

Study

MARKET INFO JORDAN – PHOTOVOLTAICS

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on the basis of a decision
by the German Bundestag

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Official websites

Homepage: www.export-erneuerbare.de

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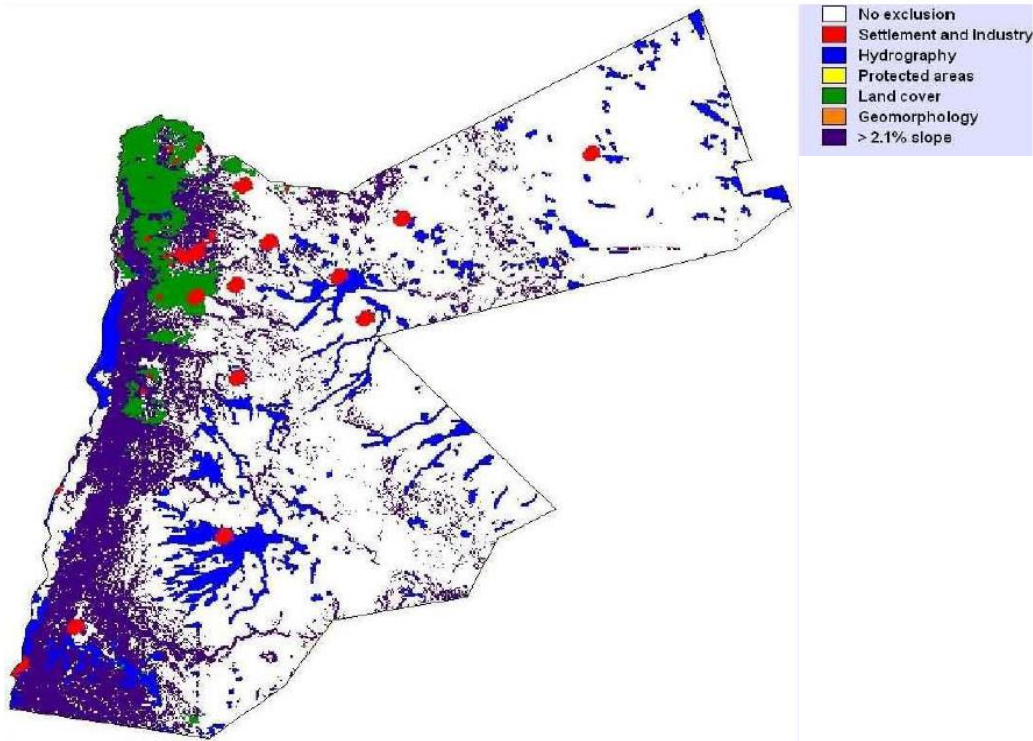


Federal Ministry
for Economic Affairs
and Energy

on the basis of a decision
by the German Bundestag

SOLAR EXCLUSION MAP

Solar Exclusion Map



BASIC DATA

General Basic Data (2012)			
Area	89,342 km ²	GDP	31.21 bn US Dollar
Population	Approx. 6.482 mil.	GDP (per capita)	~ 4,769 US Dollar
Language	Arabic	GDP growth	2.8 %
Government type	Constitutional Monarchy (Hashemite Kingdom Jordan)	Inflation	4.4 %
Administrative division	12 provinces	Unemployment rate	Approx. 12.5 – 30 % (depending on source)
Basic Energy Market Data (2011)			
Primary energy consumption	59.5 TWh (~5,121 ktoe)		
Electricity consumption (total/per capita)	14.274 TWh / (2,230 kWh)		
Total electricity import	2.186 TWh		
Electricity price 2013 (industrial consumption < 2,000 kWh/ month)	91 Fils / kWh (~ 9.4 € ct /kWh*)		
Electricity price 2013 (industrial consumption > 2,000 kWh/ month)	127 Fils / kWh (~ 13.1 € ct /kWh*)		
Electricity price 2013 (residential consumption 601 – 750 kWh/ month)	141 Fils/kWh (~ 14.5 € ct /kWh*)		
Electricity price 2013 (residential consumption 750 – 1,000 kWh/ month)	168 Fils/ kWh (~ 17.3 € ct /kWh*)		
Proportion of renewable energy (electricity consumption)	0.2 %		
Forecast growth of electricity consumption (2007 - 2020)	7.4 % p.a.		
Global solar irradiation	1,600 – 2,300 kWh/m ² a		

