

ALGERIA'S HYDROCARBON RESERVES OVERVIEW

UNFC PRESENTATION

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Algeria's Hydrocarbon Potential

Algerian energy policy since the enactment of the 1986 and 1991 oil legislation to associate foreign investors in the upstream oil and gas was proved highly successful.

A steady stream of oil and gas discoveries.

40 billion boe are considered recoverable as against 34 billion boe in 1971.

Oil 30 %

Natural gas 70 %

Algeria's Hydrocarbon Potential

More quantities are expected to be discovered with regards to these factors:

↖ **Geological**

↖ **Strategic**

↖ **Economical**

Algeria's Hydrocarbon Potential

(I) – Geological - Exploration

Considering the long term prospects for oil and gas production it is important to assess:

☛ **Reserves**

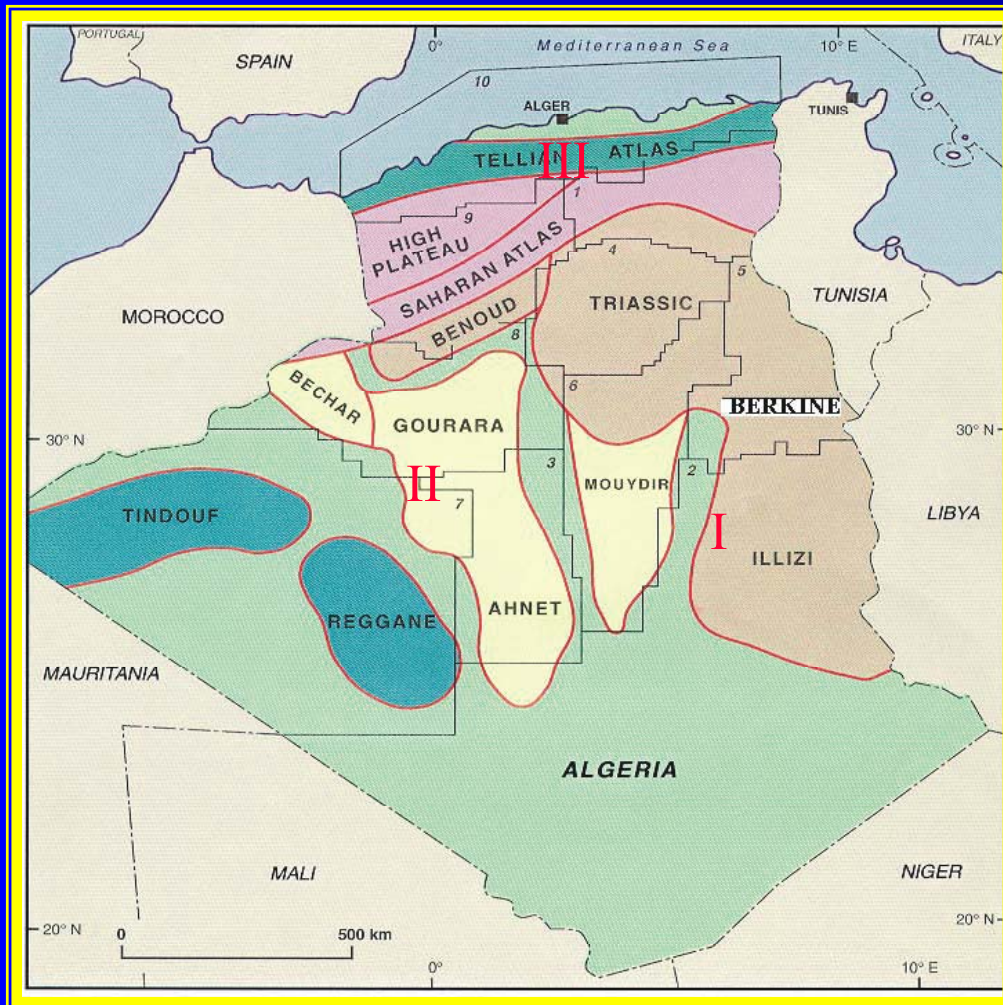
☛ **Potential Resources** which are the reserves not yet been discovered

According to N.O.C reserves remaining to be discovered are estimated to 700 billion bbl of oil and 200Tcf of Gas.

