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CPEC Success Story: Port Qasim 1,320 MW Coal-fired Power Plant

EXPLORING SOCIOECONOMIC IMPACT

Port Qasim Electric Power Company
(Private) Limited (PQEPCL)

NOVEMBER 2019

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FACTS AT A GLANCE

1st Ever CPEC Energy Project: Port Qasim Coal-fired Power Project

Capacity	1,320 MW (7.7 % of CPEC Energy Basket)
Total Foreign Investment	USD 2.085 billion
Technology	Super Critical Boiler (First Ever in Pakistan) ¹
Electricity Production till October 2019	14.7 billion units (10% of national power consumption)
Total Direct Employment	8,270 (4,960 Pakistanis + 3,309 Chinese+1 Other)
Direct Employment in Constructional Phase	7,000 (4,000 Pakistanis + 3,000 Chinese)
Direct Employment in Operational Phase	1,270 (960 Pakistanis + 309 Chinese+ 1 Other)
Indirect Local Job Opportunities	10,000 ²
Technology Transfer	150 Pakistani Engineers sent to China for Training
Environmental Awards	Certificate of Appreciation by National Forum for Environment & Health on July 17, 2018
New Tree Plantation	69,000
Primary Schools Upgradation (CSR)	1 million PKR for 130 students
Taxes submitted to GoP till August 2019	219 million USD ³
Saving of fresh water since the start of Project³	98,945,745 m ³

¹ These technically advanced plants operate above the critical conditions, (the state of a substance beyond which there is no distinction between liquid and gaseous phase) offer greater efficiency than older sub-critical designs and, most importantly, lower emissions.

² Daily Times, “Port Qasim power plant added 10bn units to national grid in one year”, May 10, 2019 (PowerChina Resources, Vice Chairman Sun Shuhua)

³ Port Qasim Coal-fired Power Project, “Diplomatic Focus”, October 2019

EXECUTIVE SUMMARY

This study tries to define the implications of newly built electricity-generating power plants in Pakistan. It will not only be focused on the provision of electricity generation, but will also highlight, how the project encourages viable, long-term job evolution in their respective areas. The two prime apprehensions which used to persist among the general masses are the employment ramifications and the need to construct these mega coal-fired power plants such as that in Port Qasim under China-Pakistan Economic Corridor.

The facts in the report have been described and refined through onsite multiple visits of research team along with primary research questionnaires answered by the officials at various relevant managerial and administrative tiers of the plant clubbed with the secondary data from different reliable sources including Pakistan Business Council (PBC), International Monetary Fund (IMF), National Electric Power Regulatory Authority (NEPRA), National Transmission and Dispatch Company Limited (NTDC), China-Pakistan Economic Corridor Secretariat (CPECS), Ministry of Planning, Development and Reform, Islamabad (MoPDR), Private Power and Infrastructure Board (PPIB), Pakistan Economic Survey, Survey of Pakistan, International Energy Agency (IEA), Chinese Embassy in Pakistan and World Coal Association.

Primary research outcomes indicate the importance of Port Qasim Coal-fired Power Plant in terms of its significant share in Pakistan's rated energy generation capacity (3 percent), Pakistan's rated imported coal-fired energy generation capacity (33 percent), Pakistan's rated coal-fired energy generation capacity (29 percent), CPEC's energy basket (7.7 percent) and CPEC's coal energy basket (16 percent)⁴, holding 5th position in latest merit order of NTDC bundled with the creation of a practical 8,270⁵ direct jobs in both the construction and operational stages of the project, as well as and additional generation of 10 thousand job opportunities⁶ for locals. Furthermore, this report is also highlighting the executed corporate social responsibility (CSR) initiatives in geographically adjacent deprived areas of the plant e.g. upgradation of two primary schools in Gharo with the investment of Rs.1 million by the plant management.

This report has been authored by Yasir Arrfat, Senior Associate Research and Communications, Pakistan-China Institute.

⁴ Author Findings

⁵ Primary data | HR Department Port Qasim Electric Power Company (Private) Limited

⁶ Daily Times, "Port Qasim power plant added 10bn units to national grid in one year", May 10, 2019 (PowerChina Resources, Vice Chairman Sun Shuhua)

ABBREVIATIONS

BRI	Belt and Road Initiative
CPEC	China-Pakistan Economic Corridor
CPECS	China-Pakistan Economic Corridor Secretariat
GDP	Gross Domestic Product
GWH	Giga Watt Hour
IEA	International Energy Agency
IMF	International Monetary Fund
KWH	Kilo Watt Hour
MoPDR	Ministry of Planning, Development and Reform, Islamabad
MW	Mega Watt
NEPRA	National Electric Power Regulatory Authority
PPIB	Private Power Infrastructure Board
PBC	Pakistan Business Council
PKR	Pakistani Rupee
SEZ	Special Economic Zone
TPES	Total Primary Energy Supply
USD	United States Dollar
WB	World Bank

1. INDUSTRIAL DEVELOPMENT

The prosperity and wellbeing of the country is absolutely dependent on the scale of industrial development. When struggling to completely industrialize and transform in a diversity of economic segments via basic commercial means, developing countries often find themselves at the consideration of undesirable phenomena such as hazardous machinery, pollution, unsafe working environments and career insecurity. Whereas ideal management of such economic impacts is yet to be found, the “invisible hand” theory as proposed by Adam Smith provides a platform by which the interests of both those in command of capital and the general consumer happen to overlap with one another, thereby creating an environment where commerce thrives. Considering the mechanism, countries which succeed to transform reap the benefit of their status as developed, which subsequently leads to increased levels of wealth generation. However, when certain industrial niches are forced to overcome specific flaws in their region’s political economy (whether they be poor regulation, vague compliance policies, or a lack of energy and mineral resources) the prerequisites for growth expand.



Figure 1. 1,320 MW Port Qasim Coal-fired Power Plant under construction

2. NEED OF 1,320 MW PORT QASIM COAL FIRED POWER PLANT

Over the past decade, Pakistan has faced chronic energy shortages (8,500 MW)⁷ and substantial underinvestment in infrastructure. The authorities estimate the cost of these challenges to the economy at about 2 percent of GDP annually. Critical production industries, such as textile, have found their investment escaping to nearby economies where uninterrupted electricity is a custom. Excessive reliance on furnace oil amid rising oil prices combined with administrative and operational inefficiencies and inadequate tariff setting produced large and persistent losses in the power sector which, in turn, led to the accumulation of power sector arrears (circular debt), underutilization of existing capacity, and underinvestment in new energy supply. The resulting gap between demand and supply of energy was manifested in power outages averaging 10–12 hours a day in FY2012/13. Alongside, public investment averaged only about 3.5 % of GDP—substantially lower than the average of over 6 % of GDP in other emerging economies⁸.

An estimated 144 million Pakistani citizens are facing lack of access to full and continuous power, and a subsection of 69 million individuals from said group lack access to the national grid. A further 65 million may have their societies wired to normal, public grid chains but remain unable to fully utilize it due to shortfalls and faulty transmission⁹.

Meanwhile, 70 percent of the work force continues to toil in the agricultural sector, albeit this aspect only contributes a mere nineteen-percent to Pakistan’s overall GDP. Services, which continue to grow on an annual basis in regard to its share of GDP [currently at 54 percent for the fiscal year] make up a third of total employment in Pakistan¹⁰. The federal government of Pakistan has continued to adopt strategies designed to mitigate both the shortfall of energy within its borders as well as the provision of employment for an ever-growing demographic bulk of youth under the age of thirty - albeit with little result. Under such a resource-stressed economy, the China-Pakistan Economic Corridor (CPEC) provides a platform by which rapid infrastructure development allows for further industrial development.

A significant proportion of capital under CPEC comprises of immense upgradation of Pakistan’s energy (17,045 MW) and transportation infrastructure¹¹. Early-harvest energy projects include

⁷ DAWN NEWS, “Electricity shortfall in the country reaches 8,500 MW”, 17th June 2012

⁸ Hiba Zaidi and Tokhir Mirzoev, “The Macroeconomics of Pakistan’s Quest for Energy and The CPEC, Pakistan Selected Issues, IMF Country Report, No. 17/213, July 2017”

⁹ Sahiwal Coal Power Plant, CPEC Insights, Centre of Excellence for CPEC, 2018

¹⁰ Government of Pakistan, “Pakistan Economic Survey 2017-18”

