

IPRO 302

Impacts of Sulfur Capture in Coal Power Plants

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Professors: *Myron Gottlieb and Don Chmielewski*

STATEMENT OF PROBLEM



- Our sponsor, Sargent & Lundy LLC, is investigating the effects of replacing conventional coal burning techniques in power plants with gasification.
- The production of energy from coal creates many byproducts including sulfur. Conventional and gasification power plants produce different sulfur byproducts.
- Sulfur must be removed because it is extremely harmful to the environment and corrosive to the power plants



PURPOSE



...to determine the economic and environmental differences in sulfur removal between a pulverized coal and a coal gasification facility of equal capacity.



BACKGROUND

Conventional Coal

- Coal is pulverized into a fine powder
- Powder injected into burners
- Coal burns fully, produces energy and byproducts
- Sulfur removed by combining with pulverized lime

Gasification

- Coal is pulverized
- Coal is partially burned under low oxygen, forming carbon monoxide gas and hydrogen
- Sulfur is removed by amine process and gas is burned to power the turbines
- More efficient and adaptable



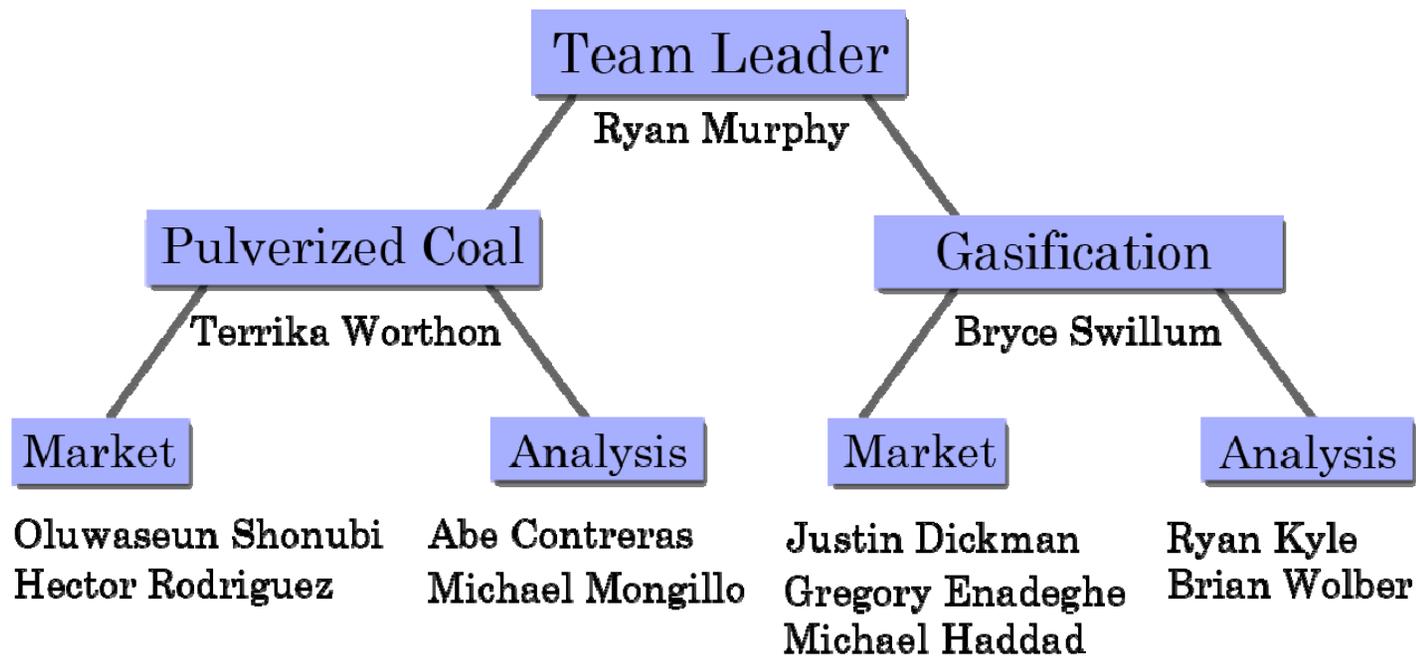
FINAL RESULTS



- An analysis of sulfur removal in two different types of coal power plants.
- A report of the economic and environmental costs of all parts of the sulfur removal process for both types of plants.
- Data found can be used by Sargent and Lundy to help determine the net value of different coal technologies.



ORGANIZATION



- Professors: *Myron Gottlieb and Don Chmielewski*



GOALS OF THE PROJECT



- Determine our initial conditions for analysis.
- Research the cost of operating power plants as well as the activities that go into sulfur removal.
- Investigate the value of sulfur going into the market and the cost of disposal.
- Study trends dealing with coal power generation and sulfur markets.
- Extrapolate our results to a broader scale.



PROGRESS TOWARD GOALS



- Clarified our goals with sponsor.
- Spoken with experts in coal gasification and sulfur removal.
- Initial research into sulfur removal technologies and the domestic sulfur markets.



CHALLENGES



Challenges

- Finding proprietary information
- Understanding sponsor's goal.
- Limiting the scope of the IPRO
- Properly utilizing individual strengths and knowledge.
- Group communication: meeting outside of class to accomplish tasks

Solutions

- Using the school's resources to find pertinent information.
- Communicating with sponsor.
- Group organization.
- Establish solid deadlines and meetings times during class



THANK YOU FOR YOUR TIME
QUESTIONS?

