



Completion Report

Project Number: 47054-001
Technical Assistance Number: 8582
April 2016

People's Republic of China: Strengthening Capacity for Promoting Distributed Renewable Energy Utilization in Hebei Province

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TA No., Country and Name			Amount Approved: \$300,000	
TA 8582-PRC: Strengthening Capacity for Promoting Distributed Renewable Energy Utilization in Hebei Province			Revised Amount: not applicable	
Executing Agency: Hebei Provincial Government		Source of Funding: TASF-other sources	Amount Undisbursed: \$72,774.60	Amount Utilized: \$227,225.40
TA Approval Date: 16 Dec 2013	TA Signing Date: 7 Jan 2014	Fielding of First Consultant: 16 April 2014	TA Completion Date Original: 31 December 2014 Account Closing Date Original: 31 December 2014	Actual: 30 September 2015 Actual: 25 November 2015
Description				
<p>The capacity development technical assistance (TA) was designed to support the central government's strategy to de-link economic growth and greenhouse gas emissions and to increase the use of renewable energy. The Hebei provincial government was the executing agency and the Demand Side Management Center under the Hebei Development and Reform Commission was the implementing agency. The TA was a timely response to the urban air pollution in northern People's Republic of China (PRC) and supported the implementation of regulations issued by the National Energy Administration in 2013 to increase nonpolluting energy sources for heat supply. Asian Development Bank's (ADB) country partnership strategy, 2011–2015, also prioritized ADB support for innovative technologies and institutional arrangements to mitigate climate change and protect the urban environment, and to promote private sector participation in delivery of public services. The TA was expected to strengthen the capacity of provincial government agencies for using distributed renewable energy for heat supply in urban areas by assessing the feasibility of geothermal energy and wind power as a potential heat source in the context of Hebei Province. In addition, the TA was expected to provide capacity building to provincial agencies to structure public-private partnerships (PPPs) to attract private sector investments to these distributed renewable energy projects.</p>				
Expected Impact, Outcome and Outputs				
<p>The expected impact of the TA was a greater use of distributed renewable energy in Hebei Province. The expected outcome of the TA was a stronger capacity of the government agencies in Hebei Province to promote the use of renewable energy in heat supply. The expected outputs of the TA are (i) the geothermal resource availability in secondary cities in Hebei Province and the feasibility of using geothermal energy for heat supply share assessed; (ii) the technical and financial feasibility of using excess wind energy and biomass for heat supply in Hebei Province confirmed; (iii) several distributed renewable energy projects for implementation selected, and (iv) the capacity of provincial government agencies to promote PPPs to implement these projects strengthened.</p>				
Delivery of Inputs and Conduct of Activities				
<p>The TA was originally aimed at increasing the use of share of renewable energy in the Hebei Province and supporting the central government program for new energy (i.e., renewable energy) city program where selected cities were encouraged to increase the share of renewable energy in their energy supply mix. The TA was focusing on increasing the utilization of renewable energy in the Hebei Province and in particular the utilization of renewable energy for heating. The Hebei government is keen to expand the use of renewable energy in heat supply in response to the increasing concern of air pollution caused by use of coal in heating boilers.</p>				
<p>The TA assessed the feasibility of using different renewable energy technologies for heating applications. This included (i) the use of biomass in combined heat and power plants, (ii) promoting biomass pellets for substituting use of coal in household heating boilers, (iii) municipal solid waste for heating using incineration and gasification technologies, (iv) use of excess wind energy for heat supply, and (v) solar heating applications for hot water supply and heat supply using hybrid systems utilizing other forms of renewable energy such as biomass or geothermal energy together with solar energy.</p>				
<p>Although the original scope of the TA included developing business models and feasibility studies for selected projects using renewable energy resources for heat supply using PPPs, this component was dropped from the TA at the request of Hebei Development and Reform Commission, as they requested the TA consultants to allocate TA resources to develop a roadmap for utilizing geothermal energy for heating. This was an expansion of the feasibility assessment of geothermal energy utilization for heating. This has required the extension of TA completion date by 9 months as some of the TA consultants recruited through a consultancy firm have to be replaced with consultants having expertise in geothermal energy.</p>				

Although it was not part of the original scope of the TA, the TA resources were utilized to identify industrial air pollution control subprojects to be included as additional financing to Loan 2835.¹ This was in response to the increased attention paid by the central government authorities to the air pollution in Beijing–Tianjin–Hebei region due to the heavy industries located in Hebei Province. However, the additional financing to Loan 2835 was not pursued as ADB has processed a separate loan to support policy incentives to reduce the air pollution in Hebei Province.

