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Project Information Document/ Integrated Safeguards Data Sheet (PID/ISDS)

Concept Stage | Date Prepared/Updated: 07-Mar-2017 | Report No: PIDISDSC21092

**BASIC INFORMATION****A. Basic Project Data**

Country Pakistan	Project ID P159712	Parent Project ID (if any)	Project Name Pakistan Solar and Renewable Energy Program (P159712)
Region SOUTH ASIA	Estimated Appraisal Date Oct 18, 2017	Estimated Board Date Dec 28, 2017	Practice Area (Lead) Energy & Extractives
Lending Instrument Investment Project Financing	Borrower(s) Ministry of Finance	Implementing Agency Sindh Department of Energy, Water and Power Development Authority, Ministry of Water and Power	

Proposed Development Objective(s)

The Project Development Objective is to increase the installed generation capacity of renewable energy (RE) and enhance RE development in Pakistan.

Financing (in USD Million)

Financing Source	Amount
Green Climate Fund	100.00
International Bank for Reconstruction and Development	200.00
Total Project Cost	300.00

Environmental Assessment Category B-Partial Assessment	Concept Review Decision Track II-The review did authorize the preparation to continue
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Other Decision (as needed)



B. Introduction and Context

Country Context

1. **Pakistan is the world's sixth most populous country with 195 million people and a per capita income of US\$1,456, placing it in the lower middle income country category.** Pakistan's economy grew by about 4.7 percent in FY16 – the highest rate in eight years, and a significant increase from the previous year's 4.0 percent expansion in Gross Domestic Product (GDP)¹. Since 2013, Pakistan has moved forward with macro-economic reforms, supported by an International Monetary Fund (IMF) Program and Development Policy Credits from the World Bank and other development partners. Despite this, the country's rebound from the global financial crisis has been slow and fragile, and there are indications of a decline in the country's export competitiveness. This may be attributed partly to volatile political and security conditions, natural disasters, and limited skills development. Adding to these factors are weak governance, limited capacity, and deficiencies in public sector management. All of these factors hamper service delivery and impact the broader macroeconomic picture. Pakistan's performance on the Doing Business index has deteriorated in recent years², and foreign direct investment (FDI) has dropped.

2. Nevertheless, **the country's economic parameters have improved under the current government**, which took office in 2013. The FY16 GDP growth rate (of 4.7 percent) is 1.0 percent higher than the corresponding rate of around 3.7 percent in FY13. In an environment of soft global demand, this has been driven largely by private consumption supported through remittances. Consumption accounted for an overwhelming 92 percent of GDP in FY16, and contributed 7 percent point towards GDP growth (moderated by a negative contribution of 2.2 percent from net exports). The threat of a balance of payments crisis, severe a few years ago, is not as severe. Low inflation and low interest rates contributed to higher credit growth. An increase in foreign investment flows from China, to fund China-Pakistan Economic Corridor (CPEC) projects, also made a contribution to growth. Foreign exchange reserves have risen and Pakistan's fiscal balance of payments is improving. The federal government aims to achieve a budget deficit of 4.8 percent of GDP, by cutting recurrent spending in the form of lower interest payments, significantly lower subsidies, and lower grants to State Owned Enterprises (SOEs). The outlook is for moderately higher growth in FY17, though the economy is still vulnerable to natural disasters, large increases in oil prices, reductions in foreign direct investments (FDI), energy shortages, and especially, lower than expected inflows of remittances.

3. **The government is pushing ahead with bold structural reforms to stabilize the economy and is increasingly focusing its efforts on higher, more sustainable and inclusive economic growth.** It aims to continue to widen the tax base to generate the necessary resources for higher infrastructure and social spending while strengthening public finances. Government is continuing to build foreign exchange reserves to bolster resilience in the face of external shocks, advancing the implementation of plans for creating suitable conditions for higher investment and exports by improving competitiveness and the business climate. An ambitious program of privatization and restructuring of public enterprises is focused on strategic sales of assets, and CPEC is also expected to make a big contribution to growth.

