

Alpha Foundation for the Improvement of Mine Safety and Health, Inc.

Atmospheric Monitoring: Research Needs and Priorities

Panel 1: Disaster Prevention and Response

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Role of Atmospheric Monitoring

- In the US, AMS systems primarily
 - Monitor belt and electrical installations for fire prevention

The US lags developing countries in
Atmospheric Monitoring



Research Needs

- Improved Sensing Technology
- Integration of Sensing with VOD
- Explosibility
- Gob Sensing and Characterization
- Data Management and Utilization



Improved Sensing

- Current mine technology
 - Not full range
 - Slow response times
 - Interference with other gases
 - Reliability and maintenance

Sensing for VOD

- Ventilation on Demand has great potential for improved efficiency particularly in deep, extensive M/NM mines.
- Can also allow for the most efficient monitoring and dilution of contaminants (fumes, strata gases, diesel) with known adverse health effects.

Explosibility

- The PDM greatly improved measurement of respirable dust.
- Real time measurement of size fractions of coal and rock dust → EXPLOSIBILITY



Lead to:

- Automated rock dusting
- Better tracking of dusting

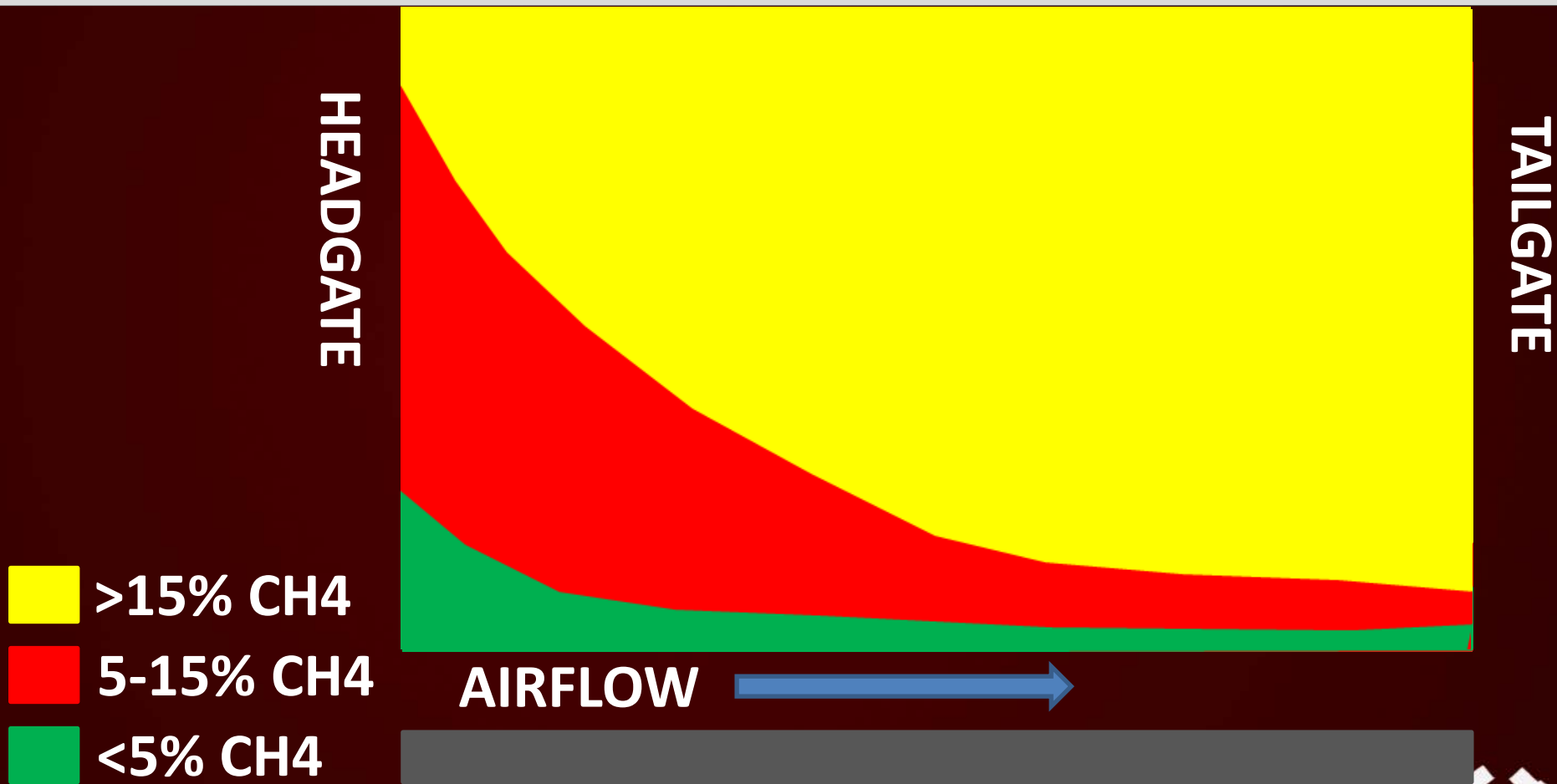


Gob Sensing and Characterization

- Gob monitoring is typically accomplished by tube bundle, rarely in the US.
- Several researchers have successfully studied gob characterization, CH₄ concentration is generally avoided.
- Real time comprehensive sensing of gob would allow for characterization and engineering of the **explosive** fringe.



