CONVERTING COAL MINE METHANE INTO ELECTRIC POWER

Coal mine methane is a viable feedstock for electric power generation in South Africa, according to Barloworld Power, Caterpillar’s southern African dealer for Energy and Transportation.

Barloworld put the spotlight on the potential of coal mine methane at a customer event on 15 April in Johannesburg. Sharing the podium with Caterpillar and industry experts, Barloworld Power focused on its capabilities in the gas segment, which is still relatively untapped in southern Africa. Only two percent of South Africa’s energy demand is currently met by gas.

Nalen Alwar, Barloworld Power’s business development manager: Gas for southern Africa, says the potential value of harnessing methane from coal beds is significant as South Africa is the sixth largest coal producer in the world with reserves estimated at 30 billion tonnes, half of this mined underground. It is estimated that mining of known reserves will continue for well over 100 years.

Methane is a naturally occurring gas formed during the mining of coal. It is highly flammable and hazardous to mining operations, which means that coal seams have to be degassed prior to mining.

As a greenhouse gas, methane released into the atmosphere does 20 times more damage than carbon dioxide. This is cause for serious concern as coal mining is still the world’s biggest contributor to feedstock for electrical power generation. Unburnt methane can remain in the atmosphere for nine to 15 years.

In a presentation at the Barloworld event, Alwar said greenhouse gas emissions in the USA decreased by more than 20% between 1994 and 2005 due to increased recovery and utilisation of coal mine methane.

Alwar explained that methane could be safely extracted and, following a treatment process, fed into Cat gas generator sets to produce electric and thermal power. “Infrastructural and energy efficiency projects can be undertaken by coal mining companies to generate their own electricity or provide revenue earning opportunities as independent power producers (IPPs).”

He said new methane gas to power projects had the advantages of short lead times in the supply and commissioning of proven and reliable Cat gas engine solutions; assisting the growth of a gas economy; wide acceptance as technology for cogeneration in parallel with the grid supply; private sector participation in the generation of electric power; reduction of stress on the grid; and the potential for hybrid solutions with other IPP technologies.

Alwar cited Caterpillar’s key technology strength as the ability to utilise gas with varying methane concentrations over the life of a mining operation. This means power production during pre-mine drainage, active mining and abandoned mine operations, supported by Barloworld Power’s project management and maintenance capabilities.

More.....
Caterpillar has several reference sites for the conversion of coal mine methane to electric power in the UK, China, Australia and Russia, among others.

According the Alwar’s presentation, the Jincheng Anthracite Mining Company in China operates the world’s largest coal mine methane power plant. The plant provides 120MW of continuous electrical power using 60 1.8MW Cat gensets and four 3MW combined cycle steam turbines.

The mine sells 840 000 megawatt-hours per year to the national power utility.

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Caption: Barloworld Power

Barloworld Power experts sharing the advantages of converting coal mine methane to electric power (from left): Nalen Alwar (business development manager: Gas); Mark Mencel (executive director: Barloworld Power southern Africa); Pravesh Kalyan (project manager); and Steven Moss (product support operations manager).

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