

FRAMEWORK FINANCING AGREEMENT
(PAK: Renewable Energy Development Sector Investment Program)

This Framework Financing Agreement (FFA), dated 31 October 2006 is made between the Islamic Republic of Pakistan (PAKISTAN) and the Asian Development Bank (ADB).

Background

Pakistan has requested ADB to help finance a renewable energy development investment program (the Investment Program) in the selected Provinces (North West Frontier Province and Punjab Province at the beginning, and any other Province meeting the requirements set forth in this Framework Financing Agreement, [the Provinces]). ADB's financial support is to be extended through a multitranche financing facility (the Facility).

**Roadmap and
Investment
Program**

Context

Pakistan is committed to and will implement the Roadmap and Investment Program described in Schedule 1 hereto. The Roadmap and Investment Program aim to expand energy supply to meet the increasing energy demand. They are also a part of indigenous and renewable energy (RE) development of Pakistan. At provincial level, the Roadmap and Investment Program are also a part of power generation policy of the Provinces. Pakistan is a water rich country, offering a total hydropower potential of more than 45,000 megawatt (MW). Hydropower resources are located mainly in the northern and central parts of the country. The total installed capacity of the hydropower stations in the country is 6,595 MW.

To support this, at the federal level, an RE development policy has been developed by the Alternative Energy Development Board (AEDB), the apex body that has been charged with promoting RE. At the provincial level, North West Frontier Province (NWFP) and Punjab Province have developed new power generation policies that provide the right incentives and promote the development of hydropower in the Provinces.

ADB's intervention will finance new investments in hydropower, develop feasibility studies of new sites for future RE investments by the public sector, bi-lateral and multi-lateral financial institutions, and the private sector, promote enhanced social and environmental safeguards in the Roadmap and Investment Program implementation, catalyze public-private participation, and build the capacity of provincial governments to develop and operate hydropower plants and other RE source based power generation stations.

Capacity development of the sector agencies such as AEDB, Sarhad Hydel Development Organization (SHYDO) of NWFP and Punjab would be a key component of the subprojects financed under the proposed Facility. RE development is also one of the key features of the Pakistan's poverty reduction agenda. Investments in RE will improve social well being, and improve the quality of life.

Investment Plan

The total investments requirement for RE development to reach 3.5% target by 2015 is estimated as \$2.2 billion. The proposed Facility will

cover up to \$510 million. The rest will have to be found from various sources such as private sector, multi-lateral and bi-lateral agencies, or through public-private partnership.

Financing Plan

The financing plan for the Roadmap and Investment Program is summarized below. Details are set out in Schedule 1 hereto.

| Financing Source | Total | Share |
|-------------------------|--------------------------|--------------|
| Asian Development Bank | \$510.0 million | 23.2% |
| Private Sector | \$900.0 million | 40.9% |
| Other donors | \$400.0 million | 18.2% |
| Government of Pakistan | \$390.0 million | 17.7% |
| Subtotal | \$2,200.0 million | 100% |

Private Sector Participation

Pakistan encourages establishment of power generation projects under public-private partnership (PPP). Pakistan considers that some incentives and concessions should be made available to the subprojects implemented under PPP to reduce operational risks and improve commercial viability. Some of the publicly financed subprojects may be open for private sector participation including outright sale or forming joint ventures when commercial viability is ensured. If the subprojects are to be privatized where the repayment to ADB has not been completed, the ADB loans will have to be repaid prior to the final hand over of the assets.

Track Record

Since the start of the ADB operations in Pakistan in 1968, total lending to the energy sector in Pakistan amounts to about \$3 billion, of which \$2.4 billion was to the power subsector and \$0.6 billion to the natural gas and petroleum subsectors. During recent years, ADB's overall lending to the energy sector accounted for about 28% of total lending to Pakistan. About three-fourths of the assistance to the power subsector (\$1,575 million for 13 loans) has been provided to Water and Power Development Authority (WAPDA) and the rest to Karachi Electricity Supply Company (KESC). ADB has been the major source of external assistance to the energy sector in Pakistan, having provided about one-third of total external resources to the sector. ADB's non-lending activities have also been important in the sector with a total of \$14.2 million provided for 27 technical assistance (TAs). No major RE focused development effort made in the past. However, the lessons learned indicate that the track record of ADB's involvement in the energy sector in Pakistan has been very positive.

Multitrance Financing Facility

The Facility will be provided in tranches¹ to support batches of investments or subprojects, as and when they are ready for financing; provided, Pakistan is in compliance with its representations and warranties to ADB, and the investments or subprojects are in line with the understandings hereunder.

Each loan may be financed under terms different from the financing terms of previous or subsequent loans. The choice of financing terms will depend on the subproject, project, capital market conditions, and

¹ Terms "tranche" and "loan" are used interchangeably.

ADB's financing policies, all prevailing at the time the loan is documented in a legal document.

Framework Financing Agreement

This FFA does not constitute a legal obligation on the part of ADB to commit any financing. At its sole discretion, exercised reasonably, ADB has the right to deny any financing request made by Pakistan, cancel the uncommitted portion of the Facility, and withdraw Pakistan's right to request any financing tranche under the Facility. Financing tranches may be made available by ADB provided matters continue to be in accordance with the general understandings and expectations on which the Facility is based and which are laid out in this FFA.

This FFA does not constitute a legal obligation on the part of Pakistan to request any financing. Pakistan has the right not to request any financing under the Facility. Pakistan also has the right at any time to cancel any uncommitted portion of the Facility.

Pakistan and ADB may exercise their respective rights to cancel the Facility or any uncommitted portion thereof, and ADB may exercise its right to refuse a financing request, by giving written notice to such effect to the other parties. The written notice will provide an explanation for the cancellation or refusal and, in the case of a cancellation, specify the date on which the cancellation takes effect.

Financing Terms

ADB will provide loans to finance subprojects under the Roadmap and Investment Program, as and when the latter are ready for financing, provided, Pakistan is in compliance with the understandings hereunder, and the subprojects are in line with those same understandings.

Each loan may be financed under terms different from the financing terms of previous or subsequent loans. The choice of financing terms will depend on the project, capital market conditions, and ADB's financing policies, all prevailing at the time the loan is documented in a legal agreement.

Tranches may be provided in sequence or simultaneously, and some may overlap in time with each other.

There is no maximum or minimum size for a tranche.

Commitment charges are not payable on the Facility. They are payable only on financing actually committed by ADB as a loan. ADB rules on commitment charges, which are in effect when a tranche is provided, will apply with respect to such tranche.

Amount

The maximum financing amount available under the Facility is five

² Provisions of the Ordinary Operations Loan Regulations Applicable to LIBOR-Based Loans Made from ADB's Ordinary Capital Resources, dated 1 July 2001, would apply to each Loan, subject, to modifications, if any, that may be included under any loan agreement.

hundred ten million dollars (\$510,000,000). It will be provided in individual loans from ADB's Ordinary Capital Resources² and \$10 million from ADB's Special Funds Resources³ for Capacity Development of related EAs, IAs, and subprojects or projects.

Availability Period

The last date on which any disbursement under any loan may be made will be 31 December 2017. The last periodic financing request (PFR) is expected to be submitted no later than 31 December 2015. Provided however, such availability period will lapse 12 months from the date of approval of the Facility by ADB Board of Directors, unless by such time the first loan agreement under the Facility is signed and made effective.

Terms and Conditions

Each loan will be used to finance a set of subprojects (projects) that meet agreed eligibility criteria described in Schedule 2 to this FFA, as amended or supplemented in related legal agreement(s). The subprojects shall adhere at all times to a set of agreed terms and conditions in the areas of safeguards, technical, commercial, legal, financial, social and economic profiles. The execution of subprojects financed by individual loans will also follow agreed procurement, disbursement, administrative, governance, fiduciary oversight and financial management arrangements. These terms and conditions are set in Schedules attached to this FFA. The specific details applicable to individual loans will be documented in the relevant legal agreements. Pakistan will cause the proceeds of each loan to be applied to the financing of expenditures of the Roadmap and Investment Program in accordance with conditions set forth in this FFA and the legal agreements for each loan.

Execution

For the Roadmap and Investment Program, AEDB will be the Executing Agency (EA) at the federal level, while participating provincial governments, acting through respective departments, will be the EAs at the provincial level. The provincial agencies dealing with RE power (where applicable) will be the Implementing Agencies (IAs). The subprojects under the first PFR will cover two provinces, i.e., NWFP and Punjab. Accordingly, governments, acting through their respective irrigation and power departments (IPDs), will be the EAs at the provincial level. The IAs will be the Sarhad Hydel Development Organization (SHYDO) in NWFP, and until such time that the proposed autonomous corporate body (Punjab Power Development Company Limited) is established and fully functioning, Punjab IPD in Punjab province, respectively.

SHYDO has established one project management unit (PMU) in its main office in Peshawar, NWFP. PMU will cover three main functions: (i) construction of the three proposed hydropower plants that have been appraised, (ii) undertaking feasibility studies and capacity development, and (iii) construction of a new office building. The PMU director and

³ Provisions of the Special Operations Loan Regulations Applicable to Loans Made from ADB's Special Funds Resources, dated 1 January 2006, would apply to each loan, subject to modifications, if any, that may be included under any loan agreement.

field level project managers have already been appointed. They report all subproject-related matters to the Director, Planning and Facilitation of SHYDO, who is ex-officio the overall coordinator for the NWFP component.

A PMU has also been established in Punjab IPD and it is headed by a project director. A several key staff members have also been assigned to carry out preparatory work including preparation and obtaining approval for PC-1s from the provincial and federal governments, obtaining approval for initial environmental examinations (IEEs) and resettlement plans by the provincial government, and undertaking of advance actions in recruiting consultants. At the same time, Punjab IPD has taken preparatory steps to establish a company, wholly owned by the provincial government, to manage the construction and to own and operate the facility-supported hydropower plants. A draft charter of the company, the Punjab Power Development Company Limited (PDC), has been prepared. It is expected that the company will be legally established, fully staffed, and functioning before 30 June 2007. Once the company is operational, the tasks of the PMU will be taken over by the company and therefore the company will become the IA.

Periodic Financing Requests

Pakistan may request, and ADB may agree, to provide loans under the Facility to finance the Roadmap and Investment Program and related subprojects (projects), upon the submission of a PFR. Each PFR should be submitted by Pakistan. Unless otherwise notified by Pakistan in writing, PFR will be signed on behalf of Pakistan by Secretary or Joint Secretary of Economic Affairs Division of the Ministry of Economic Affairs and Statistics of Pakistan. Pakistan will make available to the relevant Province(s), the proceeds of the loans in accordance with the related PFR, and the legal agreements for the loans.

Each individual loan will be for an amount of no less than fifty million dollars (\$50,000,000), or its equivalent. ADB will review the PFR(s) and, if found satisfactory, prepare the related legal agreement(s).

PFRs for financing subprojects will be subject to the selection criteria set out in Schedule 4 hereto, satisfactory due diligence and preparation of relevant safeguard frameworks, fiduciary requirements, and other relevant documents. ADB and Pakistan will agree on a Facility Administration Manual and a schedule to initiate these activities, as soon as possible after the date of this FFA, but prior to the effective date of the legal agreements for the first loan.

General Implementation Framework

Procedures

The Facility will be implemented in accordance with the general framework set out in Schedule 3 hereto.

Each loan to be provided under the Facility will be subject to following procedures and undertakings:

- (a) Pakistan will have notified ADB of a forthcoming PFR at least 15 days in advance of the submission of the PFR.

- (b) Pakistan will have submitted a PFR in the format agreed with ADB.
- (c) ADB may, in its sole discretion, decline to approve any PFR, or authorize the negotiation of any legal document for a loan, provided, any decision to so decline is communicated to Pakistan by ADB within 30 days from receipt of the PFR.

If no such decline is communicated to Pakistan, the legal documents will be negotiated and executed no later than 30 days from ADB's receipt of the PFR.

PFR information

The PFR will be substantially in the standard form and will contain the following details:

- (i) Loan amount;
- (ii) Description of subprojects to be financed under the loan;
- (iii) Cost estimates and financing plan;
- (iv) Implementation arrangements specific to the subprojects;
- (v) Confirmation of the continuing validity of and adherence to the provisions of this FFA;
- (vi) Confirmation of compliance with the provisions under previous legal agreements, as appropriate; and
- (vii) Other information as may be required under the Facility Administration Memorandum.

Safeguard Policies

All ADB safeguard policies, as amended or updated from time to time, will apply to all subprojects and projects financed under the Facility. Schedule 5 to this FFA sets forth the safeguard frameworks required under ADB's safeguard policies and which Pakistan will comply with and implement. ADB safeguard policies include (i) *Policy on Involuntary Resettlement*, 1995, (ii) *Policy on Indigenous Peoples*, 1998, and (iii) *Environment Policy*, 2002.

Procurement

All goods and services to be financed under the Facility will be procured in accordance with ADB's *Procurement Guidelines*, 2006, as amended from time to time.

Consulting Services

All consulting services to be financed under the Facility shall be procured in accordance with ADB's *Guidelines on the Use of Consultants*, 2006, as amended from time to time.

Advance Action

Advance action for procurement of civil works, and consulting services will be allowed for subprojects under the Facility, subject to these being eligible in accordance with agreed procedures and *Guidelines* as above referred.

It is understood that approval of advance action does not in any way commit ADB to finance the subprojects therein.

Disbursements

Disbursements under each loan will be in accordance with ADB's *Loan Disbursement Handbook*, 2001, and ADB's *Interim Guidelines for Disbursement Operations, LIBOR-Based Loan Products*, 2002, each

as amended from time to time.

**Monitoring,
Evaluation and
Reporting
Arrangements**

Within 3 months of the effective date of the loan agreement for the related project under the Facility, the respective IAs will establish a Project Performance Monitoring System (PPMS) in a form and substance acceptable to ADB, in accordance with the Investment Program and project performance indicators. The IAs will undertake periodic project performance review under each individual loan, as also for the Investment Program, in accordance with the PPMS to evaluate the scope, implementation arrangements, progress and achievements of objectives of the related project and overall Investment Program. The IAs will prepare and submit to ADB quarterly progress reports for the individual projects and subprojects under the Facility. The reports will include a description of physical progress, problems, and difficulties encountered and a summary of financial accounts that will consist of loan expenditures during the period, year to date, and total to date. A project completion report will be submitted within 3 months following completion of each project. A Facility completion report will be submitted within 3 months following completion of the Facility.

**Representations
and Warranties**

Pakistan represents and warrants that it will undertake the actions specified in Schedules to this FFA, and the legal agreements entered into for each loan.

ISLAMIC REPUBLIC OF PAKISTAN

ASIAN DEVELOPMENT BANK

By (Original Signed)
Najma Siddiqi
Authorized Representative

By (Original Signed)
Peter Fedon
Authorized Representative

Acknowledged by:

NORTH WEST FRONTIER PROVINCE

By (Original Signed)
Mr. Khalid Gilani
Authorized Representative

PUNJAB PROVINCE

By (Original Signed)
Mr. Arif Nadeen
Authorized Representative

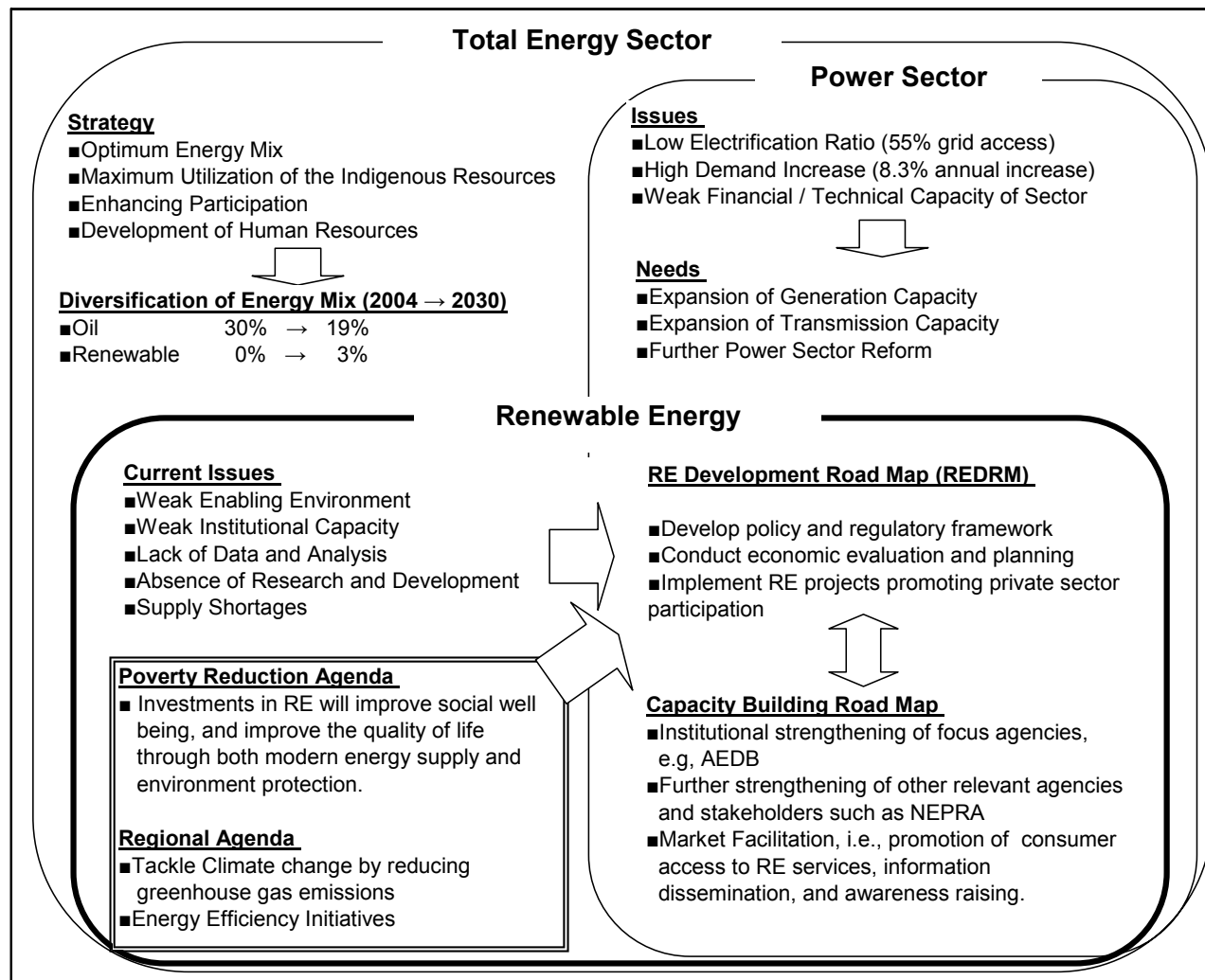
SCHEDULE 1

ROADMAP AND INVESTMENT PROGRAM FOR RENEWABLE ENERGY DEVELOPMENT

A. Introduction

1. RE development is part of a roadmap for the energy sector as a whole. Diagrammatic presentation of the investment plan is given in Figure S1.1.

Figure S1.1: An Overview of Roadmap for Renewable Energy Development



AEDB = Alternative Energy Development, NEPRA = National Electric Power Regulating Authority, RE = renewable energy.

2. **Objective:** Pakistan is a net importer of energy. Oil imports place a heavy burden on foreign exchange reserves. The recent increases in oil prices and rising consumption further complicate this problem. System losses aggravate it further. Most of the imported energy is for electricity generation. Recognizing the need for energy security, the Government of Pakistan (the Government) set out a roadmap for the energy over the medium to long term. The long term plan develops a so-called 20/30 agenda (covering 2005-2030). The medium term one is articulated in a Medium Term Development Framework for 2005–2010 (MTDF). The latter was announced in May 2005 by the Planning Commission. The main objectives are: (i) to increase the exploitation of hydropower, and exploration and production activities around oil, gas, and coal resources, increase the share of coal and alternative energy in the overall energy mix, (ii)

to optimize the utilization of the country's indigenous resource base to reduce dependence on imported fuel - through an institutionalized strategy, (iii) to create an environment conducive to private sector investment, and (iv) to develop the energy plan from a regional perspective.

3. **Strategy:** The strategic vision for development of the energy sector calls for: (i) supply to be based on an optimum energy mix; (ii) maximum utilization of the indigenous resources (iii) getting the private sector to invest in the sector and (iv) develop human resources and capacity. Renewable energy (RE) is a key component of this strategic vision.

4. The strategy also includes the expansion of liquefied petroleum gas (LPG) supply to the domestic sector, encouragement of compressed natural gas utilization in the transport sector and imports of liquefied natural gas (LNG) to meet short-term gas requirements, if feasible. Incentives will be provided for mechanized development of coal gasification technology.

5. The country's energy mix and demand projections for fuel for the short, medium, and long term are outlined in Table S1.1. The energy demand over the next five years is expected to grow at a rate of 7.4% per annum. To meet future requirements with indigenous resources, domestic exploration, needs to be intensified. Simultaneously, the energy supply options have to be diversified, with import of gas and LNG. In power generation a total of 23 hydro projects are already planned during the MTDf period, out of which 14 are hydel projects. This will allow the hydro-thermal mix to be shifted towards hydel generation. Worldwide, pumped storage is utilized to generate about 70,000 MW hydel power. This concept will be explored to tap hydropower potential. Similarly 900 MW of capacity will need to be increased through clean coal-based projects. Recognizing the importance of renewable energy, projects totaling 800 MW are also envisaged during 2005-2010.

Table S1.1: National Energy Security Action Plan: Energy Mix Projections

| | Current 2004 | | Short Term 2010 | | Medium Term | | | | Long Term | | | |
|-------------------|-----------------|-------|--------------------|-------|---------------|-------|---------------|-------|---------------|-------|---------------|-------|
| | | | | | 2015 | | 2020 | | 2025 | | 2030 | |
| Total Mtoe | 50.8 | | 79.39 | | 120.18 | | 177.35 | | 255.37 | | 361.31 | |
| Oil | 15.20 | 30% | 20.69 | 26% | 32.51 | 27% | 45.47 | 25.7% | 57.93 | 22.7% | 66.84 | 18.5% |
| Natural Gas | 25.45 | 50% | 38.99 | 49% | 52.98 | 44% | 77.85 | 44% | 114.84 | 45% | 162.58 | 45% |
| Coal | 3.30 | 6.5% | 7.16 | 9% | 14.45 | 12% | 24.77 | 14.0% | 38.28 | 15% | 68.65 | 19% |
| Hydro | 6.43 | 12.7% | 11.03 | 13.9% | 16.40 | 13.6% | 21.44 | 12.1% | 30.50 | 12% | 38.93 | 10.8% |
| Renewables | 0 | 0% | 0.84 | 1.1% | 1.60 | 1.3% | 3.00 | 1.7% | 5.58 | 2.2% | 9.20 | 2.5% |
| Nuclear | 0.42 | 0.8% | 0.69 | 0.9% | 2.23 | 1.9% | 4.81 | 2.7% | 8.24 | 3.2% | 15.11 | 4.2% |

Mtoe = metric tons of oil equivalent.

Source: Planning Commission, Government of Pakistan.

B. Roadmap for Power Sector Development

6. MTDf is based on a roadmap for the power sector. The latter is itself based on diagnostic work over several years. This identified obstacles to growth and came up with investment and non-investment ideas for the medium to long term. The investments include private and public sector transactions. To support both, the map also highlighted the need to accompany investments with reforms and capacity building. This is the essence of an investment program for the 2005-2015 period.

7. Currently, over 65% of Pakistan's electricity comes from thermal sources, a little less than 30% from hydro, and less than 1% from renewable and other sources. Even with all this imported energy, Pakistan faces a 20% power shortage. Only 55% of the population has access

to electricity from the national grid. The remaining 45% uses kerosene, fuel wood, and other forms of bio-fuels for lighting, cooking, and heating. Pakistan has one of the lowest per capita energy consumption in the world. The expansion of generation capacity is closely linked to poverty alleviation. In Pakistan, there are two major public sector utilities: the Water and Power Development Authority (WAPDA), which is a government owned statutory body, and the Karachi Electric Supply Company (KESC), which is a public limited liability company with predominantly government ownership. In addition to WAPDA and KESC, the sector consists of 21 independent power producers (IPPs), two nuclear power generation companies, and various provincial agencies.

8. The nationwide power demand is projected to grow at 7.9% during 2006–2010 and to increase from 15,500 MW in 2005/6 to 21,500 in 2009/10. Sector-wide total power demand projections are provided in Table S1.2. To cope with the electricity demand, Pakistan requires about 2,000 additional MW of newly installed capacity annually. The additional generated power increase must to be evacuated through the transmission system and brought to the consumers through the distribution network. Both of these areas need substantial investments. National Transmission and Dispatch Company (NTDC) has developed a nation-wide transmission development program for the period of 2005-2012, out of which several schemes have been approved by the Government. ADB will be supporting this program.

Table S1.2: Physical Targets: Power Sector

| S. No. | | Benchmark 2004-05 | Targets | | | | | Total ACGR |
|--------------------|---------|----------------------|---------|---------|---------|---------|---------|---------------|
| | | | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | |
| Installed | MW | 20289 | 20753 | 21401 | 22594 | 24899 | 27389 | 27389 |
| hydro | | 6459 | 81 | 98 | 383 | 455 | 240 | 1257 |
| Gas | | 5940 | 283 | 450 | 450 | 1200 | 1600 | 4000 |
| Oil | | 6400 | | | 160 | | | 160 |
| Coal | | 150 | | | | 450 | 450 | 900 |
| Nuclear | | 462 | | | | | | 0 |
| Renewable | | | 100 | 100 | 200 | 200 | 200 | 800 |
| Addition | | 94 | 464 | 648 | 1193 | 2305 | 2490 | 7100 |
| Growth Rate | (%) | 0.5 | 2.3 | 3.1 | 5.6 | 10.2 | 10.0 | 6.2 |
| Maximum Demand | MW | 14621 | 15511 | 16526 | 17904 | 19534 | 21426 | 21426 |
| Growth Rate | (%) | 3.4 | 6.1 | 6.5 | 8.3 | 9.1 | 9.7 | 7.9 |
| Energy Generation | GWh | | | | | | | |
| Annual Energy | | 87992 | 93257 | 99247 | 107484 | 117351 | 128673 | 128673 |
| Generation | | | | | | | | |
| Growth Rate | (%) | 3.2 | 6.0 | 6.4 | 8.3 | 9.2 | 9.6 | 7.9 |
| Energy Sale | | | | | | | | |
| Annual Energy Sale | GWh | 66094 | 71520 | 77905 | 85352 | 93800 | 103516 | 103516 |
| Growth Rate | | 6.1 | 8.2 | 8.9 | 9.6 | 9.9 | 10.4 | 9.4 |
| System Losses | (%) | 26.5 | 25.5 | 24.5 | 23.5 | 22.5 | 21.5 | 21.5 |
| Consumers | Million | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 3.0 |
| Cumulative | | 16.6 | 17.2 | 17.8 | 18.4 | 19.0 | 19.6 | 19.6 |
| Electrification of | Nos | 4000 | 2517 | 2517 | 2517 | 2517 | 2517 | 12585 |
| Village / Abadies | | | | | | | | |
| Cumulative | | 84988 | 87505 | 90022 | 92539 | 95056 | 97573 | 97573 |

Source: Planning Commission, Government of Pakistan.

