

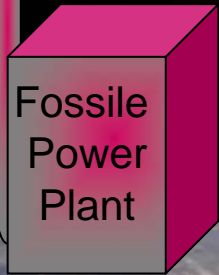
# Methane to Markets



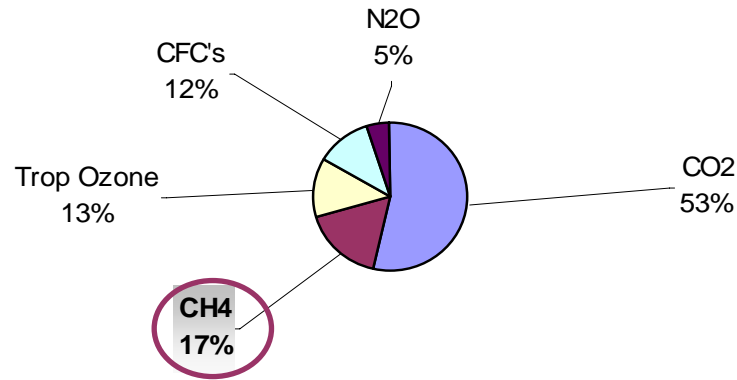
# CONSIDER Green House Gas METHANE



CO<sub>2</sub>



## GREENHOUSE GASES CONTRIBUTIONS



CH<sub>4</sub>



	Life time in atmosphere
CO <sub>2</sub>	>>10 000 years
CH <sub>4</sub>	12 years

# CONSIDER Green House Gas METHANE

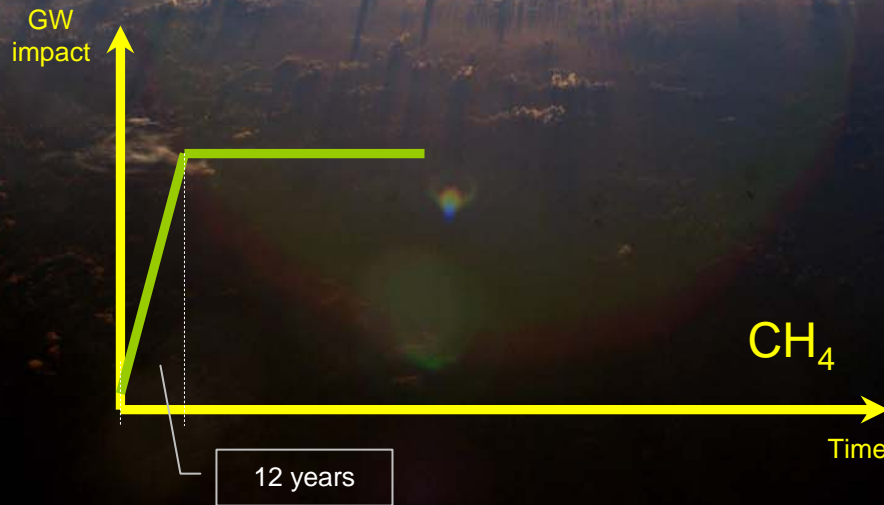


CO<sub>2</sub>



	Life time in atmosphere
CO <sub>2</sub>	>>10 000 years
CH <sub>4</sub>	12 years

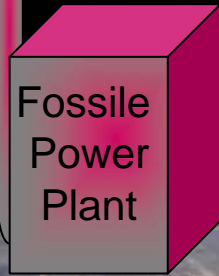
CH<sub>4</sub>



# CONSIDER Green House Gas METHANE



CO<sub>2</sub>



GW impact

Major Emission reductions

CO<sub>2</sub>

Time

## CONCLUSIONS ON MAJOR EMISSION REDUCTIONS:

- CO<sub>2</sub> continues to accumulate, but at a slower rate.

