

COAL MINE METHANE PROJECT OPPORTUNITY

CMM Capture and Utilisation for Power Generation

JSC ArcelorMittal Temirtau Coal Division

Karaganda Coal Basin, Republic of Kazakhstan

OVERVIEW OF COAL MINE METHANE PROJECT:

The proposed project is located at the mining group operated by JSC ArcelorMittal Temirtau Coal Division located in the Karaganda Coal Basin, Republic of Kazakhstan. The current CMM capture and utilization across the mining group is limited to a single pilot power plant and some process heating requirements, with a large proportion of CMM being vented to atmosphere.

The proposed project activity requires the installation of gas grid infrastructure, power grid distribution systems and containerised generating plant to enable the comprehensive capture and utilization of drained CMM for power generation.

A gas resource assessment has determined that a conservative 40 MWe of power generation can be supported by the high concentration CMM, which is currently vented. The project owner requires expertise in gas drainage, infrastructure design and power plant operation along with financial investors in order to develop this project.

ESTIMATED ANNUAL EMISSION REDUCTIONS: 1.2 MMTCO₂E

PROJECT DETAILS

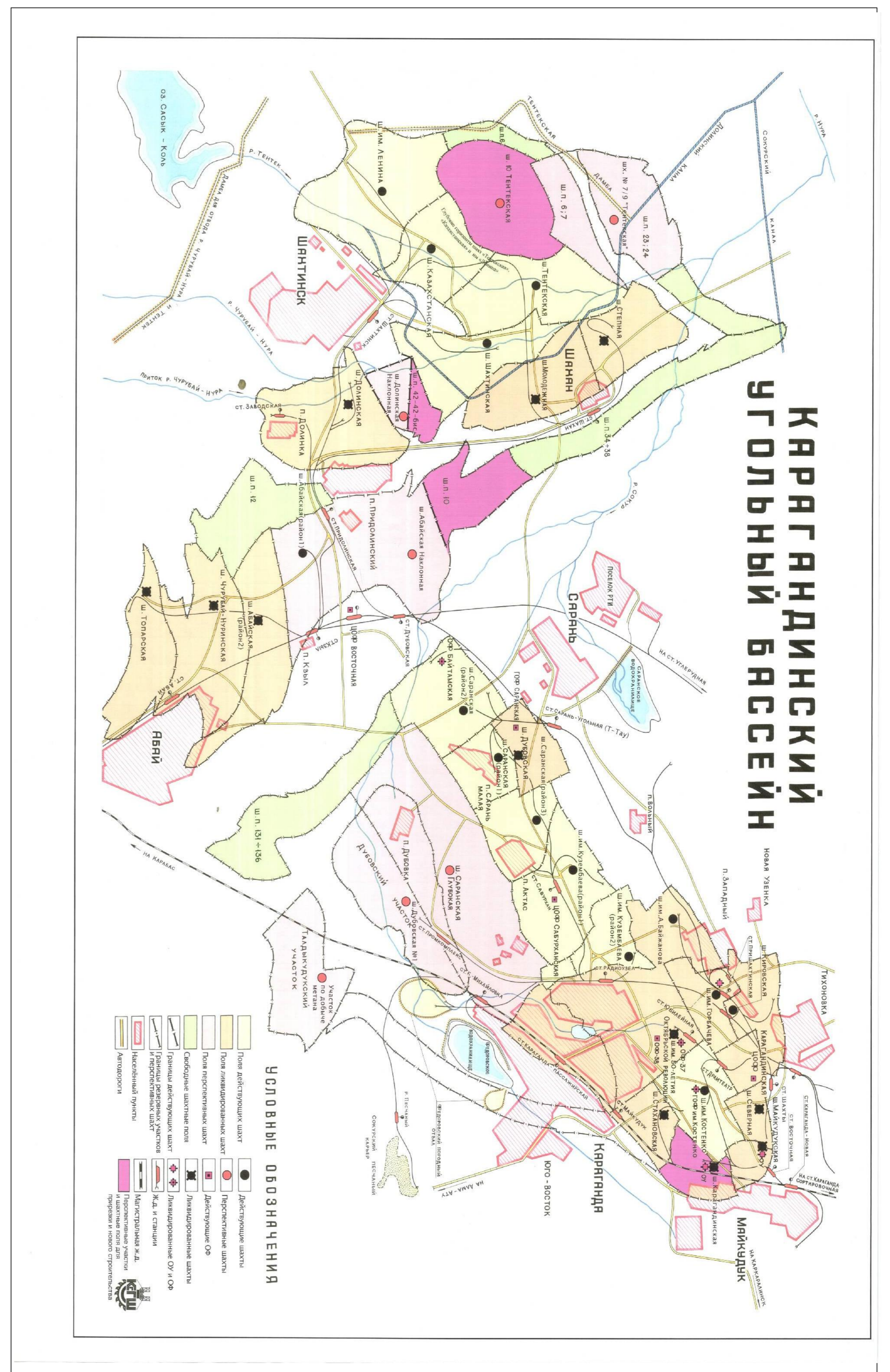
- Name of Project: ArcelorMittal CMM Capture and Utilisation Project
- Name of Mine: ArcelorMittal Mining Group consisting of six mines (Lenina, Tentekskaya, Kazakhstanskaya, Abayskaya, Kuzembaeva, and Saranskaya)
- Type of Ownership: Private
- Type(s) of assessments performed: Pre-feasibility performed March 2012 by HEL-East Ltd. and Ruby Canyon Engineering, with GMI funding

