

5 Bulgaria



5.1 Summary of Coal Industry

5.1.1 ROLE OF COAL IN BULGARIA

Most of the coal consumed in Bulgaria is used for power production. A substantial portion of its thermal electric power plants, which produce more than one-half of the country's total production of about 45 billion kilowatts, operate on domestic coal (Steblez, 2000). A reliable supply of higher-quality hard coal is, however, necessary for Bulgaria's metallurgical industries, and such coal is obtained from as near as Ukraine and as far away as Australia (USDOE, 2004). Bulgaria's annual coal production and consumption both remained relatively constant from 1990 through 2010, peaking in 2011, and the country is expected to remain a net coal importer (EIA, 2014).

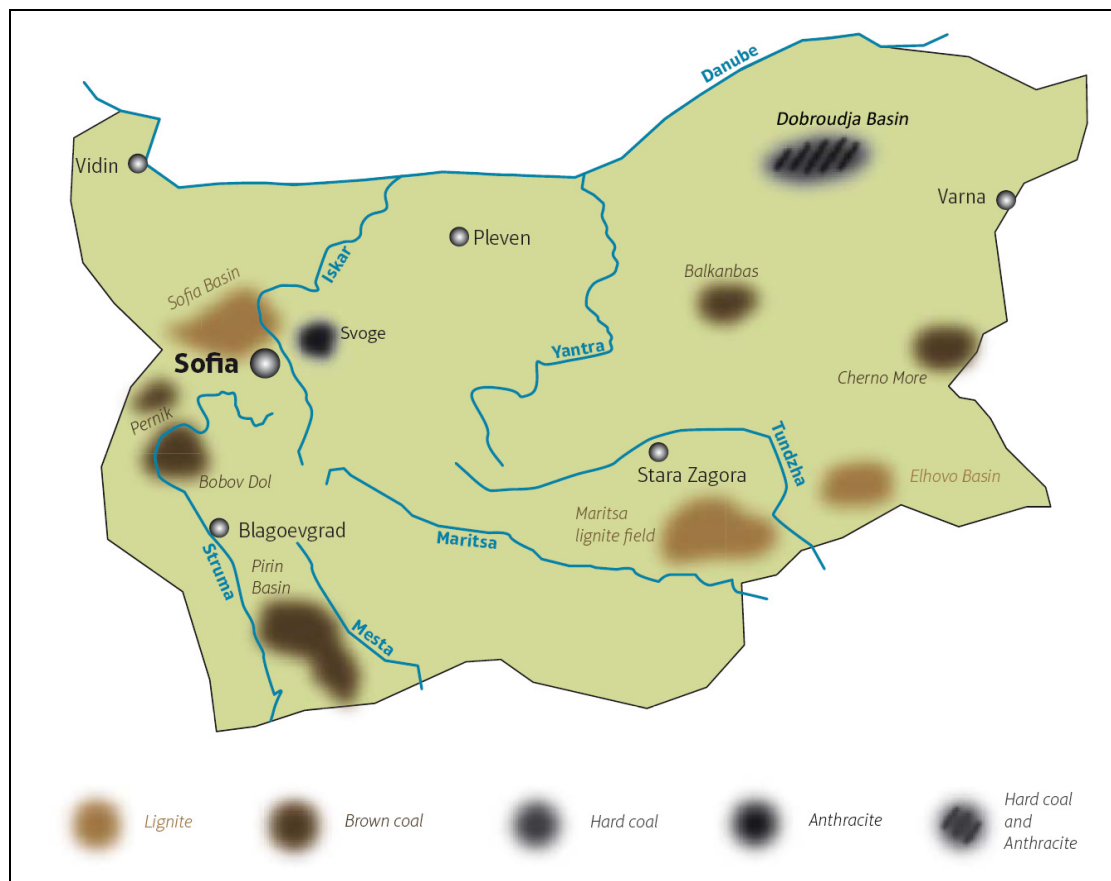
Bulgaria's coal reserves include about 88.7 percent lignite, 10.9 percent brown coal, and 0.4 percent hard coal (Euracoal, 2014). Much of the household coal heating is with briquettes, especially in the vicinity of the state-owned briquette factory, Stara Zagora (see Figure 5-1). About 9 percent of Bulgaria's coal production is used for making briquettes (USDOE, 2004).

Table 5-1. Bulgaria's Coal Reserves and Production

Indicator	Anthracite & Bituminous (million tonnes)	Sub-bituminous & Lignite (million tonnes)	Total (million tonnes)	Global Rank (# and %)
Estimated Proved Coal Reserves (2011)	2.0	2,364	2,366	20 (0.266%)
Annual Coal Production (2012)	0.01	32.51	32.52	22 (0.41 %)

Source: EIA (2014)

Figure 5-1. Bulgaria’s Coal Fields



Source: Euracoal (2014)

5.1.2 STAKEHOLDERS

Table 5-2 summarizes key stakeholders in Bulgaria’s coal mine methane (CMM) industry.

