AN AMBITIOUS ENERGY STRATEGY WITH CLEAR OBJECTIVES

AMBITIOUS OBJECTIVES SET TO ENSURE THE ENERGY SECURITY OF THE COUNTRY, DIVERSIFY THE SOURCES OF ENERGY AND PRESERVE THE ENVIRONMENT

Engaged actors to achieve national energy targets

Private actors

- Law 13-09

Keypartner to develop REN projects

- Law 57-09 / Law 37-16

Solar

Hydro

Wind

2009: 28%

2018: 35%

2020: 42%

2030: 52%
MASEN: CONTRIBUTION TO THE DEVELOPMENT OF AN INTEGRATED REN ECOSYSTEM

A UNIQUE MODEL RELYING ON AN INTEGRATED VISION OF REN PROJECTS DEVELOPMENT

SEVERAL ACTIONS FOR AN INTEGRATED DEVELOPMENT

Solar Cluster
- 80 members and 300 companies connected
- Several projects incubated and financed

R&D
- Several partnerships
- European projects of R&D collaboration
- 1 demonstrator in operation, 1 demonstrator in construction and many others under study

Local Development
- 5 sectors of intervention and 4 territories
- More than 150 actions led since 2010
- More than 77,000 beneficiaries

...for the development of an integrated RENecosystem
Almost 4 000 MW of renewables in operation over a total installed capacity of 8 200 MW

**Solar Projects – 700 MW**

1. Ain Beni Mathar – 20 MW
2. Noor Ouarzazate I – 160 MW
3. Noor Ouarzazate II – 200 MW
4. Noor Ouarzazate III – 150 MW
5. Noor Ouarzazate IV – 70 MW
6. Noor Laayoune – 80 MW
7. Noor Boujdour – 20 MW

**Wind Projects – 1200 MW**

1. Amougdoul – 60 MW
2. Tanger I – 140 MW
3. Torres / Koudia Al Baida – 50 MW
4. Tarfaya – 300 MW

...of which around 620 MW developed under the Law 13-09 scheme

**Hydro Projects – 1 770 MW**

More than 29 hydro-electric dams across the country and 1 STEP

1. Akhfenir 1 & 2
2. Foum Al Oued
3. Cimar
4. Haouma
5. Lafarge

1. 200 MW
2. 50 MW
3. 5 MW
4. 50 MW
5. 32 MW
NOOR OUARZAZATE: THE FIRST MULTI TECHNOLOGIES COMPLEX

A SOLAR COMPLEX OF 580 MW COMBINING 3 DIFFERENT SOLAR TECHNOLOGIES

NOORo I
- Technology: CSP trough
- Capacity: 160 MW
- Price: 1.62 MAD / kWh
- Storage: 3 hours
- CO2 emissions avoided: ~280 000 tCO2 / year
- Industrial integration: 30%*

NOORo II
- Technology: CSP trough
- Capacity: 200 MW
- Price: 1.36 MAD / kWh
- Storage: > 7 hours
- CO2 emissions avoided: ~380 000 tCO2 / year
- Industrial integration: 35%

NOORo III
- Technology: CSP Tower
- Capacity: 150 MW
- Price: 1.42 MAD / kWh
- Storage: > 7 hours
- CO2 emissions avoided: ~250 000 tCO2 / year
- Industrial integration: 35%

NOORo IV
- Technology: PV with tracking system
- Capacity: 70 MW
- Price: 0.44 MAD / kWh
- CO2 emissions avoided: ~87 000 tCO2 / year

* Real industrial integration reached: 34%
NOOR MIDELT Phase 1

- **Technology:** Hybrid PV - CSP
- **Capacity:** 800 MW
- **Minimum Storage:** 5 hours
- **Price:** 0.68 MAD / kWh
- **Start of construction:** Early 2020
- **Start of construction:** 2022

AWARDED to EDF Renouvelables-MASDAR-GREEN OF AFRICA

NOOR MIDELT Phase 2

TENDER PREQUALIFICATIONS ONGOING (Oct’19)
FUTURE REN PROJECTS : OTHER PROJECTS PLANNED

**SOLAR PROJECTS**

- **NOOR ARGANA** 200 MW
- **NOOR ATLAS** 200 MW
- **NOOR PV II** 800 to 1 000 MW
- **NOOR Midelt II** 800 MW

**WIND PROJECTS**

- **WIND PROJECT - INTEGRATED PROJECT OF 850 MW**
- **WIND PROJECT – TAZA** 150 MW
- **Koudia Al Baida Repowering – 120 MW**

**HYDRO PROJECTS**

- **1 770 MW OF HYDRO PROJECTS IN OPERATION**
- **MORE THAN 29 DAMS IN OPERATION AND 1 STEP**

**NOTES**

- 700 MW OF SOLAR PROJECTS IN OPERATION
- 1 200 MW OF WIND PROJECTS IN OPERATION
- Detailed programing ongoing to take into account the possible synergies between REN technologies

**By the Year 2030**

- **+ 3000 MW by 2020**
- **+ 6000 MW by 2030**

**NB:** Private projects developed under the Law 13-09 included
ACTIONS INITIATED BY MASEN IN SEVERAL SUBSAHARIAN COUNTRIES

12 MoU SIGNED IN SUBSAHARIAN AFRICA AND OTHERS MoU UNDER DEVELOPMENT IN OTHER COUNTRIES

Other potential partnerships to be developed at the international level

MoU signed with Masen
Other potential countries

Framework agreement signed or being signed
AN EXCHANGE OPPORTUNITY WITH EUROPE THROUGH THE IMPLEMENTATION OF A RE EXCHANGE ROADMAP

SIGNATURE AT COP22 OF A JOINT DECLARATION TO IMPLEMENT A GREEN ELECTRICITY EXCHANGE ROADMAP BETWEEN MOROCCO AND EUROPE

COUNTRIES:

CINQ SIGNATORY COUNTRIES:

STEERING COMMITTEE

STEERING COMMITTEE SECRETARIAT BY MASEN

PHASE I (finished)

Project scope and synthesis of previous studies

PHASE II (finished)

Studies implementation and identification of target markets for the exchange of electricity between the five countries

PHASE III (On-Going)

Roadmap elaboration and preparation of the implementation

PARTNERS INVOLVED IN THE PROJECT

Union for the Mediterranean
Commission européenne
THE WORLD BANK
Electricity transmission System Operators
TSOs