The 2001 International Coalbed Methane Symposium

EPA Workshop – "Technology and International Success Factors"

MEGTEC Systems

A Sequa Company

May 17,2001

2001 International Coalbed Symposium
Agenda

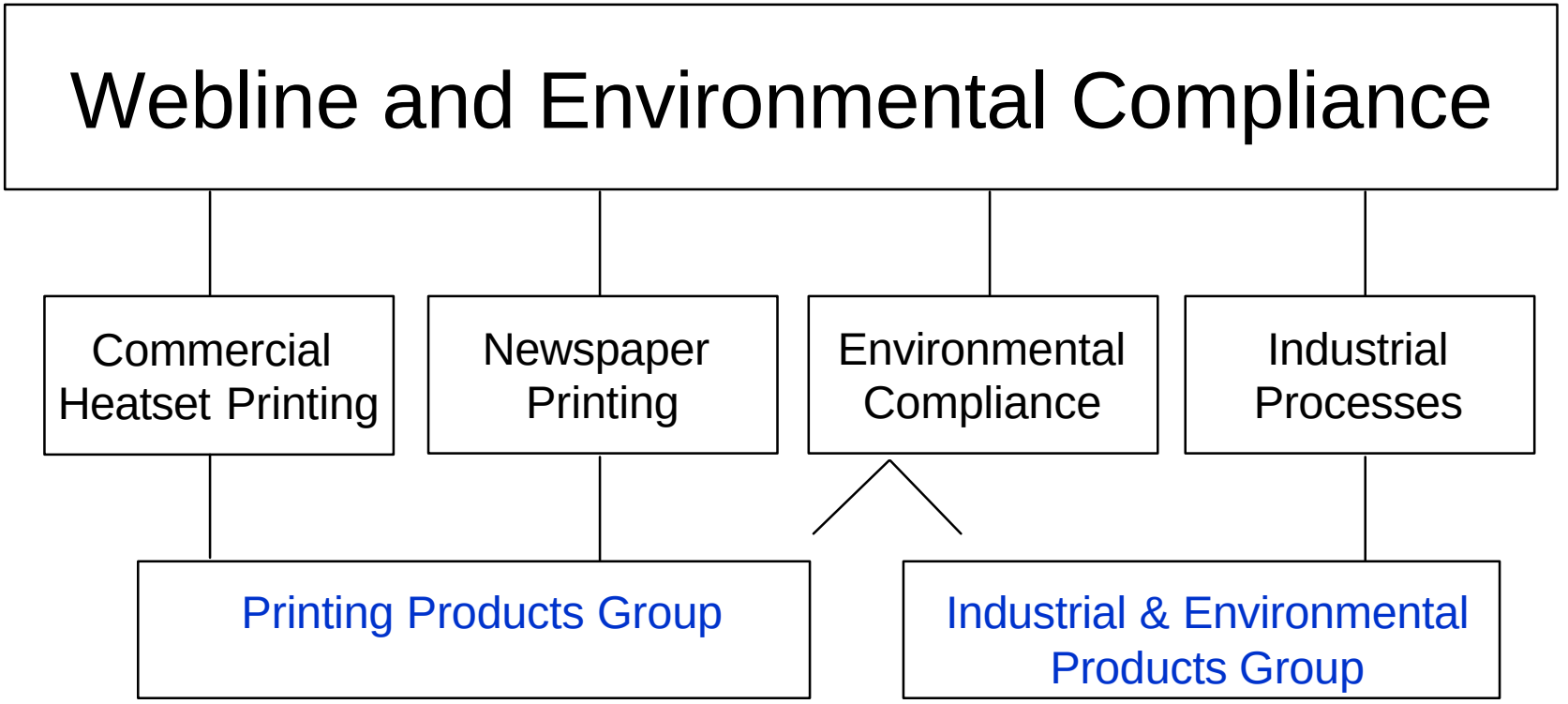
- About MEGTEC
  - Who is MEGTEC?
  - What are MEGTEC's capabilities?
- VAM use Technologies
  - VOCSIDIZER Principles
  - Applications
  - Economics
- Lessons from Developing Countries
  - Important Factors
  - How to Succeed

Who is MEGTEC?

- Company Statistics:
  - $173 Million in sales
  - Nearly 1000 employees worldwide
  - Formed in 1997 via a merger of MEG (of France) and Grace TEC Systems (USA)
  - Predecessor companies go back to the early 1960's
- Major Products:
  - Roll and Paper Handling Systems
  - Drying and Conditioning Systems
  - Air Pollution Control Technologies

