PROJECT INFORMATION DOCUMENT (PID)
CONCEPT STAGE

Report No.: 32131

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<thead>
<tr>
<th>Project Name</th>
<th>CN-PCF Xiaogushan Hydropower Project</th>
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<tr>
<td>Region</td>
<td>East Asia and Pacific Region</td>
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<tr>
<td>Sector</td>
<td>Energy</td>
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<tr>
<td>Project ID</td>
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<td>Borrower(s)</td>
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<td>Implementing Agency</td>
<td>Gansu Zhangye Xiaogushan Hydropower Company Ltd.(ZXHC)</td>
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<td>Environment Category</td>
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<tr>
<td>Safeguard Classification</td>
<td>[ ] S1  [X] S2  [ ] S3  [ ] SF  [ ] TBD (to be determined)</td>
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<tr>
<td>Date PID Prepared</td>
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<td>Estimated Date of Board Approval</td>
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1. Key development issues and rationale for Bank involvement

China, after the USA, has the second largest power industry in the world. Both the installed generation capacity and power generation increased at an annual rate of 8% on average over the last two decades. By end 2003, total installed capacity reached 381 GW and total electricity generation reached 1,911 TWh, an increase of 15.5% over 2002.

Challenges in the Power Sector. Despite of impressive achievements, China must face a number of challenges in the power sector, which include:

Coal consumption and environmental problems. Coal supplied 66% of primary energy demand in China in 2003. This made China’s emission of SO$_2$ and carbon dioxide (CO$_2$) ranked first and second in the world respectively.

Acute power shortage. Since 2001, there have been power shortages in China. In 2003, nearly two-thirds of the country experienced shortages. With an estimated total capacity of 120 GW under construction in 2004, China still faces a much greater challenges within the next 20 years to supply the energy needed to quadruple its GDP by 2020.

Unbalanced energy structure and distribution. Generating capacity is provided by thermal (about 75%), hydropower (about 24%), and nuclear (about 1%) power plants. Thermal power plant fuel mix is dominated by coal, accounting for more than 95% of the capacity. Over 80% of total generation capacity is in the eastern and central China region.

Renewable energies. Despite China’s first ranks in the world in the capacities of small hydropower, small wind turbines, methane generating pits, solar water heaters and the direct utilization of medium and lower temperature geothermal resources, a number of barriers prevent China from further expanding its renewable energy market, including (i) lack of well established policies and effective implementation to address the failure of the market to reflect externality costs; (ii) high financial cost of renewable; (iii)
weak manufacturing and service industry as well as capacities for some promising renewable energy technologies; (iv) mismatched distribution of renewable resources and capacity to finance.

**Sector policy/strategy for sustainable development.** China was one of the first countries to ratify the United Nations Framework Convention on Climate Change in 1993. China ratified the Kyoto Protocol in 2002. More significantly, China agreed to develop CDM projects with the Prototype Carbon Fund (PCF) in September 2003.

The *Provisional Regulation on the Operation and Management of Clean Development Mechanism Projects* issued in June, 2004 provides that the priority of CDM projects in China is to increase energy efficiency, develop new and renewable energies, and utilize methane. To oversee the operation of CDM projects in China, the National Council for CDM Projects has been established with participation of various ministries.

The most recent *Renewable Energy Act* issued on February 28, 2005 provided a general framework for incentives of future renewable energy development in China.

**Support from the World Bank and other donors.** Bank’s participation and support have been very active in China’s sustainable energy development. Among other activities, the Bank, together with the Global Environment Facility (GEF), is supporting China’s efforts to introduce policies required to create an enabling environment to scale up renewable energy development through the China Renewable Energy Scale-Up Program (CRESP).

**Rationale for Bank involvement**

The Xiaogushan Hydropower Project (XHP) is financed by Asian Development Bank (ADB), Bank of China and the project sponsor - ZXHC. No Bank lending will be provided. The XHP is one of the first projects the GoC has recommended to be brought into the PCF pipeline of the Bank.

