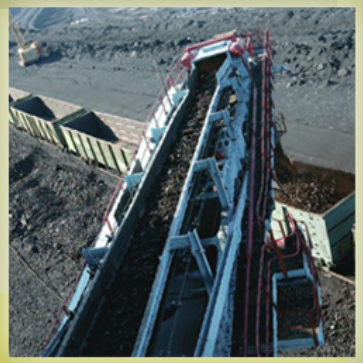


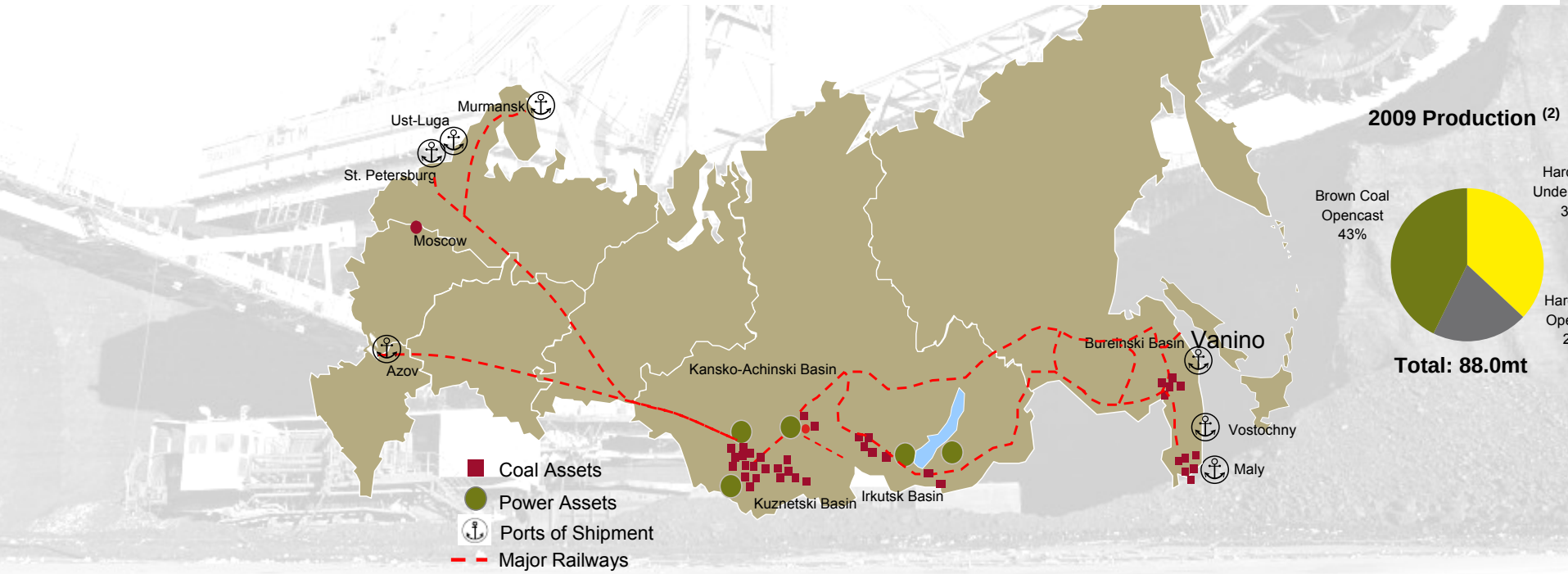
Coal mine methane utilization in Russia: example of SUEK project in Kemerovo region

Oleg Pertsovskiy, Head of Strategy, Corporate Development and Risk-Management Department

October, 2010

siness

- **Favourable geographic position –** maximising revenues by redirecting coal sales volumes between the Atlantic and Pacific basins
- **Developed infrastructure in place –** captive rolling stock and own port terminal (Vanino)
- **World class, large-scale mining operations –** 17 opencast and 13 (1) underground mines in 7 regions of Russia
  - Largest reserve base in Russia, Russia's leading producer and exporter, largest supplier of coal for domestic power generation
- **Integrated power business –** 18 power plants in 5 regions in Siberia
  - Installed electricity and heat generation capacity of 7,029 MW and 16,258 Gcal/h, respectively
  - 17.3% of total electricity production in Siberian IES for 2009
  - More than 60% of heat supply in serviced cities and townships in Kuzbass and Altai and more than 80% in Krasnoyarsk and Khakasiya



Strategic asset location in Southern Siberia facilitates access to both European and Asian markets – a competitive advantage

Source: SUEK.
(1) Includes one mine to be disposed of in 2010 – which has been excluded from the SRK estimates.
(2) Based on 100% ownership. Actual ownership stakes in certain key coal assets are as follows: 98.61% SUEK-Kuzbass, 90.68% SUEK-Krasnoyarsk, 100% SUEK-Khakasiya, 91.93% Urgalugol, 93.93% Primorskugol.

