Moroccan Energy Outlook:

Achievements and perspective

Beyrouth – December 2018
I. General presentation of the Kingdom of Morocco

II. Morocco Energy strategy

III. Oil & Gas activity in Morocco
General presentation of the Kingdom of Morocco
Morocco: A Fast Growing Economy

- Total of inhabitants: 34.8 million
- Active Population: 11.8 million
- Language: Arabic, Amazigh, French, Spanish and English
- Primary Energy Consumption 20 million TOE
- Dependency on imports 94 %
- 2030 energy consumption forecast 43 million TOE
- GDP: $103 billion
- Average annual growth rate: +3.6 %
- Inflation rate: 1.2%
- Foreign Direct Investment: $2.3 billion
- Currency: Moroccan Dirham (MAD) 1 US $ = 9.65 MAD

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Morocco: A Cross-road from Africa to Europe

- 15 km distance from Europe
- 14 foreign trade ports
- Strengthening power grids connections between Europe, Africa and Morocco

- A unique geographical position with 3,500 km coastline on the Atlantic Ocean and the Mediterranean
- Tanger Med Port: a growing global connectivity with 174 ports and 74 countries
Favourable Climat for Economic Investment

- 21 investment related multilateral conventions including ICSID, MIGA and New York conventions
- Bilateral Investment Treaties with over 70 countries around the world
- Non double taxation agreements with more than 35 countries
- High World Wide Governance Indicators

1st in North Africa
For Political Stability, Government Effectiveness, Regulatory Quality and Control of Corruption. World Bank 2016

1st in Africa
Morocco Gets Named “Most Attractive Country In Africa For Investors” Ernst & Young - 2017

Fitch Ratings maintains Morocco's sovereign rating at "BBB-" with stable outlook - March 2018
Morocco energy strategy
A Growing Energy Demand Due to Significant Economic Development

Morocco's primary energy demand
- x2 by 2020
- x3 by 2030

Morocco's electricity demand
- x2 by 2030

Morocco's dependency on imported fossil fuels around 94%
A clear Energy Strategy

Four fundamental objectives

- Security of supply and energy availability;
- Access to energy at low costs;
- Demand management;
- Preservation of the environment.

Four Strategic Orientations

- Diversified mix, optimized by reliable and competitive technology;
- Mobilization of national resources;
- Energy Efficiency;
- Regional integration.
Primary Energy Mix

Evolution of the total energy mix

2018

- Coal, 33%
- Liquid Hydrocarbons, 52%
- Hydraulic power, 2%
- Natural Gas, 4%
- Electricity imports, 3%
- Wind, 4%
- Solar, 2%

2020

- Coal, 33%
- Liquid Hydrocarbons, 50%
- Wind, 9%
- Solar, 4%
- Natural Gas, 2%
- Hydraulic power, 1%
- Electricity imports, 0%
By 2020, RE will represent 42% of the total capacity

Wind
- Capacity: **2000 MW**
- Inv: $ 3.5 Million
- Annual savings: 1.5 Million TOE / year

Solar
- Capacity: **2000 MW**
- Inv: $ 9 Million
- Annual saving: 1 Million TOE / year
- MASEN

Hydropower
- Construction of **2550 MW** hydropower plants

Fossil fuels
- Thermal power plants under construction (2010-2015): **2X500 MW**
- Complementary projects **1000 MW** (Gas or clean coal) from 2018

Energy efficiency: 5% in 2020 and 20% in 2030
Power Energy Mix

By 2030: RE will represent 52% of the total capacity.

10 100 MW of additional renewable energy capacity by 2030.

Evolution of the electric energy mix.

- Coal: 22% in 2015, 14% in 2020, 12% in 2030.
- Natural gas: 10% in 2015, 11% in 2020, 15% in 2030.
- Fuel: 32% in 2015, 40% in 2020, 20% in 2030.
- Wind: 2% in 2015, 5% in 2020, 3% in 2030.
- Solar: 14% in 2015, 14% in 2020, 20% in 2030.

