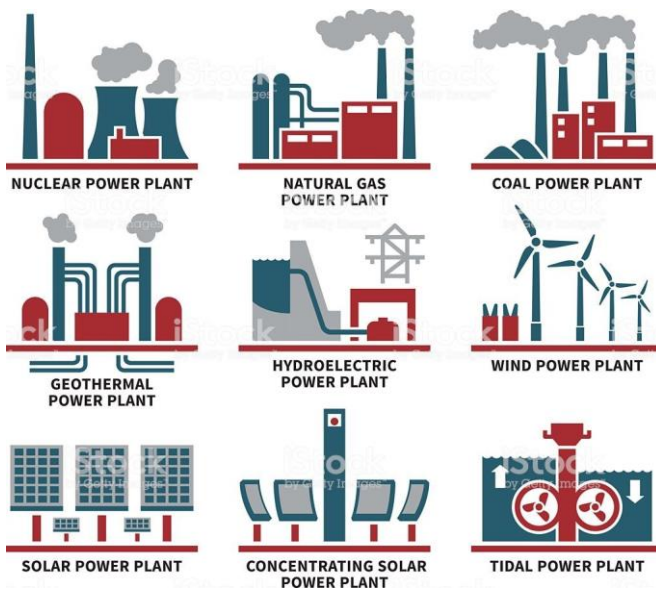


Quarterly Energy Monitor

(Jan-Mar 2020)



Rural Development Policy
Institute (RDPI)

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Introduction

Quarterly Energy Monitor (Jan-Mar 2020) prepared by Rural Development Policy Institute (RDPI) is in your hands. It is first of four quarterly monitors, which RDPI has planned to produce in the current year. The Quarterly Energy Monitor, as conceived by RDPI, is an instrument to monitor and track the progress in energy sector of Pakistan. Broadly it is expected to serve two sets of purposes—general and specific.

Generally, it is aimed at enabling our partner civil society organizations, activists and technical experts, both at national and international levels, in taking informed decisions regarding their respective initiatives of social mobilization, advocacy and research. The contents generated in this regard may include the general trends of national and international investment priorities in energy sector; progress updates on different renewable and fossil fuel-based power projects, including coal mining and coal-fueled power generation projects; the gaps in compliance of national and provincial laws/policies as well as international practices; and conflicts between federal and provincial government in governance of energy sector.

In specific terms, the monitor is meant to track the progress vis-à-vis targets set by federal government to increase the existing four percent share of renewables in national energy mix to 20 percent by 2025 and 30 percent by 2030. The kind of information in tracking progress against the development of renewable energy is intended to be used for lobbying with

parliamentarians and members of standing committees on power in senate and national assembly for promotion of clean and green energy in Pakistan.

The first Quarterly Energy Monitor (Jan-Mar 2020) is divided into four parts—(I) overview of energy sector; (II) wind and solar power projects; (III) details about the upcoming coal-based power projects; and (IV) key news stories about power sector.



I. Power Sector Overview

Pakistan's current power production projects are overwhelmingly dependent upon Chinese financial support under China Pakistan Economic Corridor (CPEC), a project of multibillion dollar Belt and Road Initiative (BRI), signed in 2013. Coal-based power projects visibly top all China-financed energy projects as they represent two thirds of the generation capacity to be added under CPEC. Out of total 17 'CPEC-Energy Priority Projects'*, nine are coal-based power plants, four wind energy projects, two hydroelectricity projects, one solar power project and one transmission line project.

* <http://cpec.gov.pk/energy>

Coal Mining and Power Generation Projects:

Four out of nine coal-based power plants under CPEC are already operational. Three coal-fired power plants in Sahiwal (2x660MW), Karachi/Port Qasim (2x660MW) and Hub/HUBCO (2x660MW) are fueled by imported coal while the fourth in Thar/Engro by local lignite coal. Apart from these power plants, coal-mining from China-financed surface mine of Thar coal field block-II 3.8 mtpa (million tones per annum), which attained financial close in 2016 has been going on since 2018.

Besides a number of coal-mining and coal based power plants under CPEC, mostly located in Tharparkar district, are in pipeline. Groundbreaking of 330MW imported coal based power plant in Gawadar was done in November 2019.