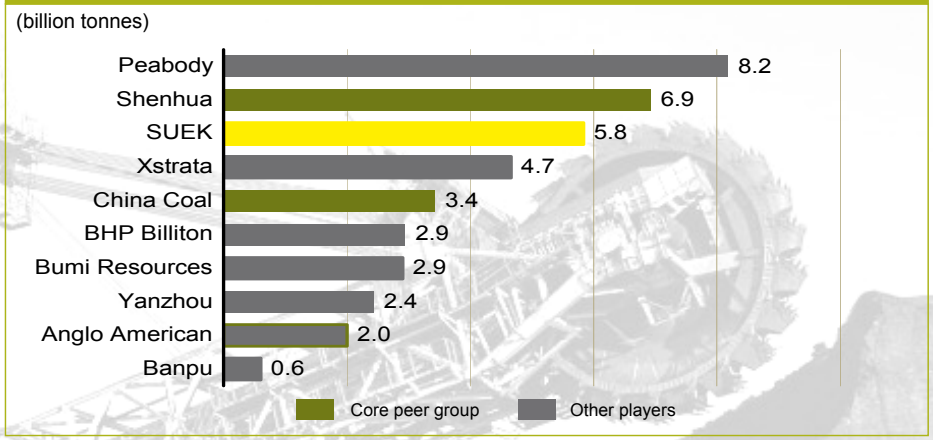
eading global coal producer

SUEK – leading global producer and exporter

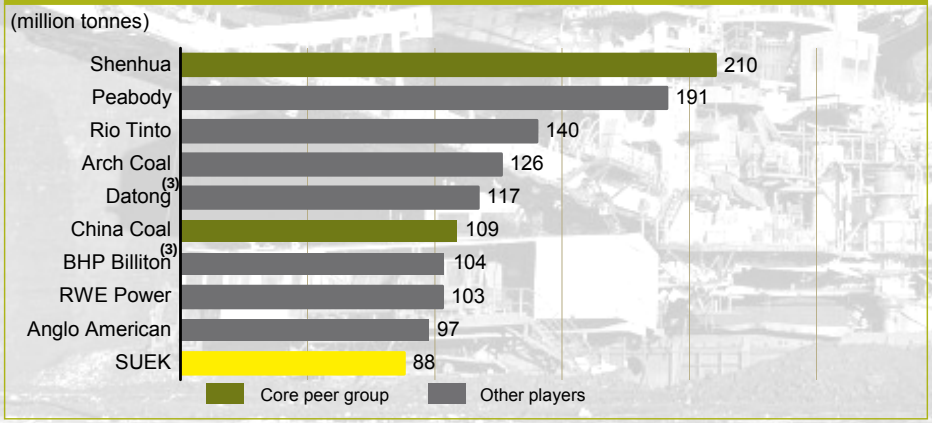
- Global coal company
- Leading Russian player in the seaborne thermal coal export market
  - Leading exporter of thermal coal to the UK market
  - Leading Russian supplier to China, Japan and South Korea
- Broad client base with c.100 export customers (including blue chip companies) in more than 30 countries around the world
- Potential to ramp up production and increase export volume given the size of the reserve base and developed infrastructure

Source: SUEK.

Global coal reserves by company– 2009 (1)

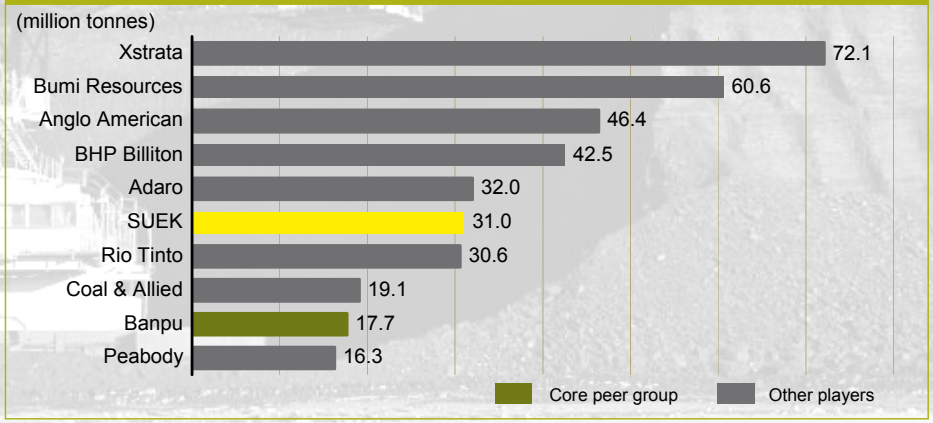


Global coal production (2) – 2009



Source: SUEK, respective company filings.
Note: Core peer group composed of thermal coal players comparable by reserves / production.
(2) Includes production of both thermal and coking coal.
(3) 2008 data.