Experts consider these resources estimates under evaluated regarding the assessment of the mining domain

Algeria's Hydrocarbon Potential

Sedimentary Basin Classification

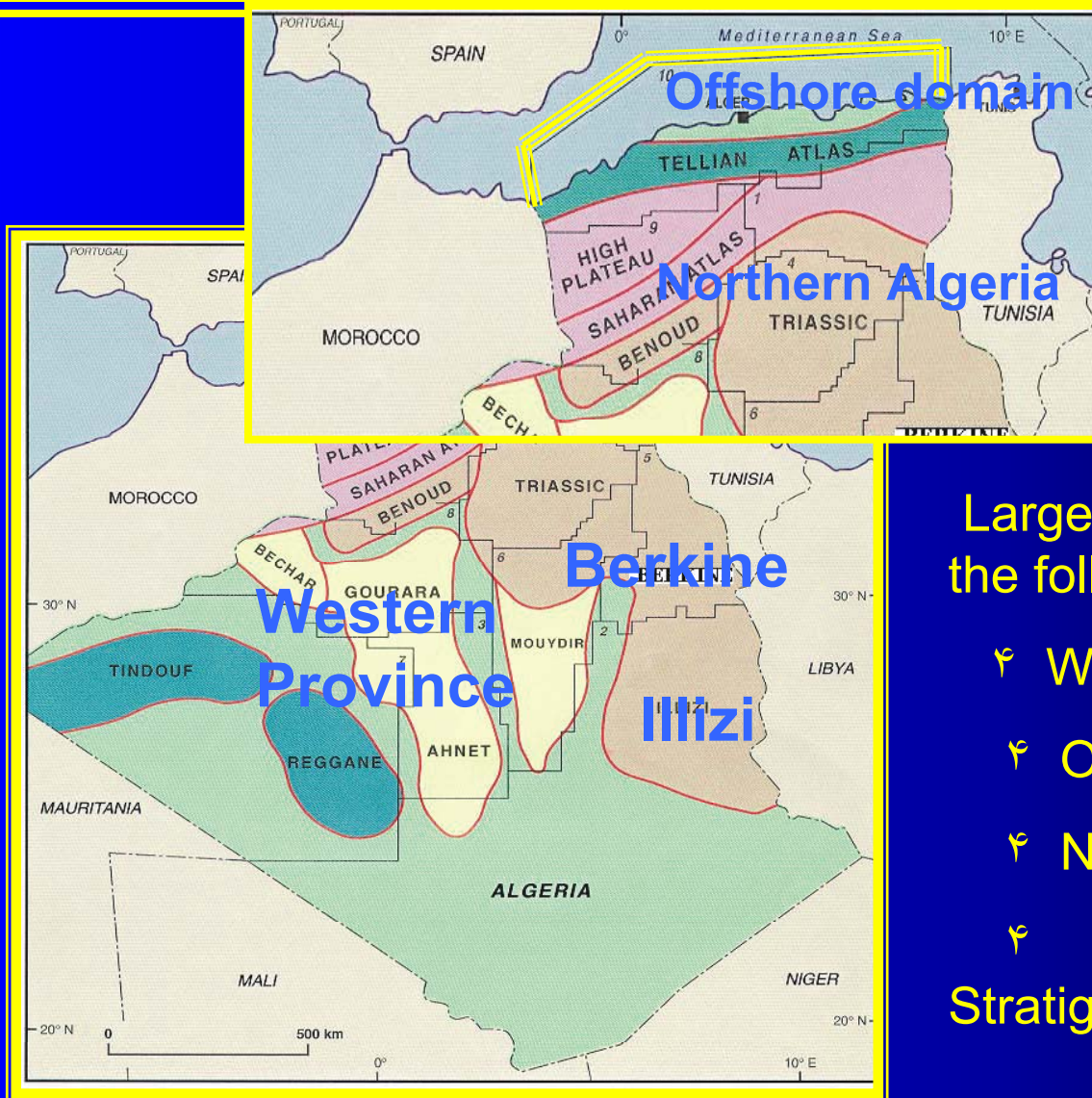


☞ Mature basins (I)
Over 20 wells drilled per
10,000Km² i.e. Illizi

☞ Semi-mature (II)
Over 20 wells drilled per
10,000Km² i.e. Timmimoun

☞ Frontier zones (III)
Less than 10 wells drilled per
10,000Km² i.e. Offshore

Algeria's Hydrocarbon Potential



Large quantities are present in the following area :

- ۴ Western Province
- ۴ Offshore
- ۴ Northern Algeria
- ۴ Deep Reservoirs and Stratigraphic prospects

Algeria's Hydrocarbon Potential

1 - Gas potential of the Western Province

It is one of the most promising region in term of gas accumulations.

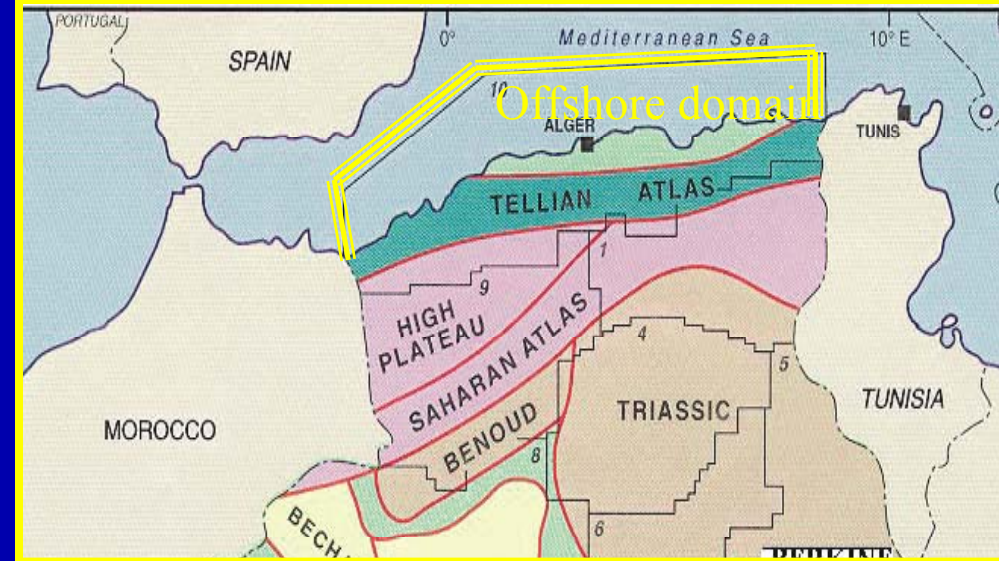
A substantial exploration program carried out by N.O.C proved the Gas potential of this province.

The volume of Hydrocarbon Gas in place could total 30 Tcf and larger quantities are expected to be discovered in the future