LOS (Letter of Support) has been issued for SSRL's (Sino Sindh Resources Limited) 16.8mtpa coal mining and power plant (2x660MW) in Thar coalfield block-I. ThalNova Thar Coal Power Project is in the process of achieving financial close. Thar Mine Mouth Oracle Power Plant (1320 MW) & surface mine is under issuance of LOI (Letter of Intent). During the reported quarter, HUBCO Thar Coal Power Project achieved financial close on 30th January 2020.

As the energy priorities set under CPEC are exceedingly tilted in favor of coal, share of the coal in national power mix, which was zero just few years ago, reached 32 percent in January 2020*. The fast increasing share of socially disruptive, economically expensive and environmentally hazardous coal power in national power mix is quite alarming. Ironically, Pakistan embraced coal power when the world is shifting away from this dirty source to clean and green options of renewable energy.

*<https://www.brecorder.com/2020/03/13/579625/share-of-coal-in-power-mix-reaches-32-percent/>

Pakistan's priority for coal power has largely been driven by power shortages during the last two decade. The demand-supply gap in energy sector marked by demand outstripping supply started to widen in 2000s. Increasing load-shedding assumed severe proportion in 2010s, badly affecting both the industry and domestic consumers. By 2014, the demand supply gap had reached up to 5,0000 MW.

Right after assuming power in 2013, the Pakistan Muslim League-Nawaz (PML-N) government haphazardly thrashed about looking for quick fixes to overcome the yawning demand-supply gap in power sector.

It formulated an ambitious energy policy* that lacked coherence, foresight, cost effectiveness and environmental sustainability. Notwithstanding Pakistan's vulnerability to climate change, the government paid no heed to perils of greenhouse gases' emissions emanating from the coal power projects it proposed and signed under CEPEC.

* <https://www.dawn.com/news/1031108>

In power sector projects signed under CPEC, the coal power projects dwarfed the renewable energy projects both in terms of generation capacity and volume of investment (the details of which are given in the database given below). On top of that, the PML-N government's cabinet committee on energy stopped implementation of renewable energy policy 2006. It served a big blow to around 145 renewable energy projects with a total power generation capacity of 8,000 MW. Out of total 145 projects started under 2006 policy, 104 projects got letter of intent (LOI), 19 managed letter of support while 22 were at advance stage of development.

* <https://www.dawn.com/news/1501131>

Renewable Energy:

In 2019, the present government of Pakistan Tehreek-i-Insaf finalized the draft Alternative Renewable Energy (ARE) Policy and shared it with multiple stakeholders at the final round of a two-day consultation held in Islamabad in August. In the draft ARE Policy 2019, the government set a target to increase the current four percent share of renewables in national energy mix to 20 percent by 2025 and 30 percent by 2030. The draft ARE Policy

2019 triggered serious concerns and apprehensions of the provinces.

The consultation attended by multiple stakeholders—including the representatives of federal and provincial governments and their companies, multilateral donor agencies, investors, energy sector think tanks, and leading law and consulting firms—was convened for enabling Alternative Energy Development Board (AEDB) to finalize the draft policy before presenting it first to the federal cabinet for approval and then to the Council of Common Interest (CCI) for final approval.

The representatives of provincial governments, private investors and energy sector experts criticized the draft ARE policy 2019 for being unstructured, contradictory to various regulations and codes, and lacking in a clear roadmap to renewable energy development.

Among other reported snags, shortcomings and deficiencies of draft ARE policy 2019 highlighted by different stakeholders, compromise on the rights of provinces guaranteed under the constitution stood out to dampen the hope for any major breakthrough in country's transition to clean energy.

Major bone of contention between the federal government and provinces in draft ARE policy 2019 is incorporation of the renewable projects in pipeline which started under the renewable energy policy 2006. The draft ARE policy foresees 'competitive tariffs' both for the old and new renewable energy projects.

The provinces and investors criticized application of ‘competitive tariffs’ on the renewable energy projects already started by the provincial governments. Concerned with the unpredictability on policy horizon, private sector developers and investors stress that the competitive tariffs should be applied only to the future projects, not to the ones in pipeline, which were halted when the previous government’s cabinet committee on energy stopped implementation of renewable energy policy 2006.

