

COAL MINING & TRADING SECTOR OVERVIEW

WORLD COAL RESERVE | SNAPSHOT

- Coal mining is also critical contributor to many economies, especially in developing nations where mining's contributions enable them to grow stronger and tackle the dual challenges of poverty and development.
- There are an estimated 1.1 trillion tones of proven coal reserves worldwide in around 70 countries. The biggest reserves are in the USA, Russia, China, Australia and India. There is enough coal to last us around 150 years at current rates of production
- In 2018, 7813.3 million tones (Mt) of coal were produced worldwide, the top five hard coal producers are China, India, USA, Indonesia and Australia.

Top 5 Coal Producing Countries 2018	
Countries	Production
India	771mt
USA	685mt
Indonesia	549mt
Australia	483mt
China	350mt
<i>Source: IEA Coal Information 2019</i>	

- Much of global coal production is used in the country in which it was produced only, around 15% of hard coal production is destined for the international coal market.

- The presence of coal deposits in Pakistan was known before independence, but its economic value was highlighted in 1980 when large reserves of coal were discovered in the Lakhra and Sonda areas of Sindh Province.
- Estimated coal potential in Pakistan is 185.175 billion tons, the share of Sindh in aforementioned deposit is 184.623 billion tones which includes 5th largest reserves of world of 175.5 billion tones in an area of 10,000 sq. km in Tharparkar District of Sindh.
- After this discovery, Pakistan is now the 6th richest nation of the world in respect of coal resources.
- Most of the Coal in Pakistan is Lignite and is ranked qualitatively at 7th in the world
- At present coal is the second largest energy source in Pakistan and comes to around **25%** of total energy mix.
- It is anticipated that, if properly exploited, Pakistan's coal resources may generate more than 100,000 MW of electricity for the next 30 years.

COAL | RESERVES & TECHNICAL DETAIL | PAKISTAN

Province	Locations	Reserves Million Tones	Heating Value (Btu/lb)	Moisture %	Ash Content %	Volatile Matter %	Fixed Carbon %	Sulfur%
Sindh	Thar, Lakhra, Indus East, Badin, Sondra Jherruk, Jhimpir	*184,623	5,219 - 13,555	16 - 47	3.3-37.5	19.1-39.8	10.96-43.46	06.10.8
Punjab	Salt range, Makarwal	235	9,472 - 15,801	3- 8	9.35-37.5	26.5-40.95	30.3-44.87	2.7-8.25
Baluchistan	Sor Range, Degari, Khost - Sharigh - Harnai- Ziarat, Mach, Duki	217	9,637 - 15,499	4 - 13	7.2-27.37	24.05-43.95	31.72-44.52	2.825-7.11
KPK	Hangu, Cherat	91	9,386 - 14,217	0.1 - 7	5.3-43.3	14-33.4	21.8-76.9	1.1-9.5
AJK	Kotli	9	7,336 - 12,338	0.2 - 6	3.3-50	5.1-32	26.3-69.5	0.3-4.8
Total		185,175	8,210 - 14,282	4 - 16	5.69-39.13	17.75-38.02	24.21-55.85	1.505-8.092

