

COAL MINE METHANE PROJECT OPPORTUNITY

Kazakhstanskaya CMM-to-Heat Project

Coal Division of ArcelorMittal Temirtau JSC

Karaganda Coal Basin, Kazakhstan

OVERVIEW OF COAL MINE METHANE PROJECT:

Kazakhstanskaya mine is located in Shakhtinsk district of the Karaganda area, 30 kilometers (km) from the city of Karaganda. The mine was commissioned in 1969 with a designed capacity of 2.7 million tonnes per annum (Mtpa) of coal. There are 1,860 employees working at the mine. Since July 1, 1996 the mine has been part of JSC ArcelorMittal Temirtau Coal Division and is a large-scale, highly-mechanized entity.

The mine has produced 64.7 million tonnes (Mt) of coal and had a maximum production output of 2,807 kilotonnes (Kt) in 1973.

All produced coal is of KZh coking grade, and total reserves of coking grade coal are 103.4 Mt. Current depth of mining activities is 650-700 meters (working seams D6 and D10).

Existing ventilation and degasification infrastructure includes 8 vertical shafts and 74.9 km of existing roadways. The mine plans to expand the current degasification by 8.5 km. The production plan in 2009 was 1.4 Mt, but the mine increased production to 1.6 Mt in 2010 and 1.8 Mt in 2012 (with 1.8 Mt planned for 2013).

ESTIMATED ANNUAL EMISSION REDUCTIONS: 111,000 MTCO₂E

PROJECT DETAILS

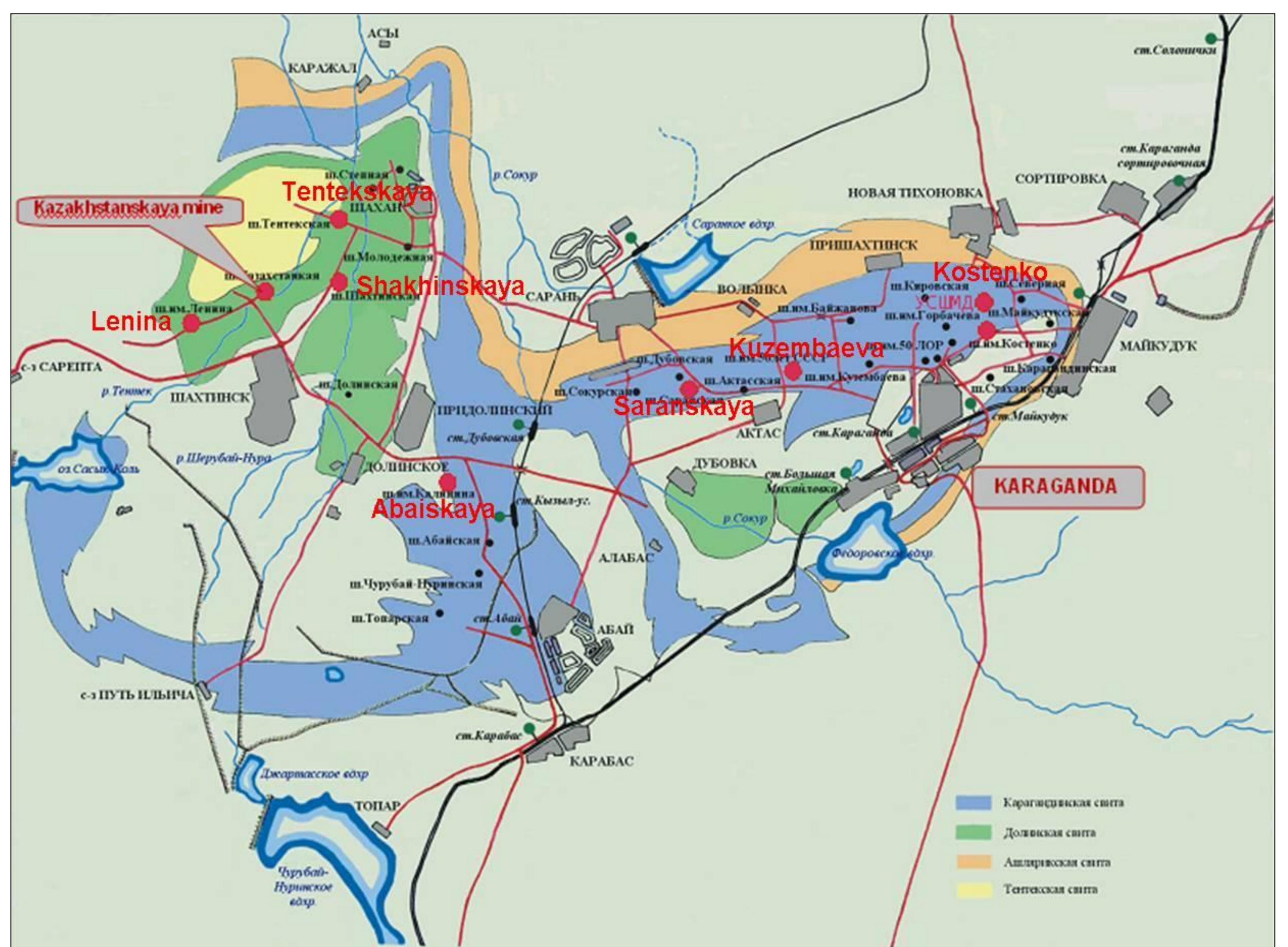
- Name of Project: Kazakhstanskaya CMM-to-Heat
- Name of Mine: Kazakhstanskaya
- Type of Ownership: Private
- Type(s) of assessments performed: Local feasibility study
 - When performed: 2004 (updated in 2007)
 - By whom: USShMD of CD of ArcelorMittal Temirtau JSC

