



masen

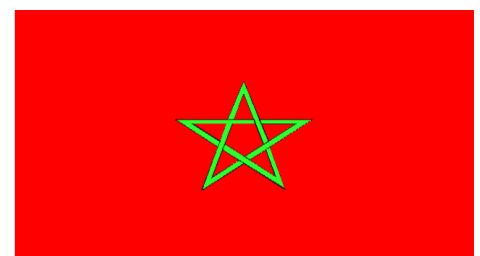
masen Moroccan Agency for Solar Energy

www.masen.ma



Moroccan Integrated Solar Plan

Venice, October 16th, 2011

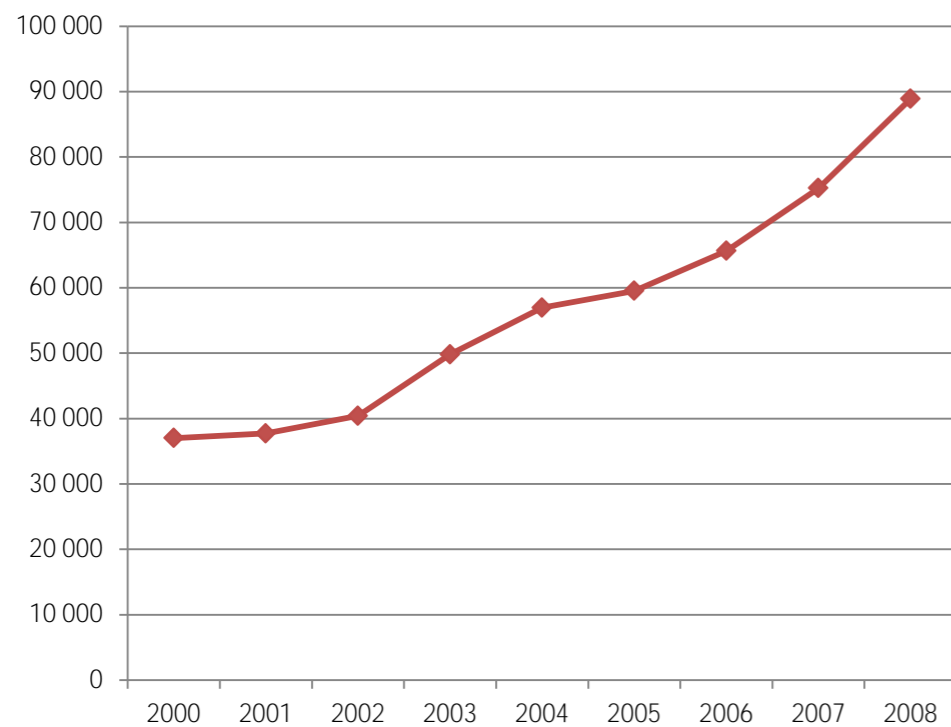


Electricity Sector in Morocco

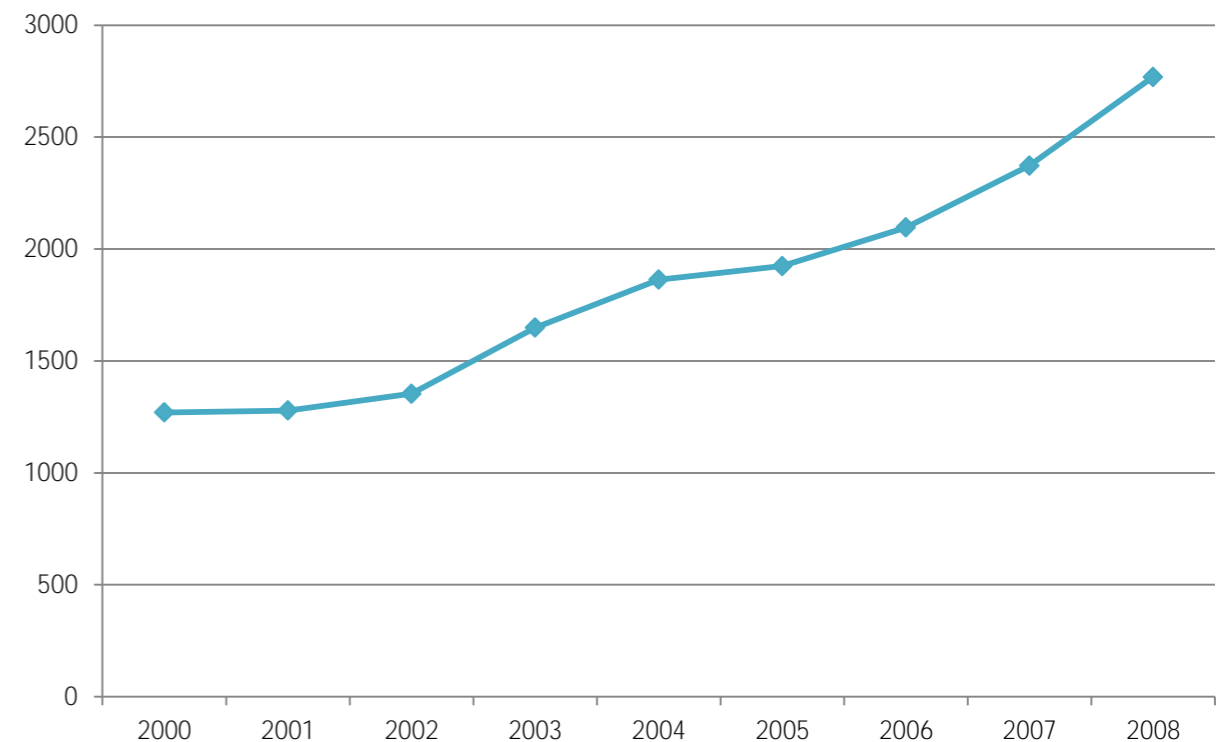
Economic and Reglementary background