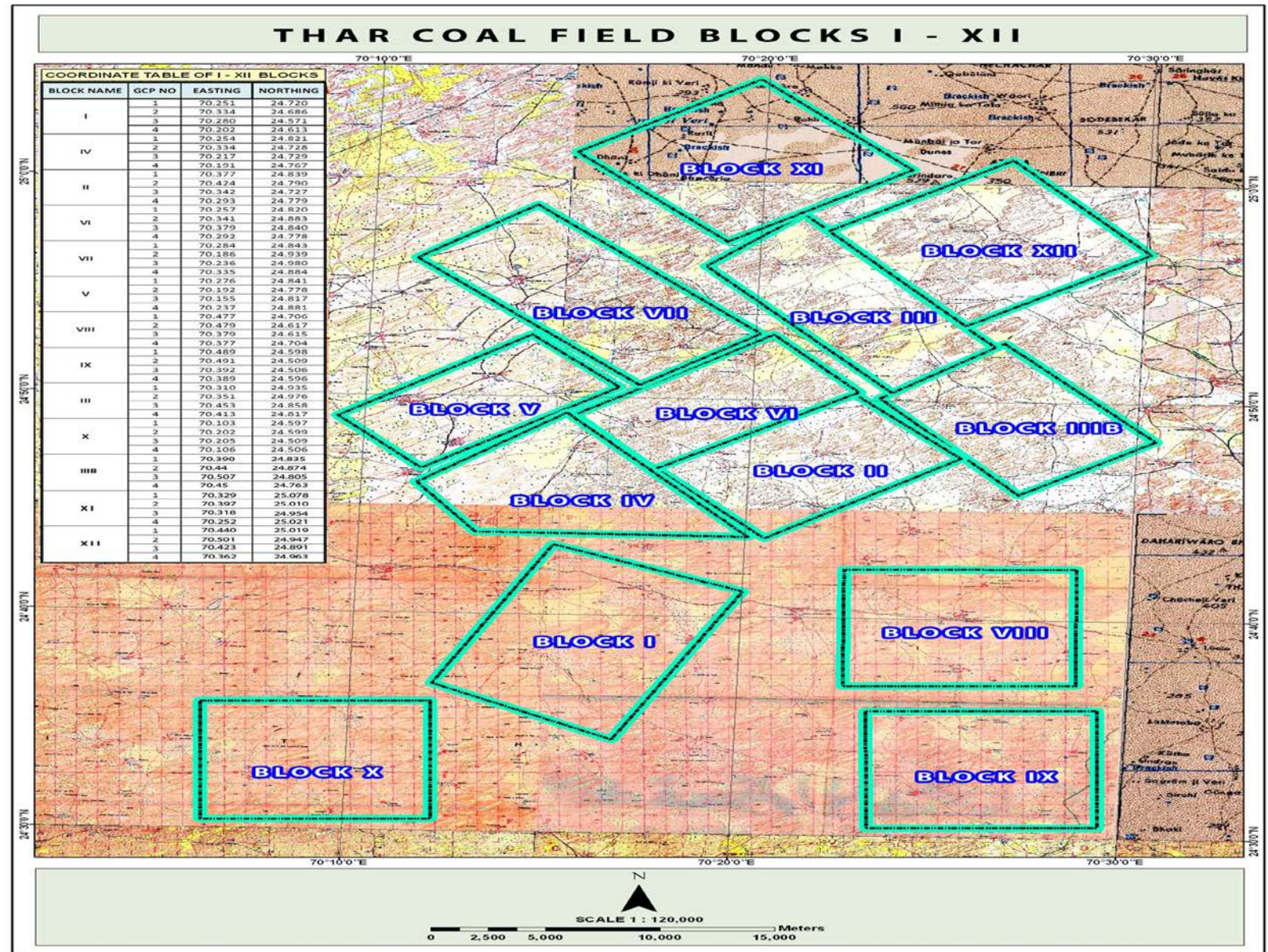
Source: Pakistan Energy Vision 2035

- In long term, there is a need to explore the coal resources in Baluchistan, Punjab, KPK and AJK having heating value around 9000 Btu/LB - 15000Btu/LB which is greater than the heating value of Thar coal resources i.e. 5000-13000Btu/LB.

