New Moroccan Energy Strategy by 2030
ASSETS, CHALLENGES & OPPORTUNITIES

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Moroccan energy transition Model

1. Security of supply
2. Energy Independence
3. Low-carbon energy: Ren + EE
4. Regional energy integration
A critical Moroccan energy context in 2008

- Deficit with a capacity of 900 MW at the end of 2007
- Sustained pace of growth in electricity demand: more than 6%
- High energy dependency: 98%
- Deficit in production means
- Offer request imbalance
- Import of 17% via the Morocco Spain interconnection
National Energy Strategy on going with an emphasis on renewable energies

5 Strategic guidelines

- Diversified and optimized mix around reliable and competitive technology choices
- National resource mobilization by the rise of renewables
- Energy efficiency built in national priority
- Strengthening regional integration
- Sustainability

4 fundamental goals

- Widespread access to energy at competitive prices
- Security supply and availability of energy
- Environmental preservation
- Demand side management
National Energy Strategy on going with an emphasis on **renewable energies**

- **5 Strategic guidelines**
- **4 fundamental goals**

Translated into strategy roadmap with short, medium and long term programs having clear and specific objectives. Increase renewable installed capacity to 42% by 2020.

Clear vision for legislative, regulatory and institutional reforms.
Currently, Morocco is really engaged in the path of energy transition.

1. Improvement of the reserve margin of the electrical system
   - About 15%

2. Increase in the share of wind and solar
   - 2% in 2009
   - to 16% in 2016

3. Reduction of energy dependence
   - 98% in 2008
   - to 93.3% in 2016

43% of the power installed from Ren by 2020.
Strong Royal impulse in favor of renewable energies to achieve 52% by 2030

Historic turning point in 2030
the share of renewable electricity will be higher than the share of fossil fuel electricity
Renewables major programs between 2016 and 2030

Achieving 10100 MW of additional capacity in renewable energy

- Solar: 4560 MW (20%)
- Wind: 4200 MW (20%)
- Hydro: 1330 MW (12%)
Morocco has huge renewable energy resources

Wind potential

25 000 MW onshore
250 000 MW offshore

Wind speed: 9.5 to 11 m/s by 40 m
Morocco has huge renewable energy resources

Solar potential

20 000 MW

Irradiation of ~ 6.5 kWh/m²/day
3 000 hours/year
CCGT role in reducing intermittence

1. Flexibility in the management of the peak

2. LNG terminal will be achieved at Jorf Lasfar

3. Combined cycles: **4800 MW**
Energy Transfer Station by Pumping (ETSP)
Need to enhance the flexibility of the Moroccan electric system

Afourar ETSP (460 MW)

ETSP Marine Program
(3500 Km of coastlines)
Morocco: crossroads of electricity transit between Africa and Europe

**Morocco-Portugal interconnection**
- Under study (1000 MW)

**Morocco-Spain interconnection**
- Commissioned in 1997
- Capacity doubled in 2006
- Available capacity of exchange: 1400 MW
- Commercial capacity: 900 MW
- ONEE has been the 4th operator in the Spanish market since 1999
- Studies of 3rd interconnection is in progress

**Expected Morocco-Mauritania interconnection**
- Under study
- As a first step, Laâyoune-Dakhla line under development

**Morocco-Algeria interconnection**
- Commissioned in 1988
  - (2x 225kV lines)
- 400 kV line in 2008
- Exchange capacity 1200 MW
Introducing **Smart Grids technologies** in the national electricity system
Investment opportunities in oil infrastructure

1. Very promising areas in terms of economic efficiency, to achieve large oil regional projects

2. Opportunity to achieve storage capacity for the transshipment of petroleum products at Nador West Med (Mediterranean sea)
Energy efficiency, an important pillar of the Moroccan energy strategy

Programs targeting consumers in priority sectors: Industry, transport, and buildings

- Saving 5% by 2020
- Saving 20% by 2030
Success Keys of the Moroccan energy model

- Political Stability
- Claire vision and specific programs
- Geostrategic Positioning
- Adequate regulatory and institutional framework
- PPA Morocco Innovative Partnership Models
- Real Opportunities
- Record performances
- Industrial Integration
  - Training and R&D
Integrated Project 850 MW

Project Noor Ouarzazate LNG Project

16 Pre-selected groups
Record price: 30 cDh/kwh

200 investors presented
Encouraging price level

100 interested companies

Increasing investor interest
Real opportunity of investment

Attractif Model & regulatory frame work

46 Billion US $ 2016-2030
Thank You
For Your Attention