MINE INFORMATION

- Mine owner: CD of ArcelorMittal Temirtau JSC
- Percent Ownership: 100%
- Parent company: JSC ArcelorMittal Temirtau
- Status and type of mine: Active, underground
- Mining Method: Conventional longwall
- Service life of mine: 30-35 years

PROJECT FINANCES

- Projected capital costs: US\$ 350,000
- Projected operation and maintenance (O&M) costs for fully implemented project: US\$ 60,000
- Estimated Return on Investment (ROI): 5 years



Location Map

(Methane Distribution Among Neighboring Mines)

HISTORICAL AND PROJECTED MINE DATA

HISTORICAL COAL PRODUCTION AND METHANE EMISSIONS

YEAR	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Coal (Million tonnes/yr)				.6	.8	1.1	1.06	1.1	1.0	1.0	1.5	1.6
<i>Methane (Mm³/yr)</i>												
Emitted from ventilation system(s)	29.8	25.8	25.7	27.5	27.3	43.8	35.8	37.0	46.0	36.5	48.0	56.0
Liberated from drainage systems	23.2	21.6	23.4	20.6	22.6	38.6	28.82	30.2	32.4	7.8	29.4	29.4
Vented to atmosphere	6.6	4.2	2.3	6.9	4.7	5.2	7.03	6.8	13.6	0	10.1	6.4
Total Methane Emissions	36.4	30.0	28.0	34.4	32.0	49.0	42.83	43.8	59.6	36.5	58.1	62.4

PROJECTED COAL PRODUCTION AND METHANE EMISSIONS

YEAR	2012	2013	2014	2015	2016	2017	2018	2019	2020
Coal (Million tonnes/yr)	1.8	1.8	1.8	1.8	1.8	1.0	1.5	1.6	1.8
<i>Methane (Mm³/yr)</i>									
Emitted from ventilation system(s)	44.0	49.0	55.0	42.0	45.0	15.3	22.1	23.7	30.2
Liberated from drainage systems	29.8	52.4	38.9	39.8	19.8	20.1	27.8	30.0	37.0
Vented to atmosphere	6.2	28.8	11.3	11.8	0	4.8	5.7	6.3	6.8
Total Methane Emissions	50.2	77.8	66.3	53.8	45.0	20.1	27.8	30.0	37.0

