

Study

MARKET INFO MOROCCO – PHOTOVOLTAICS

dena-Market Information System

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on the basis of a decision
by the German Bundestag

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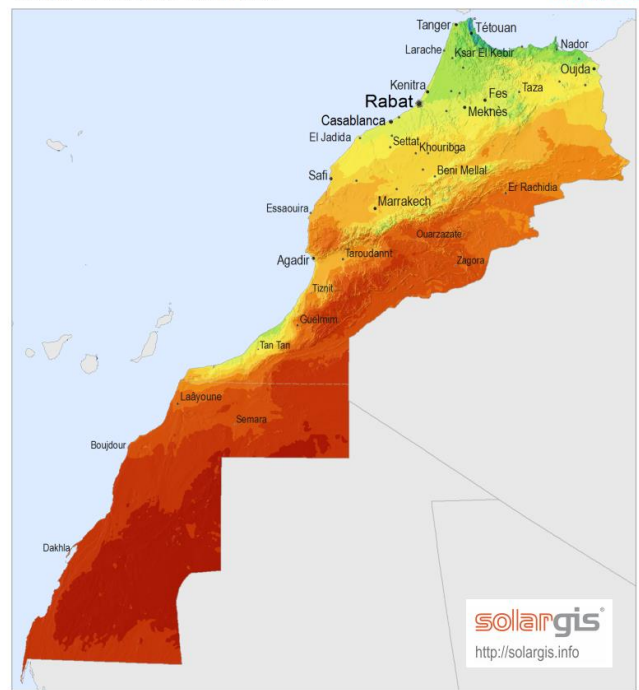
Federal Ministry
for Economic Affairs
and Energy

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SOLAR IRRADIATION & POPULATION DENSITY

Annual average global solar irradiation

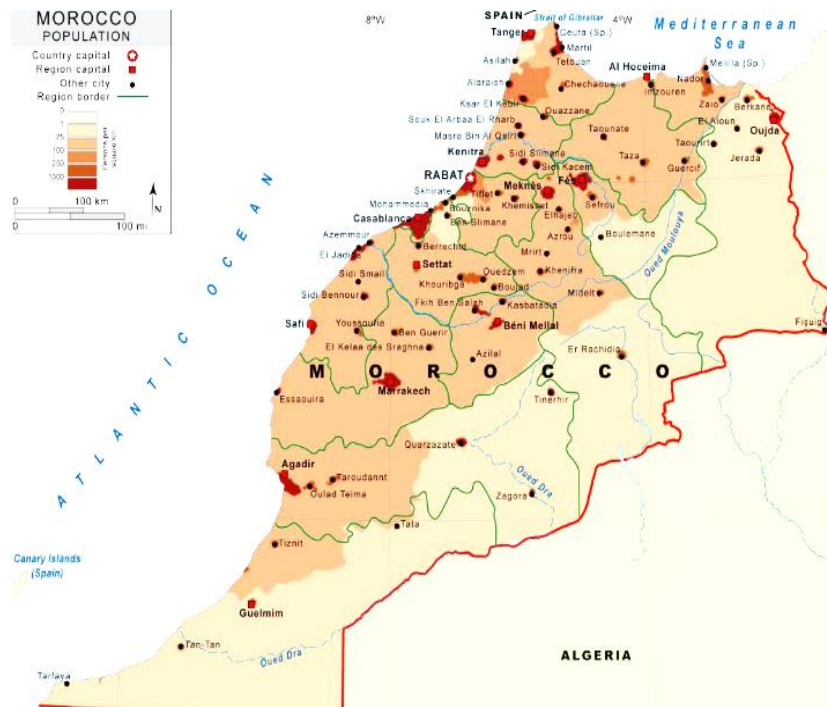
Global Horizontal Irradiation Morocco



Average annual sum, period 1994-2010
 < 1600 1700 1800 1900 2000 2100 2200 2300 kWh/m² SolarGIS © 2013 GeoModel Solar

Source: SolarGIS (2013)

Population density



Source: World Trade Press (2007)