CH<sub>4</sub>



GW impact

CH<sub>4</sub>

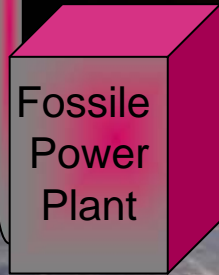
Time

12 years

# CONSIDER Green House Gas METHANE



CO<sub>2</sub>



GW impact

Major Emission reductions

CO<sub>2</sub>

Time

## CONCLUSIONS ON MAJOR EMISSION REDUCTIONS:

- CO<sub>2</sub> continues to accumulate, but at a slower rate.
- Methane reductions have full impact quickly - in only 12 years!

CH<sub>4</sub>



GW impact

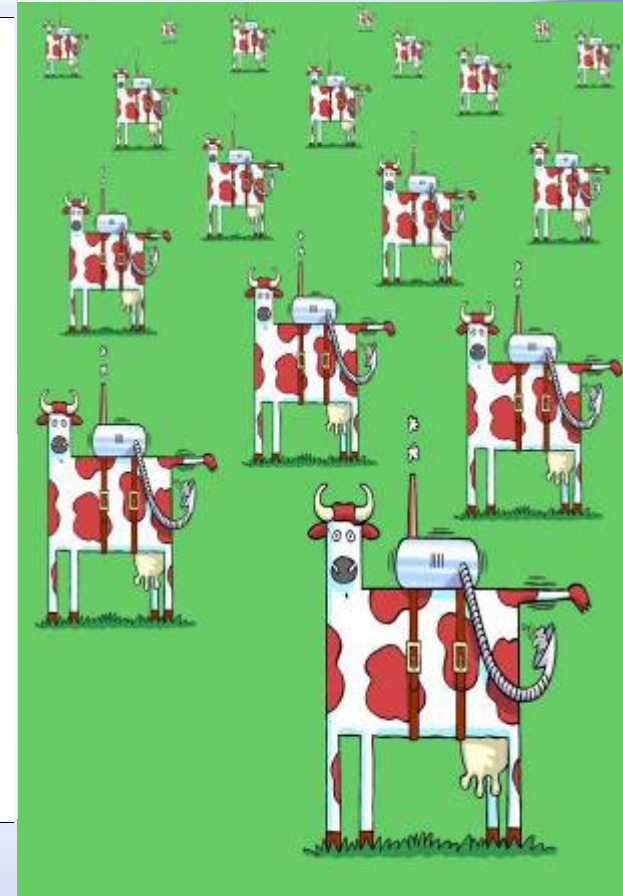
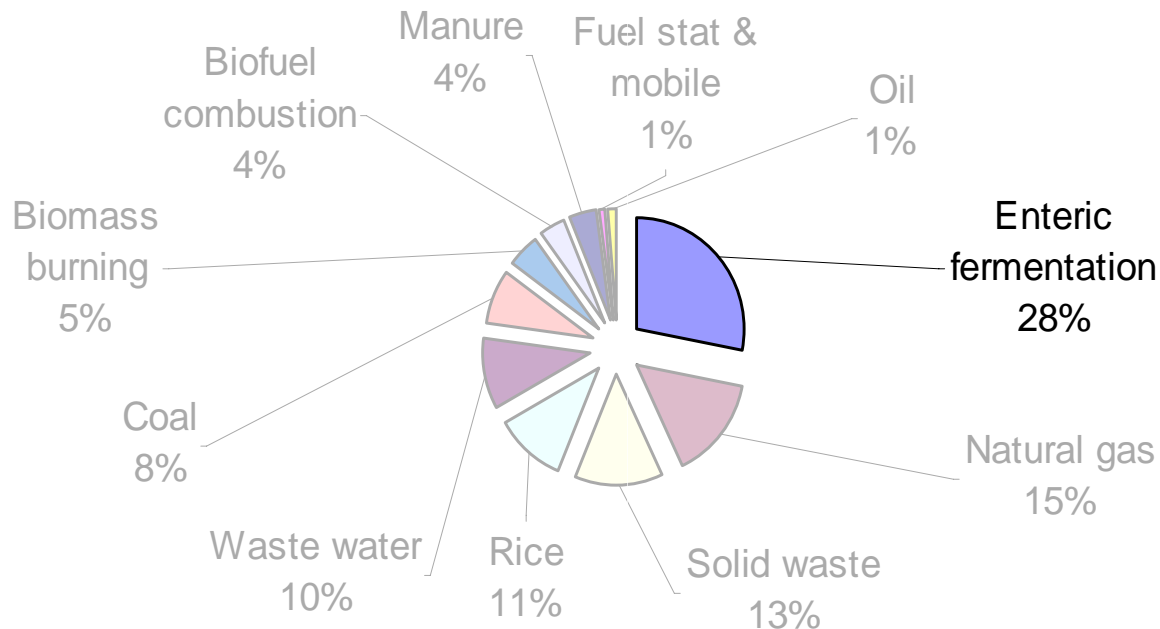
**Reducing methane emissions**  
**CONTRADICT increasing**  
**global warming!**

