

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Coal extraction data															
2	Richard Heede															
3	<i>Climate Mitigation Services</i>															
4	File started: 11 January 2005															
5	Last modified: November 2011															
6																
7																
8																
9	Kazakhstan												yellow column indicates original reported units			
10	Astana															
11	Production / Extraction data															
12	Year	Lignite & Bituminous				Anthracite & Coke				Total Coal						
13		Gross production		Gross production		Gross production		Gross production		Gross production		Gross production				
14		Million tons/yr		Million tons/yr		Million tons/yr		Million tons/yr		Million tons/yr		Million tonnes/yr				
15																
16	1950															
17	1951															
18	1952															
19	1953															
20	1954															
21	1955															
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70	2004															
71	2005															
72	2006															
73	2007															
74	2008															
75	2009															
76	2010															
77																
78	Total	71		1,644		-		-		1,890		1,715				
79																
80		1992-2010 total: 1,890 tonnes														
81	Coal Types:	Lignite 4.13%		Bituminous 95.87%		Anthracite 0.00%		100.00%								
82																



US BuMines data 1960-1969	USSR		USSR		USSR	
	%	Lignite	Bitumin. & Anthrac.	%	Total	
566.2	27%	152.41	413.80	73%	566.21	
563.2	26%	147.18	416.00	74%	563.18	
570.9	25%	144.40	426.45	75%	570.85	
586.5	26%	150.57	435.96	74%	586.53	
611.1	26%	159.98	451.12	74%	611.10	
637.4	26%	165.18	472.20	74%	637.38	
646.0	25%	161.42	484.54	75%	645.96	
656.6	24%	158.53	498.04	76%	656.57	
656.2	23%	152.45	503.73	77%	656.18	
590.0	27%	159.13	430.88	73%	590.01	
584.8	25%	148.32	436.44	75%	584.76	
603.1	26%	157.63	445.44	74%	603.07	
	Total	1,857	5,415		7,272	
	%	25.5%	74.5%			

Included in Former Soviet Union (FSU) coal production 1900-1991

EIA coal stats:

metallurgical coal not included in total

	Lignite		Bituminous		Anthracite		Metallurgical		Kazakhstan		Kazakhstan	
	million tonnes	million tonnes	million tonnes	million tonnes	million tonnes	million tonnes	million short tons	million tonnes	million short tons	million tonnes		
1991					none	3.2	139.5	127				
1992	4.2	122.4				0.8	123.3	112				
1993	4.7	107.2				1.3	115.3	105				
1994	4.8	99.8				1.9	93.1	84				
1995	3.7	80.8				1.8	86.0	78				
1996	3.6	74.4				2.7	80.1	73				
1997	2.5	70.2				2.8	78.1	71				
1998	1.7	69.1				3.6	65.9	60				
1999	1.8	58.0				2.4	85.4	77				
2000	2.6	74.9				2.5	87.2	79				
2001	2.5	76.6				2.5	81.3	74				
2002	2.7	71.0				2.5	93.6	85				
2003	4.1	80.8				2.7	95.8	87				
2004	3.8	83.1			-	2.5	95.4	87				
2005	3.8	82.8				2.6	106.1	96				
2006	4.2	92.0				2.9	107.8	98				
2007	4.3	93.5				2.7	122.4	111				
2008	4.9	106.2				2.7	111.9	102				
2009	5.3	96.2				2.7	122.2	111				
2010	5.8	105.1										

Kazakhstan

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	
83	Kazakhstan																
84																	
85																	
86																	
87													Coal methane emissions				
88	Lignite EIA coal stats: thousand tons		Bituminous EIA coal stats: thousand tons		Anthracite EIA coal stats: thousand tons		Metallurgical EIA coal stats: thousand tons		Total coal EIA coal stats: thousand tons		CMM emissions million cubic meters		Crude CMM rate Cubic meters per tonne CH4 content ranges up to 33 m ³ per tonne				
89																	
90	excluding metallurgical coal																
91																	
92	1990											1,760					
93	1991											1,695					
94	1992	4,577		134,913		-		3,490		139,490		1,648		13.0			
95	1993	5,147		118,172		-		827		123,319		1,627		14.5			
96	1994	5,307		110,023		-		1,405		115,329		1,302		12.4			
97	1995	4,123		89,016		-		2,100		93,139		1,216		14.4			
98	1996	3,958		81,998		-		1,931		85,956		857		11.0			
99	1997	2,726		77,354		-		2,967		80,080		755		10.4			
100	1998	1,890		76,181		-		3,048		78,071		649		9.2			
101	1999	1,940		63,972		-		3,915		65,912		528		8.8			
102	2000	2,820		82,548		-		2,695		85,367		704		9.1			
103	2001	2,768		84,400		-		2,714		87,167		657		8.3			
104	2002	3,009		78,264		-		2,719		81,273		609		8.3			
105	2003	4,518		89,074		-		2,727		93,593		562		6.6			
106	2004	4,200		91,563		-		2,931		95,763		514		5.9			
107	2005	4,187		91,258		-		2,747		95,445		467		5.4			
108	2006	4,653		101,424		-		2,897		106,077		589		6.1			
109	2007	4,730		103,108		-		3,224		107,838		711		7.3			
110	2008	5,370		117,065		-		2,963		122,436		833		7.5			
111	2009	5,818		106,093		-		2,963		111,911		955		9.4			
112	2010	6,353		115,854						122,207							
113	total excludes metallurgical coal production, hence 2010 estimate of lignite and bituminous in 2009																
114	Global Methane Initiative (2010)																
115	See sources below																
116																	
117																	
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subt. 1992-2010	78,094	1,812,279	-	48,265	1,890,373
percent of 2009	5.20%	94.80%	100.00%		
% 1992-2010:	4%	96%	0%	3%	