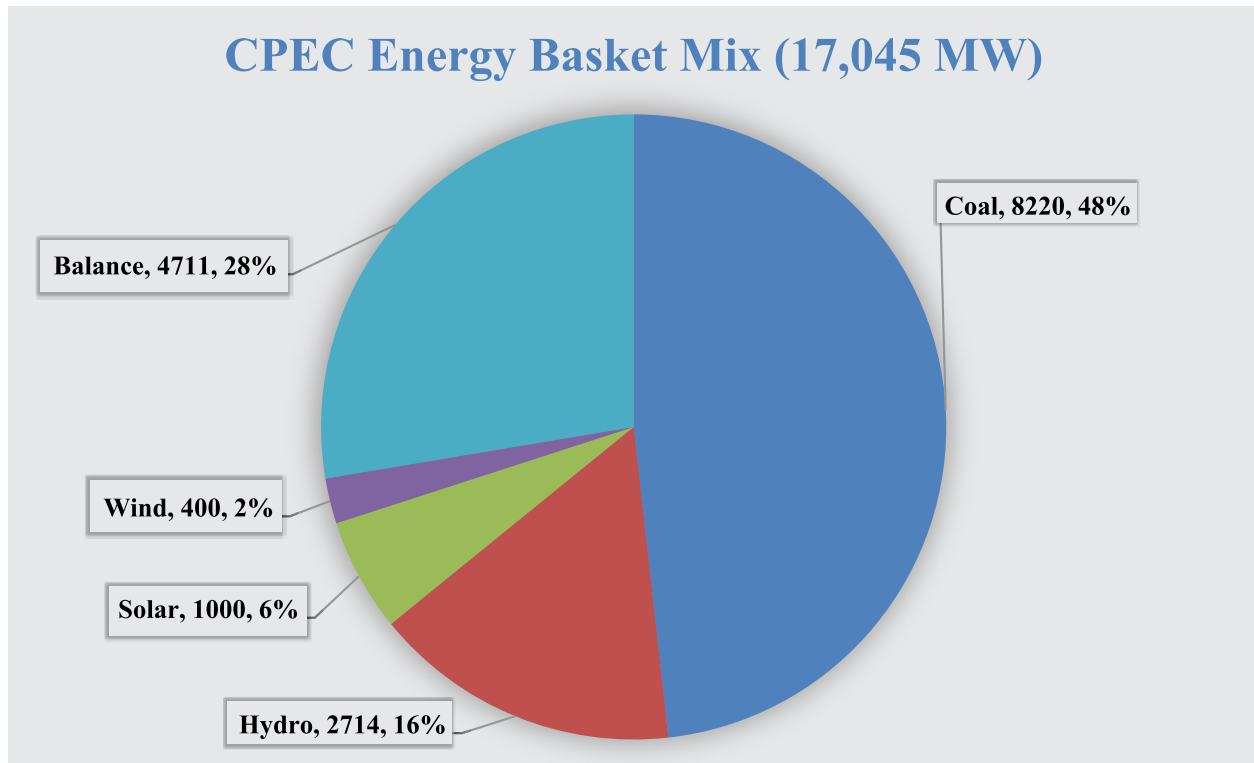
¹¹ CPEC Secretariat | Ministry of Planning, Development and Reform, Islamabad

the now-operational Port Qasim Coal-fired Power Plant (1,320 MW), which is 7.7 percent of the total energy basket of CPEC as shown in the table.

CPEC Energy Projects		MW	% Share
1	Sahiwal Coal-fired Power Project	1,320	7.7
2	Port Qasim Coal-fired Power Project	1,320	7.7
3	China-Hub Coal-fired Power Project	1,320	7.7
4	Engro Thar Coal-fired Power & Mine Project	660	3.8
5	Quaid-e-Azam Solar Park	400	2.3
6	50MW Hydro China Dawood Wind Farm	50	0.3
7	UEP Wind Farm	100	0.6
8	Sachal Wind Farm	50	0.3
9	Three Gorges Second and third Wind Power Project	100	0.6
10	Shanghai Electric (TCB-1)	1,320	7.7
11	HUBCO Thar Coal-fired Power Project (Thar Energy)	330	1.9
12	ThalNova Thar Coal-fired Power Project	330	1.9
13	Karot Hydro Power Plant	720	4.22
14	Suki Kinari Hydropower Project	870	5.10
15	Quaid-e-Azam Solar Park	600	3.5
16	HVDC \pm 660 kV Matiari-Lahore HVDC Transmission Line	4,000 Evac	
17	Gwadar Coal-fired Project	300	1.8
18	Thar Electricity (Oracle) Coal Project	1,320	7.7
19	Kohala Hydropower Project	1,124	6.6
20	Cacho Wind Power Project	50	0.3
21	Western Energy (Pvt.) Ltd. Wind Power Project	50	0.3
22	Balance	4,711	28
Total		17,045	100

Source: Ministry of Planning, Development and Reform, Islamabad

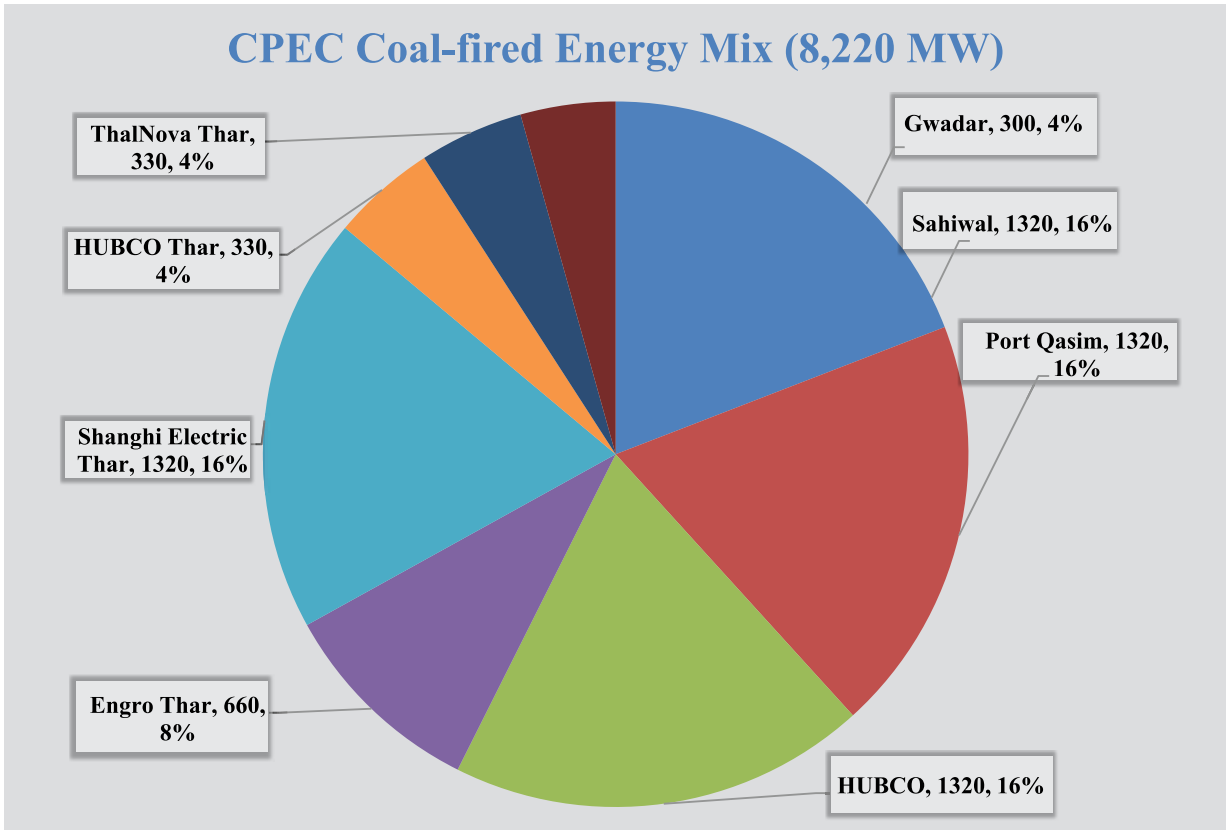
Similarly, energy mix of CPEC energy basket (17,045MW) has been shown in the chart, in which coal is leading with 8,220 MW (48%) followed by the balance¹² part of 4,711 MW (28%), Hydro 2,714 MW (16%), Solar 1,000 MW (6%) and Wind 400 MW (2%).



Graph 1 Source: Ministry of Planning, Development and Reform, Islamabad

¹² Under discussion and approval phase by CPEC Authorities

Furthermore, in below mentioned chart, Port Qasim Coal-fired Power Plant is holding 16% share in 8,220 MW coal basket of CPEC energy portfolio.



Graph 2 Source: Ministry of Planning, Development and Reform, Islamabad

Moreover, Port Qasim Coal-fired Power Plant is holding 3 percent share in overall rated power generation capacity of Pakistan (40,147 MW) as observed in below mentioned table.

Pakistan's Rated Energy History (MW)					
Category\Years	Till 2016	2017	2018	2019	Total
Imported Coal	0	1,320 (Sahiwal)	1,320 (Port Qasim)	1,320 (HUBCO)	3,960
Thar Coal	0	0	0	660 (Engro)	660
Wind	50	300	100	445	895
Solar	200	0	42	600	842
Gas	5,807	0	0	0	5,807
FO	9,642	0	0	0	9,642
RLNG	1,050	2,500	1,500	1,250	6,300
Nuclear	760	680	0	0	1,440
Hydel	7,865	147	2,487	102	10,601
Incremental Capacity	N/A	4,947	5,449	4,377	14,773
Total Rated Capacity	25,374	30,321	35,770	40,147	40,147

Source: Pakistan Business Council

It can also be analyzed from above table, Port-Qasim Coal-fired Power Plant is holding 33 percent share in Pakistan's rated imported coal-fired power generation capacity and 29 percent share in Pakistan's rated coal-fired power generation capacity.