MEGTEC Systems

Expertise



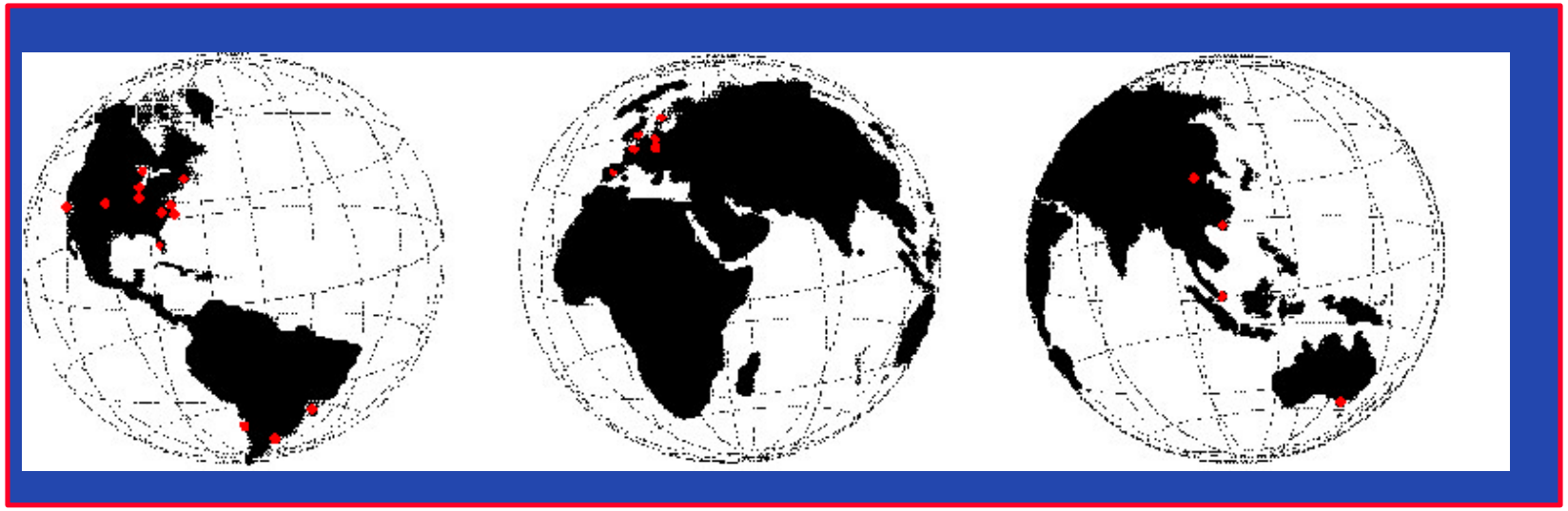
Webline: Web press sub-systems
Environmental: VOC air emission control

SEQUA Corporation: (US based)

$ 1.8 billion in Sales (2000)

- Business Groups:
  - Aerospace
  - Chemical
  - Automotive
  - Machinery & metal coating

MEGTEC Systems
Worldwide Organization



Americas Europe Asia-Pacific

- **A local company with worldwide presence**

World Headquarters

De Pere, WI USA

- 365,000 ft^2 facility
- 50+ Field Service Department Personnel
- Regional U.S. Service Centers
- Emergency parts and service assistance available 24 hours/day, 365 days/year
- Over 135 engineering staff support the Printing Products and Industrial and Environmental Product Teams

MEGTEC Systems Europe

Göteborg, Sweden

- Competence center for the VOCSIDIZER RTO technology (R&D, Design & Engineering)
- Project Management for Scandinavia, UK, Ireland, Spain and Portugal
- Industrial & Environmental Products service center for Scandinavia with 10+ service personnel
- Management of Industrial & Environmental Products manufacturing at ZVVZ, Milevsko, in Czech Republic

MEGTEC Systems

Air Emission Control Products

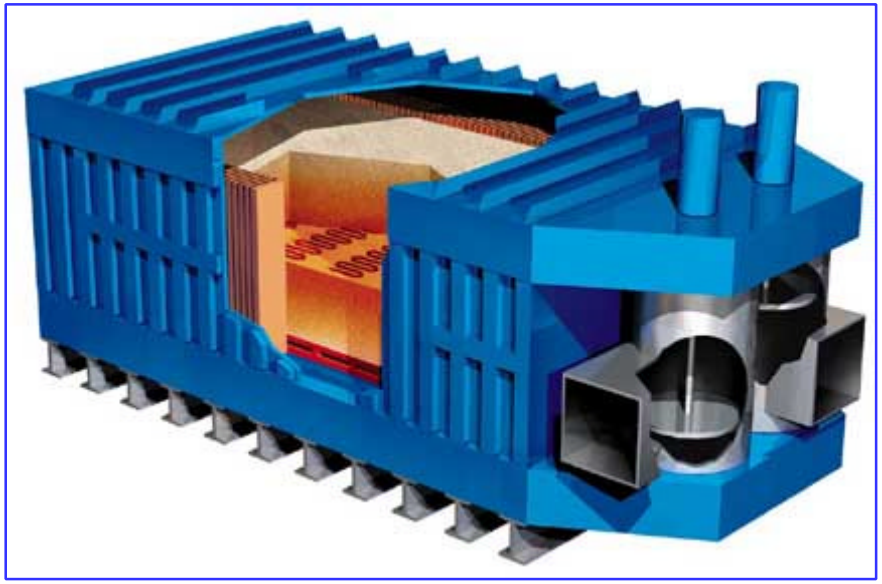
Over 2500 Oxidizers Installed Worldwide

- Thermal Regenerative Systems
  - CLEANSWITCH™
  - MILLENNIUM™
  - ENTERPRISE™ II
  - VOCSIDIZER®
- Thermal Recuperative System
  - KATEC®
  - PHOENIX®
  - SHADOW™
- Catalytic Systems
  - MAGNUM™
  - QUANTUM™
  - SPECTRUM®
- Thermal Oxidizers
  - VENTURA™
  - DIABLO™