Sectoral and Institutional Context

4. **Pakistan's installed capacity is currently about 25,000 MW but available supply is significantly lower. There is a chronic electricity shortage with peak demand-supply gap of over 5,500MW.** Demand is increasing rapidly at about 5 percent per annum and is expected to reach about 28GW in 2020. Furthermore, current electricity demand is

¹ Per the World Bank's "Pakistan Development Update," November, 2016, the South Asia region grew by 6.8 percent year-on-year, in the second quarter of 2016.

² Pakistan ranked 138 out of 189 countries in the 2016 report, down from 75 in the 2010 report.



suppressed; the per capita annual electricity consumption³ has in fact declined from 489kWh/capita in 2006 to 450kWh/capita in 2013, which is a fifth of the South and East Asian regional average of 2,226kWh/capita.

5. **Pakistan's power sector is unbundled, and has significant private participation in generation.** In the early 1990s Pakistan was one of the first countries to initiate a comprehensive program of energy sector reform. The vision was to unbundle the Power Wing of the Water and Power Development Authority (WAPDA) into commercially oriented companies. Separate corporate entities were created from WAPDA with responsibilities for: thermal generation through four generation companies (Gencos); hydropower through WAPDA Hydel; transmission through the National Transmission and Despatch Company (NTDC); and distribution through eight electricity distribution companies (Discos) (now ten). Privately-financed generation by independent power producers (IPPs) was introduced in parallel, with some success - about one half of all electricity generated today is from IPPs. The Karachi Electricity Supply Company (KESC, now K-Electric) remained an integrated utility which was privatized in 2005. An independent economic regulator, the National Electric Power Regulatory Authority (NEPRA), was established by law.

6. **Energy sector performance has improved in recent years, but challenges remain.** Subsidies to the energy sector were reduced in FY14/15 to about 0.8 percent of GDP, down from 1.5 percent in FY12/13. Falling oil prices have reduced input costs for electricity generation, enabling tariffs to be adjusted downwards. Nonetheless, a gap between costs and revenues including subsidies remains, and the sector continues to suffer liquidity shortages. As a result, accumulated arrears of payment by the public electricity distribution companies (Discos) to their suppliers, commonly known as the circular debt, reached an estimated PKR 314 billion, at the end of FY14/15 or a little over one percent of that year's GDP. Targeting of subsidies towards the poorest remains an issue, as does the need to ensure that the sector develops in a socially and environmentally sustainable way.

7. **Sector performance can further improve by reducing losses, raising collections, lowering the cost of supply, and further investment.** Distractions on the political and security front have slowed the pace of reform in the latter part of 2014, but momentum has picked up. The government has focused on better management of existing assets and resources throughout the fuel supply-generation-transmission-distribution chain. Government figures suggest that system-wide losses for 2015 at 17.9 percent, was at its lowest over the last 10 years; recovery of amounts billed was at its highest over the same period, at 94.6 percent.

8. **Pakistan has only recently opted for significant investments in new coal fired power generation.** For several decades, most of the country's thermal power stations were based on indigenous natural gas, with a number of significant oil-fired, or dual fuel (oil and gas), additions in the last fifteen years. The current installed capacity is about: 35 percent oil; 30 percent gas; 30 percent hydro; and all others, including nuclear, cumulatively at about 5 percent. With dwindling domestic fossil fuel (mainly gas) reserves and limited development of hydro resources, the energy sector is increasingly dependent on imported fuels. In order to access cheaper power, Pakistan has initiated a substantial construction program of new coal power plants, funded primarily through bilateral agreements with China. If government plans to invest in about 12,000 MW of coal fired generation, and 7,200 MW of gas fired power plants by 2025 are to materialize, dependence on imported fossil fuels will increase exponentially. Of the planned coal power plants about 7,500 MW have either started construction or have reached financial closure. International experience shows that coal fired generation requires long lead times, is prone to delays, can suffer from local resistance, and post-completion, must deal with difficult fuel transport issues, and adverse environmental impacts.