Table 5-2. Key Stakeholders in Bulgaria’s CMM Industry

Stakeholder Category	Stakeholder	Role
Mining companies	<ul style="list-style-type: none"> Mining companies (see Section xx.1.4) 	Project host
Universities, Research Establishments	<ul style="list-style-type: none"> University of Mining and Geology “St. Ivan Rilski” - Bulgaria Geological Institute “St. Dimitrov” 	Consulting assistance
Government Groups	<ul style="list-style-type: none"> Ministry of Energy and Economy 	Permitting and licensing
Other	<ul style="list-style-type: none"> Bulgaria’s Energy Efficiency Center in the Industry Efficiency Agency (executive agency to the Minister of Energy and Energy Resources) 	Transfer of technologies, knowledge , and experience in the field of energy efficiency and use of renewable energy sources

5.1.3 STATUS OF COAL AND THE COAL MINING INDUSTRY

Bulgaria produced 32.52 million tonnes (Mmt) of coal in 2012 (EIA, 2014b), with most of the lignite reserves found in the central (Maritsa East) and western part of the country (Sofia and Bobov dol) (Euracoal, 2014). There are three opencast mines operated in the Maritsa East coalfield—Trojanovo-1 mine, Trojanovo-North mine and Trojanovo-3 mine—which have the potential to produce more than 30 Mmt of lignite per year (Euracoal, 2014). Their supplies feed 2,240 MWe of three mine-mouth power plants (USDOE, 2004).

Other mines in Bulgaria have much lower production rates. The brown coal from the one open cast and two underground Bobov Dol Mines, in southwestern Bulgaria, and the lignite from the Stanyantsi, Bely Brag, and Choukourovo Mines are used mostly at the 630-MWe Bobov Dol power plant. The two open cast Pernik Mines, west of Sofia, have been supplying mainly for the Republica power plant (USDOE, 2004; Euracoal, 2008). Table 5-3 summarizes coal production by type of mine and from individual mines in Bulgaria.

Table 5-3. 2012 Statistics for Bulgaria's Coal Mining

Company/Mine Name	Coalfield	Mine Type	Coal Type	Annual Production (million tonnes)
Mini Maritsa Iztok EAD	▪ Maritsa East	▪ 3 Opencast	▪ Lignite	32.1
Bely Brag Mine AD	▪ Sofia	▪ 1 Opencast	▪ Lignite	0.6
Choukourovo Mine AD	▪ Sofia	▪ 1 Opencast	▪ Lignite	0.2
Stanyantsi Mine AD	▪ Sofia	▪ 1 Opencast	▪ Lignite	0.6
Vagledobiv Bobov Dol EOOD	▪ Bobov Dol	▪ 1 Opencast, ▪ 2 Underground	▪ Brown	0.97
Otkrit Vagledobiv Mines EAD	▪ Pernik	▪ 2 Opencast	▪ Brown	1.1
Balkan 2000 Mines EAD	▪ Sliven	▪ Underground	▪ Black	0.007

Source: MEET (2013)

Currently, there are 17 coal licensees and as of 2005, there were 19 companies operating mines (Ilkova, 2005). The Bulgarian coal industry has been restructured and certain mines have closed down, mainly underground, that have proven to be inefficient. The closing of mines is consistent with government rules and regulations. These mines namely are Zdravets, Antra, Marbas, Pirin, Bistritsa, Balkanbas, Balkan mine, Ivan Roussev mine, and Kolosh mine (Ilkova, 2005).

There are five mines considered potentially gassy – Bobov dol (two underground mines), Minior, and Balkan-2000 (two deposits are operated there – Tvarditsa and Paisii). The gas emissions are measured regularly (Ilkova, 2005).

5.2 Overview of CMM Emissions and Development Potential

The Global Methane Initiative (GMI) International CMM Projects Database currently identifies no projects in Bulgaria, in operation or under development (GMI, 2014). Updates on future CMM projects in Bulgaria can be found at <https://www.globalmethane.org/coal-mines/cmm/index.aspx>.

5.2.1 CMM EMISSIONS FROM OPERATING MINES

Methane emissions in Bulgaria were estimated at 92.4 million cubic meters (m³) in 2000, are projected to increase to 106.4 million m³ by 2015, and then anticipated to remain relatively steady with only a slight increase to 107.1 million m³ by 2030 (see Table 5-4).

