

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

Report No.: PIDA18283

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Project Name	Nepal: Power Sector Reform and Sustainable Hydropower Development (PSRSHD) (P150066)
Region	SOUTH ASIA
Country	Nepal
Sector(s)	Hydropower (50%), General energy sector (20%), Other domestic and international trade (15%), Transmission and Distribution of Electricity (10%), General education sector (5%)
Theme(s)	Infrastructure services for private sector development (50%), Environmental policies and institutions (20%), Corporate governance (20%), Education for the knowledge economy (5%), Gender (5%)
Lending Instrument	Investment Project Financing
Project ID	P150066
Borrower(s)	Government of Nepal
Implementing Agency	NEA, Water and Energy Commission Secretariat
Environmental Category	A-Full Assessment
Date PID Prepared/Updated	28-Mar-2015
Date PID Approved/Disclosed	29-Mar-2015
Estimated Date of Appraisal Completion	26-Feb-2015
Estimated Date of Board Approval	26-May-2015
Appraisal Review Decision (from Decision Note)	

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I. Project Context

Country Context

1. Nepal is a land-locked country that is facing major development challenges. With 27.8 million people, Nepal had a per capita income of US\$730 in year 2013. Of the population, 25.2 percent live on less than US\$1.25 per day and 82 percent live in rural areas. Nepal has made remarkable progress in poverty reduction and human development. Nepal attained the first Millennium Development Goal to halve extreme poverty, ahead of time. Poverty reduction accelerated sharply from 1.5 percentage points per year over 1996-2004 to 2.5 percentage points over 2004-2011. In 2014, out of 187 countries Nepal ranked 145 on the Human Development Index as compared to 157 in 2011. In addition, Nepal has achieved gender parity in education and sharp reductions in infant and maternal mortality. To maintain the momentum, Nepal will need to exploit its demographic opportunity, helping its reasonably educated youth to raise agriculture productivity

and incomes and transition to non-farm employment in the urban areas.

2. In the process of transition from conflict to peace, a Constituent Assembly (CA) was established to formulate a new constitution by May 2012, but reached the end of its mandate without coming to an agreement on a constitution. In March 2013, after almost a year of political stasis, the main parties agreed to form an interim government charged with holding new elections to form a new CA; elections were held in November 2013 for a second CA; and a Nepali Congress-led coalition was established in February 2014. The parties in the CA had set themselves a January 22, 2015 target to deliver a new constitution which could not be met. The CA still has a three year tenure during which it will continue to function as a regular Parliament as well.

3. Economic growth rate reached over 5.0 percent in FY14, slightly above the 4.7 percent achieved on average over 2008-2012. This slowdown had been resulted from reduced public spending, particularly for infrastructure; low levels of private investment, due to power outages, labor issues, policy inconsistency, and political uncertainty; and a disappointing monsoon and depressed agricultural growth. Going forward and in the absence of new endogenous sources of growth, economic activity will remain dependent on consumption (supported by remittances) and on weather conditions and external developments.

4. Endowed with rich hydropower resources, Nepal views hydropower development as the key opportunity for economic growth and human development, as was clearly evident from the recent consultations with people at different levels of society at various places across Nepal. While benefits from hydropower development, off-grid small and on-grid large hydro schemes, are expected in accessing modern energy services, generating revenues, creating jobs, spurring economic growth and improving quality of living, the macroeconomic impacts of large scale hydropower investments are yet to be clearly understood.

5. Foreign direct investment (FDI) is low (0.2 percent of gross domestic product (GDP) in FY14). The recently signed Project Development Agreement (PDA) for development of large scale hydropower projects and Power Trade Agreement (PTA) with India are expected to provide the much-needed boost in perception that the investment climate in Nepal is changing for better. FDI inflow is expected to substantially increase from these signed agreements run-up to implementation and during implementation compared to the current FDI inflow situation. The impact on the Balance of Payment in the short term can be managed (FY14 Balance of Payment reserve: US\$1.23 billion), if net transfer inflow continues at the current level and substantial part of FDI inflow covers the convertible currency cost of import project cost. To get a better handle of FDI inflow on macro aggregates, an assessment study has been initiated.

