

IPRO 302 CO₂ Mitigation: A Techno-Economic Assessment

Instructor: Professor Don Chmielewski

Team Leader: Vernell Robinson

Team Members:

John Enverga
Jarrod Godfrey
Ellen Kloppenborg
Martin Kolodziej
Da Hye Lee
Asma Mustafa
Miri Park
George Vrana

ILLINOIS INSTITUTE 
OF TECHNOLOGY

Outline

- Introduction
- Technological Assessment
- Team Structure
- Team Challenges and Accomplishment

Introduction



Introduction

- “If we allowed the globe to keep warming terrible things would happen.” Al Gore
- Question:
 - Is it true that global warming is real?

Answer Is...

- **Not our focus!**
- Potential future regulations require power plant changes

Regulations

- No current federal regulations on CO₂ containment.
- Several states have made laws limiting future emissions.
- State laws require a cut to 1990 levels by 2020.

Sargent & Lundy

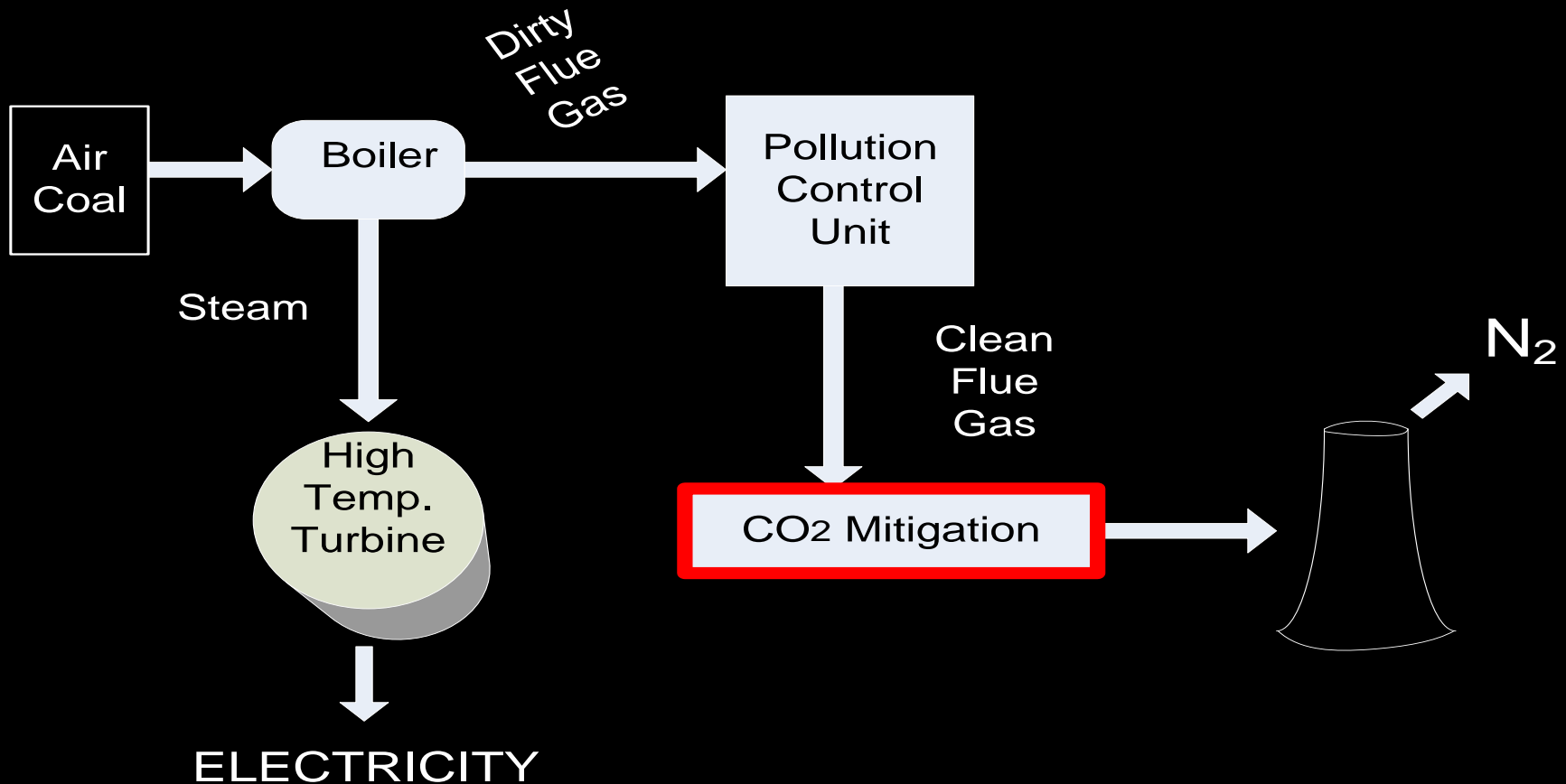


- Over 100 years of experience
- Preparing for future regulations

Objective

- Compile information on:
 - Current and future CO₂ regulations
 - CO₂ mitigation technology and vendors
 - Sequestration techniques
- Technological and economic comparison
- Recommendations to Sargent & Lundy

