OVERVIEW OF THE RESOURCES (Risked & unrisked)

Total Volumes

GIIP = 9818 Tcf
OIIP = 1174 Gbbl



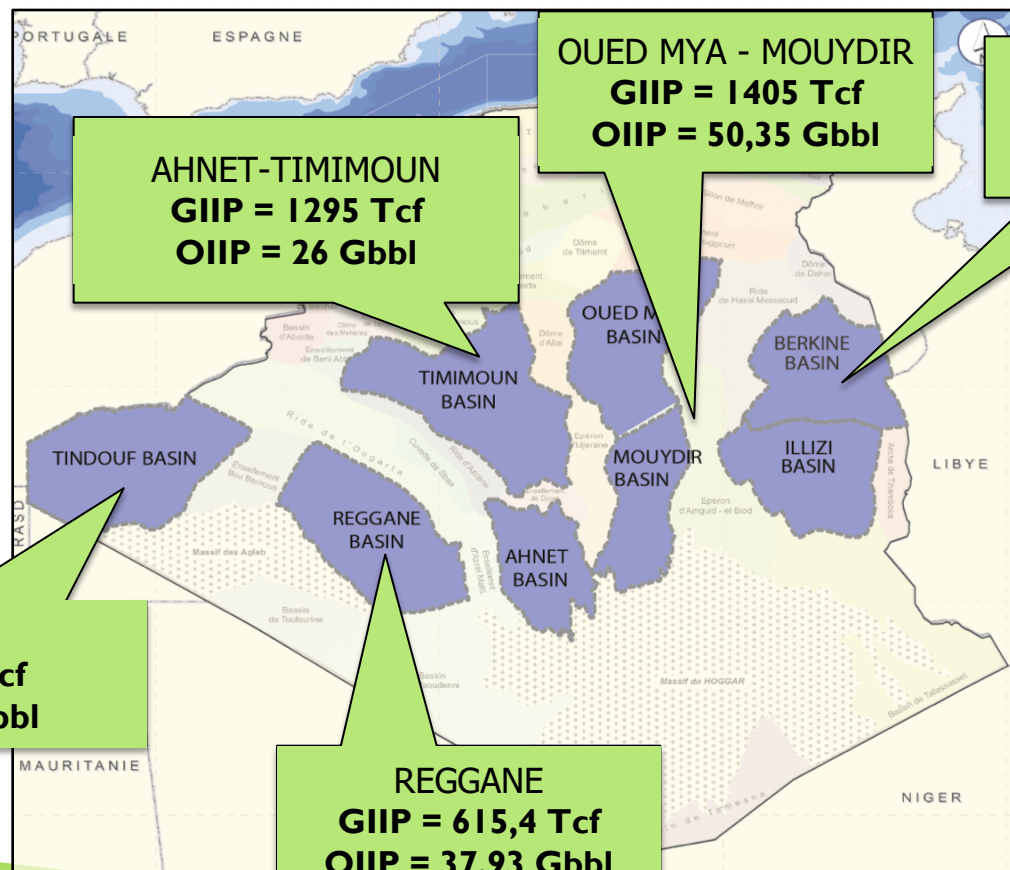
Opportunities

Unconventional Resources

REGIONAL OVERVIEW OF THE RESOURCES (Unrisked)