And Pakistan is meeting only 12 percent of its energy demands from coal. However, world average is 40 percent. Below cited table is also showing the coal-fired energy supply statistics of world's leading economies as well.

Port Qasim Coal-fired Power Plant (PQCPP), Top Five Economies, Pakistan¹³	
PQCPP Share in Pakistan's Rated Imported Coal Power Generation Capacity	33%
PQCPP Share in Pakistan's Rated Coal Power Generation Capacity	29%
PQCPP Share in Pakistan's Rated Total Power Generation Capacity	3%
World Total Primary Energy Supply (TPES) by Coal, 2016	40%
USA Total Primary Energy Supply (TPES) by Coal, 2016	16%
China's Total Primary Energy Supply (TPES) by Coal, 2016	65%
India's Total Primary Energy Supply (TPES) by Coal, 2016	42%
Japan's Total Primary Energy Supply (TPES) by Coal, 2016	28%
Russia's Total Primary Energy Supply (TPES) by Coal, 2016	16%
Pakistan's Total Primary Energy Supply (TPES) by Coal, 2019	12%

Source: International Energy Agency (IEA)

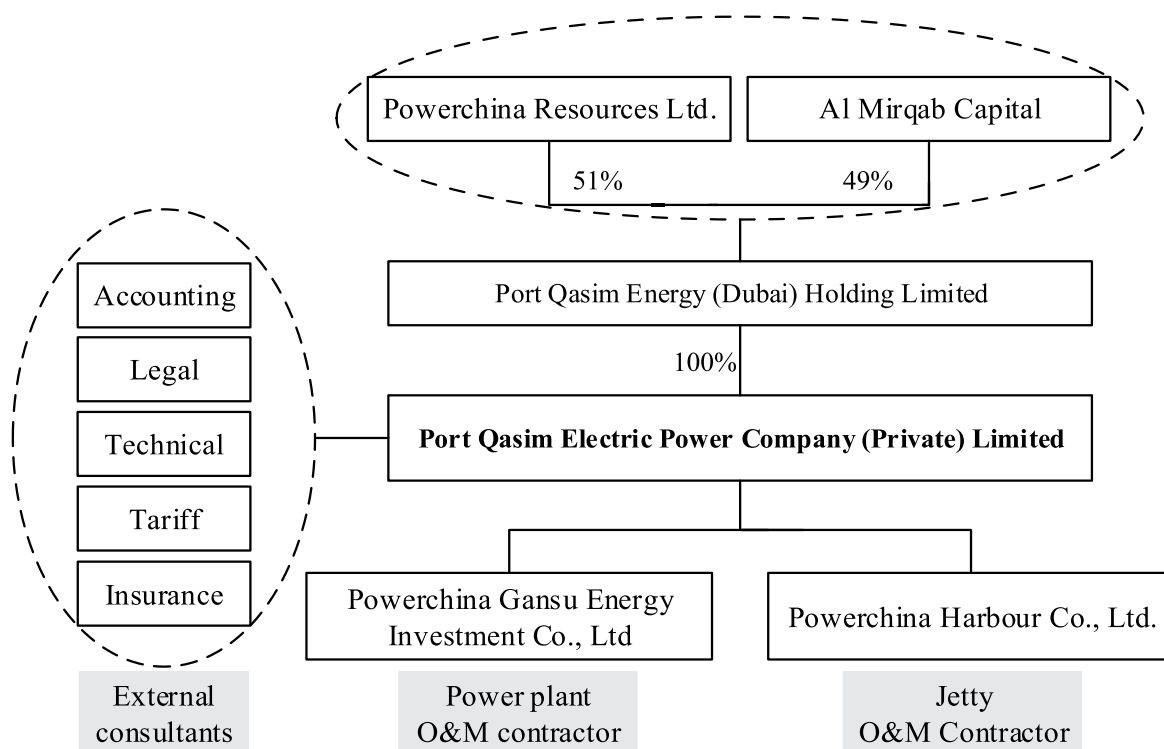
As mentioned in above table, China is producing 65 percent of its energy from coal followed by India (42%), Japan (28%), USA (16%), Russia (16%) and Pakistan (12%).

¹³ International Energy Agency (IEA)

3. PORT QASIM COAL-FIRED POWER PLANT (FDI, MERIT ORDER)

Port Qasim-Karachi is an industrial hub in the province of Sindh that enjoys a considerable population of 8,874,906 citizens as well as 1,259 square kilometers of area amidst considerable connectivity to several rail and road routes to industrial centres in Punjab and Sindh¹⁴.

Port Qasim Coal Fired Power Plant under CPEC is jointly initiated by PowerChina Resources Limited (holding 51% shares) and Qatar’s Al Mirqab Capital (holding 49% shares), with a total capital of USD 2.085 billion, spanning a construction period of 36 months. However, It has been commissioned in 32 months. Management structure has been enclosed in chart below.



The ratio of debt and equity approximately 75:25%¹⁵. Debt has been arranged and borrowed by the sponsors from the Export-Import Bank of China (China EXIM Bank) in US dollars, without increasing the financial burden of Government of Pakistan. The ground breaking was held in May 2014 by the Prime Minister of Pakistan followed by the “Power Purchase Agreement (PPA)” and “Implementation Agreement (IA)” were signed under the witness of President Xi Jinping and then Prime Minister during President Xi’s visit to Pakistan on 20th April 2015, and financial close

¹⁴ Survey of Pakistan, 2012

¹⁵ Chinese Embassy in Pakistan, “Port Qasim Coal-fired Power Project, Special Report on CPEC Projects (Energy: Part-7), 2018/10/01”

was achieved on 25th Decemebr 2015. It is the first energy project implemented under CPEC portfolio.

As per the evidences from National Electric Power Regulatory Authority (NEPRA)¹⁶, The total investment (USD 2.085 billion) of this plant has been arranged in US dollars and directly transfered by the China EXIM Bank in Pakistan. This argument proves the nature of this investment as a Foreign Direct Investment (FDI). This amount can be used to either finance the current account deficit or reduce external borrowing requirements of Pakistan.

And simlalry, with refernce to the latest “Merit Order, No. 15232-45/GM (SO)/PPC/MO” by National Transmission and Dispatch Company Limited (NTDC)¹⁷, Port Qasim Coal-fired Power Plant has achieved its 5th position in the order¹⁸ as enclosed in **Appendix-I**.

The Power Plant is located in the Port Qasim Industrial Park, approximate 37 km southeast from the city of Karachi, comprising two units with gross capacity of 1,320 MW and an exclusive coal-unloading jetty (1.6 km long). The avaaerge annual energy output is around 9000 GWh on its full rated capacity, and is averagley supporting 3-4 million families daily power consumption. The Power is transmitted to Pakistan State Grid through a 500KV A/C line¹⁹.

The project employs super-critical coal-burning technology is considered to be the first sort of facility of its kind in Pakistan. Electricity produced in Port Qasim is further transmitted to the national grid (29 percent of Pakistan’s rated coal-fired power generation capacity)²⁰. It is further overcoming the 15 percent of the overall electricity shortfall (8,500 MW)²¹ in Pakistan. After an analysis of the socioeconomic ramifications of such infrastructure, the conclusion of power plants inducing abundant jobs and further raising incomes is lent credence.

4. EMPLOYMENT GENERATION AT THE PLANT

Considering the various economic fissures prevailing in Pakistan as discussed earlier, (i.e inequitable underdevelopment, low energy access, low human capital, and accompanying low

¹⁶ NEPRA is an Autonomous Organization/Authority

¹⁷ NTDC is an Autonomous Organization

¹⁸ Revised Merit Order based on current revised fuel prices for the economic dispatch of thermal power plants (GENCO’S & IPPs) and Bagasse Plants effective from 21-10-2019 by NTDC.
<https://www.ntdc.com.pk/ntdc/public/uploads/services/meritorder/2019/October%202019/MERIT%20ORDER%20WEF%2021%20OCTOBER%202019.pdf>

¹⁹ Power Technology, Legends of Qasim | Port Qasim Electric Power Company (Private) Limited