While demanding incorporation of the projects in pipeline in the new policy, the provinces apprehended that they will have to abandon these projects unless they are incorporated in the proposed policy.

Asserting that competitive bidding is aimed at providing cheaper energy to consumers and making an exception for the projects in pipeline will delay the beneficial impact of competitive bidding, the federal government, however, showed its readiness only to incorporate the projects which are in advance stage and decide the remaining ones on case to case basis.

The provinces warned the federal agencies that if their concerns were not addressed they would raise their objection at the level of CCI—the ultimate dispute resolution forum. The federal government told the provincial governments that the new policy was now in final stages and could not be held back to accommodate 2006 policy investors. As the reservations of provinces are not addressed by the federal government, the draft ARE Policy 2019 has not yet been approved by the CCI.

It is noteworthy to mention here that 11 wind energy projects that achieved financial

close in November 2019, have been issued Force Majeure notice by NTDC due to Coronavirus situation in China. The interconnection work for these projects is mainly being carried out by Chinese contractors and manufacturers. The situation will delay the completion of these projects as NTDC has communicated its inability to provide interconnection facilities by December 2021.

Had ARE Policy 2019 been approved, the National Transmission and Dispatch Company (NTDC) would have submitted ‘Indicative Generation Capacity Expansion Plan’ to National Electric Power Regulatory Authority (NEPRA). In the absence of this plan, tracking progress against the targets set for renewable energy policy—basiCc objective of quarterly monitor—is not possible. Hence a database of renewable energy projects, coal power plants and transmission line projects along with key developments on these projects are provided below in this quarterly review. Besides, some graphs on renewable energy sector are also given below.



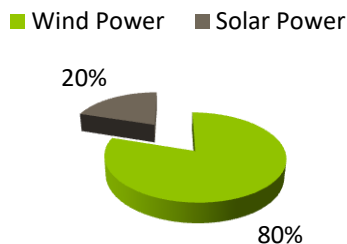
II. Wind and Solar Power Projects

(a) Operational and Upcoming Wind and Solar Power Projects At Glance:

Operational Projects	Number	Generation Capacity (MW)
Wind	24	1,236.4
Solar	6	428

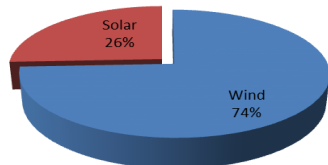
Number of Operational Wind and Solar Power Projects in Percentage:

Number of Operational Wind and Solar Power Projects in Percentage



Proportionate Generation Capacity of Operational Wind and Solar Projects:

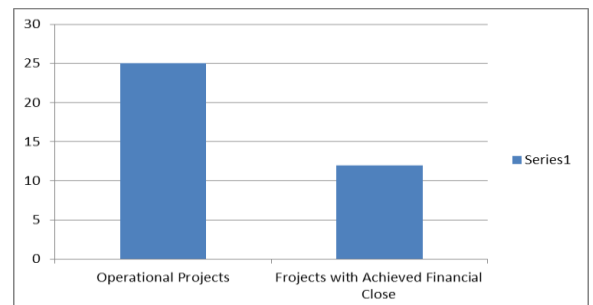
Generation Capacity of Operational Wind and Solar Power Projects in Percentage



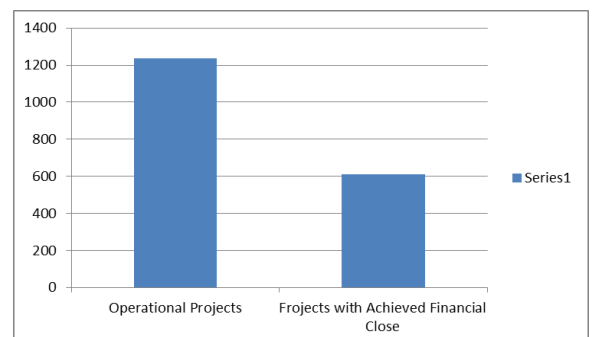
Number and Generation Capacity of Wind Power Projects with Achieved Financial Close:

Project with Financial Close Achieved	Number	Generation Capacity (MW)
Wind	12	610