2000 scfm to 60,000 scfm capabilities

VOCSIDIZER®

Single-Can RTO Products



VOCSIDIZER® Features/Benefits

Features

- Modular design
- No burner or combustion chamber (i.e. no flame)
- Integral PLC control system
- Extremely high heat recovery efficiency - Exhaust temperature only 90°F higher than incoming process air

Benefits

- Significant capital cost savings
- Minimum NOx and CO emissions
- Easy maintenance & operation
- Low energy consumption

Ventilation Air Methane (VAM)

- Low concentration, large volume (<1% CH 4 ; >500,000 Nm 3 /h)
- High energy availability
- Largest single impact on emission reduction
- Emissions in 2000 equivalent to 250 million tonnes of CO2

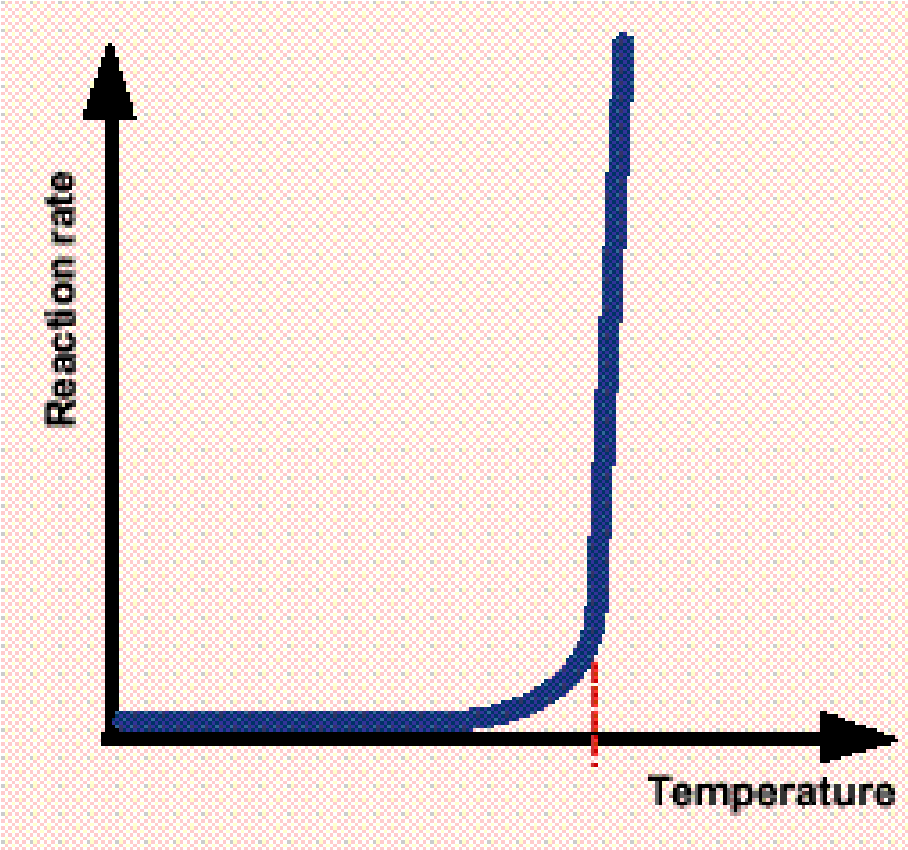
Ventilation Air: Current Technologies

- COMBUSTION AIR IN BOILERS OR TURBINES:.only possible if a power plant is close-by,

  unlikely to take care of all ventilation methane released
- SEPARATION FROM AIR:.very expensive
- FLARING TO CONVERT TO CARBON DIOXIDE: needs continuous adding of fuel to sustain flame