1. Issues

9. The power sector faces a number of constraints, such as, (i) poor financial and operating performance, (ii) limited and aging generation facilities, (iii) old and outdated dispatch center,

and (iv) transmission and distribution system deficiencies. Some of the key support aspects to be addressed are (i) ensure independent regulation; (ii) unbundling of WAPDA and establishment of 3 gencos, 8 discos, and the NTDC, the national transmission company and the executor of the single buyer model of power sector; (iii) privatization program; and (iv) optimization of fuel to reduce the overall tariff requirement.

10. The strategic focus for the sector in Pakistan has four main thrusts: (i) increased private sector investments in all parts of the chain, (ii) minimize technical, non-technical and financial losses, (iii) improve sustainability through minimizing dependence on subsidies and (iv) improve the operational and service delivery efficiency of existing utilities. Implementation of this strategy requires (i) sector reforms and higher level of private sector participation, (ii) capacity development in all relevant organizations, including planning, policy formulation, project preparation and implementation, financial management, project management, and governance (iii) promotion of projects in generation, distribution, transmission, including RE development.

2. Water and Power Development Authority (WAPDA)

11. WAPDA's reform and restructuring parameters were agreed between the World Bank and the Government in the mid-1990s, but the actual unbundling has been under implementation for quite some more time. WAPDA's power sector operations have, in theory, been unbundled into 12 companies; 3 generation companies, 1 NTDC, and 8 distribution companies. Although this restructuring has been completed in legal terms, the implementation of the unbundling program is not complete. IN fact, it has been slower than anticipated.. Of the new companies set up, one generation and two distribution companies are privatization short list. Privatization advisors have been contracted and, in terms of two of the transactions, the process is now at the bidding stage. A few issues are still outstanding, but the Privatization Commission estimates that these transactions will be closed 2006. The World Bank has been working with the Government, WAPDA, and the new companies to produce the Financial Recovery Plan (FRP) for the WAPDA group of companies. The FRP is a medium-term financial roadmap for the period 2005–2009.

3. Regulation

12. NEPRA has established its regulatory credentials over the last 5 years, and continues to emerge as a pillar of the power sector reform effort through diligent execution of the NEPRA Act. ADB provided institutional capacity support to NEPRA in 2000 and 2001 through a technical assistance project. From a business point of view, NEPRA has moved the tariff-setting approach away from subsidies towards full cost recovery. Some of the details in the tariff determinations have been viewed to lean in favor of the consumers, creating limited or negative cash values for the power sector companies and investors. But the latter may be more a function of still inherent inefficiencies in the sector. NEPRA continues to issue licenses for generation, transmission, and distribution companies. It also manages the tariff determination process for each distribution company.

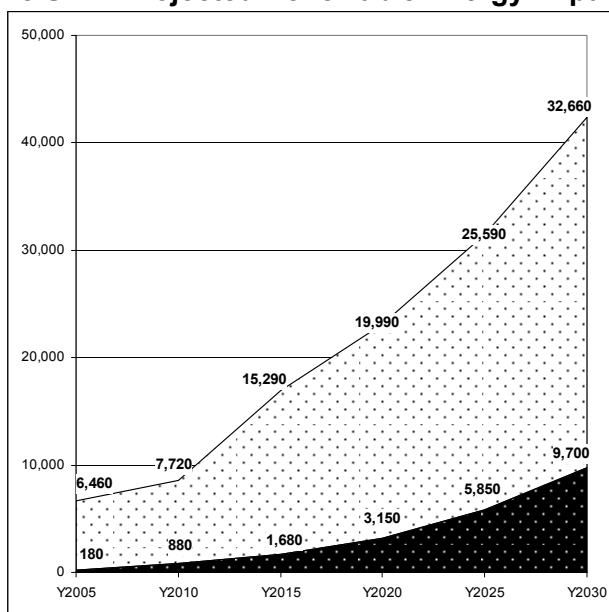
13. Of particular interest is the license issued to NTDC, which mandates NTDC as the single buyer of electricity in Pakistan, as well as being the national dispatcher of electricity or manager and owner of the transmission network. As part of ADB's sector reform and restructuring work, one proposal includes the transformation of NTDC from a department within WAPDA's organization into an independent company responsible for the single buyer market operations and dispatcher of electricity in Pakistan. The untangling of the high financial and technical losses, reduction of the subsidy levels, and meeting consumers' expectations for improved supply at minimum cost increases, appear on paper to be impossible tasks. However, some progress is being made. NEPRA has continued to address the tariff determination with clarify of purpose, bringing cost recovery and sustainability as criteria in power sector activity. Further

improvements in the timeliness of implementation of NEPRA's determinations and a further strengthening of its capabilities through a World Bank-funded facility, should further improve the financial and operational performance of the power sector.

C. Roadmap for Renewable Energy Development

14. RE is one of the pillars of the roadmap for energy / power sector development over the medium to long term. Pakistan has a significant potential for many types of RE resources - wind, solar, small to medium hydropower and biomass. These RE sources can contribute significantly to energy supplies in the country. They also can contribute to both off grid and grid connected power requirements. These activities also often bring a wide array of other benefits, including support to rural development, support for economic activities in remote areas and positive environmental and social impacts. Pakistan has a total identified hydropower potential of more than 45,000 MW, though the total installed capacity of hydropower generation in the country is only 6,595 MW. Hydropower resources are located mainly in the northern and central parts of the country. Wind and solar resources are based mainly in southern provinces of Sindh, and Balochistan, respectively (Figure S1.2).

Figure S1.2: Projected Renewable Energy Expansion



1. Objective

15. RE development meets the following objectives : (i) energy security, (ii) economic benefits to rural communities, (iii) social equity, and (iv) environment protection. **Energy Security:** Greater use of indigenous renewable resources can help diversify Pakistan's energy mix and reduce the country's dependence on a single source, particularly imported fossil fuels, thereby helping to mitigate against supply disruptions and price fluctuation risks. **Economic Benefits:** When properly assessed for their externalities, RE options can become as economically competitive as conventional supplies on a least-cost basis. This is particularly true for the more difficult, remote, and underdeveloped areas, where RE can also have the greatest impact and the avoided costs of conventional energy supplies can be significant. **Social Equity:** Pakistan's present low per-capita consumption of energy can be elevated through greater RE use. Issues relating to social equity—such as equal rights and access for all citizens to modern energy supplies, and poverty alleviation amongst deprived sections of society—can also be addressed through widespread RE deployment. RE can thus facilitate social service delivery and help improve the well-being of the country's poorest. **Environmental Protection:** Local environmental and health impacts of fossil fuel-powered electricity generation can be largely

circumvented through clean, RE alternatives. Similarly, displaced greenhouse gas emissions carry significant global climate change benefits, towards which Pakistan has pledged action under the Kyoto Protocol.

2. Policy Formulation

16. The Government is committed to RE sector development. Drafting of a new policy framework - named the Policy for Development of Renewable Energy in Pakistan (RE Policy) - has been completed and was submitted to the Cabinet for its approval. At the federal level, this RE Policy has been developed by AEDB, the apex body charged with promoting RE. This policy framework will be converted into a comprehensive RE Policy with an action plan. The Government has requested ADB TA support work on the refinement and execution of this RE Policy.

17. RE development plans are also part of a roadmap – RE Development Road Map (REDRM). This highlights major sectoral investments and reform milestones to be achieved over the period of 2005 to 2015. The REDRM presents a clear and comprehensive package of investments and changes in several areas, including regulatory, legislative and financial. It also makes provisions for investment incentives, private sector participation, better and more transparent procedures for bids and contract awards, governance and fiduciary oversight. The REDRM calls for (i) an appropriate policy and regulatory framework, (ii) investments and (iii) capacity building.

18. The capacity development approach includes (i) institutional strengthening of focus agency - AEDB, (ii) strengthening of other relevant agencies, and (iii) due diligence assistance and efficient reporting systems. At the provincial level, NWFP and Punjab have already developed new power generation policies and put in place the right incentives to promote the development of RE including small to medium hydropower in the provinces. Sindh and Balochistan Provinces are in the process of developing their own RE policies to promote wind and solar energy development, respectively. AEDB has received 13 proposals to develop 180 MW wind power in Sindh province and recently the Government has approved 9.4 US cents/kWh tariff for these wind farms.

19. Policy for Power Generation Projects of 2002 stresses development of RE resources by encouraging and ensuring the exploitation of indigenous resources. National Energy Conservation Policy, 2005 led by Ministry of Environment, also emphasizes RE utilization by promoting development of biogas units, solar thermal technologies, cost effective solar and wind energy technologies, and micro and mini-hydro plants.

3. Key Challenges and Opportunities

20. The Government has delegated authority to the provinces to develop their own generating capacity of up to 50 MW and to place greater emphasis on RE. In May 2005, it announced a target of 3.5% for RE in the total energy mix, and 6.0% in 2015 and 2030, respectively. RE development is fully compatible with the Government's twin goals of energy security⁴ and the promotion of indigenous resource utilization. RE development is also one of the key features of the Government's poverty reduction agenda. Investments in RE will improve social well being, and improve the quality of life through both modern energy supply and environment protection.

⁴ Energy security refers to meeting energy demands through sustainable energy supplies at a given time, at affordable prices.

Table S1.3: Time-bound Renewable Energy Development Roadmap

| Objectives | Impact | Performance Target | Measurement | Government Role | Time Frame |
|---|---|--|---|---|---|
| Sector Roadmap | | | | | |
| 1. Policy and Regulatory Framework | | | | | |
| <ul style="list-style-type: none"> Policy: Define and implement immediate, medium and long term RE policy instruments | Contribute to economic growth, energy security, and environmental protection through development of diversified RE options | Clear and comprehensive package of policy, regulatory, legislative and financial measures, provisions, incentives, procedures and facilities for commercial and individual investments in RE projects, systems, and services | Development of: Immediate term (2006-07) national RE policy statement and tariffs targeting key RETs on cost-plus basis Medium term (2008-2010) comprehensive national RE policy and tariffs addressing all | Approval by the federal cabinet of respective policy documents. Establishment of related implementation procedures and institutional mechanisms at the federal and provincial levels | August 2006 November 2007 |
| <ul style="list-style-type: none"> Regulations: Develop appropriate regulatory framework to address barriers, remove competitive biases, and facilitate RE investments | Develop methodology and measures for systematic expansion of efficient, cost-effective national RE capacity through sustained private and public sector participation | Reduced proportion of energy supply dependent on interruptible sources, price fluctuations, and imports Increased community and private sector involvement in dispersed RE solutions, direct marketing and servicing, and household RE system installations Deployment of RE in rural, unelectrified, and poor locations for improved income and social indicators | viable RETs on fixed price and quota basis Long term (> 2010) RE policy strategy and development guidelines on wholesale competition basis RE-specific additional legislation and regulations, e.g., environmental crediting and pollution charges, avoided-cost and dispatch prioritization, net metering, wheeling, banking, renewable portfolio standards, green tariffs, etc. Project reports, AEDB/PPIB registrations, provincial agency (e.g., P&IDs, SHYDO, NAPWD) data, and utility power market statistics on installed RE power generation | Under each respective policy tenure, provision by the federal government and regulators of: Tariff guidelines for RE power generation, including indicative tariff formulation, floors and related purchase terms; grid interconnection rules and relevant grid code amendments for RE IPPs; delicensing of small scale RE generators and net metering/billing regulations; mandated quotas, and power banking regulations for utility purchases of RE power; determination of | November 2009 Preliminary tariff formulation for wind, hydro, and biomass conversion power technologies by mid-2006; detailed tariff regime for all RETs by end-2007 Net metering/billing, wheeling, and third-party power sales regulations by December 2007 Carbon emission reduction and verification mechanisms by end-2007 RPS/RE quota mandates starting in 2010 Transition plan |

| Objectives | Impact | Performance Target | Measurement | Government Role | Time Frame |
|--|--|---|--|--|--|
| <ul style="list-style-type: none"> Legislation: Provide legislative support and operational rules to support RE policy and regulatory environment | Remove discriminatory barriers and provide level field for RE to compete on merit against conventional options | <p>Equal access of all citizens to modern energy supplies, regardless of geographical location and income status</p> <p>Achievement of 100% electrification of villages through RE systems where grid extension not feasible</p> <p>Utilization of RE to supplement and offset conventional energy use compared to present baseline trends</p> <p>RE service delivery at economically competitive terms and tariffs acceptable to users, developers, and utilities</p> <p>Reduced peak loads and smoothing out of power demand profiles through RE capacity for system-wide efficiency gains</p> <p>Increased amounts of distributed power generation to improve reliability and reduced system losses</p> <p>Flexible generation and sales terms to optimize resource utilization and dispatch, and reduced transaction costs of connecting and selling RE power to/via the grid</p> | <p>Manufacturer, retail, and service company information on RE system sales and installation</p> <p>National RE - specific regulations for imports, manufacture, investments, services, and power purchase.</p> <p>National-level energy use statistics published by Energy Wing, Planning and Development Division</p> <p>Pakistan Energy Yearbook, Hydrocarbon Development Institute of Pakistan</p> <p>RE equipment import data from Customs Directorate, Central Board of Revenue</p> <p>Power system statistics and reports of National Electricity Regulatory Authority (NEPRA), National Transmission and Dispatch Company (NTDC), distribution companies (DISCOs), National Power Control Centre on grid extension</p> | <p>'green' pricing, taxes, credits, and pollution charges. Establishment of simplified implementation rules and procedures for small (< 5 MW) RE IPPs, especially hydro and biomass-based, by provincial authorities</p> <p>Legislation at the federal and provincial levels affording industry status to RE, delicensing and net metering/billing of small RE power generation, enabling operation of RE service concessions, and providing preferential treatment to local investments in and manufacture of RE plant and equipment</p> | <p>for green credits and pricing regulations by 2012</p> <p>Small RE (<50 MW) approval and implementation rules and agreements, including simplified permitting by end-2006</p> <p>Industry status for RE by end-2006</p> <p>Grid interconnection rules for RE generators by end-2006</p> <p>Special environmental incentives and credits for RE starting in 2008</p> <p>Revised Electricity Act and institutional/provincial roles facilitating RE development by 2008</p> <p>Net metering/billing law for small (<5 MW) RE power generators by end-2007</p> <p>Provisions for RE service concessions (initial) by 2008</p> |

| Objectives | Impact | Performance Target | Measurement | Government Role | Time Frame |
|--|---|--|--|--|----------------|
| | | | and load profiles, system performance, T&D losses, direct sales, etc. General household-level surveys and census conducted periodically by the Federal Bureau of Statistics (PBS) and other agencies Specific government, donor, and NGO-executed rural, and social sector surveys on household and community-level RE use | | |
| 2. Economic Evaluation and Planning | | | | | |
| <ul style="list-style-type: none"> Analysis: Evaluate comparative economics and external costs and benefits of RE vs other energy supplies by application market | Meaningful targets, investments, and financial support directed towards cost-effective RE deployment and market development | Economically optimized national energy supply mix, with reduced average supply costs to the economy compared to baseline scenario | Report on economic evaluation of national RE options | Federal and government agency involvement and contribution to economic analysis, especially avoided cost assessments, and provision of necessary baseline data | July 2007 |
| <ul style="list-style-type: none"> Cost sharing: Determine incremental and avoided costs of RE deployment, including public investments, tariffs, subsidies, etc. | Adequate budgetary and tariff provisions for additional up-front financial costs of RE capacity development | Determination of tariff premiums, subsidies, and other financial support justified for RE supplies based on costs and benefits Development of incentives, charges, tax and credit structures reflecting comparative costs/benefits of RE versus conventional energy | RET-specific price and premium guidelines and formulation basis determined by NEPRA Specific policy, financial, and fiscal incentives notified by the GoP for RE investors, including qualification, guarantee, risk cover, revision, and arbitration criteria | Same as above | November 2007 |
| <ul style="list-style-type: none"> Planning: Integrate least-cost RE options in | Equitable distribution of RE costs | Bulk and retail power tariffs rationalized to incorporate RE costs, | Mandatory, indicative, and planning targets | Same as above. Provision by federal government of | September 2007 |

| Objectives | Impact | Performance Target | Measurement | Government Role | Time Frame |
|---|--|---|---|--|---|
| national energy planning and set targets | amongst developers, government, and rate payers in line with evolving power market deregulation Mainstreaming of RE in national development planning to realize national and global benefits | with appropriate division based on 'public' and 'private' benefits Integration with conventional supplies to compensate for intrinsic and seasonal RE supply variations | for technology- and market-specific RE deployment for the medium term and beyond | medium- to long-term energy sector planning information and targets for national primary energy supplies and power infrastructure. Incorporation of RE in integrated energy planning at the federal and provincial levels | Mid-2008 |
| <p>3. Project Implementation</p> <ul style="list-style-type: none"> Investment climate: Increased private sector participation in RE capacity deployment and manufacturing | <p>Improve business confidence in undertaking large-scale RE investments, as well as facilities to encourage dispersed, household and community use</p> <p>Enhanced national technical and industrial base for RE system manufacturing and servicing</p> | <p>Increased installed RE power generation capacity in the private and public sectors across all viable RETs, as per defined targets</p> <p>Gradual indigenization and expansion of local RE system and component manufacturing, technical services, and financing options</p> | <p>LOIs, LOSs and PPAs signed with RE developers by AEDB, PPIB, provincial governments, utilities, etc.</p> <p>Extent and capacity of local RE manufacturing facilities, technical consulting base, resource mapping and data coverage, financing and credit terms, RE-specific incentives, etc.</p> | <p>Establishment of functional RE project implementation capacity and dedicated 'one-window' support in the federal and provincial governments</p> <p>Facilitation mechanisms at national and provincial levels for financing, technology assimilation, industrial capacity building, and information access</p> | <p>Beginning in 2006 (1st Phase RE IPP implementation); large-scale private, public, and external financing by 2008 (2nd Phase); competitive RE IPP regime beginning in 2010 (3rd Phase)</p> |
| <ul style="list-style-type: none"> Public RE programs: Investment in RE services | <p>Assessment and availability of necessary resources and modalities required for widespread RE deployment and replication</p> | <p>Design and financing of public, private and donor funded dispersed RE programs, including biogas digesters, PV systems, microhydel stations, solar thermal water heaters, micro wind generators, etc.</p> <p>Public-sector funded RE power and biogas generation projects, including small and mini hydro, wind power, waste-to-energy plants, and landfill methane recovery</p> | <p>Specific itemized allocation for RE support in the National Budget document</p> <p>Number of pilot projects launched for rural and household RE application and program design</p> <p>Installed RE systems by type, capacity, and location</p> <p>Number, type, capacity, and location of public RE projects</p> | <p>Direct federal and provincial government involvement in programmatic interventions in RE deployment, especially dispersed and non-power resources and systems, including design, pilot testing, financing, monitoring, market development, and leveraging of consolidated benefits (e.g., carbon credits, risk sharing, etc.)</p> | <p>Pilot testing beginning in 2006; scaling up and commercial marketing starting in 2007-08</p> |

| Objectives | Impact | Performance Target | Measurement | Government Role | Time Frame |
|---|---|--|--|--|---|
| <ul style="list-style-type: none"> Support infrastructure: Facilitation of RE service implementation and delivery | Availability of physical and institutional support required for RE project implementation and assimilation into national economy | Provision of necessary physical infrastructure for grid connection of qualifying RE projects and other public facilities in line with policy provisions and incentives Processing of RE projects according to stipulated timelines and terms, as well as provision of mechanisms for prompt resolution of investor issues, disputes, etc. | Numbers of grid stations, kilometers of transmission lines and roads, and other physical assets constructed through public funds for RE projects Staffing levels, mandates, and budgetary provisions in key RE institutions and related agencies | Facilitation at federal and provincial levels of infrastructure development, including financing, site access, right-of-way, permitting, and integration with existing systems | RE-related public investments starting in 2007-08 |
| Capacity Development | | | | | |
| 1. Institutional Strengthening <ul style="list-style-type: none"> Focus agencies: AEDB, PPIB and provincial counterparts | Single-window, streamlined processing of commercial RE projects Promotion of dispersed RE systems, marketing, financing, and awareness development, and coordination of external assistance and carbon credits | Implementation of grid-connected and off-grid RE power projects in hydro, wind, waste-to-energy, cogeneration, and other generation technologies Widespread use in the country of dispersed RE systems as both primary and supplemental energy supply to rural and urban households | Annual reports of AEDB and PPIB on national RE deployment and related institutional activities and performance indicators Development of short- and medium-term RE activity plans for AEDB/PPIB, setting schedules, milestones, functional targets based on committed/anticipated local and external technical assistance | Capacity strengthening of AEDB, PPIB in the federal government, and counterpart agencies in the provincial governments | Capacity building TAs in 2006-2008; institutions to be largely self-sustaining thereafter Detailed AEDB/PPIB institutional workplans (2007-2010) by end-2006 |
| <ul style="list-style-type: none"> Other relevant agencies and stakeholders: NEPRA, utilities, private business and financial sector, NGOs, etc. | Facilitation and support of RE projects, sales, manufacturing, and service industries | Clear enunciation of institutional policies, facilities, rules, instruments, activities, etc., relevant to RE developers and end-users | Annual reports, notifications, publications, and offers issued by key organizations, utilities, etc. | Buy-in by all federal and provincial government agencies of RE implementation targets and support requirements | Institutional strengthening programs over 2006-08; as required thereafter |
| 2. Market Facilitation <ul style="list-style-type: none"> RE service concessions: Facilitate consumer access | Lowering of market risks for RE sales and service | Demarcation of concession terms, boundaries, tenure, etc. | Allocation of RE service concessions and geographical coverage | Federal and provincial government support to delineation and | Initiation of RE service concession (where applicable) by |

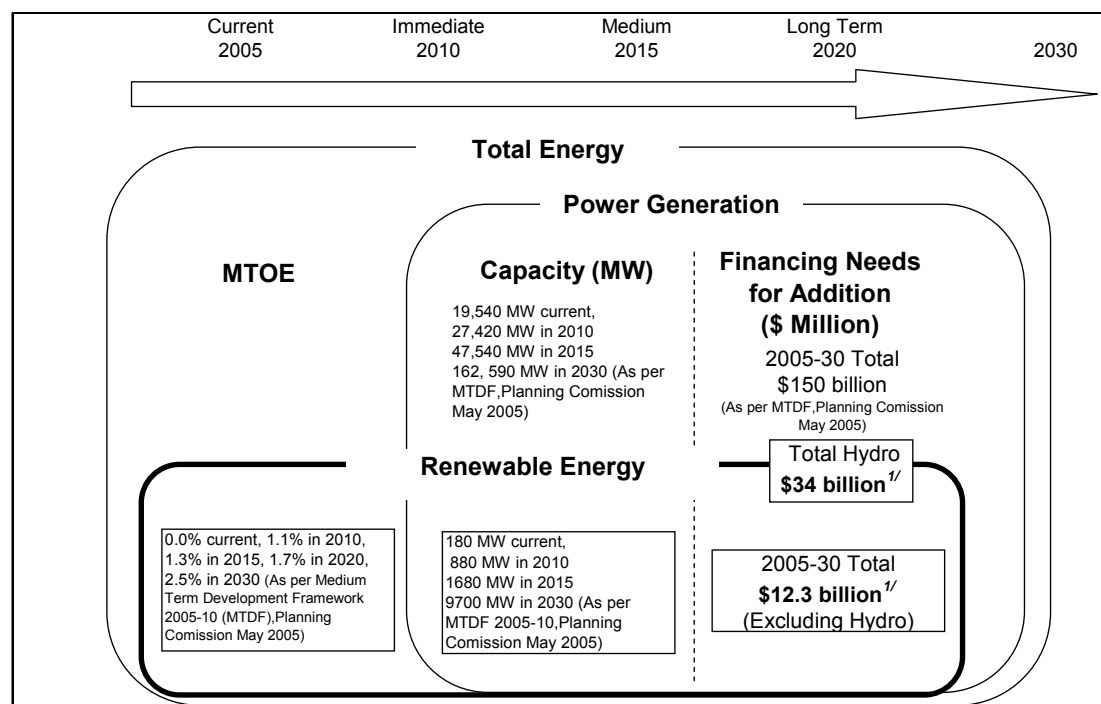
| Objectives | Impact | Performance Target | Measurement | Government Role | Time Frame |
|--|--|--|--|--|--|
| to RE services | companies | | achieved | implementation of RE service concessions | 2008 |
| <ul style="list-style-type: none"> Information dissemination: <p>highlight business opportunities and alternative options</p> | Improved RE resource data | Identification of optimal RE projects, | Extent of data availability, price, | Cooperation and facilitation by | Instantaneous free public |
| <ul style="list-style-type: none"> Awareness and education: Include RE in planning and consumer choices | access, reliability, and coverage | locations, capacities, etc. | standardization, coverage, etc., by resource type | federal and provincial government agencies in data gathering, dissemination, and advisory services | access to all available certified national RE data by January 2008 |
| | Improved awareness of RE investment opportunities in the private and public sector, and better appreciation of benefits by planners and end-users | Acceptability of RE alternatives to conventional energy supplies amongst planning agencies, utilities, financing institutions, and general population | Establishment of RE information clearing houses and awareness raising campaigns | Improvement in scope, quality, and frequency of relevant energy information services, publications, and data dissemination mechanisms at the federal and provincial government levels, including creation of relevant information clearing houses and web portals by concerned agencies in partnership with the private sector | Fully functional RE information clearing houses at federal and provincial levels by January 2008 |
| 3. Technical and Financial Support Mechanisms | | | | | |
| <ul style="list-style-type: none"> Coordination and implementation of donor assistance | Better utilization of existing and planned multilateral and bilateral technical assistance and funding of RE programs in country, including carbon financing opportunities | Increased levels of international assistance for RE projects, capacity building, and technology assimilation Improved project design-to-implementation procedures and timelines | Extent and levels of international funding and disbursement towards RE programs | Establishment by the federal government of formal RE-specific donor consultation formats (e.g., scheduled meetings, progress reports, etc.) involving all relevant stakeholders at the national and provincial levels | Formation of dedicated RE donors' coordination panel by September 2006 |
| <ul style="list-style-type: none"> Develop RE financing opportunities and instruments | Ready access to RE project, marketing, and consumer financing on par with other commercially established | Increased availability of local commercial and public financing for RE projects and programs | Level of commercial and public financing and lending for RE projects and applications Numbers and sizes of projects | Coordination, at national level, of international donor and domestic commercial financing institutions for servicing RE | Establishment of public-private RE financial advisory board by mid-2007 Availability of financial credit to |

| Objectives | Impact | Performance Target | Measurement | Government Role | Time Frame |
|--|---|---|---|---|---|
| | sectors | | qualifying for carbon credits under CDM Country commitments under GEF RAF and other funding ceilings | industry | RE investors on terms at par with conventional generators by January 2008 Fully established/ streamlined GEF programs and CDM RE implementation mechanisms by 2007 |
| 4. R&D, Technology Transfer and Commercialization | | | | | |
| <ul style="list-style-type: none"> Resource assessment | Expanded capacity and coverage of RE resource data collection, mapping, and dissemination | Targeted assessment and geographical focus based on preliminary assessment of resource-wise potential | Spatial and temporal extent of data, density and resolution, quality and standardization, public availability and cost, and sustainability of uninterrupted provision | Financing, institutional and logistical support to RE resource assessment and quality improvement programs and data acquisition activities at both federal and provincial levels | Expanded RE resource assessment and mapping starting in 2006 Designated RE data compilation and dissemination agency functional by January 2008 |
| <ul style="list-style-type: none"> Indigenous fabrication and marketing | Improved and expanded local RE systems fabrication, manufacturing, and servicing | Access of local industry to state-of-the-art RE technology and international experience | Technical collaboration agreements, technology licenses, joint-ventures, etc., between local and international industry partners | Contribution to and participation in RE-related technical training and industrial support programs, including by state-owned enterprises and relevant government entities (e.g., BOI, PIDC, technical universities, etc.) | Phased indigenous RE manufacturing beginning in 2007; commercial- and large-scale systems fabrication by 2009-10 |
| <ul style="list-style-type: none"> R&D and technical training | Enhanced capacity to service and adapt RE systems for local application and conditions | Improved and new system designs, commercialization of emerging RE technologies, and increased numbers of trained manpower in related skills | Numbers and outputs of RE technical training programs, workshops, courses, etc. Indigenously designed and modified systems, improved technical and performance parameters, new patents, etc. | Same as above | Short-term RE training programs beginning in 2006; institutionalized RE education and research by 2008 |

INVESTMENT AND FINANCING PLANS

1. In order to meet additional power generation requirement of 143 GW during 2006-2030, an investment of \$150 billion will be required (\$6 billion a year). On average, this implies that 1 MW installed capacity would cost \$1.1 million. The investment plan is given in Figure S1.3.