By 2030, renewable energy (RE) will represent 52% of the total capacity.
Oil & Gas activity in Morocco
UPSTREAM
Recently renewed framework for E&P Activity

Amendment to the Hydrocarbon Law in February 2000

Incentives Encouraging Investment

Considerable Increase in E&P Investment
New Hydrocarbon law permitted the expansion of exploration activity

ONHYM Partners on:
- 2 Exploitation concessions
- 45 Exploration Permits
- 4 Reconnaissance contracts
Total active area: ~119 000 Km²

17 Partners of ONHYM on:
- 10 Exploitation concessions
- 86 Exploration Permits
- 1 Reconnaissance contract
Total active area: ~147 000 Km²
Attractive Hydrocarbon Code and Fiscal Terms

- **Share of State interest**: 25% maximum.

- **Corporate tax**: Total exemption from corporation tax for 10 years.

- All equipment, materials, products and services required for the work are **exempt from customs duties and VAT**.

- Holders of an exploitation concession are **exempted from the tax of the patents, the urban tax and the tax on the urban undeveloped land**.

- **Tax exemption on the profits and dividends of the holders of an exploitation concession** and the shareholders of concessionary companies.

- **Low concession fees**:
  - Onshore and offshore at less than 200 meters of water depth: Oil 10%, Gas 5%.
  - Offshore at more than 200 meters of water depth: Petroleum 7%, Gas 3.5%.

- **Exemption from concession fee** for the first 300 000 Tons of oil or 300 million m$^3$ of gas produced onshore and in shallow waters and first 500 000 tons of oil or 500 million cubic meter of gas produced deep and ultra deep offshore for each exploitation concession.
Analog Basins with Major Recent Discoveries

- Morocco shares analogue basins with many recent discoveries and with some of the biggest producing fields in the world

- Continuity of the Algerian Triassic Province and the Saharan Hercynian platform in Eastern Morocco;

- Morocco is boarded by the Atlantic Meso-Cenozoic Passive Margin where big discoveries have been made (Nova Scotia and Gulf of Mexico);
Multiple leads - Petroleum Systems Offshore and Onshore

- 920 000 km² of sedimentary basins with multiple identified petroleum systems ranging from paleozique to cenozoique and proven source rocks;

- 800 identified prospects and leads offshore and onshore;

- More than 3000 km² Offshore domain on the Atlantic and the Mediterranean sea coastlines;

- Sedimentary basins in Morocco remain underexplored: Only 0.04 wells/100 km²;

- The prospects drilled so far showed hydrocarbon accumulations and discoveries that have proven their potential.
Promising Producing Fields and recent Discoveries

3 main producing fields:

- Essaouira Basin onshore: Meskala Gas and condensate;
- Gharb Basin onshore: Biogenic and thermogenic gas;
- Natural gas in High Plateaus onshore (Tendrara).

Multiple oil and gas shows offshore
Important Oil Shale Potential

Over 10 oil shale indications located in the Rif, the Atlas and the Southern provinces with two main fields:

- **Timahdit**: Potential evaluated at 15 billion barrels of oil;
- **Tarfaya**: Potential evaluated at 23 billion barrels of oil.
Shale Gas Potential

Third largest opportunity in North Africa

4 Basins geologically favourable for shale gas resources:

- Bas Draa-Zag
- Boudenib & Ouarzazate
- High Plateaux
- Tadla & Haouz

Total Gas reserves in place: **305.7 TCF**
Free rich and reliable G&G database

Seismic & wells database

Seismic :

Onshore
- 2D Seismic: 53,880 Km;
- 3D Seismic: 1,856 Km²;

Offshore
- 2D Seismic: 174,267 Km;
- 3D Seismic: 57,733 Km²;

Additional 2D & 3D seismic to be acquired.

Exploration Wells :
- 45 wells in Offshore (43 in the Atlantic & 2 in the Mediterranean);
- 300+ wells in Onshore.
Our List of partners include

[Logos of various companies]
Oil & Gas activity in Morocco
DOWNSTREAM
Downstream situation: Liquid petroleum products

Over 20 years of sectorial Liberalization policy

1994: Privatization of petroleum products distribution sector

1995: Indexation of petroleum products prices on international oil markets

1997: Privatization of domestic refining industry

2014: Ending subsidies to liquid petroleum products

December 2015: Liberalization of liquid petroleum prices
Consumption of petroleum products in Morocco, 2017