Possibilities to use ventilation methane are unattractive

VOCSIDIZER Principle

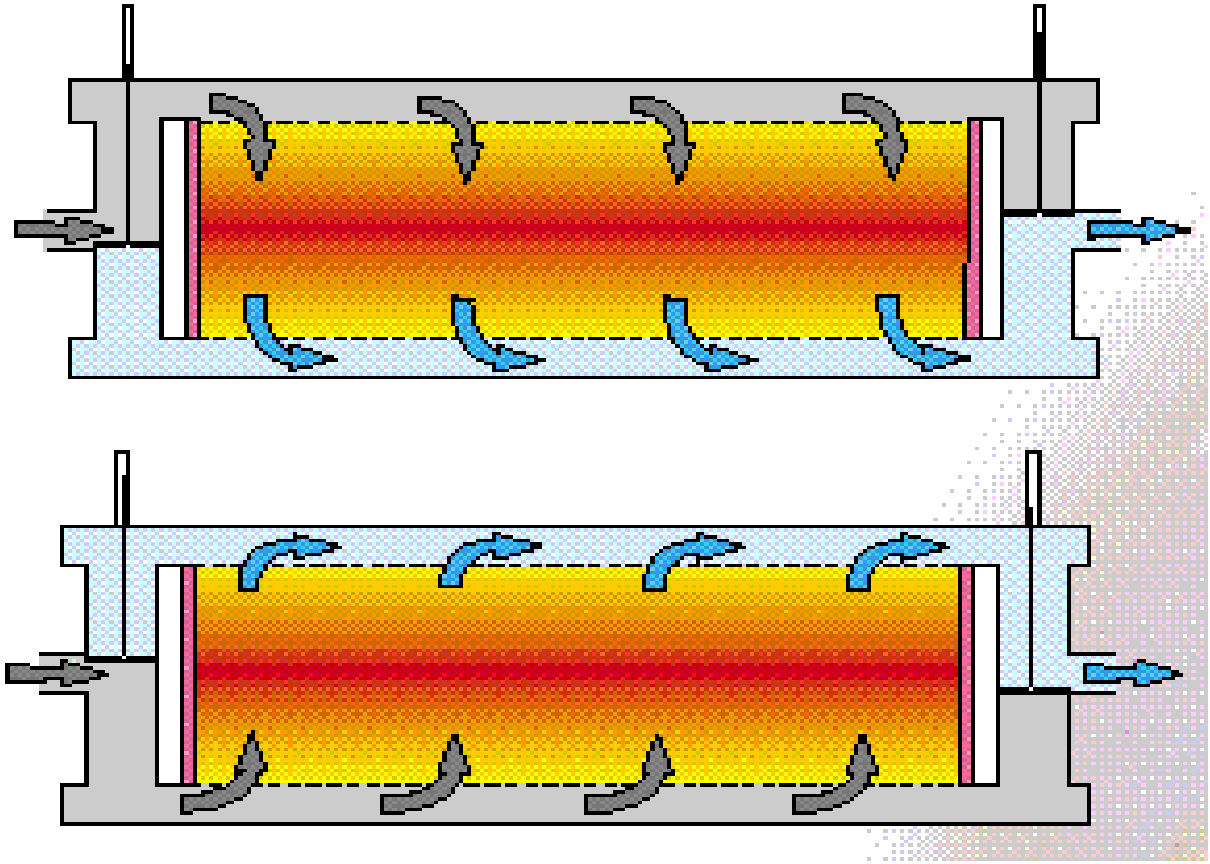


OXIDATION REACTION KINETICS

Reaction speed increases over-proportionally with temperature increase.

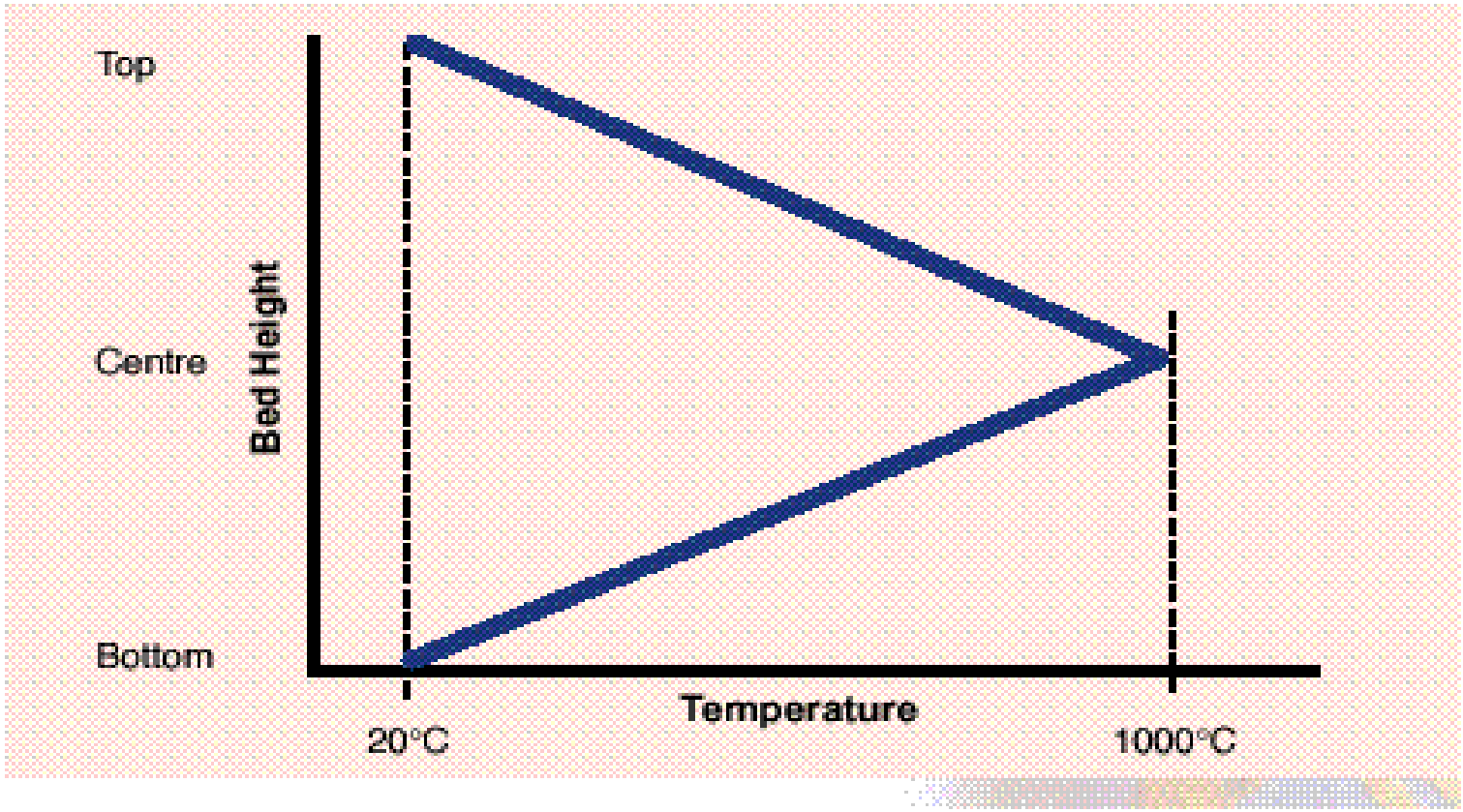
Hence the reaction temperature remains stable within a narrow band