Sectoral and institutional Context

6. Natural resources available in Nepal for power generation. Nepal's hydropower potential is estimated at about 84,000 MW theoretically and 43,000 MW economically viable. Average solar radiation varies from 3.6 to 6.2 kWh/m² per day and there is an average of 300 days of sunshine a year. The commercial potential of solar power for grid connection is about 2,100 MW. There are potential sites for wind power generation and a Bank-supported wind resource mapping is under way. Potentials of fossil fuel resources are limited and the country fully relies on import of petroleum products (POLs) and liquefied petroleum gas to meet domestic energy needs for transportation and cooking. Hydropower remains the least-cost option for power generation to meet

domestic demand and has the potential to make Nepal a battery of the South Asia region.

7. Reserve balance sufficient to cover one year equivalent of import capacity. POL imports in FY14 was US\$ 1.34 billion (10 percent increase from FY13 in U.S. dollar terms). Average annual exports earning's coverage of POL import is 70 percent (68 percent in FY 14) of total POL imports—insufficient to cover POL import bill. With positive net transfers (remittance at 28 percent of GDP in FY14), the year-end reserve coverage was equivalent to 11.5 months of merchandise import capacity. With low thermal power installed capacity (53.4 MW) and factoring in reported captive generators as a means of power generation during grid power outage, the total demand of POL to generate power is not large and not in the scale of the use of POL for transportation.

8. Access to electricity services. According to the national census published in 2013, about 75 percent of the population in Nepal is estimated to have connections to grid (about 50 percent) and off-grid (about 25 percent) electricity. Although off-grid connections provide relatively reliable electricity supply in the rural areas, access to the grid in rural and urban areas does not necessarily mean access to electricity due to continuing load shedding (see section 9). Lack of access to reliable grid-supplied electricity is one of the key obstacles to lifting the remaining people below the poverty line out of poverty. While Nepal has achieved remarkable progress in off-grid electrification, coordination with grid extension needs to be enhanced through planning future rural electrification to avoid stranded off-grid assets when the grid is extended to the off-grid areas.

9. Energy crisis as a major constraint to growth. The electricity supply and demand gap was about 410 MW in November 2013, when peak demand reached 1,201 MW, resulting in load shedding of up to 14 hours a day. The lack of grid-supplied electricity is a major barrier for Nepal to expand access to quality electricity services, improve living standards, raise agriculture productivity and incomes, and help its youth transit from farming to non-farm employment. Commercial and industrials consumers run captive generators using expensive imported diesel fuel at a very high cost, ranging from US\$0.35 to US\$1.20 per kWh. This high cost has severely weakened their productivity, competitiveness and ability to expand. Moreover, the lack of job opportunities has pushed more than 5 million Nepali laborers to work overseas. Agriculture is the major sector contributing to the GDP, but raising productivity through irrigation is also constrained by the lack of electricity. While the energy sector has the potential to become a major source of income and to bring Nepal to middle-income status, the sector currently relies on government subsidies to survive since the price charged to consumers for electricity and imported fuel consumption does not cover the high cost incurred due to inefficiency of the sector. Subsidies to the energy sector have become a major drain on scarce public resources.

10. Key barriers for power sector development. To increase electricity supply, improve the power sector performance, and develop Nepal's huge hydropower potential for earning export revenues, Nepal is facing major challenges, as described in the following paragraphs:

11. Protracted political transition and lack of consensus among political parties. There is a widespread acknowledgment among stakeholders in the Nepalese power sector that political instability has been one of the key factor in failure to exploit the country's hydropower potential. That said, there has been good progress in consensus-building among political parties around hydropower development in recent years. In a rare gesture of solidarity, top leaders of seven political parties signed a joint statement of their commitment to development of the country's hydropower on April 9, 2013, recognizing the need to improve hydropower license management, support hydropower export, ensure environmental sustainability, share benefits with the local

people, and not hinder hydropower project works. The consensus at the top-level of parties needs to filter down to implementation levels; and at implementation level, Technical Assistance (TA) is needed to agree on a generation master plan that defines the locations, sizes and functions of potential hydropower projects and sequence of development.

12. Lack of legal and regulatory framework. While successive governments in Nepal have expressed a commitment to attract private sector investment to develop hydropower potential given the scarcity of public resources, progress in an establishing enabling environment for private investments has also been limited. Attracting and retaining private investment requires mechanisms for sharing risks, the provision of common infrastructure such as transmission corridors and roads, streamlined procedures, regulatory improvements, and structural reforms. The new Electricity Act and Nepal Electricity Regulatory Commission Act are yet to be revised and enacted by the Parliament. Given the mixed role of the Nepal Electricity Authority (NEA) under the vertically integrated structure there is a need to restructure the NEA's generation, transmission and distribution businesses and functions and to establish independent sector regulation to oversee planning, pricing, and system dispatch so that independent power producers (IPPs) operate on a level playing field.