Total Volumes

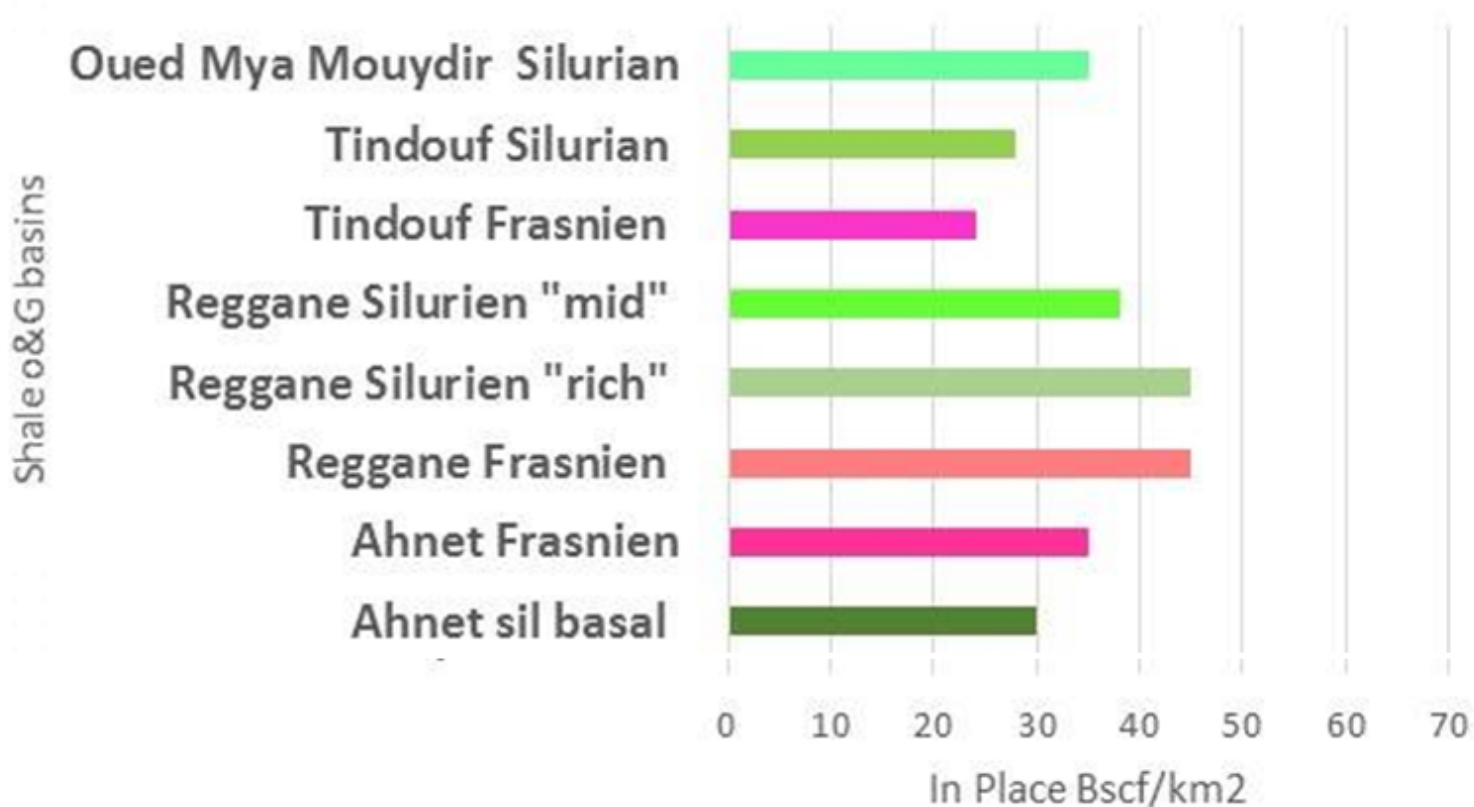
GIIP = 4456 Tcf
OIIP = 329 Gbbl



Opportunities

Unconventional Resources

Bscf/km² in place



Opportunities

Unconventional Resources

Ranking of Algerian NC Potential

Shale Gas – EIA Assessment		
Technically Recoverable		
Shale Gas Resources		
TCF		
1	U.S	1 161
2	China	1 115
3	Argentina	802
4	Algeria	707
5	Canada	573
6	Mexico	545
7	Australia	437
8	South Africa	390
9	Russia	285
10	Brazil	245

+ 30%

891 Tcf
Unrisked area
with **20%**
recovery factor

HMR= 100Tcf

Shale Oil EIA Assessment		
Technically Recoverable		
Shale Oil Resources		
Billions Barrels		
1	Russia	75
2	U.S	48
3	China	32,2
4	Argentina	27
5	Libya	26,1
6	Australia	17,5
7	Venezuela	13,4
8	Mexico	13,1
9	Pakistan	9,1
10	Canada	8,8
11	Indonesia	7,9
12	Colombia	6,8
13	Algeria	5,7
14	Brazil	5,3

+ 250%

16,5 Gbbbls
Unrisked area
with **5%**
recovery factor

HMD= 9 Gbbbl



U. S. Energy Information
Administration

Conclusion

Hydrocarbon sector is well established industry in Algeria, with an extensive and reliable infrastructure network.

ALNAFT will continue to :

- Provide oil companies with reliable data and studies
- Work closely with oil companies to accelerate the progress of E&P projects (reduce time to market)
- Assess the operating fields and improve the Recovery factor
- Enhance the use of tertiary recovery on mature deposits (already benefiting from a reduced royalty rate of 5% since 2015)



**THANK YOU FOR YOUR
ATTENTION**