The PCF is a product of the Bank to test the procedures for creating a market in project-based emission reduction (ER) under the CDM and to demonstrate how project-based emission transactions can mitigate global climate change and pioneer ER purchase based on market transactions. PCF’s stated operational objective is to “combat climate change”. It “aspires to promote the World Bank’s tenet of sustainable development, demonstrate the possibilities of public/private partnerships, and offer a “learning-by-doing” opportunity to its stakeholders”. The XHP fits PCF’s strategic objectives. It is expected to achieve the impacts as follows:

**Reduce greenhouse gas emissions.** Commissioning of the XHP will reduce anthropogenic emissions of greenhouse gas (GHG) by adding hydropower generation with the support of carbon financing, and mitigate future capacity expansion of coal-fired generation by the regional Gansu power grid.

**Gain first hand experience and demonstrate application of CDM methodology in China.** The Bank’s involvement in the first PCF project in the energy sector of China was viewed as critical in terms of (i) bringing China in as an important host country to pilot the global ER trading business and fostering both capacity as well as a market in China under the CDM; (ii) bringing to the proposed project the ability to serve as a catalyst for promoting environmental benefits and knowledge of climate change mitigation nationally, regionally and worldwide; (iii) providing incentives for pooling public and private investments in development of the vast clean energy resources in Western China, and (iv) improving the project risk profile to facilitate project financing and reduce the cost of financing.
Support China’s energy policy of harnessing zero-impact renewable energy resources and avoiding investment in high-GHG emission coal power plants. The XHP will harness the water resources of the Heihe River to feed renewable energy to the Zhangye City network, which is suffering severe shortage and importing most of its electricity from the regional Gansu power grid, of which the capacity expansion plan under implementation indicates a gradual increase of the coal-fired capacity share from 60% now to 65% in the near-to mid-term future.

Support poverty alleviation in the western poverty area. The XHP is expected to achieve great poverty alleviation impacts. It is located in Xishui, one of the poorest townships (more than 93% of the population are below the China poverty line) of Zhangye City in Gansu Province, the second poorest province in China in terms of GDP per capita. Zhangye Prefecture also has a very high poverty incidence—more than 27% of its rural population of almost 1 million are below the China poverty line. Those worst affected by this power shortage are the rural population with high percentage of poor people. XHP has the potential to provide cheaper and more reliable electricity to some of the poorest areas in Zhangye Prefecture, thus spurring and consolidating the local economic development.

Given the pivotal role of China in GHG emissions and projections for its emission trajectory in the future, it would be critical for the Bank to support this CDM project selected by the GoC. The potential of carbon financing and the willingness of China’s participation would allow the project to further leverage policy improvements in favor of renewable energy in China.

The Bank’s involvement helps to ensure quality of one of the first CDM energy projects in China, while providing necessary project due diligence. The value-added of Bank support also includes the availability of in-house expertise in managing hydropower projects and associated social and environmental impacts, ability to mobilize global experts with long experience in the field, technical support for project implementation and supervision, and experience in facilitating capacity building for sustainable development as well as implementing CDM projects.

The Bank’s involvement is in line with ADB’s policy and the Bank’s knowledge and experience in ER trading and the PCF instrument provide the Bank with comparative advantages. The above are consistent with China’s CAS which emphasizes addressing needs of the poorer and/or disadvantaged people and lagging regions, and facilitating an environmentally sustainable development process.

2. Proposed objective(s)

The proposed PCF Xiaogushan Hydropower project (the PCF project) aims to (i) reduce CO$_2$ emission through substitution of electricity generation by mainly coal-fired thermal power units with renewable hydropower generation; and (ii) support the client’s efforts on addressing and easing the severe power shortage in Zhangye network in an environmentally sustainable manner through adding 98 MW of clean energy generation capacity to the network.

3. Preliminary description

The proposed PCF project is for purchase of verifiable GHG ERs to be achieved by the XHP project under the CDM of the Kyoto Protocol with PCF managed by the Bank. An Emission Reduction Purchase Agreement (ERPA) is to be reached between the MOF on behalf GoC, and the Bank, as the trustee of the PCF.

Upon completion, the XHP will generate an output of 380 GWh electricity per annum in long-term average terms, which would otherwise be generated mainly by coal-fired thermal power plants in the
regional Gansu power grid. This will result in an estimated ER of 327,000 mtCO$_2$e annually and ease substantially the sever power shortage of Zhangye network.

The XHP project consists of: (i) a 98 MW run-of-river hydropower plant; (ii) rural electrification; and (iii) institutional strengthening program.