³ World Bank. 2016. *World Development Indicators 2016*. Washington, DC



Relationship to CPF

9. **The proposed project supports the World Bank's twin goals of poverty reduction and shared prosperity.** The Country Partnership Strategy (CPS) for 2015-2019 recognizes the importance of energy by devoting one pillar exclusively to it. A better-performing sector benefits all consumers at all levels of the economy and electricity shortages are widely recognized to have held back Pakistan's economic performance. Increased electricity supply at competitive prices supports economic growth for all enterprises that use electricity, regardless of size or sector and is especially important given Pakistan's dependence on manufacturing and services. A sector which requires less subsidy and has fewer contingent liabilities creates fiscal space for more poverty-targeted interventions. The proposed project supports the goals of the CPS by increasing access to electricity, developing human capital through building capacity, and the execution and operation of renewable energy projects. It also helps to enhance sector viability by lowering the overall cost of electricity. Since the proposed project supports renewable energy based power generation, it will help reduce fossil imports, lower sector exposure to fossil fuel price volatility, support an environmentally sustainable lower carbon growth strategy, and promote increased participation and investments in growth sectors such as solar and wind generation. Through capacity building in technical and policy areas, and a "learning-by-doing" approach, this transformative project will lead to increased supply from renewables at increasingly competitive prices.

C. Proposed Development Objective(s)

Note to Task Teams: The PDO has been pre-populated from the datasheet for the first time for your convenience. Please keep it up to date whenever it is changed in the datasheet.

The Project Development Objective is to increase the installed generation capacity of renewable energy (RE) and enhance RE development in Pakistan.

Key Results (From PCN)

10. The achievement of the Project Development Objective will be assessed using the following key outcome indicator:

- New Photovoltaic Capacity Installed: Generation capacity of energy constructed (MW)

11. In addition, the following intermediate result indicators will be included. Other intermediate result indicators related to citizen engagement, gender, etc. maybe identified and added as necessary, during project preparation.

- Investments in Renewable Energy: Investments mobilized for renewable energy generation capacity (US\$)
- Competitive Price Trajectory: Price per kW installed, or solar PV electricity off-take price (\$/kWh)
- Capacity Building: Number of RE workshops/trainings/studies commissioned/conducted
- GHG Displaced: Annual *projected* net greenhouse gas emissions avoided (tCO₂/year)

D. Concept Description



12. Renewable energy generation in Pakistan falls far short of realizing its potential, despite the country's considerable resources. Given the growing electricity demand, depleting domestic gas reserves, and increasing dependency on fossil imports, renewable energy generation can help in (i) displacing fuel imports, (ii) reducing electricity price volatility, and (iii) meeting the country's climate change mitigation targets through reductions in projected Greenhouse Gases (GHG) emissions. The World Bank's Renewable Energy Resource Mapping initiative, shows considerable solar and wind power resources across Pakistan. Nevertheless, the development of new solar plants in particular, is on hold for the following reasons:

- i. **The high off-take price (about 14 US cents/kWh) of the Quaid-e-Azam Solar Park Limited (QASPL, 100MW +300MW).** That price was based on the prevailing feed-in tariff in 2015, but it now compares poorly with much lower tariffs seen internationally (**3-6 US cents/kWh in 2015-16 time frame**);
- ii. **The unprecedented trajectory of lower global solar bid prices makes decision makers uncomfortable** in proceeding with signed Letters of Intent (LoI), even at lower upfront tariff of around 9.5-10 US cents/kWh; some 2000 MW of such LoIs are on hold in Punjab province alone;
- iii. **The variable nature of solar and wind power output, and concerns over their integration into the grid** has led to arbitrary caps on renewables, without detailed analysis of transmission and distribution (T&D), and other constraints. This is exacerbated by limited exposure to the technologies and inadequate technical capacity at various institutions;
- iv. **Low inflation and crude oil prices have somewhat eased budgetary pressures, reducing the sense of urgency** to diversify away from oil and gas based generation;
- v. **The non-price related benefits of solar (and wind) generation have not been appropriately understood as part of the planning process** (quick execution, modularity, decentralized implementation, long-term price stability);
- vi. **In the case of distributed grid-connected, and off-grid generation, inadequate policy incentives and insufficient demonstration of the technology** have been key reasons for slow market penetration.

