WestVAMP - the World’s first VAM Fuelled Power Plant

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VAM Abatement - in the US

2 April 2007
WestVAMP - VAM Power Plant at BHP Billiton in Australia

250 000 Nm3/h (150 000 scfm) of air
Driving a 6 MWe conventional turbine
The flameless VOCSIDIZER

Flameless: Oxidation completely in-bed.

No NOx: No flame. Homogeneous temp distribution without peaks.
PRINCIPLE DIAGRAM FOR: VOCSIDIZER STEAM CYCLE FOR POWER GENERATION

Steam Boiler

- Steam drum
- Deaerator
- FW tank
- Turbine
- Generator
- Condenser
- Air cooler
- FW treatment plant

VOCSIDIZER™
PROVEN TECHNOLOGY

1st DEMO INSTALLATION AT A COAL MINE

AT BRITISH COAL
8 000 Nm³/h (4 700 scfm) of vent air with 0.3 – 0.6 % methane.
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2nd DEMO INSTALLATION AT A COAL MINE

TRIAL UNIT AT APPIN COLLlERY,
BHP AUSTRALIA
6 000 Nm³/h (3 500 scfm) of vent air.
12 months of utilizing VAM for boiling water.

Awarded as ACARP’s best Greenhouse Gas Project

The Appin Project was partly Government funded by ACARP - Australian Coal Association Research Programme
INSTALLATION AT WestCliff COLLiERY, BHP Billiton AUSTRALiA  2007

250 000 m³/h of ventilation air
6 MWe steam turbine

Taking only 1/5 of the shaft air volume

Partly Government funded by AGO - Australian Greenhouse Office
ANNOUNCING: LARGE SCALE VAM PLANT IN THE US at CONSOL Energy.
Demonstration of VAM abatement at CONSOL Energy, USA
50 000 Nm3/h (30 000 scfm) of air
AREAS OF UTILIZATION OF RETRIEVED ENERGY

- Electricity
- Coal drying
- Steam production
- Sludge concentration
- Ventilation air preheating
- Ventilation air precooling
- District heating/cooling

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FOR A GOOD VAM TO ENERGY PIONEERING PROJECT

✓ ½- 1 % CH4

✓ Min 500 000 Nm3/h (300 000 scfm) Ventilation Air flow

✓ Drainage gas Near ventilation shaft

✓ Energy requirement Near ventilation shaft
WHY REDUCE VAM EMISSIONS?
GLOBAL METHANE EMISSIONS
BY SOURCE

BIGGEST TOTAL SOURCE:
Cows, sheep etc

PROBLEM:
Each source is very small

50-100 kg per cow  1 - 2 t CO2e  per year
ANNUAL GREENHOUSE EFFECT on Global Warming
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Coal mine VAM
800,000 m³/h, 1%
(50,000 t CH₄/yr)

1 million t CO₂e
ANNUAL GREENHOUSE EFFECT on Global Warming

Coal fired Power plant
300 MWth =

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1 million t CO₂e
ANNUAL GREENHOUSE EFFECT on Global Warming

Coal fired Power plant 300 MW$_{th} =$

$\frac{1}{2}$ million cars =$

1 million t CO$_2$e

Coal mine VAM
800 000 m$^3$/h, 1%
(50 000 t CH$_4$/yr)
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5 CONCLUSIONS on VAM (Ventilation Air Methane)

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5. VAM Power Plant can reduce annual emissions of 1 million tons CO$_{2e}$

Thank you!  RMATTUS@MEGTEC.SE