1. Country and Sector Background

**Main Power Sector Issues.** To meet the continued increase in demand for electricity and in line with the move to a market economy, the power sector in China is being restructured. The sector is now in a transitional phase, in which generation, transmission, and distribution have been separated. Uncertainties surrounding the future structure of the power sector and inadequate pricing policies hinder introduction of newer technologies, especially renewable forms of electricity generation. Consequently, reliance on coal is increased and the government’s aim of sustainable development is hampered.

**Renewable Energy Strategy.** China has made significant progress in developing renewable energy, especially small hydropower. However, it still has abundant undeveloped resources of small hydropower, wind, biomass, geothermal, and solar energy. Economic studies, undertaken as part of project preparation, have demonstrated that much more of these resource can be developed to produce electricity below the system avoided cost, particularly if institutional barriers are lifted and external costs of damage caused by coal-fired generation is considered.

To develop these resources, The Government of China (GoC) developed a strategy based on: (a) development and implementation of a legal and regulatory framework, in step with the overall reform process, which supports and encourages the development of economic renewable energy resources; (b) access to advanced technology and techniques to improve quality, reduce cost and permit the economic exploitation of renewable energy resources through assimilation of research, manufacturing, assembly, installation as well as operation, and (c) strengthening of the
capacity of existing companies to develop, finance, construct and operate renewable energy on a large scale and further opening of the sector to private investors.

The REL introduces a mandated market policy (MMP) policy which mandates that either a share of the electricity delivered to end consumers by power companies comes from renewable sources or imposes an obligation on power companies to buy renewable energy–based electricity at a government-determined price. Concomitant with that obligation are the rights of the power companies to recover the additional cost from consumers and for electricity generators to be able to connect to the grid. Preparation of the implementing regulations, technical assistance for their implementation and further development of the legal and regulatory framework for renewable energy in China is supported under the China Renewable Energy Scale-up Program (CRESP: Loan 4792-CHA), approved by the World Bank on June 16, 2005.

CRESP also supports the scaling up of renewable energy use, focusing on four pilot provinces, Fujian, Inner Mongolia, Jiangsu and Zhejiang. It finances a major effort to transfer technology and develop local manufacturing capacity for wind- and biomass-based power generation as a means to bring down the cost of electricity generation. It provides financing for supporting activities to foster further renewable energy development including resource evaluation and pre-investment activities. Last, it also finances specific investments in wind, through a 100MW wind project at Pingtan Island in Fujian province and a 25MW biomass combustion project at Rudong in Jiangsu province.

2. Objectives

The proposed project is part of the GEF supported CRESP that will enable commercial renewable electricity suppliers to provide energy to the electricity market efficiently, cost-effectively and on a large scale. It will support (i) the construction of a 100 MW wind farm at Huitengxile in Inner Mongolia Autonomous Region; and (ii) the rehabilitation and development of small hydro plants in Zhejiang Province to demonstrate early success in large scale renewable-based electricity in one additional province and one additional autonomous region.

The key indicators for this project are explicitly tied to the program objectives for CRESP and the extent to which the market framework and environment is improved for large scale renewable energy investments in Inner Mongolia and Zhejiang. Measures of progress made during project implementation are measures of physical implementation progress.

The most recent full Country Assistance Strategy (CAS), discussed by the Board on January 21, 2003 (Report No. 25141-CHA), focuses on supporting China's sustainable transition from a rural to an urban society and from a centrally-planned to a market-based economy. An important theme within the CAS is to facilitate an environmentally sustainable development process, including dealing with global environment and air quality issues. Increased electricity generation from renewable energy sources will contribute to improved air quality and reduce the economic costs that result from the harmful effects of the use of coal and reduce greenhouse gas emissions. The program will also contribute to the GoC objectives of economic development in the lagging regions, since much of the renewable energy resource is in those areas. The project
objectives are also fully in line with the objectives of the new CAS to be presented to the Board in early 2006.

3. Rationale for Bank Involvement

The continued involvement of the Bank through additional renewable energy investments in the pilot provinces will increase the prospects for the successful introduction of the MMP and the accompanying technology transfer and knowledge upgrade needed for the successful and sustained scaling-up of renewable energy use in China. The Bank’s sustained engagement within the programmatic approach approved by the GEF Council will facilitate the implementation of the strategy and sustain the scaling-up through support and leverage of investment in renewable energy generation.

The GEF program is justified by the long-term and complex nature of the policy issues hampering the scale-up of renewable energy and the need for a flexible approach to adapt to the fast-changing environment and the priorities as they emerge during implementation. The additional lending to contribute to the scale-up of renewable energy–based power capacity is justified because of uncertainties about other sources of funding, particularly in the pilot provinces targeted under CRESP.

4. Description

The project comprises two components.

**Huitengxile Wind Farm, Inner Mongolia ($100.92 million, Bank financing $67 million)**

The proposed wind farm is at the Huitengxile site, about 120 km north east of Hohhot, and is currently home to approximately 70MW of wind generation capacity. The site has a potential for about 10,000 MW when fully developed and is well-established as one of the best sites in China for large-scale wind development.