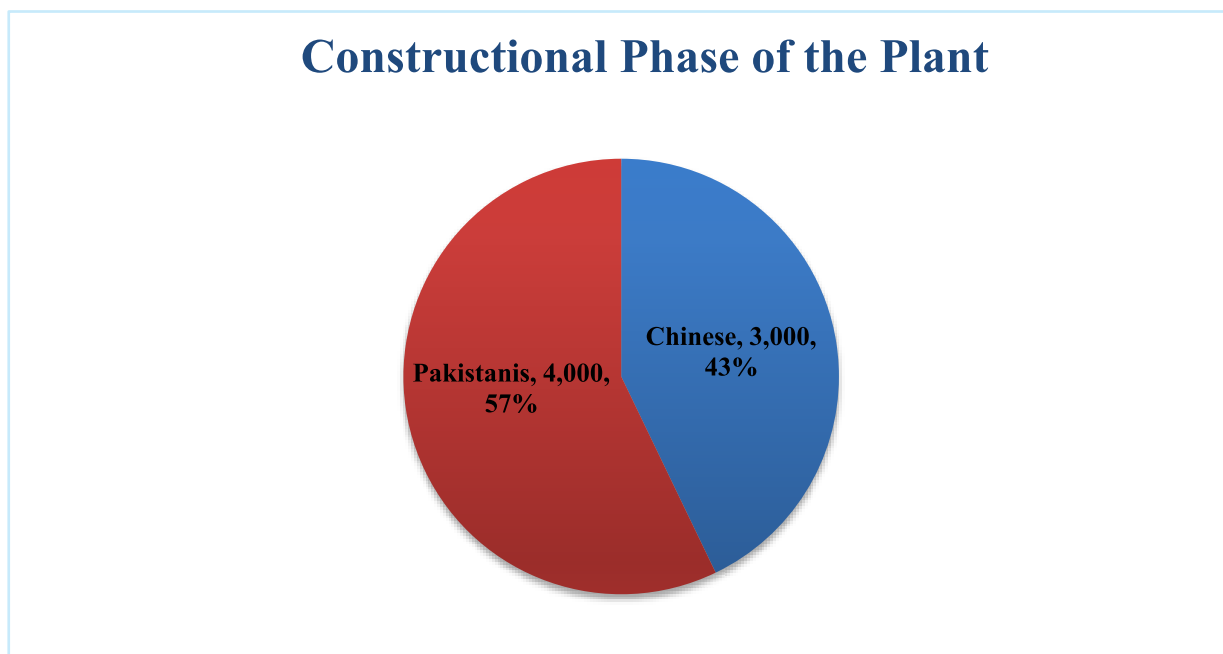
²⁰ NEPRA | National Electric Power Regulatory Authority

²¹ Haris Azhar and Amna Syed, “Impact of China-Pakistan Economic Corridor (CPEC) on The Energy Sector of Pakistan”, Monographs Pakistan-China Institute, 2017

productivity) - the Port Qasim plant, having been operational since 25th April 2018²² onwards, has performed commendably in raising overall employment (8,270)²³ throughout the Pakistan. In doing so, the overall socioeconomic demographic of around 8 thousand families has been raised, while thus skilled work force enjoys on-site training by both local and international professionals that professional work environment far surpasses the sort they'd receive while employed with other local projects. Induced employment is accompanied by a mammoth 1,320MW of generated electricity to add to a national grid that is already undergoing capacity and transmission upgrades.

4.1 Employment under Constructional Phase

Prior to the site visit, a structured questionnaire was developed in order to ascertain the specific career tiers at the Port Qasim facility, as well as the basic material provisions for staff on the site. The amount of direct jobs generated during the constructional phase of the plant numbers at 7,000 of which 4,000 (57 percent) were domestic and 3,000 (43 percent) were foreign, mainly from the People's Republic of China²⁴.



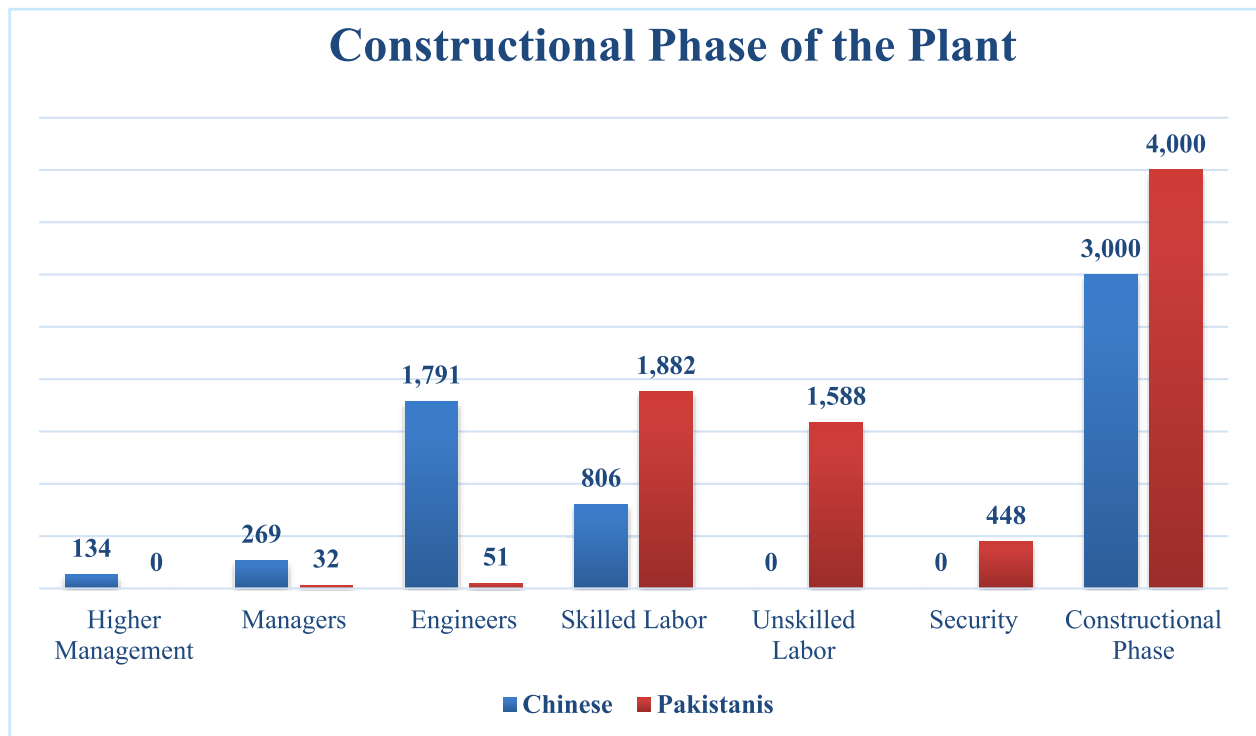
In regards to administrative occupational groups, the amount of white-collar Pakistanis in managerial posts with at least five years of relevant experience numbered at 32 (11 percent) while an additional 269 (89 percent) were sourced from China. In regards to technical (engineering),

²² CPEC Secretariat | Ministry of Planning, Development and Reform, Islamabad

²³ Primary data | HR Department Port Qasim Electric Power Company (Private) Limited

²⁴ Primary data | HR Department Port Qasim Electric Power Company (Private) Limited

51 (3 percent) came from domestic Pakistani sources while 1,791 (97 percent) were foreign (Chinese) in nature. Similarly, in skilled labor category, 1,882 (70 percent) hired from Pakistan while 806 (30 percent) were sourced from China. Additionally, 1,588 (100 percent) unskilled labor, and 448 (100 percent) security staff were all procured locally from Pakistan clubbed with 134 (100 percent) higher management staff from China during the overall culmination of the Port Qasim plant's constructional phase²⁵.

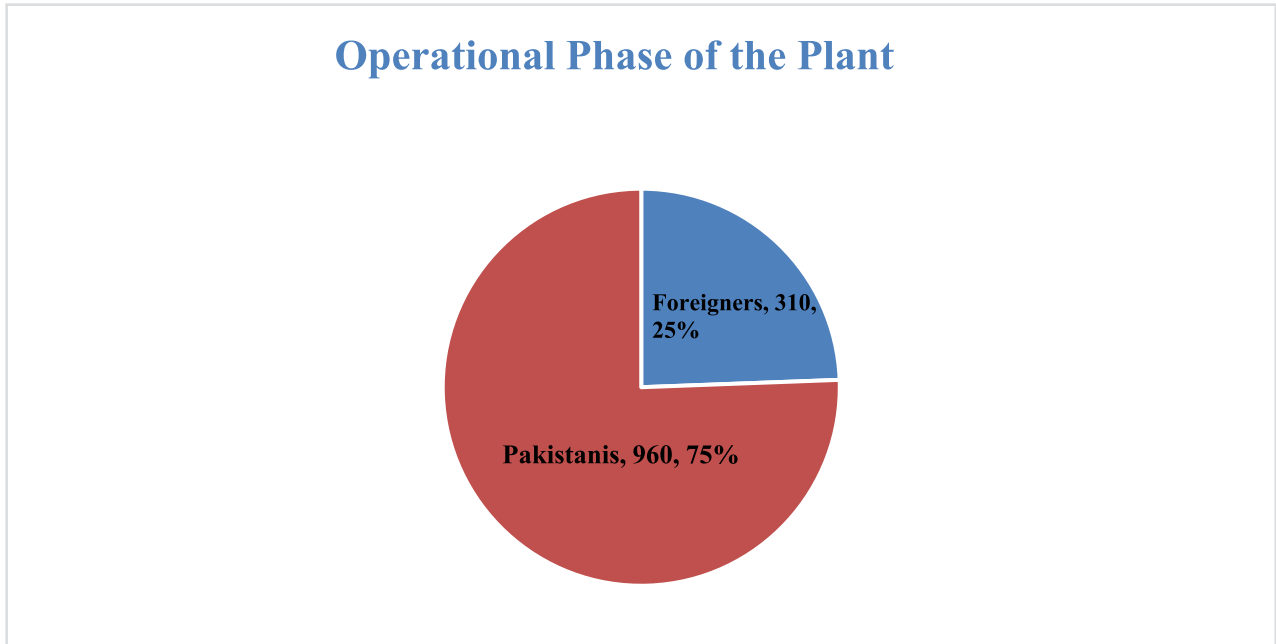


Such figures give an impression of foreign human resources outnumbering basic domestic work force. The primary exigency of such an unbalance worker composition mainly lies in the unavailability of specific skillsets amongst domestic work force, with such gaps being filled by the importation of Chinese work force resources, which are accompanied by higher operating costs in regards to wages, insurance, hazard pay, and travel accommodations.