MINE INFORMATION

- Mine owner: JSC ArcelorMittal Temirtau Coal Division
- Percent ownership: 100%
- Parent company: ArcelorMittal
- Status and type of mine: Active Underground
- Mining Method: Mechanised Longwall
- Service Life of Mine: > 30 years

PROJECT FINANCES

- Please refer to the pre-feasibility study mentioned above, for project financial information.



HISTORICAL AND PROJECTED MINE DATA

HISTORICAL COAL PRODUCTION AND METHANE EMISSIONS FOR SIX MINES: LENINA, TENTEKSKAYA, KAZAKHSTANSKAYA, ABAYSKAYA, KUZEMBAEVA, AND SARANSKAYA.

YEAR	1975	1980	1985	1995	2001	2005	2006	2007	2008	2009	2010
Coal Production (Mtonnes/yr)	9.4	10.15	11.22	5.08	6.98	7.76	8.39	9.14	7.07	7.67	7.69
Liberated from drainage systems (m ³ /min)						111	132	130	137	159	167

PROJECTED COAL PRODUCTION AND METHANE EMISSIONS

YEAR	2012	2013	2014	2015
<i>Methane (Mm³/yr)</i>				
Emitted from ventilation system(s)	60.44	73.06	54.13	62.54
Liberated from drainage systems	167.40	174.23	178.7	226.00
Total Methane Emissions	227.84	247.29	232.83	288.54