13. Electricity from solar PV has delivered prices below 10 UScents/kWh globally, with a declining future trajectory expected. Outside Pakistan, typical prices obtained through auctions for expected commissioning in 2017 range between 6-8 UScents/kWh, while solar upfront tariff in the country continues to lag this trend. The project proposes to demonstrate lower prices within Pakistan (installed cost of less than 1US\$/W). The project will also help scale-up renewable energy by combining a series of investments in solar PV sub-projects and related infrastructure, with technical assistance, and knowledge exchanges. This "learning-by-doing" approach will accelerate institutional capacity building, promote operational experience within the country, and enhance the confidence in renewable energy among policy-makers, regulators, grid dispatchers, local financiers and the general public. This in turn, will spur further scale-up, and more competitively priced private sector investments in PV.

14. In addition, this project also intends to remove a key barrier to scaling up renewables by the building technical capacity required to integrate variable renewable energy (VRE) into the grid. Capacity building activities will be designed to enhance understanding of renewable energy pricing, global best practices in terms of policies and operations, and knowledge sharing among the relevant entities within Pakistan to improve coordination, and expedite investments in renewable energy across the country. This project will also seek to address concerns around transmission constraints by working with government agencies on location and decentralization issues that are key to scaling-up of renewables, and particularly solar projects. Finally, within the framework of new investments in coal plants, and skepticism over renewable energy projects, Bank intervention will help steer Pakistan towards a lower carbon path to development, as indicated in its Nationally Determined Contribution to the global climate change agenda.



15. Furthermore, the proposed project is designed to demonstrate that solar PV can operate in conjunction with other renewable resources such as hydropower, and wind based generation. The components of the project are described below.

Component 1 – Investments in Grid-Connected Solar PV Generation (US\$260 million). This component will include a series of grid-connected sub-projects, all of which will add to solar PV capacity, and may include investments in related infrastructure for evacuation or system dispatch. The proposed plan includes three sub-components:

1(i) Land-Based Grid-Connected Solar PV Plant and Associated Infrastructure to Demonstrate Conjunctive Use with Hydro-Power Generation (US\$160 million). The World Bank and the Asian Infrastructure Investment Bank (AIIB) is engaged with the expansion of the Tarbela Hydropower facility, which is owned and operated by WAPDA. Tarbela has a current built capacity of 3478 MW, which will be increased to 6298 MW under the Tarbela additional financing project. Land availability and evacuation constraints are two key barriers to the smooth execution of solar PV projects – both of which are available at the Tarbela site. This sub-project would therefore seek to build at least 100 MW of land based, grid-connected solar PV capacity. These solar panels could be located on the south facing surface of the dam, other WAPDA land at Tarbela and/or alongside the extensive canal system already built from Tarbela to Ghazi-Barotha Hydroelectric plant. The evacuation of solar power will be through the same transmission lines that are in operation for the hydroelectric plant. This will provide a unique opportunity for developing the dispatch and pricing mechanisms linked to conjunctive use of firm hydro and intermittent PV power that is particularly relevant in Pakistan, where hydroelectric power accounts for about a third of current built capacity. Valuable experience on conjunctive solar-hydro dispatch would be replicable at other large hydro facilities. WAPDA has expressed an interest in owning and operating a blend of hydro and solar power generation, and putting in place this solar PV facility would help evolve the policy and pricing dialogue around blended “green” hydro-plus-solar energy. The sub-project could also be used to create different contractual models including procurement approaches that mimic a short(er) term (3-5 years) Power Purchase Agreement⁴.

1(ii) Sindh Solar PV Demonstration Power Plant along Wind Corridor (US\$75.0 million). With its abundant wind resource, Sindh can play a leadership role in demonstrating conjunctive use of solar and wind resources in a manner that optimizes the use of scarce evacuation infrastructure. This sub-component will finance one or more ground mounted Solar PV power plant/s cumulatively sized at approximately 50MW. The power plant/s will be appropriately located on land near transmission evacuation infrastructure, and in Pakistan’s best wind resource corridor. The Government of Sindh (GoS) will use appropriately established special purpose vehicles (SPVs) for the realization of these investments. The sub-project scope will include all the necessary balance of plant equipment for grid connection. In addition, this component will finance grid extension and enhancements to evacuate power to the nearest grid station. At a maximum cost of about \$1.5/W, the total cost of this component is estimated at about US\$ 75 million. If the realized costs for the project are lower, the savings will be either reallocated to enhance other project components or to increase the size of the demonstration plant itself. Innovations in bid design, optimization of evacuation infrastructure, as well as experience with managing the dispatch of two variable but complementary resources – wind and solar – will be key learnings that can be scaled-up and replicated in a future private sector model. Significant capacity building at the provincial level would be an added benefit of this demonstration project. This sub-project would also include deep interface with the distribution company and, among other things, look into system load curves, storage options, and smart metering as means to optimize dispatch (please see Component 3 for more information on capacity building).