Coal Field	Coal Resources (Mln Tonnes)
Sindh	
Thar	175,506
Sonda-Jherruck	5,523
Indus East	1,777
Lakhra	1,328
Meting-Jhimpir	473
badin	16
Sub Total	184,623
Balochistan	
Khost-Sharigh-Harnai-Ziarat	88
Duki	56
Sor Range/Degari	50
Mach	23
Sub Total	217
Punjab	
Salt Range	213
Makarwal	22
Sub Total	235
KPK	
Hangu	82
Cherat	9
Sub Total	91
AJK	
Kotli	9
Sub Total	9
Grand Total	185,175

Source: State of Industry Report 2017

COAL | RESERVES & BLOCKING | PAKISTAN



Source: Sindhcoal.gos.pk

COAL | RESERVES & BLOCKING | PAKISTAN

Sindh mln Tons Per Anum					
Thar					
Blocks	Total Reserves	%	sq km	Reserves Tons PA	%
Block I	3,566	2%	122	71.32	2%
Block II	1,584	1%	81	31.68	1%
Block III	2,008	1%	77	40.16	1%
Block IV	2,572	1%	82	51.43	1%
Block V	1,394	1%	71	27.88	1%
Block VI	1,655	1%	85	33.10	1%
Block VII	2,176	1%	100	43.52	1%
Block VIII	3,036	2%	100	60.72	2%
Block IX	2,862	2%	100	57.25	2%
Block X	2,948	2%	100	58.96	2%
Block XI	1,612	1%	101	32.24	1%
Block XII	2,346	1%	101	46.91	1%
Others	147,748	84%	7,879	2954.96	84%
Total	175,506	100%	9,000	3510.12	100%

Source: Sindhcoal.gos.pk

- Out of total reserves at Thar amounting to 175,506 mln Tons, 27,758 mln Tons or 16% comprising in twelve blocks with area covering ~1,121 sq km.
- Blocking of remaining 84% reserves is still need to be done with an area covered of ~7,879 sq. km

THAR | BLOCK II | SPECIFICATIONS | PAKISTAN

Deposit	Heating Value	Sulphur	Ash	Moisture
Country	(Net)(Kcal / kg)	%	%	%
	Higher is better	Lower is better	Lower is better	Lower is better
Thar Block ii	2770	1.07	7.8	47.46
Gujrat, India	2600-3000	3.4 -5.9	9 – 12	38 - 40
Hambach, Germany	1911-2747	0.2 - 0.4	2 -5	48 -52
Maritza East, Bulgaria	1550	4.5	19 - 35	54

Source: PACRA Data Base

- Better coal quality in relation to India's coal.
- Phase I of the Block II has been commissioned in July 2019 within stipulated time.
- Block II can generate 5,000 MW of electricity every year for a period of 50 years.

Electricity Generation Potential from Thar Block II

	Units	Phase 1	Phase 2	Phase 3	Phase 4
Capacity	mIn TPA	3.8	3.8	7.6	16.48
Cumulative Capacity	mIn TPA	3.8	7.6	15.2	31.68
Cumulative Capacity - 50 years	mIn TPA	190	380	760	1,584
Electricity Generation	MW	660	660	990	2,690
Cumulative Generation	MW	660	1,320	2,310	5,000

Source: PACRA Data Base

THAR | BLOCK II | CUSTOMERS | PAKISTAN

Description	Phase 1	Phase 2	Phase 3	Phase 4
Customer	Engro Power Gen Thar	i. Thal Energy Limited ii. Thal Nova Power Thar Limited	i. Lucky Electric ii. Siddiqson Limited	N/A
Power Generation MW	330*20	330*2	660+330	N/A
Coal Supply Agreement	30 years	30 years	Non-binding expression of interest is entered with above parties	N/A
Project cost	845.3 mln USD	215 mln USD	N/A	N/A
Debt	75%	69%	N/A	N/A
Equity	25%	31%	N/A	N/A

Source: PACRA Database

SECTOR WISE COAL CONSUMPTION

- The major consumers of coal in Pakistan are Power plants, cement industry and brick kilns etc. besides, households at minor level

