

## **Coal resources of Pakistan and their depositional environments**

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Owing to the present energy crises in the world and particularly in Pakistan, the government and power generation sectors have shown keen interest in the indigenous coal resources for its utilization in the electric power generation, cements and other related industries. The development of coal will have an importance multiplier effect by creating a number of supporting industries, which will provide additional employment for skilled labour, income for the mining community and experience with new and modern technologies. Production of domestic coal will reduce the demand for imported fuels which drains an inordinate percentage of Pakistan scarce foreign exchange resources.

Coal deposits are extensively developed in Pakistan. It is found in all the four provinces of Pakistan, Azad Kashmir and Gilgit-Baltistan areas. In Sindh it occurs in Sonda, Lakhra, Thatta, Indus East, Badin, Meting Jhimpir, Jheruck-Ongar and Thar, which is one of the largest coalfields in the world. In Balochistan it is found in areas of Sor Range-Deghari, Sinjidi, Pir Ismail Ziarat, Khost-Shahrig-Harnai, Duki, Mach-Abegum, Johan, Kach and the recently developed coalfields of Chamalang-Bala Dhaka and Bahlol. Coal is also found in Punjab in areas of Makarwal and Salt Range. In Khyber Pakhtunkhwa coal is found in Hangu-Orakzai, Cherat, Gulakhel/Kurd-Sho, Shirani and Dara Adamkhel areas. In Azad Kashmir it is confined to the Kotli area. All these coals are young and Tertiary in age. Limited coal resources are also found in Reshit-Chapursun Valley of Gilgit-Baltistan areas and Bori Khel of Western Salt Range, Punjab. These coals are comparatively older and are confined to Jurassic and Permian in age respectively.

Coal from different areas of Pakistan generally ranges from lignite to high volatile bituminous. These coals are friable, with relatively high content of ash and sulphur. Pakistan has huge coal resources about 185 billion tones. Out of which 3.3 billion tones are proved and 11 billion tones are indicated reserves, the bulk of it (about 98%) is found in Sindh Province.

Stratigraphically, the coals of Pakistan are developed in different stratigraphic horizons. In Balochistan coal is developed in a single stratigraphic position i.e., Toi Formation of Chamalang (Ghazij) Group of Early Eocene, while in Sindh it is confined to two different stratigraphic position i.e., in the Bara Formation of Middle Paleocene and Sohnari member of Laki Formation of Early Eocene age. In Punjab coal is developed in three stratigraphic position i.e., Tobra Formation of Lower Permian in the Western Salt Range, Hangu Formation of Early Eocene in the Makarwal and Patala Formation of late Paleocene in the Eastern and Central Salt Range. In Khyber Pakhtunkhwa, Azad Kashmir and in the Reshit Chapursun (Gilgit-Baltistan) Valley coal

is confined to the Hangu Formation (Early Paleocene), Patala Formation (Late Paleocene) and Ashtigar Formation (Jurassic) respectively.

Field, petrographic and other data show that these coals are generally thin and lenticular with prohibitively high sulphur and ash content which indicate that the major part of these coals are deposited in the near shore and marginal marine environments of deposition.