⁴ Detailed arrangements on procurement approach, financing arrangements, regulatory approvals, and tariffs will be further developed during project preparation, with WAPDA.



1(iii) Distributed Solar PV Sub-Component (US\$25 million). This component will finance grid-connected, distributed, solar PV systems for small publicly owned land parcels, public sector buildings (including, schools, hospitals, water pumping and purification stations and other office buildings) in the cities of Karachi and Hyderabad. As under sub-component 1(ii), the Government of Sindh would establish an appropriate SPV for the implementation of this sub-component. The Solar PV system will comprise photovoltaic panels and the balance of plant. The system will be connected to the nearby grid under NEPRA's net-metering policy. This component will demonstrate the viability of distributed PV and will help decrease the barriers currently facing large scale deployment of rooftop and other distributed solar PV installations. At a cost of about \$2/W about 12MW of capacity could be offset through this sub-project. This component will likely require a high level of concessionality as it is expected to include roof-tops and also storage in many cases. Given the current structure of net metering, this sub-project is expected to generate significant dialogue as well as operational data to inform government and provincial policies on distributed solar generation.

Component 2 – Renewable Energy for Village and Off-Grid Electrification (US\$30 million). This component will finance off-grid solar PV technologies, especially suitable where loads are too small to justify large transmission and distribution expansion. Recent years have seen significant progress in off-grid electrification technologies and business models, and this sub-project will help provide modern energy services to people in remote rural areas that are completely off-grid, or have very poor service from the grid. The Government of Sindh currently has two pilot projects in operation in the area of Thar in Sindh province, and this component will learn from those experiences, and replicate with modifications that may include solar mini-grids and hybrids, as well as innovative implementation modalities. This rural electrification component will showcase the viability of solar PV to provide electrification to populations located away from the grid, where it is not economical to extend the grid. The project would endeavor and establish sustainable business models that could result in entrepreneurial and employment generating opportunities for local residents⁵. Depending on the size and financing modality, the unit cost of individual Solar Home Systems (SHSs) can range from about US\$ 140 - \$940⁶. About 50,000 households could be electrified through this sub-component. This component will be subject to concessional financing, and the amount of this concessionality will depend on the types of business models used.

Component 3 – Technical Assistance and Capacity Building (US\$10.0 million). This component will finance and implement technical assistance and capacity building activities that will be needed to remove development barriers from the sector. Within Sindh province, Sindh Energy Department, Sindh Transmission and Dispatch Company, Distribution Companies (DISCOs) and other entities relevant to increasing solar and wind power generation in Sindh, would be important recipients of structured training programs and studies. In addition, supported activities would include technical studies, including, load flow analysis for integrating renewables, strategic planning and dispatch studies, and convening and coordination workshops with relevant federal agencies. Currently the lack of technical capacity in integrating renewables to the grid is a barrier to scaling up deployment, hence there is an acute need to build this capacity in provincial and national energy agencies (e.g. Ministry of Water and Power (MoWP), WAPDA, National Electric Power Regulatory Authority (NEPRA), and Alternative Energy Development Board (AEDB)). In addition, this component will also finance consultancy services required to implement the infrastructure investment components. Specifically this component will help finance the following:

- a. **Workshops:** On (i) Regulatory Issues (NEPRA, AEDB); (ii) Technical Issues (NTDC, STDC, DISCOs).
- b. **Studies:** System wide study on integrating at least 20 percent variable renewable energy to the grid in Sindh/Pakistan given current grid expansion scenarios.

⁵ Different implementation models will be explored during project preparation, to ensure that a results-based approach is taken, and local residents have a stake in post deployment sustainability.