13. Inefficiency, price distortion and poor creditworthiness. The NEA is heavily in debt and has suffered net losses over past years, due to high costs and system losses (24.8 percent in 2013/14) as well as insufficient increases in retail tariffs, among other factors. As a result, the NEA is unable to serve its debts or generate the financing required to invest in power system infrastructure. The government of Nepal (GoN) has been providing budget support to the NEA to maintain its operations has written off payment dues to GoN so far there has been no default on payment against the Power Purchase Agreement (PPA). To date, the NEA has signed take-or-pay PPAs for more than 1,700 MW of hydropower projects that are denominated, partially or fully, in U.S. dollars for projects with foreign financing. While all the NEA's revenues are in local currency, it has been paying some IPPs in U.S. dollars and recently GoN has decided to on-lend foreign loan to the NEA in U.S. dollars. These obligation to take foreign exchange risks, and possible non-utilization seasonal surplus electricity after 2017/18, due to uncertainties about the sales of the surplus electricity will put the NEA under an increasing financial risk to meet its obligations in the near future. The NEA's poor creditworthiness is one of the major difficulties in raising financing from the commercial banks for the IPPs that has signed PPAs with NEA. To improve the NEA's financial performance, there is an urgent need to; lower high transmission and distribution losses to an acceptable level, reform the NEA's retail tariff to cost recovery, pass on foreign exchange risks partially to consumers, and put in place a trading mechanism to sell surplus electricity to neighboring countries.

14. Lack of proper country risk mitigation and high risk of implementation delays due to land and forestry management issues. Due to competing uses of scarce public resources, the GoN has opened hydropower generation to private sector since 1993, and in total 13,000 MW hydropower schemes have been licensed to potential developer. Nonetheless, the NEA has completed only 70 MW of hydropower capacity while IPPs have added 140 MW since 2002. Most of the IPPs are struggling to raise financing due to lack of a guarantee for the NEA's payment as well as other risks such as hydrology, foreign exchange fluctuation, and change of laws that impede the bankability of hydropower projects in Nepal. Disputes on compensation for transmission rights-of-way (RoW), due to lack of clear policies and procedures for RoW compensation and benefit-sharing, as well as prolonged processes for forestry clearance for transmission lines, have contributed to unacceptable

delays in transmission line construction. For example, a 78 km 220 kV transmission line of strategic importance for the national grid, approved by the Bank in 2002, has not yet been completed and another donor-funded transmission could not be completed due to RoW disputes, making the project a stranded asset. Thus uncertainties in timely completion of transmission line pose another challenge for hydropower development.

15. Lack of power system master planning to guide investments. There has been no systematic planning of generation, transmission, and distribution since 2004/05 resulting in a lack of power system development strategy. The generation licenses are issued on an ad hoc basis and expansion of transmission and distribution systems are not based on overall all power system development plan. Lack of coordination among generation, transmission, and distribution projects in the absence of a power system development plan pose huge risks and challenges for private investments in the power sector. For hydropower development, there is an urgent need for planning on a basin-wide approach so that hydropower license can issued in a systematic manner that would guide the hydropower development process and investment, and also ensure environmental and social sustainability of hydropower development.

16. Export market challenges for Nepal's huge hydropower potential. In Nepal, domestic demand will reach about 2,000 MW by 2020 and 4,500 MW by 2030, as estimated by the NEA. With about 1,400 MW from a run-of-river hydropower plant (under construction) to be added to the NEA grid by 2017/18, the supply gap during in the winter will be narrowed while there will be surplus electricity during the summer. The natural market for this surplus electricity is the neighboring India, but it was not until October 2014 that the long-awaited Power PTA between India and Nepal was signed. A few other important steps were also recently taken: in particular, PDAs for the large-scale export-oriented hydropower projects, Upper Karnali (900 MW) and Arun III (900 MW), were signed in September 2014 and November 2014 respectively. Given the promising progress in PDA negotiations with other large-scale export-oriented hydropower projects managed by the Investment Board of Nepal (IBN), totaling 1,350 MW, there is an urgent need for Nepal to: (a) set up its regulatory and institutional arrangement for power trading with India to manage its power shortage in winter time and surplus in summer time; and (b) setup high-voltage cross-border transmission lines to enable power flows both ways. The first 400 kV cross-border transmission line to India is under construction with contractual commissioning date in September 2015.