BASIC DATA

General basic data (2014)			
Area	446,550 km ²	GDP per capita (est.)	28,375 DH (~2,518€*)
Population (est.)	33.2 m	GDP growth (est.)	3.9%
Language	Arabic, Berber languages	State budget	Revenue: 26.07 bn US-Dollar Spending: 34.51 bn US-Dollar
Government type	Constitutional monarchy	Inflation	2.5%
Administrative division	15 regions	Unemployment rate (est.)	9.1%
Basic energy market data (2012)			
Electricity generation	26.49 TWh		
Electricity consumption	31.05 TWh		
Electricity import (net)	4.84 TWh		
Electricity price (2014)	Industrial: 1.23 – 1.51 DH / kWh (0.109-0.134 € / kWh*) Residential: 1.37 -1.54 DH / kWh (0.122-0.137 € / kWh*)		
Share of renewable energy capacity	9.65 % (2.76 % Wind, 6.89 % hydro power)		
Increase of electricity consumption (2012 - 2020)	7.7 %		
Annual average solar irradiation	approx. 2,000 kWh / m ² a		

*Average exchange rate March 2014 GTAI: 1 Euro = 11.265 DH

PHOTOVOLTAIC MARKET INDICATORS

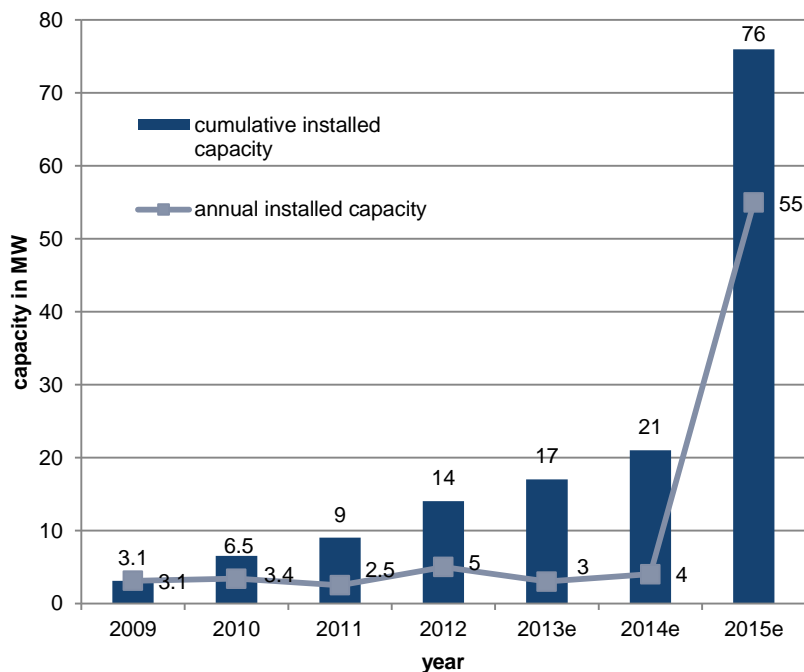
Indicators				
Market size (annual installed capacity)	2012: 5 MW	2013e: 3 MW	2014e: 4MW	2015e:55 MW
National PV target 2020	500 MWp			
Main market drivers 2014	<ul style="list-style-type: none"> High dependency on imported fossil fuels, high electricity prices. The Moroccan Solar Plan of 2009 states that by 2020 large-scale solar power plants (mainly CSP, but also PV) with a cumulated capacity of 2,000 MW are going to be built. The first planned concentrated solar power plant (CSP) was awarded to a consortium of the Saudi-Arabic company Acwa Power in September 2012. The Moroccan Solar Plan sets the share of PV capacity at 20 % (400 MW), according to MASEN, which is coordinating the tender processes for new capacities. In August 2013, a capacity of approx. 128 MWp was in the PV project pipeline. 			
Legislation and PV support in 2014	<ul style="list-style-type: none"> Morocco released a renewable energy law in 2010 (law number. 13-09). However, this law does not define a comprehensive strategy for the implementation of renewable energy in Morocco. It enables renewable electricity generation in general, but hinders i. a. the feed-in of solar electricity into the distribution grids. According to the Ministry of Energy there are no plans to adopt a FIT system for renewable energy – not even in the long-run. But a revision of the law concerning the possibility of feeding electricity into distribution grids is currently being discussed. 			
Newly established agencies	<ul style="list-style-type: none"> The following institutions for the support of renewable energy were established: <ul style="list-style-type: none"> National Agency for the Development of Renewable Energies and Energy Efficiency (ADEREE) Moroccan Agency for Solar Energy (MASEN) Société d'Investissements Energétiques (SIE), the National Agency for Investment and Renewable Project Financing 			