Morocco: Economic background



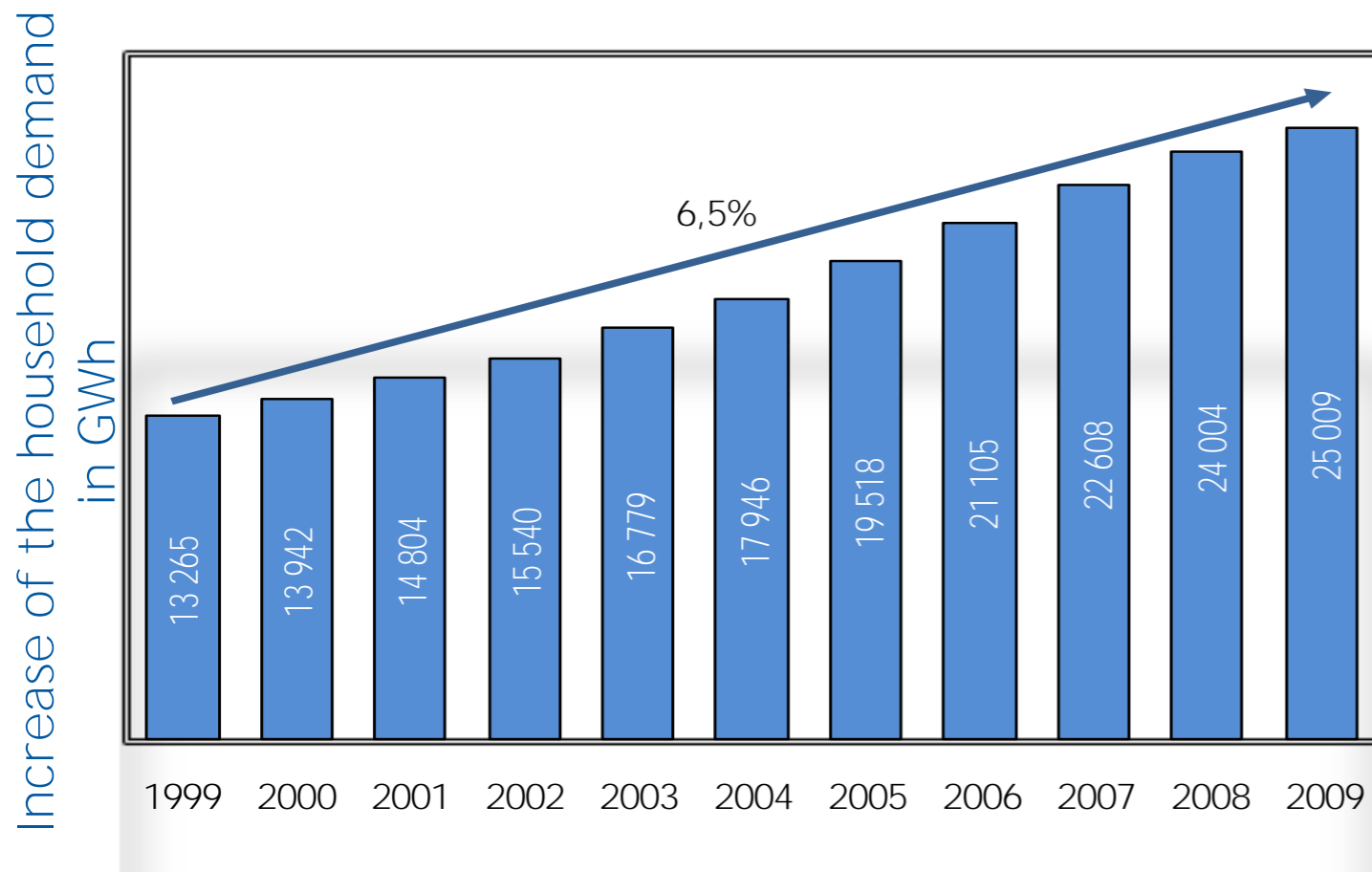
Increase of GDP (M\$ US)



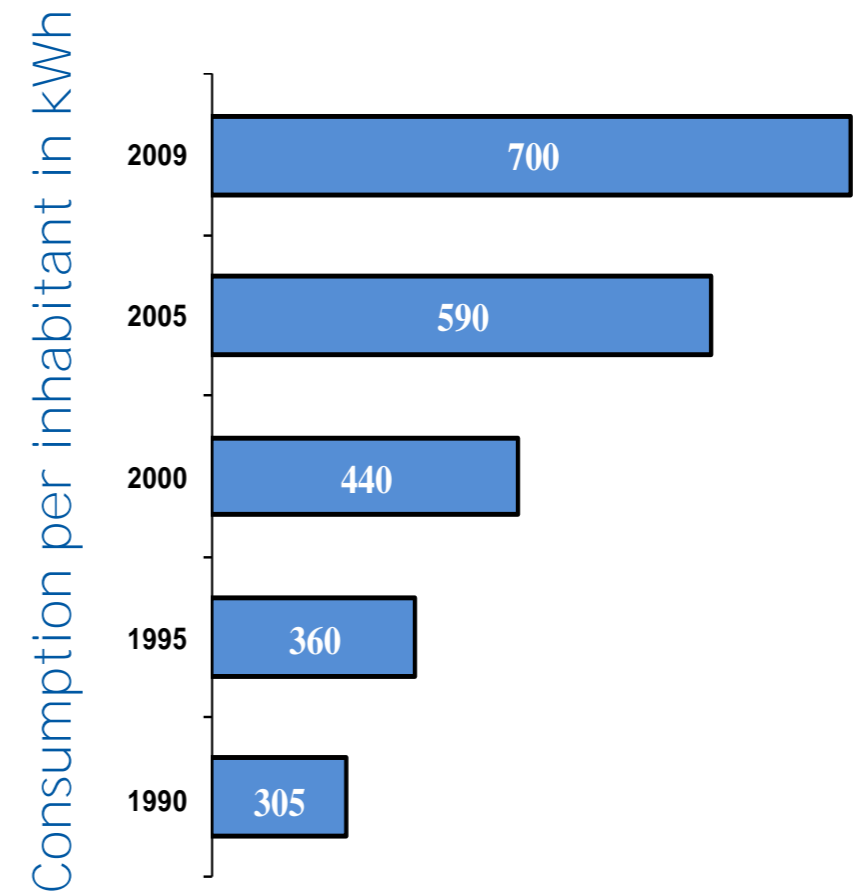
Increase of GDP/inhabitant (\$ US)

Source : Ministry of Energy, Mining , of Water and e Environment

Morocco: Economic background



HOUSEHOLD DEMAND ...