Figure S1.3: An Overview of Investment Plan



^{1/} Source: Preliminary Assessment by ADB.

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Table S1.4: Power Sector Investment Plan 2005-2010
(Rs Million)

| Name of Project | | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | Total 2005-10 |
|---|--|-------------------|-------------------|--------------------|--------------------|---------------------|----------------------|
| A. PSDP | | | | | | | |
| Pakistan Atomic Energy Commission (PAEC) | | 4,035 | 8,559 | 10,440 | 21,000 | 25,000 | 69,034 |
| Pakistan Nuclear Regulatory Authority (PNRA) | | 110 | 275 | 100 | - | - | 485 |
| Umbrella PC-II for Infrastructure Development Project | | 400 (350) | 500 (450) | 700 (500) | 400 (200) | - (0) | 2,000 (1,500) |
| Alternative Energy Development Board (AEDB) | | 133 | 1,500 | 2,000 | 6,000 | 10,000 | 19,633 |
| Rural Electrification | | 1,500 | 2,800 | 3,200 | 3,900 | 4,973 | 15,373 |
| Sub-total (A) | | 6,178 (350) | 13,634 (450) | 16,440 (500) | 31,300 (200) | 39,973 (0) | 106,525 (1,500) |
| B. Budgetary Corporations | | | | | | | |
| WAPDA | | | | | | | |
| Hydro | | 13,578 (6,350) | 24,251 (9,985) | 40,661 (19,493) | 88,525 (38,975) | 154,355 (64,166) | 321,369 (138,969) |
| GENCOS | | - | 600 | 2,200 | 1,248 | - | 4,048 |

| | | | | | | |
|---|--------------------|---------------------|---------------------|----------------------|----------------------|------------------------|
| | | (366) | (1,342) | (763) | | (2,471) |
| NTDC | 12,509 (3,000) | 16,632 (1,180) | 10,914 | 5,117 | 3,397 | 48,569 (4,180) |
| DISCOS | | | | | | |
| Secondary Transmission and Grids (6 th STG) | 5,000 (2,500) | 5,000 (2,200) | 7,739 (2,800) | 14,000 (3,370) | 17,000 (3,660) | 49,239 (14,530) |
| Distribution of power (DOP) | 2,000 | 3,000 | 3,600 | 9,500 | 11,000 | 29,100 |
| Distribution Rehabilitation | 2,500 | 2,672 | 2,900 | 4,000 | 4,800 | 16,872 |
| Sub-Total (B) | 35,587 (11,850) | 52,655 (13,731) | 68,014 (23,635) | 122,390 (43,108) | 190,552 (67,826) | 469,198 (160,150) |
| Total Public Sector (A+B) | 41,765 (12,200) | 66,289 (14,181) | 84,454 (24,135) | 153,690 (43,308) | 230,525 (67,826) | 575,723 (161,650) |
| Total Through Federal Budget | 20,928 | 34,245 | 52,275 | 111,368 | 182,805 | 400,621 |
| KESC | - | - | - | - | - | 81,000 |
| Private Sector Projects | 19,394 (10,456) | 56,400 (31,122) | 128,100 (71,747) | 145,793 (80,765) | 95,861 (54,061) | 445,548 (248,151) |
| Grand Total | 61,159 (22,656) | 122,689 (45,303) | 212,554 (95,882) | 299,482 (12,4073) | 326,386 (121,887) | 1,102,271 (409,801) |

Source: Planning Commission, Government of Pakistan.
Figures in parenthesis show foreign components.

A. Investment in Renewable Energy Sector

1. Physical Investment Plan

3. Based on MTFD, physical investments for renewable energy based power generation will be \$13.9 billion by 2030, of which \$2.2 billion are expected by 2015 (Table S1.3). The details of the RE investment plan made by ADB staff in extensive consultation with the Planning Commission, AEDB, and other concerned agencies. The immediate investment in RE sector would be mainly for small to medium hydropower and wind power generation. This is expected to be followed by solar and biomass.

B. Financing Plan

4. Total investments requirements for RE to reach 3.5% of the energy mix by 2015 is estimated at \$3 billion - assuming acceptable small, mini and micro hydropower development will require investment of \$1.1 billion. The investment needs for non-hydro based RE would also be about \$1.1 billion. This makes the total Investment Program about \$2.2 billion. The \$1.1 billion of the Investment Program will cover among others for solar PV systems, wind energy and biomass based power generation.

5. The financing plan for the Investment Program includes budget outlays from the federal and provincial governments, ADB, private sector, and other donors. The Financing Plan for the Investment Program is given in Table S1.4. The Government is actively looking for funding from the private sector and other donors. ADB's indicative commitment amounts to \$500 million. This is finance a portion of the financing plan. About \$10 million will be used to finance capacity development work.

Table S1.5: Financing Plan
(\$ million)

| Source | Total | Share (%) |
|------------------------|--------------|------------|
| Asian Development Bank | 510 | 23.2 |
| Private Sector | 900 | 40.9 |
| Other Donors | 400 | 18.2 |
| Government | 390 | 17.7 |
| Total | 2,200 | 100 |

Source: Asian Development Bank estimates.

5.

Table S1.6: Investment Program for Renewable Energy and Hydropower Development
(\$ million)

| Year | Renewables ^{1/} | | | | Hydro |
|--------------|--------------------------|-----------------------|------------|-------------------------|---------------|
| | Total | Small to Medium Hydro | Solar | Wind / Biomass / Others | |
| 2006-2010 | 1,001 | 525 | 3 | 473 | 1,900 |
| 2011-2015 | 1,232 | 600 | 92 | 540 | 11,400 |
| 2016-2020 | 2,187 | 1,103 | 92 | 992 | 7,100 |
| 2021-2025 | 3,940 | 2,025 | 92 | 1,823 | 8,400 |
| 2026-2030 | 5,578 | 2,888 | 92 | 2,599 | 10,600 |
| Total | 13,937 | 7,140 | 371 | 6,426 | 39,400 |

Source: Preliminary Assessment by ADB staff based on MTDF

6. The investment program also includes ongoing solar based rural electrification program led by AEDB. About 1,600 households have been electrified with off-grid solar power by July 2006. The long-term investment needs for this program is primarily projected at around \$370 million by 2030 (Table S1.5). Physical investment for biomass and solar-based power generation would be explored in line with non physical investment, e.g., capacity building with a greater emphasis on rural electrification. More details of solar-based generation and rural electrification are given in Table S1.6.

Table S1.6: Solar Power Based Rural Electrification Investment
(Indicative)

| Year | Number of Households | Installed Capacity (MW) | Capital Investment Cost (\$million) |
|--------------|----------------------|-------------------------|-------------------------------------|
| 2005-2006 | 1,600 | 0.1 | 0.2 |
| 2006-2008 | 26,800 | 2.1 | 2.6 |
| 2009-2030 | 487,500 | 39.0 | 47.5 |
| Total | 515,900 | 41.3 | 371.4 |

1. Provincial Investment Plan

7. The governments of NWFP and Punjab province have also developed long term investment plans for hydropower. Other renewable energy projects will be also considered but these are at early stages of development. In NWFP, a total 34 projects (7,176 MW) are identified, of which 17 projects (3,496 MW) will be implemented by public sector. The other 17 projects (3,680 MW) are to be implemented by the private sector. The total estimated cost of these projects is \$9,329 million. The government of Punjab has identified 306 potential sites

suitable for small to medium hydro power stations on canal systems. The total power potential is 347 MW. Among these, 48 sites, have a total capacity of 150 MW or more than 2 MW.

2. Non-physical Investment Plan

8. The RE program is accompanied by a number of interventions to support the efficient development of the sector. The interventions cover policy reform and capacity building.

a. Policy Framework for Development of Renewable Energy

9. Policy Framework for Development of Renewable Energy has been defined. It provides the Government's initial statement on renewable energy development. It offers immediate incentives and facilities for the first commercial-scale RE investment projects. The framework will be viewed over time.

10. **Land and Site Access:** The federal and provincial governments will help investors acquire land or rights-of-way (ROW) for project development. It will also provide site access. Such assistance shall be provided on a case-to-case basis, and may extend to the provision of land on nominal lease terms, acquisition of ROW, and/or construction of road linkages. However, the primary responsibility for acquiring land and site access shall rest with the project sponsors.

11. **Financial Regime:** The following financial incentives are available in *Policy for Power Generation Projects, 2002*. They are applicable to private, public, and public-private RE power projects:

- (i) Permission for power generation companies to issue corporate registered bonds.
- (ii) Permission to issue shares at discounted prices.
- (iii) Permission for foreign banks to underwrite the issue of shares and bonds by the private RE power companies.
- (iv) Non-residents are allowed to purchase securities issued by Pakistani companies without the State Bank of Pakistan's permission subject to prescribed rules and regulations.
- (v) Abolition of 5% limit on investment of equity in associated undertakings.
- (vi) Independent rating agencies will be available in Pakistan to facilitate investors in making informed decisions about the risk and profitability of the project company's bonds/TFCs.
- (vii) Locally manufactured equipment, components, and machinery required for RE projects shall be eligible for financing under the State Bank of Pakistan's Scheme for Financing Locally Manufactured Machinery (LMM).

12. The Government may set up special financing arrangements specifically aimed at facilitating investments, technology transfer, and local manufacturing capacity in targeted renewable energy technologies and projects. These could include, for instance, a revolving line of credit under the Public Sector Development Programme (PSDP), or a Renewable Energy Development (RED) Fund with multilateral cofinancing. In addition, opportunities for availing concessional or grant financing under available international carbon finance opportunities, such as the Clean Development Mechanism (CDM), will also be encouraged.

13. **Fiscal Regime:** The following fiscal incentives, including those available under the *Policy for Power Generation Projects, 2002*, are applicable to private, public, and public-private RE power projects:

- (i) No customs duty or sales tax on the import of RE plant and equipment.⁵
- (ii) No levy of sales tax on such plant, machinery and equipment, as the same will be used for production of taxable electricity.
- (iii) Exemption is already available from income tax, including turnover rate tax and withholding tax on imports.
- (iv) Repatriation of equity, along with dividends, is freely allowed, subject to the prescribed rules and regulations.
- (v) Parties may raise local and foreign finance in accordance with regulations applicable to industry in general. GoP approval may be required in accordance with such regulations.
- (vi) No corporate income tax on income earned from the sale of electricity by private RE power generation companies.

14. Import of construction equipment by private power companies for hydropower and wind plants, e.g., earth moving machinery, cranes, etc., will be exempt from levies except a customs duty of 2%. However, first rights on equipment to be sold after the project shall reside with the provincial government concerned.

15. **Indigenization:** In order to maximize indigenous content and participation in RE project development, the government will undertake the following steps:

- (i) Provide customs duty and sales tax exemption on raw materials, equipment, and machinery used for the manufacture or servicing of RE plant and ancillary facilities
- (ii) Exemption from income and withholding tax on such imports
- (iii) Repatriation of equity, along with dividends, for investors in RE manufacturing facilities subject to prescribed rules and regulations
- (iv) Preference for RE projects demonstrating maximum local content, employment, and/or sourcing
- (v) Facilitation of foreign collaboration in manufacturing and engineering industries through joint ventures and technology licensing agreements and
- (vi) Promotion of local training on manufacturing, installation and maintenance of RE plants; the training should include methodologies for project design, data acquisition and analysis, and other related activities.

C. Off Grid Captive and Dispersed Renewable Power Generation

16. Policy and tariff guidelines for off-grid small hydro and biomass-based power projects of less than 50 MW have been developed. These will be further developed and augmented with detailed procedural arrangements, and will be reviewed and refined further for the medium term, based on initial implementation results. A systematic approach will also be devised for the medium term for implementation frameworks suitable for off-grid captive (i.e., self generation) and dispersed (i.e., household and community-level) RE-based power schemes nationally. In the meanwhile, the focus will be on trial, demonstration, and pilot projects that can help test, refine, and provide operational and market experience in evolving wider-scale deployment and replication strategies.

⁵As per S.R.O. (1)/2005 issued by the Ministry of Finance on June 6, 2005, specifying zero customs duty and sales tax on: Machinery, equipment and spares (including construction machinery, equipment and specialized vehicles imported on temporary basis) meant for initial installation, balancing, modernization, replacement or expansion of projects for power generation through nuclear and renewable energy sources like solar, wind, micro-hydro, bio-energy, ocean, waste-to-energy and hydrogen cell, etc.

17. **Dispersed Community and Household Electrification:** During the immediate term (2006-07), the emphasis shall be on the design, demonstration, and pilot testing of dispersed off-grid,⁶ community, embedded, and standalone RE systems, including their financing and marketing modalities and integration with other social and physical infrastructure development (e.g., poverty alleviation, rural electrification). Extensive, wide-spread funding and deployment will be targeted, based on such initial studies and prototype evaluation, for the medium term (2008-2010), with specific RET- and market-wise targets and funding arrangements to be in place starting at the onset of that period.

18. **Captive generation and Other Supplies:** Currently, captive RE power generation and cogeneration plants that do not connect or despatch power to the grid are exempt from the regulatory requirements detailed in **Section 3** above, unless surplus power is to be sold to the utility (NTDC or DISCOs). Further guidelines, incentives, and facilities specifically designed for off-grid captive RE generators may also be developed in due course. The following basic approach will be followed in devising suitable implementation frameworks for non-power renewable energy systems:

19. **Biogas:** Intervention strategies, guidelines and facilities for the supply and use of anaerobic biogas digesters in rural communities for producing cooking gas and organic fertilizer will be designed and tested through public and international financing and technical assistance, and in partnership with communities and local stakeholders, during the 2006-2007 period, and replicated nationwide starting in 2008. Policy and other facilitative measures will be developed based on these trials to help nurture and sustain widespread use of such systems in rural areas.

20. **Solar Water Heating:** Intervention strategies, guidelines and facilities for the manufacture, supply, marketing, use and servicing of solar thermal water and space heating systems for residential and commercial building applications, as well as rural communities in cold climate zones, will be designed and tested through public and international financing and technical assistance, and in partnership with local private industry and stakeholders, during the 2006-2007 period and marketed nationwide starting in 2008.

21. **Improved Cook Stoves:** Intervention strategies, guidelines and facilities for the supply and use of improved biomass cook stoves and solar cookers in rural communities will be designed and tested through public and international financing and technical assistance, and in partnership with communities and local stakeholders, during the 2006-2007 period, and replicated nationwide in rural and urban households that cannot access or afford piped or bottled (LPG) gas starting in 2008.

22. **Mechanical and Solar Pumping:** Intervention strategies, guidelines and facilities for the manufacture, supply, marketing, use and servicing of mechanical wind and solar PV water pumps, including hybrid systems using diesel or grid backup, in rural and agricultural communities will be designed and tested through public and international financing and technical assistance, and in partnership with communities and local stakeholders, such as rural and agricultural extension services, during the 2006-07 period and replicated nationwide starting in 2008.

23. **Biofuels:** The production and potential market for biofuels, such as ethanol and biodiesel, will be investigated during 2006-07 for further development during the subsequent period (medium to long term).

⁶ 'Off-grid' includes mini-grid (of up to 11 kV) applications.

Major Policy Actions in the RE Sector

Immediate Term:

January 2006 – December 2007

- Documentation, stakeholder approval, and adoption of national RE development strategy.
- Identification of general and specific RE barrier removal actions, investment requirements, public budget requirements and incremental costs.
- Resolution of procedural, legal and regulatory barriers in existing frameworks as related to project execution.
- Identify complementarities and minimize potential conflicts in related policies.
- Economic assessment and target setting.
- Facilitation of first phase on-grid RE power projects.
- Demarcation of rural, off-grid, and stand-alone RE deployment.
- Technical, organizational, and administrative capacity building.
- Financial market identification, facilitation, and financing mechanism.

Medium Term:

January 2008 – December 2010

- Evaluation, selection, and quantification of specific policy and regulatory instruments feasible for each technology for on- and off-grid application.
- Approval and implementation of detailed medium-term RE policy, incentives, and regulatory frameworks.
- Development of operational rules and procedures relating to grid connection of RE IPPs.
- Implementation of second phase RE IPPs through competitive bidding.
- Implementation of RE power generation projects for captive use and/or direct third party sales.
- Design of 3rd phase RE IPP deployment based on mandatory utility RE power purchase quotas or renewable portfolio standards for each geographic area.
- Financing and implementation of large-scale RE rural energy programs.
- Facilitation of supplemental stand-alone solar home systems.
- Facilitation of carbon financing and credit negotiations through IFI and bilateral CDM mechanisms.
- Institutionalized collection and dissemination of certified RE resource data.
- RE-directed awareness raising, education and training, and technology transfer programs.

Long Term:

January 2011 and onwards

- Assessment of long-run marginal cost and market based RE energy pricing options.
- Transit from subsidized to competitive RE power market and eventually green trading.
- Policy and target reassessment and evaluation of emerging and newly maturing RE technologies.
- Adjustment of feed-in tariffs and induction of the 3rd phase RE IPP deployment under minimum RE purchase requirements, gradually moving towards a fully competitive wholesale power market.
- Extension and optimization of rural RE coverage and biofuel use.
- Realization of scale-driven economies and indigenization in local RE technologies manufacturing and supply.

D. Subprojects

24. **Small to Medium Hydropower Plants:** The RE investment program covers several subsectors, e.g., among others, small to medium hydro, wind, solar, and biomass-based power generation. The Table S1.7 and Table S1.8 show a general overview of potential hydropower projects in NWFP and Punjab province. The Punjab list is limited only to the sites with power generation potential greater than 2MW. Total estimated number of sites in Punjab is about 306. The list for NWFP is larger and diverse. These subprojects will be developed in line with federal and provincial RE policies.

Table S1.7: Long-term Investment Plan for Hydropower Development in NWFP

| Target Completion Year | Name of Project | Capacity (MW) | Planned Implementing Agency | Indicative Estimated Cost (\$ million) | Potential Financier |
|------------------------|-----------------|----------------|-----------------------------|--|-------------------------------------|
| 2006 | Malakand | 81.0 | SHYDO | 105.3 | |
| 2006 | Reshun | 2.8 | SHYDO | 3.6 | |
| 2007 | Pehur | 18.0 | SHYDO | 23.4 | |
| 2007 | Shishi | 1.8 | SHYDO | 2.3 | |
| 2009 | Allai Khwar | 121.0 | WAPDA | 157.0 | |
| 2009 | Khan Khwar | 72.0 | WAPDA | 93.6 | |
| 2009 | Duber Khwar | 130.0 | WAPDA | 169.0 | |
| 2010 | Daral Khwar | 35.0 | SHYDO | 45.5 ^a | ADB (under 1 st tranche) |
| 2010 | Ranolia | 12.0 | SHYDO | 15.6 ^a | ADB (under 1 st tranche) |
| 2010 | Machai Canal | 2.6 | SHYDO | 3.4 ^a | ADB (under 1 st tranche) |
| 2012 | Koto | 18.0 | SHYDO | 23.4 ^b | ADB for the 2 nd tranche |
| 2012 | Jabori | 8.0 | SHYDO | 10.4 ^b | ADB for the 2 nd tranche |
| 2012 | Karora | 8.0 | SHYDO | 10.4 ^b | ADB for the 2 nd tranche |
| n.a. | Chor Nallah | 1,500.0 | WAPDA | 1,950.0 | |
| n.a. | Spat Gah | 1,250.0 | WAPDA | 1,625.0 | |
| n.a. | Kayal Khwar | 130.0 | WAPDA | 169.0 | |
| n.a. | Golen Gol | 106.0 | WAPDA | 137.8 | |
| n.a. | Matiltan | 84.0 | Private Sector | 109.2 | |
| n.a. | Munda Dam | 740.0 | Private Sector | 962.0 | |
| n.a. | Kaigah | 548.0 | Private Sector | 712.4 | |
| n.a. | Karang | 454.0 | Private Sector | 590.2 | |
| n.a. | Kalam | 101.0 | Private Sector | 131.3 | |
| n.a. | Kedam | 410.0 | Private Sector | 533.0 | |
| n.a. | Maidian | 148.0 | Private Sector | 192.4 | |
| n.a. | Sharmai | 115.0 | Private Sector | 149.5 | |
| n.a. | Naran | 219.0 | Private Sector | 284.7 | |
| n.a. | Suki Kininari | 655.0 | Private Sector | 851.5 | |
| n.a. | Patrind | 130.0 | Private Sector | 169.0 | |
| n.a. | Batal | 8.0 | Private Sector | 10.4 | |
| n.a. | Summar Gah | 28.0 | Private Sector | 36.4 | |
| n.a. | Bhimbal | 8.0 | Private Sector | 10.4 | |
| n.a. | Mahandri | 13.5 | Private Sector | 17.6 | |
| n.a. | Tanger | 12.5 | Private Sector | 16.3 | |
| n.a. | Machai | 6.0 | Private Sector | 7.8 | |
| | | 7,176.2 | | 9,329.1 | |

MW = megawatts, SHYDO = Sarhad Hydel Development Organization, WAPDA = Water and Province Development Authority.

^a First of subprojects. ^b May be considered for 2nd Periodic Financing Request (PFR).

Source: Medium Term Development Framework.

