



Regional: EFFECTIVE DEPLOYMENT OF DISTRIBUTED SMALL WIND POWER SYSTEMS IN ASIAN RURAL AREAS

Project Name	EFFECTIVE DEPLOYMENT OF DISTRIBUTED SMALL WIND POWER SYSTEMS IN ASIAN RURAL AREAS	
Project Number	43458-012	
Country / Economy	Regional	
Project Status	Closed	
Project Type / Modality of Assistance	Technical Assistance	
Source of Funding / Amount	TA 7485-REG: EFFECTIVE DEPLOYMENT OF DISTRIBUTED SMALL WIND POWER SYSTEMS IN ASIAN RURAL AREAS	
	Technical Assistance Special Fund	US\$ 3.87 million
Strategic Agendas	Environmentally sustainable growth Inclusive economic growth	
Drivers of Change	Governance and capacity development Private sector development	
Sector / Subsector	Energy / Energy efficiency and conservation - Renewable energy generation - wind	
Gender		
Description	The RDTA supports multiple development purposes, including (i) supplying emission-free electricity to poor communities from indigenous renewable energy resources at zero fuel costs; (ii) reducing costs of wind power through transferring appropriate technologies and optimizing manufacturing processes; (iii) innovating financing mechanisms and mobilizing carbon credits to scale up effective deployment of distributed small wind power systems; (iv) encouraging PPP to stimulate investment and research and development activities for clean and renewable energy targeted directly for serving poor communities; (v) mitigating climate change and global warming by displacing combustion of traditional solid biomass and fossil fuels and reducing greenhouse gas emissions; (vi) improving capacities at the national and village levels for planning, implementing, and maintaining decentralized systems for power generation and distribution.	
Project Rationale and Linkage to Country/Regional Strategy	The overarching goal of Asian Development Bank (ADB) is to eradicate poverty in the Asia Pacific Region. In its 2009 Energy Policy, ADB emphasizes three pillars to achieve inclusive and sustainable development, including (i) promoting energy efficiency and renewable energy; (ii) maximizing access to energy for all; and (iii) promoting energy sector reform, capacity building, and governance. ADB has also committed to reinforce its efforts in facilitating transfer of low-carbon technologies to its developing member countries (DMCs) and to double its financial support to clean energy projects from its 2008 level to \$2 billion per year by 2013 to enhance regional energy diversity and security. The RDTA helps implement ADB's energy policy, create opportunities for ADB's public and non-sovereign lending operations, build local capacities, and strengthen regional cooperation on clean energy technology development and deployment.	
Impact	Improved economic, environmental, and health conditions of poor rural communities in remote windy areas	
Project Outcome		
Description of Outcome	Enhanced access to clean, reliable, and affordable electricity in poor windy villages currently without electricity by effectively deploying small wind power systems	
Progress Toward Outcome	ADB implemented and commissioned hybrid renewable energy pilot projects in Bangladesh, Maldives (2 pilots), Nepal, Pakistan and Sri Lanka. The pilot projects consisted of wind and/or solar, battery storage and efficient diesel generator components. Institutional support in renewable energy policy development and capacity building were provided in Mongolia and Tajikistan as well. On capacity building initiatives, a number of workshops on hybrid renewable energy systems have been conducted, and ADB sponsored participation of government officials and power sector utility engineers from Bangladesh, Maldives, Mongolia, Nepal, Pakistan and Sri Lanka in international workshops and conferences.	
Implementation Progress		
Description of Project Outputs	1. Needs assessment for typical windy poor rural communities currently lacking adequate access to electricity 2. Identification and selection of priority locations 3. Analysis of electricity demand patterns and load management requirements 4. Assessment of wind, solar, and biogas resources and load distribution in selected poor communities 5. Technical evaluation of and cost reduction exploration 6. Comparison of different approaches for energy storage and balancing 7. Examination of suitable ways to integrate wind, solar, and biogas resources 8. Environmental impact assessment on uses of conventional batteries 9. Investigation of manufacturing, delivery, and servicing procedures 10. Design of innovative financing mechanisms 11. Assistance in building public private partnerships and build-own-operate-transfer modality 12. Policy recommendations 13. Construction of pilot demonstration projects 14. Dissemination and capacity building activities	

