



Kingdom of Morocco

Integrated Solar Energy
Generation Project

TECHNOLOGY CONTEXT OF SOLAR ENERGY

Two basically different technologies of solar energy generation in continuous progress



Photovoltaic Solar(PV)

Solar energy is converted to electricity Power by semi conductor materials like Silicium.



Thermal Solar (or CSP: Concentrated Solar Power)

The sun rays are concentrated by mirrors. The heat collected produces steam which is converted to electricity power using steam turbine generator.



ONE OF THE BIGGEST PROJECTS OF SOLAR ENERGY GENERATION IN THE WORLD

- Installed Capacity : **2000 MW**
(**38** % of the current total installed capacity)
- Generation : almost **4500 GWh** annually
(Corresponding to 18% of the current annual generation)
- Estimated cost : **70 billion Moroccan dirhams**
(**9 billion US dollars**)
- Five selected sites : 10 000 hectares
- Operating dates:
 - First plant will be commissioned on 2015
 - The global project will be commissioned by the end of 2019



A PROJECT THAT MOBILIZES NATIONAL RENEWABLE RESOURCES AND PRESERVES ENVIRONMENT

This project is a part of the large projects planned as following to the High Royal Orientations related to mobilization of the national renewable resources and the preservation of environment .

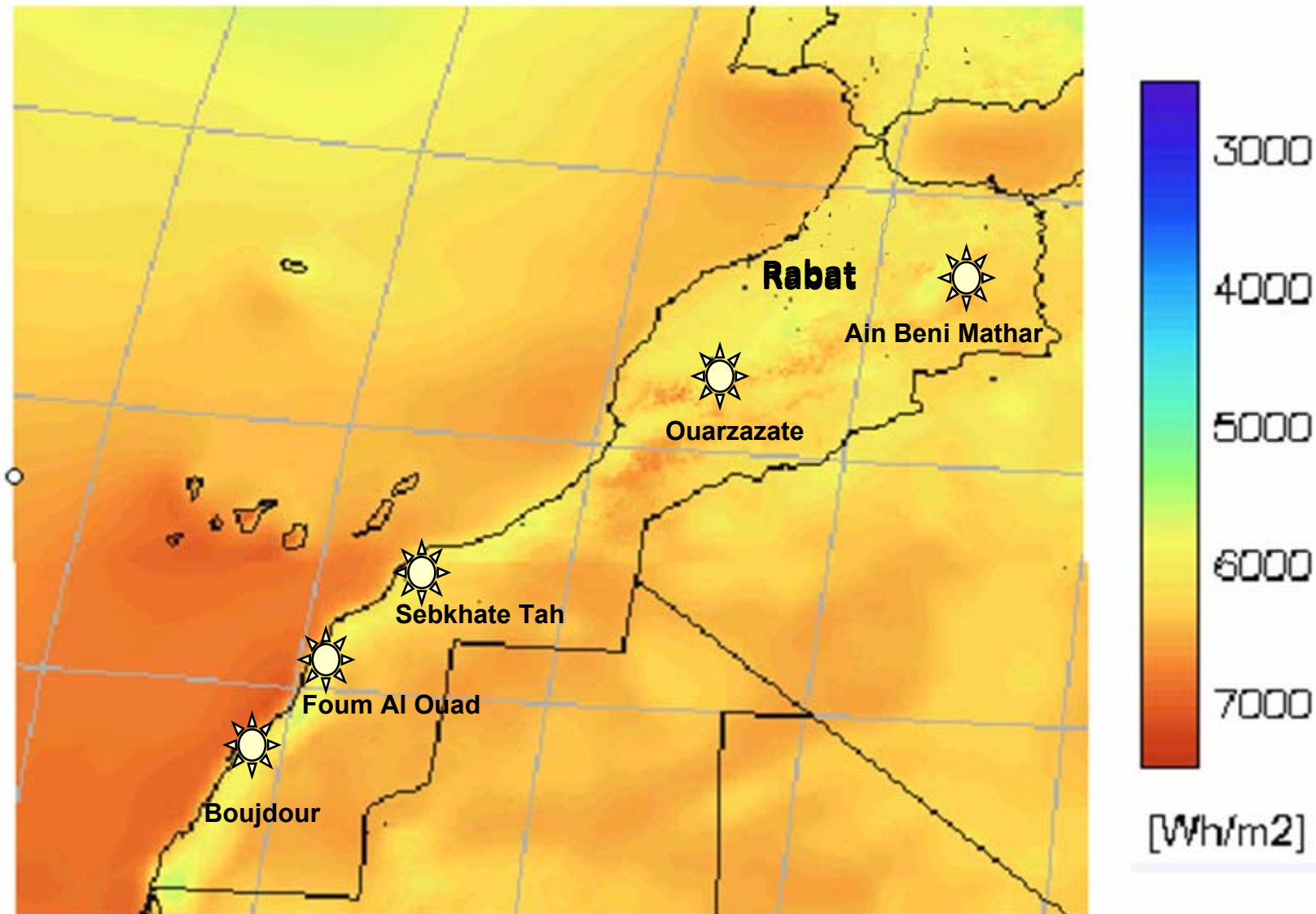


✓ Save 1 million TOE per year,
corresponding to 500 million dollars

✓ Annual CO2 emissions saving:
3,7 billion tons



SOLAR RADIATION MAP OF THE KINGDOM OF MOROCCO



SITE OF OUARZAZATE



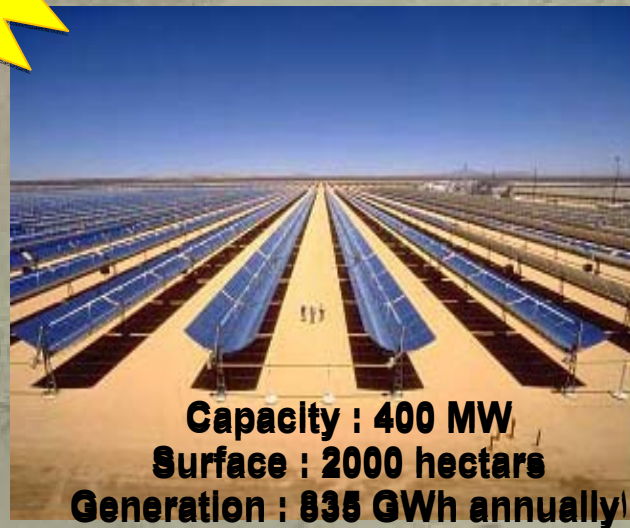
DNI:
2635kWh/m²/year

Capacity : 500 MW
Surface : 2500 hactars
Generation : 1150 GWh annually

Ouarzazate

SITE OF AÏN BÉNI MATHAR

DNI:
2290kWh/m²/year



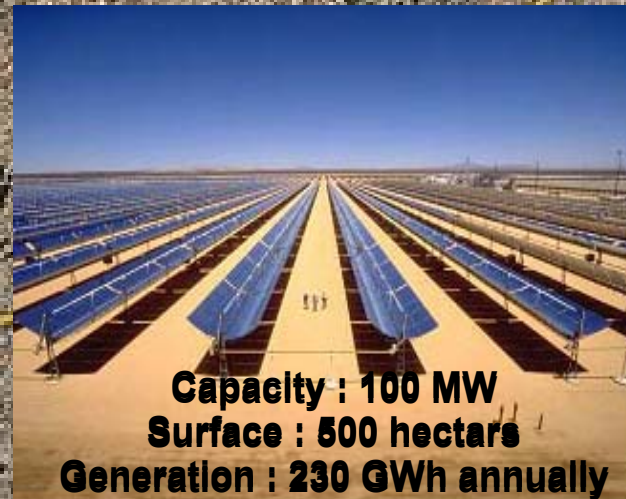
Aïn Beni Mathar

SITE OF FOUM AL OUAD



SITE OF BOUJDOUR

DNI:
2642kWh/m²/year



Boujdour

Boujdour

SITE OF SEBKHATE TAH

DNI:
2140kWh/m²/year

Tarfaya



N1

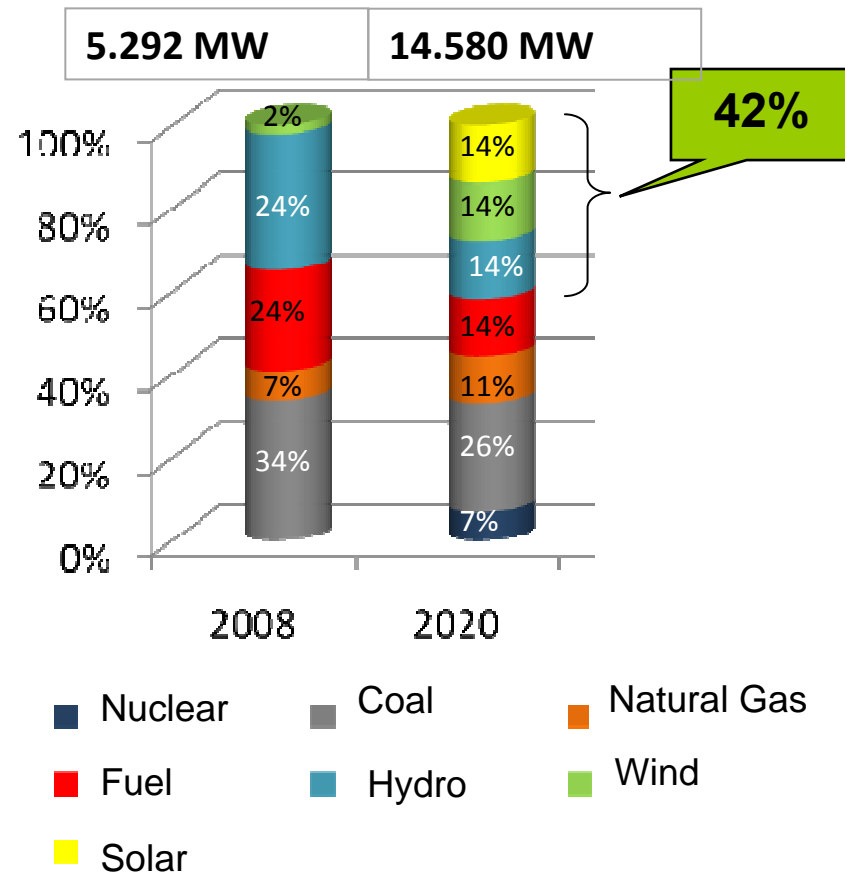
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GREEN ENERGY : THE MOROCCAN FUTURE ENERGY

The part of installed capacity of renewable energy will represent 42% of total electric installed capacity by the year 2020

Evolution of installed capacity



PROJECT WITH STRONG MULTI-SECTORS SYNERGY

- **Regional development :**
 - Positive social and economic impacts.
- **Specialized training by :**
 - Creating solar fields studies in High Engineering Schools and Universities ;
 - Training of technicians in solar energy by the professional institutes .
- **Research & Development(R&D):**
 - Creating R&D Center of energy and environment fields
- **Industrial development :**
 - Transfer of know-how and technology;
 - Development of specialized industry.



A DEDICATED AGENCY FOR THE PROJECT

- Creating of a dedicated agency supported by the State of Morocco (Moroccan Agency for Solar Energy)
 - Conduct overall project (design, choice of operators, implementation, management)
 - Coordinate and supervise others activities related to this program

- Capital with the participation of:
 - Moroccan State
 - Hassan II Fund For Economic & Social Development
 - Energetic Investment Company
 - Office National de l'Electricité



A PRIVATE PUBLIC PARTNERSHIP PROJECT

- An equilibrated partnership for the development of the project with national and international operators
- Choice of Developers of the plants based on competition and with open technologies options.
- Diversified funding mechanisms.



THE FIRST MAJOR MILESTONES