Table S1.8: Investment Plan for Hydropower Development in Punjab Grater than 2MW

| Project Name | Location | Distance RD (Feet) | Capacity (MW) | Potential Financier |
|------------------|-------------------------------------|-----------------------|------------------|------------------------|
| Indus/Chasma | Chasma Jhelum Link Canal | 0+000 | 13.85 | |
| Indus/Taunsa | T.P Link Canal | 60+000 | 4.235 | |
| Indus/Taunsa | T.P Link Canal | 131+500 | 4.042 | |
| Indus/Taunsa | T.P Link Canal | 182+000 | 6.157 | |
| Indus/Taunsa | T.P Link Canal | 184+500 | 3.789 | |
| Chenab/Khanki | Lower Chenab Canal | 0+000 | 4.9538 | |
| Chenab/Marala | B.R.B.D. Link Canal | 509+712 | 3.1414 | |
| Chenab/Marala | Chenab / Upper Chenab Canal | 0+000 | 4.789 | |
| Chenab/Marala | Chenab / Upper Chenab Canal | 0+000 | 10.52 | |
| Chenab/Marala | Chenab / Upper Chenab Canal (Lower) | 128+000 | 4.679 | |
| Chenab/Marala | Chenab / Upper Chenab Canal (Lower) | 164+400 | 3.455 | |
| Chenab/Marala | Chenab / Upper Chenab Canal (Lower) | 221+000 | 5.975 | |
| Chenab/Marala | Chenab / Upper Chenab Canal (Lower) | 225+508 | 2.761 | |
| Chenab/Marala | Chenab / Upper Chenab Canal (Lower) | 283+100 | 4.671 | |
| Chenab/Panjnad | Abbasian Canal | 0+000 | 4.671 | |
| Chenab/Panjnad | Panjnad Canal | 0+000 | 6.309 | |
| Chenab/Qadirab | Lower Chenab Canal Feeder | 0+000 | 2.143 | |
| Chenab/Qadirab | Qadirabad Balloki Link Canal | 0+000 | 2.1432 | |
| Chenab/Qadirab | Qadirabad Balloki Link Canal | 81+274 | 2.116 | |
| Chenab/Qadirab | Qadirabad Balloki Link Canal | 271+665 | 3.602 | |
| Chenab/Qadirab | Qadirabad Balloki Link Canal | 304+985 | 4.107 | |
| Chenab/Trimmu | Trimmu-Sidhuni Link Canal | 0+019 | 2.222 | |
| Jhelum Mangla | Upper Jhelum Canal | 27+500 | 2.125 | |
| Jhelum/Rasul | Rasul Qadirabad Link | 0+000 | 2.602 | |
| Jhelum/Rasul | Rasul Qadirabad Link | 145+255 | 2.117 | |
| Ravi/Balloki | Ravi/Balloki | 0+000 | 3.178 | |
| Ravi/Balloki | Lower Bari Doab Canal | 227+454 | 2.781 | |
| Ravi/Balloki | Lower Bari Doab Canal | 258+654 | 3.149 | |
| Ravi/Balloki | Lower Bari Doab Canal | 285+454 | 2.634 | |
| Ravi/Balloki | Lower Bari Doab Canal | 329+058 | 3.514 | |
| Ravi/Balloki | Lower Bari Doab Canal | 461+550 | 2.082 | |
| Ravi/Sidhuni | S.M.B Link | 0+014 | 4.479 | |
| Sutlej/Sulemanki | Pak Pattan Canal | 112+350 | 4.347 | |
| Chenab/Marala | Marala Ravi Link Canal | 220+122 | 2.046 | |
| Chenab/Marala | Marala Ravi Link Canal | 237+230 | 6.854 | |
| Chenab/Marala | Marala Ravi Link Canal | 249+850 | 10.519 | |
| Chenab/Marala | Marala Ravi Link Canal | 265+998 | 13.661 | |
| Chenab/Marala | Marala Ravi Link Canal | 302+496 | 7.105 | |
| Chenab/Marala | Marala Ravi Link Canal | 313+500 | 14.396 | |
| Chenab/Trimmu | Haveli Canal | 0+000 | 2.448 | |
| Indus/Taunsa | D.G. Khan Canal | 3+500 | 2.268 | |
| Indus/Taunsa | D.G. Khan Canal | 8+000 | 2.272 | |
| Indus/Taunsa | D.G. Khan Canal | 14+000 | 2.062 | |
| Ravi/Balloki | B.S. Link II | 33+430 | 8.21 | |
| Sutlej/Islam | Mailsi Canal | 0+000 | 3.143 | |

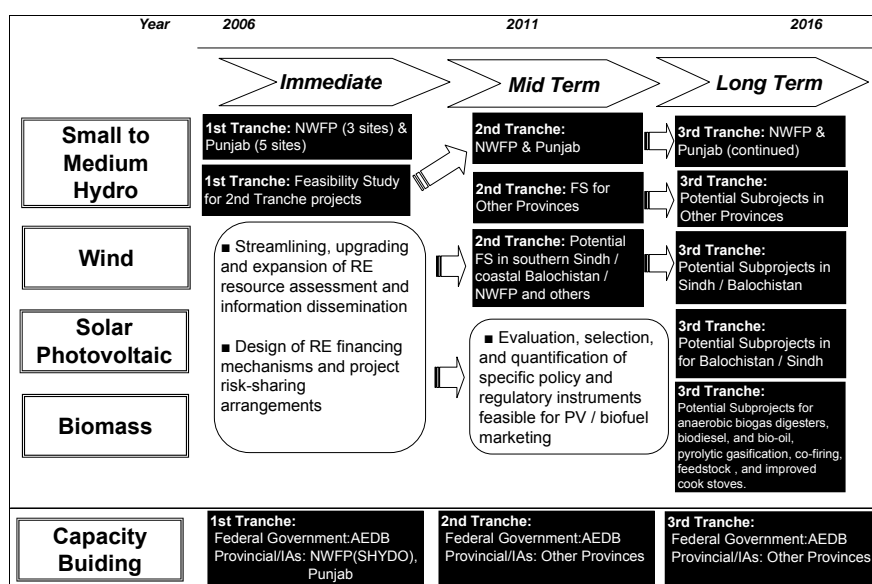
25. Hydropower subprojects financed under the first tranche of the Facility were subjected to due diligence assessments by consultants and ADB processing teams. An analysis of the other potential subprojects including wind, solar, will be carried out later and will figure in second and third tranches under the Facility as given below.

26. **Wind Energy Subprojects.** Commercially viable wind energy resources exist in many parts of Pakistan, especially in southern Sindh and coastal Balochistan. Detailed wind mapping may also reveal suitable sites in the interior parts of the country and in mountainous regions. While no large wind power scheme has been constructed thus far, small scale pilot systems (1-5 kW) have reportedly been established in some rural villages in Balochistan and Sindh. In addition, negotiations with private investors are going on for the establishment of wind farms (minimum of 700 MW by 2010) in south-east of Karachi in Sindh province.

27. Government plans to enhance its market facilitation functions through streamlining, upgrading and expansion of RE resource assessments and information dissemination, including standardization, certification, and pricing, to improve availability, efficacy, and bankability of data on potential wind towers. These initiatives are expected to enhance the economic viability of wind power projects. Other provinces and various private sector investors have already expressed interest in wind power subprojects. Once the viability is verified and their feasibility is concluded, wind power subprojects will be included for financing under the Facility.

28. **Solar Energy Subprojects.** Grid-connected solar photovoltaic (PV) is the fastest growing RE technology in the world today, averaging 60% annual growth in the five years to the end of 2004, followed by wind power (28%), bio-diesel (25%), solar hot water/heating (17%), off-grid solar PV (17%), geothermal heat capacity (13%), and ethanol (11%) during the same period. In Pakistan, the potential for solar energy is considerable. Most regions of Pakistan receive abundant solar irradiation on the order of over 2 MWh/m² and 3,000 hours of sunshine a year, which is at the highest end of global averages. Solar PV development will be one of the pillars of federal RE development program. However, a systematic assessment of economically viable resources has yet to be undertaken for specific technology applications. Along with the new RE policy, the Government is conducting pilot performance assessment of PV and cost evaluation of prototype rural RE development programs and systems at off-grid regions. With the result of these assessments and cost evaluations, the possibility of PV subprojects will be explored in the second and third set of loans under the proposed Facility. A graphical presentation of time-bound investment plan is given in Figure S1.4.

Figure S1.4: Time-bound Investment Plan for Renewable Energy Development



Note: Subproject Description in 2nd and 3rd tranches is indicative and subject to change.

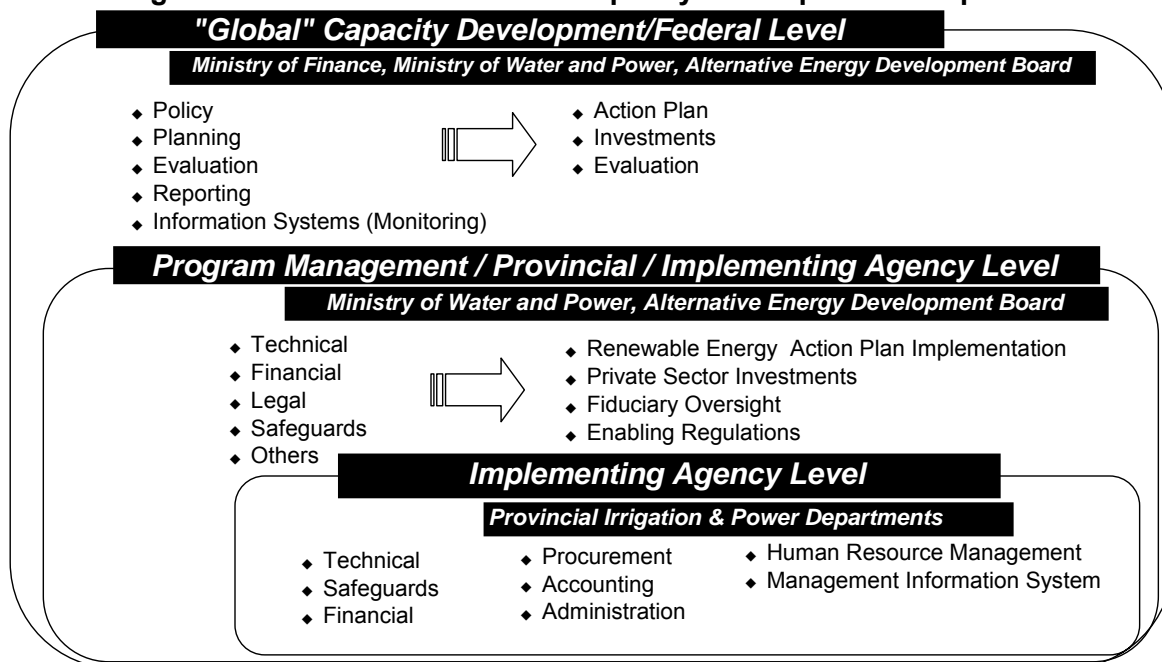
29. **Biomass-based Energy Subprojects.** Pakistan's large agricultural sector produces copious amounts of biomass in the form of crop and livestock wastes and residues—such as bagasse, rice husk, and dung—much of which is currently collected and used outside the commercial economy as unprocessed fuel for cooking and household heating. This results in significant adverse health impacts due to indoor air pollution and loss of productive labor employed in gathering fuel, especially for rural women. More efficient, modern biomass applications include anaerobic biogas digesters, biofuel production (ethanol, bio-diesel, and bio-oil), pyrolytic gasification, co-firing, feedstock (including municipal solid waste-to-energy), and improved cook stoves. Along with the progress of the RE policy implementation, concerted efforts will be made to identify and prepare biomass energy subprojects under the Facility.

CAPACITY DEVELOPMENT

A. Introduction

1. Capacity development will be a key component in the investment program. It will cover assistance to federal, provincial and program implementing agencies (IAs). It will be related to (i) planning and formulation of policy, including regulatory and legal framework, and incentives to facilitate private sector investment, (ii) development of adequate management and financial systems, targeting efficient project evaluation, monitoring and reporting (iii) expert support and training of staff in relation to best practice project preparation work – in essence covering due diligence on technical, commercial, legal, financial, operational, management, safeguards, governance, financial management, anti-corruption, procurement, fiduciary oversight and project implementation matters and (iv) establishment of systems and procedures, backed by training and computer software and hardware to set up modern management and financial information systems. The capacity component combines “big picture” strategic, policy, planning and monitoring at the top level with project preparation, evaluation, monitoring and reporting at the investment and IA level. A general overview of the capacity development component is given in Figure 4.1. More details are given in Supplementary Appendix E.

Figure 4.1: General Overview of Capacity Development Component



2. **Federal Level:** At the federal level the Alternative Energy Development Board (AEDB) is the main player involved in the investment program. It represents the Ministry of Water and Power. AEDB will become the single agency dealing with renewable energy (RE) projects. To assist AEDB implement its mandate, the capacity development component caters for assistance in the following areas:

Development of RE policy: A draft RE Policy Framework has already been prepared by AEDB. This needs to be institutionalized. With assistance from ADB, the agency will work on the development of a comprehensive and final RE policy backed by an action plan, supported by an appropriate tariff determination system and regulatory powers. This activity becomes “work in progress”. The policy agenda will be reviewed on a regular basis, molded to specific and changing circumstances. It will be structured to cover each of the sub-sectors (wind, solar, biomass and hydel) and phased according to provincial level priorities and readiness. Kick starting the process with a draft policy is

less dangerous than starting the process with a rigid “cast in stone” framework. RE is new to Pakistan and a learning process is required before formalizing all the policy arrangements. This is in effect the equivalent of a pilot scheme backed by extensive due diligence. Mainstreaming the policy will require some time. The capacity component will assist this thinking process. The assistance will also focus on planning and on monitoring and evaluation. AEDB needs to put in place better systems to deliver on both of these fronts.

Licensing of RE projects: AEDB will develop a single window procedure for obtaining licenses for RE projects. A streamlined procedure will be prepared accordingly

Incentive package: to encourage private sector investment in RE, AEDB will facilitate the preparation by NEPRA (regulator) of an incentive package including a revised tariff regime with NTDC on preferential dispatch

Monitoring and supervision: A monitoring and supervision/reporting system will be developed to quickly capture the trends and quality of new RE investments and reforms. Institutional set-up in the Renewable Energy Sector is given in Figure A4.2

3. **Provincial:** The capability of the Irrigation and Power Departments (IPDs) at the provincial government level needs improvements. The capacity development component will focus on these and provide assistance in the following areas:

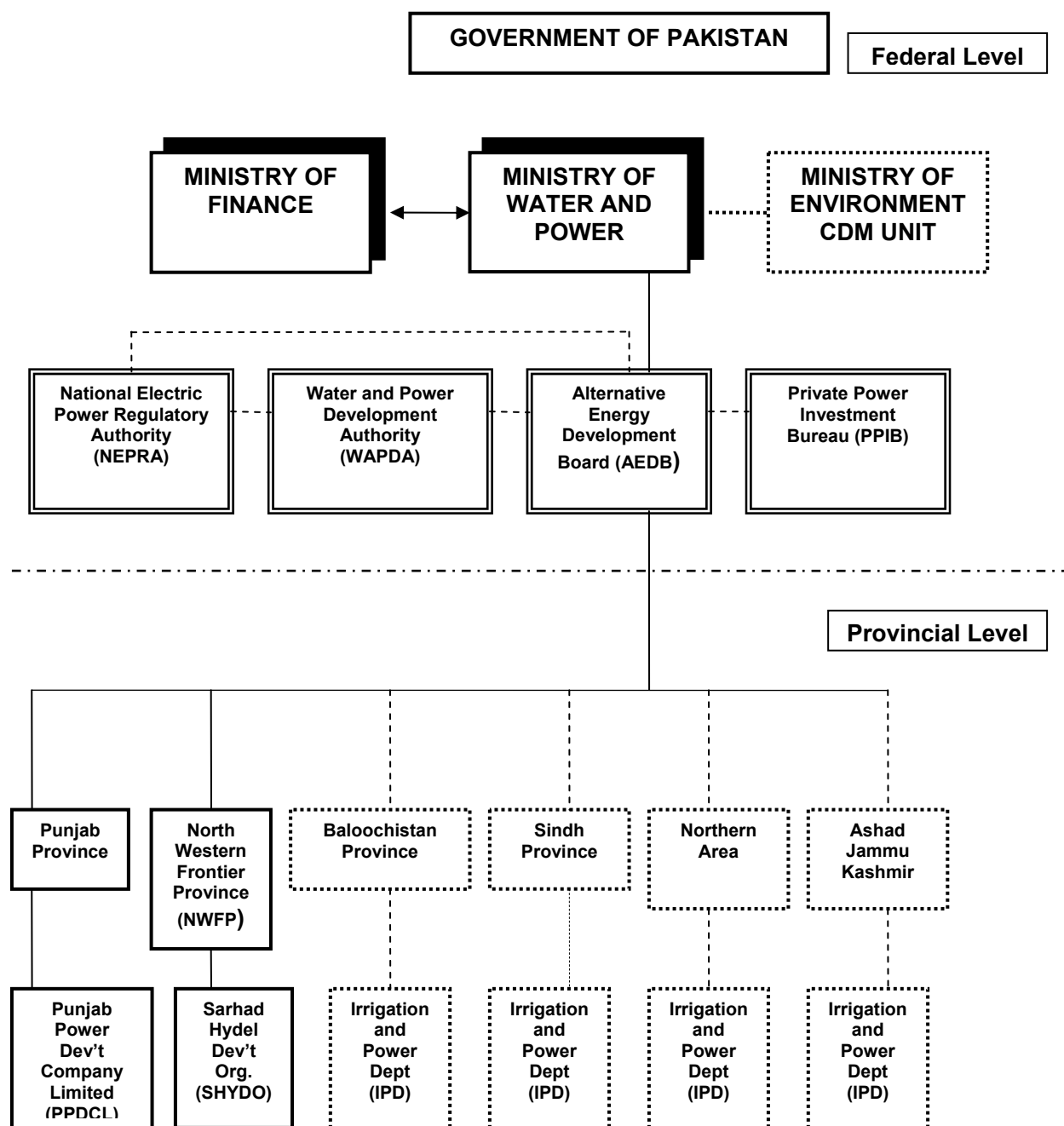
Project management. The executing agencies (EAs) responsible for the investment program at the provincial level (IPDs) need to oversee in a professional and efficient manner the various investment operations planned over the next few years. This requires sound management skills and systems. Under the capacity development component, assistance will be provided to establish such systems. It will also set up teams, and trained them, on best practice. Evaluation, monitoring and reporting will be part of the work.

Due diligence. The EAs need to coordinate the preparation of a deal flow. To do this, their counterparts at the project level (IAs) need to commission due diligence teams with expertise and experience in key areas – relevant to the EAs but also to the operating policies and procedures of ADB. Managing this process requires people and systems. The program will finance the services of external independent advisors (see below for IAs) but also a management team to coordinate their work. The component will finance the training of local staff to ultimately take full control over the process.

4. **Implementing Agency Level:** The implementing agencies (IAs) need to improve capacity as a whole. The capacity development component will focus the following areas

Investment program management. Assistance will be provided to establish teams, systems and practices to manage the due diligence process associated with all the investments and to of all investments.

Figure A4.2: Institutional Set-up in the Renewable Energy Sector



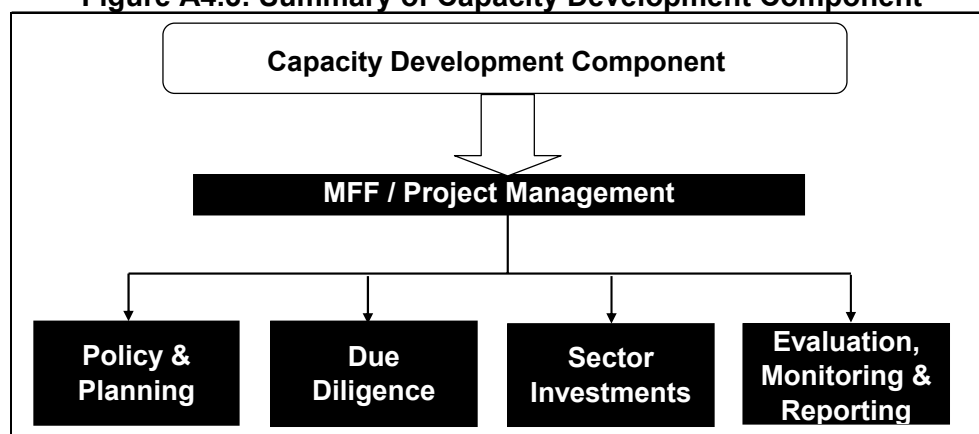
Assistance will also be provided to ensure the IAs undertake appropriate evaluation, monitoring and reporting work. A program management team will be put in place to do this work. It will define work plans and supervise their implementation. It will also oversee the implementation of the investments. This team will be an entry point to ADB program supervision teams. The latter will also work with AEDB and provincial level EAs.

Due diligence for deal flow processing. The investment program will finance the services of external independent advisors to undertake work on technical, financial, economic, governance, fiduciary, financial management, procurement, anti-corruption, disbursement and safeguards areas. These teams will be called upon on demand. They will be financed under the first tranche. Subsequent tranches could expand on this should it be required. One area that will require special assistance is related to **environmental and social safeguards**. Assistance will be provided through the fielding

of consultants and ADB missions to ensure that the right procedures are followed at all times. Similar work will be related to **governance**. Governance will need to be institutionalized and public disclosure systems will be developed and put in place. The capacity component will also focus on **fiduciary oversight**. Strong internal audits will be set up to ensure full transparency in this area.

Program implementation The IAs will require assistance with the establishment of sound project evaluation, monitoring and reporting systems. A model will be developed and implemented with finance made available under the first tranche. The objective is to effectively monitor and supervise the program implementation and its results. Reporting will take place at various levels within Government. It will also be required between the implementing agencies and ADB.

Figure A4.3: Summary of Capacity Development Component



B. More Specific Inputs for Capacity Development

5. The capacity development program will require a mix of advisory services, short and long-term in nature. Some will focus on policy formulation, others on project preparation and a number on systems and training. AEDB will coordinate the capacity development program. It will be assisted by a team of international and domestic experts, financed under an advisory technical assistance package. The exact scope and details of the capacity development for IPDs will be decided by this team and updated within each Periodic Financing Request (PFR). Each new package of assistance will be discussed and agreed with ADB and the participating provinces. A summary of the capacity development effort is presented below in Table A.4.1. Some specific activities are highlighted below.

6. **Information Services:** There is a need to improved knowledge gathering and dissemination on RE. This will be part of the capacity component. Experts will be fielded for this purpose. One outcome is to establish benchmarks and information on best practices in each of the sub-sectors. A data room will be set up. This will gather and process information on RE development world-wide, RE financing instruments, carbon trading, most suitable procurement modalities, investor profiles, equipment manufacturers, financial institutions with interest and experience in the sector, consultant rostra, tariff regimes, data collection approaches for subsectors and so forth. This information will be provided to AEDB, the EAs and the IAs. It will also be shared with the due diligence teams and the project management experts.

7. **System management:** Implementation of investment program requires an information management system. This will be set up at each level (federal, provincial and project) and will be integrated. It will feed into ADB for reporting purposes. Expert advisors will be fielded and the appropriate hardware and software purchased under the capacity development component. The

system will need maintenance and upkeep. The authorities will allocate adequate funding for this purpose. The component will be structured into several contracts, each focusing on specific themes and tasks.

8. **Program Management:** The program implementation work requires a management team. This will be established and provide support to AEDB, the EA and IAs with the management of the implementation process. It will schedule work plans, consultant selection, subproject preparation and approvals, compliance with warranties and representations, reporting to decision-makers and ADB and measure results. The preparation of candidate subprojects in the next tranches will need to meet the agreed selection criteria in terms of technical, economic and financial feasibility. The team will be accountable to the authorities for this. It will also look into the sequencing of the subprojects and their implementation. The team will work closely with ADB missions to report on the progress made with the program but also on ADB's requirements including financial, governance, procurement, disbursement, environmental and safeguard policies and procedures.

9. **Training:** This will cover (i) business management including portfolio review, project implementation and program management; (ii) technical operations and maintenance; (iii) financial and economic management, including accounting (e.g. double entry bookkeeping, register, accrual-basis accounting); contracting, procurement and inventory management, financial reporting, management information system (MIS) and economics on cost recovery and tariff setting; and (iv) project development, site identification and best practice project design.

10. **Corporate Development:** This includes help with the establishment of corporate entities to construct, own, maintain and operate RE ventures. The companies, initially wholly owned by the provincial governments, will operate commercially, and in the longer term may be partially or entirely privatized. Every implementing agency participating in the program will be requested to submit a time-bound corporate development plan.

11. **Governance and consultations:** The tasks will include help to set up systems and procedures (and train staff) so that all activities under the investment program are carried out with full transparency, adequate consultation and participation from civil society, deliver accountability, and show zero-tolerance for any form of corruption. To ensure transparency and good governance, each EA will publicly disclose on their website information on how the funds are being used. The website will present financial statements and track procurement contract awards. It will include information on, among others, about the list of participating bidders, name of the winning bidder, basic details on bidding procedures adopted, amount of the contract awarded, the list of goods and/or services purchased, and their intended and actual utilization.

12. **Fiduciary Oversight:** Fiduciary oversight is an important aspect of the overall Investment Program. Available public financial management assessment diagnostic tools such as the World Bank's comprehensive Country Financial Accountability Assessment⁷ and public expenditure review⁸, and ongoing ADB assistance programs⁹ were reviewed to assess the country's financial systems, identify issues and constraints and ongoing reforms and recommendations in the areas of budgeting, accounting, internal controls, funds transfer, audit and legislative oversight to ensure public funds are efficiently and effectively managed and utilized.

13. **Monitor/Reporting:** The Government has designed an indicative monitoring framework for implementation of a new RE Development Road Map (REDRM). Pilot projects launched for rural and household RE application and program design will also be monitored as part of the

⁷ Islamic Republic of Pakistan, Country Financial Accountability Assessment, World Bank, December 2003

⁸ Pakistan Public Expenditure Management, Strategic Issues and Reform Agenda, World Bank, January 2004

⁹ Punjab Resource Management Program-Subprogram 2, ADB, November 2005

comprehensive monitoring effort. At subproject level, quarterly progress reports will be prepared for the individual subprojects and submitted to ADB. The reports will include a description of physical progress, problems, and difficulties encountered. A summary of financial accounts will be produced. This will consist of loan expenditures during the period, year to date, and total to date. A Project Completion Report will be submitted within 6 months following completion of each subproject and PFR. In the first tranche subprojects, SHYDO and Punjab IPD will maintain separate accounts for each Loan. Within 6 months of the close of the financial year, SHYDO and Punjab IPD will submit annual pro forma project accounts and un-audited financial statements, and will submit audited project accounts and financial statements within 6 months of the close of the financial year. An independent auditor acceptable to ADB will be hired by SHYDO and Punjab IPD to conduct the audit.

C. Implementation Arrangements and Cost Estimates

14. To enable the implementation of the capacity development component to get off the ground quickly and effectively, soon after the first loan under the program is declared effective, two individual consultants (one international and one domestic) will be hired under the TA¹⁰ to review and finalize the overall capacity development program. They will then assist the AEDB and the IAs to carry out all the other necessary preparatory actions, including the engagement of a management team. The terms of reference of these consultants are given below.

D. Cost Estimates

The cost of the capacity development component is estimated at \$25 million over the program period. The funding will be provided mostly from the program funds under the MFF. Subject to availability, it is possible that both grants and TA resources could be made available over the period to finance this component. The key feature is the commitment of government to adopt this component. This commitment will be captured under the various legal agreements with ADB.

¹⁰ Proposed Technical Assistance for Renewable Energy Policy Formulation and Capacity Development of the Alternative Energy Development Board is presented in Appendix 5.