CH<sub>4</sub>

Time

12 years

# Global Methane Emissions - by source



## **BIGGEST TOTAL SOURCE:**

**Cows, sheep etc**

## **PROBLEM:**

**Each source is very small**

50-100 kg CH<sub>4</sub> per cow  
and year = 1-2 t CO<sub>2</sub>e

# ANNUAL GREENHOUSE EFFECT on Global Warming



# ANNUAL GREENHOUSE EFFECT on Global Warming



1 million t CO<sub>2</sub>e



**Coal mine VAM**

800 000 m<sup>3</sup>/h, 1%  
(50 000 t CH<sub>4</sub>/yr)



# ANNUAL GREENHOUSE EFFECT on Global Warming

1 million t CO<sub>2</sub>e



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

Coal mine VAM  
800 000 m<sup>3</sup>/h, 1%  
(50 000 t CH<sub>4</sub>/yr)

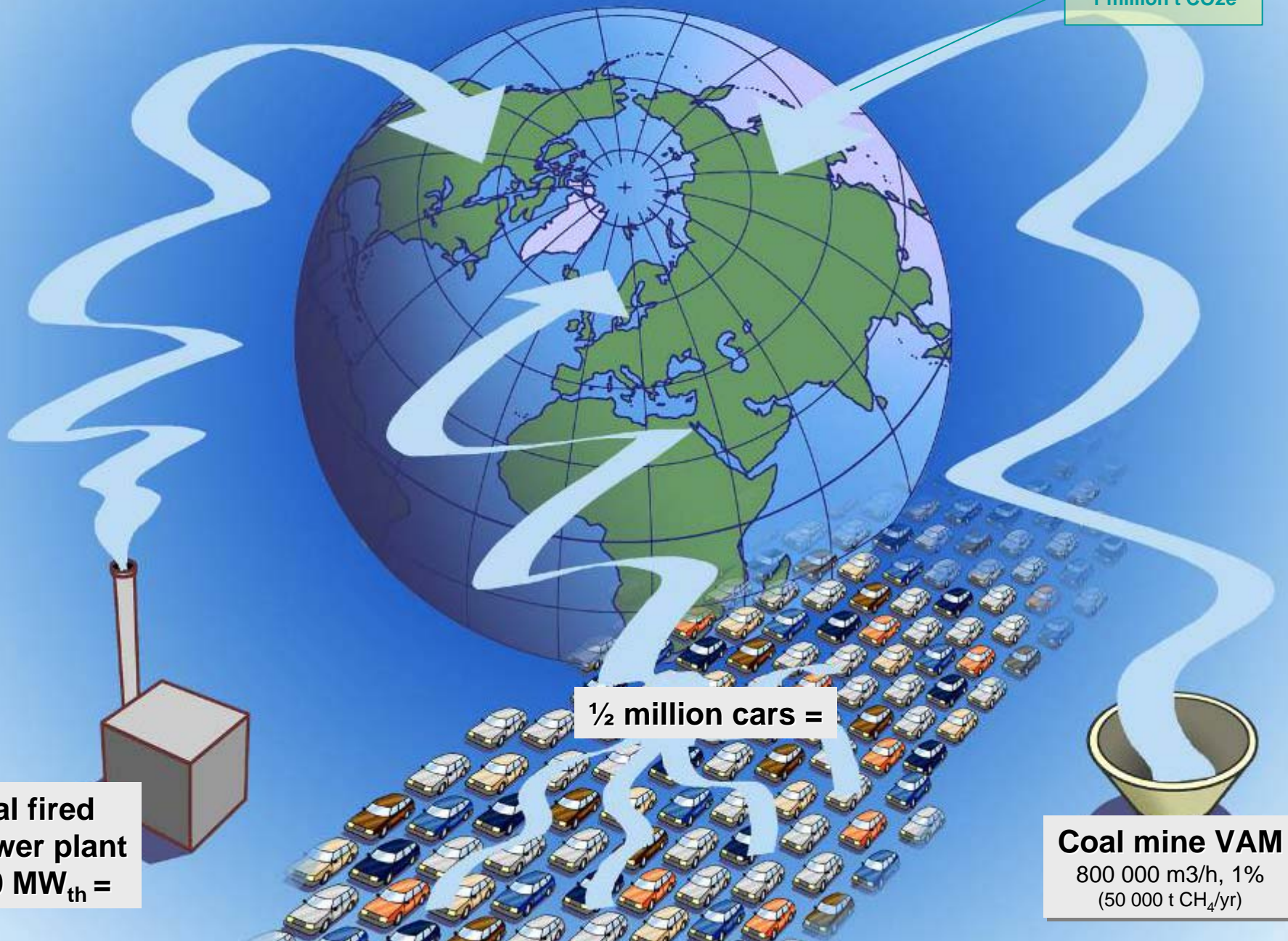
# ANNUAL GREENHOUSE EFFECT on Global Warming