The Huitengxile wind farm will consist of wind turbines, associated electrical and civil works including a substation, switchyard and control room; a 15 km, 110 kV transmission line to Desheng town; and upgrading of the existing substation there. The power of the individual wind turbines will be in the range 0.75–1.5MW, but their number and precise layout of the wind farm will be determined at procurement and will depend on the product offered by the winning bidder. Based on feasibility study calculations using 67, 1.5MW machines (considered to be the most likely configuration), permanent land acquisition including land for turbines, roads and substations, will total 23.65 hectares within an area of about 11 km². The wind farm is expected to produce about 245 GWh of electricity per year. Power will be sold to the eastern Inner Mongolia grid, at 38.2 fen/kWh, a price based on competitive bidding by another wind farm at the same site.

Inner Mongolia North Long Yuan Wind Power Company has also developed a proposal to sell reductions of carbon emissions to the Pilot Carbon Fund. The additionality of the project (for carbon financing purposes) is based on (a) the dominance of coal in Inner Mongolia where typical power prices are around 25 fen/kWh; and (b) the demonstrated requirement for additional
revenues to improve the financial viability of the project. The Bank and PCF reviewed the proposal and are working with NLYWPC and concerned government agencies to prepare the Emissions Reduction Purchase Agreement (ERPA).

**Small Hydro Projects, Zhejiang ($32.31 million, Bank financing $19.33 million)**

In Zhejiang, the Bank will finance rehabilitation and development of selected small hydropower units. The subcomponent includes into two parts: (a) rehabilitation of existing small hydro sites; and (b) development of new sites. Based on the appraised list of projects, the rehabilitation would consist of 11 projects with a total current capacity of 40 MW, which would be increased by a further 12 MW. Total costs would be US$17.82 million for which Bank financing of US$11.95 million is sought. Seven new build projects would have an aggregate capacity of 16 MW with a total cost of US$14.49 million for which Bank financing of US$7.38 million would be sought. Project design permits either a fixed number of projects to be determined beforehand or a ceiling level of Bank financing to be agreed and projects financed until all the Bank funds have been committed.

**Institutional Development and Capacity Building**

Institutional and capacity building in Inner Mongolia and Zhejiang is financed under CRESP and is a single national program implemented through a national PMO under the Energy Bureau of NDRC. Support is programmed to assist in building a strong pipeline of bankable renewable energy projects. They will receive funds to carry out feasibility studies, resource assessments and other preinvestment activities on a cost-shared basis. Training and capacity building, and access to international experience and best practice will also be eligible activities.

5. Financing

<table>
<thead>
<tr>
<th>Source:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>BORROWER/RECIPIENT</td>
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<tr>
<td>INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT</td>
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</tr>
<tr>
<td>FOREIGN PRIVATE COMMERCIAL SOURCES (UNIDENTIFIED)</td>
<td>16.82</td>
</tr>
<tr>
<td>Total</td>
<td>133.23</td>
</tr>
</tbody>
</table>

6. Implementation

**Huitengxile Wind Farm Component**

Inner Mongolia North Long Yuan Wind Power Company (IMNLYWPC) is the developer of the project and will own and operate the plant after commissioning. It is a credible developer, owned 50 percent by China Long Yuan Electric Power Group Corporation (Long Yuan), itself a well established wind developer, and a subsidiary of Guodian Corporation, one of the five state-owned generation companies. The other shareholder is Northern Union Power Group (NUPG), a holding company for much of Inner Mongolia’s power generation plant.

A wind turbine supplier will be selected under international competitive bidding (ICB) to supply and supervise the installation of wind turbines, to design and supervise the manufacture of
towers, to design and supervise the construction of foundations, and to provide design services for the balance of the wind farm, including electrical and civil works. Local contractors, not financed by the Bank, will manufacture the towers, and undertake electrical and civil works, under the supervision of the turbine supplier. Consultants have been hired to support the bidding process, including preparation of the bidding documents for the turbine supply, assistance during the bid period and in bid evaluation, and to assist in supervising the turbine supplier’s work.

Funds will be onlent from the MOF to Inner Mongolia Autonomous Region, and from there onlent to IMNLYWPC with a guarantee provided in equal shares by Guodian and NUPG.

**Zhejiang Small Hydro Component**

The Zhejiang sub-component consists of several small hydro projects. Rehabilitation projects are mainly within state or collectively owned county-level companies. New build projects are mostly sponsored by private companies. A leading group has been formed by Zhejiang Province Government to oversee project implementation. Capacity at the individual company level is limited, hence the sub-component will be managed by a provincial project office (PPO) staffed by members of the Zhejiang Hydro Power Management Development Center (ZHPMDC) which has extensive experience in managing international cooperation projects and will oversee and provide additional capacity for the technical, financial, procurement and safeguard aspects of the individual projects.