* Exchange rate 21/10/2013 : 1 Euro = ~ 970 Fils or ~ 0,97 JOD see also [Central Bank of Jordan](#)

PHOTOVOLTAIC MARKET INDICATORS

Indicators				
Market size (annual installed capacity)	2012: 0 MW	2013: 0 MW	2014 (est.): 0 MW	2015 (est.): 200 MW
National PV target 2020	<ul style="list-style-type: none"> 300-600 MW of solar capacity (CSP & PV) PV capacity: specifications differ (100 MWp) 		<ul style="list-style-type: none"> RE share of energy consumption: 10 % RE share of electricity consumption: 15- 20% 	
Main market drivers since 2012	<ul style="list-style-type: none"> Since the implementation of the Renewable Energy and Energy Efficiency Law in 2012, two kinds of project awards are provided. The Ministry of Energy is in charge of tendering RE projects (see next slide). Additionally, companies and private persons can hand-in project proposals to the Ministry of Energy. Since the Renewable Energy and Energy Efficiency Law from 2012 off-take of electricity produced by RE-systems is guaranteed. The Electricity Regulation Commission (ERC) has established a limit for the distribution price for which the electricity can be sold to the transmission and utility companies (see next slide). Therefore, the current prices (limit) listed below apply. 			
Tariff 2013/14	<ul style="list-style-type: none"> CSP: 135 Fils/kWh; 14.9 €ct/kWh PV: 120 Fils/kWh; 13.3 €ct/kWh (conversion in €cent based on the conversion rate from the banking association as of 14/11/2012). In cases where the RE-system is of Jordanian origin the operator will receive an additional 15 % bonus. In August 2013, 400 MW of PV capacity was already in the project pipeline. 			
Changes to the support regulation since 2012	<ul style="list-style-type: none"> Before the Renewable Energy and Energy Efficiency Law came into effect in 2012, the operation of grid-connected RE systems was not possible. Therefore PV projects were primarily found in off-grid applications. With a net metering directive for households and SMEs as well as a list price for renewable energy power plants, grid-connected PV-capacities can also be developed. 2013: rising electricity prices facilitate cost savings through net metering for households and SMEs (see slide 4). 			

RENEWABLE ENERGY & ENERGY EFFICIENCY LAW 2012 (1/2)

Support	Details
Renewable Energy & Energy Efficiency Law 2012	<ul style="list-style-type: none"> Art. 3 & 4: the Ministry of Energy is entitled to promote the usage of renewable energies and is responsible for the identification of suitable sites for this purpose within the country. Art. 5: the Ministry of Energy can tender RE projects. Art. 6: project proposals can be handed-in directly to the Ministry of Energy. Art. 6 & 7 include detailed provisions with regards to the submission of project proposals as well as the approval process. Art. 8: envisions an obligation to purchase electricity from renewable energy sources. Art. 9: “cost for interconnecting a Renewable Energy Facility to the grid shall be at the expense of the Bulk Supply Licensee (NEPCO)” & the cost for interconnection to the distribution system “in accordance with instructions issued by the Commission (ERC)”. Art. 10: regulation of electricity sales, electricity generated by small-scale RE power plants, also applicable for households. The electricity which is produced by such systems can be sold to either the Bulk Supply Licensee or distribution companies. Art. 11: tax reduction and exemption from tariff commitments. Art. 12: establishment of Renewable Energy and Energy Efficiency Funds in the Ministry of Energy, in order to supply financing for “exploitation of renewable energy sources and the rationalization of energy consumption including small renewable energy facilities”.
Directive Governing the Sale of Electrical Energy Generated from Renewable Energy Systems (Net Metering)	<ul style="list-style-type: none"> Directive “Governing the Sale of Electrical Energy Generated from Renewable Energy Systems” is referring to Art. 10 b of the Renewable Energy & Energy Efficiency Law 2012 and establishes that the capacity per site of the mentioned systems must be 5 MW per site, excess electricity needs to be fed-in, and it determines the feed-in tariff (net-metering). The feed-in tariff for households and SMEs that sell excess electricity, produced by their RE systems, to distribution companies is 120 Fils/kWh for PV electricity and 95 Fils/kWh for electricity generated by hybrid systems (e. g. PV and wind power combined) as well as 85 Fils /kWh for other technologies (e. g. (small-scale) wind power). In cases where the RE system is of Jordanian origin, the operator will receive an additional 15 % bonus. The scheme, however, can be reviewed if installed renewable energy systems in the country reach a total capacity of 500 MW.