Coal and Peat in Kazakhstan in 2008

	Anthracite	Coking Coal	Other Bituminous Coal	Sub-Bituminous Coal	Lignite/Brown Coal	Peat	Patent Fuel	Coke Oven Coke	Gas Coke	Coal Tar
Unit	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt
Production	0	14086	92114	0	4872	0	0	2688	0	0
From Other Sources	0	0	0	0	0	0	0	0	0	0
Imports	0	0	264	0	0	1	0	766	0	0
Exports	0	-376	-42323	0	-283	0	0	-235	0	0
Stock Changes	0	0	13	0	0	0	0	-22	0	0
Domestic Supply	0	13710	50068	0	4589	1	0	3197	0	0

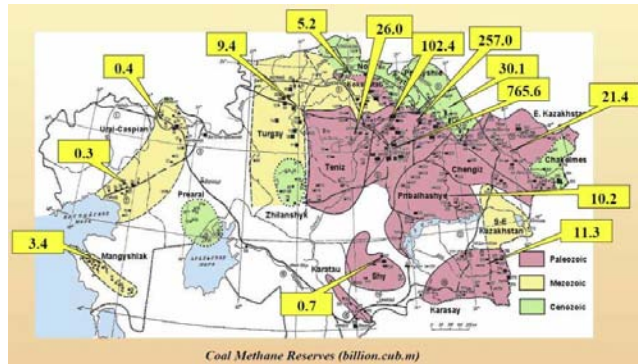
International Energy Agency Coal and Peat in Kazakhstan in 2008

Table 20-1. Kazakhstan'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 (2009)	28,170	3,130	31,300	7 (3.8%)
Annual Coal Production (2009)			101.5	9 (1.5%)

Source: BP (2010)

Global Methane Initiative (2010) Coal Mine Methane Country Profiles, Kazakhstan, chapter 20, www.globalmethane.org/tools-resources/coal_overview.aspx



Global Methane Initiative (2010) Coal Mine Methane Country Profiles, Kazakhstan, chapter 20, www.globalmethane.org/tools-resources/coal_overview.aspx

Sources for Coal Mine Methane emissions data in column K90-K109:

KazNIMOSK (2002): Kazakhstani GNG Emissions Inventory from Coal Mining and Road Transportation – Final Project Report, Kazakh Research Institute for Environment Monitoring and Climate (KazNIMOSK), Almaty, July, 2002.

* USEPA (2006): Global Anthropogenic Non-CO2 Greenhouse Gas Emissions: 1990–2020, U.S. Environmental Protection Agency, Office of Atmospheric Programs, Climate Change Division, June 2006, at http://www.epa.gov/climatechange/economics/downloads/GlobalAnthroEmissionsReport.pdf

** Shultz, K. and Alekseev, E. (2010): The Role of Policy on CMM Project Development: Ukraine and Kazakhstan as Case Studies. Presented at International Investment Forum: Funding of CMM Project in Ukraine. Donetsk, Ukraine June 3, 2010.

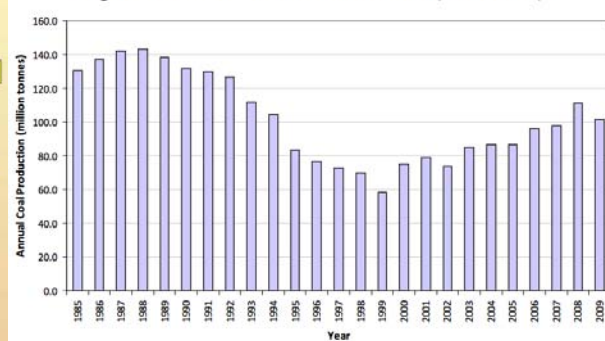
Table 20-5. Kazakhstan's CMM Emissions (million cubic meters)

Emission Category	1990	1991	1992	1993	1994	1995
Underground coal mines – ventilation emissions	983.66	914.75	915.52	957.82	678.12	671.37
Underground coal mines – drained emissions	189.84	200.83	179.87	162.96	148.31	115.8
Post-underground emissions	34.8	36.4	33.9	30.6	28.7	23
Surface mine emission	560.1	554.1	529.3	488.8	452.0	411.9
Total liberated (= sum of all above)	1768.4	1706.08	1658.69	1640.18	1307.13	1222.07
Recovered & Used	8.8	10.9	11.0	13.0	5.6	5.9
Total emitted (= Total liberated – recovered & used)	1759.6	1695.18	1647.69	1627.18	1301.53	1216.17