Table S1.9: Topics and Inputs for Capacity Development

| Agency/Level | Investment Program | Activities | Capacity Building Needed | Year | | | | |
|--|--|---|---|------|------|------|------|------|
| | | | | 2007 | 2008 | 2009 | 2010 | 2011 |
| Federal Level MOF MWP AEDB | Policy | | | | | | | |
| | Policy Formulation | Formulate federal RE policy and time-bound action plan | Policy and action plan formulation | | | | | |
| | Licensing | Single window, streamlined processing of commercial RE projects | Project analysis of specific investment proposals | | | | | |
| | Incentives | Tariffs & Preferential Dispatch | Tariff analysis | | | | | |
| | Deal Flow | | | | | | | |
| | Market Facilitation | Lowering market risks for RE sales and service companies | RE service concessions | | | | | |
| | | Highlight business opportunities for public and private sector, and alternative options | Information dissemination and marketing | | | | | |
| | | Improve appreciation of RE benefits by planners and end-users | Improvement of awareness and education | | | | | |
| | Technical and Financial Support Mechanism | Maximize utilization of existing and planned multilateral and bilateral TA and funding of RE programs | Coordination and implementation of donor assistance | | | | | |
| | | Provide access to RE project, marketing and consumer financing on par with other commercially established sectors | RE financing opportunities and instruments | | | | | |
| | Monitoring and Supervision | | | | | | | |
| | | Monitoring of investment commitments | Monitoring systems development | | | | | |
| | | Carbon trading | CDM and other carbon market analysis, proposal development, marketing, contracts | | | | | |
| Provincial Level IPDs Implementing Agency Level SHYDO PPDC Other Ias | Physical Investment | | | | | | | |
| | Project Management | Procurement | Turnkey contract, BOT, PPP, Management contract | | | | | |
| | | Accounting | Project Accounting | | | | | |
| | | Contract Management | Project Management | | | | | |
| | Non Physical Investment | | | | | | | |
| | RE Development Policy | Development of Action Plan | | | | | | |
| | Corporate Development | Establishment of commercial entities as implementing agencies | Commercialization/corporatization | | | | | |
| | | Human Resources Development | Corporate structure, integrated utility model, asset management model | | | | | |
| | | Improved profitability of the company | Financial Management and Tariff | | | | | |
| | | Application of Information Technology | Linkage to financial management, tariffs, and resource data collection and monitoring | | | | | |
| | | Privatization/Private investments | Privatization or other modes of private sector participation | | | | | |
| | Program Management | Environment and Social Safeguards | Environmental and Social Analysis | | | | | |
| | | Governance | | | | | | |
| | | Fiduciary Oversight | Procurement and Financial Auditing | | | | | |
| | | Feasibility Studies | Technical, Financial and Economic Analysis | | | | | |
| | | Monitoring, Supervision and Reporting | Monitoring systems development | | | | | |
| | Legal Framework for RE Development | Enabling Regulation | Regulatory, power purchase agreements, investment modality | | | | | |
| | R&D, technology transfer and commercialization | Expand capacity and coverage of RE resource data collection, mapping and dissemination | Resource assessment, hydro-meteorology monitoring with real-time telemetry of system operations | | | | | |
| | | Improve and expand local RE systems fabrication, manufacturing and servicing | Indigenous fabrication and marketing | | | | | |
| | | Enhance capacity to service and adapt RE systems for local application and conditions | R&D and technical training | | | | | |

SCHEDULE 2

DESIGN AND MONITORING FRAMEWORK

| Design Summary | Performance Targets/Indicators | Data Sources/Reporting Mechanisms | Assumptions and Risks |
|---|--|---|--|
| <p>Impact Contribute to inclusive economic development through expanded power supplies.</p> <p>Development of clean energy and the environment and energy efficiency</p> | <p>Relative to a 2005 baseline, increase gross energy output by 8% per year, or an amount sufficient to serve 600,000 new connections or 4.8 million domestic consumers at current consumption rates.</p> <p>Contribute to Provincial level gross domestic product growth.</p> <p>Contribute to poverty reduction facilitated through village and rural electrification programs.</p> | <p>Policy dialogue, program and project progress reports, reports - from state utility companies and the regulator, AEDB, provincial governments, and ADB loan review missions</p> <p>Electricity sales data from utilities; gross domestic product data, poverty assessments undertaken over the period.</p> | <p>Reform program. Execution of investment program, combining physical and non physical investments. Sound monitoring and reporting system on the ground.</p> |
| <p>Outcome Expansion of electricity service coverage and improvements in supply reliability and quality.</p> <p>Increased production and use of clean energy through RE sources.</p> <p>Feasibility studies and due diligence work on technical and thematic areas related to potential RE investment proposals.</p> <p>Capacity development program, covering planning, policy reform formulation, design and implementation support, evaluation, monitoring and results measurement systems, sound financial management, strong governance and tight fiduciary oversight.</p> <p>Sound financial</p> | <p>Sufficient power supplies to serve about 600,000 new domestic consumers or about 4.8 million people by the end of the program period.</p> <p>The share of RE sources in energy mix to increase relative to the national power generation total from 0.9% in 2005 to 3.5% in 2015.</p> <p>At least 30 RE projects to be screened, assessed, structured and developed into a high readiness mode. for investment by public and/or private sector. Adherence to best practice and thematic policies and procedures</p> <p>Material improvements in capacity under program and individual projects, with low nonperformance reports on quantitative and qualitative targets (faster turnaround time for preparation and delivery of quality assessments and efficient reporting). Compliance with covenants, assurances and ADB policies and procedures. Improvement in the implementation schedules with material reductions in time gap between loan submissions and disbursement.</p> <p>Investment Program IAs to maintain as far as possible debt-service coverage ratios of around 1.2, accounts receivable of no more than 3 months of billings.</p> | <p>Program and project progress reports, reports from state utility companies AEDB and provincial agencies</p> <p>Physical investments in new facilities in all provinces, non-physical investments and reforms, including capacity development and new tariff orders and private sector participation</p> <p>Assessments or due diligence reports. Number of transactions developed and taken into investment mode. Progress reports on performance and results.</p> <p>Performance evaluation reports. Number of non compliance reports. Implementation and disbursement reports</p> <p>Management and audited accounts</p> | <p>Assumptions An enabling policy framework to facilitate the development of RE</p> <p>Level playing field for public and private investment – reforms and capacity</p> <p>Engagement of advisors on time. Supervision and reporting by agencies and ADB teams</p> <p>Risks Delays in implementation of RE policy reform program</p> <p>Tariffs set below cost-recovery levels</p> <p>Generating capacity, including associated facilities not financed by ADB, not commissioned in a timely manner</p> <p>Delays in transmission system construction</p> <p>Lack of counterpart funding</p> |

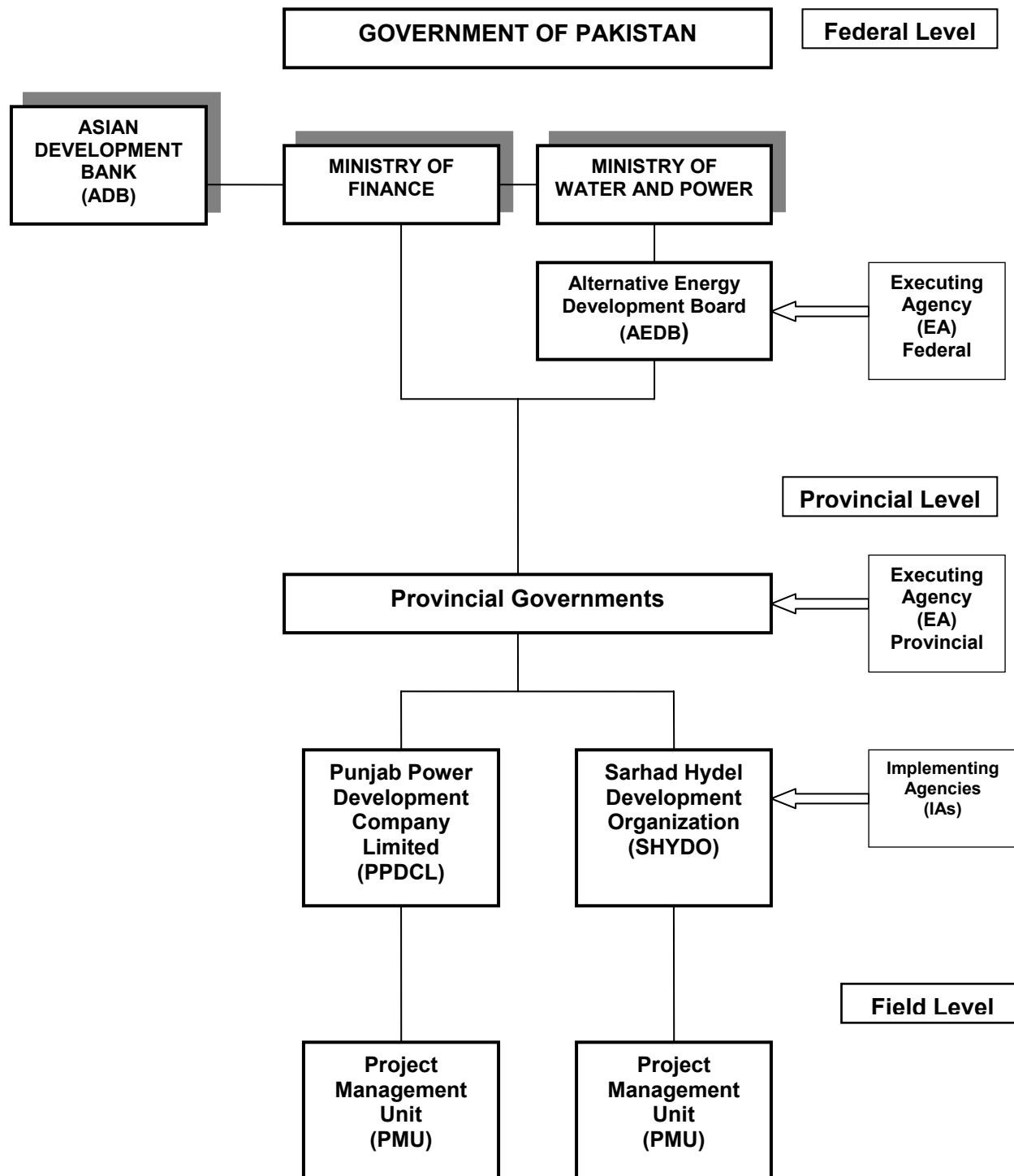
| Design Summary | Performance Targets/Indicators | Data Sources/Reporting Mechanisms | Assumptions and Risks |
|---|---|---|---|
| performance | IA's adoption and strengthening of financial management via independent audit departments, and management information systems, and collection systems where appropriate and practical. | | |
| <p>Outputs :Facilities: Part A: New small to medium size hydropower stations, and other sources of renewable energy (RE) generation units will be constructed during the program period.</p> <p><u>Due Diligence Support:</u> Part B: Feasibility Studies and other due diligence work on new RE schemes</p> <p>Part C: <u>Capacity Development</u> Introduction of a capacity development program at federal, provincial and project level</p> | <p>About 325 MW of new generating capacity constructed and functioning by 2017.</p> <p>About 1,700 GWh (giga watt-hours) annually of incremental energy output at 60% load factor by 2017.</p> <p>Feasibility studies (on 8 new RE schemes) completed by 2008, second batch in 2010, third batch in 2012, and fourth batch in 2014. Full list of due diligence reports on key sector and thematic areas.</p> <p>By the first quarter of 2008 establish a capacity program focusing on planning, policy, project preparation, implementation, evaluation, monitoring and results reporting. Establishment of system and procedures, recruit staff, coach and train. Establish information and financial systems.</p> | <p>Reports from state utility companies, EADB, provincial agencies and, loan review missions</p> <p>Implementation progress report and loan review missions</p> <p>Payment certificates for contracts</p> <p>Review of project accounts</p> <p>Quarterly and semi-annual progress reports</p> <p>Contracts with consulting services</p> <p>Staff recruitment and payroll records</p> <p>Evaluation report on capacity development</p> | <p>Assumption Counterpart funds for operation and maintenance of project components made available</p> <p>No material delay in concluding the negotiations on tariff and Power Purchase Agreement</p> <p>Risks Regulatory approval for rights-of-way and land acquisition is not obtained in a timely manner</p> <p>Increase in prices of raw materials and fuel for construction operations exceeds contingency and inflation forecasts</p> <p>Delay in procurement and recruitment of consultants</p> |
| <p>Activities with Milestones</p> <p>A.1 Recruitment of first batch of consultants completed by March 2007</p> <p>A.2 Initiation of tariff negotiations and details of Power Purchase Agreement by August 2006</p> <p>A.3 Approval of PC-1 documents by August 2006</p> <p>A.4 Land acquisition and compensation of right-of-way completed by September 2007</p> <p>A.5 Cost estimates and bidding documents completed by June 2007</p> <p>A.6 Bidding for construction and procurement of equipment completed by March 2008</p> <p>A.7 Construction and installation of equipment completed by December 2011</p> <p>B.1. Recruitment of Consultant completed by March 2007</p> <p>B.2. Feasibility Study and due diligence teams completed by September 2008</p> <p>C.1 Training commenced in January 2007, long-term training completed by December 2011</p> | | | <p>Inputs Consultancy services for project preparation, project management, design, due diligence on standard thematic areas, including risk evaluation and implementation of safeguards, construction oversight, financial management, fiduciary oversight and ADB policies and procedures</p> <p>Civil works and equipment for the new small hydropower plants and other RE generation units</p> <p>ADB: \$510 million Private sector:\$900 million; Other donors: \$400 million Government: \$390 million</p> |

ADB = Asian Development Bank, Implementing Agency = IA, kV = kilovolt, MVA = megavolt ampere, MW = megawatt, RE = renewable energy

SCHEDULE 3

IMPLEMENTATION FRAMEWORK

1. Unless modified or amended in related loan or project agreements, the Investment Program will be implemented as outlined below:



2. Unless modified or amended in related loan or project agreements, each subproject or project under the Facility (Project) will be implemented as follows

Implementation Arrangements

3. (a) All Projects will be carried out in accordance with the RE policies of the federal and relevant provincial levels and their amendments (RE Policy) and related manuals and instructions as supplemented by specific requirements described in this FFA, including those described more fully in the agreed and attached to Schedule 5 of this FFA Resettlement Framework (RF), the Environmental Assessment Framework (EAF) and the Indigenous Peoples' Development Framework (IPDF) for the participating Provinces, as applicable. The Projects will provide adequate support for capacity development of the sector institutions including all EAs, IAs and other relevant agencies to assure the proper implementation of the Projects.

(b) A Coordination Committee will be set up at the AEDB to assist in implementation of Projects.

(c) Each participating Province will likewise set up a Project implementation committee for implementation of Projects at provincial levels.

4. Each Province will assist in obtaining the requisite approvals and clearances for timely implementation of related Project.

5. Pakistan will cause each Province to ensure the availability and timely release of counterpart funding for the timely implementation of Projects. For this purpose, the Pakistan will cause the Provinces to ensure that (i) the annual development program incorporates revised estimates of the funding requirements for the related Projects under the Facility, and (ii) the funds are released to the assigned accounts.

6. Each Province will provide, as necessary, respective counterpart staff, land facilities, and counterpart funding for related Project in accordance with the financing plan, cost of making land available for Project and assistance, and implementation and monitoring under the EAF (including unforeseen expenses beyond the estimates), utility relocation, general Investment Program management expenses, and road maintenance, in a timely manner through approved annual budget allocations.

7. All Provinces will ensure that the respective IAs will recruit Project implementation consultants (PICs) with expertise in social development and environmental management to help implement the provisions of the EAF for Projects in the related Provinces.

RE Generation Plant Maintenance

8. In accordance with the RE Policy, the Provinces will provide adequate and timely funding for proper maintenance of the RE power generation plants. Any increases in the actual amounts to be provided will be met by the respective Province through additional budget allocations, or other alternative sources of financing.

9. As also required under the RE Policy, except as ADB may otherwise agree, the Provinces will require the respective IAs (through the Project management units [PMUs]) to ensure proper maintenance of the RE generation plants until these are transferred to the

designated districts, or operating entities in accordance with the RE Policy. The Provinces will also allocate the requisite funds to the relevant functionaries (the related districts and operating entities) for such maintenance in accordance with the requirements of the RE Policy.

10. The Provinces will ensure that related districts and operating entities, as the case may be in each Province, will enter into further maintenance contracts with competitively procured contractors (on the basis of the standard performance-based contracts). The contracts will begin upon completion of the initial maintenance period under the related construction contracts and will cover routine maintenance and renewal of all subproject related RE generating plants for further periods.

Generation Plant Safety

11. As part of the mid-term review of the Investment Program as also under each Project, AEDB, the Provinces, and ADB will review the outcomes of the generation plant safety program, to consolidate the institutional mechanism, financing modalities, and detailed implementing arrangements to further ensure sustainable RE development programs for the generating plants to be developed under RE Policy and the Investment Program at the federal and provincial levels.

Performance Monitoring and Reporting

12. The Province(s) shall ensure that within 3 months of the Effective Date of the loan agreement for the related Project under the Facility, the respective IAs shall establish a Project Performance Monitoring System (PPMS) in a form and substance acceptable to ADB in accordance with the Investment Program and Project performance indicators. The IAs shall undertake periodic Project performance review under each individual loan, as also for the Investment Program, in accordance with the PPMS to evaluate the scope, implementation arrangements, progress and achievements of objectives of the related Project and overall Investment Program.

13. AEDB will coordinate with the Provinces responsible for preparing the quarterly progress reports on subprojects' implementation and submit the same to ADB. Such reports shall include (i) a narrative description of progress made during the period on the parts of the program and loan relating to them, (ii) changes in the implementation schedule, if any (iii) problems or difficulties encountered, and (iv) work to be carried out over the next six month period. The progress reports will also include a summary financial account for the loans, including expenditures during the period, total expenditure to date. The reports will also cover the variables included the design and monitoring framework. The reports that shall be submitted to ADB within 45 days from close of each quarter.

14. Pakistan and the Provinces will ensure that respective IAs submit to ADB a Project completion report within 3 months of physical completion of the related Project financed under each individual loan, and Facility completion report within 3 months of physical completion of the all ADB supported activities and Projects under the Facility. These reports shall cover a detailed evaluation of subprojects, Projects and the Facility respectively, covering the design, costs, contractors' and consultants' performance, social and economic impact, economic rate of return, and other details for each Province as may be requested by ADB.

Review

15. (a) ADB, Pakistan, and the Provinces will meet at least semi-annually to discuss the progress of the individual loans and any changes to implementation arrangements or remedial measures required to be undertaken towards achieving the objectives of the Project(s) and Investment Program.

(b) Two years after the loan effectiveness, a mid-term review of each Project will be undertaken by ADB, Pakistan and the related Province. The mid-term review will focus on the policy, capacity, engineering, social, resettlement, environmental, governance, financial management, and implementation track.

Accounts

16. Pakistan, AEDB and the Provinces will ensure that proper accounts and records are maintained and audited in a timely manner to adequately identify the use of loan proceeds in such manner and detail as may be specified under each related legal agreement.

Anticorruption and Governance

17. Pakistan, AEDB and the Provinces acknowledge that consistent with its commitment to good governance, accountability, and transparency, ADB reserves the right to investigate, directly or through its agents, any alleged corrupt, fraudulent, collusive, or coercive practices relating to subprojects financed under the Facility. To support these efforts, relevant provisions of ADB's Anticorruption Policy are included in the loan regulations and the bidding documents for the Investment Program. In particular, all contracts financed by ADB in connection with subprojects under the Facility will include provisions specifying ADB's right to audit and examine the records and accounts of the EAs and IAs and all contractors, suppliers, and consultants and other service providers as they relate to the subprojects or projects under the Investment Program.

18. To ensure transparency and good governance, each EA will publicly disclose on their website information on how the funds are being used. The website will present financial statements and track procurement contract awards. It will include information on, among others, about the list of participating bidders, name of the winning bidder, basic details on bidding procedures adopted, amount of the contract awarded, the list of goods and/or services purchased, and their intended and actual utilization. Likewise, national and provincial newspapers in Urdu, Pushtoo and English will carry such details on a regular basis, at least semiannually. Similarly, TV and radio broadcasts will be made in these language broadcasts at national and provincial levels, as appropriate, giving these same details.

SCHEDULE 4

SELECTION CRITERIA AND APPROVAL PROCESS FOR SUBPROJECTS

Subproject

Selection Criteria The following criteria will apply in selecting subprojects intended for financing under the Facility:

- a. The proposed subprojects will involve either new construction or rehabilitation of (i) small to medium hydropower with installed capacity of not more than 50 MW, preferably run-of-the river schemes; (ii) wind turbines; (iii) solar cells; (iv) biomass; or (v) other forms of renewable energy sources.
- b. If grid-connected, the total capacity of each of the subprojects will not be less than 2 MW.
- c. For each subproject, a feasibility study and support due diligence shall have been prepared. The feasibility study and due diligence will include the following aspects among others: (i) technical design including the proposed technology; (ii) economic and financial viability, including the tariff requirement; (iii) operational sustainability, including maintenance and availability of spare parts; (iv) institutional capacity analysis; (v) environmental analysis; and (vi) social assessments, and resettlement plans, following a proper consultation process. The work will also include financial management, governance and fiduciary oversight, procurement, disbursement and implementation plans, including monitoring and reporting.
- d. Each proposed subproject will meet the ADB safeguard requirements. ADB compliance teams will review the proposals in advance of being submitted for finance.
- e. The subprojects will be ranked using a least cost expansion plan reviewed or assessed by an optimization program such as the Wien Automatic System Planning (WASP)-IV, selecting subproject RE generation plants that contain: (I) the closest link to the national or provincial grid; (ii) the high priority off grid sites; and (iii) other eligible ways to maximize social welfare or minimize unforeseen risks.
- f. Each subproject will have been endorsed by the implementing agency, relevant Province and the AEDB (on behalf of Pakistan).
- g. Power generation plant safety measures will be incorporated in the subproject designs as required by appropriate national and international norms and values.
- h. Design of subprojects will be based on inputs from community consultations conducted in accordance with the RE Policy. However, Pakistan and/or ADB may from time to time require additional requirements to be fulfilled in subproject selection as needed.
- i. Each participating Province will: (i) have established a project management unit to implement the proposed subprojects, (ii) commit to provide the required

counterpart funding on time, and (iii) agree to implement the subprojects in accordance with the ADB's Procurement Guidelines, Guidelines on the Use of Consultants, and other relevant guidelines on disbursements, financial management, fiduciary oversight (including anti-corruption measures) and auditing requirements.

The investment program will also accommodate special pilot projects that are directly linked, closely associated, to RE development itself. For example, for some off-grid RE projects, it may be necessary to include a rural electrification component or community management component to assure the sustainability of the project. There are also various pilot activities that may have the potential to scale-up but have never been tested to assure their sustainability.

Approval Procedures for Subprojects

Approval procedures for RE generation plant subprojects intended for financing under the Facility will follow the process given in the RE Policy as supplemented by the requirements of the RF, the IPDF and the EAF (including EMP), as applicable.

For the subprojects already prepared under ADB project preparatory technical assistance,¹¹ the approval process stands completed, subject to their meeting the selection criteria (vi) to (viii) above.

For subprojects other than those referred in previous paragraph above, intended for financing under the Facility, the approval procedures will be as follows:

- (i) The Provincial IA will prepare subproject proposals in agreed formats, and submit the proposals to the AEDB;
- (ii) AEDB will review the subproject proposals, check compliance with the selection criteria, and for those found compliant with the selection criteria, recommend clearance to the Coordination Committee;
- (iii) AEDB through Economic Affairs Division (EAD) of the Ministry of Finance of Pakistan will further submit the subproject proposals to ADB for review and approval;
- (iv) ADB will approve the subproject proposals, subject to any further modifications required to be made to the proposals;
- (v) Subject to addressing any modification as required under subclause (iv) above, AEDB will give final approval for the subproject proposals to the Provincial IA; and
- (vi) The Provincial IA will proceed with tendering in accordance with ADB's *Procurement Guidelines* and *Guidelines on the Use of Consultants*, both as amended from time to time.

Monitoring during Implementation

Adherence to requirements of the RE Policy, the RF, the IPDF and the EAF (including EMP), as required and other applicable guidelines for

¹¹ TA4425-PAK: Renewable Energy Development Project.

subproject implementation will be monitored through the completion of each subproject and only those subprojects meeting the requirements will be eligible for ADB financing. The existing monitoring mechanism under the RE Policy will be supplemented by the input from the PICs for safeguard compliance and generation plant safety.

SCHEDULE 5

SAFEGUARD FRAMEWORKS

Environment

1. ADB will only finance subprojects that meet the eligibility requirements set out in Schedule 4 to this FFA, and which adhere to relevant requirements of the RE Policy, the attached EAF and other applicable guidelines for subproject implementation. The Provinces will monitor the implementation of subprojects through to their completion of each subproject.
2. The Provinces will ensure that environmental assessment of the subprojects are conducted according to the ADB's *Environment Policy, 2002*, Pakistan's environmental laws, and the EAF.
3. The Provinces will ensure that the recommendations of the environmental assessment approved by ADB and relevant government agencies are adhered to during design, construction and operation phases of the subprojects.
4. The Provinces will ensure that the residual flow in the rivers and canals are maintained throughout the operational life of subprojects.
5. The Provinces will ensure that (a) the subprojects are not located within national parks and wildlife sanctuaries; (b) monuments of cultural or historical importance are avoided; (c) EMP with adequate budget is developed for each subproject; and (d) Environment Category A subprojects are not included in the Project.

Land Availability and Resettlement

6. The Provinces will cause the respective IAs to, subject to compliance with the relevant provisions of the RF and in accordance with all applicable laws and regulations of Pakistan, acquire or make available the land and rights to land free from any encumbrances, and cleared the utilities, trees and any other obstruction from such land, required for commencement of construction activities in accordance with the schedule agreed under the related civil works contract.
7. The Provinces will cause the respective IAs to ensure that all land and rights-of way required by the subprojects are made available in a timely manner and that the provisions of the resettlement plans (RPs), including compensation and entitlements for affected households and persons, are implemented in conformity with (i) all applicable laws and regulations of Pakistan, (ii) ADB's *Policy on Involuntary Resettlement, 1995*, and the agreed and attached RF.
8. The Provinces will cause the respective IAs to ensure that people affected by each subproject are fairly compensated in a timely manner on replacement values in accordance with the related RPs and the RF, such that their living standards are not adversely affected. The IAs will submit progress and completion reports on land acquisition and resettlement under the quarterly progress reports for each subproject.
9. The Provinces will cause the respective IAs to ensure that prior to land acquisition and any resettlement under each subproject, the related RP including its update based on consensus of affected peoples, is disclosed with all necessary information made available to

persons affected by the subproject and confirm that it be uploaded onto ADB web site. The IAs will ensure that essential public infrastructure that may be affected under land acquisition and resettlement is replaced, as appropriate, in an expeditious manner in accordance with the related RPs.

10. The Provinces will cause the respective IAs to ensure that construction contracts contain binding requirements for construction contractors to fully reinstate pathways, other local infrastructures, and agricultural land to at least their pre-subproject condition upon construction completion. Provision should be made for adequate recording of the condition of roads, agricultural land and other infrastructure prior to transport of material and construction commencement.