RENEWABLE ENERGY & ENERGY EFFICIENCY LAW 2012 (2/2)

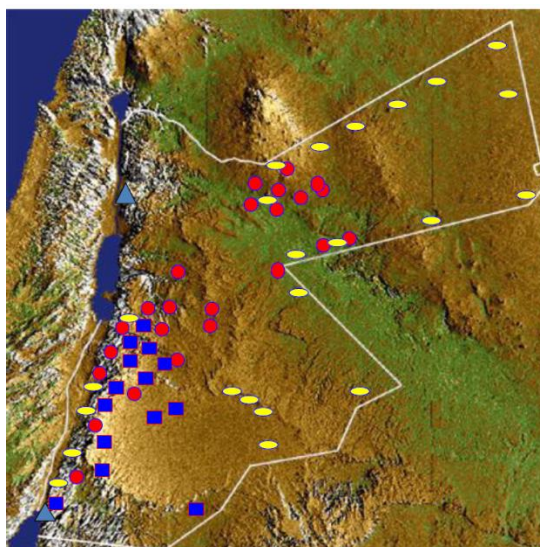
Support	Details
<p>Price list as reference for renewable energy power plants projects</p>	<ul style="list-style-type: none"> ▪ Art. 2 of the Renewable Energy & Energy Efficiency Law establishes that the ERC has to set a reference price for the distribution price of electricity from renewable energy power plants. Already in 2012 the ERC has developed a “Reference Pricelist Record” which is valid for planned renewable energy power plants, which project developers have directly submitted to the Ministry of Energy. ▪ The highest purchasing price for electricity from solar power projects is the following: <ul style="list-style-type: none"> ▪ 135 Fils/kWh for CSP systems ▪ 120 Fils/kWh for PV plants ▪ In cases where the PV system is of Jordanian origin, the operator will receive an additional 15 %. ▪ This scheme can be reviewed as well if installed renewable energy systems in the country reach a total capacity of 500 MW.
<p>RE tenders of the Ministry of Energy 2011/2013/2014</p>	<ul style="list-style-type: none"> ▪ After the first round of tendering, which commenced in May 2011, twelve PV projects with a total capacity of 170 MW and two wind farms with additional 200 MW were approved. ▪ The authorizations for the respective project funding was finally announced by the Ministry in 2014. Talks with the bidders from 2011 were made until the end of 2013 because some of the offered PV purchasing prices and project capacities differ from what has been published as list reference prices for renewable energy projects as price limits, which was published in 2012 after the tendering took place. ▪ Furthermore one tender has been set up until the end of January 2013 for one single PV power plant at the site of Azraq (see website Ministry of Energy). ▪ In a second round of tendering in 2013, bidders had to hand-in a preliminary expression of interest by 31st October 2013 (originally 30th September 2013). Based on these expressions of interest bidders were selected who then could apply for support in form of long-term electricity purchasing contracts. Those contracts include fixed prices for the duration of 20 years. In their offers bidders had to consider the official price limits for electricity from wind and solar (on BOO basis (Built-Own-Operate)). A third (for now the last) round of tendering is planned. ▪ April 2014: The government signed contracts for the construction of two PV plants with a capacity of 10 MW each. The government of Jordan approved the signing of PPAs for twelve PV plants of the first round of tendering with a total capacity of 200 MW, which shall be connected to the grid until mid 2015.

OTHER SUPPORT SCHEMES

Support	Details
Renewable Energy and Energy Efficiency Fund (REEF)	<ul style="list-style-type: none"> ▪ The Renewable Energy and Efficiency Fund (REEF) was established in order to promote the setting up and implementation of renewables and energy efficiency measures. ▪ The fund is also intended to assist renewable energy projects with loan guarantees. ▪ The funding is provided by the Jordan government, donations, and capital gains. In order to create this fund the government has provided 20 m JD.

MARKET DEVELOPMENT AND BARRIERS

Development of installed PV capacity (off-grid) until 2011



~100 PV Installations in Jordan

1985-2011

10 kWp/year

- 112.1 kWp Water Pumping
- 72.5 kWp Rural Electrification
- 21.6 kWp Telecomm.
- ▲ 27.2 kWp Brackish Water Desal.