²⁵ Primary data | HR Department Port Qasim Electric Power Company (Private) Limited

4.2 Employment under Operational Phase

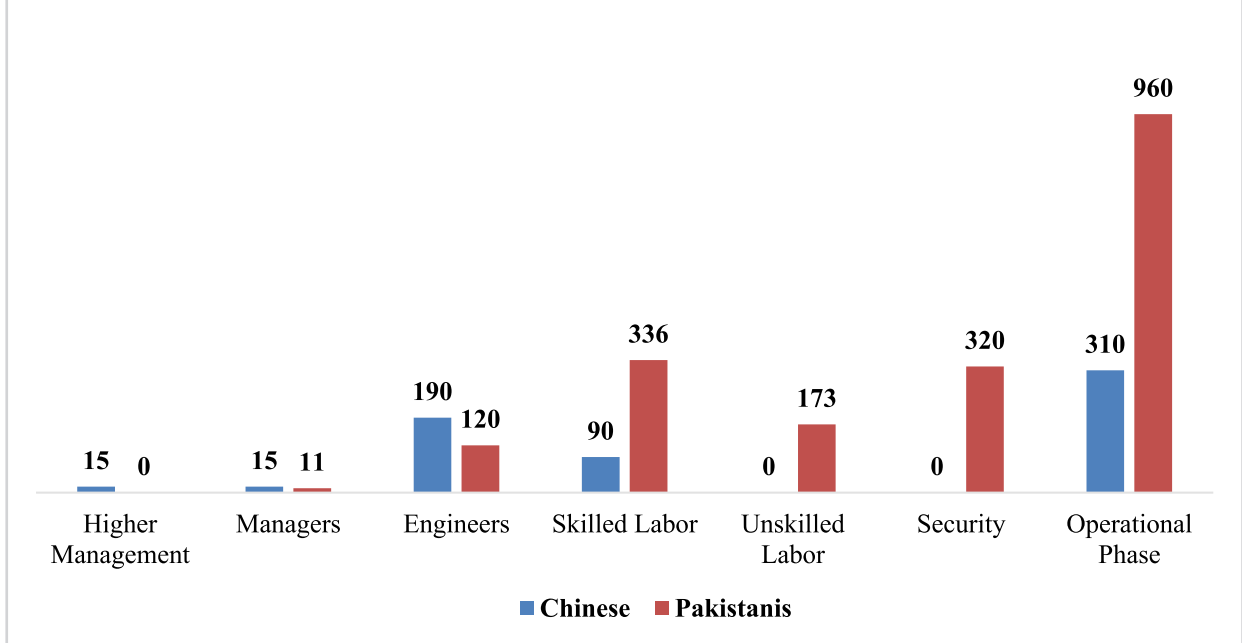
Moving on towards the operational phase, the total amount of direct jobs created under this phase are 1,270, from which 960 (75 percent) are Pakistanis while 310 (25 percent) are foreigners (Chinese and Australian).



After considering the six major occupational groups, 11 (42 percent) individuals have been hired on professional and managerial posts, domestically, while the remaining 15 (58 percent) from abroad, summing up a total of 26 executive managers. While the engineers hired domestically are 120 (39 percent) in contrast to 190 (61 percent) as Chinese. Similarly, in skilled labor category, 336 (79 percent) and 90 (21 percent) individuals have been sourced from Pakistan and China respectively. Additionally, 173 (100 percent) unskilled labor individuals, 320 (100 percent) security personals have been sourced locally clubbed with 15 (100 percent) managers in higher management from China and Australia for the purpose of the operations²⁶.

²⁶ Primary data | HR Department Port Qasim Electric Power Company (Private) Limited

Operational Phase of the Plant



This information has been presented into the following figure which clarifies the whole picture. Along with the job creation, certain steps have been taken to intensify the job standards within the premises, with the help of which, both domestic and foreign work force are entertained. This includes a cafeteria with hygienic food, sports complex, gymnasium, medical facilities, appropriate ventilation and climate control, safety training, in-house trainings, and paid leave. Domestic and international-tier training as well as workshop seminars are organized, job promotions are fairly awarded without nationality-based biases or discrimination, hence, administrative talent is developed from within the plant. One thing which is pertinent to note here is that, above analysis focuses on the direct jobs created under this project. While the plant has further sub-contractors which are required to accomplish other tasks of the firm, including security, coal intake from the seaport till the coal mill etc. which created almost 10 thousand local indirect jobs opportunities as well.

5. TECHNOLOGY TRANSFER

Currently, coal fired power plants are generating 38 percent of global electricity (World Coal Association)²⁷. Port Qasim Power Plant is Pakistan's first supercritical coal-fired power plant which consists 2x660MW, having combined capacity of 1,320 megawatts. These technically advanced plants operate above the critical condition, (the state of a substance beyond which there is no distinction between liquid and gaseous phase) offer greater efficiency than older sub-critical designs and, most importantly, lower emissions.

As the plant is based on super-critical coal technology, the prevailing engineering graduate skill-set was insufficient to meet the requirements for technical personnel. As a result, Chinese administrators began by being focused on the employment of graduates from specific universities in Pakistan. The first batch was completely hired from the NED University of Engineering and Technology, Karachi and the National University of Sciences and Technology (NUST) Islamabad. 150 young and dynamic engineers were selected and sent to China for a 6-month technical and management training. They came back to the Project site after finishing training sessions to take charge of important operation work. However, the next recruitment cycle in 2019 was derived from almost all accredited engineering universities in Pakistan through “Human Resources Systems Group (HRSB)”²⁸. The engineering employees, soon after recruitment, are sent to China for 6 months for technical training to complete a module program specifically designed for the operational phase of the Port Qasim plant. Currently, foreign workers are mostly employed in the maintenance department and have an exit window from the Pakistani work force market of three years. In this regard, around 100 domestic work force have been hired in the previous year (2018) in the maintenance department, whereas, with a hundred more expected for the next fiscal year. As per the vision and direction of the company’s leadership, share of Pakistani work force will 80 percent from the current 68 percent with in next five years. And plant will be completely (100 percent) operated by Pakistani work force with next decade²⁹.

²⁷ World Coal Association 2019

²⁸ Primary data | HR Department Port Qasim Electric Power Company (Private) Limited

²⁹ Primary data | Liang Baihua, GM, PowerChina Gansu Energy Investment Company Limited

6. CORPORATE SOCIAL RESPONSIBILITY (CSR)

a. Creating more jobs for talented engineers, graduates and skilled workers

A recruitment interview of Pakistani graduates (1st batch) was held at Karachi at the end of July 2016 and 16,000 engineers submitted the application online for the jobs. After prudent screening, testing and interviewing the candidates, 150 young and dynamic engineers were selected and sent to China for a 6 months training.

They all were back to the project site after completing training sessions, took charge of the installation and commissioning of the plant, as well as the operation and maintenance (O&M) work. The project directly creates around 4,000



jobs to Pakistani engineers and work force during construction period, and around 960 jobs during operation period³⁰.



Figure 2 Pakistani Skilled Worker



Figure 3 1st Graduation (Training from China) Batch

³⁰ Chinese Embassy in Pakistan, "Port Qasim Coal-fired Power Project, Special Report on CPEC Projects (Energy: Part-7), 2018/10/01"

b. Rehabilitation and Upgradation of Gharo Primary School

Gharo is a city in Thatta District, Sindh, Pakistan with population of around 979,817 folks³¹. Recently, Port Qasim Electric Power Company (Private) Limited sponsored around Rs. 1 million to upgrade two school's (130 students) infrastructure by providing new furniture, school bags and textbooks clubbed with the construction work to rehabilitate the floor and walls of the school³².



Figure 4 Deprived Schools Up-gradation Drive

³¹ Survey of Pakistan, 2012

³² Kang Congqin, Director Administration, & Assistant of GM, Port Qasim Electric Power Company (Private) Limited

c. Forestation and Plantation

Before the construction work, there were mangroves plants on around 25 acres land area then the management of the plant decided to compensate the green drive by planting 5 times more mangroves plants. They recently planted mangroves plants (67,000) at another area of 125 acres which is 8-10 km away from the plant location. Similarly, 2,000 more trees have also been planted in plant vicinity to mitigate the pollution issues as well.



Figure 5 125 Acres Area of Mangroves Plants

d. Contributing to federal and local fiscal income

Till the August of 2019, the project has paid in full applicable taxes amounting to USD 219 million³³ to Pakistani government, including federal taxes, provincial taxes, sales taxes, and tariffs, and fulfilled all the obligations as a responsible taxpayer, which has contributed to the increase of local and federal fiscal income effectively.

e. Adopting high standard environmental protection technology

Fueled by coal, the project adopts the world's leading supercritical thermal technology. The environment friendly operation including seawater desalination and flue gas desulfurization will help saving the freshwater and preventing the surrounding marine ecosystem of the project from the damages and hazards.