11. The Provinces will cause the respective IAs to ensure that in the event irrigation supplies are disrupted and adjacent farmers experience losses, provision will be made for independent valuation of losses and timely compensation.

12. For each subproject, the Provinces will cause the respective IAs to ensure timely provision of budget for land acquisition and other activities outlined in the related RP and will meet any unforeseen obligations in excess of the RP budget estimate in order to satisfy the RP requirements.

13. The Provinces will ensure that within 3 months of the Effective Date of the related loan agreement, the respective IAs will engage an independent external expert/agency acceptable to ADB for monitoring and verification of the RP implementation under each subproject that will be responsible for providing ADB through the PMUs, quarterly monitoring and evaluation reports on resettlement implementation in accordance with the RPs.

14. The Provinces will ensure that within 3 months of the Effective Date of the related loan agreement, the respective IAs will also establish grievance redress committee (GRC) for the related Project for addressing any grievances from affected peoples concerning resettlement, environment and other social issues in a timely manner.

Execution of Civil Works Contracts

15. The Provinces will ensure that, subsequent to award of civil works contract under any subproject, no section or part thereof under the civil works contract will be handed over to the contractor unless the applicable provisions of the RF/RP and the EAF/EMP have been complied with.

16. Any changes to the location, land alignment of facilitating roads, or environment impacts on account of detailed designs of related subproject roads will be subject to prior approval by ADB or related agency (AEDB) as the case may be in accordance with the subproject selection criteria and procedures included in Schedule 4 to this FFA.

Social Impacts and Other Issues

17. (a) The Provinces will ensure through specific provisions in the bid documents and the civil works contracts under each subproject under the Facility that the contractors will: (i) disseminate information at work sites on the risks of sexually transmitted diseases and HIV/AIDS as part of the health and safety measures for those employed during construction; (ii) follow legally mandated provisions on health, welfare, sanitation, and appropriate working

conditions, including accommodation, where appropriate, for construction workers at camp sites; (iii) comply with all applicable labor laws, not employ child labor for construction and maintenance activities, and (iv) provide equal opportunity for women for construction activities, and not differentiate wages for men and women for work of equal value.

(b) The Provinces will ensure that compliance with provisions in clause (a) of this paragraph is monitored by the respective IAs.

18. In case of any significant or related impacts on tribal people (TP) under any subproject, these will follow the requirements as set out in the attached IPDF as agreed by ADB including special provisions for all TP households to ensure that their living standards are not adversely affected as a result of land donation or in the event of any loss of non-land asset and impacts on their livelihoods. As also laid down in the IPDF, for any impact on land involving traditional and tenurial rights of the TPs, the legal provisions laid down by Pakistan and Provinces pertaining to transfer of land will be duly followed.

19. The Provinces will ensure acceptance of subprojects through effective community participation in selecting and implementing subprojects in accordance with ADB's safeguard policies and the RE Policy, as supplemented by the RF and EAF.

20. Applicability of the RF, the IPDF and EAF/EMP to subprojects under the Facility may be reviewed and necessary modifications, acceptable to ADB and Pakistan, will be made prior to finalizing the corresponding legal agreements.

ANNEX 1 TO SCHEDULE 5

RESETTLEMENT FRAMEWORK

Note: During preparation of each PFR, this RF will be reviewed to assess whether it needs to be updated to reflect (i) changes in Pakistan and ADB's policies and applicable regulations; (ii) changes in prices, impacts on affected persons and entitlements; (iii) institutional arrangements; and (iv) any other. Standards agreed in the RF will not be lowered. Any change will be reflected in a revised RF in consultation and agreement with ADB.

A. Introduction

1. The proposed loans will follow the multi-tranche financing facility (MFF) lending approach. The first tranche will cover three components, namely, clean energy development, feasibility studies and capacity development. The implementation period of the overall Renewable Energy Development Sector Investment Program (REDSIP) is estimated to be ten years. The Resettlement Framework will be used as the broad framework within which Resettlement Plans for subprojects with resettlement impacts will be formulated. The subprojects that will be implemented during the first tranche of the REDSIP will also closely follow the resettlement principles, entitlements of affected persons (APs), institutional framework and monitoring and evaluation of resettlement implementation.

2. **Part A: Clean Energy Development:** Part A includes the expansion of small hydro-power generating capacity by constructing 3 grid-connected power plants, each ranging from 2.6 MW to 36 MW in the Northwest Frontier Province (NWFP). This component will also include the construction of 5 small to medium hydro-power stations in Punjab Province and consulting Services for detailed design as well as implementation of Part A. **Part B: Feasibility Studies:** Part B will undertake 8 feasibility studies of raw sites in both NWFP and Punjab. **Part C: Capacity Development:** Part C will support (i) training and capacity development of Project-related agencies in operating and maintaining new hydropower stations; (ii) external monitoring of safeguards; and (iii) various other financial management and human resource development activities within EAs and IAs.

5. The subprojects under the first *tranche* are: (i) Daral Khwar Hydropower in NWFP (ii) Ranolia Khwar Hydropower and (iii) Machai Canal Hydropower in Punjab (i) Chiannawaii Hydropower (ii) Deg Fall Sheikhpura Hydropower, (iii) Pakpattan Canal Hydropower, (iv) Okara Hydropower and (v) Marala Canal Hydropower. During implementation, under Part B, additional subprojects will be appraised by executing agencies (EAs and Provincial governments, which are not EAs under the first tranche), and will be reviewed and endorsed by ADB in accordance with the established project administration procedures.

6. Land acquisition and resettlement impacts of proposed subprojects under the first tranche have been examined. Part A will require permanent acquisition of 11.78 hectares (ha) in NWFP, and temporary acquisition of 0.85 ha of 0.45 in NWFP, and 3.2 in Punjab. Part B and Part C will not require any acquisition of land or other property and therefore will not have any resettlement impacts. Land acquisition for Part A subprojects will affect 61 households, and 2 residential structures. Details of resettlement impacts of the Project are given in Table A19.1.

Table S4.1: Land Acquisition and Affected Households by Subproject

| Province | Non-significant ¹² Affected households (AHHs) | Significant AHHs | Total AHHs | Total APs | Affected Residential Structures | Permanent Land Acquisition (ha) | Temporary Land Acquisition (ha) | Trees |
|----------------------|---|-------------------------|-------------------|------------------|---|--|--|------------|
| NWFP | | | | | | | | |
| Daral Khwar | 21 | 0 | 21 | 218 | 0 | 5.78 | 0.1 | 460 |
| Machai | 7 | 0 | 7 | 77 | 0 | 0 | 0.2 | 12 |
| Ranolia | 22 | 2 | 24 | 274 | 2 | 6 | 0.15 | 5 |
| Total NWFP | 50 | 2 | 52 | 569 | 2 | 11.78 | 0.45 | 477 |
| PUNJAB | | | | | | | | |
| Chianwaili | 3 | 0 | 3 | 21 | 0 | 0 | 0.6 | 3 |
| Deg Outfall | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pakpattan | 4 | 0 | 4 | 28 | 0 | 0 | 0.2 | 4 |
| Okara | 4 | 0 | 4 | 28 | 0 | 0 | 2.4 | 0 |
| Marala | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total PUNJAB | 11 | 0 | 11 | 77 | 0 | 0 | 3.2 | 7 |
| Total Project | 61 | 2 | 63 | 646 | 2 | 11.78 | 3.65 | 484 |

7. The Resettlement Framework (RF) was formulated to guide the preparation of RPs of subprojects, under future tranches, that may have resettlement impacts. The RF identifies the broad scope of the Investment Program and outlines the policy, procedures and institutional requirements that will be followed in preparing RPs. The EAs of the Investment Program will be the Provincial governments; and the IAs for the first *tranche* will be Sarhad Hydel Development Organization (SHYDO) in NWFP, and the Irrigation and Power Department (IPD) in Punjab. For the subsequent *tranches* the EAs will be the provincial governments where the subprojects will be implemented. IAs are yet to be identified. The Project Management Units (PMUs) will be responsible for formulating RPs for subprojects with resettlement impacts, as outlined in RF. The draft RPs will be submitted to ADB for review and approval prior to contract award, and compensation will be paid to all APs before the commencement of civil works of any subproject.

B. Resettlement Policy Framework and Entitlements

8. The resettlement framework (RF) is based on ADB's Involuntary Resettlement Policy, Land Acquisition Act, and state-level variations to the Act. If any subproject requires land acquisition or relocation or both, EA/IA will prepare a resettlement plan according to the approved RF.

9. The core involuntary resettlement principles applicable to the REDSIP are:

- (i) Involuntary resettlement will be avoided; if it cannot be avoided, it will be minimized.
- (ii) Where involuntary resettlement is unavoidable, affected persons will be assisted to re-establish themselves and improve their quality of life.

¹² Resettlement is "significant" where 200 or more people experience major impacts. Major impacts are defined as when the affected people are physically displaced from housing and/or more than 10% of their productive assets (income generating) are lost.

- (iii) Lack of formal legal land title is not a bar for compensation and rehabilitation assistance.
- (iv) Land-for-land is an option for compensation in the case of loss of land; however, in the absence of replacement land, cash compensation for the property acquired will be paid at their replacement value in addition to any transaction costs.
- (v) Each AP is entitled to receive assistance to restore income and livelihood at pre-project standard, and all vulnerable APs are entitled to receive assistance to improve their income and livelihood.
- (vi) All APs will be fully informed and consulted on compensation, relocation, and rehabilitation programs.
- (vii) APs will fully involve in the selection of relocation sites, livelihood compensation and development options at the earliest opportunity.
- (viii) All APs will be integrated economically and socially into their host communities, if relocated. For this, participatory measures will be designed and implemented by the EA or IA.
- (ix) APs' social and cultural institutions will be protected and supported.
- (x) Common property resources and community and public services will be provided to AP communities.
- (xi) Compensation and rehabilitation programs will be carried out with equal consideration for women and men; in the case of these projects, particular attention will be placed on the rights of women, widows, orphans, and the elderly, and other vulnerable persons and groups such as indigenous peoples and ethnic minorities. Appropriate and sufficient assistance will be provided to help them improve their socioeconomic status.
- (xii) Compensation and resettlement assistance will be fully provided before approving any subproject, if it involves involuntary resettlement impacts.
- (xiii) The full compensation and resettlement costs are included in subproject costs.

10. The application of policy and laws in the sphere of involuntary resettlement are outlined below. The entitlement matrix is not exhaustive: more entitlements can be added if any resettlement impacts not listed in the matrix are identified during project implementation.

Table S4.2: Entitlement Matrix

| Type of losses | Definition of APs | Entitlement | Details |
|---|--|---|--|
| 1. Land | | | |
| Loss of agricultural land by individual landowners | <ul style="list-style-type: none"> Individual landowners: Titled or locally recognized owners and having physical possession of the affected land or having recognized traditional land rights. | <ul style="list-style-type: none"> Provision of equivalent land within village If land is unavailable compensation at market/ replacement value Provision long-term jobs for those losing more than 10% of farmland affected by the project. | <ul style="list-style-type: none"> Cash compensation based on current market value (plus 15% Compulsory Acquisition Surcharge) The two landowners losing more than 10% of their farmlands (ie, 20% & 25%) will be entitled to long-term jobs with the project, as a livelihood restoration strategy. |
| Loss of lowland forest, pasture, and riverbed land by individual landowners | <ul style="list-style-type: none"> Individual landowners: Titled or locally recognized owners and having physical possession of the affected land or having recognized traditional land rights. | <ul style="list-style-type: none"> Provision of equivalent land within the same village If land is unavailable compensation at market/ replacement value | <ul style="list-style-type: none"> Cash compensation based on current market value in cooperation with the village jirga |

| | | | |
|---|---|--|--|
| Temporary loss of land | <ul style="list-style-type: none"> Titled owners and all affected persons (AP) with traditional land rights and non-titled land users, tenants and sharecroppers | <ul style="list-style-type: none"> Notice to harvest standing crops Compensation at market value Restoration | <ul style="list-style-type: none"> Cash compensation at market value for the equivalent of three seasons (nine months of crop income) |
| 2. Loss of Built-Up Structures | | | |
| Individual residential houses | <ul style="list-style-type: none"> Locally recognized and in physical possession owners and affected persons (AP), including non-titled land users, sharecroppers and tenants. | <ul style="list-style-type: none"> Compensation at market value of land plot and the structure based on the local value of construction material, plus a 15% surcharge. | <ul style="list-style-type: none"> Relocation and Disturbance Allowance at 15% of the total assessed compensation for the house along with the land plot. Two Affected Persons (Heads of Household) whose houses are affected will also be provided long-term jobs (at one job per affected house) by the project. |
| 3. Income | | | |
| Income from standing crops and rent | <ul style="list-style-type: none"> Farming households with individually owned farmland and non titled land users, including sharecroppers and tenants. | <ul style="list-style-type: none"> Notice to harvest standing crop Compensation at market value | <ul style="list-style-type: none"> Compensation for sown or standing crops at market value as for mature crop |
| Income from trees | <ul style="list-style-type: none"> Tree owners Sub-tribes | <ul style="list-style-type: none"> Compensation at market value | <ul style="list-style-type: none"> Fruit bearing trees will be compensated at current market value after fruit for 10 years determined by the Horticulture Department, Forest royalty at 60% of the sale of proceeds by Forest Department. |
| Income from forest products and grazing land | <ul style="list-style-type: none"> All affected sub-tribes | <ul style="list-style-type: none"> Lump sum compensation | <ul style="list-style-type: none"> Lump sum compensation for lost income for three months based on income from the forest/ grazing land determined by the Forest Department in consultation with the jirga |
| 3. Individual and Community Infrastructure | | | |
| Private Infrastructure – Damaged | <ul style="list-style-type: none"> Affected Household/s | <ul style="list-style-type: none"> Sufficient protection and/or restoration | <ul style="list-style-type: none"> Houses, farmlands, pasture resources, irrigation/power channels. Damages caused by all the construction works and operations, including uncontrolled blasting and dumping of materials. |
| Community Infrastructure – Damaged | <ul style="list-style-type: none"> Affected Community | <ul style="list-style-type: none"> Sufficient protection and/or restoration | <ul style="list-style-type: none"> Irrigation/power channels, access roads/paths, water/pasture/forest. Damages caused by all the construction works and operations, including uncontrolled blasting and dumping of materials. |
| 5. Other impacts not yet identified | | | |
| Unforeseen losses | <ul style="list-style-type: none"> Affected individuals Vulnerable groups, including non titled land users | <ul style="list-style-type: none"> Additional assistance Additional assistance | <ul style="list-style-type: none"> Unforeseen impacts on individuals/vulnerable groups will be documented and mitigated based on the principles in the Resettlement Plans. For Vulnerable groups, 20% additional compensation. |

C. Procedure of Formulating a Resettlement Plan

11. The EA/IA of a subproject will try to avoid or at least to minimize land acquisition or resettlement or both as much as possible. If such resettlement impacts are unavoidable in implementing a subproject, the IA will formulate a resettlement plan (RP) for the subproject by following the procedure given below:

- (i) Conduct consultations with all stakeholders to obtain inputs regarding how to avoid or at least minimize involuntary resettlement impacts, and to identify their needs and

- preferences. A socioeconomic survey of a sample population will also be undertaken to identify different categories of APs, based on the degree and scale of impacts of the subproject on them.
- (ii) Outline policy and legal framework applicable. If the policy and legal framework discussed in the approved RF is adequate, only a summary of the policy and legal framework is required. A reference to RF is needed.
 - (iii) Undertake a census and complete an asset inventory of all affected persons/households. All APs will be notified of resettlement information in their own language.
 - (iv) Develop an entitlements matrix to outline entitlements of all affected persons including non-titled persons, e.g., squatters, encroachers, using the guidance from the approved RF. If new categories of APs and types of losses are identified during project implementation, appropriate entitlements will be added to the resettlement plan and forward to ADB for review and approval. All APs should be informed of such changes.
 - (v) Discuss relocation plan, rehabilitation strategy including income restoration and improvement of APs.
 - (vi) Describe the institutional framework for resettlement.
 - (vii) Itemize budget for all resettlement activities in the resettlement budget and financial plan.
 - (viii) Outline, if applicable, environmental impacts of relocation.
 - (ix) Formulate a time-bound schedule for RP implementation.
 - (x) Outline procedures contain in the grievance redress mechanism
 - (xi) Describe both internal and external monitoring program and the final evaluation
 - (xii) Once the draft RP is ready, it will be disclosed to all APs in their own languages and should be kept at public offices such as divisional secretariat and Grama Niladharis' offices. The EA will endorse it before submitting to ADB for review and approval.
 - (xiii) Once ADB approves it, it will be disclosed again to all APs if revised based on ADB's advice, and will be posted on ADB's Involuntary Resettlement Website.
 - (xiv) At least the payment of compensation, and relocation, if required, will be completed before award of any construction contracts of the subproject.

D. Institutional Arrangements

12. A Project Management Unit (PMU) will be established in each IA. The PMUs will be responsible for the overall implementation of the Project. IAs will create a respective administrative unit, the Environmental and Social Development Cell (ESDC) consisting of two members: an environmental specialist and a resettlement specialist. The ESDC will work in close cooperation with the respective field-based office on the day-to-day activities of the Short Resettlement Plan implementation.

13. The PMU through ESDC field offices, District Land Acquisition Collector (LAC/DRO) and the Resettlement Specialist will monitor the progress of the work. He will ensure the coordination between the relevant departments, the Grievance Redress Committee and the Project's affected people. In each subproject, its PMU will do the overall coordination, planning, implementation, and financing of RP. The PMU will form an 'Environment and Social Unit' which will have a full-time resettlement specialist to ensure timely and effective implementation of RPs. The Resettlement Specialist (RS) resettlement specialist and staff, and the PIU resettlement specialist and staff will provide the necessary capacity development training under the Project's Component C.

14. The PMU will maintain all databases, work closely with APs and other stakeholders. Based on regularly updated PIU data, a central database will also be maintained by ESDC. Roles and responsibilities of various agencies are in Table 3. The EA and the IAs will ensure that key institutions including local governments are involved in RP implementation. Moreover, in recognition of the complexity of resettlement in a sector project, experienced NGOs will be hired for RP implementation and for developing community-based social development programs. Local level Resettlement Committees will be formed with representatives from Ps including vulnerable APs, community-based organizations (CBOs), NGOs, and other local civil society and interest groups, local government officials, village leaders, and PMU staff.

Table S4.3: Agencies Responsible for Resettlement Implementation

| | Activity | Agency Responsible |
|----|--|--|
| 1 | Hiring of implementing NGOs and Resettlement Specialists | Environmental and Social Development Cell (ESDC) |
| 2 | Screening of sub projects for resettlement impacts | Project Management Unit (PMU)/Implementing NGO/ESDC |
| 3 | Updating the Land Acquisition and Resettlement Plan | PMU/Implementing NGO/ESDC |
| 4 | Review and Approval of Land Acquisition and Resettlement Plan | RESDC |
| 5 | Submission of plans for ADB review and coordination of revisions | PMU |
| 4 | Verification survey for identification of APs | PMU/Implementing NGO/ESDC |
| 5 | Land survey for identification of plots | ESDC |
| | Valuation of losses | ESDC |
| 6 | Issue of identity cards | PMU/Implementing NGOs |
| 7 | Resettlement training workshops | RU/Project Consultants |
| 8 | Consultation and disclosure of Land Acquisition and Resettlement Plan to APs | PMU/Implementing NGOs/ESDC |
| 9 | Preparation of land acquisition plan | PMU/ESDC |
| 10 | Submission of land acquisition proposals to District Commissioner | PMU/ESDC |
| 11 | Compensation award and payment of compensation | District Land Acquisition Collector |
| 12 | Payment of replacement value allowance | PMU/Implementing NGO |
| 13 | Takeover the possession of acquired land/houses | PMU/ESDC |
| 14 | Hand over acquired land to contractors for construction | PMU/ESDC |
| 15 | Notify construction starting date to APs | PMU/Implementing NGO/ESDC |
| 16 | Assistance in relocation, particularly for vulnerable groups | PMU/Implementing NGO/ESDC |
| 17 | Income restoration activities, particularly for vulnerable groups | PMU/Implementing NGO/ESDC |
| 18 | Restoration of temporarily acquired land to its original state including restoration of private or common property resources | Contractors subject to monitoring by PMU/Implementing NGO/ESDC |
| 19 | Internal monitoring | PMU/Implementing NGO |
| 20 | External monitoring | Independent Monitoring Agency |

E. Eligibility for Compensation and Other Resettlement Assistance

15. All APs are entitled to compensation and rehabilitation. However, eligibility to compensation and other assistance will be limited by a cut-off date to be set for each subproject on the day corresponding to the beginning of its impacts assessment. The cut-off date defines “eligibility” and “affected person.” APs arrived in the subproject areas after the cut-off date will not be eligible for compensation and other assistance.

F. Consultation, Disclosure, and Grievances

16. Each subproject’s RP will be prepared and implemented in close consultation with all project stakeholders, particularly APs, through focus group discussions, socio-economic surveys, and stakeholder consultation meetings. Each RP will be made available in local language(s) during focus group discussions and stakeholder meetings at the village/community

level to ensure that inputs from all stakeholders are taken into consideration in formulating RP.. Female-headed households will be consulted by female fieldworkers. A resettlement information leaflet containing information on compensation and resettlement options will be made available in local language(s) and distributed to all APs of the subproject. The PMU through its ESDC and the PMUs will conduct consultations in affected villages to explain RP in coordination with village/community leaders. Each AP will be provided information regarding specific entitlements. Disputes on entitlements are to be forwarded to PMUs for appropriate action. The summary RP will be disclosed on the ADB resettlement website, and information dissemination and consultation will continue throughout project implementation phase.

17. A Grievance Redress Committee (GRC) will be formed to ensure APs' grievances are addressed and appropriated actions are taken to resolve them. The committee members of a GRC will include AP representatives especially representatives of vulnerable APs, local-level IA/PMU staff, local governments, respected citizens in diverse professions, NGOs, CBOs, and local civil and interest groups. The head of a locally elected body will head the GRC. The GRC will meet every 2 weeks especially during land acquisition and resettlement phase. After that, it will meet as and when grievances are referred to it to redress. The main responsibilities of the GRC are to: (i) provide help APs in resolving issues arising from land/property acquisition processes; (ii) record APs' grievances, categorize, and prioritize them and resolve them; (iii) immediately inform the PMU of serious issues and problems; and (iv) to inform APs of the decisions of GRC and PMU. Each GRC will review grievances involving all resettlement benefits, compensation, relocation, and other assistance. Detailed investigation will be undertaken which may involve field investigation with the concerned APs. Grievances will be redressed within 2-3 weeks from the date of lodging the complaints. The GRCs will continue to function during the life of the Project including the defects liability period.

G. Monitoring and Evaluation

18. Internal monitoring of resettlement implementation will be the responsibility of PMO-RU cell through PMUs and engaged NGOs. The ESDC internal monitoring will include: (i) **administrative monitoring**: daily planning, implementation, feed back and trouble shooting, AP file maintenance, and preparation of progress reports; (ii) **socio-economic monitoring**: case studies, development of baseline information on APs' socio-economic conditions, compensation payment, grievance resolution, relocation, payment of other entitlements etc; and (iii) **impact evaluation monitoring**: calculation of compensation payment rates, quality of resettlement sites if any, consultation programs, and restoration and improvement of income standards and livelihoods against established benchmarks Monitoring and evaluation reports documenting progress on resettlement implementation and RP completion reports will be provided by ESDC to ADB for review.

19. The EA will engage the services of an independent agency not associated with project implementation to undertake external monitoring and evaluation of resettlement implementation. The external monitoring agency will have experience in resettlement implementation and a satisfactory familiarity with lands laws and regulations and ADB' Involuntary Resettlement Policy. It will be hired in consultation with ADB within three months of the loan effectiveness. The agency will monitor and verify RP implementation to determine whether resettlement goals have been achieved, livelihood and living standards have been restored/improved, and highlights weaknesses in the implementation process with recommendations on how to overcome them.

21 The external monitoring of the Project will be done twice a year and impact evaluation during the midterm review of resettlement implementation and at the end of the subproject. Monitoring will also indicate whether AP understood their entitlements and their views on resettlement site conditions; compensation valuation methods, and disbursement; grievance redress procedures; and staff competencies. The external monitor will also evaluate the performance of the ESDC, PMU, and NGOs. The external agency will report its findings simultaneously to the EA and to ADB twice a year. Provisions will be made in each RP for engaging an external resettlement implementation monitor.

H. Implementation schedule

22. Each draft RP will be disclosed to all APs prior to sending to ADB for review and approval. Where necessary, an updated and revised RP will be prepared once the subproject design is completed and a census of all APs is carried out. All activities related to acquisition (both temporary and permanent) of property will be planned carefully in order to ensure that compensation and resettlement assistance are paid prior to displacement and commencement of civil works.

I. Resettlement Budget

24. Detailed budget estimates for involuntary resettlement will be an important component of each RP. The EA will allocate sufficient funds for the formulation of a satisfactory RP and for its implementation. The budget estimates will include i) detailed costs of land acquisition, relocation, and livelihood and income restoration and improvement, ii) source of funding, iii) arrangements for approval, and the flow of funds and contingency arrangements. In each subproject, its EA will pay land acquisition, relocation and income restoration expenses. All land acquisition, compensation, relocation and rehabilitation of income and livelihood will be integral components of project costs.

ANNEX 2 TO SCHEDULE 5

INDIGENOUS PEOPLES DEVELOPMENT FRAMEWORK

Note: During preparation of each PFR, this Framework will be reviewed to assess whether it needs to be updated to reflect (i) changes in Pakistan and ADB's policies and applicable regulations; (ii) institutional arrangements; and (iv) any other. Standards agreed in the Framework will not be lowered. Any change will be reflected in a revised Framework in consultation and agreement with ADB.

A. Background

1 The proposed Investment Program will be provided under a multi-tranche financing facility (MFF) lending approach over a span of 10 years. The first project under the MFF will have three components: clean energy development, feasibility studies of new sites and capacity building.

2 **Part A: Clean Energy Development:** Part A includes expansion of small hydropower generating capacity, by construction of 3 grid-connected plants ranging from 2.6 MW to 36 MW in the Northwest Frontier Province (NWFP). This will also include 5 small to medium hydropower stations to be constructed in the Province of Punjab by the Irrigation and Power Department.

1. **Part B: Feasibility Studies of New Sites:** Part B will undertake 5 to 10 feasibility studies of raw sites in both NWFP and Punjab.