236.4 kWp Total

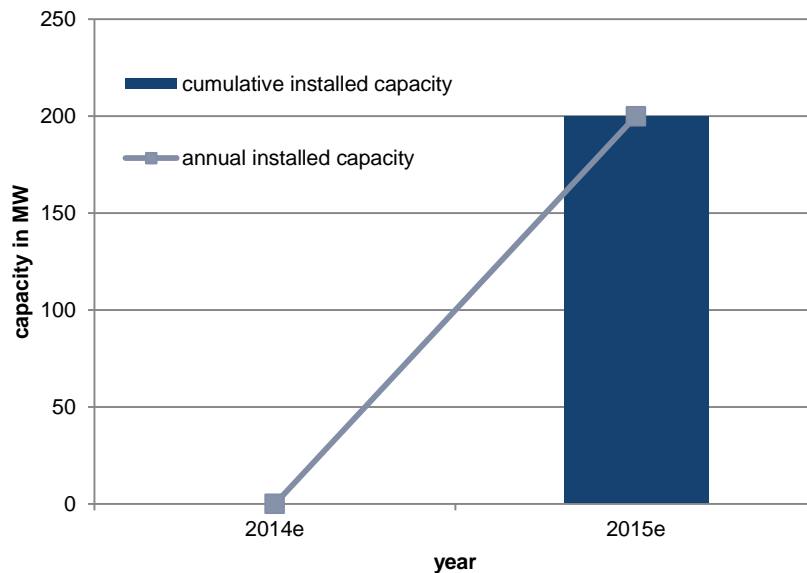


The main barriers of the Jordanian PV market

- The energy supply in Jordan is largely based on imported fossil fuels, which shall in the future be replaced by local shale deposits.
- The “Arab spring” has changed the energy import situation in Jordan for a period of time. Gas deliveries from Egypt were disrupted, which normally accounts for 80 % of electricity generation. The substitution with heavy fuel oil and diesel fuel posed a huge financial burden.
- The official focus is laid on the development of renewable energy electricity generation capacities until 2020 mainly with wind, biogas, and solar – including PV.
- The government has put an emphasis on off-grid PV-systems for rural electrification, supply of telecommunication towers, water pumps, and desalination plants (see graph on the left).

MARKET DEVELOPMENT AND BARRIERS

Development of installed PV capacity (on-grid) until 2015



Source: dena (2014)



The main barriers of the Jordanian PV market

- In the first tendering in June 2011 grid-connected PV-capacity in total of 170 MW have been approved.
- For PV capacity of 200 MW in 2014, the signing of PPAs was only then (three years later) accepted by the government. Talks with the bidders from 2011 were made until 2013 because some of the offered PV purchasing prices and project capacities differed from what had been published as list reference prices for renewable energy projects as price limits, which was published in 2012 after the first tendering took place.

MARKET NEWS (1/3)

Date	Topic	Source
01/04/2014	<p>12 deals for solar energy-run power plants shine on Jordan Jordan on Monday signed deals with two companies to build two solar energy-run power plants, Energy Minister Mohammad Hamed said. Under the agreements, the two companies will build power generation facilities in the southern region, each with 10-megawatt capacity, the minister told The Jordan Times after the signing of the two deals. The agreements raise the number of deals signed by the government for renewable energy projects to 12, he said, ending the first phase of a three-stage project to increase the locally produced renewable energy input. “Under the first round, we signed 12 agreements. We have two remaining rounds under which about eight renewable energy projects for power generation will be built,” said the minister. The total cost of the 12 projects under the first round stands at \$560 million, Hamed added. The 12 projects will generate 470 gigawatt hours per year and will create about 2,500 jobs, said the minister. “The 12 projects are expected to be completed early 2015 and in mid-2015 they will be connected to the grid,” said the minister.</p>	Albawaba Business
19/03/2014	<p>First Solar, Shams Ma'an obtain PPA for 52.5 MW solar PV project in Jordan Jordan's National Electric Power Company (NEPCO, Amman, Jordan) has signed a 20-year power purchase agreement (PPA) with First Solar Inc. (Tempe, Arizona, U.S.) and the Shams Ma'an Consortium for a 52.5 MW solar photovoltaic (PV) project planned in the nation. The Shams Ma'an PV plant is around the same size as the largest PV plant under construction in the Middle East, a 55 MW project in Israel's Negev Desert. First Solar will provide engineering, procurement and construction (EPC) and operations and maintenance (O&M) services for the plant, as well as its cadmium telluride thin-film PV modules.</p>	SolarServer