Algeria's Hydrocarbon Potential

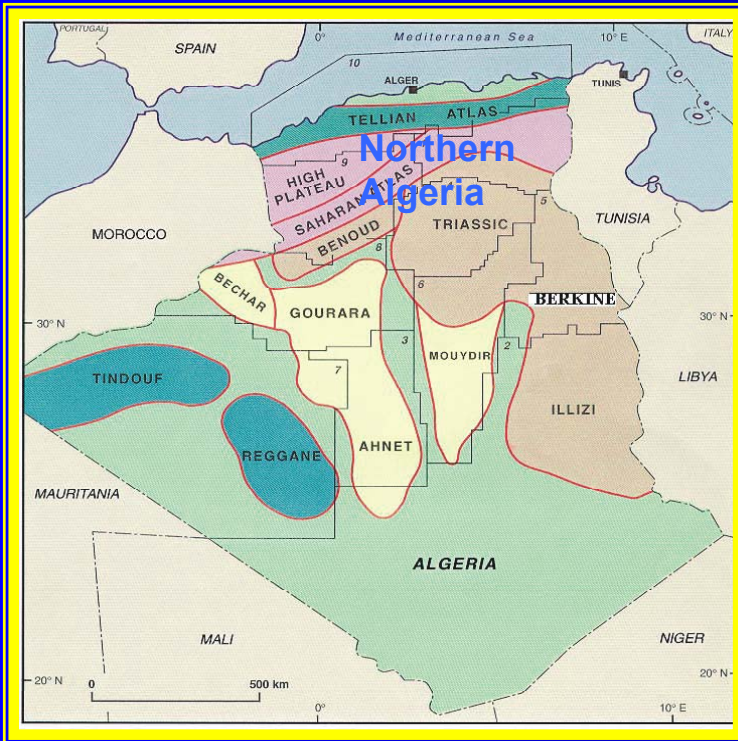
2- Offshore

According to the 1st offshore well results, the presence of a considerable hydrocarbon potential is established.



The successful exploration on the equivalent basins Northern Tunisia and Southern Italy confirm the existence of hydrocarbons. But exploring this kind of domain is financially risky and needs a well established technology on deep offshore.

Algeria's Hydrocarbon Potential



3 - Northern Algeria

As in the Chellif Basin which contains a considerable concentration of hydrocarbons, There is a large volume to be discovered from this very complex geological province

4 - Deep Reservoirs and Stratigraphic prospects

- Large Gas potential exists in deep targets such as Paleozoic reservoirs in the Berkine basin.
- Presence of non negligible quantities of hydrocarbons in stratigraphic traps that have been ignored so far

Algeria's Hydrocarbon Reserves

To increase the Reserves level Algeria adopted a Global strategy involving

- Undeveloped fields
- Redevelopment of the old field
- New technological effort

Partnership with foreign investors

Exploration Contracts

Field development Contracts

- PSC : Production Sharing Contract
- EOR : Enhanced Oil Recovery

Algeria's Hydrocarbon Reserves

Many gas fields considered as proven reserves with SPE definition were not exploitable because they were in remote areas and the price of gas did not make them economical.