OVERVIEW OF PV SUPPORT SCHEMES

Support / Regulation	Details
Renewable Energy Law (Nr. 13-09)	<ul style="list-style-type: none"> The renewable energy law (number 13-09) regulates the support of electricity generation, trade and export of renewable energies. Plants with a capacity > 2 MW need a pre-approval. Plants with a capacity between 20 kW \geq 2 MW need an informal registration. Law Number 13-09 authorises commercial plant operators to generate renewable electricity and to transmit it through electricity grids of medium or high voltage or through maximum voltage grids.
Fonds Capital Carbone Maroc (FCCM)	<ul style="list-style-type: none"> This fund was established to promote Clean Development Mechanism (CDM) projects in Morocco and to reach the carbon-reduction goals set by the Kyoto Protocol. Renewable energy, energy efficiency, waste management and reforestation projects were eligible. However, due to high administrative barriers only five CDM projects have been developed since 2008 (no solar project was registered).
Société d'Investissements Energétiques (SIE)	<ul style="list-style-type: none"> Investor and co-developer during renewable energy project development: The agency supports projects within the Moroccan Solar Plan as well as other projects that increase the share of renewables and promote energy efficiency.
Moroccan Integrated Solar Plan	<ul style="list-style-type: none"> In the 4th development phase of the project „NOOR - Ouarzazate Solar Power Station“ the first construction of a PV plant with a capacity of 50 MWp is scheduled. <ul style="list-style-type: none"> Project awarding will be conducted via tender by MASEN. Bids can be handed in from July until September 2014. The awarding of the project developer is planned for November 2014. The plant has to be operational by October 2016. In 2012 Fraunhofer ISE suggested to MASEN to carry out the following tenders for new PV capacities in the coming years to fulfil the Moroccan Integrated Solar Plan: <ul style="list-style-type: none"> 2013, 50 MW; 2014, 50 MW; 2015, 75 MW; 2016, 75 MW; 2017, 100 MW; 2018, 100 MW; 2019, 125 MW

MARKET DEVELOPMENT AND BARRIERS

Development of installed PV capacity



Sources: dena (2012), Forecast 2015: dena (2014)



The main barriers in the Moroccan PV market

Lack of liberalisation in the electricity market:

- ONEE, the state-owned energy and water supplier, is the main electricity grid operator and dominates the energy supply system.
- Generally electricity generation is only possible through power purchase agreements with ONEE.
- New generation capacities are only tendered through and awarded by ONEE.

Lack of political support for PV:

- The renewable energy law does not allow feeding electricity into low voltage grids. Large PV market segments (private households, small enterprises) can use PV electricity for self consumption only.
- Even in the long-run there is no FIT system considered.
- The Moroccan Solar Plan favours large-scale CSP plants, PV is marginally represented with 400 MW.

Administrative barriers:

- All plants with a capacity > 2 MW need an official approval of operation.
- Administrative processes are rather time-consuming, which is why developers should allow extra time in their planning.

MARKET NEWS

Date	Topic	Source
08/04/2014	<p>Energy-saving measures for 15,000 mosques The Secretary of Energy and the Minister of Islamic Affairs presented the project "Green Mosque" and approved a related package of measures. The program foresees measures regarding efficiency and the use of PV systems for around 15,000 mosques in the country.</p>	L'Agence France-Presse
13/05/2013	<p>Morocco: German Government to participate in worlds largest CSP plant (in German) In a joint press release of 10/05/2013 , the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and the Federal Ministry for Economic Cooperation and Development (BMZ) have announced that the construction of the power plant Ouarzazate I in Morocco has started.</p>	Exportinitiative Erneuerbare Energien

CONTACT INFORMATION

Category	Name	Website
Ministry of Energy	Ministère de l'Énergie, des Mines, de l'Eau et de l'Environnement	www.mem.gov.ma
German-Moroccan Chamber of Commerce	Deutsch-Marokkanische Industrie- und Außenhandelskammer (AHK)	www.marokko.ahk.de
Solar and Wind Energy Association	Association Marocaine des Industries Solaires et Eoliennes (AMISOLE)	www.amisole.com
National Energy Agency	National Agency for the Development of Renewable Energies and Energy Efficiency (ADEREE)	www.aderee.ma
National Solar Promotion Agency	Moroccan Agency for Solar Energy (MASEN)	www.masen.org.ma
State-owned Electricity Utility / Grid operator	Office National de l'Eau et de l'Électricité (ONEE)	www.one.org.ma
National Agency for Investment and Renewable Project Financing	Société d'Investissements Energétiques (SIE)	www.siem.ma

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