Thermal coal exports – 2009

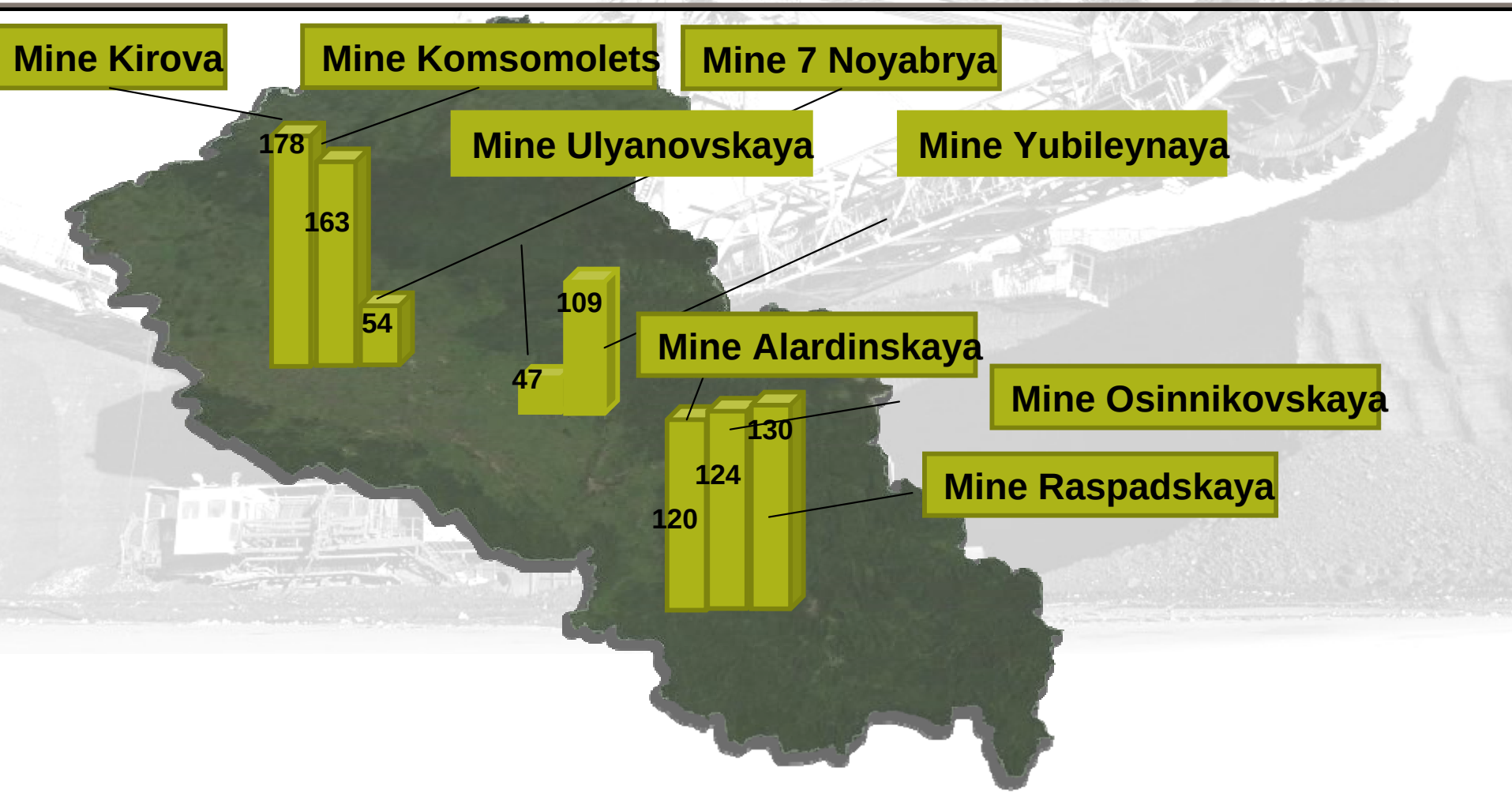


Source: SUEK, respective company filings.
Note: Core peer group composed of thermal coal players comparable by reserves / production.