GREENHOUSE GAS EMISSION REDUCTIONS

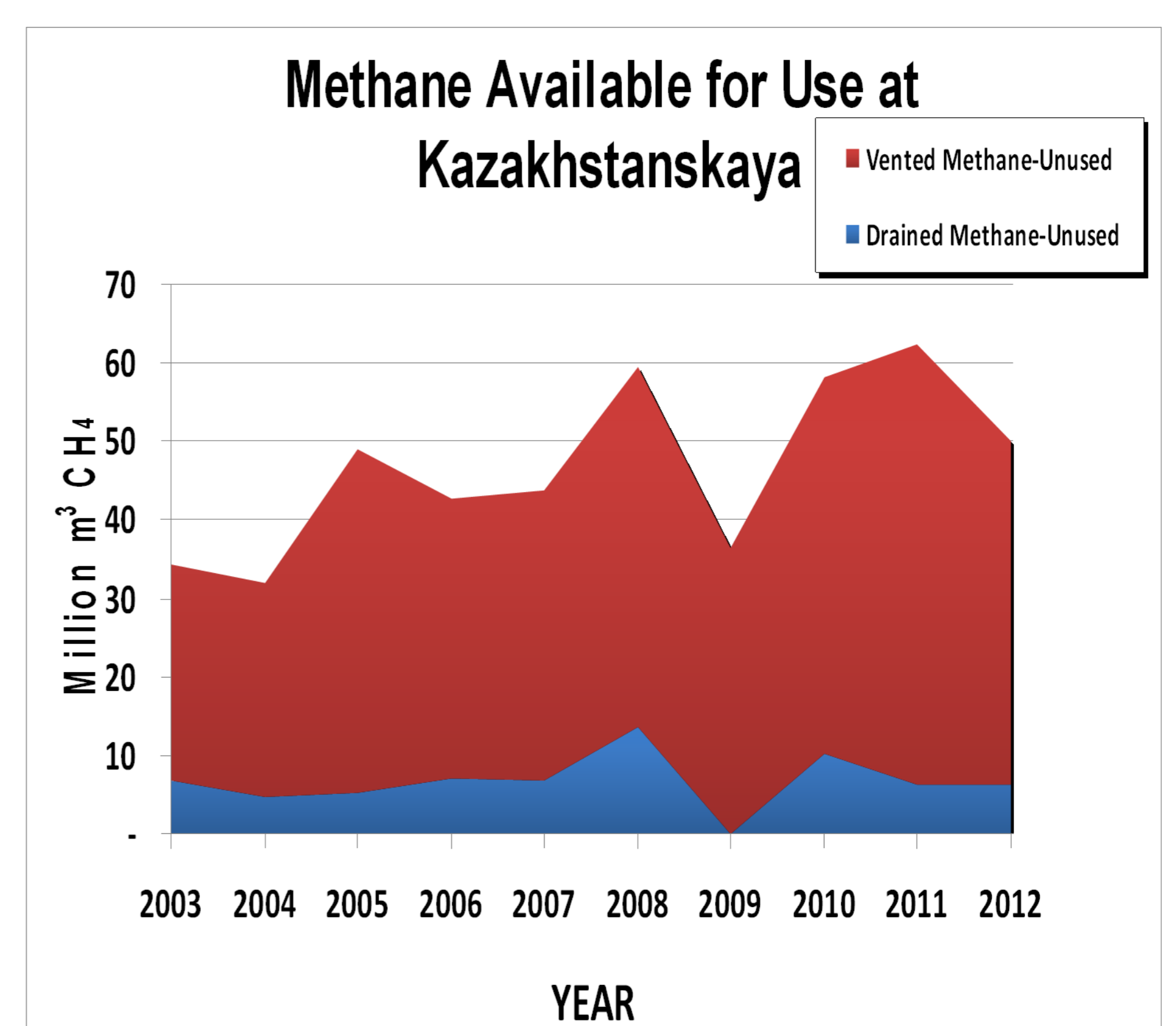
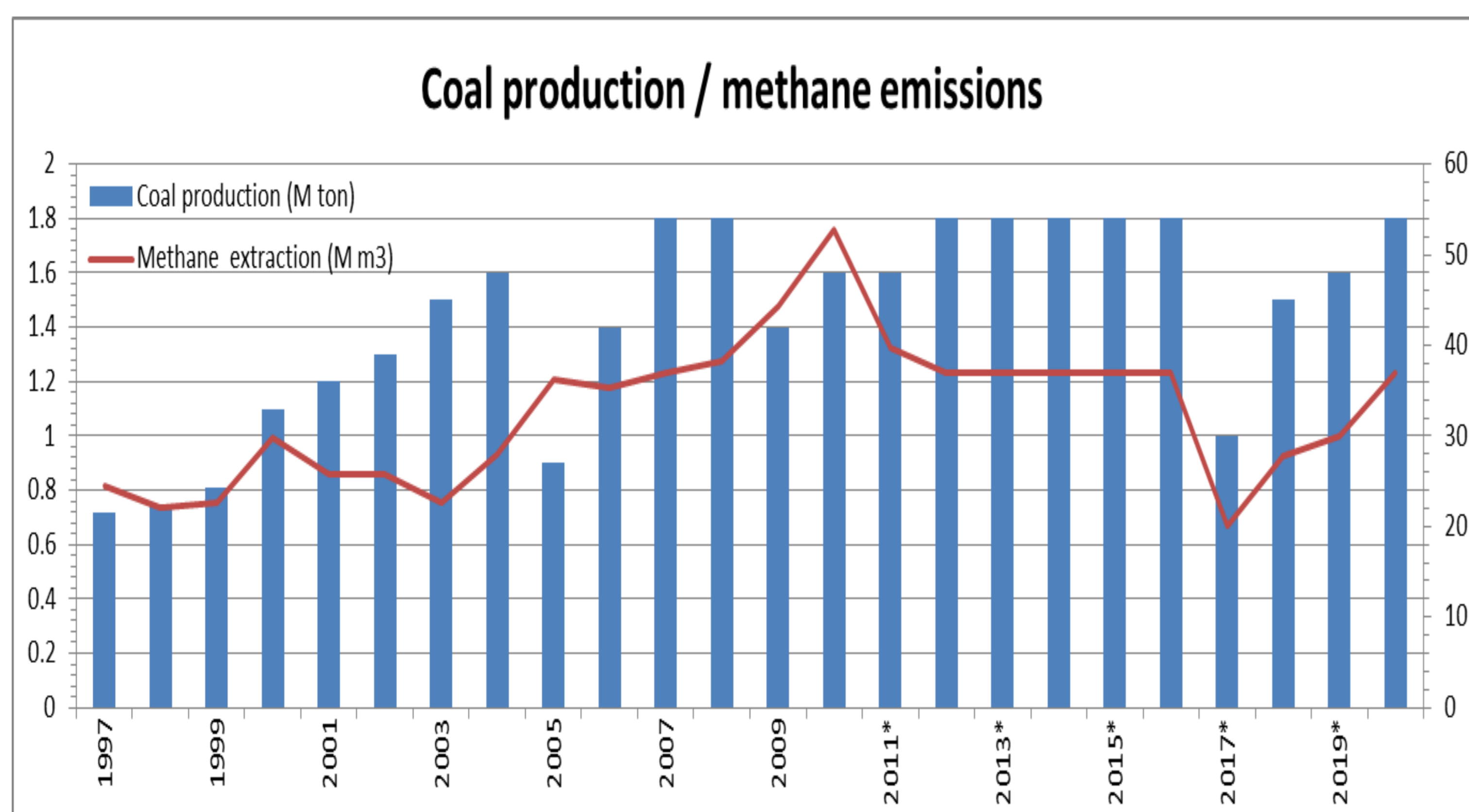
ESTIMATED GHG EMISSION REDUCTIONS AND TOTAL VOLUME OF METHANE ALREADY RECOVERED/UTILIZED