17. Weak technical capacity in preparation of large-sized hydropower and transmission line projects. Preparation of large-sized hydropower projects and transmission lines and substations with voltages higher than 220 kV, including feasibility study and design, bidding documents, environmental and social impact assessment (ESIA), and mitigation in a strategic and cumulative basin-wide approach, is still far beyond local capacity in Nepal. A lack of projects prepared in line with international standards is also one of the major barriers in catalyzing expected foreign investment and financing. Inadequate capacity within public agencies has generated long delays in the review and approval process when the technical preparation work was submitted from private developers.

18. Other factors that hindered the hydropower development in Nepal:

- (a) Lack of clearly stated and widely committed power sector vision/objectives, strategies and action plans
- (b) The multiplicity of institutions involved in hydropower with overlapping mandates and

authority, which prevents a streamlined decision and planning process

- (c) Weak management in hydropower licensing and the need of transition from a developer driven ad hoc approach to an open, transparent and efficient licensing process based on basin-wide hydropower development planning
- (d) Weak institutional capacity in Nepal to develop and enforce appropriate environmental and social policies and regulation related to hydropower development
- (e) The potential for politicization of hydropower projects by local, regional and national interest groups, particularly in the on-going debate of federalism
- (f) Lack of coordinated planning for expanding access to electricity through grid extension and off-grid renewable technologies

19. Government short-, medium-, and long-term strategies and actions. While the GoN has been continuously promoting off-grid renewable energy development to expand access to energy services in rural areas, it is re-shaping and implementing a strategy for on-grid solutions to deal with the energy crisis in urban areas and, eventually, achieve the long-term power sector objectives. The strategy and actions are to; (a) reduce load shedding in the short term, through rehabilitation of existing generation plants to increase supply, rehabilitation of distribution network to reduce system losses, adding generation capacity that can be quickly installed (25 MWp grid-connected solar farm), issuing tax policy to support roof-top solar in urban areas, and launching a power sector reform to address key sector issues; (b) expand access to grid electricity services and reach supply-demand balance in the medium term, through grid extension, commissioning of hydropower under construction (about 1,500 MW), including the Upper Tamakoshi (456 MW) developed by the NEA subsidiary for commission in 2017, and the first 400 kV cross-border transmission line for power import from India (up to 1,000 MW); and (c) ensure universal access to sustainable, reliable and affordable electricity supply in Nepal and generate export revenues to sustain economic growth through development of its huge hydropower potentials and integration into the South Asia regional power market in the long term.

20. Regional and GoN commitment to power sector development. The signing of the PDAs of export-oriented Upper Karnali and Arun III projects and a paradigm shift in regional cooperation with signing of the PTA between Nepal and India shows strong commitment from the GoN to expedite the development of hydropower sector. This commitment was further reinforced on multilateral basis through the South Asian Association for Regional Cooperation (SAARC) Framework Agreement on Cooperation in energy which was signed by all SAARC countries.

21. Rationale for World Bank Group support. In line with the GoN objectives and strategy for the power sector, the World Bank Group has both (a) on-going projects supporting the immediate needs of increasing power supply through grid and off-grid solutions; and (b) a planned hydropower transformational engagement program, to address key power sector challenges at the sector level, and to facilitate financing and implementation at the project level. At sector level, the Bank is considering to support the GoN, through a series of Development Policy Credit (DPC) operations, to implement key policy and reform actions to address key sector issues, in a phased approach. The proposed project will prepare and prioritize recommendations of policy and reform actions, and strengthen capacity of sector institutions. And at the Project level, the Bank will support preparation of priority projects in line with international standards, to facilitate both public and private investments.

22. Other Development Partners' support to energy sector development. The Bank is working

jointly with the development partners (DPs) jointly on transformation of the energy sector of Nepal, to develop off-grid renewable energy for expansion of access to electricity in rural areas and develop its hydro potentials to meet domestic demand and enhance regional integration. Together with Asian Development Bank (ADB), the Department for International Development (DfID), and the Norwegian Government, the Bank has supported Alternative Energy Promotion Center (AEPC) in the development of off-grid solutions through micro and small hydro, solar home systems, biogas, waste to energy and improved cook stoves to meet the energy needs of rural people,. The Bank and DfID jointly supported the IBN in review of the four export-oriented large hydropower projects and negotiation of PDAs, with the major outcome of PDAs signed for two of the four large hydropower projects in November 2014. The Bank, ADB and DfID jointly supported the policy dialogue and capacity building for regional integration, with the major outcomes of the PTA signed between India and Nepal. The Bank and ADB are jointly supporting the rural electrification master planning, and development of a power trading strategy, and are coordinating with the Millennium Challenge Corporation (MCC) and the United States Agency for International Development (USAID) to support sector regulations.