Emission Category	1996	1997	1998	1999	2000	2005 (estimated)	2009** (estimated)
Underground coal mines – ventilation emissions	408.0	347.45	303.45	227.32	286.23		400
Underground coal mines – drained emissions	55.4	48.2	42.6	27.2	41		130
Post-underground emissions	14.9	12.7	9.0	7.1	8.0		
Surface mine emission	381.7	350.2	304.3	273.3	381		450
Total liberated (= sum of all above)	860	758.55	659.35	538.92	716.23		980
Recovered & Used	3.5	4.0	10.5	11.3	12.2		25
Total emitted (= Total liberated – recovered & used)	856.5	754.55	648.85	527.62	704.03		955

Source: KazNIMOSK (2002); *USEPA (2006); **Shultz & Alekseev (2010)

Figure 20-1. Kazakhstan Annual Coal Production (million tonnes)



Cell: D11**Comment:** Rick Heede:

Coal production by coal mining companies and state-owned enterprises, including subsidiaries of oil and gas companies.

Coal types produced are not ordinarily reported by coal operators (except for metallurgical coal). We distinguish, where possible and reasonably well known, between hard (bituminous and subbituminous) and soft (lignite or peat) coals, especially for the larger companies operating in regions such as Australia and India where soft coals are predominant. Soft coals have lower carbon content per tonne than do hard coals.

Cell: H25**Comment:** Rick Heede:

Soviet production includes Svalbard production-sharing with Norway (~0.4 million tons per year).

Cell: H52**Comment:** Rick Heede:

EIA (2011) International Energy Statistics on World Coal Production (lignite, bituminous, anthracite, and metallurgical coal), by country; data for 1980-2009; total Primary Coal Production data extends to 2010. www.eia.gov/emeu/internationalenergy.html or www.eia.gov/countries/data.cfm.

Cell: E70**Comment:** Rick Heede:

EIA (2006) Table 5.3 World Bituminous Coal Production, 1980-2004.

Cell: M74**Comment:** Rick Heede:

World Coal Institute 2009 report, <http://www.worldcoal.org/resources/coal-statistics/>, [http://www.worldcoal.org/bin/pdf/original_pdf_file/coal_factsnewversion09\(15_09_2010\).pdf](http://www.worldcoal.org/bin/pdf/original_pdf_file/coal_factsnewversion09(15_09_2010).pdf)

Cell: K76**Comment:** Rick Heede:

World Coal Assoc website <http://www.worldcoal.org/resources/coal-statistics/>, 2010 production, link to 2008 production, no link to 2009 (Rhea), assume 2009 same as 2010

Cell: H84**Comment:** Rick Heede:

EIA (2011) International Energy Statistics on World Coal Production (lignite, bituminous, anthracite, and metallurgical coal), by country; data for 1980-2009; total Primary Coal Production data extends to 2010. www.eia.gov/emeu/internationalenergy.html or www.eia.gov/countries/data.cfm.

Cell: K87**Comment:** Rick Heede:

Source: Global Methane Initiative (2010) Coal Mine Methane Country Profiles, Kazakhstan, chapter 20, www.globalmethane.org/tools-resources/coal_overview.aspx

"Coal production in Kazakhstan declined by more than 50 percent in the years following independence from the Soviet Union in 1991 (BP, 2010).

The Kazakh coal mines are particularly gassy and prone to violent gas outbursts, and must be degasified and ventilated to prevent explosions and promote worker safety. The underground mines in the Karaganda basin use a variety of pre-mining and post-mining methane drainage techniques. Most of the mines are operated at a depth of more than 500 meters (m) and gas contents in these mines average between 18 and 24 m³/tonne (Baimukhametov et al, 2009) with specific emissions averaging 33 m³/tonne (KazNIMOSK, 2002). Pre-drainage has historically been carried out using in-seam boreholes. Advance degassing from the surface has been trialed with limited success because of the low permeability of the coal seams. The Arcelor Temirtau Coal Division has had recent success in increasing degasification rates, and hence coal production rates, by drilling cross-measure boreholes from a roadway driven 8–12 m below the coal seam. Gob gas is drained with vertical wells from the surface or via galleries driven 20–30 m above the seam (Baimukhametov et al., 2009).

Current drained methane emissions are estimated to be approximately 130 million m³ resulting from increased underground coal production rates (Alekseev, 2010), However, the level of methane utilization is very low, only about 25 million m³ annually, which is recovered and combusted in the boiler houses of five mines for mine heating. Surface mines are heavily ventilated and ventilation air with methane concentrations of about 1 percent is vented to the atmosphere (KazNIMOSK, 2002).

Table 20-5 details Kazakhstan's measured and estimated CMM emissions. The data in this table may vary from the U.S. EPA data presented in the Executive Summary due to differences in inventory methodology and rounding."

Cell: O175**Comment:** Rick Heede:

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