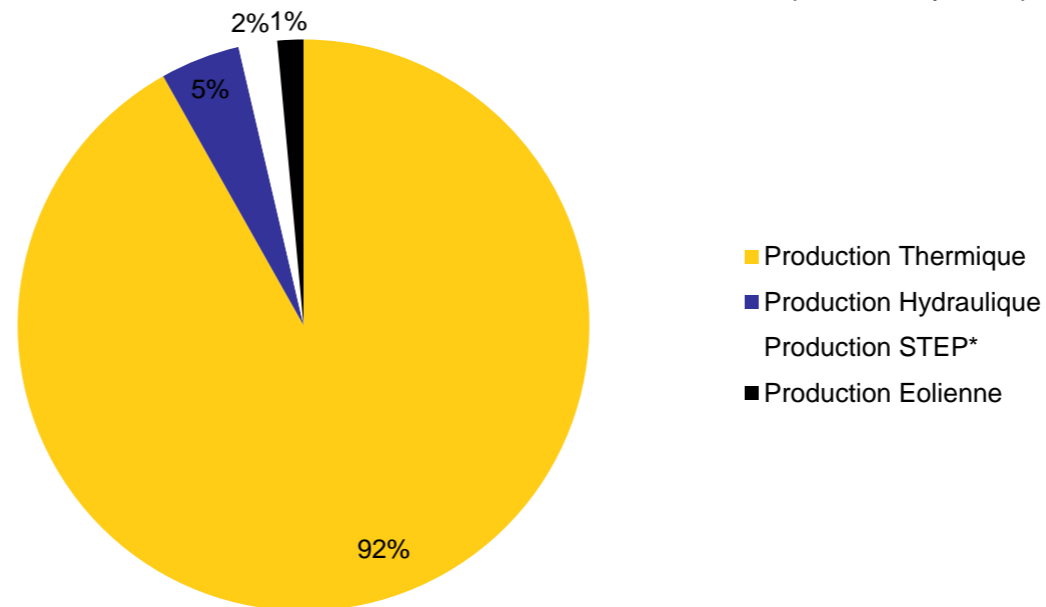
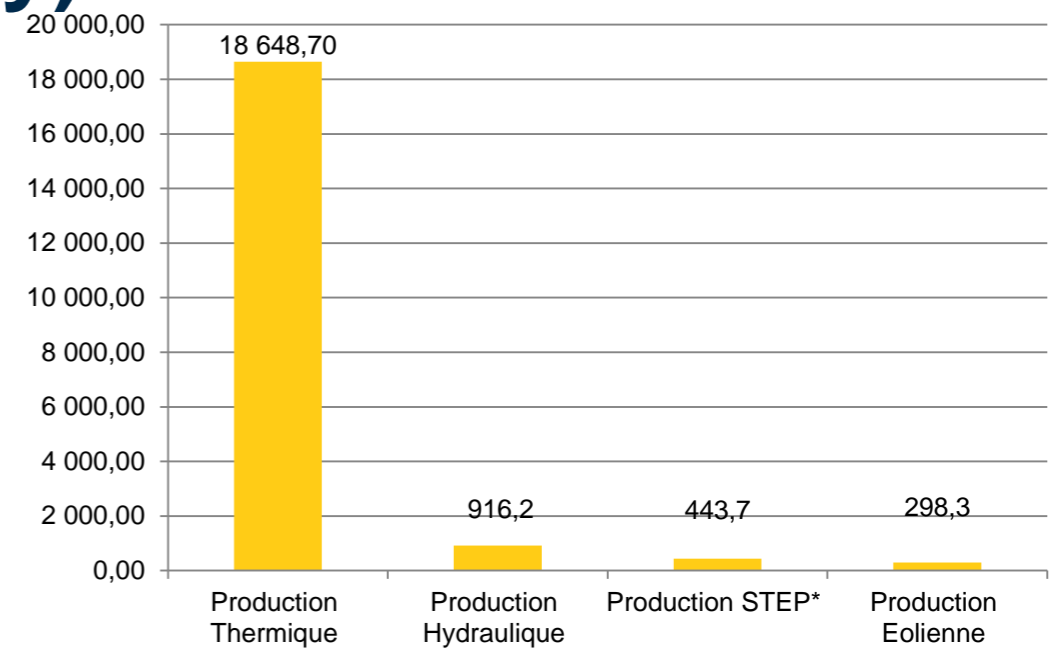


