

New Jersey— An American low carbon leader

The state is a leader in initiatives to deploy carbon removal for low carbon concrete and applications on working land. New Jersey also hosts the most sophisticated private research and development facility for direct air capture (DAC), and the state's many scientists and engineers can drive development, integrating carbon removals with industrial processes and manufacturing.

How It Works

Carbon dioxide can be removed from the atmosphere in a variety of ways. For one, New Jersey's farmland can benefit from enhanced rock weathering, in which certain kinds of rock are finely ground and spread over fields. This can replace some common soil amendments while also accelerating natural processes that remove carbon. New Jersey's quarries produce excess fine-grained materials suitable for these removals,¹ and is a leader in agrivoltaics, generating solar power in actively farmed fields, which can be deployed in parallel with enhanced rock weathering.

Sustainably produced biomass, like agricultural waste, can also be stabilized as biochar, bio-oil, or slurry and stored or injected underground. New Jersey is projected to produce about 4 million metric tons of biomass suitable for bioenergy each year². When bioelectricity is produced, carbon dioxide is emitted as a waste gas, but it can be captured before it reaches the atmosphere, a process called bioenergy with carbon capture and sequestration (BECCS). Carbon dioxide can also be removed from ambient air, as opposed to a concentrated source, which is known as direct air capture (DAC). Companies like Avnos already have active DAC projects in New Jersey. Most of New Jersey sits over geologic formations that are suitable for underground carbon dioxide storage, where carbon captured from bioenergy or DAC could be stored without interstate carbon transport.\

The state coastline can also host carbon removal projects, using crushed rocks to remediate ocean acidification and restore coastlines damaged by storms and erosion.

Manufacturing processes, like chemical production, can integrate carbon removal to improve waste management. These processes stabilize the carbon in waste sludge that is locked away or use minerals to reduce acidity. Several municipal wastewater treatment facilities are already deploying projects to add minerals like calcium carbonate during treatment and disposing of biosolids as a means of storing carbon. Concrete manufacturing can also use carbon dioxide to cure the concrete or add biochar into the cement mix, and New Jersey legislation is leading the nation on this issue.

How It Benefits New Jersey

New Jersey already has some of the most valuable farmland per acre in the US, and carbon removal via the enhanced weathering of alkaline minerals can increase the productivity, soil health, and financial yields of that land.

In coastal New Jersey, reducing the acidity of the water, as ocean carbon removal methods aim to do, improves marine ecosystems, making aquatic life healthier and especially improving the cultivation of shellfish like clams and oysters. A contained test to simulate an open ocean project has already been successfully performed at a US Navy facility in New Jersey⁴. Beach nourishment projects and coastline restoration can simultaneously remove carbon, providing benefits without new infrastructure or large disruptions.

Carbon removal can contribute to economic stability as well. While manufacturing is no longer the cornerstone of the New Jersey economy, it still employs more than a quarter million people⁵. Another quarter million people⁶ are employed in construction, which could benefit from the tax incentives that increase the use of low carbon cement. Carbon removal can also create new jobs, both in existing industries and new projects, including 1,700 annual jobs from DAC.⁷

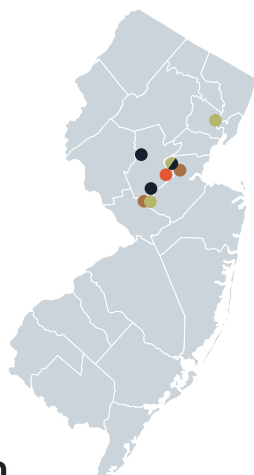
Photo of Rep Kean at Avnos' Bridgewater facility



Carbon Removal Companies and Research in New Jersey

- Material Producers
- Research
- Headquarters
- Project

CRA MEMBER COMPANIES



WHAT THEY'RE WORKING ON

Avnos: Developing its latest hybrid DAC facility, Project Brighton, in Bridgewater, New Jersey with funding from the U.S. Office of Naval Research. This is the latest addition to Avnos' technology development site, one of the world's most advanced direct air capture centers, designed to accelerate innovation and drive down costs.

Eion: Leading research and development projects with Rutgers University to investigate the application of minerals for enhanced rock weathering in the outer coastal plain of New Jersey. Their work evaluates agronomic benefits and develops a new approach to quantify carbon.

New Jersey Carbon Renewal Key Institutions + Players

UNIVERSITIES AND RESEARCH INSTITUTES

New Jersey has one of the highest concentrations of scientists and engineers in America. University expertise groups like the New Jersey Institute of Technology's Carbon Capture, Removal and Conversion Test Centers (funded by the Dept of Energy)⁸, and Princeton's Zero Lab⁹ created a national decarbonization plan and groups like the Materials for Energy and Climate Lab¹⁰ are developing cutting edge carbon removal. Rutgers University is deploying projects with industry, including an enhanced weathering project with Trap Rock Industries and a Dept of Energy Carbon Negative Shot project with Eion, working to solve process challenges necessary to scale carbon removal as an industry.

STATE GOVERNMENT

New Jersey has developed strategic plans for carbon management, including carbon sequestration, an inventory of greenhouse gas emissions, and incentives for projects that will advance carbon sequestration through working land and low carbon cement. Efforts span many departments and agencies, including the Department of Environmental Protection, Department of Agriculture, and State Agricultural Development Committee.

State Senator Andrew Zwicker is a scientist at the Princeton Plasma Physics Lab, developing next-generation nuclear fusion power production¹¹, and working to combat climate change.

POLICY LANDSCAPE

New Jersey is one of the states leading America in forward-thinking carbon management legislation and strategy.

- The "New Jersey Protecting Against Climate Threats" regulatory reforms to monitor and reduce emissions¹²
- The Natural Climate Solutions Grants¹³ to increase carbon sequestration in natural and working lands
- Membership in the Regional Greenhouse Gas Initiative, a coalition of eleven states working to reduce carbon dioxide emissions from the power sector¹⁴
- The "Low Embodied Carbon Concrete Leadership Act," a first of its kind bill to incentivize the use of low carbon concrete¹⁵

At the federal level:

- In 2019 and 2021, Rep Smith (NJ-4) co-sponsored HR 4408, "Carbon Capture Improvement Act of 2021"¹⁶
- Representatives Kim, Sherrill, Smith, and Van Drew cosponsored the USE IT Act (H.R. 1166)¹⁷
- Senator Robert Menendez cosponsored the Clean Energy for America Act (S 2118)¹⁸
- Representatives Jefferson Van Drew and Christopher Smith cosponsored the SCALE Act¹⁹
- Representatives Tom Malinowski and Mikie Sherrill cosponsored the Federal Carbon Dioxide Removal Leadership Act of 2022²⁰
- Representative Albio Sires cosponsored the Ocean Based Climate Solutions Act²¹



1. Beerling
2. Rutgers
3. US Geologic Survey
4. ECO Magazine
5. NJ Dept of Labor & Workforce Development
6. NJ State Data Center
7. Rhodium Group
8. NJ Institute of Technology

9. Princeton University
10. Princeton University
11. Thea Energy
12. NJ Dept of Environmental Protection
13. NJ Dept of Environmental Protection
14. The Regional Greenhouse Gas Initiative

15. New Jersey Legislature
16. Congress.gov
17. Congress.gov
18. Congress.gov
19. Congress.gov
20. Congress.gov
21. Congress.gov