

**PROJECT INFORMATION DOCUMENT (PID)
CONCEPT STAGE**

Report No.: AB5136

Project Name	Luhri Hydro Electric Project
Region	SOUTH ASIA
Sector	Power (50%); Renewable energy (50%)
Project ID	P102843
Borrower(s)	SJVN LIMITED
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Implementing Agency	SJVN LIMITED
Environment Category	[X] A [] B [] C [] FI [] TBD (to be determined)
Date PID Prepared	February 9, 2010
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Estimated Date of Board Approval	March 31, 2011

1. Key development issues and rationale for Bank involvement

The Government of India (GoI) has identified the power sector as being vital for sustained and inclusive economic growth and has taken decisive steps to improve the legal and policy frameworks. The landmark 2003 Electricity Act seeks to improve the efficiency and accountability of the sector, building upon the establishment of autonomous electricity regulatory commissions at the Centre and in many of the states since 1998. The 2005 National Electricity Policy (NEP), 2006 National Tariff Policy (NTP), 2006 Rural Electrification Policy and 2007 Integrated Energy Policy (IEP) are intended to facilitate the goals established in the Act by detailing policy on specific issues. The NEP sets ambitious targets for providing universal access to reliable and good quality power by 2012, while also highlighting the need to mitigate power shortages as well as achieving financial viability of the electricity sector. The 2005 National Water Policy calls for the planning, development and management of India's water resources to be governed from the national perspective, and assigns hydropower third place in the priority of use of water resources, after drinking water and irrigation.

While the above policy actions have helped, the power sector still faces significant challenges: (i) low levels of connectivity, overall 35 percent¹ (44 percent in rural areas) of the households in India are still without access to electricity; (ii) high coping costs of industry, with 60 percent of Indian firms relying on captive or back-up generation; (iii) limited grid supply infrastructure; limited capacity for inter-regional electricity trade; and under-maintained state distribution systems that cannot meet demand; (iv) power shortages likely to continue with slower than needed additions of new capacity and about 25 percent of existing generation capacity in need of rehabilitation; (v) weak utility governance in most states resulting in high system losses; (vi) unpredictable fuel supply and costs, particularly for gas; and (vii) contribution to 50 percent of India's carbon emissions, with reliance on indigenous coal based generation continuing and supply shortages leading to use of small inefficient and polluting back-up generators. During FY2009, the country faced a peak power shortage of 12.0 percent

¹ Source: NSS Report No. 527, Household Consumer Expenditure in India, 2006-07

and an energy deficit of 11.0 percent². The cost of un-served energy is consequently high, placing an inordinate burden on households and industries. The Economic Survey of 2006 estimated the annual cost to the economy from power sector inefficiencies to be about US\$ 75 billion, or 7 percent of GDP.

With a total potential of 150,000 MW, hydropower remains one of the critical options to address the energy/peak shortages and limit the carbon intensity of the power sector. Given the profile³ of the daily load curve in India, the ability of hydropower plants to respond quickly to demand fluctuations makes them the ideal electricity source to cope with demand peaks and help stabilize system frequency. In addition, hydropower can help India address energy security concerns linked to a growing dependence on imported fossil fuels, and implement a lower carbon growth path for the sector. Despite its critical role, the share of hydropower in India's installed capacity has been steadily declining over the past decades. From 44 percent in 1970, this share has decreased to about 25 percent today, which is suboptimal to meet peak load requirements as well as system and frequency stability. Hydropower's share of energy generated, as opposed to installed capacity, is even smaller, at 16 percent (2009), reflecting a lower availability of the existing installed hydropower capacity relative to the thermal plants that predominate in India's generating system.

The government plans to develop about 45,000 MW of this total hydro potential, mostly located in the Himalayan region, by the end of 12th five year plan (2017), representing a development program on a scale that has never before been attempted in India: today's existing installed hydropower generation capacity of about 36,000 MW was developed over more than 50 years. To accelerate this development, the 2008 national Hydro Power Policy has introduced important reforms to further the GoI's objective of accelerating the pace of hydropower development. These include measures (i) to increase private sector investment in hydropower; (ii) to improve the benefit sharing regime for project-affected people, hence moving beyond the paradigm of compensation for losses imposed; and (iii) to enhance the financial viability of projects by allowing a share of the plant output to be sold in the "merchant" or unregulated market.

Notwithstanding the above positive initiatives, hydropower development remains challenging due to a number reasons including technical challenges of geological surprises leading to significant cost- and time-overruns and to frequent disputes with contractors; sediment management in the operations stage; social issues; projects are capital-intensive, risky and have long pay-back periods; limited availability of long-term financing and a slow emergence of tariff incentives to stimulate hydropower development, etc.

While there is growing private sector interest – and participation – in hydropower generation in India, the above-mentioned factors are expected to limit private sector participation in the medium term, despite efforts by the GoI and individual state governments to encourage private participation. Private companies which had shown a strong initial interest in the hydropower sector, have had mixed experience⁴ with developing and operating hydropower plants in India. With the current capacity expansion plans, the public sector, and the Central power utilities in particular, will continue to play the dominant role⁵. In that context, the GoI intends to develop the public sector companies to a level where

² Source: Monthly Review of Power Sector (March, 2009), Central Electricity Authority.

³ characterized by pronounced daily surges ("peaks") due to the large number of households whose demand for power is concentrated in a few morning and evening hours

⁴ Private ownership of the current installed hydro capacity is only 3.4 percent of the installed hydro power generation capacity, compared to 13.9 percent share of the installed thermal power generation capacity

⁵ About 22% of the planned installed capacity in the hydropower sector during the 11th plan is expected to be developed by the private sector while the balance 78% is expected to be developed by the central/ state sector.

they can raise private commercial financing on their own and it has recently taken a decision to divest a part of its equity stake in several Central power utilities⁶ through public offers.

