

Integration of Wind Turbines and CO2 Capturing Filter

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Categories:

- Green Technology

Keywords:

- Calcium carbonate production
- Calcium hydroxide
- Corn process wastewater recycling
- Direct Air CO2 Capture
- Green Technology
- Hydraulic wind turbine

Researchers at Purdue University have developed a system to capture CO₂ from the air and use it to make calcium carbonate for cement or other applications. Large-scale carbon capture technologies are needed to slow climate change and ocean acidification and prevent global warming above 2.0 degrees Celsius. The Purdue researchers' technology uses a wind turbine to capture CO₂ and provide the energy to a liquid filter system that absorbs CO₂ by injecting polluted air from point sources or other air with concentrated CO₂ into a water-calcium hydroxide solution. The carbon dioxide reacts with the calcium hydroxide, forming calcium carbonate, which can be used for concrete production, among other applications. This technology could have a large impact on "closing the loop" in concrete production, which accounts for 8% of global CO₂ emissions. The researchers have also proposed installing the filtration component of the system in the exhaust of vehicles, which will capture concentrated CO₂ streams.

Technology Validation: In a simulation, the energy transmission of the wind turbine was 78% efficient. The production of the prototype of liquid filter assembled with wind turbine system is ongoing.

Advantages:

- Reduces atmospheric CO₂ concentration
- Traps other pollutants like NO_x
- Slows climate change and ocean acidification
- Allows reuse of wastewater with high pH from different industries, including the corn processing industry
- Reduces demand for wastewater treatment'

Applications:

- CO₂ removal from the atmosphere

- Concrete production with reduced abiotic depletion
- CO2 removal from transport exhausts and from industries' point of CO2 emissions

People:

- Velay Lizancos, Maria Mirian (Project leader)
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Intellectual Property:

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