Uzbekistan: Solar Energy Development

Project Name	Solar Energy Development
Project Number	45120-001
Country / Economy	Uzbekistan
Project Status	Closed
Project Type / Modality of Assistance	Technical Assistance
Source of Funding / Amount	TA 8008-UZB: Solar Energy Development Project Technical Assistance Special Fund — US$ 1.50 million TA 8008-UZB: Solar Energy Development Technical Assistance Special Fund — US$ 750,000.00
Strategic Agendas	Environmentally sustainable growth Inclusive economic growth
Drivers of Change	Governance and capacity development Private sector development
Sector / Subsector	Energy / Renewable energy generation - solar
Gender	
Description	The PATA will promote solar energy development in Uzbekistan through: (i) the creation of an enabling environment for solar energy development; (ii) on-site solar resource assessment; and (iii) solar energy project preparation. The TA impact will be an increase in environmentally sustainable and efficient power generation, with installed capacity of renewable energy increasing by 100 megawatts within 5 years of completion of the TA. The outcome will be increased readiness for solar application in Uzbekistan - at least one commercial-scale solar power is committed for development by 2013, and solar energy will be used for off-grid applications by 2013.
Project Rationale and Linkage to Country/Regional Strategy	The most promising source of renewable energy in Uzbekistan is solar energy. The country is blessed with abundant solar irradiance (annual total global horizontal irradiance) of 1,400 - 1,800 kilowatt-hours per square meter, which is comparable to leading countries in solar energy such as Germany and Spain. In fact, Uzbekistan was selected as the optimum location in the former Union of Soviet Socialist Republics to establish a solar furnace to conduct material science research in a high-temperature environment created by concentrating solar energy. With such foundation, the government aims not only to develop solar energy but also to become the region's knowledge hub for solar technologies. Despite its solar resource potential, a pool of solar energy experts, and abundant land on which to develop solar energy, limited exposure to modern solar technology and applications have impeded Uzbekistan from effectively harnessing its solar resources. In addition, it does not have sufficient reliable solar irradiance data or an enabling environment for such development. The TA will contribute to the deployment of solar energy in Uzbekistan by removing such impediments and by preparing feasibility studies for both pilot and commercial solar energy projects. The harnessing of indigenous solar energy as a result of the TA will diversify the energy mix and reduce greenhouse gas emissions from the thermal power plants that make up 86% of the country's installed generation capacity. Environmental and health benefits are also expected from reduced local pollutants from combustion of fossil fuels. Since the power grid in Central Asia connects the countries in the region, the benefit of solar energy deployment in Uzbekistan is expected to extend beyond its borders. The policy and advisory TA is expected to complement the ongoing small-scale capacity development TA requested by the government and approved on 15 August 2011. Under the small-scale capacity development TA, a modern solar energy institute will be designed and the capacity of solar energy experts developed. The institute will be the knowledge hub for solar energy and will draft laws and regulations related to renewable energy, provide assistance to solar energy project development, and transfer solar technology to local industries in Uzbekistan as well as in neighboring countries with rich solar resources. The institute is expected to be founded on the existing Scientific-Production Association on Solar Physics, which is the implementing agency for both the policy and advisory TA and the small-scale capacity development TA. The government is committed to allocating necessary budget to establish the solar energy institute, and appreciates that the activities under the policy and advisory TA will provide capacity development opportunities. Ultimately, it is envisaged that the synergy between the policy and advisory TA and the ongoing small-scale capacity development TA will result in the creation of a solar industry in Uzbekistan, bringing vast economic benefits to the local economy and beyond.
Impact	Environmentally sustainable and efficient power generation increased.

Project Outcome	
Description of Outcome	Enhanced readiness for solar application in Uzbekistan
Progress Toward Outcome	Training workshop in March 2016.
Implementation Progress	
Description of Project Outputs	Enabling environment for development of, and investments in, solar power development is institutionalized A national solar power development road map is prepared Accurate solar irradiance data are obtained Feasibility study reports including CDM PDDs or other carbon financing applications are produced Enhanced solar technology testing and research capacities
Status of Implementation Progress (Outputs, Activities, and Issues)	Done. Policy framework established. Samarkand Solar Power Project approved in Nov 2013. Done. Solar energy roadmap was presented to the Government on 11 Nov 2014, and approved by MOE and MOF in June 2015. The roadmap enabled the development of the Nationally Appropriate Mitigation Actions, which were registered with the UN Framework Convention on Climate Change in February 2016. Done. On-site measurements of 6 solar energy meteo-stations completed in February 2014. Done. Feasibility study for 1 commercial project (Samarkand Solar Power Project) approved. Remaining FS presented during the TA workshop in Nov 2014. Final version approved in July 2015. Ongoing. Target still feasible. Procurement done in May 2015. Completion of delivery and commencement of installation in March 2016.
Geographical Location	