2. **Part C: Capacity Development:** Part D will support (i) consulting services for detailed design as well as implementation of Part A, (ii) training and capacity building of the Project related entities to operate and maintain new hydropower stations; and (iii) external monitoring of the safeguards.

3. The subprojects under the first tranche are: in NWFP (i) Daral Khwar Hydropower, (ii) Ranolia Khwar Hydropower, and (iii) Machai Canal Hydropower; in Punjab (i) Chiannawail Hydropower, (ii) Deg Fall Sheikhpura Hydropower, (iii) Pakpattan Canal Hydropower, (iv) Okara Hydropower, and (v) Marala Hydropower. During implementation, under Part B, additional subprojects will be appraised by the executing agencies (EAs), and endorsed by ADB in accordance with the established project administration procedures.

B. Indigenous Groups

4. Indigenous peoples (IP) are defined as those having a distinct social, cultural, economic, and political traditions and institutions compared with the mainstream or dominant society.¹³

¹³ ADB uses the following characteristics to define indigenous people: (i) descent from population groups present in a given area before territories were defined; (ii) maintenance of cultural and social identities separate from dominant societies and cultures; (iii) self identification and identification by others as being part of a distinct cultural group; (iv) linguistic identity different from that of dominant society; (v) social, cultural, economic and political traditions and institutions distinct from dominant culture; (vi) economic systems oriented more toward traditional production

5. In accordance with ADB procedures for MFF lending, 8 subprojects under the first tranche have been selected for project preparation and processing. The Pakistani constitution does not recognise any ethnic and linguistic indigenous group; it takes notice only of the religious minorities. However, referring to the ADB criteria, in NWFP, the Kohistani population of the project area belongs to a group of indigenous people. The Kohistani tribes have their distinct ethnic identity and see themselves different from the mainstream society. They were living in the respective area before the modern state of Pakistan was created and were part of the Muslim Kingdom of Swat.

6. In NWFP, all the affected people, apart for the Machai subproject, belong to sub-tribes. In fact, the great majority of NWFP population falls under ADB's definition of IP. Traditional decision making mechanisms were taken into account during consultation. In Punjab, none of the APs fall under ADB's IP policy, in the subprojects under the first tranche.

7. During project preparation, extensive consultations were undertaken and analysis with reference to IPs.

C. The Indigenous Peoples Development Framework

8. This Indigenous Peoples Development Framework is intended to guide selection and preparation of subprojects under the Project to ensure better distribution of project benefits and promote development of IPs in the project area. In cases where significant impacts on IPs are identified, this framework will be applied if necessary during subproject preparation, in accordance with requirements for sector loans and ADB's *Indigenous Peoples Policy* (1998).

9. A full Indigenous Peoples Development Plan (IPDP) is required if there exists:

- (i) adverse impacts on customary rights of use and access to land and natural resources;
- (ii) negative effects on socioeconomic and cultural integrity;
- (iii) effects on health, education, livelihood, and social security status; and/or
- (iv) other impacts that may alter or undermine indigenous knowledge and customary institutions.

10. If impacts are insignificant, specific actions in favor of IPs can be incorporated within the Resettlement Plan (RP) for the subproject.¹⁴ This would ensure appropriate mitigation and benefits for indigenous people.

11. The EA will be the Provincial Governments and the IAs, for the first tranche, will be SHYDO, in NWFP, and the Irrigation and Power Department, in Punjab. For the following tranches the EAs and the IAs are yet to be identified. The PMO will subproject processing including undertaking detailed design, procurement, and construction supervision. Project Implementation Units (PIU), guided by the PMO will be responsible for implementing the

systems rather than mainstream; and (vii) unique ties and attachments to traditional habitats and ancestral territories.

¹⁴ Impacts are insignificant when fewer than 100 indigenous people are affected.

subprojects (commissioning, maintenance, and operation). The PMO/PIUs will be assisted by technical experts who will evaluate technical reports, feasibility studies, preliminary design reports, environmental assessment reports (including environmental management plan with budget) reports, RPs, IPDPs, and detailed design reports to ensure compliance with ADB and Government requirements. Summary appraisal reports will be submitted to ADB subsequent to EA approval and required Government clearances. Overall Project progress reports will be submitted to ADB on a quarterly basis, and other required project performance and monitoring reports (including environmental monitoring) will be submitted on a twice per year basis.

12. The PMO will provide guidelines and will assist PIUs in undertaking required social assessments (including IP issues) for subprojects. With technical assistance from the PMO, the PIUs (further elaborated in the following section), where required, will be responsible for preparing IPDPs for subprojects, and will submit IPDPs to the PMO, IAs and EA for review and approval. Approved IPDPs will be provided to ADB's India Resident Mission (PRM) for review and approval prior to implementation.

13. The IPDP policy framework is based on the overall local and national development strategies and ADB's *Policy on Indigenous Peoples* (1998). The principal objectives are to:

- (i) ensure IPs affected by any subproject will benefit from the Project;
- (ii) ensure IPs inclusion in the entire process of preparation, implementation, and monitoring of Project activities;
- (iii) ensure benefits of the subprojects are available to IPs more than or at least equal to other affected groups; this may require giving preference to IPs as vulnerable groups over others on certain benefits under the Project; and
- (iv) provide a base for IPs in the area to receive adequate development attention.

D. Procedures for IPDP Preparation

14. This framework seeks to ensure that IPs are informed, consulted, and mobilized to participate in the subprojects. Their participation can either provide them benefits with more certainty, or protect them from any potential adverse impacts of the subproject. The main features of the IPDP will be a preliminary screening process, a social impact assessment to determine the degree and nature of impact of each subproject, and an action plan developed if warranted. Consultations with and participation of IP communities, their leaders, and local government representatives will be an integral part of the overall IPDP.¹⁵

1. Preliminary Screening

15. The PIUs will visit all IP communities and villages near subproject sites or areas being affected and influenced by subproject sites. The PIUs will arrange public meetings in selected communities to provide information on the Project and the subproject. During the visits, community leaders and other participants will present their views with regard to the Project and subproject.

¹⁵ The IPDPs components are: preliminary screening, social impact assessment, mitigation measures, development assistance, and project monitoring.

16. At this visit, the PIU will undertake a screening for IP populations with the help of IP community leaders and local leaders. The screening will check for the following:

- (i) Name(s) of IP community group(s) in the area;
- (ii) Total number of IP community groups in the area;
- (iii) Percentage of IP community population to that of area population; and
- (iv) Number and percentage of IP households to be affected by the subproject site.

17. The PIU will also accomplish an IP assessment checklist. The results of the preliminary screening will be provided to the PMO for review as part of the pre-feasibility assessment of the subproject. If the results show that there are IP households in the zone of influence of the proposed Project, a social impact assessment (SIA) will be planned for those areas.

2. Social Impact Assessment

18. The PIU, with technical assistance from PMO, will undertake an SIA as part of the detailed technical feasibility report. The SIA will gather relevant information on demographic data; social, cultural, and economic situation; and both positive and negative social, cultural and economic impacts.

19. Information will be gathered through separate group meetings within the IP community, including IP leaders; group of IP men and women, especially those who live in the zone of influence of the proposed work under the subproject. Discussions will focus on positive and negative impacts of the subproject as well as recommendations on the design of the subproject and Project. The PMO will be responsible for analyzing the SIA and for leading the development of an action plan with the IP community leaders. If the SIA indicates that the potential impact of the proposed subproject will be significantly adverse—threatening the cultural practices and IP sources of livelihood, or that the IP community rejects the Project works—the PIU in consultation with the PMO will consider other design options to minimize such adverse impacts. If IP communities support the subproject, implementation of an IPDP will be developed.

3. Indigenous Peoples Development Plan

20. The action plan will consist of a number of activities and will include mitigation measures of potentially negative impacts, modification of project design, and development assistance. Where there is land acquisition in IP communities, the Project will ensure their rights will not be violated and that they be compensated for the use of any part of their land in a manner that is culturally acceptable to the affected IPs.¹⁶ The IPDP will include:

- (i) Baseline data,
- (ii) Land tenure information,
- (iii) Local participation,
- (iv) Technical identification of development or mitigation activities,

¹⁶ The compensation will follow the Resettlement Framework of the Project.

- (v) Institutional arrangement,
- (vi) Implementation schedule,
- (vii) Monitoring and evaluation, and
- (viii) Cost estimate and financing plan.

21. Where warranted, the IPDP will be developed by the PIU with technical assistance from the PMO, and the IPDP will form part of the final feasibility report for the subproject. The PMO, IAs and EA will then review and approve the IPDP and provide the approved IPDP to INRM for review and approval. The IPDP policy and measures must comply with ADB's *Policy on Indigenous Peoples* (1998).

E. Consultation and Information Disclosure

22. The IPDP will be prepared in consultation with the affected IP groups. The mitigation measures and strategies will be presented to them by the PIU, with technical assistance from the PMO and consultants, in community level workshops. Inputs from the community level workshops will be considered in subproject design and the final IPDP. The IPDP will be translated into local IP language(s) prior to implementation.

23. Nongovernmental organizations will be involved in implementing the IPDP and resolution of any dispute arising out of the implementation process. The EA will further ensure that adequate budget will be available to implement the IPDP.

F. Institutional Framework

24. In the preparation of subproject IPDPs, the PMO will have overall coordination and financing responsibilities. The PMO through the relevant PIUs and in coordination with the relevant IA will prepare, implement, and monitor the IPDP. Since IP issues are sensitive, the PMO will ensure that a consultant with knowledge and experience of working among IP groups is available for assisting in the planning and implementation of IPDPs for the Project. The PMO will ensure that the consultant hired to assist the PIU in planning and implementation of IPDPs for subprojects is familiar with ADB policy and requirements for IPDPs.

G. IPDP Budget

25. The EA will provide sufficient resources to formulate IPDPs in subprojects which will have impacts on IPs. It will implement the IPDP through PIUs. A detailed budget will be prepared by the PIU taking into account all activities associated with the formulation and implementation of IPDPs. Each IPDP will have its own budget. Such budgets will be an integral part of the project cost, and will be made available during project implementation.

H. Monitoring and Evaluation

26. Implementation of the IPDP will be monitored regularly. The PIU will establish a quarterly monitoring system involving the PIU staff, representative of affected IP groups, and nongovernmental and community-based organizations to ensure participatory monitoring arrangements. A set of monitoring indicators will be determined during IPDP implementation.

The PIU will also prepare appropriate monitoring formats for effective internal and external monitoring and reporting requirements. Independent monitoring will be undertaken through nongovernmental or community-based organizations engaged by the EA/PMO with INRM concurrence to carry out external monitoring of the IPDP operations for the whole Project. Monitoring will be carried out twice a year during project implementation. These reports will be submitted to the EA and INRM for review. The EA through the PMO will be responsible for determining if any follow-up actions are necessary and ensuring any necessary actions are taken regarding the implementation of IPDPs.

ANNEX 3 TO SCHEDULE 5

ENVIRONMENTAL ASSESSMENT FRAMEWORK

Note: During preparation of each PFR, this Framework will be reviewed to assess whether it needs to be updated to reflect (i) changes in Pakistan and ADB's policies and applicable regulations; (ii) institutional arrangements; and (iv) any other. Standards agreed in the Framework will not be lowered. Any change will be reflected in a revised Framework in consultation and agreement with ADB.

A. INTRODUCTION

1. Government of Pakistan (GoP) has requested the Asian Development Bank (ADB) to provide a multi-tranche financing facility (MFF) to facilitate investments in renewable energy (RE). The RE Investment Program is part of the GoP long term energy security strategy. The proposed ADB's intervention will finance new investments in RE, develop feasibility studies of new sites for future investments by the public sector, and assist capacity building of sector related agencies. The Investment Program will cover various RE development activities in all parts of the Pakistan. These include hydropower projects, wind power projects, solar power projects, and biomass projects.

2. The first batch of investments includes various activities (e. g. generation, equipment, power evacuation, safeguard issues, capacity building and feasibility studies) related to development of eight (8) core subprojects for small to medium hydropower development. For each core subproject initial environmental examinations (IEE) were completed following ADB's *Environment Policy, 2002* and *Environmental Assessment Guidelines, 2003* and GoP's environmental assessment regulations and guidelines. Based on these IEEs, a summary IEE (SIEE) with environmental management plan (EMP) with a budget has been prepared for the first batch of subprojects.

3. This Environmental Assessment Framework has been prepared for additional subprojects as required under ADB policy for sector lending. The Framework identifies the broad scope of the project and outlines the policy, procedures and institutional requirements for preparing subsequent sub-projects under the sector loan. The Implementing Agency for the future subprojects will be responsible for preparing environmental assessment and implementing EMPs for subprojects as outlined in this framework and submit to ADB for review and approval prior to commencement of work/finalization of contracts. In the absence of a policy consistent with ADB's policy on environment, this framework and environmental management procedural guidelines shall apply to all subprojects under the loan so as to ensure that the environmental issues are appropriately addressed and mitigated to acceptable levels.

B. ENVIRONMENTAL REGULATORY AND POLICY FRAMEWORK FOR SUBPROJECT SELECTION

4. The environmental regulations of the GoP¹⁷ categorizes development projects into two lists according to their anticipated potential environmental impact. The proponents of projects that are not likely to have significant adverse impacts are required to submit an IEE for their respective projects, whereas for projects that are likely to have adverse environmental impact,

¹⁷ The Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environmental Impact Assessment Regulations, 2000.

the proponents are required to submit an environmental impact assessment (EIA) to the respective provincial Environmental Protection Agency (EPA). Renewable energy, in general, is not included in either of the IEE or EIA list. However, hydropower electric generation requires an IEE if the capacity of the project is less than 50 MW and an EIA if the capacity is greater than 50 MW. Similarly, waste-to-energy projects also require an IEE, irrespective of the size.

5. RE projects normally are classified as Category B under the ADB's classification of environmental impacts. Under the MFF, sector loan procedures for safeguards implementation are followed, with an environmental assessment of each subproject undertaken following Asian Development Bank's (ADB) Environment Policy, 2002, and Environmental Assessment Guidelines, 2003 and GoP's environmental assessment guidelines and regulations.

C. Environmental criteria for additional subproject selection

6. Potential adverse environmental impacts associated with RE projects can be avoided or minimized through careful route and site selection. Specific environmental criteria for subproject selection are:

- (i) The environmental assessment of the subprojects will be conducted according to the ADB's Environment Policy, 2002 and Environmental Assessment Guidelines, 2003, the GOP's environmental assessment regulations and guidelines, and the Environmental Assessment Framework (EAF).
- (ii) The future subprojects will not be located within national parks and wildlife sanctuaries
- (iii) Monuments of cultural or historical importance will be avoided
- (iv) An environmental management plan (EMP) with adequate budget will be developed for each subproject.
- (v) Potential environmental impacts associated with the subprojects will be minimized by re-alignment or selection of alternative sites
- (vi) Clearing of any existing forest resources will be avoided if possible, and where unavoidable will be minimized and compensated.
- (vii) For hydropower projects, a minimum residual flow in the rivers and canals will be determined and such flow will be maintained throughout the operational life of subprojects

D. Environmental assessment and review procedures of additional subprojects

1. Application of selection criteria

7. Any additional subproject not meeting the criteria listed above will be rejected. A final check on conformity with the selection criteria will be the submission of detailed IEE of additional subprojects for ADB's clearance.

2. Environmental classification

8. Environmental categorization process using checklist approach in compliance with the ADB *Environmental Assessment Guidelines, 2003* will be applied.

3. Preparation of Environmental Assessments

9. After identifying the categories of the additional subprojects, an IEE/SIEE including an EMP of each subproject, will be conducted. At least one public consultation will be conducted

with local community and potentially affected people for each subproject IEE. IEE will be approved before commencement of detailed design while IEE results will be communicated to the local community before commencement of construction. Any category "A" subprojects will require a full environmental impact assessment (EIA), 2 public rounds of consultation, and a summary EIA (SEIA) will be made available to general public at least 120 days before the subproject approval by ADB.¹⁸

4. Responsibilities /Authorities of various agencies

10. The IA will be solely responsible for the implementation of the entire environmental assessment and review procedures of selecting additional subprojects. This include, among others, ensuring that the selection criteria are adhered to strictly, the preparation of IEE/SIEEs be done in a timely and adequate manner, environmental monitoring and institutional requirements be fully met while public consultations be carried out satisfactorily. The IA will submit the categorization checklist and IEE/SIEEs and monitoring reports to ADB for review.

11. The IA will also be responsible to submit the IEEs for regulatory approval of the relevant provincial environmental protection agency and obtain approval as per the regulatory requirements of the GOP.

12. ADB will be responsible for regular review and timely approval of subproject checklists and IEE/SIEEs. Technical guidance will be provided by ADB to IAs if needed. ADB will also be responsible for reviewing regular monitoring reports and officially disclosing the IEEs for selected subprojects on its website.

5. Preparation of detailed design

13. Detailed design work for each additional subproject will follow the recommendations of the IEE. The IA will vet detailed designs before contracts are finalized and modifications are incorporated if considered necessary. Certification to ADB that the detailed designs comply with IEE (including EMP) recommendations will be required before contracts can be made effective.

6. Preparation of construction contracts

14. Early in the implementation period, model construction contracts will be prepared incorporating general environmental safeguards and practices. Specific, individual contracts will be based on the model contracts, but vetted by the IA to ensure that any special or particular safeguard recommended by the IEE (including EMP) for the particular additional subproject is incorporated within the contract.

7. Monitoring during the construction period

15. Monitoring during construction will be IA's responsibility. Monitoring will relate to compliance with construction contracts, the state and health of the environmental resource, and the effectiveness of mitigation measures. Reporting will be to ADB and the relevant EPA, on a regular basis.

8. Monitoring of subproject operations

16. Although it is desirable to the EMP is formulated in such a way so as to minimize recurrent responsibilities and costs in circumstances where staff, expertise and finances are limited, some aspects of additional subproject design may require continuous monitoring to guard against negative environmental impacts.

¹⁸ This procedure will also apply to Category "B Sensitive" subprojects, except only an IEE and SIEE are required.

E. Environmental management plan

17. Table 1 presents environmental management plan in matrix form that will apply to additional subprojects. The matrix is developed on the basis of environmental analysis of core subprojects and review of environmental impacts of typical RE projects. The mitigation measures for the additional subprojects will be developed on the in the spirit of the principles agreed upon in this EMP framework. Any unanticipated consequence of the project will be documented.

Table 1: Environmental Management Plan

| <i>Project activity /stage</i> | <i>Subproject type of component</i> | <i>Potential impact</i> | <i>Proposed mitigation measure</i> | <i>Parameter to be monitored</i> | <i>Measurement and frequency</i> | <i>Institutional responsibility</i> | <i>Implementation schedule</i> |
|--|-------------------------------------|--|--|--|---|-------------------------------------|--|
| A - Pre-construction | | | | | | | |
| Location of Facilities | Transmission line | Exposure to safety related risks | Setback of dwellings to overhead line route designed in accordance with permitted level of power frequency and the regulation of supervision at sites. | Tower location and line alignment selection with respect to nearest dwellings | Setback distances to nearest houses - once | IA | Part of tower siting survey and detailed alignment survey and design |
| | | Impact on water bodies and land | Consideration of tower location at where they could be located to avoid water bodies or agricultural land. | Tower location and line alignment selection (distance to water and/or agricultural land) | Consultation with local authorities and land owners - once | IA | Part of tower siting survey and detailed alignment survey and design |
| | | Social inequities | Careful route selection to avoid existing settlements | Tower location and line alignment selection (distance to nearest dwellings or social institutions) | Consultation with local authorities and land owners - once | IA | Part of detailed tower siting and alignment survey and design |
| | | | Minimise need to acquire agricultural land | Tower location and line alignment selection (distance to agricultural land) | Consultation with local authorities and land owners - once | IA | Part of detailed tower siting and alignment survey and design |
| Equipment specifications and design parameters | All plant equipment | Release of chemicals and gases in receptors (air, water, land) | PCBs not used in facility equipment. | Transformer design | Exclusion of PCBs in transformers stated in tender specification - once | IA | Part of tender specifications for the equipment |
| | | | Processes, equipment and systems not to use chlorofluorocarbons (CFCs), including halon | Process, equipment and system design | Exclusion of CFCs stated in tender specification – once | IA | Part of tender specifications for the equipment |
| Transmission line design | Transmission line | Exposure to electromagnetic interference | Transmission line design to comply with the limits of electromagnetic interference from overhead power lines | Electromagnetic field strength for proposed line design | Line design compliance with relevant standards - once | IA | Part of detailed alignment survey and design |
| Equipment location and design | Substation, wind turbines | Exposure to noise, Nuisance to | Design of plant to comply with noise | Expected noise based emissions | Compliance with regulations – once | IA | Part of detailed siting survey and |

| <i>Project activity /stage</i> | <i>Subproject type of component</i> | <i>Potential impact</i> | <i>Proposed mitigation measure</i> | <i>Parameter to be monitored</i> | <i>Measurement and frequency</i> | <i>Institutional responsibility</i> | <i>Implementation schedule</i> |
|--|-------------------------------------|--|--|---|---|-------------------------------------|--|
| | | neighboring properties | regulations and World Bank guidelines | on plant design | Noise levels to be specified in tender documents - once | | equipment design |
| Involuntary resettlement or land acquisition | All facilities | Social inequities | Compensation paid for temporary/ permanent loss of productive land as per Land Acquisition Act and its process | RAP implementation | Consultation with affected parties – once in a quarter | IA | Prior to construction phase |
| Encroachment into protected area | All facilities | Loss of precious ecological values/ damage to precious species | Avoid encroachment by careful site and alignment selection | Distance to nearest designated ecological protection area | Consultation with local authorities, Wildlife Department and design engineer - once | IA | Part of detailed siting and alignment survey /design |
| Encroachment into precious ecological areas | All facilities | Loss of precious ecological values/ damage to precious species | Avoid encroachment by careful site and alignment selection | Tower location and line alignment selection (distance to nearest designated ecological protection area) | Consultation with local authorities, Wildlife Department and design engineer - once | IA | Part of detailed siting and alignment survey /design |
| Encroachment into forest | All facilities | Deforestation and loss of biodiversity | Avoid encroachment by careful site and alignment selection | Distance to nearest protected or reserved forest | Consultation with local authorities - once | IA | Part of detailed siting and alignment survey/design |
| | | | Minimise the need by using existing RoW, wherever possible | | Consultation with local authorities and design engineers - once | | |
| | | | Obtain statutory clearances from the Government | Statutory approvals from Government | Compliance with regulations – once for each subproject | | |
| Encroachment into farmland | All facilities | Loss of agricultural productivity | Avoid siting facilities on farmland wherever feasible | Facility location | Consultation with local authorities and design engineers - once | | Part of detailed siting and alignment survey /design |
| | | | Farmers compensated for any permanent loss of productive land | Implementation of Crop Compensation (based on affected area) | Consultation with affected parties – once in a quarter | | Prior to construction phase |
| | | | Farmers/landowners compensated for significant trees that need to be trimmed/ removed along RoW. | Implementation of Tree compensation (estimated area to be trimmed/removed) | Consultation with affected parties – once in a quarter | | Prior to construction phase |
| Interference with drainage | All facilities | Flooding hazards/loss of | Appropriate siting of facilities to avoid | Distance to nearest flood zone, | Consultation with local authorities | IA | Part of detailed alignment survey |

| <i>Project activity /stage</i> | <i>Subproject type of component</i> | <i>Potential impact</i> | <i>Proposed mitigation measure</i> | <i>Parameter to be monitored</i> | <i>Measurement and frequency</i> | <i>Institutional responsibility</i> | <i>Implementation schedule</i> |
|-----------------------------------|-------------------------------------|--|---|--|--|---|--|
| patterns/Irrigation channels | | agricultural production | channel interference | irrigation channel | and design engineers - once | | and design |
| Escape of polluting materials | All plant equipment | Environmental pollution | Equipment designed with oil spill containment systems, and purpose-built oil, lubricant and fuel storage system, complete with spill cleanup equipment. | Equipment specifications with respect to potential pollutants | Tender document to mention specifications - once | IA | Part of detailed equipment design /drawings |
| | | | Facilities to include drainage and sewage disposal systems to avoid offsite land and water pollution. | Sewage design | Tender document to mention detailed specifications - once | IA | Part of detailed layout and design /drawings |
| Equipment submerged under flood | All plant equipment | Contamination of receptors (land, water) | Appropriate siting and facilities constructed above the high flood level (HFL) by raising the foundation pad. | Facility design to account for HFL (elevation with respect to HFL elevation) | Base height as per flood design - once | IA | Part of detailed layout and design /drawings |
| Explosions/Fire | All facilities | Hazards to life | Design of facilities to include modern fire control systems/firewalls. | Design compliance with fire prevention and control codes | Tender document to mention detailed specifications - once | IA | Part of detailed layout and design /drawings |
| Residual flow | High-head hydro power plant | Reduction in available water for existing uses | Plant design to account for existing needs and ensure residual flow | Residual flow | Tender document to mention detailed specifications - once | IA | Part of detailed layout and design /drawings |
| Plant siting | Wind farms | Impact on bird population | Wind farm not to be located in close proximity of known bird habitat and fly path | Distance to bird habitat | Consultation with wildlife authorities - once | IA | Part of detailed layout and design /drawings |
| Plant siting | Wind farms | Visual impact | Wind farms not to be located in areas with potential tourist activities | Appropriate assessment of visual impact | Consultation with local authorities - once | IA | Part of detailed layout and design /drawings |
| Construction | | | | | | | |
| Equipment layout and installation | All facilities | Noise and vibrations | Construction techniques and machinery selection seeking to minimize ground disturbance. | Construction techniques and machinery | Construction techniques and machinery creating minimal ground disturbance - once at the start of each construction phase | IA (Contractor through contract provisions) | Construction period |