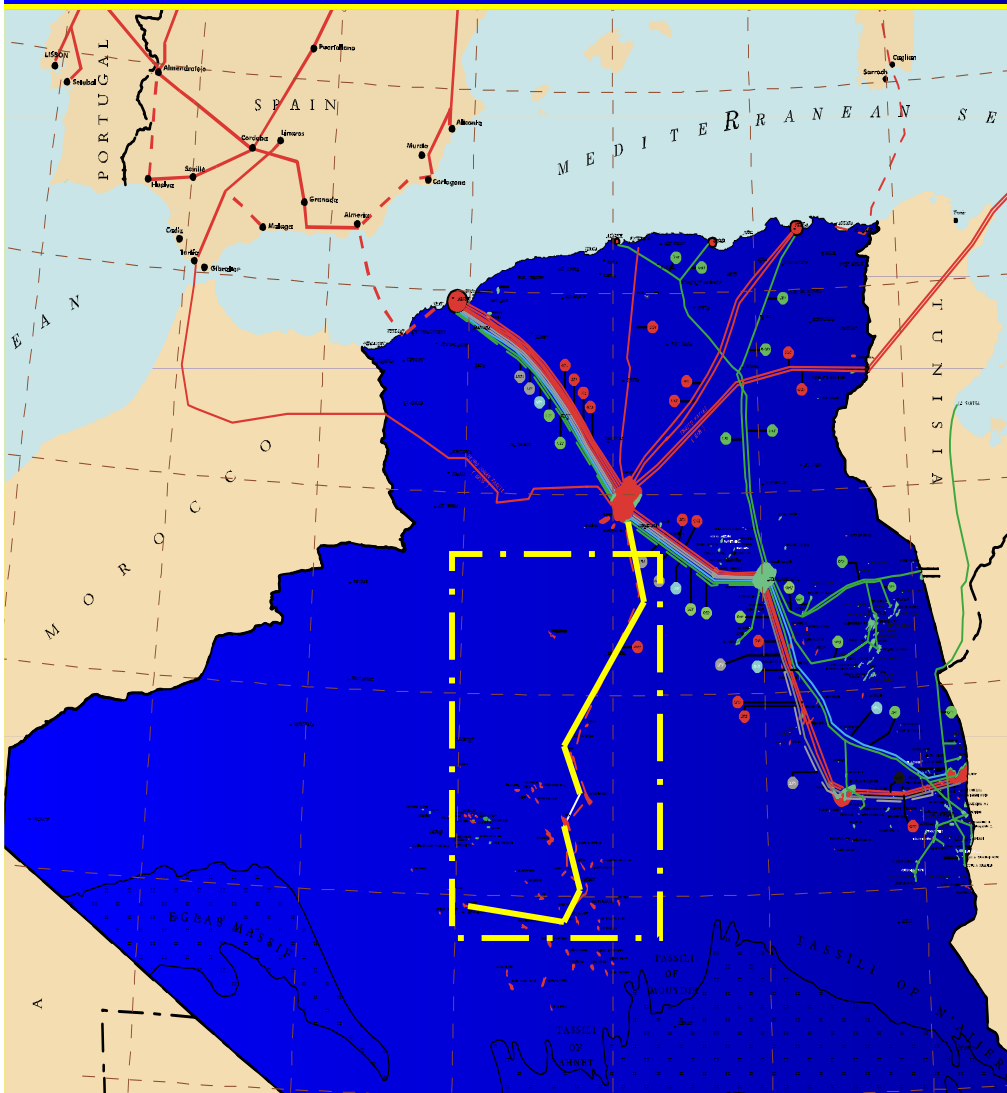
No surface facilities were available:

- process plant
- transportation pipeline

With the development of the area the synergy changed those reserves into proved under both SPE and UNFC definitions.