YEAR	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total CH ₄ vented (ave. m ³ /min)	36.4	30	28	34.4	32	49	42.83	43.8	59.6	36.5	48.0	56.0
Average CH ₄ concentration, %	40-60	40-60	40-60	40-60	40-60	40-60	40-60	40-60	40-60	40-60	40-60	40-60
Total CH ₄ recovered and utilized (Mm ³ /year)	16.6	17.4	21.1	13.7	17.9	33.4	21.79	23.4	18.8	7.8	19.3	23

TOTAL VOLUME OF METHANE EXPECTED TO BE RECOVERED/UTILIZED

YEAR	2012	2013	2014	2015	2016	2017	2018	2019
Total CH ₄ recovered and utilized at Kazakhstanskaya (m ³ /year)	8,600,000	8,600,000	12,600,000	13,000,000	13,000,000	10,000,000	12,600,000	13,000,000
Total CH ₄ recovered and utilized in Coal Mine Group (m ³ /yr)	23,600,000	23,600,000	27,600,000	28,000,000	19,800,000	18,000,000	23,600,000	23,000,000

COAL PRODUCTION AND METHANE EMISSION CHARTS



MARKET ANALYSIS / DEMAND ANALYSIS

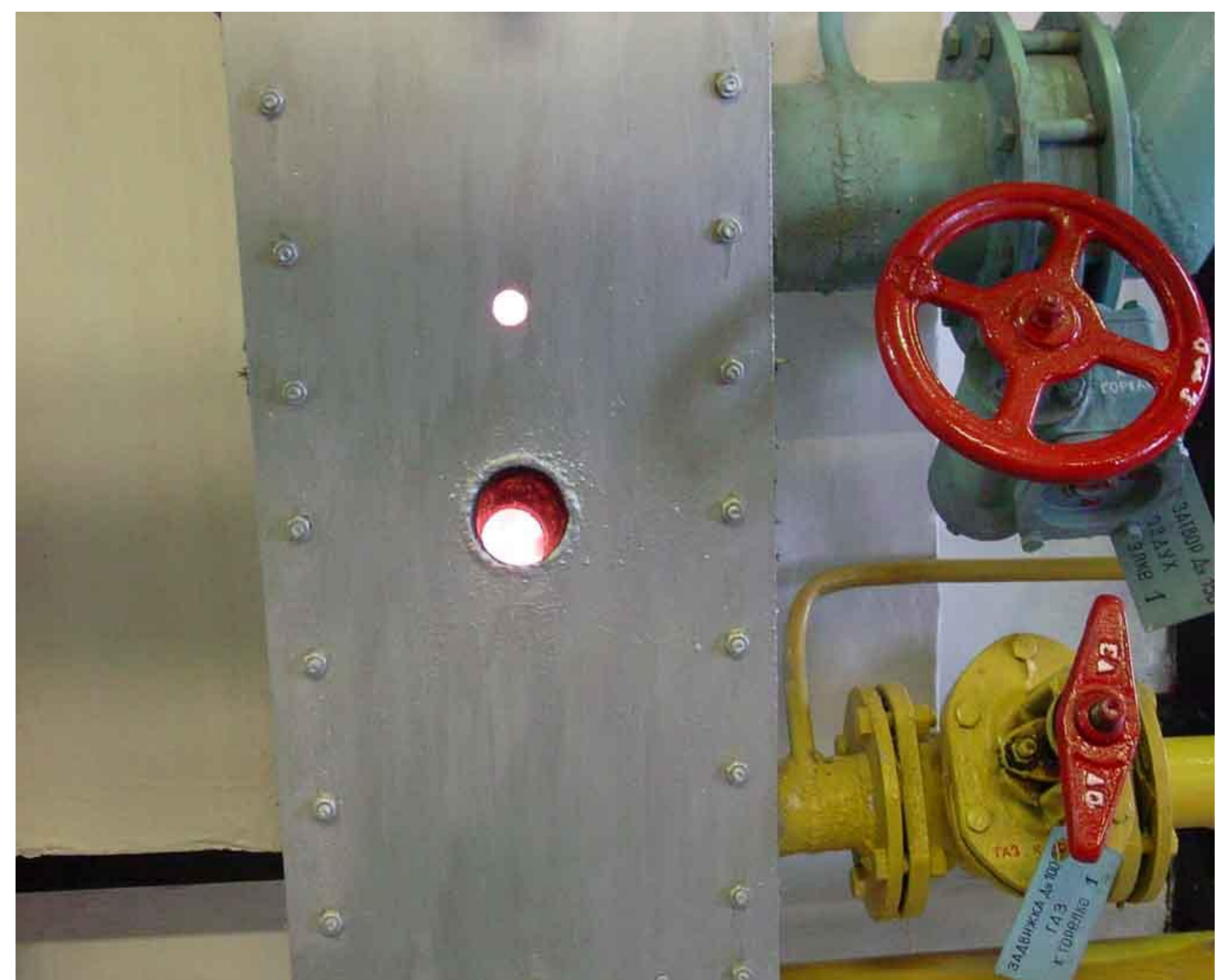
Consumers of the heat generated by combustion of CMM in boilers are the mines of ArcelorMittal Temirtau JSC. Drained methane gas is currently used as a fuel in boiler houses of five mines: Lenina, Kostenko, Saranskaya, Shakhtinskaya and Abaiskaya (see map on page 1).

TYPE OF ASSISTANCE SOUGHT

- Financial Assistance
- Technical assistance: Resource assessment, economic assessment, feasibility study
- Assistance with legal issues and licensing documents

PROPOSED TECHNOLOGIES

USE OF CMM AS A FUEL IN BOILERS FOR HEATING PURPOSE



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