Number of Operational Wind Power Projects and the ones with Achieved Financial Close:



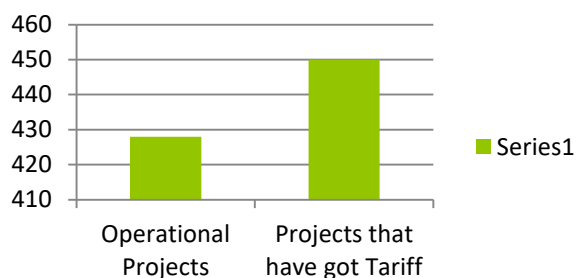
Generational Capacity of Operational Wind Power Projects and the ones with Achieved Financial Close:



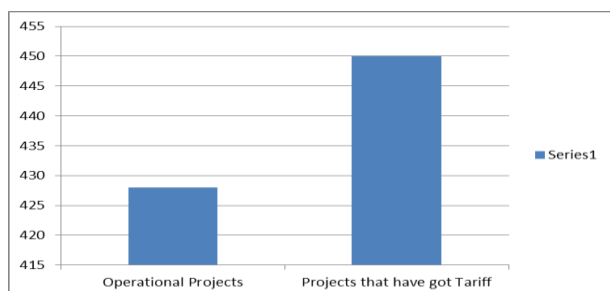
Number and Generation Capacity of Solar Power Projects that have got Tariff:

Technology	Number	Generation Capacity (MW)
Solar	7	450

Number of Operational Solar Power Projects and the ones that have got Tariff:



Generation Capacity (MW) of Operational Solar Power Projects and the ones that have got Tariff:



NOTE: These charts have been drawn on the basis of data given in next pages. The data in this part has been taken from World Wind Energy Association (WWEA)

(b) Wind Power Projects:

Operational Wind Power Projects:

No.	Company	Capacity (MW)	COD	Total MW
1	Zorlu Enerji Pakistan Limited	56.4	2013	105.9
2	FFC Energy Limited	49.5	2013	
3	Foundation Wind Energy – I Limited	50	2014	99.5
4	Three Gorges First Wind Farm Pakistan Pvt Limited	49.5	2014	
5	Foundation Wind Energy – II Pvt Limited	50	2015	102.8
6	Sapphire Wind Power Company Limited	52.8	2015	
7	Metro Power Company Limited	50	2016	282.3
8	Yunus Energy Limited	50	2016	
9	Gul Ahmed Wind Power Limited	50	2016	
10	Act Wind Pvt. Limited	30	2016	
11	Master Wind Energy Limited	52.8	2016	
12	Tenaga Generasi Limited	49.5	2016	
13	UEP Wind Power Pvt Limited	99	2017	149
14	Sachal Energy Development Pvt Limited	50	2017	
15	Artistic Energy Pvt Limited	49.3	2018	446.9
16	Hawa Energy Pvt Limited	50	2018	
17	Hydrochina Dawood Power Pvt Limited	49.5	2018	
18	Jhimpir Power Pvt Limited	49.5	2018	
19	TriconBoston Consulting Corporation Pvt Ltd-A	50	2018	
20	TriconBoston Consulting Corporation Pvt Ltd-B	50	2018	
21	TriconBoston Consulting Corporation Pvt Ltd-C	49.6	2018	
22	Three Gorges Second Wind Farm Pakistan Ltd	49.5	2018	
23	Three Gorges Third Wind Farm Pakistan Pvt. Ltd	49.5	2018	
24	Zephyr Power (Pvt.) Ltd	50	2019	50
TOTAL				1236.4

SOURCE: World Wind Energy Association (WWEA)

Wind Energy Projects with Achieved Financial Close:

No.	Company	Capacity (MW)
1	Master Green Energy Ltd	50.0
2	Metro Wind Power Ltd	60.0
3	Gul Ahmed Electric Ltd	50.0
4	ACT2 Wind (Pvt) Ltd	50.0
5	Artistic Wind Power (Pvt) Ltd	50.0
6	Tricom Wind Power Pvt Ltd	50.0
7	Liberty Wind Power 1 (Pvt.) Ltd	50.0
8	Liberty Wind Power 2 (Pvt.) Ltd	50.0
9	Lakeside Energy (Pvt.) Ltd	50.0
10	NASDA Green Energy (Pvt.) Ltd	50.0
11	Din Energy Limited	50.0
12	Indus Wind Energy Limited	50.0
TOTAL		610