**The hydropower plant** will be located on the Heihe River in the Sunan Yugu Autonomous County of Zhangye Prefecture, Gansu province, China. The project site is part of the Experimental Zone of the national Qilianshan Natural Reserve (QNR). It is a run-of-river power plant with an installed capacity of 98 MW. It includes a diversion weir, intake tunnel, powerhouse, a road connecting the weir and powerhouse, and a double-circuit 110 kV transmission line (19 km) for power evacuation. The 380 GWh outputs per annum of the power plant will supply about 27% of the total electricity demand of Zhangye network in the year 2005.

**The rural electrification component** includes 26 km of 35 kV transmission lines to three poor townships (92.3% of the 24,037 population are below the Gansu Province poverty line) in the vicinity of XHP, to directly benefit the rural populations in these townships by providing them cheaper and more reliable electricity, and to enhance direct poverty alleviation benefits from the XHP. This fact responds to the necessity in proving social benefits to the community which is also a factor stated in the CDM. The Base cost of this component is estimated US$ 0.9 million.

**The Institutional strengthening program** is designed and agreed between ADB and ZXHC to assure capacity building to support achievement of project objectives. ZXHC has been created for the preparation, construction and operation of the XHP.

### 4. Safeguard policies that might apply

Safeguard policies that apply include EA (OP/BP 4.01), Natural Habitat (OP/BP4.04), Involuntary Resettlement (OP/BP4.12), and Safety of Dams (OP/BP4.37).

Four consultation meetings on environmental impacts and six ones on social impacts have been conducted between January 2001 and February 2003 under the preparation for ADB financing. Summary of the draft EIA and RAP has been disclosed on the project website ([www.xhconline.com](http://www.xhconline.com)) since July 2003, and no negative comments and complaints are received.

Since involvement of the Bank in September 2003, extensive supplementary social and environmental work has been conducted to comply with Bank’s Safeguard policies. Impact assessment was enhanced through (i) social assessment for purpose of EMDP; (ii) social surveys and studies for RAP; (iii) retroactive review of resettlement activities undertaken; (iv) supplementary environment assessment covering associated transmission lines, ecological system and biodiversity, historic relics and cumulated impacts of cascaded dams; and (v) dam safety review. A second-round extensive public consultation was carried out to discuss the main findings of environmental and social assessment. Based on the assessment and public consultation, EMP, RAP, DSP and draft EMDP were developed in accordance with Bank’s Safeguard policies and disclosed locally in May 2004 and at InfoShop on June 9, except for the EMDP which will be finalized and disclosed in the same way by June 30, 2004. An Improvement Action Plan to address outstanding issues caused by previous resettlement and construction activities is under refining and some actions are under implementation.

Given the location of the XHP in the Experimental Zone of the Qilianshan Nature Reserve areas and the indigenous minority groups involved, an additional technical mission consisted of one senior social scientist who was not a member of the Bank’s Task Team was made in July – August 2004 to further
review potential environmental and social risks, even though construction of the XHP was in compliance with all relevant local and national laws and regulations and had secured approvals of national and local environmental and social government authorities. The mission concluded that social and environmental risks are minimum and manageable. Following that mission, the Bank Management and the Task Team consulted three external environmental experts, one from the UNDP, Flora and Fauna International respectively, and IUCN Cat Specialist Group, who confirmed that environmental risks were minimum and manageable.

Under the PCF Project, the Zhangye Municipal Government has issued an official government letter endorsing that 5% of incremental fiscal revenues from XHP will be ear-marked for grass and tree plantation in the project area, for the 10-year duration of the PCF supported procurement.

Envisaging the XHC and Zhangye Municipal Government do not have experience with World Bank projects, and the Bank’s Safeguard policies are new to them, institutional arrangements for implementation and monitoring of these plans deemed appropriate are in place, independent external monitoring for both environmental and social plans are set up, and a strong POE is appointed and has had its first meeting. With enhancement of regular supervision by Bank mission, compliance with relevant Safeguard Policies will be further assured.

5. Tentative financing

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<th>Source</th>
<th>($m.)</th>
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<td>Asia Development Bank</td>
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<td>Xiaogushan Hydropower Company Ltd.</td>
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<td>Bank of China</td>
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<td><strong>Total</strong></td>
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Note: All sources of financing are secured through legal agreements.

6. Contact point

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