Coal Consumption Mix mln Metric Ton						
Sectors	*2018-2019	%age	2017-2018	%age	2016-2017	%age
Power	8.857	70.8%	4.436	24.7%	0.859	7.7%
Brick Kiln	2.155	17.2%	3.941	21.9%	2.855	25.5%
Cement	1.500	12%	9.603	53.4%	7.470	66.8%
Total	12.512	100	17.980	100	11.184	100
<i>Source: Ministry of Energy</i>						
*Estimated figure for a period of 9 Months from July 2018 to March 2019						

COAL | DEMAND & SUPPLY | PAKISTAN

- Total coal demand jumped to 21 mln TPA during FY19 as comparison with the corresponding period. (FY18: 18 mln TPA)
- Estimated quantity of coal imported reached to 15.5 mln TPA (FY18: 13.7 mln TPA).
- However, increase in local production amounting to 5.5 mln TPA in FY19E as compare to 4.3 mln TPA during FY18
- The production and import data for are tabulated as under:

Financial Year	Domestic Coal Production		Coal Import		Import Total Supply		
	Units	Million Tons	Million TOE	Million Tons	Million TOE	Million Tons	Million TOE
2017-18		4.3	1.92	13.70	9	18	10.92
2018 -19		5.5	2.46	15.50	10.19	21	12.65

Source: Ministry of Energy, Mineral Wing

- Cargo composition graph shows that second largest imported cargo was the coal represented 29 percent of total throughput
- Negative growth of 25.42% is witnessed in coal during the period FY 2019

Extraction of Mineral					
Coal	Unit	2016-17	2017-18	2018-19	% change FY19/FY18
		Metric Tons	3,953,992	4,477,555	3,339,582

Economic Survey of Pakistan 2018-2019 / Punjab Bureau of statistic

- Govt. has planned project of estimated cost of PKR03 billion relating to coal based power stations at Quetta, Loralai, Sibi and Hernai.
- Indigenous production would make our reliance less on import going forward, thus reducing import bill.
- There has been significant increase in import of coal as well due to commissioning of new power plants based on imported coal at Sahiwal and Port Qasim. However, domestic production of coal is expected to increase in the coming years with projects on Thar coal.
- Detail of import Bill with %age growth are as below:

Import Bill	2015-2016	2016-2017	2017-2018	2018-2019
Import Value (Million Rupees)	47,415	81,280	154,795	204,403

Source: Pakistan Energy Year Book 2018 / Pakistan Bureau of Statistic

- In coming years, local coal use should be promoted to achieve larger contribution. Thar coal utilization is accorded strategic importance. Many coal mining and power generation project are in process of development in Thar coalfield. Imported coal-fired power plants may also be required to consider mixing with Thar Coal

AVERAGE SELLING PRICE OF COAL

- Average selling price of Coal in Pakistan is as under:

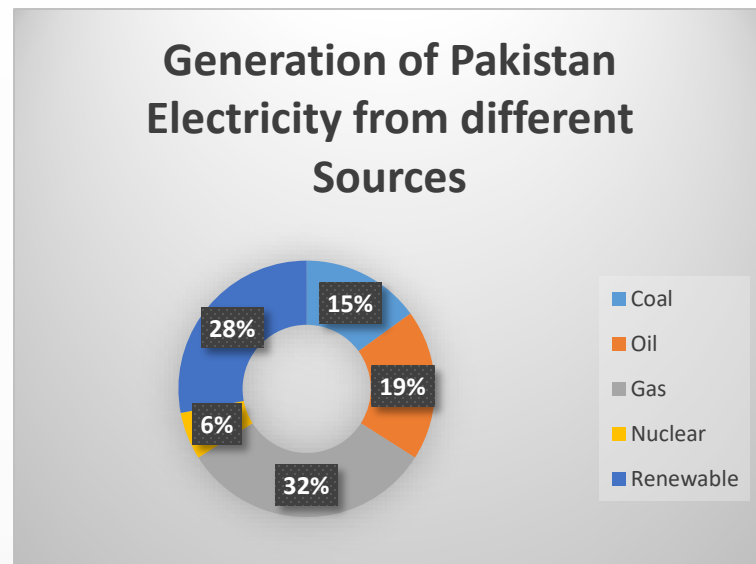
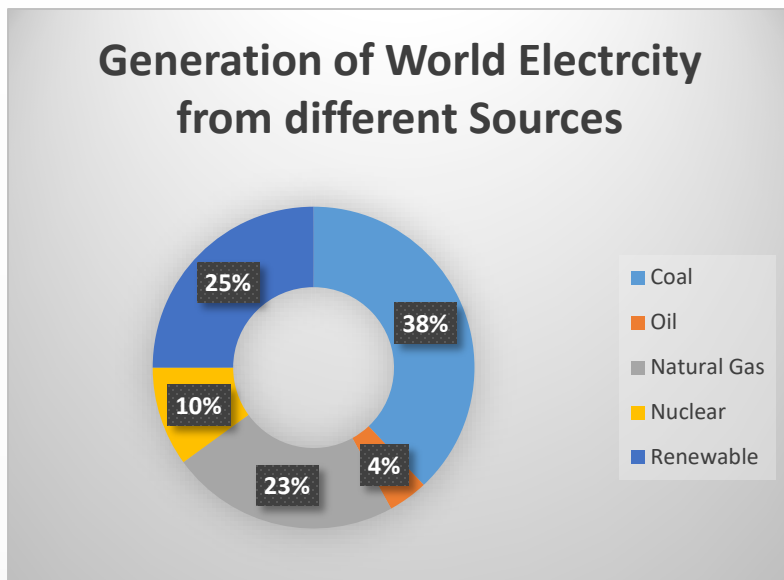
Average selling price of Coal in Rupees / Tone				
Mine	Province	2015-16	2016-17	2017-18
Degari	Balochistan	9,240	9,906	9,800
Sor Range	Balochistan	9,692	9,981	10,017
Sharigh	Balochistan	10,094	9,973	11,600
Lakrah	Sindh	2,026	3,975	3,983

Source: PMDC / Energy year book 2018

- Coal prices in international market in July 2020 is traded \$54.32. Pressure on prices are build due to strong production in Indonesia and Australia alongside with significantly weaker demand from China and India. The coal price, hovering around \$54 per tone since April,
- Trend of Coal prices in international market is as tabulated below



Source :Tradingeconomis



- Coal plays a vital role in electricity generation worldwide. Coal-fired power plants currently fuel 38% of global electricity
- Most of the power generation will be through coal till 2020 but after that hydropower, nuclear and renewables will take over. The power generation by oil will remain in a decreasing trend till the proposed future projects till 2030 are commissioned.
- In Pakistan reliance on electricity generation through coal is improving, by FY 2019 15% of the Pakistan total generation comes from coal, however due to improvement and massive investment, in this sector its share in total energy mix comes up to 25%

COAL HANDLING & TRANSPORT

- PIBT has been setup as the Country's first terminal for handling Coal, Clinker and Cement on build, operate and transfer (BOT) basis at total cost of US \$305 million at Port Qasim Authority.
- Port Qasim handles more than 40% of Pakistan's cargo.
- PIBT has built capacity for handling up to 12m tons of Coal. PIBT has been set up for handling and delivering coal to Power and Cement plants by utilizing the rail, road and sea networks.
- Coal handling has been shifted to Pakistan International Bulk Terminal (PIBT) after Supreme Court had banned the handling of coal at Karachi Port due to pollution and other reasons
- Pakistan Railways (PR) has chalked out the details of a plan for constructing a rail track to facilitate coal transportation at Port Qasim, under this plan 6-kilometer track from Pakistan International Bulk Terminal (PIBT) to Juma Goth junction is to be laid to carry out transportation of coal. The track would be completed in 12-18 months after the approval from the Planning Commission

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