Summary of Environmental and Social Aspects	
Environmental Aspects	
Involuntary Resettlement	
Indigenous Peoples	

Stakeholder Communication, Participation, and Consultation	
During Project Design	Consultations with government officials at the national and sector levels were held to identify their capacity and need for solar power development. Consultations with specific CSOs were not necessary.
During Project Implementation	The outputs of the TA disseminated among government officials/solar experts through workshops and the Asia Solar Energy Forum. No specific CSOs have been identified. However, social due diligence conducted for developing the ensuing solar power project.

Business Opportunities	
Consulting Services	The PATA will require 40.0 person-months (12 experts) of international and 40.0 person-months (8 experts) of national consultants over a period of 21 months. Required positions include Solar Development Expert; Solar Policy, Laws & Regulations Expert, Solar Resource Assessment Expert, Photovoltaic Expert, Concentrated Solar Thermal Power Expert, Integrated Solar Combined Cycle Expert. ADB will engage a consulting firm in accordance with ADB's Guidelines on the Use of Consultants (2010, as amended from time to time). The firm will be recruited through quality- and cost-based selection method using a full technical proposal. The quality and cost ratio will be 90:10 since the PATA requires high level of specialized technical expertise. Main deliverables of the consulting services are: Component A: Creating an Enabling Environment (i) Recommendation on policy, laws and regulations conducive to the introduction and development of solar energy including enabling environment for private sector participation. (ii) Phase-wise road map for the development of solar energy. Component B: Solar Resource Assessment (iii) Satellite model-based national solar resource map with overlay of geographical information system (GIS) data to screen for potential solar energy development sites. (iv) Procurement and installation of appropriate on-site measurement stations in up to six sites. (v) Satellite model-based 11-year data series corrected using 12 months of on-site measurement data. Component C: Project Preparation (vi) Feasibility studies for up to six solar energy development projects including two pilot-scale demonstration projects and two commercial-scale projects. The projects are to include photovoltaic (PV), concentrated solar thermal power (CSP) technologies, integrated solar combined cycle (ISCC) technology, and other distributed uses of solar energy. The outputs of the PATA will be disseminated through workshops included in the scope of works of the consulting services and through the Asia Solar Energy Forum.
Procurement	For on-site solar irradiance measurement, six complete meteorological stations with rotating shadowband pyranometers will be procured and installed by the consultants in up to six potential project sites. One complete meteorological station with air transmissivity sensor and pyrheliometer with tracker will also be procured and installed to calibrate the rotating shadowband pyranometers. In addition, one set of specialized computers will be procured under the PATA for data collection and analysis. All equipment will be procured in accordance with ADB's Procurement Guidelines (2010, as amended from time to time). All equipment procured by the consultants under the PATA will be handed over to the implementing agency upon delivery.

Responsible ADB Officer	Tiangco, Cinderella C.
Responsible ADB Department	Central and West Asia Department
Responsible ADB Division	Energy Division, CWRD
Executing Agencies	Ministry of Finance Mr. Shukhrat Y. Abdullaev, Deputy Minister 5 Mustaqiliik Square Tashkent 100008 Republic of Uzbekistan

Timetable	
Concept Clearance	30 May 2011
Fact Finding	24 May 2011 to 27 May 2011
MRM	-
Approval	16 Dec 2011
Last Review Mission	-
Last PDS Update	31 Mar 2016

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Milestones					
Approval	Signing Date	Effectivity Date	Closing		
			Original	Revised	Actual
16 Dec 2011	11 Jan 2012	11 Jan 2012	30 Sep 2013	30 Jun 2016	16 Sep 2016

Financing Plan/TA Utilization							Cumulative Disbursements	
ADB	Cofinancing	Counterpart				Total	Date	Amount
		Gov	Beneficiaries	Project Sponsor	Others			
2,250,000.00	0.00	0.00	0.00	0.00	0.00	2,250,000.00	17 Jun 2022	2,215,298.79

Request for Information	http://www.adb.org/forms/request-information-form?subject=45120-001
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