The previously possible reserves moved to probable reserves and exploration is encouraged in the basin

Algeria's Hydrocarbon Reserves



1- Undeveloped fields

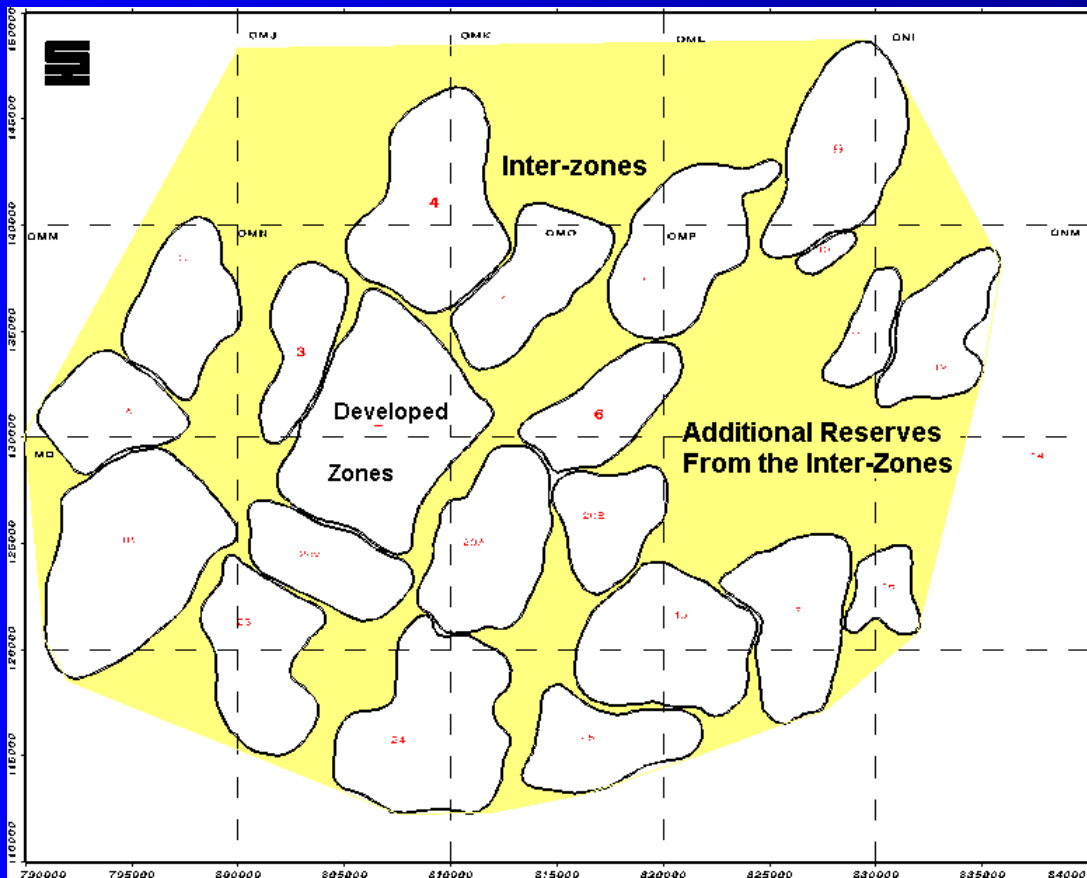
The lack of infrastructure number of discovered fields remained undeveloped in the extreme south:

The potential of the Province is now recognised:

- A gas development project is in progress in the Ahnet Basin.
- The construction of new plants and facilities gave the opportunity to develop these fields (i.e. the gas province of the Western Sahara Reggane Timmimoun Sbaa).

Algeria's Hydrocarbon Reserves

2- Redevelopment Field



The new reservoir characterisation allowed to:

- 1- Mobilise additional reserves
- 2-reassess the inter-zones and plan the adequate development plan in drilling horizontal well .
- 3 - implement new exploitation method and increase the recovery factor

Algeria's Hydrocarbon Reserves

Inter-zones areas hydrocarbons considered as proved reserves under SPE definition were probable reserves under UNFC definition prior, to the implementation of horizontal wells.

-Horizontal wells helped define more precisely the reservoir in these areas and produced the hydrocarbons trapped there.

- Drilling of 115 horizontal wells increased the production by 26%.
- Drilling on UBD (underbalance drilling method) enhanced the recovery
- New exploitation method such a WAG helped increase the recovery factor

This led to a 10 % increase in the proved reserves of the field.

Algeria's Hydrocarbon Reserves

-3- Technologic effort

Semi-exploration around the Giants field

New prospects have been drilled around the Giant field.

More than 5% additional reserves were discovered **in the satellites fields**

Partnership

4- Exploration Contracts

- 42 Exploration contracts have been signed between 1993-2002
- 34 Discoveries were made of which 8 by N.O.C.

The Additional Reserves compensated more than the volumes already produced

Algeria's Hydrocarbon Reserves

Field development Contracts

- PSC : Production Sharing Contract
BERKINE BASSIN : Proved Reserves over
8 Billion bbl
- EOR : Enhanced Oil Recovery
NOC – PARTNAIRES : over 135 Million bbl

Algeria's Hydrocarbon Reserves

These type of contracts introduced the terms:

Contractual reserves during the contract period

Ultimate reserves remaining after the contract period

Algeria's Hydrocarbon Reserves

CONCLUSION:

ALGERIA uses SPE reserves definition:

Volumes were risks adjusted but did not consider the economical aspect of the projects.

A lot of discovered fields were considered as proved reserves but were not being produced.

With developed infrastructures and synergy due to area investments those fields became exploitable and the definition of their reserves approaches the UNFC definition.

A large potential of ressources remain to be discovered in Algeria