

I PRO 302

Key Tasks

- Research CO₂ mitigation technology for pulverized coal-fired and integrated gasification/combined cycle power plants
- Learn about the current and future regulations and sequestration options
- Perform a technological and economic comparison of these mitigation strategies.

Sponsor



Obstacles

- Large amount of information on CO₂ mitigation available
- Team members had various amounts of background knowledge on the subject.



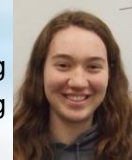
Vernell Robinson
Business Administration
Team Leader



John Enverga
Physics



Jarrod Godfrey
Computer Science



Ellen Kloppenborg
Chemical Engineering



Martin Kolodziej
Electrical Engineering



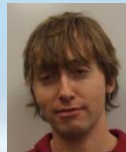
Da Hye Lee
Chemical Engineering



Asma Mustafa
Biomedical Engineering



Miri Park
Chemical Engineering



George Vrana
Electrical Engineering



Professor Don Chmielewski
Chemical Engineering Department
Faculty Advisor

I PRO 302 CO₂ Mitigation: A Techno- Economic Assessment

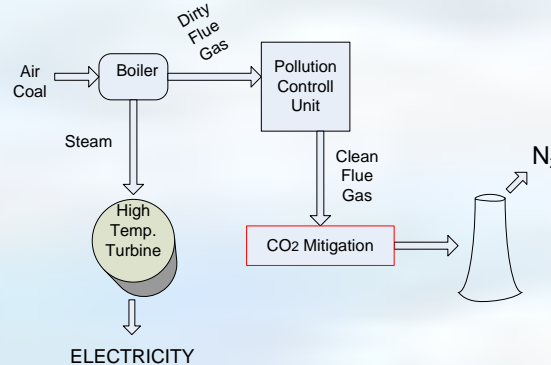
Objective

Research and compile information on potential future CO₂ environmental regulations, current CO₂ mitigation technology, and CO₂ sequestration techniques.

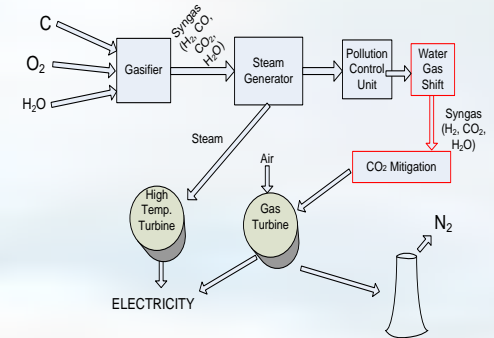
Regulations

- Currently, there are no federal regulations on CO₂ containment.
- California, New York, New Jersey, and Hawaii have made laws limiting emissions in future years.
- State laws often require a cut to 1990 levels by 2020.

Pulverized Coal-Fired (PC) Plant



Integrated Gasification/Combined Cycle (IGCC) Plant



Sequestration

- Geologic – CO₂ is injected into saline aquifers and depleted oil and natural gas fields or used for Enhanced Oil Recovery.
- Terrestrial – Forests and other vegetation are used to absorb CO₂.
- Oceanic – CO₂ is injected into the ocean floor or absorbed into the water.

Companies Designing Mitigation Technology for PC Plants

Alstom – Chilled Ammonia
 Fluor – Ecoamine
 MHI – KS-1,2,3
 Powerspan – ECO₂

Companies Designing Mitigation Technology for IGCC Plants

General Electric
 Shell
 Conoco/Phillips
 MHI

Next Steps

Next semester's IPRO will use this information to design a power plant that includes CO₂ mitigation technology.

The team has decided that **Fluor** currently has the most cost-effective, efficient, and mature technology for PC plants and recommends it to Sargent & Lundy.

General Electric is thought by IPRO 302 to presently have the most cost-effective, efficient, and mature technology for IGCC plants and is recommended to our sponsor.