Status of Implementation Progress (Outputs, Activities, and Issues)	<p>Nepal Pilot Project: The pilot project in Nepal was completed in May 2014. Wind turbines and solar panels have been installed, and the agreement on transfer of ownership to the implementing agency was signed in June 2014.</p> <p>Maldives: Rakheedoo Island Solar-Battery Storage-Diesel Hybrid Power Project: Installation and commissioning were completed in June 2016. Installation and commissioning of the similar second project in Dhihdhoo Island were also completed in June 2016.</p> <p>Sri Lanka: The Hybrid Wind-Solar-Battery Storage-Efficient Diesel Generator Pilot Project in Elevaithivu Island has been completed and commissioned in May 2017. The project has been transferred to Ceylon Electricity Board.</p> <p>Bangladesh: The first solar-battery storage pilot project for Power Development Board High School in Siddhirganj was commissioned, fully tested, and trial operated in March 2016. EGCB operators and personnel have been trained.</p> <p>Additional work to include construction of nano-grid to improve the impact of the compact hybrid solar power plant by distributing and selling additional power at a fixed tariff to local adjacent community was also completed in May 2016.</p> <p>Pakistan: In 2014, the bidding of the pilot project failed due to very high bid price from a lone bidder. Re-bidding was successful and contract signing was in June 2016. The equipment required to complete various works have been supplied, inspected by the implementing agency (IA) and installed. Training on maintenance component is being undertaken by the contractor to concerned personnel of the IA. Installation and commissioning were complete in 2017.</p> <p>Capacity Building Initiatives: ADB has conducted a number of workshops relating to mini-grid hybrid renewable energy systems, trouble-shooting and operation and maintenance of solar photovoltaic systems, use of Homer software and modeling. ADB has sponsored participation of government officials and engineers from Bangladesh, Nepal, Maldives, Mongolia, Pakistan and Sri Lanka to renewable energy-related workshops, seminars and conferences.</p> <p>Knowledge Product: A knowledge product on Improving Lives of Rural Communities through Developing Small Hybrid Renewable Energy Systems was published in September 2017. Two other knowledge products are expected to be published/posted in the ADB's website in October 2017.</p>
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Geographical Location	Regional
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Summary of Environmental and Social Aspects	
Environmental Aspects	
Involuntary Resettlement	
Indigenous Peoples	
Stakeholder Communication, Participation, and Consultation	
During Project Design	The International Energy Agency has been consulted in June 2009 during its world wind roadmap workshop. Several rural communities have expressed their willingness to be the candidates for hosting the pilot projects. Several private sector companies have shown interest in cooperating with ADB to upgrade small wind power technologies.
During Project Implementation	The final dissemination workshop and presentation of TA results was conducted on 7-8 September in Bangkok, Thailand. Senior government officials and power sector utility engineers from Bangladesh, Maldives, Nepal, Pakistan and Sri Lanka have attended the final workshop. The final workshop highlighted the completion of the 6 pilot projects in five countries (Bangladesh, Nepal, Maldives, Pakistan and Sri Lanka). Regular communication and consultation were conducted with the governments and TA implementing agencies in the DMCs covered by the TA via fax and emails, as well as during review missions. Consultation meetings were conducted with communities where hybrid renewable energy pilot projects were proposed or implemented (in particular, Bangladesh, Maldives, Nepal, Pakistan and Sri Lanka) by ADB staff and TA consultants. Workshops were arranged to discuss with stakeholders matters relating to pilot project design and implementation, mini-grid technologies to be implemented and lessons learned.

Business Opportunities	
Consulting Services	The services of 3 individual international consultants (Renewable Energy Technologies Specialist, Renewable Energy Operational Specialist, and Procurement and Management Specialist) are ongoing. The services of an international Energy Economic and Financial Specialist has been completed. A national energy project coordinator's services is ongoing.
Procurement	All equipment and materials financed under the TA have been procured in accordance with ADB's Procurement Guidelines (2007, as amended from time to time). On the completion of the TA project, the equipment will become the property of the government and participating local institutions and/or communities.

Responsible ADB Officer	Zheng, Liping
Responsible ADB Department	South Asia Department
Responsible ADB Division	Energy Division, SARD
Executing Agencies	Asian Development Bank 6 ADB Avenue, Mandaluyong City 1550, Philippines

Timetable	
Concept Clearance	02 Oct 2009
Fact Finding	19 Mar 2009 to 05 Apr 2009
MRM	-
Approval	17 Dec 2009
Last Review Mission	-
PDS Creation Date	27 Oct 2009
Last PDS Update	29 Sep 2017

TA 7485-REG

Milestones					
Approval	Signing Date	Effectivity Date	Closing		
			Original	Revised	Actual
17 Dec 2009	-	17 Dec 2009	30 Jun 2012	30 Sep 2017	31 Dec 2017

Financing Plan/TA Utilization	Cumulative Disbursements
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ADB	Cofinancing	Counterpart				Total	Date	Amount
		Gov	Beneficiaries	Project Sponsor	Others			
3,870,000.00	0.00	0.00	0.00	0.00	0.00	3,870,000.00	17 Jun 2022	3,187,147.76

Project Page <https://www.adb.org/projects/43458-012/main>

Request for Information <http://www.adb.org/forms/request-information-form?subject=43458-012>

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