Pulverized Coal-Fired Power Plants



Pulverized Coal-Fired Power Plants (PC)

Major Vendors

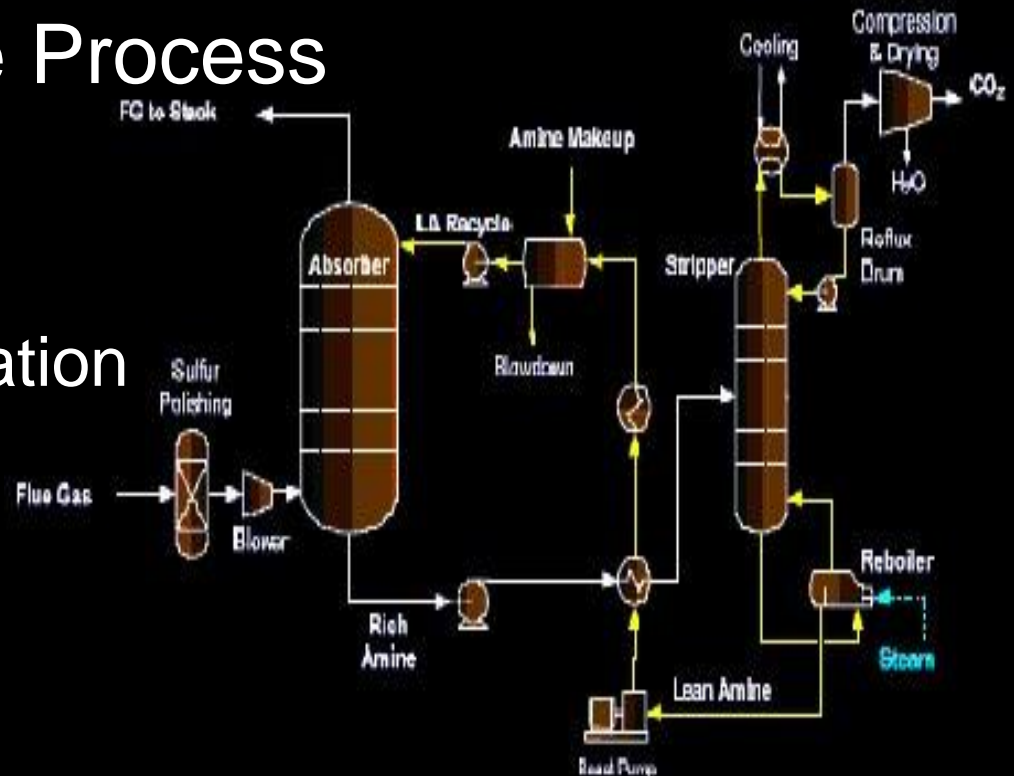
- Alstom
- Fluor
- MHI
- Powerspan

The logo for Alstom, featuring the word "ALSTOM" in a bold, blue, sans-serif font. The letter "O" is stylized with a red circular element inside it.The logo for Powerspan, featuring a stylized green and blue square icon to the left of the text "POWERSPAN®" in a blue, sans-serif font. Below "POWERSPAN®" is the tagline "Clean Energy Technology" in a smaller, blue, sans-serif font.The logo for Fluor, featuring the word "FLUOR" in a bold, blue, italicized, sans-serif font. A registered trademark symbol (®) is located to the right of the word.The logo for Mitsubishi Heavy Industries, Ltd., featuring the red Mitsubishi three-diamond symbol to the left of the text "MITSUBISHI HEAVY INDUSTRIES, LTD." in a bold, black, sans-serif font.