| <i>Project activity /stage</i> | <i>Subproject type of component</i> | <i>Potential impact</i> | <i>Proposed mitigation measure</i> | <i>Parameter to be monitored</i> | <i>Measurement and frequency</i> | <i>Institutional responsibility</i> | <i>Implementation schedule</i> |
|---|-------------------------------------|---|---|---|--|---|--------------------------------|
| Physical construction | All facilities | Disturbed farming activity | Construction activities on cropping land timed to avoid disturbance of field crops (within one month of harvest wherever possible). | Timing of start of construction | Crop disturbance – Post harvest as soon as possible but before next crop - once per site | IA (Contractor through contract provisions) | Construction period |
| Mechanized construction | All facilities | Noise, vibration and operator safety, efficient operation | Construction equipment to be well maintained. | Construction equipment – estimated noise emissions | Complaints received by local authorities - every 2 weeks | IA (Contractor through contract provisions) | Construction period |
| | All facilities | Noise, vibration, equipment wear and tear | Turning off plant not in use. | Construction equipment – estimated noise emissions and operating schedules | Complaints received by local authorities - every 2 weeks | IA (Contractor through contract provisions) | Construction period |
| Construction of roads for accessibility | All facilities | Increase in airborne dust particles | Existing roads and tracks used for construction and maintenance access to the line wherever possible. | Access roads, routes (length and width of new access roads to be constructed) | Use of established roads wherever possible - every 2 weeks | IA (Contractor through contract provisions) | Construction period |
| | All facilities | Increased land requirement for temporary accessibility | New access ways restricted to a single carriageway width within the RoW. | Access width (meters) | Access restricted to single carriageway width within RoW - every 2 weeks | IA (Contractor through contract provisions) | Construction period |
| Temporary blockage of utilities | All facilities | Overflows, reduced discharge | Temporary placement of fill in drains/canals not permitted. | Temporary fill placement (m ³) | Absence of fill in sensitive drainage areas - every 4 weeks | IA (Contractor through contract provisions) | Construction period |
| Site clearance | All facilities | Vegetation | Marking of vegetation to be removed prior to clearance, and strict control on clearing activities to ensure minimal clearance. | Vegetation marking and clearance control (area in m ²) | Clearance strictly limited to target vegetation - every 2 weeks | IA (Contractor through contract provisions) | Construction period |
| Trimming/cutting of trees within RoW | All facilities | Fire hazards | Trees allowed growing up to a height within the RoW by maintaining adequate clearance between the top of tree and the conductor as per the regulations. | Species-specific tree retention as approved by statutory authorities (average and maximum tree height at maturity, in meters) | Presence of target species in RoW following vegetation clearance – once per site | IA (Contractor through contract provisions) | Construction period |

| <i>Project activity /stage</i> | <i>Subproject type of component</i> | <i>Potential impact</i> | <i>Proposed mitigation measure</i> | <i>Parameter to be monitored</i> | <i>Measurement and frequency</i> | <i>Institutional responsibility</i> | <i>Implementation schedule</i> |
|--------------------------------|-------------------------------------|---|--|---|--|---|--------------------------------|
| | All facilities | Loss of vegetation and deforestation | Trees that can survive pruning to comply should be pruned instead of cleared. | Species-specific tree retention as approved by statutory authorities | Presence of target species in RoW following vegetation clearance – once per site | IA (Contractor through contract provisions) | Construction period |
| | All facilities | | Felled trees and other cleared or pruned vegetation to be disposed of as authorized by the statutory bodies. | Disposal of cleared vegetation as approved by the statutory authorities (area cleared in m ²) | Use or intended use of vegetation as approved by the statutory authorities – once per site | IA (Contractor through contract provisions) | Construction period |
| Wood/vegetation harvesting | All facilities | Loss of vegetation and deforestation | Construction workers prohibited from harvesting wood in the project area during their employment, (apart from locally employed staff continuing current legal activities). | Illegal wood /vegetation harvesting (area in m ² , number of incidents reported) | Complaints by local people or other evidence of illegal harvesting - every 2 weeks | IA (Contractor through contract provisions) | Construction period |
| Surplus earthwork/soil | All facilities | Runoff to cause water pollution, solid waste disposal | Soil excavated from tower footings disposed of by placement along roadsides, or at nearby house blocks if requested by landowners. | Soil disposal locations and volume (m ³) | Acceptable soil disposal sites - every 2 weeks | IA (Contractor through contract provisions) | Construction period |
| Facility construction | All facilities | Loss of soil | Fill for the facility foundations obtained by creating or improving local water supply ponds or drains, with the agreement of local communities. | Borrow area siting (area of site in m ² and estimated volume in m ³) | Acceptable borrow areas that provide a benefit - every 2 weeks | IA (Contractor through contract provisions) | Construction period |
| Facility construction | All facilities | Water pollution | Construction activities involving significant ground disturbance (i.e. land forming) not undertaken during the monsoon season. | Seasonal start and finish of major earthworks (pH, BOD/COD, Suspended solids) | Timing of major disturbance activities - prior to start of construction activities | IA (Contractor through contract provisions) | Construction period |

| <i>Project activity /stage</i> | <i>Subproject type of component</i> | <i>Potential impact</i> | <i>Proposed mitigation measure</i> | <i>Parameter to be monitored</i> | <i>Measurement and frequency</i> | <i>Institutional responsibility</i> | <i>Implementation schedule</i> |
|--|-------------------------------------|---|---|---|--|---|--------------------------------|
| Site clearance | All facilities | Vegetation | Tree clearances for easement establishment to only involve cutting trees off at ground level or pruning as appropriate, with tree stumps and roots left in place and ground cover left undisturbed. | Ground disturbance during vegetation clearance (area, m ²) | Amount of ground disturbance - every 2 weeks | IA (Contractor through contract provisions) | Construction period |
| | All facilities | | | Statutory approvals | Statutory approvals for tree clearances – once for each site | IA (Contractor through contract provisions) | Construction period |
| Facility construction – disposal of surplus earthwork/fill | All facilities | Waste disposal | Excess fill from foundation excavation disposed of next to roads or around houses, in agreement with the local community or landowner. | Location and amount (m ³) of fill disposal | Appropriate fill disposal locations - every 2 weeks | IA (Contractor through contract provisions) | Construction period |
| Storage of chemicals and materials | All facilities | Contamination of receptors (land, water, air) | Fuel and other hazardous materials securely stored above high flood level. | Location of hazardous material storage; spill reports (type of material spilled, amount (kg or m ³) and action taken to control and clean up spill) | Fuel storage in appropriate locations and receptacles - every 2 weeks | IA (Contractor through contract provisions) | Construction period |
| Construction schedules | All facilities | Noise nuisance to neighbouring properties | Construction activities only undertaken during the day and local communities informed of the construction schedule. | Timing of construction (noise emissions, [dB(a)]) | Daytime construction only - every 2 weeks | IA (Contractor through contract provisions) | Construction period |
| Provision of facilities for construction workers | All facilities | Contamination of receptors (land, water, air) | Construction workforce facilities to include proper sanitation, water supply and waste disposal facilities. | Amenities for Workforce facilities | Presence of proper sanitation, water supply and waste disposal facilities - once each new facility | IA (Contractor through contract provisions) | Construction period |

| <i>Project activity /stage</i> | <i>Subproject type of component</i> | <i>Potential impact</i> | <i>Proposed mitigation measure</i> | <i>Parameter to be monitored</i> | <i>Measurement and frequency</i> | <i>Institutional responsibility</i> | <i>Implementation schedule</i> |
|----------------------------------|-------------------------------------|--|--|---|--|---|--------------------------------|
| Encroachment into farmland | All facilities | Loss of agricultural productivity | Use existing access roads wherever possible | Usage of existing utilities | Complaints received by local people /authorities - every 2 weeks | IA (Contractor through contract provisions) | Construction period |
| | | | Ensure existing irrigation facilities are maintained in working condition | Status of existing facilities | | | |
| | | | Protect /preserve topsoil and reinstate after construction completed | Status of facilities (earthwork in m ³) | | | |
| | | | Repair /reinstate damaged bunds etc after construction completed | Status of facilities (earthwork in m ³) | | | |
| | | Social inequities | Compensation for temporary loss in agricultural production | Implementation of Crop compensation (amount paid, dates, etc.) | Consultation with affected parties – once in a quarter | IA | Prior to construction |
| Uncontrolled erosion/silt runoff | All facilities | Soil loss, downstream siltation; | Need for access tracks minimised, use of existing roads. | Design basis and construction procedures (suspended solids in receiving waters; area re-vegetated in m ² ; amount of bunds constructed [length in meter, area in m ² , or volume in m ³]) | Incorporating good design and construction management practices – once for each site | IA (Contractor through contract provisions) | Construction period |
| | | | Limit site clearing to work areas | | | | |
| | | | Regeneration of vegetation to stabilise works areas on completion (where applicable) | | | | |
| | | | Avoidance of excavation in wet season | | | | |
| | | | Water courses protected from siltation through use of bunds and sediment ponds | | | | |
| Nuisance to nearby properties | All facilities | Losses to neighbouring land uses/ values | Contract clauses specifying careful construction practices. | Contract clauses | Incorporating good construction management practices – once for each site | IA (Contractor through contract provisions) | Construction period |
| | | | As much as possible existing access ways will be used. | Design basis and layout | Incorporating good design engineering practices – once for each site | | |

| <i>Project activity /stage</i> | <i>Subproject type of component</i> | <i>Potential impact</i> | <i>Proposed mitigation measure</i> | <i>Parameter to be monitored</i> | <i>Measurement and frequency</i> | <i>Institutional responsibility</i> | <i>Implementation schedule</i> |
|--|-------------------------------------|--|--|--|---|---|--------------------------------|
| | | | Productive land will be reinstated following completion of construction | Reinstatement of land status (area affected, m ²) | Consultation with affected parties – twice – immediately after completion of construction and after the first harvest | | |
| | | Social inequities | Compensation will be paid for loss of production, if any. | Implementation of Tree/Crop compensation (amount paid) | Consultation with affected parties – once in a quarter | IA | Prior to construction |
| Flooding hazards due to construction impediments of natural drainage | All facilities | Flooding and loss of soils, contamination of receptors (land, water) | Avoid natural drainage pattern /facilities being disturbed /blocked /diverted by the on-going construction activities | Contract clauses (e.g., suspended solids and BOD/COD in receiving water) | Incorporating good construction management practices – once for each site | IA (Contractor through contract provisions) | Construction period |
| Equipment submerged under flood | All facilities | Contamination of receptors (land, water) | Equipment stored at secure place above the high flood level (HFL). | Store room level to be above HFL (elevation difference in meters) | Store room level as per flood design - once | IA | Construction period |
| Canal closure and diversion, river diversion | Hydel project | Reduction of water supply to community to meet their existing needs | Ensure minimum supply | Water flow | Water flow (m ³ /day) – weekly average | IA | Construction period |
| Inadequate siting of borrow areas | All facilities | Loss of land values | Existing borrow sites will be used to source aggregates, therefore, no need to develop new sources of aggregates | Contract clauses | Incorporating good construction management practices – once for each site | IA (Contractor through contract provisions) | Construction period |
| Community safety | All facilities | Injury to members of the public due to fall into borrow pit | Depth of borrow pit to be limited to safe limit, provision of fall protection fencing where depth is excessive, contouring of pit after completion of work | Depth of borrow pit (in meters compared to surrounding land) | All borrow pit – once per week | IA (Contractor through contract provisions) | Construction period |
| Health and safety | All facilities | Injury and sickness of workers and members of the public | Contract provisions specifying minimum requirements for construction camps | Contract clauses (number of incidents and total lost-work days) | Contract clauses compliance – once every quarter | IA (Contractor through contract provisions) | Construction period |

| <i>Project activity /stage</i> | <i>Subproject type of component</i> | <i>Potential impact</i> | <i>Proposed mitigation measure</i> | <i>Parameter to be monitored</i> | <i>Measurement and frequency</i> | <i>Institutional responsibility</i> | <i>Implementation schedule</i> |
|---|-------------------------------------|---|---|--|---|-------------------------------------|--|
| | | | Contractor to prepare and implement a health and safety plan. | caused by injuries and sickness) | | | |
| | | | Contractor to arrange for health and safety training sessions | | | | |
| Inadequate construction stage monitoring | All facilities | Likely to maximise damages | Training of IA environmental monitoring personnel | Training schedules | Number of programs attended by each person – once a year | IA | Routinely throughout construction period |
| | | | Implementation of effective environmental monitoring and reporting system using checklist of all contractual environmental requirements | Respective contract checklists and remedial actions taken thereof. | Submission of duly completed checklists of all contracts for each site - once | | |
| | | | Appropriate contract clauses to ensure satisfactory implementation of contractual environmental mitigation measures. | Compliance report related to environmental aspects for the contract | Submission of duly completed compliance report for each contract - once | | |
| Operation and Maintenance | | | | | | | |
| Oil spillage | All facilities | Contamination of land/nearby water bodies | Oil storage facilities located within secure and impervious bunded areas with a storage capacity of at least 120% of the capacity of tank | Facility bunding All oil storage within bunded area | Bunding capacity and permeability - once | IA | During operations |
| Inadequate provision of staff/workers health and safety during operations | All facilities | Injury and sickness of staff /workers | Careful design using appropriate technologies to minimise hazards | Usage of appropriate technologies (lost work days due to illness and injuries) | Preparedness level for using these technologies in crisis – once each year | IA | Design and operation |
| | | | Safety awareness raising for staff. | Training/awareness programs and | Number of programs and | | |

| <i>Project activity /stage</i> | <i>Subproject type of component</i> | <i>Potential impact</i> | <i>Proposed mitigation measure</i> | <i>Parameter to be monitored</i> | <i>Measurement and frequency</i> | <i>Institutional responsibility</i> | <i>Implementation schedule</i> |
|--|-------------------------------------|---|--|--|--|-------------------------------------|--------------------------------|
| | | | Preparation of fire emergency action plan and training given to staff on implementing emergency action plan | mock drills | percent of staff /workers covered – once each year | | |
| | | | Provide adequate sanitation and water supply facilities | Provision of facilities | Complaints received from staff /workers every 2 weeks | | |
| Electric Shock Hazards | All facilities | Injury/mortality to staff and public | Careful design using appropriate technologies to minimise hazards | Usage of appropriate technologies (number of injury incidents, lost work days) | Preparedness level for using these technologies in crisis – once a month | IA | Design and Operation |
| | | | Security fences around facility | Maintenance of fences | Report on maintenance – every 2 weeks | | |
| | | | Barriers to prevent climbing on/dismantling of transmission towers | Maintenance of barriers | | | |
| | | | Appropriate warning signs on facilities | Maintenance of warning signs | | | |
| | | | Electricity safety awareness raising in project areas | Training /awareness programs and mock drills for all concerned parties | Number of programs and percent of total persons covered – once each year | | |
| Operations and maintenance staff skills less than acceptable | All facilities | Unnecessary environmental losses of various types | Adequate training in O&M to all relevant staff of facility maintenance crews. | Training/awareness programs and mock drills for all relevant staff | Number of programs and percent of staff covered – once each year | IA | Operation |
| | | | Preparation and training in the use of O&M manuals and standard operating practices. | | | | |
| Inadequate periodic environmental monitoring. | All facilities | Diminished ecological and social values. | Power Grid staff to receive training in environmental monitoring of project operations and maintenance activities. | Training/awareness programs and mock drills for all relevant staff | Number of programs and percent of staff covered – once each year | IA | Operation |
| | | | | | | | |

| <i>Project activity /stage</i> | <i>Subproject type of component</i> | <i>Potential impact</i> | <i>Proposed mitigation measure</i> | <i>Parameter to be monitored</i> | <i>Measurement and frequency</i> | <i>Institutional responsibility</i> | <i>Implementation schedule</i> |
|--|-------------------------------------|--|--|--------------------------------------|---|-------------------------------------|--------------------------------|
| Equipment specifications and design parameters | All facilities | Release of chemicals and gases in receptors (air, water, land) | Processes, equipment and systems using chlorofluorocarbons (CFCs), including halon, should be phased out and to be disposed of in a manner consistent with the requirements of the Government. | Process, equipment and system design | Phase out schedule to be prepared in case still in use – once in a quarter | IA | Operations |
| Transmission line maintenance | All facilities | Exposure to electromagnetic interference | Transmission line design to comply with the limits of electromagnetic interference from overhead power lines | Required ground clearance (meters) | Ground clearance - once | IA | Operations |
| Noise related | All facilities | Nuisance to neighbouring properties | Facility sited and designed to ensure noise will not be a nuisance. | Noise levels (dB(a)) | Noise levels at boundary nearest to properties and consultation with affected parties if any - once | IA | Operations |
| Residual flow | High-head hydel power plant | Reduction in available water for existing uses | Plant design to account for existing needs and ensure residual flow | Water flow | Water flow (m ³ /day) – weekly average | IA | Operations |

18. Environmental monitoring will consist of routine systematic checking that the above environmental management measures have been implemented effectively during each stage of the project. Table 2 presents the summary monitoring plan for the Project. Table 3 presents the indicative estimated costs for EMP implementation of the core subprojects.

Table 2: Summary Environmental Monitoring Plan

| Environmental Monitoring Tasks¹⁹ | Implementation Responsibility | Implementation Schedule |
|---|---|---|
| Pre Construction Phase | | |
| Audit project bidding documents to ensure EMP is included. | IA through project implementation unit | Prior to issue of bidding documents. |
| Monitor contractor's detailed alignment survey to ensure relevant environmental mitigation measures in EMP have been included. | IA with assistance of project implementation unit | Prior to IA approval of contractor's detailed alignment survey. |
| Audit detailed designs of Facilities to ensure standard environmental safeguards/mitigation measures (as identified in EMP) have been included. | IA with assistance of project implementation unit | Prior to IA approval of contractor's detailed designs. |
| Construction Phase | | |
| Regular monitoring and reporting of contractor's compliance with contractual environmental mitigation measures. | IA with assistance of project implementation unit | Continuous throughout construction period. |
| Operation and Maintenance Phase | | |
| Observations during routine maintenance inspections of facilities and transmission lines RoWs. Inspections will include monitoring implementation status of mitigation measures specified in EMP. | IA | As per IA inspection schedules |

Table 3: Summary of Estimated Costs for EMP Implementation

| Item | Sub Item | Total Cost (\$) |
|---|---------------------------------|------------------------|
| Monitoring activities | As detailed under EMP | |
| Mitigation measures | As prescribed under EMP and IEE | |
| Independent audit and monitoring agencies | As described above | |
| Contingency | 3% contingency | |
| Total | | |

F. Institutional Arrangements

19. IA will be the Executing Agency (EA) for the Project. A Social, Resettlement and Environment Implementation Unit (SREIU) will be established for each additional subproject, headed by concerned head of the region (from Power Grid), which will be accountable and responsible for implementation of the EMP. Each unit will have an Environment Officer to

¹⁹ Monitoring of issues related to compensation of landowners for land acquisition and loss of production, etc. are addressed in the Resettlement Action Plan.

coordinate implementation of the EMP. The EA will hire local development partner (DP). The DP will work in close coordination with SREIU in facilitating EMP implementation.

20. The SREIUs will also be responsible for internal monitoring, quality control, supervising the functioning of DP, and progress reports on implementation of the EMP. The implementation of EMP shall be a time bound activity. Hence, the local DP will be engaged within three months of the loan becoming effective.

21. IA will further ensure the environmental management and monitoring budgets are made available for timely EMP implementation.

I. G. DISCLOSURE, CONSULTATION AND GRIEVANCES

22. The IEE including EMP prepared for additional sub projects will be translated into local language(s) and made available to the public. A Grievance Redressal Committee (GRC) will be set up in each of the subproject location to address all concerns and grievances of the local communities and affected parties. The GRC will comprise of representatives from local authorities, affected parties, and well-reputed persons from health, education sectors, as mutually agreed with the local authorities and APs. This committee will address the Project related grievances of the affected parties and will provide them a public forum to raise their concern or objections. A senior official from region/corporate office will represent IA. The GRC will be locally located and functional so as to ensure easy access to communities and affected parties. The EA will be responsible to disseminate information about the functional norms of the GRC. The committee will meet at least twice in a year or as and when required.

H. Monitoring and Evaluation

23. The EMP will have both internal and external monitoring. The SREIU at the local level will be responsible for internal monitoring of the EMP implementation, and will forward quarterly progress reports to the EA. The reports will contain progress made in EMP implementation with particular attention to compliance with the principles and matrix set out in the EMP. The EA will submit semi-annual monitoring report to ADB. An independent monitoring agency will be hired by the EA with ADB concurrence for undertaking external monitoring of the entire project. The monitoring agency will be selected within three months of loan approval. The monitoring agency shall report on semi-annual basis directly to ADB and determine whether sound environmental management practices have been achieved, and suggest suitable recommendations remedial measures for mid term correction and improvement.

Draft Terms of Reference for External Monitoring and Evaluation

1. The general scope of work will be:
 - To review and verify the progress in EMP implementation as outlined in the EMP;
 - To assess whether the objective of adoption of sound environmental management practices have been achieved and /or improved continually;
 - To assess efficiency and effectiveness of environmental mitigation measures implemented, their impacts (positive as well negative) and sustainability, drawing both on policies and practices and to suggest any corrective measures, if necessary.
2. The specific scope of work will be:
3. An Independent monitoring agency will be involved in ongoing monitoring of the EMP implementation by the EA. The major tasks expected from the external monitor are:
 - Review results of internal monitoring and verify claims through random checking at the field level to assess whether EMP objectives have been generally met.
 - Identify the strengths and weaknesses of the EMP objectives and approaches, implementation strategies.
 - To review and verify the progress in EMP implementation of each subprojects and prepares bi-annual reports for IA and ADB.

A. Time Frame and Reporting

4. The independent monitoring agency will be responsible for overall monitoring of the EMP implementation and will submit biannual review directly to ADB and determine whether EMP objectives have been achieved, and suggest suitable recommendations /remedial measures for improvement.

II. B. QUALIFICATIONS

5. The monitoring agency will have significant experience in environmental management and monitoring of projects of similar nature. Further, work experience and familiarity with all aspects of environmental management would be desirable. Candidates with higher degrees in environmental engineering or environmental science or environment management will be preferred.

SUMMARY POVERTY REDUCTION AND SOCIAL STRATEGY

A. Linkages to the Country Poverty Analysis

| Sector identified as a National Priority in Country Poverty Analysis? Yes | Sector identified as a National Priority in country poverty Partnership Agreement? N/A |
|--|--|
| <p>Contribution of the sector/subsector to reduce poverty in Pakistan:</p> <p>Major interventions in the energy sector are designed to achieve economic progress through infrastructure development. Both physical investment support and sector reform are necessary so that the benefits from economic growth will accrue to the poor. Cleaner and renewable hydropower will specifically benefit the poor because they are the most adversely affected by pollution and environmental degradation. These sources are also often found in rural areas and development of them will assist a more balanced economic development.</p> <p>By expanding generation capacity, the proposed Investment Program is expected to result in efficient and more reliable delivery of services to consumers, particularly benefiting commercial, residential, and agricultural customers in the region. The generation expansion program will address demand at provincial level.</p> <p>Poor and vulnerable consumers, including social utilities like hospitals and schools are often the hardest hit by inadequate power supply, load shedding, and poor power quality, will benefit directly from the subprojects. Direct positive economic and social benefits will result from the Investment Program. Power generated by small hydropower plants will be partially connected to the local grid. Increasing power supplies to local grids, particularly under the future tranches, will bring the benefits of electricity to remote communities, including better health care, sanitation, and education; greater income-earning opportunities; and higher living standards.</p> <p>A positive, direct impact on local labor is expected during implementation and an indirect impact will be due to the increased income-earning opportunities generated by increased access to electricity and job opportunities during construction.</p> | |

B. Poverty Analysis

Proposed Classification: General intervention

| |
|--|
| <p>Project preparatory technical assistance consultants have prepared a social impact assessment and a poverty impact assessment. A socioeconomic survey was undertaken to provide a basis for the assessments.</p> <p>Newly generated power will have productive use, as well as it will provide electricity as substitutes for various energy sources used by households such as wood, kerosene and candles usually at lower costs. After the first three years of operations total benefits are in the range of \$200,000–\$250,000 added value through production or services. Approximately 500 persons are (self) employed and have generated \$200–\$250,000 additional income, for each of the 8 subprojects.</p> <p>Most poor people in Pakistan are wage labourers or are self-employed. Over 40 percent of them live close to the poverty line; this indicates that shocks, such as illness, death or draught have the potential to drive large numbers into poverty. Most are landless and less likely to have access to a health clinic or to send their children to school than those with higher incomes. A disruption of their daily routines makes them more vulnerable than other societal groups as they don't have resources to cover their risks.</p> <p>The Investment Program is expected to create new full-time employment opportunities for civil works on small hydropower plant and renovation, monitoring, and upgrade investments. Improved power supplies will induce light industrial and commercial activity, creating employment opportunities and improving the productivity and quality of outputs in the manufacturing and agriculture sectors.</p> |
|--|

C. Participation Process

| | | |
|---|---|-----------------------------|
| Is there a stakeholder analysis? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| Is there a participation strategy? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| <p>Stakeholder analysis has been undertaken. All stakeholders have been actively involved to reduce the likelihood of grievances and to ensure that benefits are distributed fairly. In addition, for the selection of unskilled labor in the project area, the contractors will consult with local township labor officials, local village leaders and jirgas and will also ensure that labor is hired on a nondiscriminatory basis. A detailed account of activities undertaken during project processing is presented in Supplementary Appendix K.</p> | | |

D. Gender and Development**Strategy to maximize impacts on women:**

The poor and women have been included in conducting participatory activities.

Has an output been prepared? ☐ Yes ☒ No

E. Social Safeguards and other Social Risks

| Item | Significant/ Not significant/ None | Strategy to Address Issues | Plan Required |
|------------------------------------|--|---|---|
| Resettlement | <input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None | The proposed subprojects involve the construction of high-voltage transmission lines, run-of-river hydropower facilities, and substations. Some land acquisition is required, although impacts on individual households are limited. | <input type="checkbox"/> Full <input checked="" type="checkbox"/> Short <input type="checkbox"/> None |
| Indigenous Peoples | <input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input checked="" type="checkbox"/> None | The subprojects identified so far do not have significant impacts on indigenous peoples. However, an indigenous peoples development framework was prepared to cover any impact that the subprojects, under future tranches, may have. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Labor | <input checked="" type="checkbox"/> Significant <input type="checkbox"/> Not significant <input type="checkbox"/> None | Positive impacts are expected. The subprojects will require construction labor and will result in permanent employment for the operation and maintenance of project facilities. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Not required |
| Affordability | <input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None | The subprojects are unlikely to result in increased prices of goods and services accessed by the poor. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Not required |
| Other Risks and/or Vulnerabilities | <input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input checked="" type="checkbox"/> None | There are no known fisheries or migratory fish species in the project area, and fish do not constitute a principle source of protein in the diet of the majority of the population. The livelihoods of downstream communities will not be adversely affected. The development of aquaculture may be viable as a means of local income generation. EAs and IAs have been responsive and pro-active in addressing all social concerns related to the investment program supported by ADB. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |