



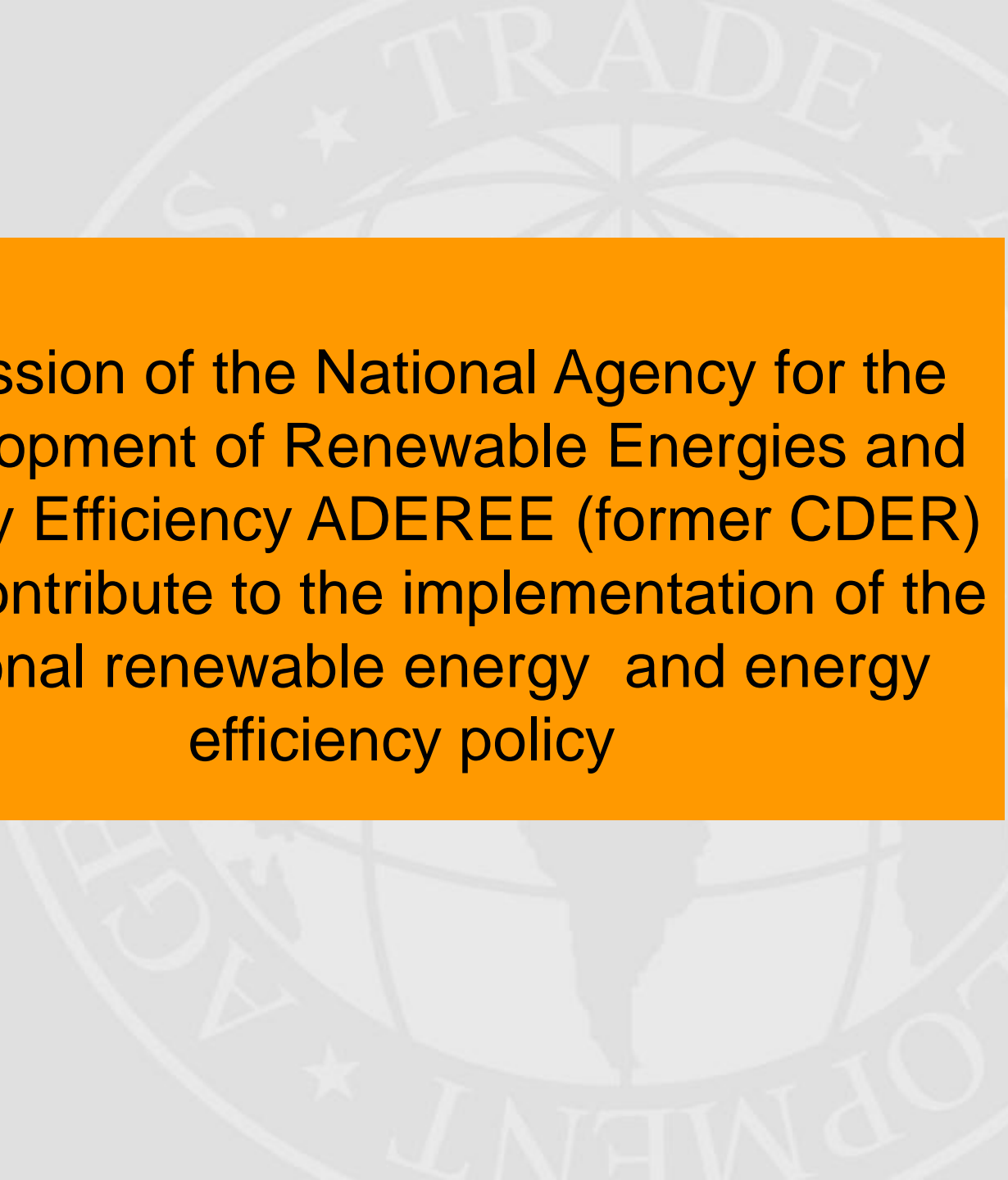

# National Agency for RE and EE Development (ADEREE)

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**Morocco Solar Photovoltaic (PV) Reverse Trade Mission**

June 8 - 18, 2014

***Mohamed El Haouari***  
*Director of Renewable Energy and Energy  
Efficiency Pole*



The mission of the National Agency for the Development of Renewable Energies and Energy Efficiency ADEREE (former CDER) is to contribute to the implementation of the national renewable energy and energy efficiency policy

# Main Mission

- ❑ **Set up and implement RE and EE Development/Pilot programs and Plants**
- ❑ **Identify, estimate and carry out the cartography of RE resources and the potential of energy efficiency (industry, building and transport sector)**
- ❑ **Carry out, evaluate and follow up national energy audits**
- ❑ **Suggest and disseminate technical standards and labels and ensure local adaptation**
- ❑ **Contribute to the promotion of the national capacity building and standards;**
- ❑ **Sectors : EE Industry, EE Building, EE Agriculture, EE Transport  
Biomasse, PV, Thermal, MCH, Wind Energy**



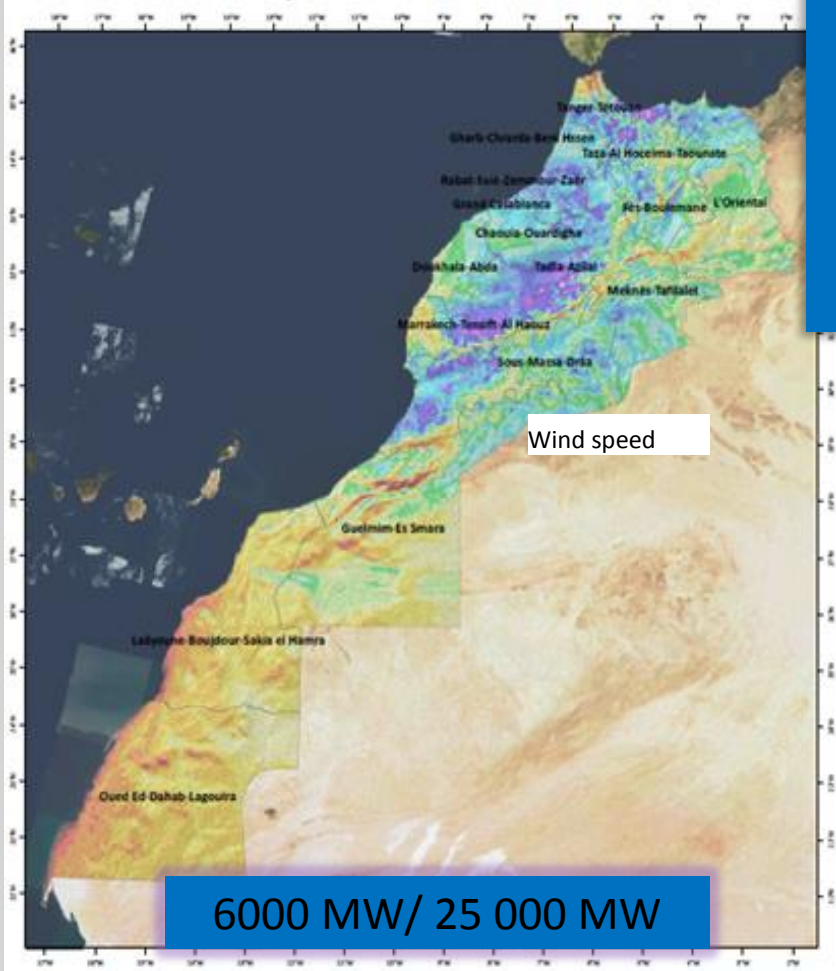
**Aderee is involved in most of National PV  
Projects**