Sindh Environmental Protection Agency (SEPA) granted approvals of environmental impact assessment of the power plant and jetty respectively on 17 June 2014 and 30 January 2015, after detailed evaluation procedures including rounds of public hearings attended by local residents, communities, government authorities, factories, NGOs, fisheries' association, research institutes and media. In addition, the environmental protection technology also meets the environmental standards of World Bank as well.

f. Greatly relieving the power shortage

The annual energy output is around 9000GWH after COD, which is supporting 3-4 million households' daily power consumption and will help to alleviate the load shedding in Pakistan³⁴. Till now, it has produced electricity of more than 14.7 billion kwh³⁵ since synchronization, accounting for nearly 10 percent of the national power consumption, greatly relieving the power shortage, optimized Pakistan's energy infrastructure by replacing the high-cost fuel such as oil and natural gas, which is one of the most important contribution of this country.

³³ Port Qasim Coal-fired Power Project, "Diplomatic Focus", October 2019

³⁴ Power Technology, Legends of Qasim | Port Qasim Electric Power Company (Private) Limited

³⁵ Port Qasim Coal-fired Power Project, "Diplomatic Focus", October 2019

g. Providing good working environment to Pakistani workers

The project has always been caring for Pakistani workers and providing good welfare to Pakistani workers, including medical insurance, birthday allowances, holiday allowances, paid annual leaves, etc. It has also improved the income level of Pakistani employees and improved their family living conditions and the quality of their life. The project has built dormitory and cafeteria with the highest standards and provide a good working environment and comfortable living place for workers.



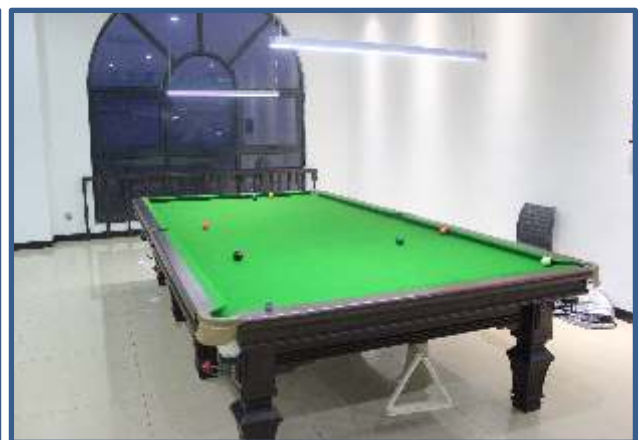
Emergency Hospital (In-house)



Sports Complex



Badminton Court in Sports Complex



Snooker in Sports Complex

h. Cultural Synchronization

The project fully respects the local traditions and customs, actively connects into the local area, and celebrates traditional festivals e.g. Eid-ul-Azha, Eid-ul-Fitr and other religious festivals with Pakistanis workers. At the same time, the plant management invited Pakistani workers to participate in Chinese traditional festivals i.e. Spring Festival and Lantern Festival and received energetic responses from all the workers at the plant. Moreover, the plant management organizes cultural and sports events every month. Employees from both Chinese and Pakistanis actively participated in the exchanges, which enhanced the bonding among employees and further strengthened the friendship.



Pak-China Dosti Zindabad Song



Chinese and Pakistanis Employees enjoying BBQ at the Plant

i. Industry Academia Linkages

The project also believes the technological improvement in its surrounding universities through university students visits and internships at the plant. Similarly, two top engineering universities (Mehran University, FAST University) have been visited the plant with their bright engineering students couple of months back. The project is just not focusing on direct impact on energy sector, it's also improving our professional knowledge gradually.



Study Visit of Mehran University



Study Visit of FAST University

7. CONCLUSION


Port Qasim Electric Power Company (Private) Limited is considered to be an early-harvest CPEC project, under close collaboration between Power China Resources Limited (holding 51% shares) and Qatar's Al Mirqab Capital (holding 49% shares). However, PowerChina Resources Limited alone is responsible for the operation of the plant. It is a 2x660 MW project, which is one of the first super-critical technology facilities utilized for energy generation plants in Pakistan. It has the capacity to generate over 9 billion KHW of electricity annually, which is enough to meet the demand of over 4 million households. The Power is transmitted to Pakistan State Grid through a 500KV A/C line³⁶.

Moreover, the total amount of direct jobs generated under the 'constructional phase' of this project were almost 7,000, employing 4,000 (57 percent) from Pakistan and 3,000 (43 percent) possessing foreign nationalities. Similarly, the total direct jobs created under the 'operational phase' are 1,270 from which 960 (75 percent) consist of domestic work force while 310 (25 percent) are foreigners³⁷ clubbed with 10 thousand local jobs opportunities as well. It is evident from the survey that the foreign workers employed in this phase will return-back to their country within 5-10 years due to the length of their contracts as well as continuous human resource development as practice on the site itself. Keeping this in view, an advantageous approach adopted for hiring work force in this phase consisted of a policy requiring that all domestic work force is freshly-qualified engineers from numerous engineering universities within Pakistan. In addition, new advanced technical training institutes are planned to open within the premises with the intention of providing technical training free of cost for the domestic workers e.g. collaboration with NED University.

Furthermore, this plant is one the early harvest projects of CPEC energy portfolio, which holds 3 percent share in Pakistan's total rated energy generation capacity, 33 percent share in Pakistan's rated imported coal-fired energy generation capacity, 29 percent share in Pakistan's rated coal-fired power generating capacity, 16 percent share in CPEC coal-fired energy basket, 7.7 percent share in CPEC energy portfolio and 5th position in latest merit order by NTDC.

³⁶ Power Technology, Legends of Qasim | Port Qasim Electric Power Company (Private) Limited

³⁷Jiang Xingcheng, DGM, Port Qasim Electric Power Company (Private) Limited



Moreover, the plant management is not just focusing on direct socioeconomic outcomes of the plant, they are also investing a lot in deprived areas which are geographically adjacent to the plant. e.g. Rs. 1 million investment for two primary school's upgradations in Gharo.

This certainly is an indication that such mega projects can enhance the pace of economic growth and overall productivity in Pakistan via the procurement of stable, uninterrupted energy sources.

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9. APPENDIX-I



NATIONAL TRANSMISSION & DESPATCH COMPANY LTD.

PHONE: 051-8311557
EXCHANGE: 051-9258177, 9258178
FAX No. 051-9250851

OFFICE OF THE
GENERAL MANAGER (SO)
NATIONAL POWER CONTROL CENTRE,
SECTOR H-8/1, ISLAMABAD.

No. 15232-48 GM (SO)/PPC/MO

Dated: 21/10/2019

OFFICE ORDER

SUBJECT: REVISED MERIT ORDER

Revised Merit Order based on current revised fuel prices for the economic dispatch of thermal power plants (GENCO'S & IPPs) and Bagasse Plants effective from 21-10-2019 received to this office on 21-10-2019 (04:00 PM) is hereby issued for implementation.

GENERAL MANAGER (S.O)
NPCC, NTDC ISLAMABAD

DISTRIBUTION:

1. Chief Engineer (Operation Planning), NPCC, NTDC, Islamabad
2. Chief Engineer (Network Operation), NPCC, NTDC, Islamabad
3. Director Private Power Control, NPCC, NTDC, Islamabad
4. Director Power Control, NPCC, NTDC, Islamabad.
5. NPCC Control Room, all Supervisory Shift Engineers.

COPY TO:

- || PS to Secretary Ministry of Power (Energy) for information please.
- || Special Secretary, Power Division for information please.
- || M.D (NTDC) WAPDA House Lahore for information please.
- || Registrar NEPRA, NEPRA Tower Islamabad.
- || Chief Financial Officer (CFO CPPA-GL), Shaheen Plaza, Plot no. 73-West, Blue Area Islamabad.
- || Chief Technical Officer (CTO CPPA-GL), Shaheen Plaza, Plot no. 73-West, Blue Area Islamabad.
- || Chief Technical Officer (GENCO Holding), OPF Building G-5/2 Islamabad.
- || General Manager Power System Planning NTDC, 4th Floor PIA Building Lahore.
- || Director I.T NTDC, WAPDA House Lahore.