23. For concept design of the proposed project, the Bank conducted several rounds of communication and consultation with all the donors respectively, and a joint workshop was held in early 2014 with all these DPs and relevant government institutions. The key outcome of the consultation and the workshop was that, there is a consensus among the all the stakeholder of the need for the power sector reform and regulation and basin-wide planning for optimal hydropower development.

24. Institutions. For policy formulation, planning, implementation and regulation of the energy sector, the Ministry of Energy (MoE) is the apex energy agency responsible for sector policy formulation and regulation, oversight of planning, investment, and development of the power sector, as well as issuing of licenses to the private sector for electricity generation, including hydropower below 500 MW, transmission, and distribution. The IBN, Department of Electricity Development (DoED), Water and Energy Commission Secretariat (WECS), Electricity Tariff Fixation Committee (ETFC), NEA and AEPC are other agencies in the power sector. In addition, the National Planning Commission provides policy guidance to these agencies. However, these agencies sometimes have overlapping functions, unclear mandates or multiple roles.

II. Proposed Development Objectives

The Project Development Objectives are to: (a) strengthen the capacity of the power sector agencies to plan and prepare hydropower and transmission line projects following international standards and best practices; and (b) improve the readiness of the power sector agencies for regulatory and institutional reforms.

III. Project Description

Component Name

Component A: Preparation of Hydropower and Transmission Line Investment Projects

Comments (optional)

This component will support preparation Upper Arun Hydroelectric Project (UAHEP) and Ikhuwa Khola Hydropower Project (IKHP), as proposed by the GoN , and one priority high voltage transmission line project to be identified by the on-going Transmission System Master Planning on-going under NIETTP, in line with international standards and the World Bank Safeguard Policies.

This component will finance (a) the preparation of detailed engineering design and bid documents for the UAHEP and IKHP, including the transmission lines for evacuation of power from these projects; and (b) the undertaking of a feasibility study and the preparation of basic design, route survey, environmental and social impact assessment, and bid documents for the planned transmission line project.

Component Name

Component B: Studies and Preparation for Policy Recommendations and Sector Reform

Comments (optional)

This component will address critical power sector issues. This component will support preparation of (a) river basin planning in an integrated water resource management (IWRM) approach for selected river basins; (b) recommendations for improvement of water resources management and regulations, including updating of the Water Resource Act and capacity building of WECS; (c) Power System Expansion Plan, including updating the Generation Master Plan (d) establishment and operationalize of a power trading company; (e) NEA business restructuring for improved management and efficiency, including provision of computerized management tools and installations of smart meters to enhance the distribution business management, and conducting asset evaluation.

Component Name

Component C: Capacity Building for Safeguard Management and Hydropower Development

Comments (optional)

This component will support improving the environmental and social safeguard management system in Nepal and associated capacity building, including:

- (a) Conducting Strategic Environment and Social Assessment (SESA) as part of the integrated river basin planning under Component B;
- (b) Preparation of recommendations for environmental and social regulations;
- (c) Safeguard capacity building for management of transmission line ROW issues; and
- (d) Project management.

IV. Financing (in USD Million)

Total Project Cost:	24.00	Total Bank Financing:	20.00
Financing Gap:	0.00		
For Loans/Credits/Others			Amount
BORROWER/RECIPIENT			1.50
International Development Association (IDA)			20.00
South Asia Water Initiative (SAWI)			2.50
Total			24.00

V. Implementation

25. An inter-agency PSC will be established to ensure coordination among various government agencies. The Project will also strengthen the capacity of PMUs for project implementation.

26. Project Steering Committee. The MoF, MoE, DoED, NEA, WECS, ETFC, IBN and academic institutions will be fully involved through a PSC to be chaired by the Energy Secretary. The role of the PSC will be to oversee and coordinate the PMUs in formulating the various policy

and reform recommendations under the Components B and C of the Project.

27. Project Implementation Agencies. Two IAs for implementation of the Project are

- a) NEA and ;
- b) WECS.

28. Each IA will set up a PMU consisting of a full/part time Project Manager, a Financial Management Specialist and a Procurement Specialist, supported by technical staffs of the IAs.

VI. Safeguard Policies (including public consultation)

Safeguard Policies Triggered by the Project	Yes	No
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

Comments (optional)

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