*Draft*

**Government of Pakistan**

**Planning Commission**

INVESTMENT PROSPECTUS

SUSTAINABLE ENERGY FOR ALL

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| Ministry of Planning, Development & Reform Government of Pakistan (Energy Wing) | United Nations Development Programme - Pakistan |

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**Executive Summary**

This document presents the Sustainable Energy for All (SE4All) Investment Prospectus (IP) for Pakistan. The Investment Prospectus is designed to provide an approach for operationalizing the Pakistan SE4ALL National Action Plan /Action Agenda, identifying and developing a set of implementable programs and projects and enunciate the investments potential. These projects and programs reflects the investment opportunities for private and public investors. Therefore, the Investment Prospectus proposes to operationalize the Pakistan SE4ALL National Action Pan by combining the different investment opportunities in one package. Considering the projected rate of GDP growth and sectoral growth; the overall investment potential for SE4All targets from 2018-2030 is estimated around $ 240 billion.

Overall, there is $ 240 billion investment potential for SE4All objectives by 2030:

a) Universal Energy Access;

b) Doubling the share of renewable energy; and

c) Doubling the rate for energy efficiency.

Energy Access projects for rural electrification and supply of piped gas connections to households provides an investment opportunity of $ 80 billion by 2030. The investment potential for renewable energy projects is $ 100 billion. The energy efficiency projects investment opportunities are estimated around$ 60 billion with energy saving potential of 15-20%.

Investment Prospectus covers all the operational and planned projects to streamline the existing initiatives under the umbrella of SE4All targets at national level by 2030. This document is divided into two main sections. First section gives holistic view of energy supply and demand scenarios and key investment areas to meet the set targets of universal energy access, doubling the share of renewable energy and energy efficiency. The set targets are:

Table 1: SE4All Pakistan's Targets

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SE4All Pakistan’s Target 2030 | Status 2017 | Target2030 | Difference | Remarks |
| Energy Universal Access | 73% | 100% | 27% | Regional Matrix  |
| Energy Efficiency[[1]](#footnote-1) | 1.5 % | 18% | 16.5% | NEECA Established  |
| Renewable Energy[[2]](#footnote-2) | 7% | 15%  | 8% |  Projected 15% in NAP |

Secondly, the Investment Prospectus presents three scenarios for operationalization of SE4All in Pakistan:

* First, the short-term Programs and Projects (2018-2023),
* Medium-terms Programs and Projects (2023-2028) aligned with public sector annual and 12thfive years plans,
* Lastly long-terms Programs and Projects in accordance with global commitment of NDCs

This investment prospectus categorizes the projects to attract foreign direct investment in the energy sector with major participation of private sector. Similarly, the international donors’ agencies will be synergized through the list of the projects to execute projects as per their resource availability, field of expertise and technical capacity. The Vision 2025, energy policies promulgated by Government from the time to time, and initiation of China-Pakistan Economic Corridor with the portfolio of $ 36 billion in energy sector shows strong commitment of Government of Pakistan to ensure universal access to energy, doubling renewable energy share and doubling energy efficiency.

In addition to that, Pakistan is also signatory of Paris Agreement and submitted it Nationally Determined Contributions (NDCs) which provides impetus to international community to support Pakistan in its Climate Change Adaptation and Mitigation efforts. It is worth mentioning that most of these mitigation and adaptation measures will be implemented through investment in energy sector of Pakistan.

# **Introduction**

The implementation of SE4All National Action Plan largely depends on the resource availability which is linked to the Investment Prospectus (IP). Adaption of viable financial mechanism are dependent and integrated with the business models. The execution of the planned projects and sustainability depends largely on the selection of projects having potential to repay the capital investment through its own cash generation. In addition, the prioritization of projects is needed to make the Action Agenda financially viable and pragmatic.

 Investment Prospectus categorizes the projects to attract foreign direct investment in the energy sector based on net present value and positive returns on these investments. It also pertinent to mention that delays in portfolio management may cause high equity to debt ratio and expected payback period may not be able to provide rate of return in given timeframe. Therefore, the IP is developed considering the timeframe and goals set by Sustainable Development Goals. Similarly, the international donors’ agencies collaboration is sought through the listing of the projects to execute projects as per their resource availability and field of expertise. The Public Private Partnership is one of the key areas which will be promoted for the development of medium and long-term power projects. Additionally, Government to Government (G2G) mechanisms such as – China-Pakistan Economic Corridors (CPEC) serves as example for investments in the infrastructure and energy sector of Pakistan.

SE4All goals and targets for the year 2030 are based on the accelerated growth scenario, adjusted to the average GDP growth rate as estimated by the government. Overall, a high demand energy sector growth scenario is envisaged, which would result in substantial increase in total energy capacity by the year 2030. From thermal, renewable, coal, nuclear, LNG, biomass and hydel is likely to significantly increase in future. Keeping in view the projected rate of GDP growth and sectoral growth; and taking into consideration the proposed implementation of power generation investment plans, the overall investment potential for SE4All goals are estimated around $ 240 billion.

The investment potential of $ 240 billion in the energy sector has been developed on the three objectives i.e. energy access, enhanced share of renewable energy and adopting mechanisms for energy efficiency. Energy access projects include both rural electrification and supply of piped gas connections for households as well as the provision of off-grid advance energy solutions where grid and piped gas infrastructure is unreachable. The overall investment potential under access objective is $ 80 Billion by 2030. The share of renewable energy projects investment is near to $ 100 billion subject to portfolio management in agreed targeted time period with marginal interest rate. The investment opportunities for energy projects is estimated to $ 60 billion with efficiency in energy saving potential of 20-25%.

The Investment Prospectus presents three scenarios for operationalization of SE4All in the country.

* First and foremost, Short Term Projects,
* Medium-Term Projects and
* Long-Terms Project.

With these scenarios and projections, SE4All initiative’s two main components i.e. National Action Plan and Investment Prospectus reinforces each other to achieve these projections. The investment prospectus is based on the SE4All Action Plan to financially operationalizes the “Priority Action Areas”.SE4All goals are tangible; trackable and implementable. These goals through high-impact opportunity areas are made more focused. Overall, Sustainable Development Goal # 7 which is SE4All.

The SE4All initiative aims to ensures universal access to energy. The energy access can be divided into two major categories a) access to fuel for lighting b) access to fuel for cooking and space heating.  For the first component i.e. access to fuel for lighting the electricity access in the country (through on grid connections) is 73 percent. To meet the target of providing 100 percent access to modern energy system, the first quantifiable goal is providing over 15 million domestic connections in the next 15 years – an average of 1 million connections per year.

The target for access to fuel for cooking and space and water heating is a daunting challenge particularly those in far flung areas is going to prove economically and financially challenging. Currently only 25 percent households have access to modern fuel for cooking, space and water heating. In order to provide access to piped gas to 100 percent of population will not be possible by 2030. Therefore, the target for providing modern fuel for cooking and space-heating through laying gas pipeline will remain around 44% across the country.

The households without access to piped gas network are planned to be provided energy for cooking, space and water heating through alternate means including improved cook stoves, solar cookers, biogas digesters, LPG air mix plants and solar heaters. To achieve these targets the action plan envisages increase in overall final energy consumption from present level of 2015-16 (45.38 MTOE) to (85.4 MTOE) during the plan period (2029-30) representing an overall increase of 103.72 percent.

The universal energy access goal will not achievable without the renewable energy, especially in areas where grid will not reach in foreseeable future. The distributed energy systems will be the most practical and sustainable solution. The share of renewables (solar, wind and bagasse) is 7%. Additionally, the large hydro projects development till 2020 is projected to be 6,494 MW which will almost double the share of hydel in the energy mix. One of the caveats for the share of renewables growth is extension and up gradation of the national grid for evacuation of intermittent variable renewable share by NTDC (National Transmission and Desptach Company).

The NTDC will implement a comprehensive power evacuation plan during the plan period, at total estimated cost of USD 9 billion to evacuate 9400 MW of new generation capacity, including renewables. Nonetheless, the off-grid solar is expanding at a much faster rate with small and medium size companies providing a solar home solution to the houses in urban and rural areas. However, the penetration rate of distributed solar is not very well reported (author estimated through imports of solar equipment other than large scale on-grid solar show that it is more than 1000 MW).

NEPRA (National Electric Power Regulatory Authority) recent policy regulation of Net-Metering is already proving disruptive. It will increase the RE share exponentially in foreseeable future surpassing the renewable targets mentioned in the SE4All targets. Nonetheless, the renewable energy share in electricity is projected to increase from present level of 2015-16 (0.9 MTOE) to (14 MTOE) during the plan period (2029-30).

# **Description of Investment Prospectus**

## **Country Profile**

Pakistan is strategically located to become Asia’s premier trade, energy and transport corridor. It is the gateway to the energy rich Central Asian States, the financially liquid Gulf States and the economically advanced Far Eastern tigers. This strategic advantage alone makes Pakistan a marketplace full of economic possibilities.

Pakistan is world’s sixth most populous country (2016) – a population of 207.07million.[[3]](#footnote-3)Pakistan is the most urbanized country in South Asia, with 35% of its population living in urban areas, compared to the regional average of 29%. The country’s annual urbanization rate of 3.5% is well above the regional urban growth rate of 2.4%. Fifty five percent of country’s population is below the age of 19, which bodes well for long- term sustainable economic growth. Pakistan has a strong middle class. A large part of the workforce is proficient in English. Pakistan possesses a large pool of trained engineers, bankers, lawyers and other professionals with many having international experience. The consumer market in Pakistan is growing at a very fast pace as reflected by tele-density which has now reached more than 150 million.

The rural population is 62.3% of the total population which is employed by the agriculture sector. Traditionally, Pakistan has been an agrarian economy. However, over the years the economy has shifted towards industry and service sector, contributing approximately 80.47% in GDP.[[4]](#footnote-4)

Pakistan’s economic history is characterized by recurring cycles of high growth and subsequent stagnations. This volatility of economic growth has serious implications for the social and economic well-being of people at large. However, the recent performance of the economy has largely been positive. The economy has maintained growth in real GDP over 4 percent consecutively in last four years.

Rigorous macroeconomic reforms have been pursued over the last couple of decades making Pakistan a dynamic, open and private sector friendly economy. The policy has been designed to provide a comprehensive framework for creating a conducive business environment for the attraction of FDI. Pakistan's policy trends have been consistent, with liberalization, de-regulation, privatization, and facilitation being its foremost cornerstones. The foreign investments are encouraged and the share of international trade in the GDP has also increased significantly. China-Pakistan Economic Corridor (CPEC) is a recent economic development initiative, poised to bring economic, social and regional benefits for the people of Pakistan. Under this initiative, USD 52 billion will be invested on country’s infrastructure – the share of energy sector out of this amount is USD 36 billion.

The Law of Special Economic Zones has been made to meet the global challenges of competitiveness to attract FDI. The law allows to create industrial cluster with liberal incentives, infrastructure, investor facilitation services to enhance productivity and reduce cost of doing business for economic development and poverty reduction. The Law further envisages to reduce processes through SEZ in Pakistan.

Institutional mechanism for energy sector comprises of Ministry of Energy and its constituted departments, boards, wings and divisions. The 18th Constitutional has further changed the resource allocation and development of energy projects between federal and provincial governments.

* Ministry of Planning, Development and Reforms
	+ Energy Wing
* Ministry of Energy
* Power Division
	+ National Transmission and Despatch Company
	+ Alternative Energy Development Board
	+ National Energy Efficiency and Conservation Authority
	+ National Electric Power Regulatory Authority
	+ Central Power Purchasing Agency
	+ Distribution Companies
* Petroleum Division
	+ Sui Northern Gas Pipelines Limited
	+ Sui Southern Gas Pipelines Limited
	+ Oil and Gas Regulatory Authority
* Ministry of Finance / Economic Reform Unit
* Ministry of Housing and Works
* Ministry of Communication / National Transportation Research Center
* Capital Development Authority / Planning and Design Wing

Policy Framework:

* National Policy for Power Co-Generation by Sugar Industry
* Guidelines for Setting up Private Power Projects
* Guidelines for Determination of Tariff for IPPs
* NEPRA Mechanism for Determination of Tariff for Hydro Power Projects
* Power Policy 2015
* Transmission Line Policy 2015
* Renewable Energy Policy for Development of Power 2006
* Policy for Use of Biodiesel as an Alternative Fuel

## **Pakistan’s Energy Sector**

Pakistan’s existing energy mix is highly dependent on oil and gas which together provide over 80 percent of the country’s primary energy supplies, followed by 11 percent from hydroelectricity and 5.4% percent from coal. This disproportionate reliance on imported oil has impacted strain on the national exchequer. The power supply of a country is dominated by thermal power, as it constitutes over 60% of the total installed capacity. On the other hand, renewable energy (including hydroelectricity) constitutes 34% of the entire power generation mix of the country. Without the inclusion of hydroelectricity, the share of renewables (solar, wind, biomass) is (7%), as it has only been a couple of years since investment by private and public sectors has opened-up in the renewable energy market in Pakistan.

According to estimates, 64 million people do not have access to modern sources of energy, which is 27 percent of the total population of the country. The projected population growth rate of 2.4%; this number is expected to increase to 95.5 million by 2025 and 102 million by 2030. In the year 2014, Pakistan’s per capita oil equivalent use was reported 482 kg (including traditional biomass fuels) which is one of the lowest ranked across the world. Similarly, Pakistan greenhouse gas emissions are very low; between 0.1-4.0 tons CO2-equibvalent per capita/year.

Considering the gravity of the current energy sector problems, both long-term and short-term measures are being taken. Ministry of Energy (Former Ministry of Water and Power) addressing the electricity sector of Pakistan has focused on increasing electricity supply from a diverse source such as gas, oil, coal, hydro and nuclear. The development of hydel power, natural gas, and coal power projects are its top priority. The National Power Policy of 2013 and later policy of 2015, have been launched to set some clear standards and resolve the electricity problem through tariff rationalization to arrest circular debt, energy conservation, changing energy mix, and strict punishment for electricity pilferages.

In the medium term, to meet the energy demands of the country, Ministry of Energy (Former Ministry of Petroleum and Natural Resource) imports LNG as a medium-term solution. Whereas, coal and gas power plants development are envisioned as long-term strategy. Oil and Gas Regulatory Authority (OGRA) as a regulator, provides level playing field for all energy sector stakeholders and players in the market with its effective regulations.

Country’s energy sector is being redefined. With the given reform agenda, it is expected that in future the energy sector will transform and evolve with privatizations, mergers, and consolidations as well as disaggregation of vertically integrated utilities. Resultantly, the sector will see new opportunities and challenges at all levels of the unbundled energy market. This will demand the more proactive role of sector’s regulators (NEPRA & OGRA).

### **Power Sector of Pakistan**

Pakistan power sector supply-demand gap peaked between 5000-7000 MWtill 2014-15. The capacity shortfall was finally overcome by 2018 due to effective government policies. A sizable population in the country is still deprived of clean and affordable electricity and other energy sources. Off-grid renewable energy solutions can play important role in bridging this gap in access to clean and affordable energy. Various plans and reforms to enhance access to energy, improve energy conservation, and increase the share of renewable energy. However, substantive efforts are needed to achieve SE4ALL goals.

The governance and structural reforms of the sector has been initiated with a special emphasis on the performance of Distribution Companies (DISCOS) and government owned Generation Companies (GENCOS). Similarly, National Transmission and Despatch Company (NTDC) have been reformed with the creation of CPPA (G) and plans are made for the least cost generation plan. NEPRA capacity building has been developed and plans are underway to unfold multi-year tariff regime for all DISCOs to avoid delays in tariff determination. However, the privatization of the DISCOs is one of the big challenges for the government, as it is a politically charged agenda item.

Financially, Pakistan’s power sector is still struggling to address the persistent problem of circular debt which stands at PKR. 441 billion. In absence of the comprehensive governance reforms, the circular debt will be a major burden on Pakistan’s overall economy and more specifically power sector viable operations. Another factor which distorts the power sector operations is the power sector subsidy – “Tariff Differential Subsidy” which was PKR. 136 billion in FY 2015 -16. Though, GOP has planned to phase out the power sector subsidy by 2017. However, given the nature of political-economy of the power sector, institutional dynamics and population living under the poverty line; the total phase out of power sector subsidies will be not a practical option.

However, the recent investment of USD 36 billion for power sector under the China-Pakistan Economic Corridor (CPEC) will increase the energy access, with shifting the energy mix from thermal to hydro, coal, nuclear and other renewable energy sources.

### **New Targets for Energy Access**

The SE4All action plan provides a framework for high-priority initiatives that can help achieve the SE4All objectives. Current strategies that aim to support energy supply and to meet access targets in the medium and long term, include:

* The short-term (2015-2020),
* Medium-term (2020-2025) and
* long term (2025-2030) plan

For the development of the electricity supply, the focus is on providing access to electricity through grid extension and increase in generation. The Action plan aims at increasing the overall electrification rate to 73% by 2015 to100% by 2033; electricity supply to 2,7800 MW by 2016 and more than 101325 MW by 2030.

For piped gas, Government’s planned connections are going to increase gradually. Assuming a 5% annual increase in connections, the total domestic connections are going to increase to 9.75 million by 2020, 12.38 million in 2025 and 15.81 million by 2030. Thus, by the end of the planned period, 42% of the population will be provided access through piped gas network. The criterion for sanctioning gas connection varies from one region to another based on the population density, geography, and the socio-political context. In Punjab, a new housing scheme will be given gas connection if the cost of providing the connection is less than PKR. 54,000 per customer. On the other hand, in KP and Sindh, the cost threshold is PKR. 108,000 while in Baluchistan it is PKR. 200,000 per customer. Even with these differences in cost, it will not be financially or economically viable to extend piped gas network to several remote locations.

## **Investment and Regulatory Framework in Pakistan**

### **Existing Trends in Energy Sector Investment**

Pakistan has embarked on a massive investment program in energy and infrastructure sectors to mitigate chronic energy shortages, diversify the country’s fuel mix and improve trade connectivity. Part of this investment is implemented in the context of the China Pakistan Economic Corridor (CPEC)—a package of investment projects, potentially totaling about $55 billion (19 percent of FY 2015/16 GDP) over the next decade. The analysis below is based on realization of 19 CPEC projects ($17.7 billion in energy sector and $5.9 billion in infrastructure) and several non-CPEC energy sector projects ($25.4 billion), which are either in advanced planning stages or already in the process of implementation.

CPEC projects in the energy sector involve foreign direct investment and commercial borrowing from Chinese financial institutions, either by majority foreign-owned joint ventures or Chinese investors. Financing of non-CPEC energy projects ranges from private domestic financing to private commercial as well as government concessional borrowing from international financial institutions.

The planned expansion of energy sector capacity could eliminate Pakistan’s generation capacity gap in 2016 as early as 2018. In the process, Pakistan’s excessive reliance on furnace oil would be significantly reduced. Impact on GDP will likely come in three stages: construction, power generation, and—over time— second-round effects on broader economic activity due to increased productivity, lower costs, and improved trade connectivity. The first two stages (direct contribution) could add about $13 billion to Pakistan’s GDP in the next seven years (4.7 percent of FY 2015/16 GDP). Second-round effects will likely accrue gradually and could lead to a significant contribution in the long run, depending on various other supportive factors.

The focus of the CPEC and other donors’ investment strategy is to shift the generation mix to low-cost sources and prioritizing supply of natural gas to thermal power generation, thus making electricity more reliable and affordable. Hydropower development along the Indus River Cascade will be the cornerstone of the energy sector strategy, for more and lower cost power generation.

This strategy will support large public-sector hydropower projects, including Tarbela and Dasu, while IFC (International Finance Cooperation) will engage with domestic and international sponsors (from China and the Republic of Korea) to finance large private hydropower and renewable power projects over the next three to five years. It will support the development of small, predominantly renewables-based, electrification schemes to bring affordable electricity to those not served by the grid, particularly in Balochistan. IFC will also invest in developing a storage and regasification terminal to facilitate liquefied natural gas imports.

The WBG (World Bank Group) is supporting enhancing the supply of natural gas through the Natural Gas Efficiency Project. The Power Sector Reform DPC (Development Policy Credit) will support the government in putting in place a policy framework mandating expansion in generation through a least-cost plan, for all new future power generation

Table 2: Foreign Investment inflows in Pakistan($Millions)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Country | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 (Jul-Sep)\*\* |
| USA | 869.9 | 468.3 | 238.1 | 227.7 | 227.1 | 212.1 | 223.9 | 13.2 | 71.1 | 22.4 |
| UK | 263.4 | 294.6 | 207.1 | 205.8 | 633.0 | 157.0 | 169.6 | 151.6 | 68.9 | 12.2 |
| U.A.E | 178.1 | 242.7 | 284.2 | 36.6 | 22.5 | (47.1) | 213.6 | 109.7 | 55.8 | 22.1 |
| Japan | 74.3 | 26.8 | 3.2 | 29.7 | 30.1 | 30.1 | 71.1 | 35.4 | 45.2 | 13.3 |
| Hong Kong | 156.1 | 9.9 | 125.6 | 80.3 | 242.6 | 228.5 | 136.2 | 93.3 | 25.0 | 0.0 |
| Switzerland | 227.3 | 170.6 | 110.5 | 127.1 | 149.0 | 209.8 | (6.5) | 58.0 | 16.9 | 0.6 |
| Saudi Arabia | (92.3) | (133.8) | 6.5 | (79.9) | 3.2 | (40.1) | (64.8) | 24.0 | 1.9 | 0.2 |
| Germany | 76.9 | 53.0 | 21.2 | 27.2 | 5.5 | (5.7) | (18.2) | (10.6) | (5.2) | 5.6 |
| Korea (South) | 2.3 | 2.3 | 7.7 | 25.4 | 25.8 | 24.4 | 14.3 | 4.0 | 7.8 | 0.0 |
| Norway | 101.1 | 0.4 | (48.0) | (275.0) | (258.4) | (21.6) | 2.7 | 172.5 | (12.6) | (50.2) |
| China | (101.4) | (3.6) | 47.4 | 126.1 | 90.6 | 695.8 | 319.1 | 1,063.6 | 1,185.6 | 429.8 |
| Others | 1,964.2 | 1,019.6 | 631.3 | 289.7 | 285.5 | 255.4 | (73.1) | 590.6 | 950.5 | 205.9 |
| Total including Pvt. Proceeds | 3,719.9 | 2,150.8 | 1,634.8 | 820.7 | 1,456.5 | 1,698.6 | 987.9 | 2,305.3 | 2,410.9 | 661.9 |
| Privatization Proceeds | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| FDI Excluding Pvt. Proceeds | 3,719.9 | 2,150.8 | 1,634.8 | 820.7 | 1,456.5 | 1,698.6 | 987.9 | 2,305.3 | 2,410.9 | 661.9 |

Source: Board of Investment, Pakistan

Note: 56.4% increase in Net FDI in July-Sep, 2017-18 as compared to July-Sep, 2016-17.
Note: Pakistan’s Fiscal Year runs from 1st July till 30th June. The figures in brackets are in negative.

Table 3: Sector Wise Foreign Direct Investment Inflows ($Millions)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Country | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 (Jul-Sep)\*\* |
| Oil & Gas | 775.0 | 740.6 | 512.2 | 629.4 | 559.6 | 502.0 | 300.5 | 248.9 | 157.6 | 48.7 |
| Power | 130.6 | (120.6) | 155.8 | (84.9) | 28.4 | 71.4 | 282.2 | 1,159.2 | 795.4 | 268.2 |
| Transport | 93.2 | 132.0 | 104.6 | 18.7 | 44.1 | 2.7 | 6.2 | 70.2 | 53.5 | 9.6 |
| Others | 763.4 | 586.3 | 416.3 | 282.2 | 765.5 |  375.2 | (105.7) | 109.2 | 784.5 | 46.4 |
| Total including Pvt. Proceeds | 3,719.9 | 2,150.8 | 1,634.8 | 820.7 | 1,456.5 | 1,698.6 | 987.9 | 2,305.3 | 2,410.9 | 661.9 |
| Privatization Proceeds | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| FDI Excluding Pvt. Proceeds | 3,719.9 | 2,150.8 | 1,634.8 | 820.7 | 1,456.5 | 1,698.6 | 987.9 | 2,305.3 | 2,410.9 | 661.9 |
|  |

Note: 56.4% increase in Net FDI in July-Sept, 2017-18 as compared to July-Sept, 2016-17.
Note: Pakistan’s Fiscal Year runs from 1st July till 30th June. The figures in brackets are in negative.

The list of FDI inflows in Pakistan clearly depicts major donors’ preferences for investment in energy sectors. It clearly reflects that FDI inflows in energy sector are higher than any other sector of Pakistan. Only inflows from China include $ 36 Billion for energy projects by 2030. Similarly, investment inflows in oil, gas, power sector and transport are in the top priority list of all major donor agencies as the inflow suggests.

### **Energy Sector Investment Potential in Pakistan**

Pakistan energy sector potential offers a wide range of investment opportunities, such as hydro, solar, wind, biomass and coal.

* The total generation of electricity projected by 2030 is estimated around 101325 MW. By 2030, the generation mix will be dominated by hydel and renewable with share 49 percent (Hydel 34500 MW and Renewable16200 MW). It means payback period will be so long (starting from 2015) and rate of return will be high compared to non-renewable resources. It will also help to achieve the targets of low GHG emissions (less than 2 %).
* The share of coal, gas, and oil with overall share will be 34 percent (Domestic Coal 13,225 MW, Gas 11300, and Oil 10000 MW). The share of nuclear will increase to 8 percent (8000 MW). The imported Coal share is estimated around 3 percent (3000 MW) whereas, Imported LNG share will be 4 percent (3600 MW) and Imported Electricity share will be more than 1 percent (1500 MW).
* Investment in energy sector over the next 15 years have potential to attract foreign investor and local investors.

### **Policy Environment for Investment in Pakistan**

The investment in energy sector are designed by the Government to provide attractive incentives to investors. Following is the list of investment policy framework and incentives regime in place:

* **Investment Liberalization Policy:** Liberal and transparent policy for investors to set up Independent Power Projects (IPPs). Guaranteed power purchase produced by IPPs, backed by sovereign guarantee of GoP provides a very secure investment climate for investors.
* **Investment Policy 2013:** The goal of Investment Policy 2013 is to address and adjust economic priorities in the face of changing global scenario of economic slowdown coupled with domestic difficulties of power outages and continued pressure on economy due to war on terror. It is an endeavor to address the changed economic realities and to achieve the targets given in National Policy Document and Vision 2025.
* **Special Economic Zones, Rules 2103.** GoP has set up power parks at various locations where the Government will develop the site with water, power-evacuation and access provided. The investors only have to set up power projects at these locations with the entire support infrastructure in place.
* **Foreign Direct Investment Strategy 2013-17:** The Ordinance 2001 (Clause -9) mandates Board of Investment to promote, encourage and facilitate local and foreign investment inflow in Pakistan.
* **National Power Generation Policy 2015:** Generation Policy 2015 and Policy Framework for Private Sector Transmission Line Projects 2015 have been launched to attract new investments for development of new power generation projects and augmentation of transmission network in the country. These two policy frameworks received overwhelming market response and has successfully attracted many renowned local and international players to participate in the development of Pakistan’s Power Sector.

Private Power and Infrastructure Board is handling portfolio of thirty-two 32 multiple fuel (coal, hydro, RLNG/ Gas) based IPPs with cumulative capacity of more than 19,500 MW worth multi billion dollars. The present target is to complete, and commission twenty multiple fuel-based power projects of around 15,000 MW by end of 2022. These projects are at different stages of implementation, some are under construction, some are about to start construction, while others are under pre-development regime.

* **Strategic Trade Policy Framework (STPF) 2015-18:** This strategic trade policy is designed to achieve the national trade targets, through key enablers like:
	1. Competitiveness (quality infrastructure, labor productivity, access to utilities, and level of technological development)
	2. Compliance to standards (convergence of local & international standards, protection of intellectual property, and effective and efficient disputes resolution mechanism)
	3. Policy environment (monetary policy, tariff & tax regime, and synergic industrial & investment policies)
* **Domestic Resource Mobilization Strategy:** Increasing the flow of taxes and other income into government treasuries – is key to achieving the ambitious Sustainable Development Goals (SDGs). ... Fair, efficient tax systems are necessary for poverty alleviation and equitable growth.
* **CPEC and National Financial Inclusion Strategy:** Pakistan’s financial sector has undergone considerable reforms that have significantly strengthened its soundness, profitability, efficiency and diversity. Until that time, it had been dominated by a handful of nationalized banks that suffered from poor performance and asset quality. CPEC investment will give new arena to financial inclusion.

### **Incentive Regime of Investment in Pakistan**

Table 4: Incentive Regime of Investment in Pakistan

|  |  |
| --- | --- |
| Investment Incentive | Brief Description |
| Investment Incentives | Foreign Private Investment (Promotion & Protection) Act 1976Tax Concession and Avoidance of Double Taxation The Federal Government may allow such concessions to industrial undertaking having foreign private investment as may be admissible under any law for the time being in force. Foreign private investment shall not be subject to other or more burdensome taxes on income than those applicable to investments made in similar circumstances by the citizens of Pakistan. Foreign private investment shall be allowed, all the tax concessions admissible on the basis of any agreement (for avoidance of double taxation which the Government of Pakistan may have entered into with the Government of the country of origin of such investmentProtection of Economic Reforms Act, 1992Immunities to Foreign Currency Accounts * All citizens of Pakistan resident in Pakistan or outside Pakistan who hold foreign currency accounts in Pakistan, and all other persons who hold such accounts, shall continue to enjoy immunity against any inquiry from the Income Tax Department or any other taxation authority as to the source of financing of the foreign currency accounts.
* The balances in the foreign currency accounts and income there from shall continue to remain exempted from the levy of wealth-tax and income tax and compulsory deduction of Zakat at source.
* The banks shall maintain complete secrecy in respect of transactions in the foreign currency accounts.
* The State Bank of Pakistan or other banks shall not impose any restrictions on deposits in and withdrawals from the foreign currency accounts and restrictions if any shall stand withdrawn forthwith.

Protection of Fiscal Incentives for Setting-up of Industries The fiscal incentives for investment provided by the Government through the statutory orders listed in the Schedule or otherwise notified shall continue inforce for the terms specified therein and shall not be altered to the disadvantage of the investors.Protection of Transfer of Ownership to Private Sector. The ownership, management and control of any banking, commercial, manufacturing or other company, establishment or enterprise transferred by the Government to any person under any law shall not again be compulsorily acquired or taken over by the Government for any reason whatsoever.Protection of Foreign and Pakistan Investment No foreign, industrial or commercial enterprise established or owned in any form by a foreign or Pakistani investor for private gain in accordance with law, and no investment in share or equity of any company, firm, or enterprise, and no commercial bank or financial institution established, owned or acquired by any foreign or Pakistani investor, shall be compulsorily acquired or taken over by the Government.Secrecy of Banking Transaction Secrecy of bona-fide banking transactions shall be strictly observed by all banks and financial institutions, by whosoever owned, controlled or managed.Protection of Financial Obligation. All financial obligations incurred, including those under any instrument, or any financial and contractual commitment made by or on behalf of the Government shall continue to remain in force, and shall not be altered to the disadvantage of the beneficiaries. |
| Investment Guarantees’ | **According to BOI Investment Policy 2013**The BOI has instituted an online registration procedure for foreign companies entering and operating in Pakistan. Registration serves as a notification to the Government of Pakistan of the presence of the investor and guarantees the investor to entitlements specified in the Investment Policy but is not an approval mechanism. For rendering efficient services, BOI charges a nominal fee as well.In view of the technology and know-how that foreign investors can bring to Alternative and Renewable Energy (ARE) projects, the BOI shall strengthen its cooperation with Ministry of Energy, Alternative Energy Development Board (AEDB) and other line ministries in respect to promoting and facilitating projects with foreign investors.**Foreign Private Investment (Promotion & Protection) Act 1976/Protection of Agreement** The Federal Government considers it necessary in the public interest to take over the management of an industrial undertaking having foreign private investment or to acquire the ownership of the shares of citizen of Pakistan in the capital of such industrial undertaking, any agreement approved by the Federal Government relating to such undertakings entered into between a foreign investor or creditor and any person in Pakistan shall not be affected by such taking over or acquisition. Foreign capital or foreign private investment in an industrial undertaking shall not be acquired except under the due process of law which provides for adequate compensation therefore to be settled in the currency of the country of origin of the capital or investment and specifies the principles on and the manner in which compensation is to be determined and given.**Repatriation Facilities**Subject to the provision of the Foreign Exchange Regulation Act, 1947: A foreign investor in an industrial undertaking established after the 1st day of September 1954, and approved by the Federal Government may at any time repatriate in the currency of the country from which the investment was originated; Foreign private investment to the extent of original investment; Profits earned on such investment; and any additional amount resulting from the reinvested profits or appreciation of capital investment; and a creditor of an industrial undertaking referred to in clause (a) may repatriate foreign currency loans approved by the Federal Government and interest thereon in accordance with the terms and conditions of the said loan; and provided that nothing in this section shall affect the terms of the permission to make such investment granted to a foreign investor before the commencement of this Act. |
| CPEC Potential | More than 20 Projects of energy sector are in planning phase or being implemented. Generating New opportunities for investment and efficiency regime in energy sector. |
| Public-Private Partnership | PPIB is solely working to deal with IPPs to ensure demand driven energy requirements of the National Grid.  |
| Growth Potential | Average growth rate of some 7 – 8 % per year (supported by the Framework for Economic Growth)Employment for an increasing and increasingly urbanized population (230 – 260 million by 2030)Building a knowledge-based economy and prioritizing the development of human capitalEnhancing the global competitiveness of the Pakistani economy from the 2011- 12 rank (118 out of 142 benchmarked countries) to rank 50 by 2030 |
| Renewable Energy Resources | * Hydro Power Potential
* Solar Potential
* Wind Potential
* Geothermal Potential
* Biomass and others
 |

## **Investing in Energy Sector of Pakistan**

Pakistan is endowed with diverse energy sources of energy including natural gas, biomass, hydro, solar, wind, geothermal. Pakistan has potential of more than 100,000 MW of hydro, Solar, and wind. Commercial energy sources such as petroleum and electricity account for more than 80% and 90 % of primary energy used, respectively, while coal, solar and wind account for less than 10 % present energy mix.

To increase electricity access, the GoP is encouraging investment in generation capacity, distribution systems and in developing indigenous sources of energy. Moreover, scope exists to accelerate electrification to meet growing demand, especially in the rural areas through off-grid solutions and expansion of Gas Network for households heating and cooking purpose. In addition to this, there is potential for LNG cylinders for far furlong areas, Solar electrification and installation of wind energy units in plain areas.

Investment environment is very conducive. One of the major investments in energy sector of Pakistan is CPEC, consisting of $36 billion for energy projects up-to 2030. Similarly, private sector is already contributing to more than 50% in total installed capacity of electricity sector of Pakistan. It constitutes 31 independent private power projects totaling about 9071 MW. The current demand and supply gap of 2,000 MW and demand growing at 6% per annum ensures guaranteed uptake of power produced by IPP projects at market competitive prices.

The following investment opportunities in the energy sector exist in Pakistan:

* Generation, transportation and distribution of energy from various sources;
* Power infrastructure development, rehabilitation and expansion;
* Extraction of biofuels, such as ethanol from sugar and biodiesel etc.
* Construction of Gas pipelines and petroleum products offloading terminals, and development of upcountry storage and distribution facilities;
* Rural electrification through distributed energy sources;
* Exploration of new and renewable energy resources;
* Energy efficiency appliances and development of labs.

## **Investment Priorities Identified in NAP for SE4All**

|  |
| --- |
| Investment Potential in Enhance Energy Access Projects |
| # | **Project Title** | **Investment Potential**  | **Description of the Project** | **Responsibility** |
| 1 | Off- Grid Lightening in far off Districts | $16.75 billion | Prioritize underserved districts in all provinces for off-gird lightening programs are already assessed in NAP. The numbers of these districts are given as: Punjab (10 districts), Sindh (07 Districts), KPK (10 districts), Baluchistan (08 District), AJk (03 district), Gilgit Baltistan (04 districts) | Provincial and Federal Governments and International Agencies |
| 2 | New Gas Connection | $12.34 billion | Provision of new gas connections through piped network to 8205002 households to meet the set targets of 2030. | SNGPL & SSGPL |
| 3 | Solarization of Schools and Basic Health Units | $12.5billion | Solarization of government schools and colleges (the number of institutions without access to electricity in each province has been documented. Solarization of basic health units which do not have access to the electricity at the moment. The total number goes to 22898 for schools and basic health units. | Provincial Governments |
| 4 | Access to Clean energy | $4.146 billion | Improve access to clean cooking by extending provision of LPG to the regions without access to gas connections. Subsidy for one cylinder per month using BISP mechanism. Total Targeted households as stated in National Action Plan 450,000. The total estimated value per households per month is 1500. | Provincial Governments and International Agencies |
| 5 | Powering Schools and Colleges through Solar PV Technology | $ 12.5billion | Schools, colleges and universities should be powered using Solar PV technology through either standalone system with a battery backup or through installation of micro grids of 5kW-115kW. | Provincial Govts. / Federal Govt. and International Agencies |
| 6 | Increasing the Share of Renewable Energy Sources to Curb Power shortage | $9.34 billion | Increase the utilization of renewable energy to alleviate the power shortage problems as renewable (wind and PV energy). These projects will have lower costs fluctuations as compared to Oil, Coal and LNG (14% of 65 MTOE in 2030) | Provincial Governments and International Agencies |
| 7 | Installation of LPG Plants | $ 2 billion | Installation of 60 LPG Air Mix plants in areas un served by piped network, out of which 28 will be in Baluchistan, 2 in Sindh and the remaining 30 will be set up in Punjab, KPK, AJK and Gilgit-Baltistan. Size of these plants is going to be between 0.5 and 1 mmcfd.Assuming an average size of 0.75 mmcfd, one LPG air mix plant will serve gas to 7,500 households. 60 such plants will serve 450,000 households by 2018. | Federal Governments |
| 8 | The SE4ALL Small Grants Program | $20 Million | The SE4ALL Small Grants Programme will be established to offer grants up to USD 100,000/- for any initiatives that accelerate the adoption of any of the proposed actions within the SE4ALL plan. A trust fund of USD 20 million should be set aside, and only the investment income be utilized for grant making. It is suggested that at least 40% of this USD 20 million is contributed from the government’s own funds, and the rest can be through donor contributions facilitated by UNDP. The SE4ALL Trust Fund should be established as a Section 42 non-profit company with an independent Board | SE4All Secretariat / Governments and International Agencies |
| 9 | Provision of Improved Cook Stoves | $10.5billion | Improved Cooking Stoves for around 40 percent of population by giving alternate source of cooking (biomass) | Provincial Governments and International Agencies |
| A |  **Sub-Total**  | **$80 billion**  |
| Investment Potential in Renewable Energy Projects |
| 1 | Municipal Solid Waste | $ 240 Million | Exploit potential of Municipal Solid Waste (MSW) to generate around 360 MW of gross power capacity in the anaerobic digester-based power plants by utilizing 16 landfill sites | Provincial Governments through Public Private Partnership |
| 2 | Promotion of Biomass Energy in the Rural Areas | $2 billion | Promotion of biomass energy in the rural areas where no gas connections are available. Materials that can be fed into a biogas digester are mostly readily and locally available and it can be used for households (cooking/ lighting) and industry, transportation and to generate electricity helping to reduce the dependency on fossil fuel imports. | Provincial Governments |
| 3 | Biomass Fuel Generation | $ 120Million | Biomass fuel of 1.86 million tonnes/year, 1062 GWh (potential capacity of 162 MW) can be annually generated through Rice mills. | Provincial Governments |
| 4 | Installation of Cogeneration Plants in Sugar Mills | $ 600 Million | Replace low-pressure steam boilers in 84 Sugar Mills with high-pressure cogeneration plants. This can double the total current capacity 830 MW. |  National Energy Efficiency Conservation Authority |
| 5 | Solar Water Heater at Provincial Level | $ 5billion | Promote solar water-heating for areas, like Gilgit Baltistan and/or villages in AJK, KPK and Punjab, with no access to traditional gas network where otherwise it would require billions of rupees in capital expenditure to lay down the pipeline network. Moreover, utilizing solar water heating technology instead of natural gas or conventional sources has significant advantages on economic, environmental, and social sustainability | Provincial Governments |
| 6 | Distribution of basic solar products to low-income households | $ 1.5billion  | Promotion of Solarization in the country through Distribution of basic solar products to low-income households (40% population) | NGOs and Provincial Governments |
| 7 | Solar Powered Water Pumps | $ 3.5billion | Need to provide solar powered water pumps to reduce the cost of fuel consumption to farmers on subsidized rates. (With a fuel consumption of around 3 to 5 liters per hour, the average daily expense per pump is approximately PKR 700 per day ($7/day) in fuel costs every day) | Federal and Provincial Governments |
| 8 | Heating Pipeline Network | $100 Million | Promote water heating pipelines for areas, like Gilgit Baltistan and/or villages in AJK, KPK and other regions with geothermal energy. Instead of natural gas or conventional sources has significant advantages on economic, environmental, and social sustainability. Initially it be on experimental basis | Provincial Government and NGOs |
| 9 | Local Manufacturing of Renewable Technologies | $ 20.03 billion  | Promote job creation through fostering renewable energy technologies. Developing indigenous capacity for manufacturing renewable energy. | Federal and Provincial Governments Policy – Board of Investment and Private Sector  |
| 10 | Hydropower Generation (Small, medium and large) | $60 billion | Exploit Pakistan’s hydropower potential of 60,000 MW (Khyber Pakhtunkhwa (24,736 MW), Gilgit-Baltistan (21,125 MW), Azad Jammu & Kashmir (6,450MW) and Punjab (7,291MW)). | Federal and Provincial Governments |
| 11 | Wind Energy Projects | $6billion | Promote Wind energy projects in Hyderabad to Gharo region and coastal areas south of Karachi in southeastern Pakistan, hills and ridges in northern Punjab and near Mardan and Islamabad in northern Indus valley, and near Nokkundi and hills and ridges in the Chagai area and Makran in the southwestern part of the country. (upto 10,000 MW) | Federal and Provincial Governments / AEDB |
| 12 | Production of Biodiesel |  $ 127 Million | Produce biodiesel in Pakistan to strengthen agricultural sector and empower the farmers (Need to set up nurseries for Jatropha seeds for germination at various sites in Sindh, Punjab, and Balochistan) | Provincial Governments |
| 13 | Conversion of Gas Geyser to Solar Water Heater | US$ 1.5 billion | Convert 2 million gas geyser consumers to solar water heater in the SNGPL network can save 15 BCF annually or 41 MMCFD which is about 9% of total natural gas consumption in Punjab. | Federal Government- SNGPL/SSGCL |
| B | **Sub-Total**  | **$100 billion** |
| Investment Potential in Energy Efficiency Projects |
| 1 | Provide Improved Cookstoves | US$ 657.54 Million | Provide Clean and Improved Cook stoves with higher conversion efficiencies to help relieve the environmental damage and to save biomass resources | Provincial Governments and NGOs |
| 2 | Energy Management in Industrial Sector | US$ 6billion | Achieve Energy efficiency in the industrial sector by employing a broad range of energy management, efficient technologies and practices to reduce overall energy consumption.Following technologies and practices for improvements of High Impact Opportunity which can offer high energy saving:* Retrofitting;
* Variable Frequency Drives (VFDs);
* Efficient Electric Motors;
* High Pressure and Efficient Boilers;
* Energy-Efficient Lighting;
* Heating Ventilation & Air Conditioning (HVAC);
* Waste Heat Recovery Systems;
* Renovation of Process Equipment;
* Improved Process Performance with Applications of Sensors and Controls Network; and Development of Adequate Energy Management Systems
 | Federal and Provincial Governments / NEPRA |
| 3 | Energy Efficient Appliances | $ 50 Million | Need to set the rules and regulations for the appliances manufacturers to manufacture the energy efficient products (product wise consumption detail is mentioned in the report) | Federal and Provincial Governments / NEECA |
| 4 | Improvement in Process Operation | $ 50 Million | Improvement in Process Operation. e.g. proper metering in the textile and sugar industry. | Federal and Provincial Governments / NEECA |
| 5 | Installation of Heat Recovery Systems (HRS) | $ 30 Million | Installation of Heat Recovery Systems (HRS) from exhaust flue gases in sugar and paper industry can increase energy efficiency | Provincial Governments |
| 6 | Thermal Insulation of Steam Lines and Valves | $ 300 Million | Thermal insulation of steam lines and valves in almost all industrial units | Provincial Governments |
| 7 | Installation of Variable Frequency Drive (VFD) | $ 70 Million | Installation of Variable Frequency Drive (VFD) or inverters on pumps and motors reduce energy losses; | Federal and Provincial Governments / NEECA |
| 8 | Improvement of Maintenance Operation | $ 100 Million | Improvement of Maintenance Operation i.e. reduction of air leakages; and Proper maintenance and operation of electrical motors will increase energy efficiency | Federal and Provincial Governments / NEECA |
| 9 | Energy Savings in the Textile Industry | $ 1.1billion | Energy savings in the textile industry by installation of meters controls to reduce leakages of compressed air and improved maintenance of electrical motors | Federal and Provincial Governments / NEECA |
| 10 | Energy Efficient Technologies for Sugar Industry | $ 230 Million | Sugar industry to deploy energy efficient technologies, such as the High-Pressure Cogeneration (HPC). Sugar mills with HPC technology, consumes 46% less bagasse to produce same amount of electricity compared to existing low-pressure technology (23 bar) | Federal and Provincial Governments / NEECA |
| 11 | Single Stage Dry Kilns for Cement Units | $ 700 Million | Cement units to employ single stage dry kilns which can be shifted to more efficient process of multistage dry kilns to improve overall energy efficiency of cementing process. Higher efficient processes in the cement industry would also help in reduction of dust, GHG emissions and conserve water. | Provincial Governments / NEECA |
| 12 | Implementation of Simple Energy-Saving Techniques in Leather Sector | $ 134 Million | Implementation of simple energy-saving techniques such as efficient lighting and installing controls for compressed air could help save $134,000 in energy costs annually in leather sector. In addition, proper metering and insulation offer best energy efficiency potential and reduce the energy consumption. | Provincial Governments |
| 13 | Energy Efficiency in Fertilizer Sector | $ 800 Million | Energy efficiency in fertilizer sector to convert existing processes to a high efficiency steam reforming and Haber-Bosch synthesis. It has the potential to reduce gas consumption by 25% by 2030.Significant energy efficiency gains in fertilizer sector can be achieved by investing in co-generation, installation of meters and improvement of power factors etc. | Federal and Provincial Governments |
| 14 | Boiler and Burner Tuning of Pulp and Paper Mills | $ 70 Million | Pulp and Paper mills to reduce their gas demand by 7% and overall energy consumption by 5.6% percent just by tuning their boiler burners and adjusting air-to-fuel ratios. | Provincial Governments |
| 15 | Introduction of Zig-Zag Technology | $ 600 Million | Introduction of small-scale brick-makers to increase energy efficiency and save money to keep bricks dry before feeding into the kiln.It offers huge fuel/energy savings where sun-baked bricks can be a good alternative, provided kiln design is architecturally good and is protected from floods and water. (Introduction of Zig-Zag Technology). | Federal and Provincial Governments / / NEECA |
| 16 | Freight Transportation from Road to Rail | $ 20 billion | Shifting freight transportation from road to rail that can save about 80% of less than conventional road transport. | Federal Government |
| 17 | Smart Metering Technology | $ 2.0billion | Need to deploy smart metering technology for natural gas and power consumers to avoid transmission losses | Federal Government / DISCOs / NEPRA |
| 18 | Expansion of the Electricity Network | $ 26 billion | Expansion of the network to withstand pressures from demand and potential breakdowns is an urgent task for the Pakistan’s electricity sector as a whole | Federal Government / International Donor Agencies.  |
| 19 | Replace Maximum Possible Tube Wells Pumps | $ 700Million | Replace maximum possible tube wells pumps (out of 180,000) with more efficient pumps by 2030 | Provincial / Federal Government |
| C | **Sub-Total**  | **$60 billion**  |
|  | **Grand Total****(A+B+C)** | **$ 240 billion**  |

### **Investment Potential in Energy Sector Programs**

Programme 1: Management Support to SE4ALL Secretariat at Energy Wing, Planning Commission

|  |  |
| --- | --- |
| Program Description This programme aims to provide Technical Advisory services to support the SE4ALL Secretariat in the identification, analysis, design, and implementation of other actions and interventions that will contribute to the achievement of SE4ALL goals in Pakistan, with a special focus on the identification of investment programmes and projects to be included in Pakistan’s IP for its integration into the SE4All agenda throughout the AA implementation process. | ImplementationImplementation partnersLead: Energy Wing, Planning Commission Partners: To be defined. |
| Objectives * Identify, analyze, design and implement other SE4ALL actions and initiatives;
* Identify projects on energy access, energy efficiency and renewable energy to be implemented in Pakistan that complement on-going projects and initiatives that contribute to the achievement of Pakistan’s SE4ALL goals.
 | Financing |
| Proposed Activities1. Support the SE4ALL Secretariat in the development of Renewable Energy programmes.

ii. Support the SE4ALL Secretariat in the implementation and consolidation of Energy Efficiency Programmes, including:* Assessment of opportunities for energy efficiency in multiple sectors.
* Demand side management programmes across different sectors of activity (commercial, residential and industrial).

iii. Create a mechanism to support early stage renewable energy projects into maturity and late stage renewable energyprojects into financial close;iv. Develop a programme to identify, develop and implement renewable energy projects for heat and power, withparticular emphasis in clean cooking and off-grid electricity services;v. Revise and update Pakistan’s IP to include the identified programmes and projects;vi. Develop a capacity building programme for SE4ALL Secretariat and Regional Energy Desks on these subjects. |
| Resources: |
| Timeline |
| Contact:  |  |

Programme 2: Support SE4ALL Secretariat in the Revision and Alignment of Pakistan’s

Legal Framework with the SE4ALL Action Agenda

|  |  |
| --- | --- |
| Program Description This programme aims to provide SE4ALL Technical Advisory services to the SE4ALL Secretariat to review, refresh, consolidate or update policies and mechanisms to promote the implementation of Pakistan’s SE4ALL NAP and IP. It is expected that under the SE4ALL framework, the SE4ALL Secretariat will undertake the regulatory framework review to assess the need to appropriately refresh (or renew) policies, regulations and energy plans, and to reinforce synergies across sectors. | ImplementationImplementation partnersLead: Energy Wing, Planning Commission Partners: To be defined. |
| Objectives The main objective of this programme is to develop a regulatory strategy to address critical areas associated to energy planning and policies in Pakistan. | Financing |
| Proposed Activities* Support the SE4ALL secretariat in compiling an inventory of the inter-relations between different policies and the identification of the needs for policy updates in the Energy Sector and across sectors
* Review the Energy Sector in Pakistan’s current policy, strategy and regulatory framework and assess how itcorrelates to Pakistan’s SE4ALL Goals and AA.
* Review current strategies in the Energy sector and improve the complementarities and alignment with SE4ALL objectives.
* Development of nexus with other sectors like Health, Education and Water and coordination between governmental bodies:
* Coordination of the policies developed with other sectors.
* Review, refresh, consolidate or update policies to promote the implementation of the SE4ALL goals and initiatives under the AA and IP:
* Develop a comprehensive Access Acceleration Strategy with clear links to the Rural Electrification Strategy,
* Renewable Energy and Energy Efficiency strategies and any other strategies in place that promote access to energy.
* Develop a comprehensive Rural Electrification Strategy and consolidate the SE4AAL (including strategy for mini-grids and stand-alone systems for access below 1 MW);
* Develop a comprehensive Renewable Energy Strategy with clear goals and targets and integrate it into the Energy Sector Wide policy framework.
* Develop a comprehensive Energy Efficiency strategy with clear goals and targets and integrate it into the Energy Sector Wide policy framework;
* Define, develop and adopt EE standards, labelling schemes, Minimum Performance Standards (MEPS) and other necessary secondary legislation to promote EE.
* Review, adopt and implement a Biomass Energy Strategy (BEST) including supply and demand of forestry products
* Develop specific regulations for sustainable efficient charcoal production methods depending on availability of raw materials.
* Develop a concrete policy, strategy and targets to regulate the clean cooking sector.
* Develop and implement a MER system for the energy sector to monitor the performance of the different strategies and plans being implemented in Pakistan.
* Review, refresh, consolidate or update investment incentives/mechanisms associated to subsidies and incentives for the energy sector, especially those that will have an impact on the IP:
* Create a financial incentive package for the implementation of actions and initiatives in the fields of renewable energy, energy efficiency and energy access
 |
| Resources: |
| Timeline |
| Contact:  |  |

Programme 3: Support SE4ALL Secretariat/MEM in the Identification and Analysis of Investment

Projects to be included in Pakistan’s IP

|  |  |
| --- | --- |
| Program Description This programme aims to provide Technical Advisory services to support the SE4ALL Secretariat in the identification, analysis, design, and implementation of other actions and interventions that will contribute to the achievement of SE4ALL goals in Pakistan, with a special focus on the identification of investment programmes and projects to be included in Pakistan’s IP for its integration into the MTP and throughout the AA implementation process. | Implementationimplementation partnersLead: Energy Wing, Planning Commission Partners: To be defined. |
| Objectives * Identify, analyze, design and implement other SE4ALL actions and initiatives;
* Identify projects on energy access, energy efficiency and renewable energy to be implemented in Pakistan that complement on-going projects and initiatives that contribute to the achievement of Pakistan’s SE4ALL goals.
 | Financing already mentioned under Priority Areas  |
| Proposed Activities* Support the SE4ALL Secretariat in the development of Renewable Energy programmes for solar, wind, mini-hydro and geothermal energy.
* Support the SE4ALL Secretariat in the implementation and consolidation of Energy Efficiency Programmes, including:
	+ Assessment of opportunities for energy efficiency in multiple sectors.
	+ Demand side management programmes across different sectors of activity (commercial, residential and industrial).
* Create a mechanism to support early stage renewable energy projects into maturity and late stage renewable energy projects into financial close;
* Develop a programme to identify, develop and implement renewable energy projects for heat and power, with particular emphasis in clean cooking and off-grid electricity services;
* Revise and update Pakistan’s IP to include the identified programmes and projects;
* Develop a capacity building programme for SE4ALL Secretariat/Energy Wing and Regional Energy Desks on these subjects.
 |
| Resources: |
| Timeline |
| Contact:  |  |

# **Investment Projects and Programs in Pakistan’s Energy Sector**

This section is presented with three components:

* + 1. Current Plan and Strategies for energy Projects: This section is about the detail of existing energy sector projects and initiatives taken by provincial and federal government to make sure the availability of sustainable energy utilization at all level.
		2. Donor Supported Initiatives: Pakistan is one of the largest recipient of FDI particularly for investment in energy sector projects by bilateral and multilateral donor agencies in energy efficiency, energy generation and enhancing the share of renewable energy projects.
		3. Project Investment at Federal and Provincial Level: This section gives details about the list of projects started or completed by provincial governments for energy generation through all means i.e. renewable and non-renewable resources.

# **The Existing Plans / Strategies and the Gaps**

The following are the existing plans and programs under the provincial governments to ensure universal access to energy in the respective province.

Existing Programs on Off-Grid Electrification

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Region | Program/Project Name | Beneficiaries/Purpose | Implementing Agency | Funding Sources | Execution Period |
| Punjab | Khadam-e-Punjab Ujala Program(KPUP) | Solarization of 20000 off- grid schools and BHUs | Punjab Energy Department | ADB  | 2016-2020[[5]](#footnote-5) |
|  | Energy solution using indigenous resources in villages (PV and Biogas Hybrid) | Vehari and Faisalabad  | Directorate of Power Projects, Punjab Energy Department  | Annual Development Program  | 2017-2018 |
| Sindh | Pakistan Solar and Renewable Energy Program | 50,000 households could be electrified | Sindh Energy Department | World Bank | 2017-20 |
|  Solar Electrification of 284 BHUs  | Solar Systems were handed over to School ManagementCommittees through respective District Education Officer | Sindh Energy Department | Total Cost PKR. 454 million to be funded by ADP | 2017-18 |
| Scheme IElectrification of 40 homes each in 300 villages Scheme 2: Electrification of 5000 Schools on Stand Alone off-Gridtechnology in 10 Border Districts of the province | 12,000 households altogether in 300 villages will be electrified through solar home systems | Sindh Energy Department | Total Cost is PKR. 0.5 billion to be funded through ADP | 2016-18 |
| Construction of 230 Biogas Plants in Rural Areas | Rural Populations  | Sindh Energy Department  | 20 million by ADB | 2017-18 |
| Khyber Pakhtunkhwa | Mini/Micro Hydel | 356 stations to be set up in 12 districts through 6 NGOs (35 MW). 248 completed and 108 under construction. To be scaled up to 1028 stations with cumulative capacity of 100 MW targeting 1.0 Million population | Pakhtunkhwa Electricity Department (PEDO) | PEDO, ADB | 2016-2020 |
| Solar Home Solutions | Chitral – 3750 households (2750 achieved)Central/Southern Districts – 2,950 households | Pakhtunkhwa Electricity Department (PEDO) | ADB | 2016-2020 |
| Solarization of Schools and BHUs  | 8000 Schools and 187 BHUs will be solarized with cumulative capacity of 50 MW | Pakhtunkhwa Electricity Department (PEDO) | ADB | 2018-2020 |
| Solarization of Mosques  | 4440 Mosques will be solarized  | Pakhtunkhwa Electricity Department (PEDO) | KPK – ADP | 2018-19 |
| Balochistan | Provision of Solar System for Water Access | Tapping shallow groundwater emanating from perennial streams of the river basins of Zhob and Mula, using solar-powered systems in off-grid locations | Balochistan Energy Department | ADB | 2018-2022 |
| FATA | Micro Hydel | 19 Small Hydropower Projects for Power generation and irrigation  | FATA Secretariat  | ADP | 2017-2020 |
| AJK | Micro Hydel Stations | 34 micro-hydro stations of 1250 kW capacity have been commissioned while another 122 are in the pipeline. A total of 9,630 households will benefit from this.  | AJK Power Development Organization | ADP | 2013-2017 |
| Solarization of Schools and Hospitals  | 400 Schools and 100 BHUs | AJK Electricity Department | ADP | 2017-2020 |
| Solarization of Remote Areas | 10,000 Houses will be electrified  | AJK Electricity Department | ADP / Community Participation | 2017-2022 |
| GB | Solarization of office buildings and hospitals | More than 100 buildings and 5 hospitals in GB | GB Water and Power Departments | GB ADP | 2018-2025 |

Source: Review of Government Programs and SE4All Review Meeting

# **International Donor Agencies Projects**

|  |
| --- |
|  |
| Sr.No | Donor Name | on-going Initiatives | Amount (US$ mil) | Year | Remarks |
|  | Renewable Energy |
| 1 | World Bank | Pakistan Community-Based Renewable Energy Development in Northern Areas and Chithral |  |  | Active |
| Pakistan Solar and Renewable Energy Program | 200 |  | Pipeline |
| Pakistan Hydro-meteorological and Climate Services Project | 100 |  | Pipeline |
| Additional Financing to PK: Tarbela 4th Extension Hydropower Project | 390 |  | Active |
| Dasu Hydropower Stage I Project | 588 |  | Active |
| Energy Access |
| Electricity Distribution and Transmission Improvement Project | 256 |  | Closed |
| Transmission Extension & Reinforcement Project | 162 |  | Closed |
| National Transmission Modernization I Project | 425 |  | Pipeline |
|  |  | Energy Access |
| 2 | Asian Development Bank | MFF Power Transmission Enhancement Investment Program II Tranche 2 | US$ 260.00 million | 29-Sep-17 | Approved |
| Second Power Transmission Enhancement Investment Program - Tranche 1 | Ordinary capital resources US$ 115.00 millionLoan 3420-PAK: Second Power Transmission Enhancement Investment Program - Tranche 1concessional ordinary capital resources lending / Asian Development Fund US$ 10.00 million | 31-Aug-16 | Active |
| Second Power Transmission Enhancement Investment Program | Ordinary capital resources US$ 800.00 millionconcessional ordinary capital resources lending / Asian Development Fund US$ 10.00 million | 23-Aug-16 | Active |
| Power Transmission Enhancement Investment Program II | TA 8818-PAK: Power Transmission Enhancement Investment Program IITechnical Assistance Special Fund US$ 1.50 millionTA 8818-PAK: Power Transmission Enhancement Investment Program II (Supplementary)Technical Assistance Special Fund US$ 600,000.00 | 16-Dec-14 | Active |
| Second Power Distribution Enhancement Investment Program | concessional ordinary capital resources lending / Asian Development Fund US$ 20.00 millionOrdinary capital resources US$ 970.00 million | 20-Nov-15 | Active |
| Second Power Distribution Enhancement Investment Program - Tranche 1 | Ordinary capital resources US$ 380.00 millionLoan 3329-PAK: Second Power Distribution Enhancement Investment Program Tranche 1concessional ordinary capital resources lending / Asian Development Fund US$ 20.00 million | 25-Nov-15 | Active |
| Power Transmission Enhancement Investment Program Tranche 4 | concessional ordinary capital resources lending / Asian Development Fund US$ 400.00 millionLoan: Sustainable Energy Sector Reform Program - Subprogram 1World Bank US$ 600.00 millionJapan International Cooperation Agency US$ 49.00 million | 3-Dec-14 | Active |
| Power Transmission Enhancement Investment Program Tranche 3 | US$ 243.24 million | 22-Dec-11 | Active |
| Power Distribution Enhancement Investment Program - Tranche 3 | US$ 245.00 million | 14-Dec-12 | Active |
| Power Transmission Enhancement Investment Program Tranche 2 | US$ 165.00 million | 17-Dec-17 | Closed |
| Power Distribution Enhancement Investment Program- Project 1 | Ordinary capital resources US$ 200.83 millionLoan 2439-PAK: Power Distribution Enhancement Investment Program- Project 1concessional ordinary capital resources lending / Asian Development Fund US$ 10.00 million | 12-Sep-08 | Active |
| Power Distribution Enhancement Investment Program | Ordinary capital resources US$ 800.00 millionconcessional ordinary capital resources lending / Asian Development Fund US$ 10.00 million | 3-Sep-08 | Active |
| Renewable Energy |
| Renewable Energy Development Sector Investment Program - Tranche 2 | US$ 200.00 million | 13-Dec-10 | Closed |
| Renewable Energy Development Sector Investment Program - Project I | Ordinary capital resources US$ 105.00 millionLoan 2287-PAK: Renewable Energy Development Sector Investment Program - Project Iconcessional ordinary capital resources lending / Asian Development Fund US$ 10.00 million | 13-Dec-06 | Archived |
| MFF - Renewable Energy Development Sector Investment Program (formerly Renewable Energy Development Facility) | Ordinary capital resources US$ 500.00 millionconcessional ordinary capital resources lending / Asian Development Fund US$ 10.00 millionTA 4881-PAK: Renewable Energy Policy Formulation and Capacity Development of the Alternate Energy Development BoardTechnical Assistance Special Fund US$ 800,000.00 | 1-Dec-06 | Archived |
|  |  | Energy Access |
| 3 | JICA | Punjab Transmission Lines and Grid Stations Project | 11,943 million Yen | May 2008 to October 2015 (7 year) |  |
| National Transmission Lines and Grid Stations Strengthening Project | 23,300 million Yen | March 2010 to January 2017 (7 year) |  |
| Dadu Khuzdar Transmission System Project | 3702 million Yen | December 2006 to June 2015 (8 year) |  |
| Renewale Energy |
| Introduction of Clean Energy by Solar Electricity Generation System | 480 million Yen | 2010 to 2012 (3 year) |  |
|  |  | Energy Access |
| 4 | Kfw | A whole generation of hydropower plants were built in Pakistan with German involvement, including the large-scale Tarbela Dam and Ghazi Barotha plant, plus the associated transmission and distribution system across the country. The substantial commitments in the field of hydropower utilization have made a key contribution to the development of urban areas and industrial zones in Pakistan. |  |  |  |
| Together with our Pakistani partner, German experts have conducted numerous feasibility studies for hydropower projects with an energy potential of 3,000 MW. Run-of-river power plants with a total output of 2,000 MW have been constructed or are under construction. |  |  |  |
| Renewable Energy |
| Political objectives in regard to renewable energies and energy efficiency in Pakistan were defined on the basis of the combined efforts of experts from Germany and Pakistan; these objectives have been adopted by the Pakistani cabinet. |  |  |  |
| 5 | DFID |  |  |  |  |
|  |  |  |  |  |  |
| 6 | UNDP | Energy Access |
|  |  |  |  |
| Renewable Energy |
|  |  | Energy Access |
| 7 | USAID | Generation of Electricity:  USAID-funded renovations of Tarbela Dam in Khyber Pakhtunkhwa, the Jamshoro and Guddu Thermal Power Plants in Sindh, and the Muzaffargarh Thermal Power Plant in Punjab generated 978 MW of electricity.  |  |  |  |
| Transmission to Distribution Companies:  By repairing and replacing aging equipment – including transformers, circuit breakers, and transformer cooling fans – USAID programs have increased transmission capacity by 1,791 MW. |  |  |  |
| Distribution to Customers:  USAID worked with power distribution companies (DISCOs) to improve management systems, upgrade equipment, and maintain the distribution network. DISCO improvements recovered 212 megawatts of electricity and saved over $429 million.   |  |  |  |
| Renewable Energy |

# **Province wise Projects Investment**

|  |
| --- |
| Investment Prospective |
| Sr. No | Project Name | Description 362626 | Budget |
| Sindh Province |
| 1 | Development of 05X20 MWs SOLAR POWER PROJECTS AT VARIOUS LOCATIONS IN SINDH | 05 Solar Power Projects each of 20 MW capacity are under processing in five districts. i) Thatta ii) Shaheed Benazirabad, iii) Larkana, iv) Sukkar and v) at Jamshoro | 1MW Solar Thermal Plant is around 2-2.5 million |
| 2 | Establishment of 2 X 50 MW Wind Power Projects in theProvince. | Sindh Renewable Energy Company is actively engaged in developing two 50 MW Wind Power projects in the province. The feasibility Studies have been completed andnegotiations are underway with foreign development partners to start the physicalactivities. |   |
| 3 | 20 MW "Waste-to- Energy" Power Plant, Based on MunicipalSolid Waste and Agricultural waste in Khairpur SpecialEconomic Zone. | The Municipal Solid waste and Agro –waste are available in abundance in the province, but are not properly utilized for energy sector development as per international practice. The Government of Sindh initiated a project of 20 MW based on MSW and Agro waste in the Khairpur Distt. The bidding process is near finalization. |   |
| 4 | Asia’s Biggest Wind Power Project of 500 MW. | The Energy Department has signed an Agreement with Norwegians investor and Asia’s biggest Wind Power Project of 500 MW will start producing electricity within 2-3 years. The feasibility studies have been completed and as soon as tariff is awarded,the ground works will be started. |   |
| 5 | Feasibility Study for Concentrated Solar Thermal Power Generation Projects | The approved cost of the project is 18.6 million. Through this project a detailedfeasibility study will be carried out for establishment of Concentrated Soar ThermalPower Generation Projects of 50 MW, 20 MW and 10 MW at most feasible sites inNorthern areas of Sindh | 18.6 million |
| 6 | 02x50 MWs Gas Based Power Generation Projects. | 02X50 MWs gas based power generation projects were initiated in PPP mode atJhimpir Road adjacent to Sindh Nooriabad Industrial Trading Estate, District Jamshoro,by the Government of Sindh through Energy Department and M/s Technomen KeneticsPvt. Ltd., has been declared qualified bidder for both the projects. |   |
| 7 | 05 MWs HYDRO POWER GENERATION PROJECTS. | 05 MWs hydro power generation project on Run of River (RoR) has been initiated atRD-15, Rohri Canal, near Sukkur Barrage, Sukkur, under PPP mode. M/sIqbal ali mohammad Pvt. Ltd., has been declared successful bidder. |   |
| 8 | 2×660MW Coal-fired Power Plants at Port Qasim Karachi | 1320 MW | 1,980 (US$ M) |
| 9 | Engro Thar Block II 2×330MW Coal fired Power Plant TEL 1×330MW Mine Mouth Lignite Fired Power Project at Thar Block-II, Sindh, Pakistan ThalNova 1×330MW Mine Mouth Lignite Fired Power Project at Thar Block-II, Sindh, Pakistan | 660 MW330 MW330 MW | 2000 (US$ M) |
| 10 | Surface mine in block II of Thar Coal field, 6.5 million tons/year |   | 1470 (US$ M) |
| 11 | Hydro China Dawood 50MW Wind Farm(Gharo, Thatta) | 50 MW | 125(US$ M) |
|   |   |   |   |
|   |   |   |   |
|   |   |   |   |
|  |
| 1 | Quaid-e-Azam 1000MW Solar Park (Bahawalpur) Quaid-e-Azam | 300 MW600 MW100 MW | 1302 (US$ M) |
| 2 | Establishment of 2x55 MW Coal Based Power Plant at M-3 Industrial Estate Faisalabad |   | 15,158 (Rs. M) |
| 3 | PC-II, Feasibility Study Consultancy for Bio-Mass based power plants setup near wheat and rice proceeding areas Punjab  |   | 104.050 (Rs.M) |
| 4 | Solar solution for P & D building Lahore |   | 35.601 (Rs. M) |
| 5 | Establishment of 2x55 MW Coal Based Power Plant at Sunder Industrial Estate Lahore |   | 15,114.000 (Rs. M) |
| 6 | Renewable Energy DevelopmentSector Investment Programme (REDSIP) Construction of MaralaHydel PowerStation |   | 10,803.000 (Rs. M) |
| 7 | PC-II, Feasibility Study for Developmentof Coal Based Power Projects andIndustrial States in Punjab i) M-3Faisalabad ii) Sunder, Lahore |   | 239.000 (Rs.M) |
| 8 | Establishment of 15-20 MW Bio Mass Thermal Power Plant near ChakJhumra, Faisalabad |   | 3000 (Rs. M) |
| KPK Province |
|   |   | MW | Rs. M |
| 1 | Ranolia HPP | 17 MW |   |
| 2 | Machai HPP |   |
| 3 | DaralKhwar HPP | 36.6 MW |   |
| 4 | Koto HPP |   |
| 5 | Jabori HPP | 10.2 MW |   |
| 6 | Karora (New) HPP |   |
| 7 | Matiltan HPP | 84 MW |   |
| 8 | Lawi HPP |   |
| 9 | KeyalKhwar HPP | 122 MW | 21,713 |
| 10 | Dasu Dam | 4000 MW | 473,746 |
| 11 | Chor Nullah HPP | 665 MMW | 133,133 |
| 12 | Spat Gah HPP | 496 MW | 99,299 |
| 13 | Thakot Dam | 2800 MW | 546,000 |
| 14 | Patan Dam | 2800 MW | 546,000 |
| 15 | AllaiKhwar HPP | 121 | 13,835 |
| 16 | Khan Khwar HPP  | 72 | 8,301 |
| 17 | DuberKhwar HPP | 130 | 16,324 |
| 18 | Golen Gol HPP | 106 | 11,830 |
| 19 | KurammTangi  | 83.4 | 59,000 |
| 20 | GomalZam Dam | 17.4 | 12,829 |
| 21 | Basha Dam | 4500 | 894,257 |
| 22 | Munda Dam | 740 | 119,000 |
| 23 | Barum Gol  | 24.93 | 17.63 |
| 24 | Mastuj River | 18.21 | 17.63 |
| 25 | Ayun Gol  | 15.17 | 30.2 |
| 26 | Gande Gar HPP | 3.21 | 5.1 |
| 27 | Balkani HPP  | 5.17 | 6.25 |
| 28 | Bhimbal Katha  | 7.86 | 21.72 |
| 29 | Nila da Katha  | 2.47 | 4.28 |
| 30 | Safar Maluk Katha | 7.43 | 27.2 |
| 31 | ChowkelKhwar | 12 | 19.01 |
| 32 | KedamKhwar | 17.14 | 20.02 |
|   |  | 147 | Feasibility study completed 19-6-2007 |
|   |  | PPIB issued LOS 19-06-2010 |
|   |  | PPA initiated |
| 33 | Kunhar | WUAs of KP and AJK under process |
|   |  | Land Acquisition in AJK started |
|   |  | Land Acquisition in KP under process |
| 34 | Suki Kinari HPP |  | 168,168 |
|
| 35 | Asrit-Kedam HPP |  | 43,043 |
|
| 36 | Madian HPP |  | 31,431 |
|
| 37 | Kalam-Asrit HPP |  | 39,439 |
|
|
| 38 | Kaigah HPP |  | 109,710 |
|
| 39 | GabralKalam HPP |  | 20,220 |
|

# **Power Project List by 2025 (Source PPIB)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| # | Project | Sponsor/Company Name | Power Policy | Location | Fuel | Capacity (MW) | Expected COD/Remarks |
| 2017 |
| 1 | Patrind Hydropower Project | Star Hydropower Limited | 2002 | Kunhar River, KP/AJ&K | Hydel | 147 | Oct-17 Under testing & commissioning |
| 2\* | 1320 MW Imported coal based Power Project at QadarabadDist Sahiwal | Huaneng Shandong Ruyi (Pakistan) Energy (Pvt) Limited | 2015 | Qadarabad, District Sahiwal | Coal | First Unit660 Second Unit660 | Inaugurated on 25.05.17 Inaugurated on 03.07.17 |
| 3(i)\* | 1320 MW Imported coal based Power Project | Port Qasim Electric Power Co. (Pvt) Ltd | 2015 | Port Qasim, Karachi | Coal | First Unit660 MW | Dec-17  Under construction |
| 4 | 1180 MW RLNG based Project at Bhikki | QATPL | 2015 | Bhikki, Punajb | RLNG | 1180 | Open Cycle (717 MW) commissioned  Combined Cycle by Dec-17 |
| 5(i) | 1223 MW RLNG based Project at Balloki, Punjab | NPPMCL | 2015 | Balloki, Punjab | RLNG | GT1 & GT2800 | Open Cycle bySep-17 |
| 6(i) | 1230 MW RLNG based Project at Haveli Bahadur Shah, Punjab | NPPMCL | 2015 | Haveli Bahadur Shah, Punjab | RLNG | GT1 & GT2800 | Open Cycle (760 MW) inaugurated on 07.07.17   |
| 7 | Fatima Energy Cogeneration Project | Fatima Energy Limited | Co-gen Policy 2008 | Muzaffargarh | Bagasse/ Imported Coal | 118 | Dec-17 LOS issuedFC in progress(Under Construction) |
| Sub Total (2017) | 5025 |   |
| 2018 |
| 5(ii) | 1223 ME RLNG based Project at Balloki, Punjab | NPPMCL | 2015 | Balloki, Punjab | RLNG | ST423 | Combined Cycle by Jan-18 |
| 6(ii) | 1230 MW RLNG based Project at Haveli Bahadur Shah, Punjab | NPPMCL | 2015 | Haveli Bahadur Shah, Punjab | RLNG | ST430 | Combined Cycle by Jan-18 |
| 8(i)\*  | 1320 MW Imported coal based Power Project at HUB Balochistan | China Power HUB Generation Co. Ltd.   | 2015 | HUB, Balochistan | Coal |   First Unit660 MW  | Dec-18 LOS issuedFC in progress(under construction) |
| 9(i)\* | 660 MW Thar Coal based Power Project | Engro Powergen Thar Limited | 2015 | TharBlock-II, Sindh | Coal |  First Unit330 MW | Oct-18 FC achievedUnder construction |
| 3(ii)\* | 1320 MW Imported coal based Power Project | Port Qasim Electric Power Co. (Pvt) Ltd | 2015 | Port Qasim, Karachi | Coal | Second Unit660 MW | Jun-18 FC achieved.Under construction |
| Sub Total (2018) | 2503 |   |
| 2019 |
| 8(ii)\*  | 1320 MW Imported coal based Power Project at HUB Balochistan | China Power HUB Generation Co. Ltd.  | 2015 | HUB, Balochistan | Coal |  Second Unit660 MW |  Aug-19   |
| 9(ii)\* | 660 MW Thar Coal based Power Project | Engro Powergen Thar Limited | 2015 | TharBlock-II, Sindh | Coal |  Second Unit330 MW |  Jun-19  |
| 10 | 163MW imported coal based Power Project at Arifwala Punjab | Grange Power Limited | 2002 | Arifwala, Punjab | Coal | 163 | Sep-19LOS issuedFC in progress |
| 11 | Gulpur Hydropower project | Mira Power Ltd | 2002 | Poonch River/Gulpur, AJ&K | Hydel | 102 | Oct-19       FC achievedUnder Construction |
| 12 | 1250 MW RLNG based Project near Trimmu Barrage, Jhang, Punjab | Punjab Thermal Power (Pvt) Ltd (PTPL) | 2015 | Near Trimmu Barrage, Jhang, Punjab | RLNG | 1250 | Oct-19 LOI issued.LOS in progress |
| Sub Total (2019) | 2505 |   |
| 2020 |
| 13\* | 1320 MW Thar Coal based Power Project | Thar Coal Block-I Power Generation Co. Ltd. | 215 | TharBlock-I, Sindh | Coal | 1320 | Dec-20 LOS issuedFC in progress |
| 14\* | 330 MW Thar Coal based Power Project | Thar Energy Limited | 2015 | Thar Block-II, Sindh | Coal | 330 | Dec-20 LOS issuedFC in Progress |
| 15\* | 330 MW Thar Coal based Power Project | Thal Nova Power Thar (Pvt) Ltd | 2015 | Thar Block-II,Sindh | Coal | 330 | Dec-20 LOS issuedFC in Progress |
| Sub Total (2020) | 1980 |   |
| 2021  |
| 16 | 660 MW Thar Coal based Power Project | Lucky Electric Power Company Ltd. | 2015 | Port Qasim, Karachi | Coal | 660 | Jun-21 LOS issuedFC in progress |
| 17 | 330 MW Thar Coal based Power Project | Siddiqsons Energy Limited | 2015 | Thar Block-II | Coal | 330 | Sep-21 LOS issuedFC in progress |
| 18\* | 1320MW Thar coal based Power Project | Oracle Coal Fields PLC England | 2015 | Thar Block VI, Sindh | Coal | 1320 | Dec-21 Project proposal yet to be submitted |
| 19\* | 300 MW Imported coal based Power Project at Gawadar | China Communication Construction Co. Ltd. (CCCC) | 2015 | Gawadar | Coal | 300 | Dec-21 LOI issuedTariff determination in progress |
| 20\* | Karot Hydropower Project | Karot Power Company Pvt Ltd | 2002 | Jehlum River, Distt. RawalpindiPunjab | Hydel | 720 | Dec-21 FC achievedUnder construction |
| Sub Total (2021) | 3330 |   |
| 2022 |
| 21\* | Suki Kinari Hydropower Project  | S.K Hydro Pvt Ltd | 2002 | Kunhar River/Mansehra, KP | Hydel | 870 | Dec-22 FC achievedUnder construction |
| Sub Total (2022) | 870 |   |
| 2024 |
| 22\* | Kohala Hydropower Project | China International Water & Electric Company | 2002 | Jehlum River/Kohala, AJ&K | Hydel | 1124 | Jun-24 LOS issuedFC in progress |
| 23 | Chakothi-Hattian Hydropower Project | Suhail Jute Mills Ltd | 2002 | Muzaffarabad, AJ&K | Hydel | 500 | Jun-24 Feasibility Study level tariff determined by NEPRA. PPIB has requested the Sponsors for submission of Performance Guarantee for issuance of LOS. |
| 24 | Azad Pattan Hydropower Project | Alamgir Power Pvt Ltd | 2002 | Jehlum River/Sudhnoti, AJ&K | Hydel | 640 | Dec-24 LOS issuedFC in progress |
| 25 | Kaigah Hydropower Project | Telecom Valley Pvt Ltd | 2002 | Kaigah/Indus River, KP | Hydel | 548 | Dec-24 Feasibility Study completed. Sponsors submitted feasibility study level tariff to NEPRA |
| Sub Total (2024) | 2812 |   |
| 2025 |
| 26 | Mahl Hydropower Project |  CWE Investment Corporation/ China Three Gorges & Trans Tech Pakistan | 2002 | Jehlum River, AJ&K/Punjab | Hydel | 590 | Dec-25 LOI issued.FS completed and approved by POE. Tariff Application has been filed with CPPAG for negotiation |
| 27 | Turtonas-Uzghor Hydropower Project | Sinohydro-Sachal Consortium | 2015 | Golen Gol River, Chitral Valley KP | Hydel | 58 | Dec-25 LOI issued.Feasibility Study in progress |
| 28 | Athmuqam Hydropower Project | Korea Hydro and Nuclear Company  | 2015 | Neelum River, AJ&K | Hydel | 350 | Dec-25 LOI issued.Feasibility Study in progress |
| Sub Total (2025) | 998 |   |
| 29 | Rajdhani Hydropower Project | - | 2002 | Poonch River AJ&K | Hydel | 132 | \*\* to be advertised shortly |
| 30 | Neckeherdim-Paur Hydropower Project | - | 2015 |  Yarkun River, Chitral Valley KP | Hydel | 80 |
| 31 | MadianHydropower  Project | - | 2015 | Swat River, KP | Hydel | 157 |
| 32 | Asrit-Kedam Hydropower Project | - | 2015 | Near Kalam/Swat River, KP | Hydel | 215 |
| 33 | Kalam-Asrit Hydropower Project | - |   | Swat River, KP | Hydel | 197 |
| Sub Total | 781 |   |
| Grand Total | 20804 |   |

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|   |
| Transmission Line Projects |
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|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sr.# | Project | Sponsor/Company Name | Transmission Line Policy | Location | Technology | Expected COD/Remarks |
| 1\* | Matiari-Lahore HVDC Transmission Line Project | China Electric Power Equipment and Technology Co. Ltd. (CET)/ State Grid Corporation of China (SGCC) | TLP 2015 | Matiari to Lahore (Approx 880 Km) | + 660 kV HVDC Transmission Line  | 2020 LOS issued.Tariff Approved by NEPRAFC in progress |

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| *\*    CPEC Projects**\*\* COD will be assessed after issuance of LOI**GT = Gas Turbine**ST = Steam Turbine* |
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1. UNDP, SE4ALL “Pakistan: Rapid Assessment Gap Analysis, 2014“, “Pakistan's total energy savings potential at 11.16 million tons of oil equivalent (MTOE), (inclusive of savings in end uses as well as energy transformation), or 18% of primary energy use (FY2008)”. Another indicator for energy efficiency thorough rate of decrease in energy intensity from 2000 onward which is 1.7% and it should be doubled 3.4%. [↑](#footnote-ref-1)
2. Alternative Energy Development Board, “The Government of Pakistan has tasked the AEDB to ensure 5% of total national power generation capacity to be generated through renewable energy technologies by the year 2030. In addition, under the remote village electrification program, AEDB has been directed to electrify 7,874 remote villages in Sindh and Baluchistan provinces through ARE technologies”. http://www.aedb.org/index.php/ae-technologies/biomass-waste-to-energy/53-about-aedb [↑](#footnote-ref-2)
3. National Censuses, 2017. [↑](#footnote-ref-3)
4. Economic Survey of Pakistan 2016-17 [↑](#footnote-ref-4)
5. Source: http://cm.punjab.gov.pk/node/3971 [↑](#footnote-ref-5)