Table 5-4. Bulgaria's CMM Emissions (million cubic meters)

Emissions	2000	2005	2010	2015 (projected)
Total CH ₄ Emitted	92.4	86.1	101.5	106.4

Source: USEPA (2012)

5.2.2 CMM EMISSIONS FROM ABANDONED COAL MINES

No data quantifying CMM emissions from abandoned mines were found.

5.2.3 CBM FROM VIRGIN COAL SEAMS

In April 2014, Park Place Energy Corp. (headquartered in Texas) announced an agreement with the Bulgarian Ministry of Economy and Energy to explore the Vranino coal block in the country's northeast region as a source for natural gas. The company will drill five wells and utilize seismic data to get a better understanding of the potential to exploit coal resources for natural gas development (Park Place Energy Corp, 2014).

Table 5-5 summarizes coal bed methane (CBM) resources in Bulgaria's Dobroudja Basin.

Table 5-5. CBM and Coal Resources of Bulgaria's Dobroudja Basin

CBM Resource	Proven	Probable	Possible	Total
Billion m ³	3.2	81.6	80.8	195.6
Coal Resource	Measured	Indicated	Inferred	Total
Billion tonnes	2.8	6.8	11.8	21.4

Source: Marshall (2001)

5.3 Opportunities and Challenges to Greater CMM Recovery and Use

Bulgaria signed and ratified the United Nations Framework Convention on Climate Change and Kyoto Protocol (see Table 5-6) as an Annex 1 country. As such, it is eligible to host Joint Implementation projects that generate revenue by creating emission reduction credits. Bulgaria's greenhouse gas (GHG) emission reduction target under the Kyoto Protocol was 8 percent of base year 1988 emissions during the first commitment period from 2008-2012 (UNFCCC, 2000; UNFCCC, 2002).

Table 5-6. Bulgaria's Climate Change Mitigation Commitment

Agreement	Signature	Ratification
UNFCCC	June 5, 1992	May 12, 1995
Kyoto Protocol	September 18, 1998	August 15, 2002

Source: UNFCCC (2014)

An evaluation of 2011 GHG data revealed Bulgaria's emissions had decreased by approximately 50 percent against the Kyoto base year, and the country was likely to meet its Kyoto target through domestic emissions reductions directly (Ecologic Institute/eclareon, 2014). In May 2012, Bulgaria's Ministry of Environment and Water (MoEW) issued its Third National Action Plan on Climate Change (NAPCC). Bulgaria's climate change policy is based on two essential aspects: 1) the country's international commitments under UNFCCC/Kyoto Protocol (described above) and 2) the newly-adopted European climate legislation that seek to reduce emissions from member countries by 2020. The Third NAPCC outlines a framework to combat climate change for the period from 2013 to 2020, and focuses Bulgaria's efforts on actions leading to commitment(s) implementation and climate impacts reduction (MoEW, 2012).

5.3.1 MARKET AND INFRASTRUCTURE FACTORS

The Bulgarian coal industry has been restructured, shifting the focus to privatization and compliance with environmental standards. Certain mines, mainly underground, that have proven to be inefficient per government rules and regulations, have closed, and a gradual shift toward the privatization of Bulgaria's mines has encouraged foreign investment. AES Corporation, of the United States, took over operations of the Maritsa Unit 1 power plant, part of the Maritsa East mining and power generation complex, in late 2008. As part of the transaction, AES financed the construction of a newer 2 x 300-MW lignite-fired power plant, which became operational in 2011 (PowerEng, 2011). The new plant replaced an older, inefficient, 500-MW plant. An earlier analysis revealed the effort as one of Bulgaria's largest foreign investment projects, and construction of the adjacent state-of-the-art ash disposal facility would help the coal industry comply with European Union environmental standards (EBRD, 2005). Also, the Kanina Mine, Oranovo Mine, and Otkrit Vagedobiv Mines were privatized in 2004. The Stanyantsi Mines, Bely Brag Mines, Choukourovo Mines, and Pernik Mines have also been privatized (Euracoal, 2008).

The Maritsa East Mines and the Bobov Dol Mines are state-owned and sell coal at state-regulated prices to consumers. Similarly, the briquette factory at Maritsa East sells briquettes to consumers at state-regulated prices (USDOE, 2004).

Besides these state-owned mines, there are some coal mines that sell their products at contracted prices. The largest of these are the Pirin Mine, the Maritsa Basin Mine, the Balkan Mine, the Chernomore Mine, the Vitren Mine, and the Anthra Mine (USDOE, 2004).

5.3.2 REGULATORY INFORMATION

No regulatory information was found specifically applicable to CMM development in Bulgaria.

5.4 Profiles of Individual Mines

See Table 5-3 above for information on individual mines in Bulgaria.

5.5 References

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