& OF THE INDIVIDUAL CONSUMPTION

Source : Ministry of Energy, Mining , of Water and e Environment

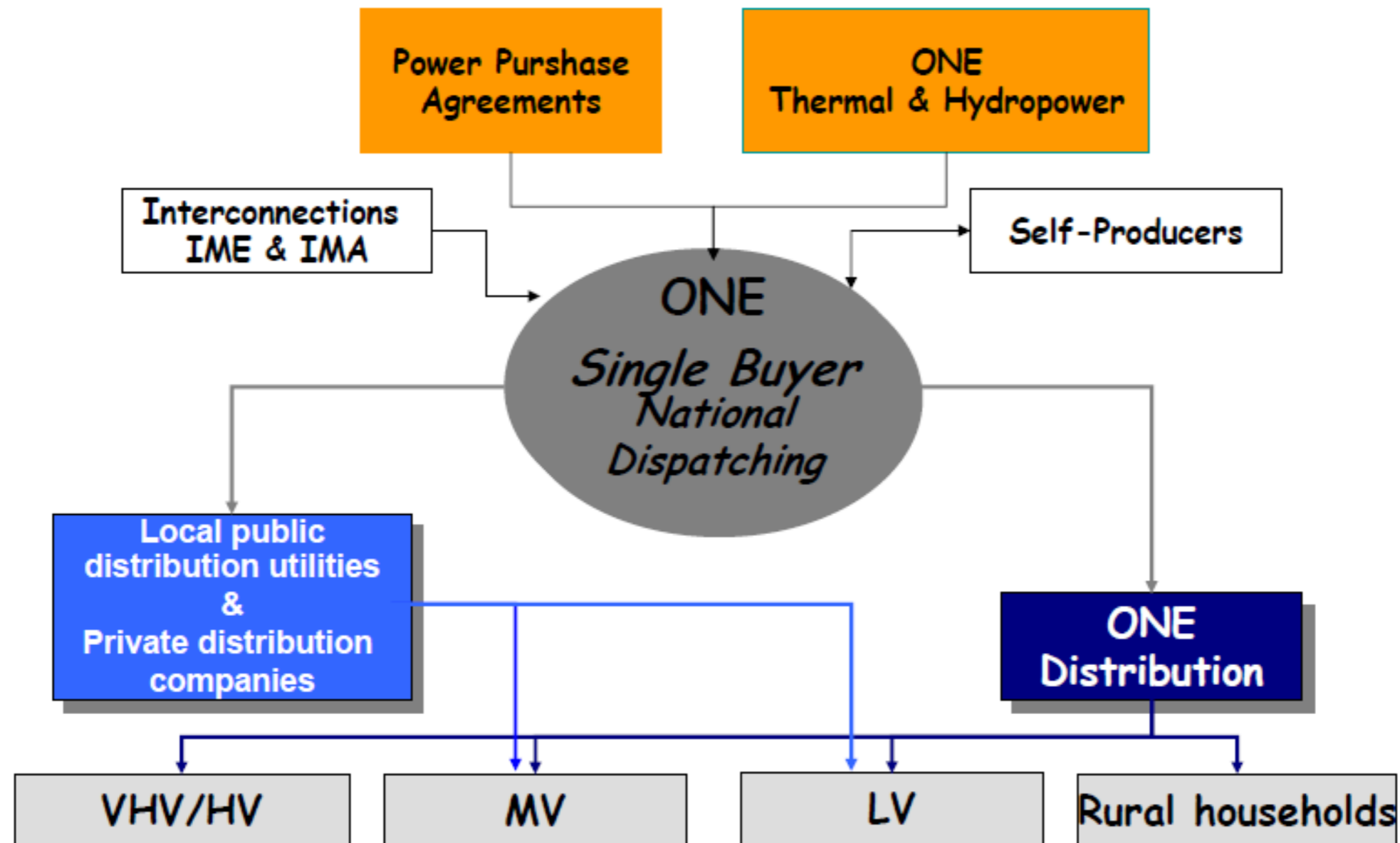
Energy Sector in Morocco

1. ONE (national electricity Utility)
2. IPPs in Morocco
3. Dependency on imports: 97%
4. Installed capacity: 6150 MW
5. Transmission



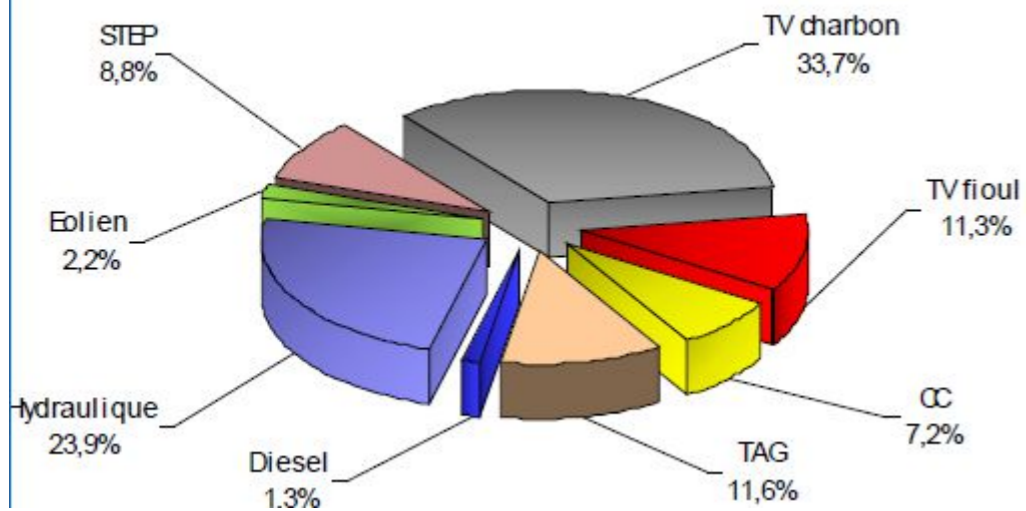
Source: www.one.ma

Electricity Procurement in Morocco



Source : Ministry of Energy, Mining , of Water and e Environment

Installed Capacity (2008)



Thermique vapeur charbon 1 785

- JLEC (4*330MW) 1 320

- Mohammedia (2*150MW) 300

- Jerrada (3*55MW) 165

Thermique vapeur fioul 600

- Mohammedia (2*150MW) 300

- Kenitra (4*75MW) 300

Cycle combiné (EET) 380

TAG (15*33MW + 6*20MW) 615

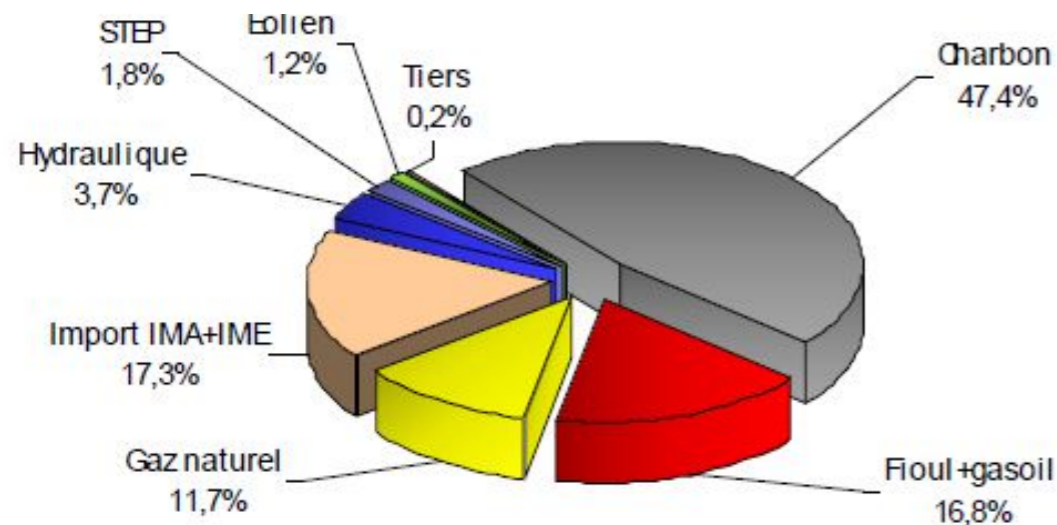
Groupes Diesel 69

Hydraulique 1 265

Éolien 114

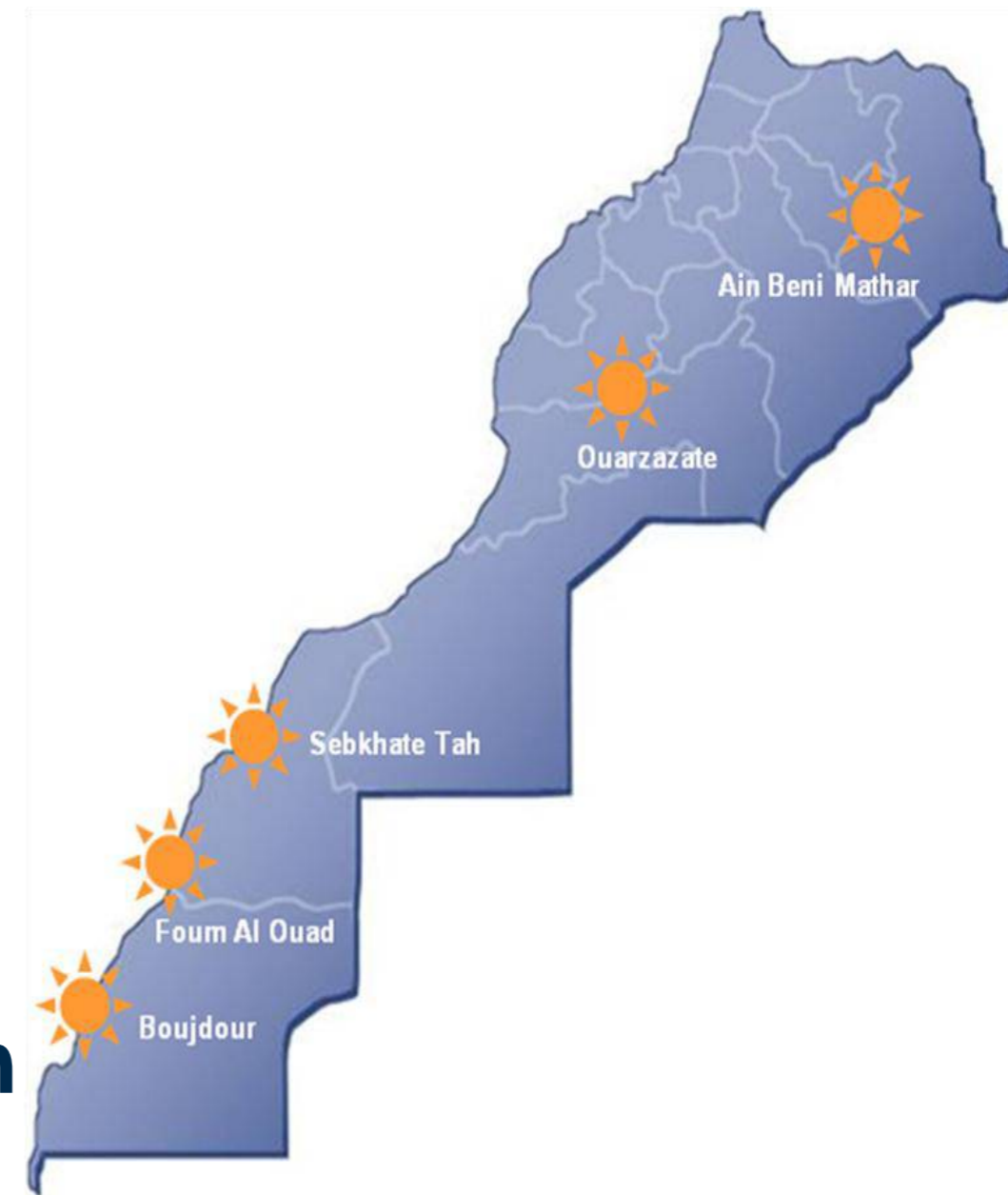
STEP (Afourer) 464

Total 5 292



Renewable Energy Policy Framework

- 1. Morocco Solar Plan**
- 2. Legal environment**
 - a) Bill 13-09**
 - b) Bill 16-09**
 - c) Bill 57-09**
- 3. State-MASEN convention**
- 4. ONE-MASEN-State convention**
- 5. 5 sites identified**



Objectif 2020
2000 MW

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The Moroccan Solar Plan

Driven by Masen, Well On Track



National energy strategy focusing on RE

Sustainable
economic growth



Energy consumption
Increasing demand
x2 by 2020 and x4 by 2030

Willingness to increase
energy independency
Limiting import (today 95%)

Capacity increase



Stable offer
less volatile fossil based

Sustainable
development conviction

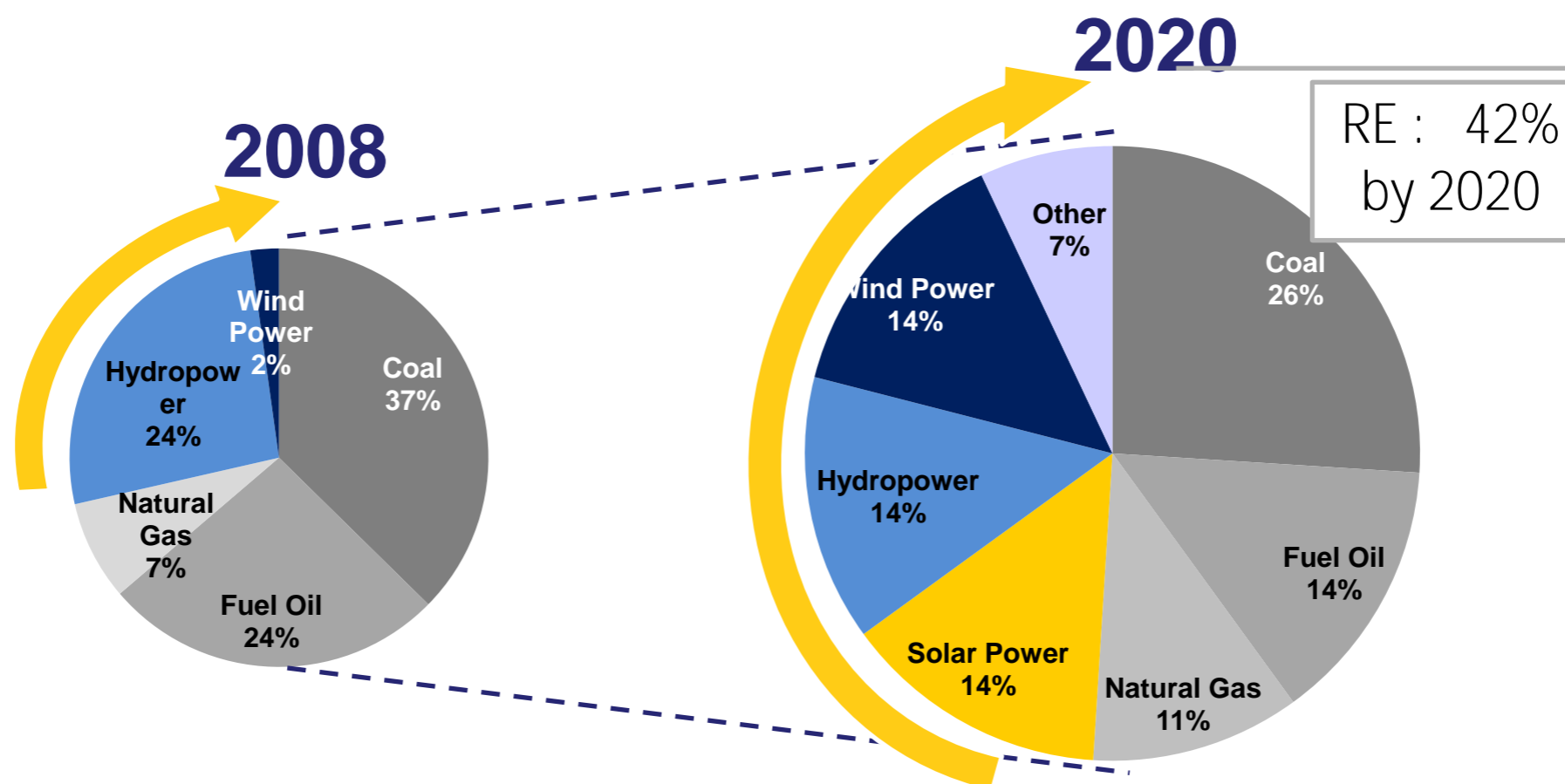
Diversification



ALL ~~X~~ COAL

Promote renewable
energies

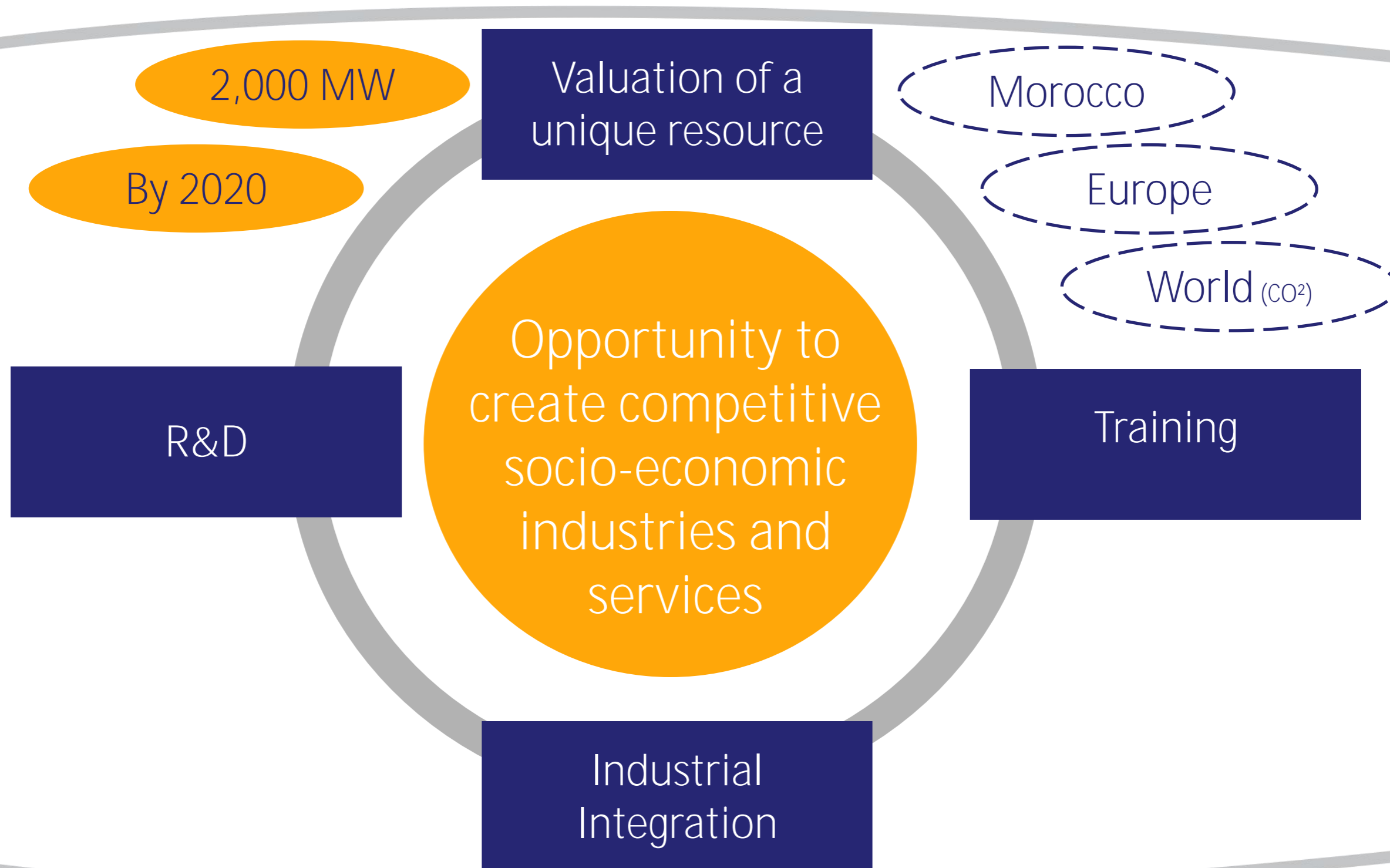
Strong commitment to the targeted mix



By 2020, the installed capacity from renewable sources shall represent 42% of the total capacity of which 14% for Solar

Solar : CO₂ emissions to be avoided add up to 3.7 Mt per year

An Integrated and Multi-dimensional Vision



Well-equipped to meet the ambitions level

Abundant solar resources



At the heart of energy crossroads

Capacity to achieve large projects



Institutional

Clear support from the Government
 ← reduction of fossil compensation in progress

Legislative

Enactment of new laws :
 ENR, ADEREE, MASEN
 → Increased liberalization

Operational

Creation of dedicated entities: SIE, ADEREE, MASEN, ...

ENR : Renewable Energies

ADEREE : Agency for the Development of Renewable Energies and the strengthening of Energy Efficiency

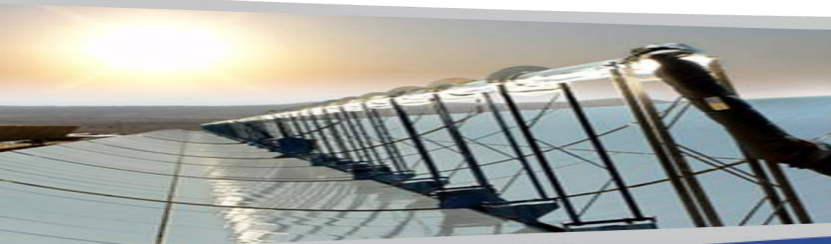
SIE : Company for Energy Investments

Objectif 2020
2000 MW

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Moroccan Agency
for Solar Energy

MASEN

A Dedicated, Dynamic, and “Forearmed” Actor



Three major missions, all in the framework of Tri-partite logic

MASEN's Missions

Contributing to
the development
of local expertise

Developing solar
power plants

Acting as a trigger
at national and
international scales

***...supported by 2 conventions which seal MASEN's relations with
the State and ONE (Office National de l'Electricité)***

State-MASEN

- Modalities, technical requirements and mechanisms designed to ensure financial balance of each project throughout the realization of the solar plan

ONE-MASEN

- Rules and terms for the supply, transportation, and the commercialization of the electric power produced

A joint stock company publicly funded

Objective

Achievement of a min of 2 000 MW of integrated solar projects by 2020.
(electric production of solar origin, industrial integration , R&D, Training...)

Legal Status

– Joint Stock Company

Governance

– Board of Trustees and Supervisory Board

Initial Capital

– 500 000 000 MAD

Distribution of capital

– Government, ONE, Hassan II Fund and SIE (equal parts)

A global and rigorous methodological approach

Land mobilization

Site qualification

Technological configurations

Consultants recruitment

Infrastructure
implementation

Institutional structure

Tendering process
management

Operational priority: Ouarzazate integrated complex



The Ouarzazate Complex

The First Project within the Moroccan Solar Plan

The Ouarzazate Complex: 500 MW by

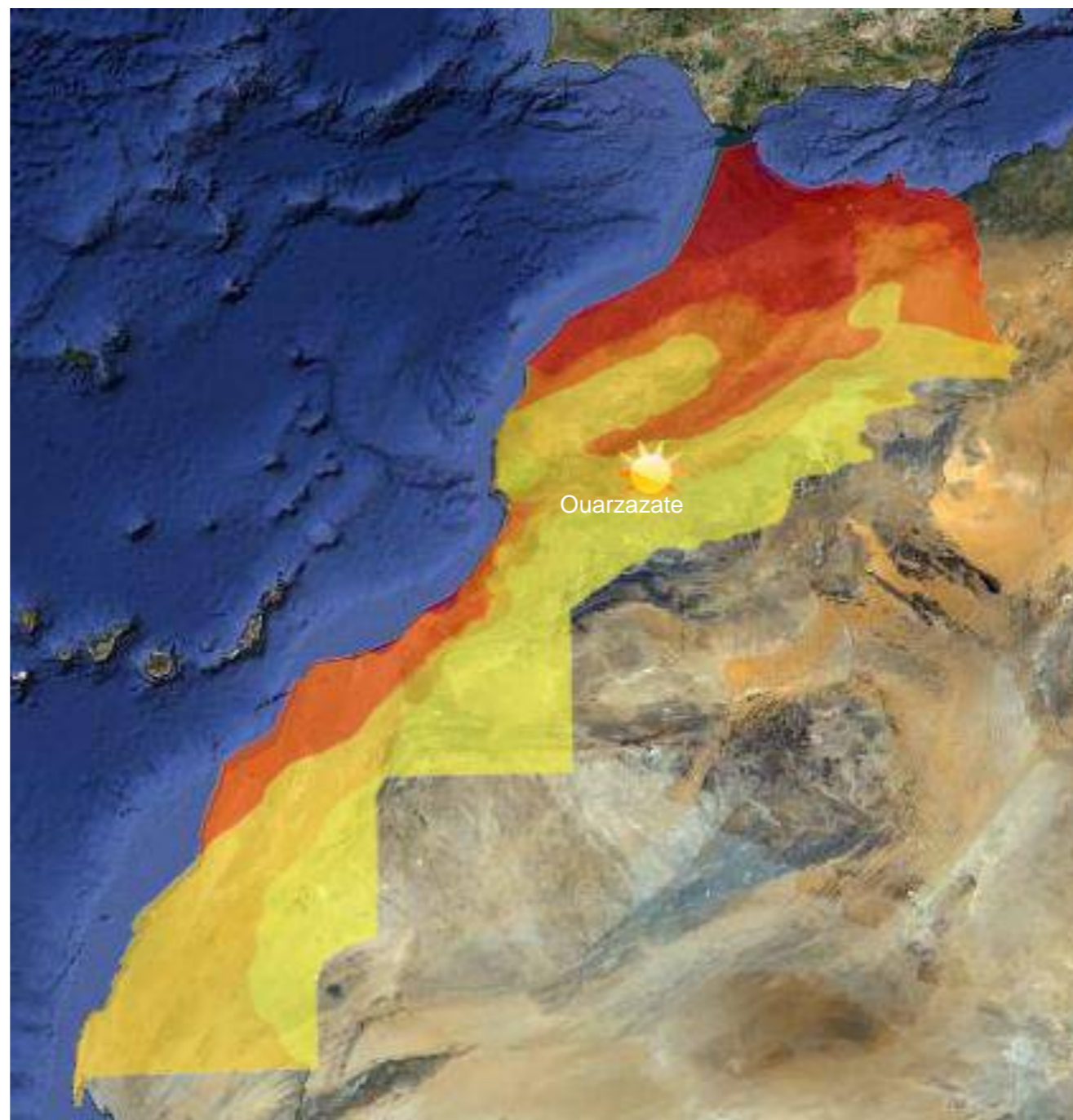
2015

Site



Ouarzazate City

Mansour Eddahbi Lake



≥ 2800 kWh/m²
2500 kWh/m²
2200 kWh/m²
1900 kWh/m²
< 1500 kWh/m²

Annual direct solar radiation

The Ouarzazate Complex: Several Steps Completed (1/2)

Land Mobilization

- A site of 2,500 hectares, located at 10 km North-east of Ouarzazate
- Contract for the acquisition of the site has already been signed

Site Qualification

- Qualification of the site is well underway, with confirmation of its perfect adaptability to a 500MW project

Solar Measurement	✓
Topography	✓
Seismicity	✓
Geotechnics	✓
Hydric resources	✓
Environmental impacts	✓ ...
Hydrological	...

Technological Configurations

- Phasing : 2 phases
- Capacity : 125 MW per project as a minimum at least for the first phase

Recruitment of Consultants

- Recruitment of leading consultants : (WorleyParsons; International Finance Corporation; Linklaters; Deloitte; Gide Loyrette Nouel; Valyans Consulting; Experts)

✓ Already completed

... underway

The Ouarzazate Complex: Several Steps Completed (2/2)

Infrastructure Development



- Infrastructure development (water carriage; power connection; road access; telecommunication network, basic structures) of the site spearheaded by MASEN , preparing the site for developers
- The launch of works scheduled for 2011

Institutional Structuring



- Institutional Scheme has been defined : it is based on a public-private partnership (PPP) for the sake of a better distribution of risks among the various actors

Launch of the Invitation to Tender



- A Process in three stages:
 - Call for Expression of Interest: March 2010
 - RFQ for Phase 1: 19 consortiums and 4 prequalified
 - RFP for Phase 1: currently underway

Wide Adherence to the Project and its Structure

Local players and Population

Consultation meetings

- Rationale well understood
- Strong support
- Positive impact expected at different levels

Operators/Developers

Expression of Interest Stage

- 200 company bids
- Strong international presence
- Value chain covered

Pre-qualifying stage

- 19 candidates have responded to the Phase 1 RFQ launched by MASEN

International Financial Institutions

Exchange and Analysis already engaged

- Multilateral Development Banks
- Bilateral Development Banks

Many institutions have already expressed their interest in principle to participate in the financing of the Ouarzazate Program



Thank you
for your attention

masen
Moroccan Agency
for **Solar Energy**