VOCSIDIZER Cycling



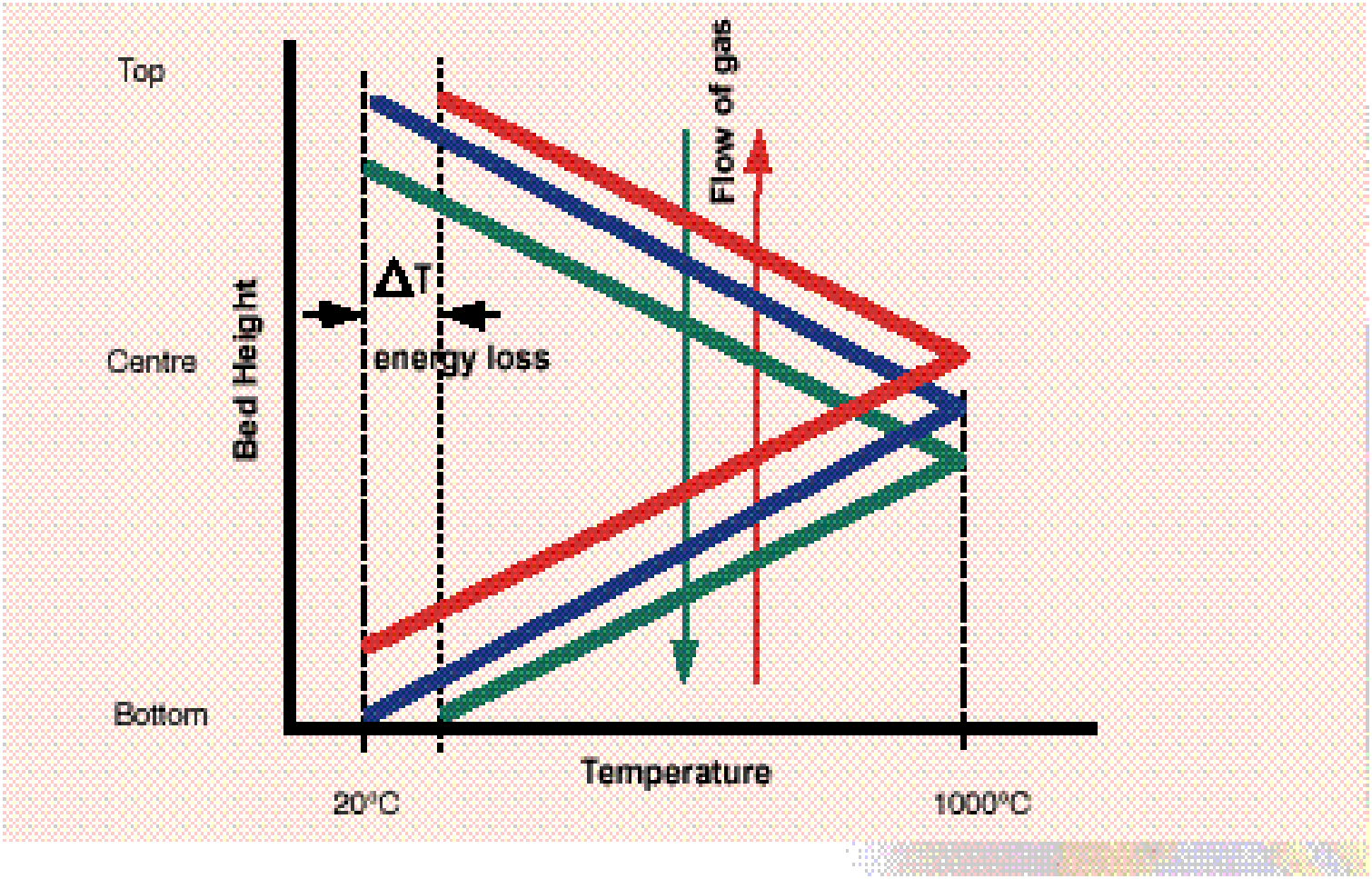
VOCSIDIZER

Principles of Operation



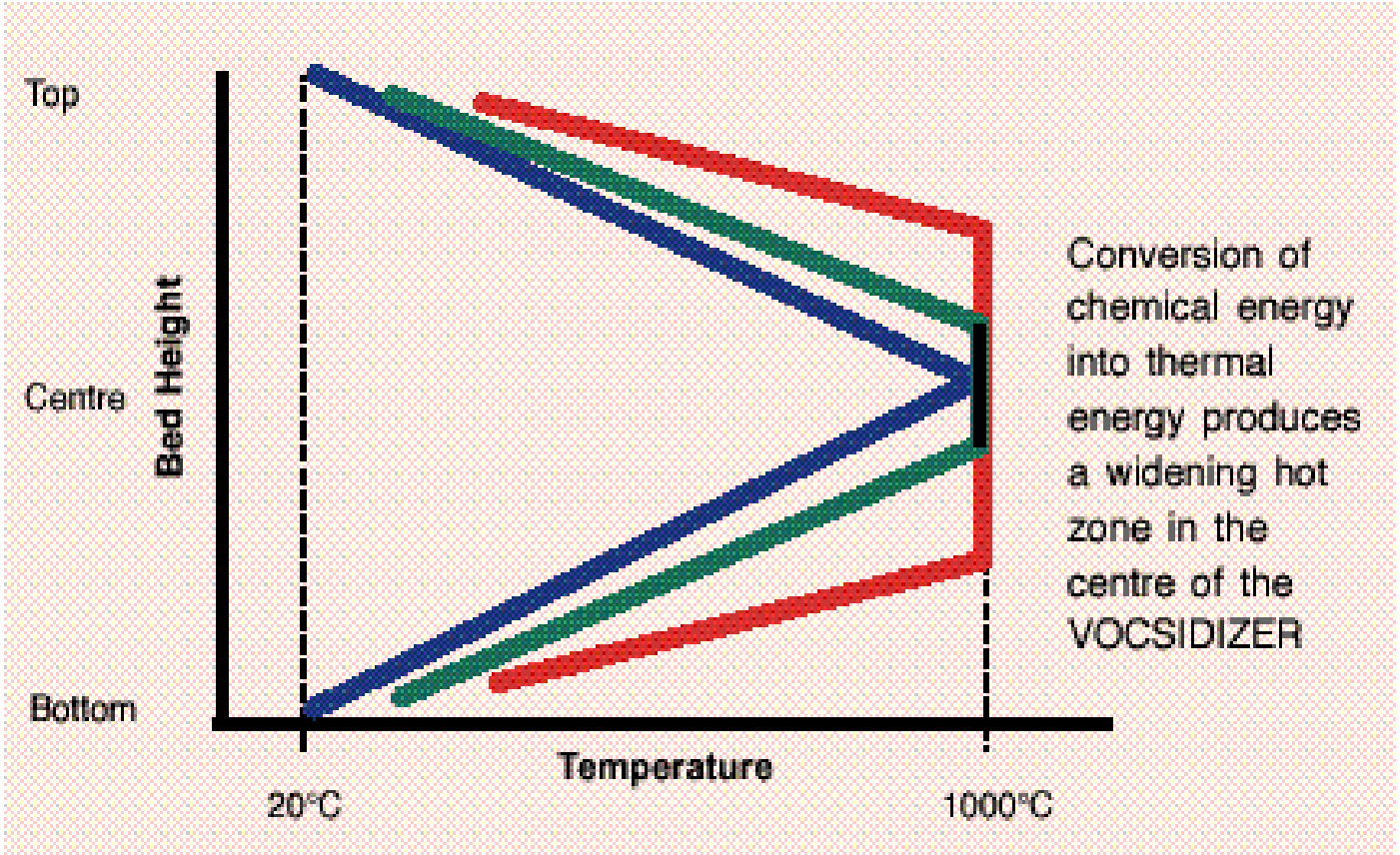
VOCSIDIZER

Principles of Operation



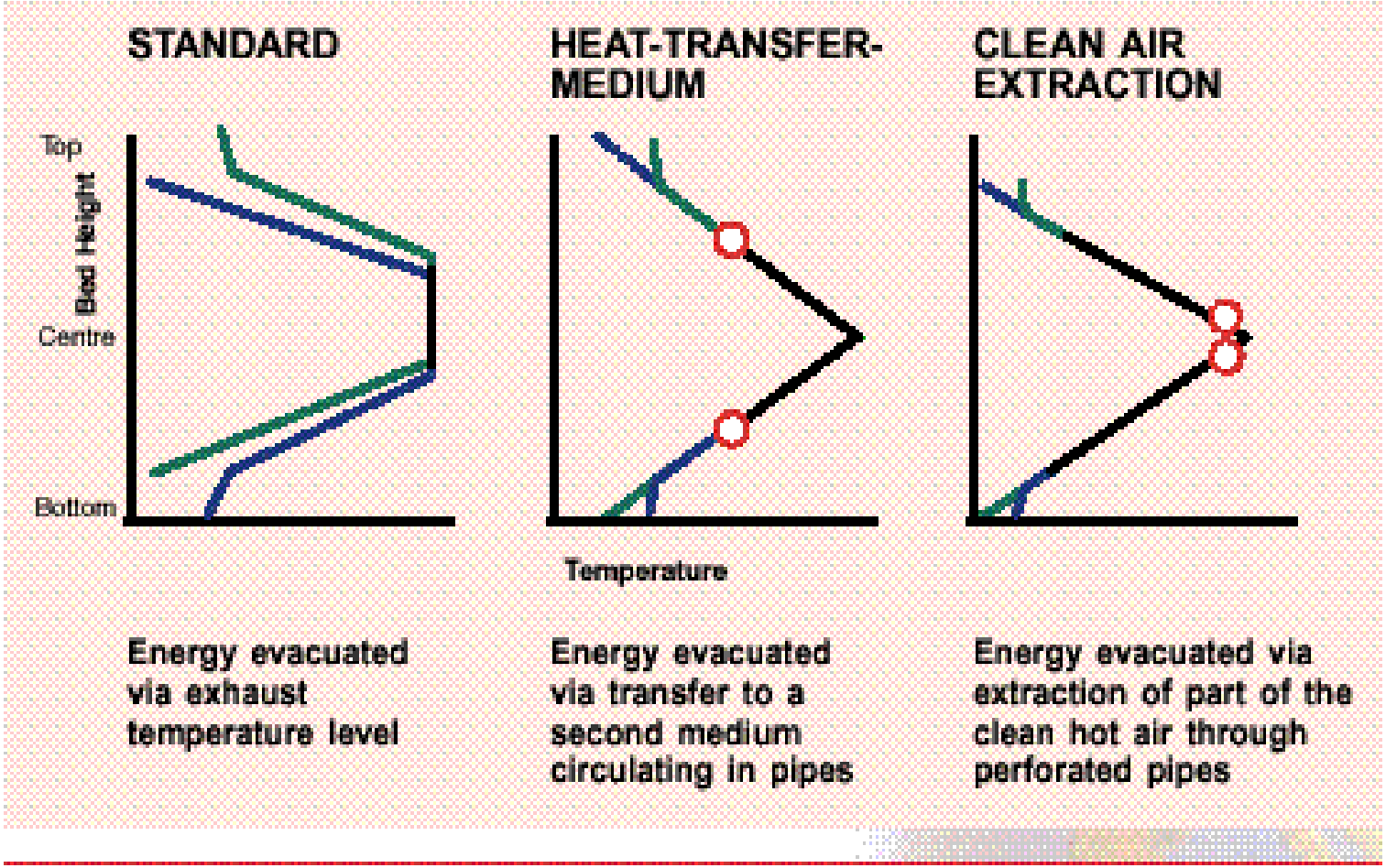
VOCSIDIZER

Principles of Operation



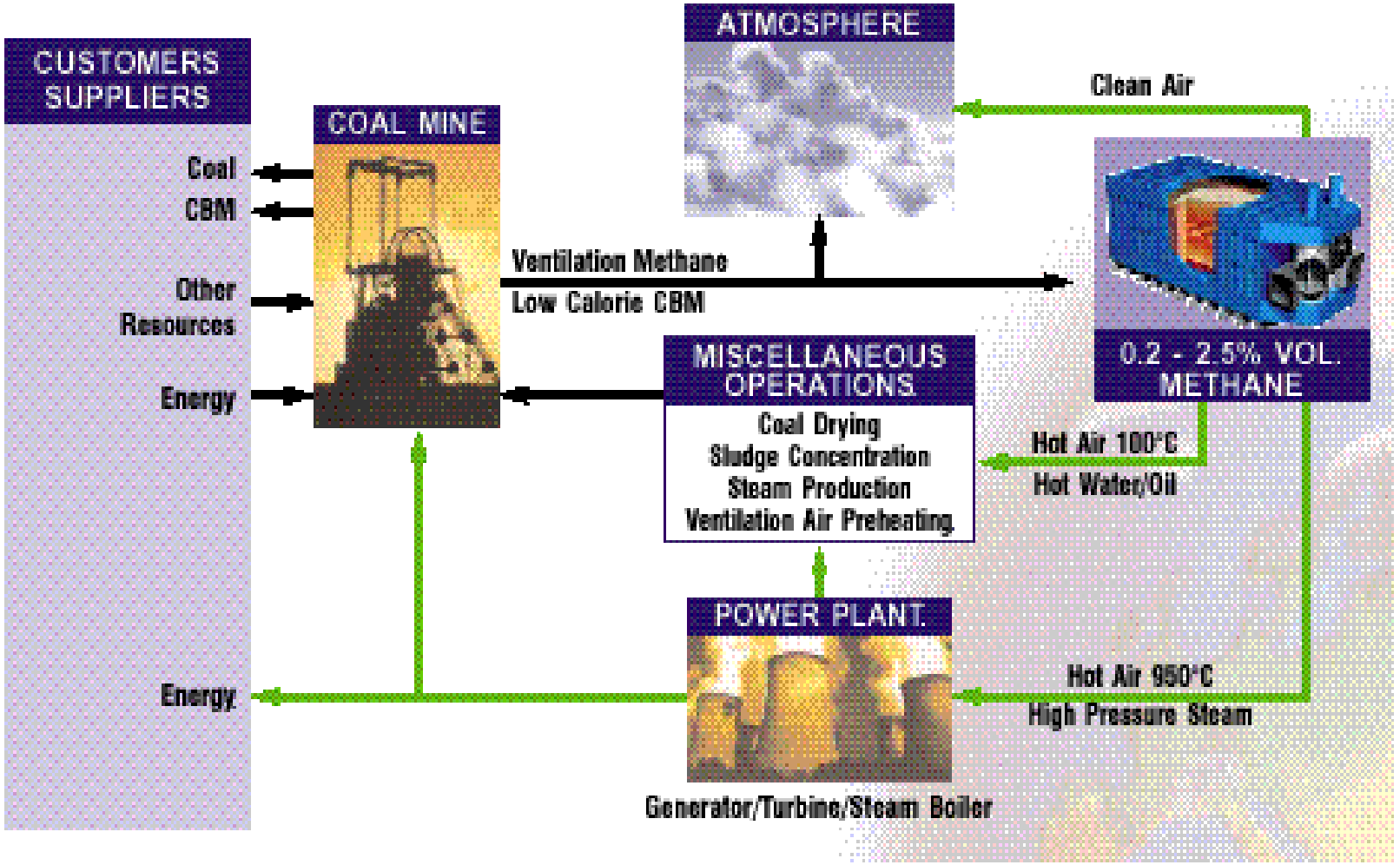
VOCSIDIZER

Energy Recovery Possibilities



VOCSIDIZER

Use in Coal Mines



VOCSIDIZER Economics

Methane Destruction

- Oxidizer system 3 duplex VOCSIDIZER 2215 systems
- VAM characteristics 300,000Nm 3 /hr and 0.8% methane
- Total capital costs US$2,150,000
- Annual operating costs US$370,000

- Methane destroyed per annum 14,000 tonnes
- Carbon dioxide equivalent per annum 254,000 tonnes
- Internal rate of return before tax 27.5%

VOCSIDIZER ECONOMICS

Thermal Energy Production

- Oxidizer system 9 duplex VOCSIDIZER 2215 systems
- VAM characteristics 950,000Nm 3 /hr and 0.8% methane