1 million t CO<sub>2</sub>e

1/2 million cars =

Coal fired  
Power plant  
300 MW<sub>th</sub> =

Coal mine VAM  
800 000 m<sup>3</sup>/h, 1%  
(50 000 t CH<sub>4</sub>/yr)



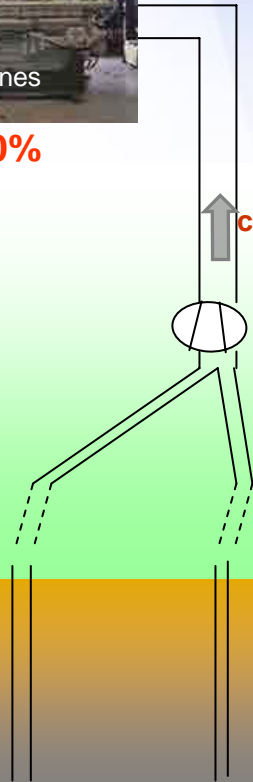
# Methane in coal mines - **safety issue**



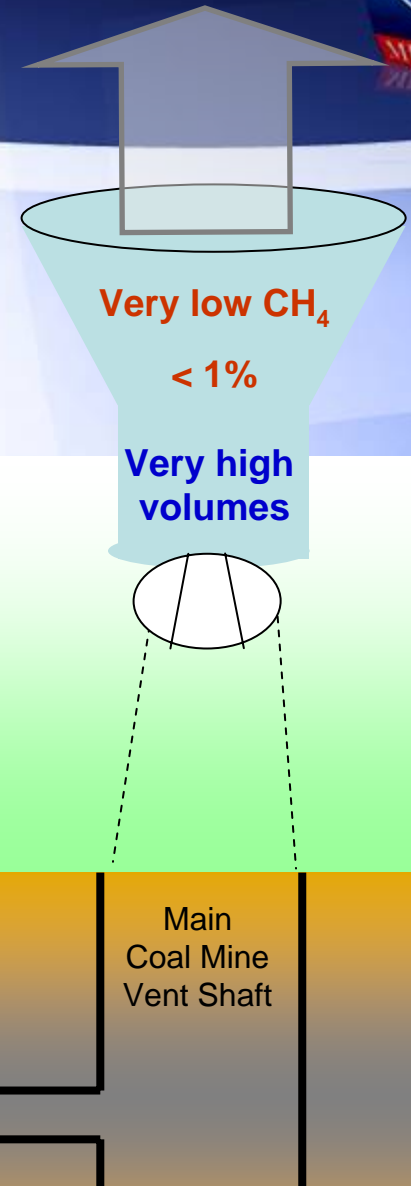
Gas Engines

**>30%**

High CH<sub>4</sub>  
concentration



Coal Excavation



Main  
Coal Mine  
Vent Shaft

# MEGTEC APPROACH - FROM DIFFERENT ANGLE



- Global leader in VOC emission control
- In house competence & experience of energy systems

# VAM Abatement



## 1st DEMO INSTALLATION AT A COAL MINE

abating vent air methane in 1994.