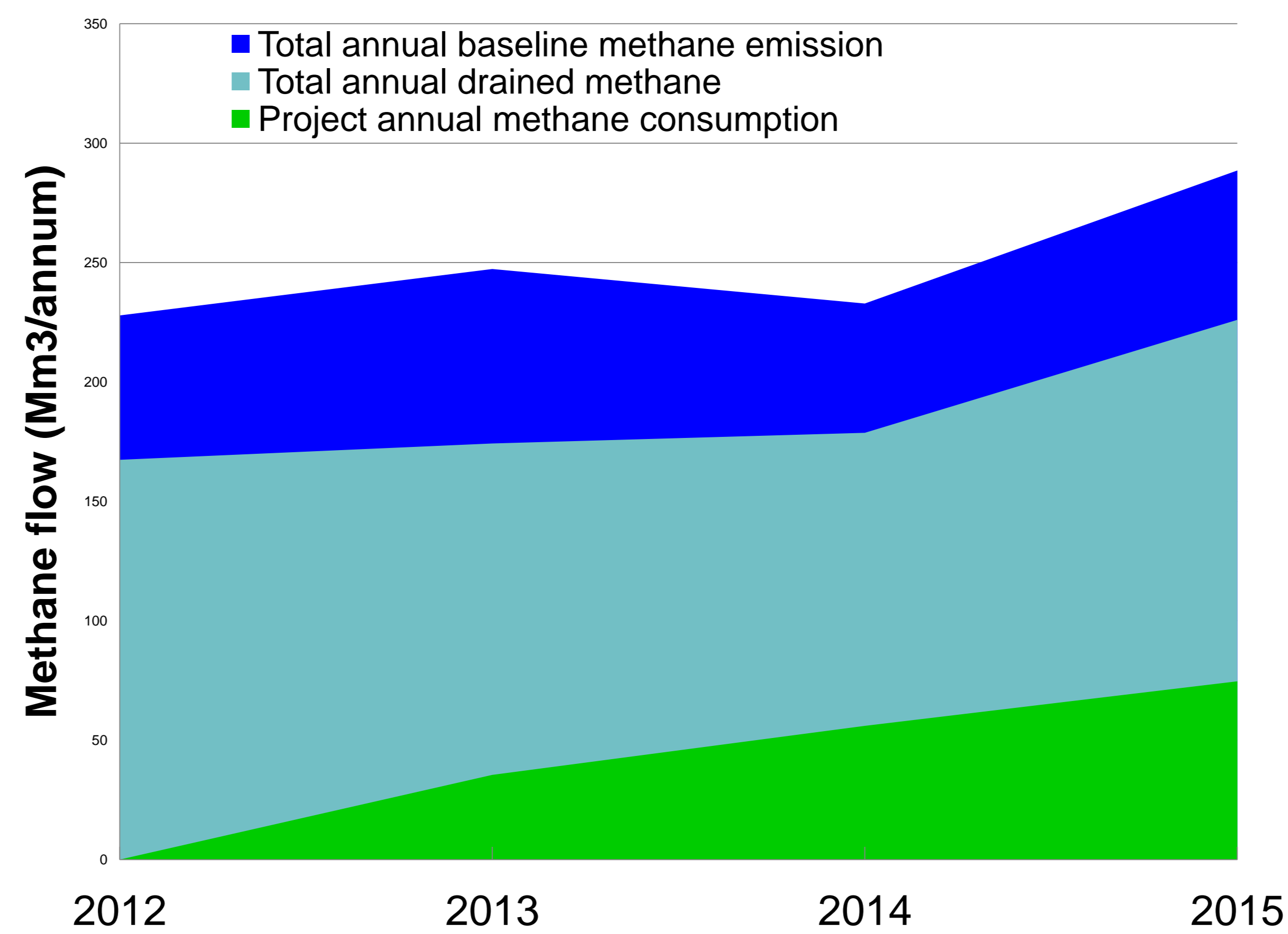
GREENHOUSE GAS EMISSION REDUCTIONS

TOTAL VOLUME OF METHANE EXPECTED TO BE RECOVERED/UTILIZED

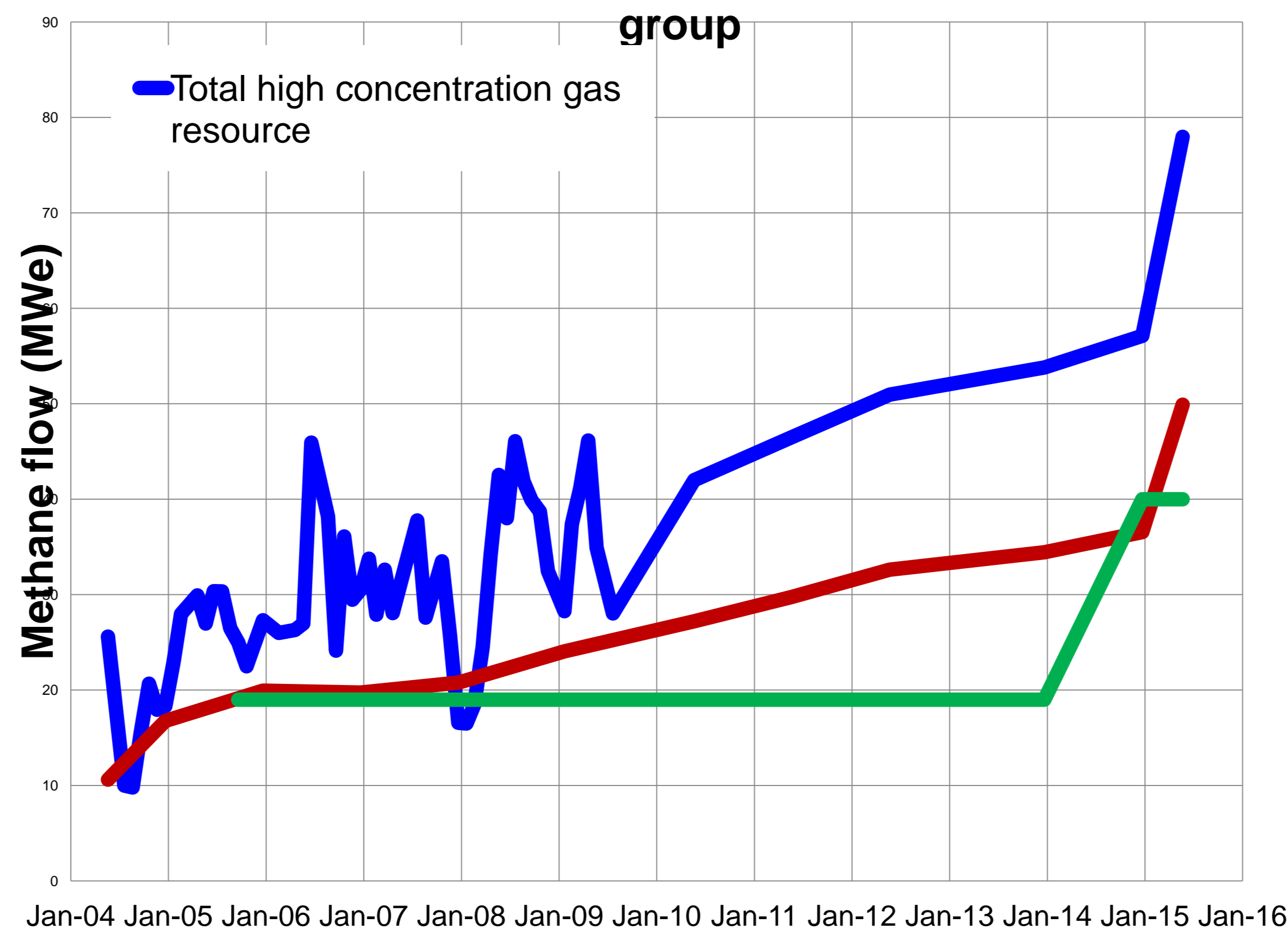
YEAR	2012	2013	2014	2015	2016	2017	2018	2019
Total CH ₄ recovered and utilized (Mm ³ /year)	-	35.46	56.00	74.65	74.65	74.65	74.65	74.65

COAL PRODUCTION AND METHANE EMISSION CHARTS

Methane liberation from mining group



Historical and projected high concentration drained methane resource across the mining group



MARKET ANALYSIS / DEMAND ANALYSIS

The primary market for the CMM is electricity. The average load imported from the local grid by each coal mine is between 6 – 10 MWe. There is a shortage of supply, and power cuts in the region are frequent. Embedded power generation would help stabilize the grid, improving security of supply for the mines, and reducing their exposure to the highly volatile electricity prices in Kazakhstan.

An additional market is the supply of process heat in the winter for the purpose of shaft heating. This is considered a secondary market as heat demand is limited to five months per year. Heat recovery from the power generation has been considered as a method to supplement the existing coal-fired boilers and reduce coal burn for heating.

TYPE(S) OF ASSISTANCE SOUGHT

- Financial assistance to fund capital and infrastructure items, including the electrical and gas distribution networks and the generator assets.
- Technical expertise and practical experience of methane drainage management, CMM gas pre-treatment, and CMM power generation in reciprocating engine gensets.

PROPOSED TECHNOLOGIES



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