

Use of Full Oxy-Fuel Combustion and Accelerated Carbonation Curing for Carbon  
Capture and Storage in Concrete Manufacturing  
(Technical Report)

The Lobbying Game: How Chemical Companies and Environmental Advocates  
Shape Policy  
(STS Research Paper)

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by

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## **Sociotechnical Synthesis**

How do American corporations respond and resist U.S. federal regulations? Especially in the environmental aspect of the chemical industry, there is a lot of friction between corporations and federal regulation. Though there is a significant push by environmental advocacy groups and scientific experts for the chemical industry to become more environmentally friendly, the chemical industry has largely ignored these efforts, and still conducts business as normal. If this continues at the same pace, the chemical industry will likely dominate all environmental policy. One of the chemical manufacturing industries that poses the biggest threat to the environment is the cement industry. The cement industry contributes around 5% of global man-made CO<sub>2</sub> emissions. Though there are existing technologies to make the cement production process less harmful, there are sociotechnical barriers that have prevented these processes from gaining traction.

In order to find a more environmentally friendly process for cement production, we designed and modeled a process for carbonation cured cement produced with oxy-fuel combustion. Accelerated carbonation curing and oxy-fuel combustion are newer technologies that allow less carbon dioxide to be released into the environment. The current cement manufacturing process, though well-established globally, will cause drastic damage to the environment if continued. Though the designed process works and is less harmful to the environment, it would be difficult to implement due to the larger costs of manufacturing. More research can be conducted to improve the energy efficiency of the process to make it economically viable with the existing cement manufacturing process.

The chemical industry as a whole has been involved with American legislation for many years. In 2020 alone, the chemical industry spent around \$47 million on lobbying. However, the role of environmental advocacy groups and expert scientists is often understated. Though these

two participant groups do not spend nearly as much on lobbying as the chemical industry, they utilize other strategies, such as investigative reports, to further their desired legislation. Only by examining all the strategies of these groups to push favorable legislation can their overall influence be determined.

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## **List of Contents**

1. Technical Report: Use of Full Oxy-Fuel Combustion and Accelerated Carbonation Curing for Carbon Capture and Storage in Concrete Manufacturing
2. Sociotechnical Research Paper: The Lobbying Game: How Chemical Companies and Environmental Advocates Shape Policy
3. Prospectus