SOURCE: World Wind Energy Association (WWEA)



(c) Solar Power Projects:

Operational Solar Power Projects:

No.	Company	Capacity (MW)	COD	Total MW
1	Quaid-e-Azam Solar Pakistan Pvt Ltd	100	2015	100
2	Appolo Solar Development Pakistan Ltd	100	2016	300
3	Best Green Energy Pakistan Ltd	100	2016	
4	Crest Energy Pakistan Ltd	100	2016	
5	AJ Power	18		
6	Harappa Solar	20		
TOTAL				428

SOURCE: World Wind Energy Association (WWEA)

Solar Power Projects that have got Tariff:

No.	Company	Capacity (MW)
1	Zorlu Solar Pakistan Pvt Ltd	100
2	Gharo Solar Pvt Ltd	50
3	Helios Power Pvt Ltd	50
4	Meridian Energy Pvt Ltd	50
5	HNDS Energy Pvt Ltd	50
6	Zhenfa New Energy Company Pvt Ltd	100
7	Enertech	50
TOTAL		450

SOURCE: World Wind Energy Association (WWEA)

(d) Projects at LOS stage:

There are 19 projects in this category totaling 531.02 MW, with 15 projects of a total 489.5 MW of bagasse and 4 projects of a total 41.53 MW of Solar Power Projects. List of projects under this category is given below:

Sr #	Name of Project	LOI Issued By	Type	Capacity (MW)	Date of Tarrif Award	Tariff (Us Cents/ Kwh)	Generation License
1	Access Solar (Pvt.) Ltd.	AEDB	Solar	11.52	11-Oct-18	5.9374	22 Aug,2013
2	Access Electric (Pvt.) Ltd.	AEDB		10	11-Oct-18	5.9674	26 Jun,2014
3	Buksh Solar (Pvt.) Ltd.	AEDB	Solar	10	29-Feb-2016	14.4096	26 Jun,2014
	Safe Solar Power (Pvt.) Ltd.	AEDB	Solar	10	29-Feb-2016	14.4096	12 Sep,2014
5	Shahtaj Sugar Mills Ltd. At Mandi Bahauddin, Punjab	AEDB	Bagasse	32	02-Jan-2017	10.6202	10 Nov, 2016
6	Hunza Power (Pvt.) Ltd. District Jhang, Punjab	AEDB	Bagasse	49.8	22-Feb-2017	10.6202	20 Mar,2017
7	Ittefaq Power (Pvt.) Ltd. District Bhawalpur, Punjab	AEDB	Bagasse	31.2	25-May-2107	10.6202	4 May,2017
8	Kashmir Power Private Ltd, District Jhang, Punjab	AEDB	Bagasse	40	26-April-2017	10.6202	30 May, 2017
9	Indus Energy Limited, District Rajanpur, Punjab	AEDB	Bagasse	31	26-April-2017	10.6202	13 Jun,2017
10	Bhawalpur Energy Ltd. District Jhang, Punjab	AEDB	Bagasse	31.2	26-April-2017	10.6202	2 May 2017
11	Alliance Sugar Mills Ltd. Ubauro, District Ghotki, Sindh	AEDB	Bagasse	30	11-Sep-2017	10.6202	2 Oct, 2014
12	RYK Energy Limited, Rahim Yar Khan, Punjab	AEDB	Bagasse	25	11-Sep-2017	10.6202	30 May,2017
13	Two Star Industries (Pvt.) Ltd	AEDB	Bagasse	49.8	11-Sep-2017	10.6202	25 Sep,2017

Sr #	Name of Project	LOI Issued By	Type	Capacity (MW)	Date of Tarrif Award	Tariff (Us Cents/ Kwh)	Generation License
14	TAY Powergen Company, Tando Allahyar, Sindh	AEEDB	Baga sse	30	11-Sep-2017	10.620 2	20 Mar,2015
15	Faran Power Ltd. District Tando Muhammad Khan, Sindh	AEEDB	Baga sse	26.5	11-Sep-2017	10.620 2	13 Jun, 2017
16	Hamza Suagr Mill Limited (Unit-II), Rahim Yar Khan, Punjab	AEEDB	Baga sse	30	11-Sep-2017	10.620 2	10 Oct, 2017
17	Sheikho Power Ltd. District Muzafargarh	AEEDB	Baga sse	30	11-Sep-2017	10.620 2	20 Sep, 2017
18	Mehran Energy Ltd. District Tando Allahyar, Sindh	AEEDB	Baga sse	26.5	11-Sep-2017	10.620 2	26 Sep, 2017
19	Habib Sugar Mills Ltd. District Saheed Benazirabad, Sindh	AEEDB	Baga sse	26.5	11-Sep-2017	10.620 2	14 Oct, 2017

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III-Coal-based Power Projects

Upcoming Coal-based Power Projects:

Sr No	Name of Project	Primary Input	Capacity	Technology	Estimated Cost US \$ M	Status	Executing Company/Sponsor	Coordinating Ministry	Financing	Supervising Agency	Location
1	300MW Imported Coal Based Power Project at Gwadar, Pakistan (CPEC)	Coal	300	Imported Coal	542.32	a) LOI 26-5-2017. NOC issued by b) Balochistan Environment Protection Agency (BEPA) on 07-07-2018. c) Groundbreaking done on 4th November 2019. d) <u>Operation Delayed due to Corona Virus</u>	China Communications Construction Company (CCCC)	Ministry of Energy (Power Division)		Gwadar Port Authority (GPA)/Gwadar Development Authority (GDA)	Gawadr, Balochistan
2	Thar Mine Mouth Oracle Power Plant	Thar Coal	1320	Thar Coal	Yet to be determined	Feasibility stage tariff obtained for coal. Shareholding agreement on new equity partners in process. <u>Under issuance of NTP/LOI.</u>	M/s Oracle Coalfields SEPCO and Yanzhou Coal	Ministry of Energy (Power Division)		Private Power and Infrastructure Board (PIIB)	Thar Block-VI, Thar, Sindh Province
3	HUBCO Thar Coal Power Project (Thar Energy)	Thar Coal	330	Sub Critical	497.70	Financial Closed (FC) achieved on 30th January 2020 Target Commercial Operation Date(COD) date 31 March 2021		Ministry of Energy (Power Division)	Independent Power Producer (IPP)	Private Power and Infrastructure Board (PIIB)	Block-II, Thar, Sindh Province
4	SSRL Thar Coal Block-I 6.8 mtpa & Power Plant(2x660MW)	Coal Local	1320	Sub Critical	1912.12	LOS issued (Financial Close Achieved) First Unit (660MW) is targeted by Aug 2022 COD of complete project is targeted by Feb 2023	Shanghai Electric Power Company Limited / CCTEG and SSRL	Ministry of Energy (Power Division)	Independent Power Producer (IPP)	Private Power and Infrastructure Board (PIIB)	Block-I, Thar, Sindh Province

Source: Data compiled in this table has been extracted from CPEC's website

IV. Key News Stories about Power Sector

❑ Financial Close achieved for Coal Power Plants in Block I (1320) and Block II (660 MW)

Total Amount: US \$1.301 billion

Source: Dawn, January 2, 2020

(<https://www.dawn.com/news/1525802>)

❑ Share of coal in power mix reaches 32 percent. Induction of China Power Hub Generation and Engro Powergen Thar in the system was the primary reason behind this surge

Business Recorder, 13 March 2020

(<https://www.brecorder.com/2020/03/13/579625/share-of-coal-in-power-mix-reaches-32-percent/>)

❑ Nepra grants generation tariff for two 150MW solar power projects.

Source: The News, January 18, 2020

(<https://www.thenews.com.pk/print/600105-nepra-grants-generation-tariff-for-two-150mw-solar-power-projects>)

❑ NTDC gets Rs. 6.4b loan for wind energy

Source:Dawn 27th February, 2020

(<https://www.dawn.com/news/1536948/ntdc-gets-rs64bn-loan-for-wind-energy>)