Gob Sensing Application



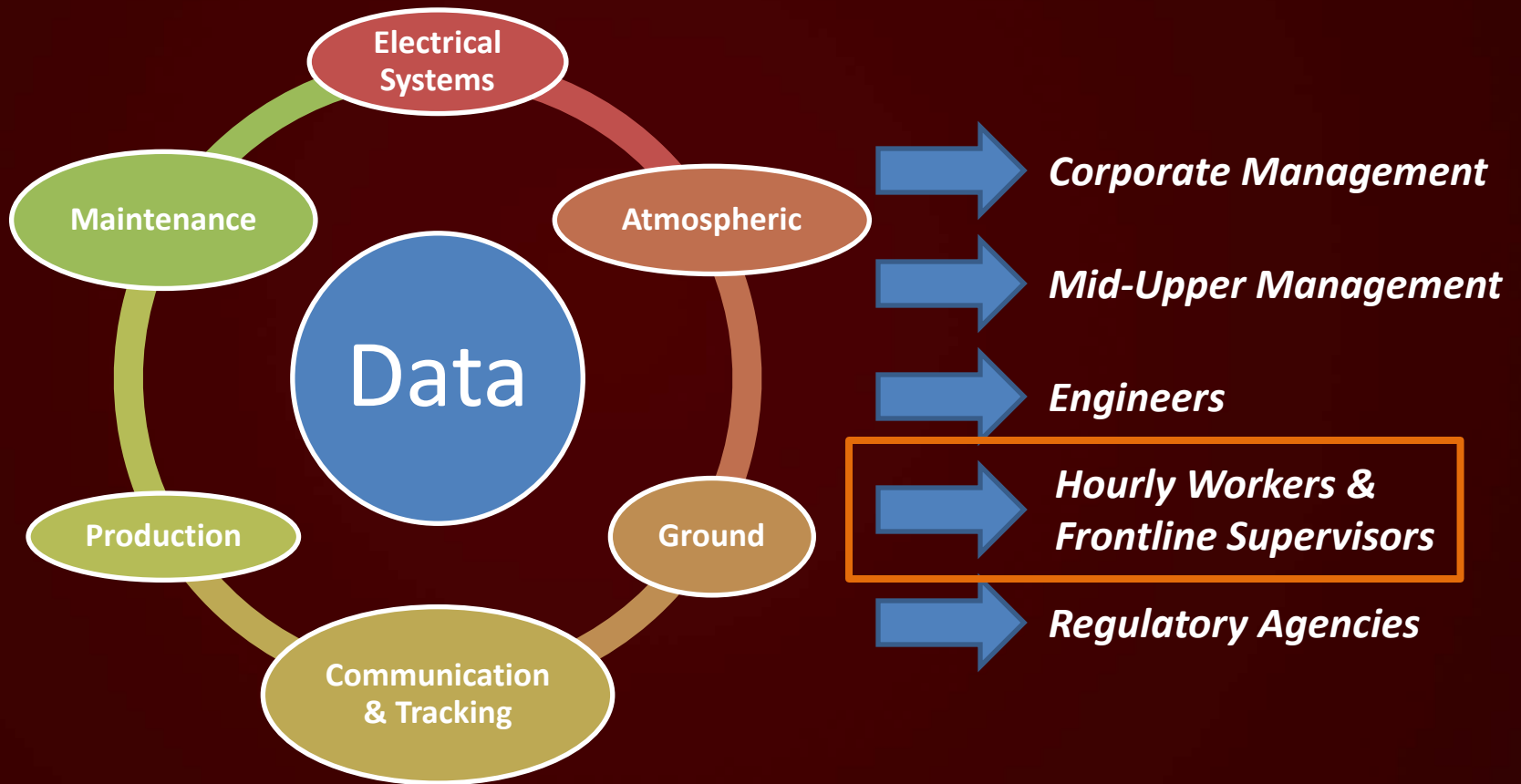
Data Management and Utilization

Real time continuous sensing quickly amasses terabytes of data:

How are they best utilized?

How are the various systems best integrated?

Data Utilization



Thank you



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