Individual subprojects will undergo due diligence by the provincial government, which has appointed Zhejiang Hydropower Management Development Center (ZHPMDC) to act for it. A framework has been agreed and appraised by the Bank which sets out the technical (including safety), financial, economic, fiduciary and safeguards requirements a project must meet to be eligible for Bank financing. The framework is set out in the Project Implementation Plan (PIP). Due diligence of individual projects will be managed by ZHPMDC and expert consultants as required. The findings of the due diligence will be recorded and reported to Zhejiang government’s leading group and the Bank. On completion of due diligence, each project owner will sign a subloan agreement with Zhejiang Province. The due diligence reports of the first two and the three largest subprojects will be subject to prior review by the Bank. Others will be subject to post review.

Funds will flow from MOF to Zhejiang provincial finance bureau, on to county finance bureaus, and thence to project companies. Payments will be made on a reimbursement basis to project companies.

### 7. Sustainability

The GoC’s renewed commitment to the support and development of renewable energy is documented in a Letter of Sector Development Policy (LSDP), which is attached in Additional Annex 1A of the Project Appraisal Document of the China Renewable Energy Scale up Program Phase 1.

The passage of the REL introducing an MMP is a major step toward sustainable scale-up of renewable energy. Success now hinges on adequate regulations and design of an effective
regulatory system with GEF support to ensure adequate implementation. Sustainability is likely because (a) the rapid progress in developing and passing the law indicates the desire of the government to meet the sector development objectives; and (b) the programmatic approach provides a means of steadily broadening and deepening the engagement of all concerned parties, leading to the point where the environment for renewable energy has been embedded into the legal and institutional framework of the country in step with the long-term plan outlined by the GoC in its LSDP.

Sustainability of the investment projects has been aided by reflecting in their institutional arrangements the principles set out in the law, namely creating a long-term requirement for renewable electricity at the provincial level, backed by Power Purchase Agreements (PPAs) and ensuring cost recovery. The project supports this goal through various activities envisaged under the institutional development and capacity building provided by CRESP to the project implementing agencies and more widely within the pilot provinces.

8. Lessons Learned from Past Operations in the Country/Sector

Over the longer term, sustainability of development of the renewable energy sub-sector requires (a) development of a competitive environment in the renewable energy subsector to reduce technology and project development costs; (b) flexibility to allow quick adaptation to changing market conditions, such as restructuring and deregulation of power sectors; and (c) minimal reliance on administrative procedures, and increased focus on market-based approaches as soon as barriers are removed. These lessons have been incorporated into the design of CRESP, from which this project will benefit.

At the project level, the following lessons were learned from renewable energy assistance in China:

- Consensus among all concerned agencies is vital to project success.
- The renewable energy resource for individual projects must be carefully assessed and checked.
- Attention must be paid to arrangements for procurement and construction that are in line with international best practice to ensure rapid and effective implementation.
- Agreement on important principles that are essential to the project functioning as envisaged (for example, power offtake and purchase agreements) should be established before project appraisal.
- TA must be coordinated with the construction of the physical parts of the project to ensure that the implementing agencies have adequate and timely knowledge of construction, operation, and maintenance.

Incorporation of these lessons learned in the proposed project required full engagement of all concerned Chinese agencies.

9. Safeguard Policies (including public consultation)
Environmental screening category is B.

In Inner Mongolia, land is being acquired from a state-owned stud farm and there are no project affected households nor major environmental impacts. Participatory consultations on both resettlement and environment issues have taken place during Environment Assessment (EA) and Resettlement Action Plan (RAP) preparation. Local consultation has taken place through surveys of affected households, discussions with local government and businesses at town and village levels and public meetings. Compensation rates have been discussed and agreed and there is a system of redress in place. Implementing agencies’ ability to implement safeguards policies is satisfactory and will be independently monitored. EIAs and RAPs have been disclosed as shown in the table below.

A safeguards framework for the small hydro projects in Zhejiang has been discussed and agreed with stakeholder groups and will be disclosed by appraisal. Main safeguards issues are potentially environmental, resettlement and dam safety. Precise safeguards issues will be identified on appraisal of individual sub-projects. Based on the information available is not expected that any project will trigger environment category A or safeguards category S1.

Both EAs and RAPs have been disclosed as follows:

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<thead>
<tr>
<th>Safeguard Policies Triggered by the Project</th>
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</thead>
<tbody>
<tr>
<td>Environmental Assessment (OP/BP/GP 4.01)</td>
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<td>Natural Habitats (OP/BP 4.04)</td>
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<td>Projects in Disputed Areas (OP/BP/GP 7.60)*</td>
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<td>Projects on International Waterways (OP/BP/GP 7.50)</td>
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</tr>
</tbody>
</table>

Environmental screening category is B.

* By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims on the disputed areas.
10. List of Factual Technical Documents

11. Contact point
Contact: Noureddine Berrah
Title: Lead Energy Specialist
Tel: (202) 473-1132
Fax: (202) 522-1648
Email: Nberrah@worldbank.org

12. For more information contact:
The InfoShop
The World Bank
1818 H Street, NW
Washington, D.C. 20433
Telephone: (202) 458-5454
Fax: (202) 522-1500
Web: http://www.worldbank.org/infoshop