⁶ Based on Bangladesh's RERED II



- c. Tools: Power systems planning and grid control operations tools to help manage and plan for integrating VRE. The workshop training program on VRE will give an overview of various tools and their merits, helping the government procure the tool best suited for their needs.
- d. Consultancy Services: Finance consulting firms/individuals to help implement the infrastructure investment components.

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SAFEGUARDS

A. Project location and salient physical characteristics relevant to the safeguard analysis (if known)

PSREP has four investment components: (i) Solar facility within Tarbela Hydro site; (ii) Solar facility in Sindh's wind corridor; (iii) Distributed Solar installations on government buildings in Karachi; and (iv) Off-Grid Solar options in selected rural areas of Sindh. PSREP will have two land-based, grid-connected sub-projects (i) Sindh based project (~50 MW), and (ii) Tarbela linked solar project (~100 MW).

Component i: Located within the precincts of the Tarbela hydropower facility. The Dam and storage reservoir are located at the end of a narrow valley of Indus, cutting through Hazara hills, which are a part of the foothills of Western Himalayas. River valley near the dam is up to 1.8 km wide - filled with alluvial deposits submerged by the reservoir. Northern part of the reservoir stretches about 100 km upstream, between mountains with elevations over 2400 m. The hillsides near the dam are generally steep and rising to an altitude 600 m. The Ghazi- Barotha headpond is a regulating reservoir immediately downstream of the dam and part of Ghazi-Barotha barrage located about seven kilometers from Tarbela. From here the topography slopes more gently via a transitional zone and further down towards the plains of Punjab. Totalai Game Reserve located 20-25 km from Tarbela is nearest protected area; PSREP will not impact it.

Component (i) is on land owned by Water and Power Development Authority (WAPDA) under the Ministry of Water and Power (MoWP) and for component (ii) it will be owned by the GoS. The exact impact, if any, on people residing on the site is not known. During site selection, social assessment will be undertaken to assess the nature and scale of social impacts, if any, and appropriate mitigation instruments will be prepared and implemented. No Indigenous People reside in Sindh.

Component ii - Sindh Site: Exact location not yet clear, but location within a designated solar park. Proposed site does not have any sensitive habitats. Component will require about 4 acres/MW or 200 acres for 50 MW. The land to be used is owned by the Government of Sindh (GoS).

Component iii & iv: An initial list of buildings for intervention (iii) already provided by GoS; includes hospitals and health centers. For intervention (iv) focus will be on solar devices not requiring land acquisition; site locations may not be known by appraisal. Since the sites are not identified yet, the impact on Physical Cultural Resources can also not be determined.

B. Borrower's Institutional Capacity for Safeguard Policies

There will be a number of implementing agencies with varying capacity on social safeguards.

For Component (i), WAPDA is the implementing authority. Tarbela has a Social Management Unit which is implementing



existing Bank financed project. The Unit is well aware of The Bank requirements and has the capacity to implement safeguards. Sindh Department of Energy will be implementing Sindh land-based grid connected solar PV component and would require technical support as well as capacity building and handholding on environment as well as socials safeguard aspects. Ministry of Water & Power through its designate (Alternate Energy Development Board) may require technical support on social safeguards. Adequate technical support and staff enhancement will need to be undertaken.

C. Environmental and Social Safeguards Specialists on the Team

Salma Omar, Ahmad Imran Aslam

D. Policies that might apply

Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	Yes	The project involves investments in solar PVs at Tarbela and in Sindh. The investment related activities including construction activities for installation of ground mounted solar PVs have the potential to cause negative environmental and social impacts. Therefore, OP/BP 4.01 is triggered. However, most of these impacts are likely to moderate in intensity, reversible, localized and temporary in nature. As a result, the project has been categorized as category B. Some of these impacts during the construction can be dust and noise generation, release of effluents, vehicular traffic, safety hazards for workers, etc. Potential impacts during operation and maintenance activities include waste generation from repair and maintenance of power plant and also from offices and residential facilities for the WAPDA staff, safety hazards caused by power generation facility as well as transmission lines, and electromagnetic radiation from transmission lines. The project will follow hybrid approach where ESMP will be prepared for Components (i) and (ii) related to ground mounted solar PVs. For Components (iii) and (iv), framework approach will be followed. ESMF will include TORs for preparation of ESMPs for remaining two components of the project. Both ESMP and ESMF for Tarbela and Sindh ground mounted solar projects will be prepared, approved and disclosed by appraisal.