While exploring mechanisms to expand private participation in hydropower development, the GoI intends to strengthen the capacity of the public sector hydro companies to bring them to the level of top-performing public companies in the power sector. It envisages that the Bank's engagement in the hydropower sector in India will offer the opportunity to implement good technical, environmental and social practices, through a long-term partnership with a few developers in specific states in the Himalayan region. The Bank expects to leverage its support to the proposed Luhri Hydro Electric Project (LHEP), together with its ongoing support of the Rampur Hydropower Project (RHP) in Himachal Pradesh, to help the state and SJVN Limited (SJVNL) take the lead in demonstrating effective project execution capacity and sustainable development of hydropower to the other hydro-endowed hill states of India. The proposed support to the LHEP is consistent with the current Country Strategy (CAS) (FY2009-12) objective to ensure a sustainable development through the promotion of clean and renewable energy sources, and is included in the lending program agreed upon with the GoI.

2. Proposed objective(s)

The proposed development objectives of the project are:

- i. Primary development objective is to increase the supply of clean, renewable, low-carbon and peaking energy to India's northern grid [and to enhance the reliability of the grid], and
- ii. Secondary development objective is to further enhance SJVN Limited's (SJVNL) institutional capacity with respect to the preparation and safe implementation of technically sound and economically, environmentally and socially sustainable hydropower projects.

3. Preliminary description

The proposed LHEP is located on the Sutlej River in the state of Himachal Pradesh and is planned as a run-of-river project, downstream of the under-construction 412 MW RHP. The project is to be implemented through a Special Purpose Vehicle (SPV), which will be a subsidiary of SJVNL in the form of a Joint venture (JV) with 49% equity share of GoHP and 51% of GoI⁷ through SJVNL. GoHP and SJVNL have not yet finalized the timing, whether during construction or during operation stage, for the formation of SPV and till the formation of SPV, SJVNL will be undertaking implementation of the project.

The project with 775 MW rated capacity will generate some 3,152 million units (in a 90% hydrologically dependable year); representing a valuable addition of peaking power to India's Northern grid, which is severely constrained by peaking shortages. The project will involve construction of an 86 m high concrete gravity dam (with gross reservoir capacity of 35 million cubic meter) near the village of Nirath from which 38.14 km long twin tunnels of 9 m diameter would bring water to an underground power house at the village of Marola, about 40 km downstream of the dam site. The gross water storage capacity is equivalent to about 5 hours on average (i.e. storage for meeting diurnal peak). All water diverted from the river will be returned to the river near the power house site. Adequate environmental in-stream flows⁸ will be ensured in the stretch between the dam and the power house to support the downstream water needs. Therefore, hydrologically speaking, it is a run-of-the-river project. The project

⁶ GoI has previously adopted the same approach for stake divestment through public offers in POWERGRID, NTPC and NHPC.

⁷ SJVNL is a JV between GoI and GoHP with 75:25 equity share.

⁸ As per current regulations in the State, an in-stream flow of a minimum of 15% of the lean season flow, downstream of any dam/ diversion structure, is mandatory.

will also contribute to the development of the state of Himachal Pradesh, which will receive a royalty of 12% of the power generated in return for the use of its water resources, in addition employment creation and its share in dividends (as an equity partner in the project). An additional 1% of the free power revenue will be available for undertaking community development activities in the project area. The project is likely to result in emission reductions of more than 2.5 million tonnes of CO₂ equivalent per annum after commissioning.

The proposed Bank financed project will be structured as a sector investment loan, tentatively in the amount of \$650 million, to be lent directly to SJVNL, representing project investment costs and funds for technical assistance.

4. Safeguard policies that might apply

Safeguard Policies Triggered	Yes	No	TBD
Environmental Assessment (OP/BP 4.01)	X		
Natural Habitats (OP/BP 4.04)		X	
Forests (OP/BP 4.36)	X		
Pest Management (OP 4.09)		X	
Physical Cultural Resources (OP/BP 4.11)	X		
Indigenous Peoples (OP/BP 4.10)			X
Involuntary Resettlement (OP/BP 4.12)	X		
Safety of Dams (OP/BP 4.37)	X		
Projects on International Waterways (OP/BP 7.50)	X		
Projects in Disputed Areas (OP/BP 7.60)		X	

According to SJVNL estimates, the project would require 301 hectares of land -- this includes 118 hectares of private land and 183 hectares of government forest land. It is provisionally estimated that 2,337 families may be directly affected by private land acquisition and of these, 37 families may be relocated.

The key safeguard actions required during project preparation will be to conduct a detailed social impact assessment, socioeconomic baseline study, preparation and disclosure of resettlement plan and community development program, and extensive stakeholder consultations by SJVNL. The Environmental Impact Assessment (EIA) report for the project is under preparation. Based on the EIA report, additional studies to meet Bank's due diligence requirements will be undertaken by SJVNL. All the key documents/ study reports will also be disclosed in Bank's Info shop and will also be available at the two Project Information Centres set up by SJVNL in the project area, as well as on their corporate website (www.sjvn.nic.in).

5. Tentative financing

Source:	(\$m.)
Borrower	262
International Bank for Reconstruction and Development	650
Government of Himachal Pradesh	83
Financing Gap	155
Total	1150

The project intends to explore availing carbon finance to raise additional debt to meet the financing gap.

6. Contact point

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