# New Wind and solar maps

## Atlas éolien du Maroc

Vitesse moyenne annuelle du vent à 100 m au-dessus du sol



Wind speed

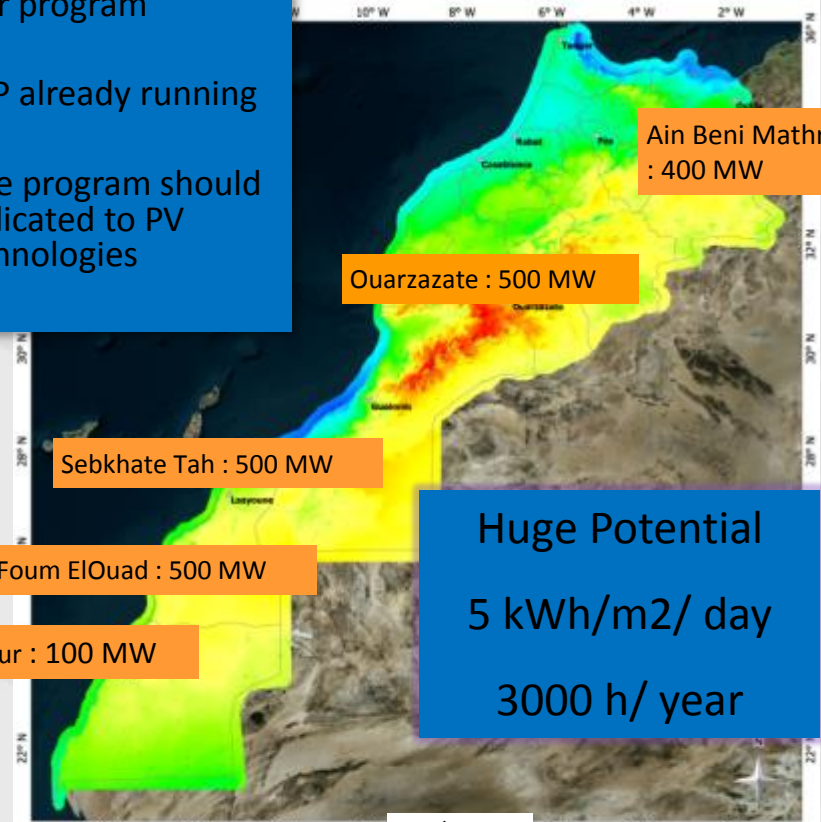
6000 MW/ 25 000 MW

The ongoing 2000 MW national solar program

20 MW CSP already running

A part of the program should be dedicated to PV technologies

## Energies Renouvelables du Maroc Directe en Incidence Normale Annuelle - Maroc



Ain Beni Mathra : 400 MW

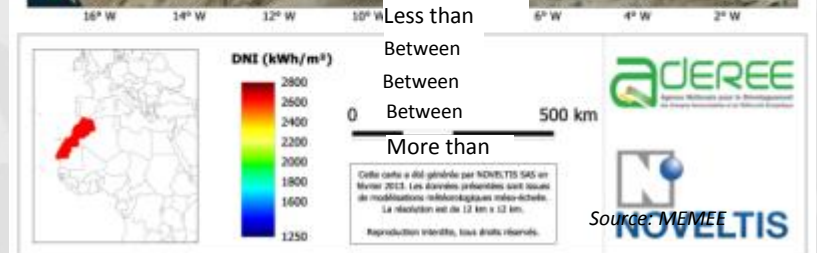
Ouarzazate : 500 MW

Sebkhat Tah : 500 MW

Foum ElOud : 500 MW

Boujdour : 100 MW

Huge Potential  
5 kWh/m<sup>2</sup>/ day  
3000 h/ year



## Solar Pumping

- National program for PV solar pumping :
  - **Launched in 2013-** MAPM-ADEREE-MEMEE-
  - **1<sup>st</sup> stage 43 Million Dollars** underway,
  - Up to 20 ha
  - target of 440 000 farmers

**Goal : Replacement of Diesel and Butane pumping systems by PV solar systems**

- Very Cost effective versus Diesel
- Indicated for low depths (~140 m),
- Very low O&M costs



# Solar Roof program

## In Progress – 2015-2016

- ❑ **National PV Roof program / Low Voltage system – 1000 /1500 MW:**

### **Underway, setting up :**

- ❑ Regulatory framework
- ❑ Financial issues (Net-metering)
- ❑ Technical issues (converter standards, technology, protection, etc)

### **Opportunity :**

- ❑ **Grid parity is reached for a house consuming more the 200 kWh/month**
- ❑ Decreasing cost of PV
- ❑ Strong national commitment

## Essaouira Solar Photovoltaic Power Project Technical Assistance (TA)

### In Progress

- ❑ The U.S. Trade and Development Agency ("USTDA") has made a Grant for Morocco/ADEREE

**Objectives of the TA :** to evaluate and recommend appropriate alternative Solar Photovoltaic (PV) technologies for a 5 MW solar PV plant in Essaouira, Morocco (the “Pilot Project”). This TA and the subsequent implementation of the Pilot Project would showcase the applicability of solar PV on a utility scale and create a duplicable and generic PV methodological guideline for evaluating and selecting site specific PV technology, facilitating replication for the Moroccan 2020 Program and beyond.

- ❑ **Partners :** SIE, MASEN, ONEE, MEMEE
- ❑ **Contractors :** Power Engineers /USA



# Rural Electrification

## PV electrification

ADEREE is involved in Regional Program to electrify by PV :

- Rural hospitals
- Schools
- Student resident buildings
- Etc

# Technical Assistance

## Stakeholder, users, Ministries, Compagnies,etc

Beside, ADEREE is giving **its expertise to the main stakeholders** in order to develop solar PV projects (rural electrification, pumping, PV roofs) :


- Technical specification
- Call for tender
- Evaluation of the proposal
- Implementation of the PV systems
- Training of the users
- Validation
- Follow up

## Legislative framework

- 1- Renewable Energies Law project (13-09): promoting Investment for Export, assistance in site selections, permits and authorization, access to National Grid and Interconnections, export of RE, etc,
  - Under 2 MW declaration,
  - More than 2 MW authorization
- 2- Energy Efficiency Law 47-09

**Transformation of CDER to ADEREE (+ EE)**

**Creation of the MASEN : Creating of a dedicated agency supported by the State of Morocco (Moroccan Agency for Solar Energy) - Conduct the overall solar 2000 MW project (*design, choice of operators, implementation, management, etc....*)**



# Thank you for your attention

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