MERIT ORDER

Based on Revised Fuel Prices, Effective From 21-10-2019

Sr.No.	Plant Groups	Fuel Type	Other Cost Rs./kWh	Fuel Cost Rs./kWh	VOM Cost Rs./kWh	EPP Rs./kWh	Status in Last Merit Order
1	UCH (upto 152,375 MWh)	Gas	0.98	0.79322	0.348510	2.12276	1
2	LIBERTY Power (Upto 61,804 MWh)	Gas	-	1.87883	0.483600	2.46223	2
3	Engro Power Thar	Coal	-	2.13380	1.070700	3.20450	3
4	UCH (above 152,375 MWh)	Gas	0.98	3.51248	0.348510	4.84202	4
5	PORT QASIM	Coal	-	5.007800	0.185100	5.19279	5
6	JDW Sugar Ltd. (III)	Bagasse	-	6.20890	0.646500	6.85540	6
7	747 MW GUDDU (CCP)	Gas	-	6.40990	0.536300	6.94620	8
8	China Power HUB Gen CO	Coal	-	6.47150	0.49950	6.97100	9
9	Sahlwal Power	Coal	-	6.98040	0.162090	7.14240	7
10	UCH-II	Gas	-	6.867174	0.342680	7.20977	10
11	KAPCO B-I	Gas	-	7.34081	0.38718	7.72797	11
12	Guddu (CCP) B-I (Unit 11-13)	Gas	-	7.88440	0.068900	7.95330	12
13	Foundation Power	Gas	-	7.87933	0.890900	8.27023	13
14	Engro PowerGen	Gas	-	7.93447	0.522100	8.45657	14
15	KAPCO B-II	Gas	-	8.05164	0.45286	8.50450	15
16	GTPS Faisalabad B-IV (Unit 5-9)	Gas	-	8.37840	0.149000	8.52540	16
17	Guddu (CCP) B-II (Unit 5-10)	Gas	-	8.76020	0.268900	8.82910	17
18	HCPG	Gas	1.8689	6.71381	0.74080	9.12331	18
19	KAPCO B-III	Gas	-	8.32741	0.87291	9.20032	20
20	Kohi (CCP) B-II (Unit 3-7)	Gas	-	9.45900	0.092500	9.55150	23
21	NPPMC - HBS (CC)	RLNG	-	9.21728	0.505200	9.72248	19
22	NPPMC - Baloki (CC)	RLNG	-	9.33974	0.504700	9.84444	21
23	GATFL - Bhaki (CC)	RLNG	-	9.34533	0.508900	9.85423	22
24	LIBERTY Power (Above 61,804 MWh)	Gas	-	9.89314	0.483600	10.37674	24
25	Guddu B-III (Unit 3-4)	Gas	-	10.51200	0.068900	10.58090	26
26	Muzaffargarh B-I (Unit 4)	Gas	-	10.51640	0.149000	10.66540	27
27	Muzaffargarh B-I (Unit -3)	Gas	-	10.53220	0.149000	10.68120	28
28	Jamshoro B-II (Unit 4)	Gas	-	10.72890	0.092500	10.82240	29
29	Muzaffargarh B-I (Unit -1)	Gas	-	10.76350	0.149000	10.91250	30
30	Jamshoro B-II (Unit 3)	Gas	-	10.86540	0.092500	11.05790	31
31	Muzaffargarh B-I (Unit -2)	Gas	-	10.89950	0.149000	11.05850	32
32	Nandpur (CC)	RLNG	-	10.47910	0.606200	11.08530	25
33	Guddu B-IV (Unit 1-2)	Gas	-	11.26270	0.068900	11.33160	34
34	Muzaffargarh B-II (Unit -5)	Gas	-	11.19790	0.149000	11.34690	35
35	Jamshoro B-II (Unit 2)	Gas	-	11.26480	0.092500	11.35730	36
36	KAPCO B-I (S/Cycl)	Gas	-	11.01122	0.38718	11.39838	39
37	Muzaffargarh B-II (Unit -6)	Gas	-	11.58420	0.149000	11.65320	41
38	Orent Power Company Ltd	RLNG	-	11.44513	0.359000	11.80413	33
39	Guddu(W/oCCP) B-I (Unit 11-13)	Gas	-	11.82680	0.068900	11.89560	43
40	GULF PowerGen	RFO	1.2119	9.84620	0.947500	12.00560	44
41	Sapphire Electric Co	RLNG	-	11.42180	0.60390	12.02570	37
42	Halmora Power	RLNG	-	11.42252	0.61260	12.03602	38
43	Saf Power	RLNG	-	11.44616	0.610700	12.05686	40
44	Jamshoro B-II (Unit 4)	Mix.(****)	-	12.08450	0.092500	12.15700	45
45	KAPCO B-I	RLNG	-	11.85694	0.38718	12.34320	42
46	Jamshoro B-II (Unit 3)	Mix.(****)	-	12.32950	0.092500	12.42300	47
47	KAPCO B-II (S/Cycl)	Gas	-	12.07746	0.45286	12.53032	46
48	Atock Gen	RFO	-	11.26380	1.408050	12.67180	80
49	GTPS Faisalabad B-IV(S/Cy.)	Gas	-	12.58460	0.149000	12.71360	49
50	Jamshoro B-II (Unit 2)	Mix.(****)	-	12.66550	0.092500	12.75800	50
51	ROUSCH	RLNG	-	12.69783	0.40863	13.01646	46
52	Guddu(W/oCCP) B-II (Unit 5-10)	Gas	-	13.14030	0.068900	13.20920	53
53	FKPCL	RLNG	0.0407	12.18359	1.09728	13.32153	54
54	KAPCO B-III (S/Cycl)	Gas	-	12.49112	0.87291	13.36403	55
55	KAPCO B-II	RLNG	-	13.11377	0.45286	13.56603	51
56	KEL	RFO	-	12.89953	0.87299	13.67352	74
57	GTPS Faisalabad B-IV (Unit 5-9)	RLNG	-	13.64260	0.149000	13.79160	52
58	Kohi (W/O CCP) B-II (Unit 3-7)	Gas	-	14.18850	0.092500	14.28100	57
59	KAPCO B-I	RFO	-	13.71644	0.67158	14.38802	59
60	KAPCO B-III	RLNG	-	13.58291	0.87291	14.43582	56
61	ALTEIN ENERGY LTD. (Ph-II)	RLNG	-	13.59822	1.00960	14.59882	66
62	Liberty Power Tech Limited	RFO	-	13.12120	1.586400	14.68960	58
63	Engro PowerGen	Mix.(***)	-	14.16279	0.32755	14.89034	60
64	Nishat Chumian Power Ltd	RFO	-	13.31390	1.426000	14.74190	65
65	Nishat Power Ltd	RFO	-	13.74240	1.431300	15.17370	63
66	Muzaffargarh B-II (Unit 4)	Mix.(**)	-	15.30945	0.149000	15.45845	67
67	Muzaffargarh B-I (Unit 3)	Mix.(**)	-	15.33230	0.149000	15.48130	68
68	Adas Power	RFO	-	14.18110	1.308400	15.56950	62
69	Muzaffargarh B-I (Unit 1)	Mix.(**)	-	15.66915	0.149000	15.81815	71
70	KAPCO B-II	RFO	-	15.05402	0.94533	15.99935	76
71	Muzaffargarh B-I (Unit 2)	Mix.(**)	-	15.88150	0.149000	16.03050	75
72	Guddu B-III (Unit 3-4)	Mix.(**)	-	15.97710	0.068900	16.04600	70