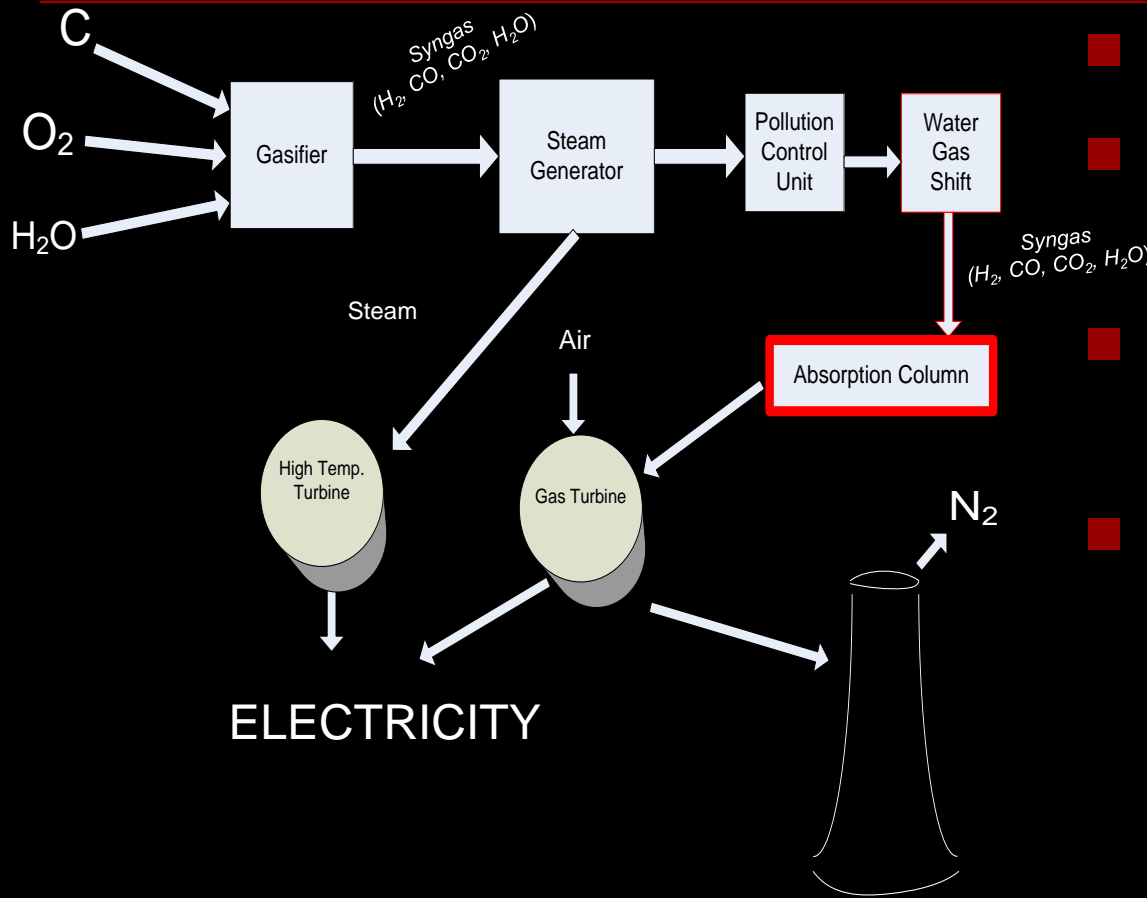
Recommendation

■ Fluor – Ecoamine Process

- Maturity
- Efficiency
- Cost of CO₂ mitigation



Integrated Gasification Combined Cycle (IGCC)



- Higher Efficiency
- Marketable Byproducts
- Smaller Absorption Column
- Accepts Multiple Fuel Feedstock

Integrated Gasification Combined Cycle (IGCC)

