



The Development and Utilization of Coalbed Methane in Henan Province, China

Wang Sipeng

Zhengzhou Coal Industry (Group)Co., Ltd.



Contents



1

Coalbed Methane in Henan

2

Drainage and Utilization of Coalbed Methane in Henan

3

The existing technical problems Challenging the Development and utilization of Coalbed Methane in Henan

4

The future development and utilization of coalbed methane in Henan, China





1. Coalbed Methane in Henan

Raw coal output in 2012: 1.48 million tons

7 major coal mining groups and 15 mining areas :

Pingdingshan, Zhengzhou, Yima, Jiaozuo, Hebi, Anyang and Yongxia.

Coal Seams extracted:

1) **Yima** which are composed of anthracite and highly metamorphic bituminous coal —one mines in

2) **Cambrian-Permian coal seam**—all the other mines in Henan





Numbers of mines
(807)

95 national key mines (excluding
mines under construction)

712 local ones

Registered coal and gas outburst mines : 55

High-gas mines : 22

Characteristics of the coal seams: strongly absorptive with
high gas content and high gas saturation





Main Mines' Coalbed Methane Reserve

Mines [↕]	Containing Methane [↕]			Rich in Methane [↕]			Total [↕]		
	Resource 10 ⁸ m ³ [↕]	area [↕] km ² [↕]	Abundance 10 ⁸ m ³ /km ² [↕]	Resource 10 ⁸ m ³ [↕]	area [↕] km ² [↕]	Abundance 10 ⁸ m ³ /km ² [↕]	Resource 10 ⁸ m ³ [↕]	area [↕] km ² [↕]	Abundance 10 ⁸ m ³ /km ² [↕]
Anyang-Hebi [↕]	22.93 [↕]	42.9 [↕]	0.53 [↕]	1324.58 [↕]	566.0 [↕]	2.21 [↕]	1347.51 [↕]	608.9 [↕]	2.74 [↕]
Jiaozuo [↕]	20.18 [↕]	40.0 [↕]	0.50 [↕]	1556.18 [↕]	709.4 [↕]	2.42 [↕]	1576.36 [↕]	749.4 [↕]	2.92 [↕]
Yanlong [↕]	10.22 [↕]	25.1 [↕]	0.41 [↕]	224.64 [↕]	205.4 [↕]	1.09 [↕]	234.86 [↕]	230.5 [↕]	1.50 [↕]
Xinggong [↕]	7.46 [↕]	16.8 [↕]	0.44 [↕]	1724.33 [↕]	875.2 [↕]	1.97 [↕]	1731.79 [↕]	892.0 [↕]	2.41 [↕]
Dengfeng [↕]	22.60 [↕]	57.4 [↕]	0.39 [↕]	781.89 [↕]	522.8 [↕]	1.50 [↕]	804.49 [↕]	580.2 [↕]	1.89 [↕]
Xinmi [↕]	46.45 [↕]	48.4 [↕]	0.96 [↕]	889.33 [↕]	367.5 [↕]	2.42 [↕]	935.78 [↕]	415.9 [↕]	3.38 [↕]
Yu County [↕]	37.12 [↕]	99.7 [↕]	0.37 [↕]	929.07 [↕]	990.4 [↕]	0.94 [↕]	966.19 [↕]	1090.1 [↕]	1.31 [↕]
Pingdingshan [↕]	128.18 [↕]	64.8 [↕]	1.98 [↕]	706.4 [↕]	415.2 [↕]	0.99 [↕]	834.58 [↕]	480.0 [↕]	2.97 [↕]
Coal bearing areas of Taikang [↕]	117.31 [↕]	192 [↕]	0.61 [↕]	43.99 [↕]	120 [↕]	0.37 [↕]	161.30 [↕]	312 [↕]	0.98 [↕]
Coal bearing areas of Fugou [↕]	48.39 [↕]	88 [↕]	0.55 [↕]	13.44 [↕]	44 [↕]	0.31 [↕]	61.83 [↕]	132 [↕]	0.86 [↕]
Coal bearing areas of Taikang [↕]	87.36 [↕]	84 [↕]	1.04 [↕]	53.66 [↕]	86 [↕]	0.62 [↕]	141.02 [↕]	170 [↕]	1.66 [↕]