SUEK is a major global coal producer, which provides the company with stability

• A lot of Kuzbass coal mines have significant amount of methane sufficient to produce electricity and heat

Gasoutput for some of Kuzbass coal mines (m^3/min)



Mine methane utilization opportunities in Kuzbass

- Projects implementation at largest mines of Kuzbass will enable to install 250-300 MW
- Mine-methane utilization projects, including those using Kioto protocol mechanisms, are being actively developed in many countries
- Russia is among «poorly performing» countries so far

International experience

Ukraine
8 projects of joint implementation
Total capacity: 103 MW

Germany
59 installations
Total capacity: 82 MW

China
78 installations
Total Capacity: 220 MW

oject technological scheme

2 • Gas is pumped from the mine using the pumping station

Pumping station

1 • Drilling of degasification wells from the surface

Coal bed

3 • Gas utilization

Mini CHP

Heat

Electricity

Boiler of the mine

Heat

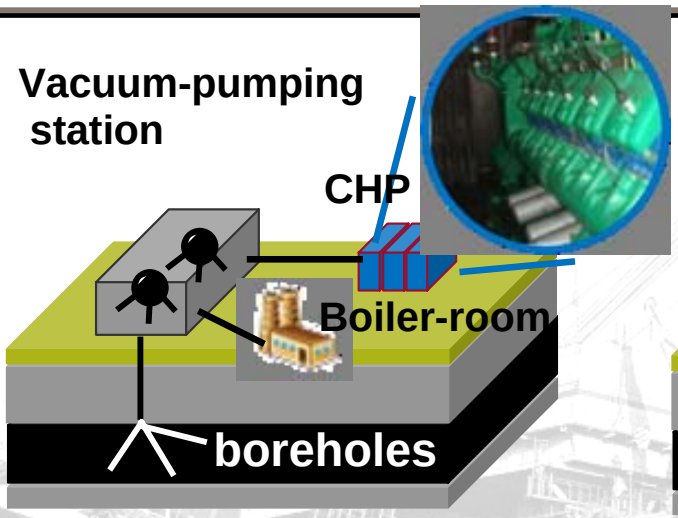
Flaring equipment

Utilization of excessive gas

...in benefits from the project

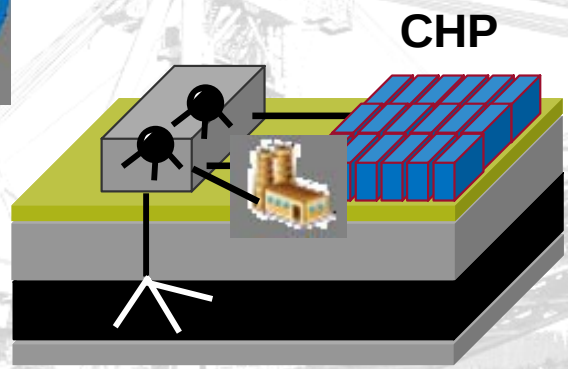
Environment	• Significant reduction of greenhouse gas emissions: 1 tone of methane has the greenhouse effect of the 25 tones of CO2
Energy efficiency	• Power and heat production from coal mine methane
Safety	• Reduction of accident risk on mines using more efficient method of coal mine methane removal
Finance	• Possibility to attract financing using Kyoto protocol mechanisms

Pilot project (Kirova mine)



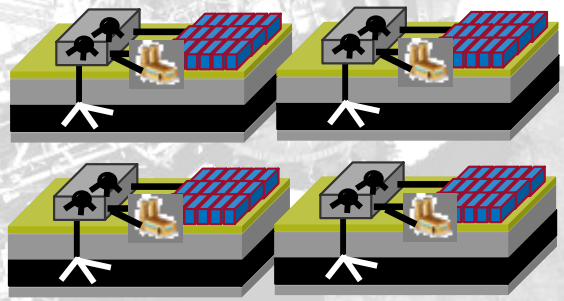
- In the course of pilot project at Kirova mine the necessary infrastructure was constructed:
  - underground gas pipeline 4,5 km long
  - vacuum-pumping station and gas pipeline to the boiler-room of the mine
  - torch furnace
- 3 mini-CHP with total installed capacity 4 MW

Project expansion (Kirova mine)



- On basis of existing infrastructure the project will be supplemented in short terms with new mini-CHP blocks and torch furnaces with relatively moderate capital expenditures

Project expansion (4 SUEK mines)



- Technical solutions replication at other SUEK mines will enable potentially to increase the total installed capacity to 137 MW

Project

	First Phase	Second Phase
	5-5,5 MW installed capacity	137 MW installed capacity
	29 mln. kW*h per year	725 mln. kW*h per year
	Prevention of emissions of 450 thousand tones CO2-equivalent per year	Prevention of emissions of 5,2 mln.tones CO2-equivalent per year

Sufficient for power supply of:

metallurgical installation

or

large chemical industrial complex

Consumption of 700 ths. people

More than 50 mln. euro from emission reduction units

plementation of the second phase of the project depends on the state of post

Key steps and their implementation:

Document preparation (June 2007 – February 2008)

International verification of project documentation (August 2008)

Application to register project at the Ministry of Economic Development (September 2008)

Pilot project start up at Kirova mine (September 2008)

Project registration at the Ministry of Economic Development (July 2010)

Verification of CO2 emission reduction (November 2010)

Sale of CO2 quotes (from December 2010)

Thank you!