

## The Middle East and North Africa Concentrated Solar Power Knowledge and Innovation Program

From the World Bank and Clean Technology Fund



***Concentrated solar power technologies offer great potential to meet global and national goals for clean, secure and affordable energy. Like many new technologies, there are challenges in bringing it to market. So the World Bank, with support from the Clean Technology Fund, is launching a Knowledge and Innovation Program to help lay the groundwork for new CSP investment projects in the Middle East and North Africa.***

The Middle East and North Africa (MENA) has some of the world's best solar energy resources. These will last longer than its oil and gas reserves, and will generate considerable benefits, while causing less environmental damage.

Solar resources provide great potential for three different types of technologies: thermal heat, photovoltaic (PV) and concentrated solar thermal power (CSP).





operation. It provides electricity at 18.4 US cents/kWh.

- **Noor 2 and Noor 3** (parabolic trough and solar tower respectively, 340 MW in total, and up to eight hours storage) are in an advanced state of construction. They are contracted to provide electricity at 15.7 US cents/kWh.

As a result of this scale-up, **CSP generation costs are coming down, and hours of storage are increasing. Subsequent plants outside MENA have been bid at even lower per kWh costs, with even longer storage hours.**

**Within MENA, Dubai, Egypt, Kuwait, and Morocco are moving ahead with tenders for new plants.** Other countries in MENA and elsewhere are planning and proceeding with CSP investments; plants are under construction in Chile and South Africa, and China has started an ambitious program of construction.

Since the Investment Plan was adopted in 2009, few actual CSP investments have been completed in MENA, other than the spectacularly successful Noor plants as well as the 100 MW Shams plant in Abu Dhabi. This may have been partly because of temporary delays following the political turbulence of the Arab Spring and its aftermath.

Progress has also been slowed by factors which have tended to mask CSP's potential to

contribute to power sector development in the region, in particular, the current difference in project costs with photovoltaic, and a lack of awareness of the system value of thermal storage versus other options, including battery storage from PV. This has also taken place in a context of rapidly-changing cost and availability of natural gas, particularly in the Eastern Mediterranean.

More generally, there is a lack of information about the vital role CSP can play as firm, dispatchable power and a source of energy security. For informed decisions, more awareness is needed on how

**CSP could fit into long-term least-cost power sector plans and grid integration approaches. Similarly, more information is needed about suitable generation procurement processes and the availability of concessional financing for CSP, given its transformational potential. CSP can also promote local skills development and local manufacturing for CSP components.**

The same solar thermal resource that CSP transforms into electricity can also be used in myriad other applications, from enhanced oil recovery, as is being pursued in Oman, to desalination to industrial process heat. These innovative applications of solar thermal energy are already proving economic, and hold the potential to displace fossil fuel use well beyond the power sector.

To help accelerate MENA CSP investments, the CTF launched a Knowledge and Innovation Program in late 2016.<sup>3</sup> This three-year Program is designed primarily as **a resource to address knowledge and awareness gaps, to link projects with sources of finance and technical advice, and to promote innovation to enable CSP investments in MENA to move forward faster**, and in more countries. The knowledge generated in MENA could also facilitate CSP investments elsewhere in the world, creating a virtuous circle of CSP investments and cost reductions through global economies of scale and learning.

**The key activities to be rolled out in 2017 under the MENA CSP Knowledge and Innovation Program are:**

- **Just-in-Time Assistance**

The Just-in-Time facility, administered primarily through a multilingual web-based platform, will connect demands for expertise (e.g. questions needing rapid answers, support for designing bidding documents and other aspects of project development) with experts who can respond.

- **Web-based Knowledge Exchange**

This activity will include newsletters and a web-based platform to disseminate information about the about the Knowledge and Innovation Program itself. The aim is to link project sponsors, governments, financiers, investors, and technology and service providers to help development of CSP projects and related industries/services. It will serve mainly as centralized platform to guide counterparts to the right sources of information, and will be offered in English, French, and Arabic.

- **In-Depth Technical Support**

The provision of focused, in-depth technical support, including through projects funded by small grants, to generate and transfer knowledge that will stimulate CSP decision-making, local impact, and innovation.

- **Face-to-Face Knowledge Exchange and Cooperation**

This activity will bring together decision makers and stakeholders for knowledge exchange events to distill lessons from the MENA CSP experience, to draw on lessons from the rest of the world, and to foster the ties necessary for development of investment projects.

- **Capacity Building and Training**

This activity will provide training on CSP-related topics, and support the development of training from national facilities. It will include training programs and adapted courses, following a knowledge assessment of the participating countries.



For further information on the World Bank/Climate Technology Fund MENA CSP Knowledge and Innovation Program, please contact [menacsp@castalia-advisors.com](mailto:menacsp@castalia-advisors.com)

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<sup>3</sup> See the project document here: <https://www-cif.climateinvestmentfunds.org/projects/mena-csp-technical-assistance>