Although the consultants were mobilized within 4 months of the TA approval, the TA completion was delayed due to the revisions on the terms of reference of the consultancy firm. The consultants have performed satisfactorily as they have undertaken a comprehensive assessment of potential for use of renewable energy for heating purposes. The implementing agency has performed adequately in monitoring the performance of the consultants and administered the consultant's contract in a timely manner. The implementing agency has closely collaborated with the consultants and provided access to relevant data. ADB has reviewed and provided timely feedback on consultant's reports and attended tripartite meetings with the consultants and the implementing agency to provide further guidance and direction to the consultants. The performance of ADB and the implementing agency has been rated as *satisfactory*.

Evaluation of Outputs and Achievement of Outcome

- (i) The TA assessed the current status of use of biomass and municipal solid waste for heating applications, estimated the potential for expanding the biomass based heating applications and identified the constraints for further expansion. They have proposed recommendations for overcoming some of these barriers. This output is useful for Hebei government in preparing a strategy for expanding the use of biomass in heating applications.
- (ii) The TA assessed the feasibility of using solar energy for heating applications. The solar heat applications in Hebei province is currently limited to solar water heating. The consultants have concluded that it may be possible to use solar energy for space heating in combination with other low-carbon heat sources (i.e., geothermal, biomass, and natural gas) to reduce the carbon emissions and air pollution associated with coal based heating. But the analysis is inconclusive and requires further work.
- (iii) The TA has briefly touched on the use of excess wind energy for heating applications. The analysis is inadequate and has not addressed in detail the institutional and regulatory barriers to wind energy for heating applications. The analysis is limited to describing some of the pilot wind energy based heating projects in Inner Mongolia.
- (iv) The TA has undertaken a comprehensive analysis of geothermal resource base of Hebei Province and assessed the resource based by location, temperature and depth. Based on this analysis, the TA has estimated the recoverable geothermal energy resource in Hebei Province and proposed a roadmap to develop the geothermal resource in a systematic manner. The TA also set targets for geothermal utilization for different prefectures in Hebei Province.
- (v) The TA also identified potential subprojects to be financed under the proposed additional financing to Loan 2835. However, this did not materialize as the government decided to request a Policy Based Loan (to support policy reforms to alleviate the air pollution in Hebei Province).

Overall Assessment and Rating

The TA has undertaken an assessment of the potential of using different forms of renewable energy for space heating in Hebei Province and made recommendations on how the renewable energy applications in heating can be expanded. In addition, the TA has prepared a roadmap for use of geothermal energy for heating. The outputs and some of the renewable energy based heating projects identified by the TA could be considered for financing under the proposed Beijing–Tianjin–Hebei Air Pollution Control Project. Although the depth of analysis is inadequate, the TA can be rated as “successful” as it provides a basis for the provincial government to offer policy incentives to promote renewable energy in heating.

Major Lessons

The TA's effectivity is limited due to insufficient TA funds to undertake a more comprehensive analysis. The TA could have focused on a particular type of renewable energy and undertake a more thorough analysis given the limited TA resources.

Recommendations and Follow-Up Actions

The TA provides useful insights on how different forms of renewable energy can be utilized to meeting the heating demand of Hebei Province. Although the data may be different, the situation in most of the northern PRC provinces would be similar. Hence, the TA findings can be utilized in designing proposed ADB lending projects to address air pollution in greater Beijing–Tianjin–Hebei region.

¹ ADB. 2011. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of China for the Hebei Energy Efficiency and Emission Reduction Project*. Manila