Major Vendors

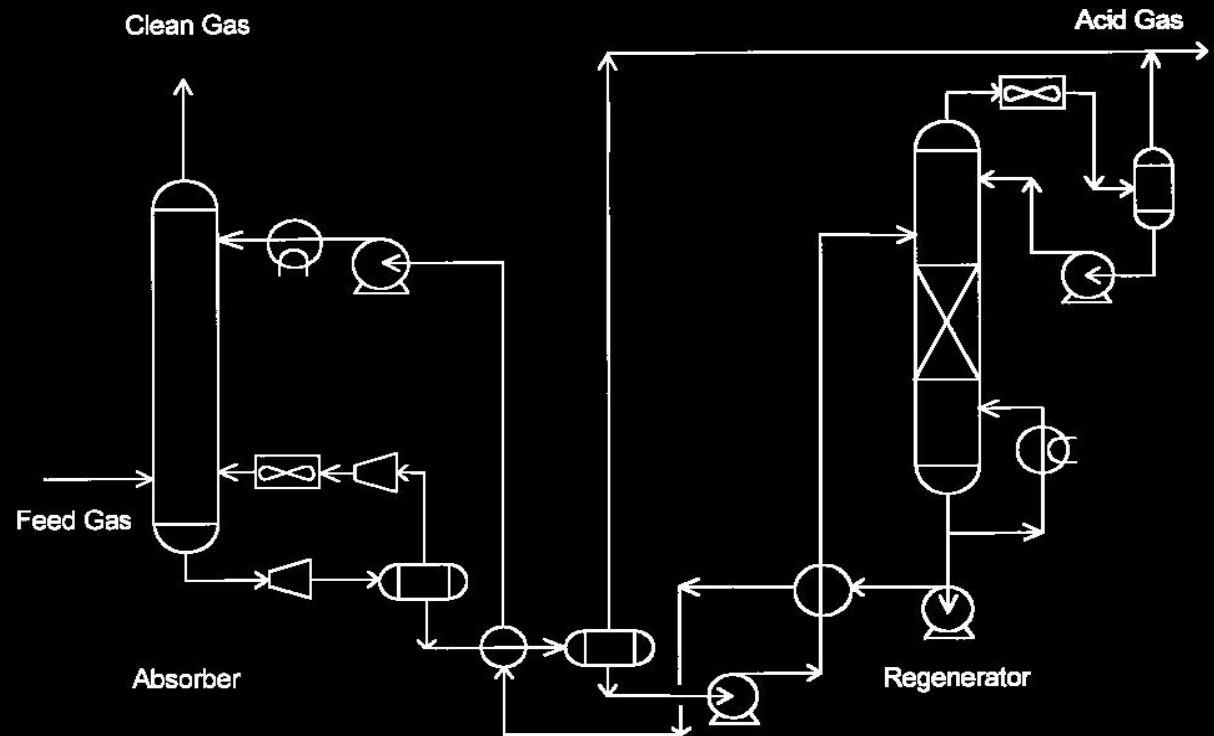
- General Electric
- Shell
- Conoco/Phillips
- MHI



Recommendation

■ GE with Selexol Process

- Mature
- Efficient
- Lower Cost



Sequestrations Techniques

- Geologic
- Terrestrial
- Oceanic

Code of Ethics

- Law
- Contracts
- Professional Codes
- Industry Standards
- Community
- Personal Relations
- Moral Values

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Pressure: To use recent and accurate information about CO₂ mitigation technologies

Risk: Using new, unverified information

Risk: Potentially harmful societal or environmental impact not addressed

Cannon

We shall insist on using only credible information in a time-effective manner.

Team



Vernell Robinson
Business Administration
Team Leader



Jarrod Godfrey
Computer Science
Group Member



Martin Kolodziej
Electrical Engineering
Group Member



John Enverga
Physics
Group Member



Ellen Kloppenborg
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Assistant Team Leader



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Biomedical Engineering
Group Member



George Vrana
Electrical Engineering
Group Member



Miri Park
Chemical Engineering
Group Member



Da Hye Lee
Chemical Engineering
Group Member



Professor Don Chmielewski
Chemical Engineering Department
Faculty Advisor

Team Structure

Team Leader

Vernell Robinson

Red: Written Report

Blue: Presentation

Gray: Code of Ethics

Newspaper:

Miri P.

Asma M.

Martin K.

Patents:

Da Hye L.

Jarrod G.

Vernell R.

Technical Journals:

Ellen K.

George V.

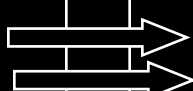
John E.

Focus Areas:

PC

IGCC

Regs/Sequester



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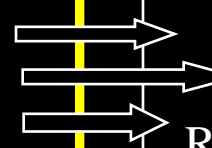
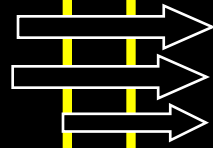
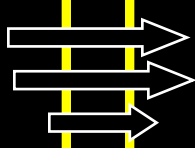
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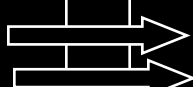
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Milestones

- Project Planning Phase
 - Created Project Plan 9-28
- Code of Ethics
- Research Phase
 - Midterm Presentation 10-23
 - Created Midterm Report 10-26
- Final Presentations

Team Problems

- Information Overload
- Personal Emergencies
- Project Refocused

Accomplishments

- Project Plan
- Midterm Report
- Code of Ethics
- Technology Comparisons
- Recommendations

Questions

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