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73	Hubco Narowal	RFO	-	14.96480	1.273600	16.23840	81
74	Jamshoro B-II (Unit 4)	RLNG	-	16.25960	0.092500	16.35210	84
75	LALPIR (Pvt) Ltd	RFO	-	16.12165	0.25007	16.37172	86
76	Muzaffargarh B-II (Unit 5)	Mix.(**)	-	16.30150	0.149000	16.45050	81
77	Davis Energen	RLNG	-	15.70948	0.75045	16.45993	92
78	Jamshoro B-II (Unit 4)	Mix.(**)	-	16.31675	0.092500	16.46925	79
79	SABA	RFO	-	16.35925	0.23010	16.60935	83
80	PAKGEN Power Ltd.	RFO	-	16.39860	0.25007	16.64867	84
81	Jamshoro B-II (Unit 3)	RLNG	-	16.60450	0.092500	16.69700	69
82	Muzaffargarh B-II (Unit 4)	RLNG	-	16.62790	0.149000	16.77690	72
83	Muzaffargarh B-I (Unit -3)	RLNG	-	16.65140	0.149000	16.80040	73
84	Jamshoro B-II (Unit 3)	Mix.(**)	-	16.75180	0.092500	16.84430	82
85	Muzaffargarh B-III (Unit 6)	Mix.(**)	-	16.74740	0.149000	16.89640	87
86	Jamshoro B-II (Unit 2)	RLNG	-	17.05030	0.092500	17.14280	77
87	Muzaffargarh B-I (Unit -1)	RLNG	-	17.00620	0.149000	17.15520	78
88	Jamshoro B-II (Unit 2)	Mix.(**)	-	17.21355	0.092500	17.30605	89
89	Muzaffargarh B-I (Unit -2)	RLNG	-	17.23840	0.149000	17.37940	80
90	HUBCO	RFO	-	17.41440	0.21818	17.63258	93
91	Muzaffargarh B-III (Unit -5)	RLNG	-	17.67210	0.149000	17.82110	85
92	Muzaffargarh B-III (Unit -4)	RLNG	-	18.13950	0.149000	18.28850	90
93	KAPCO B-I (Si/Cycl)	RLNG	-	17.93496	0.38716	18.32122	91
94	ALTERN ENERGY LTD. (Ph-I)	RLNG	-	17.47236	1.00060	18.47296	104
95	Muzaffargarh B-II (Unit 4)	Mix.(****)	-	18.36520	0.149000	18.51420	94
96	Muzaffargarh B-I (Unit 3)	Mix.(****)	-	18.39190	0.149000	18.54090	95
97	Muzaffargarh B-I (Unit 1)	Mix.(****)	-	18.79050	0.149000	18.93950	96
98	KAPCO B-I	HSD	-	18.68400	0.38931	19.07331	101
99	Muzaffargarh B-I (Unit 2)	Mix.(****)	-	19.04195	0.149000	19.19095	98
100	Jamshoro B-II (Unit 4)	Mix.(****)	-	19.16160	0.092500	19.25410	97
101	Orient Power Company Ltd	HSD	-	19.06210	0.588500	19.65060	105
102	Jamshoro B-II (Unit 3)	Mix.(****)	-	19.57135	0.092500	19.66385	99
103	Muzaffargarh B-III (Unit 5)	Mix.(****)	-	19.53860	0.149000	19.68760	102
104	Reshma PowerGen	RFO	1.3589	17.28650	1.077200	19.72260	107
105	Halmore Power	HSD	-	18.89318	0.885600	19.77878	108
106	Sapphire Electric Co	HSD	-	18.91340	0.871900	19.78530	109
107	Saf Power	HSD	-	19.29560	0.861400	20.15700	111
108	KAPCO B-II (Si/Cycl)	RLNG	-	19.67088	0.45286	20.12352	100
109	Jamshoro B-II (Unit 2)	Mix.(****)	-	20.10630	0.092500	20.19880	103
110	Muzaffargarh B-III (Unit 6)	Mix.(****)	-	20.86905	0.149000	20.21405	106
111	Muzaffargarh B-II (Unit 4)	RFO	-	20.10250	0.149000	20.25150	113
112	Muzaffargarh B-I (Unit -3)	RFO	-	20.13240	0.149000	20.28140	114
113	Jamshoro B-I (Unit 1)	RFO	-	20.62460	0.092500	20.71710	112
114	Muzaffargarh B-I (Unit -1)	RFO	-	20.57480	0.149000	20.72380	115
115	Engro PowerGen	HSD	-	20.39110	0.533500	20.92410	116
116	Muzaffargarh B-I (Unit -2)	RFO	-	20.85350	0.149000	21.00250	118
117	KAPCO B-II	HSD	-	20.50591	0.52341	21.02932	119
118	KAPCO B-II (Si/Cycl)	RLNG	-	20.34437	0.87291	21.21728	110
119	KAPCO B-I (Si/Cycl)	RFO	-	20.57466	0.67158	21.24624	120
120	Gudu (CCP)	RFO	-	21.44320	0.086900	21.51110	117
121	Muzaffargarh B-III (Unit -5)	RFO	-	21.46510	0.149000	21.55410	121
122	QATPL - Bhikki (CC)	HSD	-	20.90518	0.734200	21.63938	123
123	NPPMC - HBS (CC)	HSD	-	20.98115	0.729100	21.71025	124
124	NPPMC - Bakki (CC)	HSD	-	21.14197	0.728300	21.87027	125
125	Muzaffargarh B-III (Unit -6)	RFO	-	21.99060	0.149000	22.13960	127
126	Jamshoro B-II (Unit 4)	RFO	-	22.06360	0.092500	22.15610	122
127	KAPCO B-III	HSD	-	21.20748	1.32176	22.52924	128
128	Jamshoro B-II (Unit 3)	RFO	-	22.53920	0.092500	22.63070	126
129	Jamshoro B-II (Unit 2)	RFO	-	23.16230	0.092500	23.25480	129
130	KAPCO B-II (Si/Cycl)	RFO	-	22.58103	0.94533	23.52636	130
131	KAPCO B-I (Si/Cycl)	HSD	-	28.02690	0.38931	28.41531	131
132	KAPCO B-II (Si/Cycl)	HSD	-	30.75887	0.52341	31.28228	132
133	KAPCO B-III (Si/Cycl)	HSD	-	31.81122	1.32176	33.13298	133

The calculation of fuel cost Rs./MWh and O&M cost Rs./MWh has not been calculated by NPCC Islamabad. The same has been communicated to NPCC by Chief Technical Officer CPPA-G vide letter No.CPPA-G/IMIT/1416-24, dated 21-10-2019 received in the office of General Manager (System Operation) through fax/Email dated 21-10-2019, because NPCC has no any Data regarding heat rate, fuel cost and O&M cost etc.

Notes:

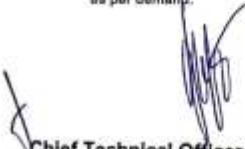
- Fuel cost component of All IPPs / GENCOs (Running on RFO / HSD/ Coal) is calculated on the basis of Fortnight projections of available Fuel Inventory & Weighted Average Fuel Price prevailed.
- Fuel Index for HUBCO also includes Heat Rate & C.Value on the basis of 100% load. The PLAC payable to HUBCO may please be kept in view by NPCC.
- Stock of Fuel prior to increase / decrease in rate should be despatched at the old rates (FIFO Basis).
- FKPCL uses mixed fuel (70% LBG and 30% PQG)
- General Sales Tax is not included in the above calculations.
- RFO rates are on per Metric Ton, HSD rates are on per Litre, Gas rates are in MMBTU except KAPCO and FKPCL.
- FKPCL is using RLNG in PQG (MCF) and LBG (MMBTU) and is prepared on the basis of Gas consumption of Dec,2016.


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MERIT ORDER


- 8 For KAPCO Complex, Fuel Rates and Dependable Capacity are used in accordance with the amendment signed in 04 / 2002.
 - 9 Other cost of Uch Power is due to Excise duty on gas.
 - 10 Fuel Revised Rates are calculated on the basis of average rates supplied by PSO of Local / Imported & PARCO Fuels for IPPs 1994 policy.
 - 11 Rate of Attock Gen is taken from Attock Petroleum Ltd.
 - 12 Fuel rates of Nishat Power, Nishat Chunian Power and Liberty Tech are taken from Parco , C&C and Hascol & Bakri Trading for these calculations.
 - 13 Rate of Gas for Guddu , Jamshoro & Muzaffer Garh Rates taken from Gencos as notified & for IPPs from OGRA.
 - 14 HSD rates taken from PSO Notification for current month.
 - 15 The IPPs (KAPCO,Roush, FKPCL, Davis, Sapphire, Orient, Halmore and Saif) are operating on RLNG. RLNG price has been notified by OGRA for the current month. The price has been taken and calculated as per recent notification issued by OGRA for IPPs 2002 policy & KAPCO ROUSCH ,DAVIS & Altern IPPs 1994 policy..
 - 16 Other cost of ROUSCH is Gas Efficiency of the month.
 - 17 Reshma Powergen & GULF Powergen ,NPPMCL included in Merit Order on upfront Tariff.
 - 18 Fuel price for Guddu & SPS Multan not provided as plant are shut down since long. Genco's FCC Revised as per NEPRA latest Determination for May,2017.
 - 19 GENCO-I & GENCO-III operation on Simple Cycle by using RLNG shall not be allowed. QATPL , HBS & Baloki achieved COD ,therefore Simple Cycle Operation Discontinued.
 - 20 Japan Power and Sepcol are not operational and excluded from EMO till commencing of operation.
 - 21 SPS Faisalabad Bk-V(Unit 1-2) & GTPS Faisalabad Bk-VI (U 1-4) generation License cancelled by NEPRA Hence excluded for EMO Till Authorized for Generation.
 - 22 GENCOs using Indigenous Gas & RLNG (Mixed) shall utilize Gaseous mixture as per Optimal procedure.
 - 23 Cost of transmission losses on dispatch of plants may be given due consideration .
 - 24 Plant Availability on Any specific Fuel must be confirmed before the Dispatch is given.
 - 25 Engro Power Thar Limited and China Power HUB Gen CO Ltd are incorporated due to COD from 10-07-19 and 17-08-2019 respectively.
- ** Mixed: 50% FO and 50% Gas
*** Mixed: 50% HSD and 50% Gas
**** Mixed: 50% FO and 50% RLNG
***** Mixed: Gas and RLNG

Note: 1- System Operator will ensure stable power supply in accordance with the Grid Code clause SDC 1.4.3 Page 185 Grid Code and specially the subclause 1.4.3.3 Page 185 Grid Code & subclause 1.4.3.4 Page 186 Grid Code
2- Merit list issued is only a part of that Grid Code for operation.
3- System Operator will give first priority to smooth, stable, uninterrupted power supply by utilizing all available resources as per demand.


Chief Technical Officer (GENCOs Holding Co.)


General Manager Power System Planning (NTDC)


Chief Technical Officer (CTO CPPA-G)


Chief Financial Officer (CFO CPPA-G)


General Manager (System Operation) NPCC (NTDC)
Convener

HIGHLIGHTS



Whole view of “1,320 MW Port Qasim Coal-fired Power Plant”, 2018 (Under Construction)



Whole view of “1,320 MW Port Qasim Coal-fired Power Plant”, 2017 (Under Construction)



Pile Foundations



Main Building



Cooling Towers



Cooling Towers



Cooling Tower Aerial View



Boiler System



Welding of small-diameter pipeline of the boiler



Transmission Tower



Installation of thermal control instruments



Installation of 11KV Distribution Cabinet



Generator Stator



Gauge Pipes



Complete view of in-house “Coal Unloading Jetty”



School visit - Mehran University of Engineering and Technology Jamshoro 2



Complete view of “1,320 MW (Super Critical Technology)
Port Qasim Coal-fired Power Plant

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