ADB ASIAN DEVELOPMENT BANK

Regional: Regional Cooperation on Renewable Energy Integration to the Grid

Project Name	Regional Cooperation on Renewable Energy Integration to the Grid
Project Number	51148-001
Country	Regional
Project Status	Active
Project Type / Modality of Assistance	Technical Assistance
Source of Funding / Amount	**TA: Regional Cooperation on Renewable Energy Integration to the Grid** Asian Clean Energy Fund under the Clean Energy Financing Partnership Facility — US$ 1.50 million
Strategic Agendas	Inclusive economic growth Regional integration
Drivers of Change	Knowledge solutions Partnerships
Sector / Subsector	**Energy** - Electricity transmission and distribution - Renewable energy generation - solar - Renewable energy generation - wind
Gender Equity and Mainstreaming	No gender elements
Description	The proposed knowledge and support technical assistance (TA) will support Afghanistan, Kazakhstan, Kyrgyz Republic, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan (the region) increase intermittent renewable energy generation (solar and wind power generation) by providing training to transmission grid operators on modernized control techniques to address renewable energy intermittency and by analyzing regional cooperation arrangement options. The TA will recruit consultants to solve the identified problems through following studies, among others: (i) To estimate necessary grid reinforcement investment to accept large-scale intermittent renewable energy connection which are planned in the countries. A harmonized regional roadmap of renewable energy integration will be prepared. (ii) To assess the benefit of using regional cooperation approach to achieve the above grid reinforcement, specifically to develop balancing capacity reserve, compared with the case without the cooperation. The capacity reserve provided by backup generators, such as gas turbines and hydro power plants, would balance with intermittent power from solar and wind power plants. The application of regional balancing coordination mechanism to the region, which is one of the regional cooperation schemes to share the capacity reserve among the countries, will be analyzed. Possible harmonized cooperation framework will be designed. (iii) To evaluate the impact of high-technology operation supporting tools, such as Energy Management Systems (EMS) with renewable energy output forecasting and demand response so that the most effective tools will be selected to be used in daily dispatching in the region. (iv) To provide capacity building to the countries' grid operators on the system operation of grid with intermittent renewable energy. Its topic will focus on the above mentioned regional balancing mechanism and the tools, e.g. how to utilize tools at their daily power dispatching operation. The transmission companies will be equipped with trained operation staff. The TA findings will be disseminated to the countries at workshops and meetings mainly at CAREC-ESCC through a working committee, which will be established for this TA. The capacity building will be also provided to the working committee members, who will be composed of grid operators of the target countries.

Project Rationale and Linkage to Country/Regional Strategy	The TA was agreed by the countries at the Energy Sector Coordinating Committee (ESCC) meeting under the Central Asia Regional Economic Cooperation (CAREC) to address the challenges of securely and less costly integrating renewable energy to the grid. This TA is aligned with ESCC's work plan. Despite abundant renewable energy potential, the current installed capacity share of intermittent renewable energy power generation in the region is less than 5% on average, while the majority of electricity is generated from fossil fuels or traditional hydropower. The region's abundant solar resource (8,700 gigawatts) is enough to replace the existing generation capacity of about 80 gigawatts. The countries committed to the targets of reducing carbon dioxide (CO2) emissions by 10% 15% of the 1990 levels on average by 2030 in their Nationally Determined Contributions (NDCs) and communications to the United Nations Framework Convention on Climate Change (UNFCCC). CO2 emissions could be doubled without any major action, such as promoting more renewable energy. Kazakhstan and Turkmenistan are among the world's top 20 countries with the highest CO2 emissions per capita. Thus, accelerating clean energy development is a top agenda in the region. While the costs of solar and wind power generations are becoming competitive with conventional generation, making it financially and environmentally more viable, lack of technical experience to address the intermittency of renewable energy generation remains as one of major technical challenges for renewable energy adaptation into generation mix. This TA will assist the countries in achieving their target by addressing this challenge: (i) training transmission operators on modernized techniques to control the intermittency, and (ii) analyzing least-cost balancing capacity reserve development. Lessons from leading renewable energy countries like Germany show that regional cooperation is less costly than national remedies. The wider the regional connectivity and cooperation, the less total backup generation or storage capacity to balance with intermittency is necessary. The TA is expected to facilitate the transition by exploring regional cooperation arrangements to increase energy security and decrease costs. Seven Central and West Asian countries were selected because they are geographically connected, enabling them to share backup generators or storage capacity. Since these countries have historically shared electricity with each other, their legacy-sharing protocols and/or mechanisms can be easily utilized.
Impact	(i) Selected CAREC countries' emissions reductions target achieved (ii) CAREC regional cooperation framework accomplished

Project Outcome	
Description of Outcome	CAREC countries' transmission capacities for renewable energy enhanced
Progress Toward Outcome	
Implementation Progress	
Description of Project Outputs	Transmission grid reinforcement investment plan developed Regional cooperation framework to share balancing capacity reserve designed Transmission system operation enhancement tools analyzed Utilities' system operation skills reinforced
Status of Implementation Progress (Outputs, Activities, and Issues)	
Geographical Location	

Summary of Environmental and Social Aspects
Environmental Aspects
Involuntary Resettlement
Indigenous Peoples
Stakeholder Communication, Participation, and Consultation
During Project Design
During Project Implementation

Business Opportunities	
Consulting Services	This TA will recruit international consulting firms by the quality- and cost-based selection (QCBS) method, following ADB's Guidelines on the Use of Consultants (2013, as amended from time to time).

Responsible ADB Officer	Sakai, Atsumasa
Responsible ADB Department	Central and West Asia Department
Responsible ADB Division	Energy Division, CWRD

Executing Agencies	*Asian Development Bank* *6 ADB Avenue,* *Mandaluyong City 1550, Philippines*

Timetable	
Concept Clearance	-
Fact Finding	-
MRM	-
Approval	08 Sep 2017
Last Review Mission	-
Last PDS Update	30 Jun 2017

Project Page	https://www.adb.org/projects/51148-001/main
Request for Information	http://www.adb.org/forms/request-information-form?subject=51148-001
Date Generated	16 September 2017