Trial unit at [British](#) Coal



## DEMO INSTALLATION LONG TERM ENERGY RECOVERY

-small scale trial unit at BHP in [Australia](#) 2001 – 2002,  
12 months of utilizing VAM for generating steam



## LARGE SCALE DEMO ABATEMENT

CONSOL ENERGY in the [US](#)



## LARGE SCALE COMMERCIAL ABATEMENT

First VAM project in [China](#).

Generation of hot water.

In full operation by April 2007  
– the world's first VAM Power Plant



# VAM POWER PLANT – at BHP Billiton in Australia

- first large scale generation of VAM energy



Has generated over 300 000 carbon credits

Has generated over 50 GWh of electricity

Processing only 20% of  
ventilation air volume

# VAM market and Methane to Markets Partnership



*Opening up a completely new market not easy.*

## BARRIERS:

- Projects totally depending on CERs/ERUs (new phenomena)
- Attitude – coal miners mine coal
- Ownership of VAM (safety hazard and GHG)
- Quality of info
- .....

*These are exactly the issues  
addressed by Methane to Markets!*



# PRESENT VAM MARKET STATUS



- MEGTEC VAM technology and VAM Power Plant has won several awards such as the Excellence in Energy Award by the Australian Institute of Energy, and the US EPA 2008 Climate Protection Award.



# PRESENT VAM MARKET STATUS



- MEGTEC VAM technology and VAM Power Plant has won several awards such as the Excellence in Energy Award by the Australian Institute of Energy, and the US EPA 2008 Climate Protection Award.



- Near market break through.
- Competitors starting to try the market.
- Investor hesitation on future of carbon credits market (and new application).

# PRESENT VAM MARKET STATUS



- MEGTEC VAM technology and VAM Power Plant has won several awards such as the Excellence in Energy Award by the Australian Institute of Energy, and the US EPA 2008 Climate Protection Award.

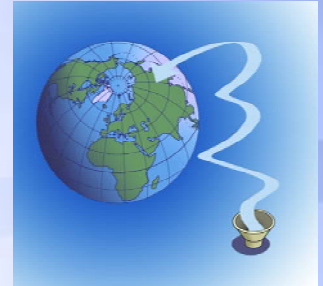


- Near market break through.
- Competitors starting to try the market.
- Investor hesitation on future of carbon credits market (and new application).
- ***Within 3 years, MEGTEC and competition should be able to reduce VAM emissions of over 30 million tons CO2e.***

# 3 CONCLUSIONS



1. VAM is a major opportunity to significantly reduce GHG emissions.



# 3 CONCLUSIONS



1. VAM is a major opportunity to significantly reduce GHG emissions.



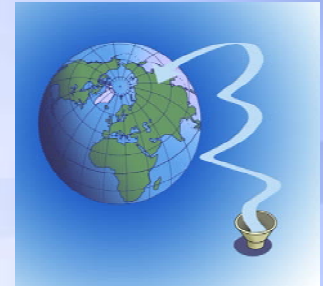
2. In addition to reducing CO<sub>2</sub> emissions, focus should ALSO be on reducing methane - CONTRADICTING the increasing global warming.



# 3 CONCLUSIONS



1. VAM is a major opportunity to significantly reduce GHG emissions.



2. In addition to reducing CO2 emissions, focus should ALSO be on reducing methane - CONTRADICTING the increasing global warming.



3. Methane to Markets is an excellent vehicle to identify and to overcome barriers holding back further reductions of methane emissions.