Natural Habitats OP/BP 4.04	TBD	The sites for the four components of the project are expected to be located in areas where natural habitats have been mostly modified due to previous projects. Therefore, they are not expected to adversely impact natural habitats. However, as the exact location of solar park in Sindh is not known at this stage, final decision on this policy will be taken during preparation.
Forests OP/BP 4.36	TBD	There are no known forests in Tarbela or potential solar park in Sindh. Depending upon the final selection of site, some trees may have to be cut in Tarbela. Further, as the exact location of solar park in Sindh is not known at this stage, final decision on this policy will be taken at preparation stage.
Pest Management OP 4.09	No	Not triggered. The Project does not involve use of pesticides in construction, operation or maintenance of solar facility. National transmission and Despatch Company (NTDC) or WAPDA does not rely on use of pesticides to control weeds.
Physical Cultural Resources OP/BP 4.11	TBD	The sites and locations of distributed generation are not known at this stage. The location of Solar installations may be close to Physical Cultural Resources. Additionally, some buildings selected for installation of solar panels may be PCR. Screening criteria for PCR will be included in the ESMF. For selected sites, Cultural Resources Management Plans will be prepared where required.
Indigenous Peoples OP/BP 4.10	No	No IPs are known to reside in Sindh.
Involuntary Resettlement OP/BP 4.12	TBD	Based on current information, the project is unlikely to trigger this policy because of the following reasons: (i) For Tarbela Solar facility, WAPDA already owns all of the land around this large hydropower project. Choice of a parcel of land for the 100 MW solar facility will be on government (WAPDA) owned land already dedicated to hydro project, so no involuntary resettlement is involved; (ii) For Sindh ground mounted solar facility, the provincial government has confirmed that the project will be located within the precincts of a solar park on land already under Government of Sindh (GoS) ownership, and earmarked for solar or renewable energy production/project development; (iii) For distributed generation on government



		building roofs and small parcels of government owned land, there is no involuntary resettlement; (iv) For the off-grid component focus is small devices such as solar lanterns, solar home systems and solar appliances – none of which require land acquisition or involuntary resettlement. In case there is scope for small mini-grids, given the small load being serviced, land use in that case is very small, and voluntary purchase is the mechanism for that, not involuntary resettlement. Furthermore, final decision about this policy will be taken at project preparation, prior to appraisal. This would be based upon more analysis, site visits and clarifications from the client. Further inquiries will be made about the existence of squatter/encroacher on the Tarbela sites and sites for activities i) ii) and iii). Also, the voluntary nature of the land transaction for small mini grid if part of (iv), will be made during project preparation.
Safety of Dams OP/BP 4.37	No	The project does not involve any kind of work that may trigger this policy.
Projects on International Waterways OP/BP 7.50	No	The project does not affect international waters as defined in the policy.
Projects in Disputed Areas OP/BP 7.60	No	The project is not located in disputed areas.

E. Safeguard Preparation Plan

Tentative target date for preparing the Appraisal Stage PID/ISDS

Oct 16, 2017

Time frame for launching and completing the safeguard-related studies that may be needed. The specific studies and their timing should be specified in the Appraisal Stage PID/ISDS

For components (i) and (ii), a social assessment would be done to establish whether there may be people encroaching on government owned land to be used for said components, and if so, if there is any adverse impact on them. If that is the case, then a Resettlement Action Plan will need to be prepared prior to appraisal.

For Tarbela location:

An ESMP will be prepared by appraisal – 1st October 2017.

Since the location is inside the premises of Tarbela HP owned by WAPDA and cordoned off from public use, resettlement and encroachment are not expected to be an issue. Hence a RAP is not expected to be required.



For all other sites:

For component (ii), the sites will be known prior to appraisal. For this components an Environment and Social Assessment (ESA) will be prepared by appraisal - 1st October 2017). For components (iii) and (iv) if sites are not known prior to appraisal, an Environment and Social Management Framework will be prepared.

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APPROVAL

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