- Total capital costs US$9,500,000
- Annual operating costs US$800,000

- Methane destroyed per annum 44,000 tonnes
- Carbon dioxide equivalent per annum 922,000 tonnes
- Thermal energy produced (per hour) 55MW (th)
- Annual value of carbon credits @ US$1.50 US$1,400,000
- Internal rate of return >100%

VOCSIDIZER Economics

Energy Production

- Oxidizer system 9 duplex VOCSIDIZER 2215 systems
- VAM characteristics 950,000Nm 3 /hr and 0.8% methane
- Total capital costs US$17,000,000
- Annual operating costs (no fan power) US$600,000

- Methane destroyed per annum 44,000 tonnes
- Carbon dioxide equivalent per annum 922,000 tonnes
- Electrical energy produced (per hour) net of fan 14.2MW (e)
- Annual value of carbon credits US$1,400,000
- Annual value of electricity sales US$5,400,000
- Internal rate of return 47%

VOCSIDIZER

Summary

- The VOCSIDIZER is proven:-
  - for VOC treatment (> 600 installations)
  - for methane destruction as low as 0.1%
  - for integration with heat recovery applications
  - demonstration at a UK coal mine in early 1990's
  - installed with in-bed heat exchange at an Australian coal mine
- Analysis of target projects for system optimization
  - Straight methane destruction
  - Thermal energy production
  - Energy production

Doing Business in Developing Countries

Key Success Factors

- Cultural Communications Challenges – How to flourish (and even enjoy) diversity
- In Country Capital – Show me the Money !!!!!
- Managing Risk – Business is still Business (on both sides)

Key Success Factors

Cultural Communication Challenges

- Training
  - Cultural
  - Business Practices – ethics and expectations
  - Language – a little means a lot
- Local Support
  - Agents
  - Partners – tap into the network
  - In Country Hiring – the sooner, the better
- Personal Values
  - Relationships are Critical – long-term focus
  - Keep an Open Mind – try it, you might like it !!
  - Remember your Goals

Key Success Factors

In Country Capital

- Funding Sources
  - In Country – Business and Government
  - Out Country – Investment Teams
  - International – e.g. World Bank, Green Funds, Equity Markets
- Getting Paid
  - Letters of Credit
  - Remedies
- Cost Reduction
  - Sell Appropriately (Scope & Technology)
  - Local Content

Key Success Factors

Managing Risk

- Investment vs. Profit – What is Your Goal?
- Selecting the Right Customers
  - Credit Worthiness
  - Business Prospects
  - Management Abilities
- Managing Expectations
  - Customer Support
- Financial

Conducting International Business

- Is Success Possible????

Absolutely YES !!!!!