MARKET NEWS (2/3)

Date	Topic	Source
18/02/2014	<p>Jordan government approves PPAs for 200MW</p> <p>The government of Jordan has approved power purchase agreements (PPAs) for 200 MW of new solar plants in the country. The seven individual projects will each be awarded 120 fils/kWh (US\$0.17/kWh). The current cost of electricity is around US\$0.25/kWh. The country's state news agency reported that the Council of Ministers had given the green light to the contracts, which will now be put to the seven firms that were awarded each project. "This was the official approval of the PPAs, but PPAs were not signed," explains Iyad Zawaideh, partner, clean energy and sustainability group, Eversheds, Jordan. "Developers are expected to receive communication from MEMR informing them officially of the approval and setting a time limit within which to sign. "Until developers receive such official communication from MEMR we won't know when signing is expected," said Zawaideh, pointing out that the tendering process for the first of three planned rounds of PV procurement had now taken three years.</p>	PV-Tech
13/09/2013	<p>Jordan to open second solicitation for solar and wind projects</p> <p>Jordan will open a second round of solicitations for large-scale wind and solar projects with a deadline of September 30th, 2013 for expressions of interest, according to Clear Sky Advisors (Toronto). Under the program, projects will be built on a build-own-operate basis, and developers will sell the electricity generated to national utility NEPCO through power purchase agreements (PPAs). The initial round of the program resulted in the pre-approval of 12 PV projects totaling 200 MW. Unlike the first round of the program, the second solicitation will be limited to wind and solar projects. Rates for solar photovoltaic (PV) projects will be capped at USD 0.169/kWh and USD 0.135/kWh for other solar technologies, which will likely preclude the participation of concentrating solar power (CSP) projects.</p>	SolarServer

MARKET NEWS (3/3)

Date	Topic	Source
22/08/2013	<p>Hashemite University calls for PV tenders The Hashemite University (HU) in Zarga, Jordan, has launched the tender for the design and construction of a 5 MW PV system to cover all the energy needs.</p>	www.solar-international.net
06/02/2013	<p>New publication: country profile Jordan Due to the political changes brought about by the “Arab Spring” the energy situation in Jordan has changed. The disruption in gas deliveries from Egypt, which normally accounts for 80 % of electricity generation, and the resulting substitution with heavy fuel oil and diesel fuel posed a huge financial burden on the country.</p>	www.exportinitiative.de
07/12/2012	<p>Jordan published FIT for renewable energy The Electricity Regulatory Commission (ERC) has published Jordan's first feed-in tariff (120 fils /kWh for PV and 135 fils/kWh for other solar systems) for in total 500 MW of capacity.</p>	PV-Tech
24/07/2012	<p>Jordan: Renewable energy policy attracts local and international companies With the adoption of the Renewable Energy Law, Renewable Energy and Energy Efficiency Law (REEL) by the Jordanian Parliament in May 2012, the way is paved for planned projects and investments in renewable energy.</p>	www.exportinitiative.de
19/05/2011	<p>Jordan: tender for power plant capacities in the area of renewable energies According to recent news from the Jordanian Ministry of Energy it is planned to extend 1,800 MW of power plant capacities based on renewable energy technologies in the coming years. In order to reach those goals, investors are asked to submit proposals for power plant projects. The deadline is 30th June 2011.</p>	www.exportinitiative.de

CONTACT INFORMATION

Category	Name	Website
Ministry of Energy	Ministry of Energy and Mineral Resources (MEMR)	www.memr.gov.jo/Default.aspx?alias=www.memr.gov.jo/english
Regulatory authority	Electricity Regulation Commission (ERC)	www.erc.gov.jo/English/Pages/default.aspx
State energy provider	Central Electricity Generating Co. (CEGCO) National Electric Power Co. (NEPCO)	www.cegco.com.jo www.nepco.com.jo
National energy research and certification institute	National Energy Research Center (NERC)	www.nerc.gov.jo/
Entrepreneurs association for Jordan's sustainability	EDAMA Association	www.edama.jo/index.aspx

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