2. Drainage and Utilization of Coalbed Methane in Henan

Four key coal mining groups :

- 1) Henan Coal Chemical Industry Group*
- 2) China Pingmei Shenma Group*
- 3) Yima Coal Industry Group*
- 4) Zhengzhou Coal Industry Group*





Henan Coal Chemical Industry Group

Gas drainage mines : 39

Gas drainage stations on the ground : 47

Drainage pumps : 186 (drainage capacity of 26081m³/min)

Actual gas drainage amount from January to September in 2012 and the utilizing amount :

2.068973 × 10⁸m³ 7.1146 × 10⁷m³

Mines with CMM power plants: 22

Power plants: 26

Total capacity: 49200KW.h





China Pingmei Shenma Group

Preliminarily verified geological resources amount of coalbed methane: 61.663 billion cubic meters (3.332 billion cubic meters consumed and the residual of 58.331 billion cubic meters)

average abundance of coalbed methane:

$1.56 \times 10^8 \text{ m}^3/\text{km}^2$.

Mines with coalbed methane drainage systems : 22





Annual coalbed methane drainage : over 110 million cubic meters (concentration from 2% to 30%)

Built power plants of low methane concentration from 6% to 25% : four power plants with capacity of 4×500KW each

A gas storage tank of 5000m³ for life usage of the bathhouse, boiler and canteen cooking at the mine of No.10, consuming CMM of 600 thousand cubic meters





Others:

The geological exploration of No.1 mine of Shoushan power station has been undertaken. And four 4×500KW units have been built in phase I project with the monthly gas utilization from 500 thousand cubic meters to 600 thousand cubic meters.





Yima Coal Industry Group

13 mines: drainage capacity of 12374m³/min

23 Gas drainage pumps on the ground (flow rate of 150 m³/min to 500m³/min) :the gas drainage capacity of 2900m³/min

67 Gas drainage pumps under the ground (flow rate of 40m³/min to 220m³/min) : the gas drainage capacity of 9474m³/min.





Gas drainage amount and the gas utilizing amount in 2011:

85.05 million cubic meters & 23.16 million cubic meters

Mines utilizing the gas : Qianqiu Mine, Gengcun Mine, Xin'an Mine, Yi'an Corporation and Yuxin Corporation.

The mines with gas power stations : Qianqiu Mine, Gengcun Mine, Xin'an Mine and Yuxin Corporation.

total installing capacities of gas engine : 14×500KW units





Zhengzhou Coal Industry Group

Three 2×500KW gas power stations have been built in the mines of Chaohua, Peigou, Cuimiao and Gaocheng and one set of purification equipment of ventilation air methane (VAM) – cooperation with Sweden, with investment of 35 million RMB

Up to the date of October 30, 2012, the projects utilizing gas in Zhengzhou Coal Industry Group has generated electricity of 1200 kwh, at average annual electricity generation is more than 2 million kwh.





3. The existing technical problems Challenging the Development and utilization of Coalbed Methane in Henan

- 1) The complicated geological structure that caused the greatly unbalanced distribution of coalbed methane;*
- 2) The great difficulty of coalbed methane drainage;*
- 3) The urgent improvement of the coalbed methane drainage equipments*
- 4) The lacking of fund input;*
- 5) The lagging of management construction which hinders the comprehensive utilizing of coal mine methane.*





4 The future development and utilization of coalbed methane in Henan, China

It is an urgent task to adjust China's energy consumption structure so as to meet the high demands on energy and to face challenge of energy security. The total resource amount of Henan is 879.571 billion cubic meters with overburden depth less than 2000m, the development and utilization of the methane source would be great contributions to energy security in China





Thank You!