- Gasoil, 51%
- LPG, 22%
- Fuel Oil, 15%
- Aviation fuel, 6%
- Gasoline, 6%

11,6 Mt of liquid petroleum products consumption in 2017
Downstream situation : Liquid petroleum products

Market supply and actors

- Petroleum products domestic market is fully supplied trough import by 11 Moroccan private companies since refinery SAMIR shutdown in August 2015;
- Domestic storage capacity: 1,3 millions cubic meters among which 93% is connected to ports (Tangier Med, Jorf Lasfar, Mohammadia, Nador, Agadir…);
- 20 companies are active in the distribution of liquid petroleum products (including importing companies);
- Distribution of unleaded gasoline and Diesel 10 ppm is carried through more than 2 500 sale points;
- Dedicated investment of 3 billion Dirhams will allow to have an additional storage capacity of 756,000 m³ by 2021.
Downstream situation : LPG

Market supply and actors

• Market supply is ensured by the filling centers through imports on different ports of the Kingdom: Mohammedia (Somas), Jorf Lasfar, Nador, Tanger Med, Agadir and Laayoune (terminals and a global storage capacity of 549.000 m³.)

• 15 filling companies holding 37 filling centers with a global filling capacity of 2,4 millions Tons/an;

• LPG distribution (butane and propane) is ensured by 16 companies operating important butane cylinders parc: more than 34 millions bottles

• These companies ensure the distribution of filled cylinders through their « concessionaries » : « dépositaires » which operate under an exclusive agreement in limited areas.

• Number of these concessionaries: 500 ranging from small, medium and big « dépositaires ». 
Downstream situation: Natural Gas

Power generation from natural gas

- Effective use of natural gas in electricity sector since 2005: with the first combined cycle power plant in Tahaddart, near Tangier:
  - Power of 385 MW;
  - 2016 production: 2,800 GWH (12.5% of the energy called);
  - Tahaddart Annual consumption of gas: around 480 million M3;
  - Supply: royalty gas (Gazoduc Maghreb Europe Pipe Line).

- With the commissioning in 2009 of the AIN BENI MATHAR combined cycle/solar thermal power plant in the East of the country, Morocco's consumption amounted globally 1.1 billion M3 / year (royalty gas + direct contract with SONATRACH).
Natural gas is expected to support the intermittency of Renewable energy development.

Launched in 2015, the roadmap for the reinforcement use of natural gas has 2 phases:

- **1st phase**: "Gas To Power": to satisfy the needs of the electricity sector;
- **2nd phase**: "Gas To Industry": to extend the use of natural gas to the industry sector.

The "Gas to Power" phase consists of the realization of the following gas and power infrastructures:

- The maritime infrastructure at Jorf Lasfar;
- The LNG terminal including storage capacity at Jorf Lasfar;
- Power plants operating on natural gas (4 x 600 MW);
- The transmission pipeline connecting the LNG Terminal to the existing Maghreb Europe Gas Pipeline "GME".

ONEE is entrusted the development and implementation of this project for a commissioning by 2028;

The global investment is estimated at 4.6 billion US Dollars.
“Gas to Power” and “Gas to Industry” projects

- With regard to supply, discussions have been initiated with several international companies producing and marketing liquefied natural gas.

- A Call for Expressions of Interest for participation in the project has been launched internationally. 93 companies responded.

- The technical, legal, financial and commercial advisers have been hired by ONEE and are working on the different aspects of the project.

- Next Step: ONEE is expected to launch an international bid to select the consortium which will develop and exploit the infrastructure within a PPA (Power Purchase Agreement).

- A Gas Code covering downstream activities is under discussion with all multistakeholders.
CONCLUSION

- The main objectives of the Moroccan energy strategy are aiming at **securing energy supply and preserving the environment**.

- **Progress towards reduction of energy dependency:**
  1. Foster oil & gas exploration;
  2. Develop renewable energy sources;

- **Progress towards sustainability is sought through:**
  1. Energy efficiency;
  2. Renewable energy development (national programs): hydro, wind and solar (combination of different solar technologies);
  3. Renewable energy development relies on means of electricity generation which allow required flexibility regarding the intermittency as well as the management of the demand peak: Hydro (Energy Transfer Station by Pumping) and LNG terminal project: expected to reinforce gas use (cleaner than coal);