Bernoulli: method and apparatus for smart CO2 capture and urban electricity generation.

Al-controlled bladeless device captures CO₂ while generating urban rooftop electricity.

Researchers at Purdue University designed a device that captures CO2 and generates electricity. The device is a bladeless turbine with CO2 capture capabilities that uses artificial intelligence to improve its performance based on the current environmental conditions. The researchers envision the Bernoulli device being placed on building rooftops in urban environments to generate renewable energy and improve air quality. This application stems from the fact that buildings naturally facilitate wind acceleration as it flows over their edge and surfaces. Additionally, placing the devices on top of urban buildings allows them to be directly in areas with high CO2 concentration from urban activities like driving and industrial processes. A key feature of the device is its Al driven control system that can predict wind patterns and CO2 concentrations to maximize power generation and carbon capture efficiency. This is an invention that combines sustainable energy production with active air pollution mitigation that is suitable for urban deployment.

Advantages:

- -Dual Functionality
- -Urban Friendly
- -Scalable
- -Bladeless
- -Low-energy intensive device

Applications:

-Clean Energy Production

Technology ID

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Category

GreenTech/Carbon Management Semiconductors/Devices & Components Energy & Power Systems/Power Generation

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Further information

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- -Air Quality Data Collection
- -CO2 capture/reduction
- -Green Buildings

TRL: 2

Intellectual Property:

Provisional-Patent, 2024-07-12, United States

Utility Patent, 2025-07-01, United States

Keywords: carbon capture, Civil Engineering, Clean Power, Green

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Sustainable Buildings, Urban Air Purification, Urban Energy