An Atlas of Natural Gas Power with Carbon Capture and Storage

Developed by the Great Plains Institute with support from the Cynthia and George Mitchell Foundation

Atlas overview

An Atlas of Natural Gas Power with Carbon Capture and Storage **identifies locations across the United States with the highest suitability for natural gas power generation with carbon capture and storage (NG+CCS)** by evaluating siting conditions under four scenarios:

- **Baseline deployment:** identifies locations suitable for building new NG+CCS under general development conditions
- **Storage-prioritized:** identifies locations for building new NG+CCS by prioritizing proximity to geologic storage resources
- **Data center co-location:** identifies locations for building new NG+CCS by prioritizing proximity to population centers with higher water availability
- **Retrofit:** identifies existing natural gas combined-cycle facilities located in areas favorable for adding carbon capture

Why natural gas+CCS?

The United States' electricity demand is rising, driven by artificial intelligence, data centers, and the electrification of industry and transportation, with demand projected to increase by 35 to 50 percent by 2040.[1] Meeting this demand while maintaining reliability and advancing decarbonization goals will require a mix of power sources.

Natural gas currently provides about 40 percent of the nation's electricity supply.[2] **Pairing natural gas power plants with carbon capture and storage (NG+CCS) offers a promising pathway to provide dispatchable power while capturing and permanently storing carbon dioxide (CO_2).**

Siting factors considered

Land

Access to suitable land is an important step in siting new projects. We considered land cover, federal and state land ownership, slope, seismic considerations, urban areas, transportation access, natural gas costs, and geologic storage.

Water use

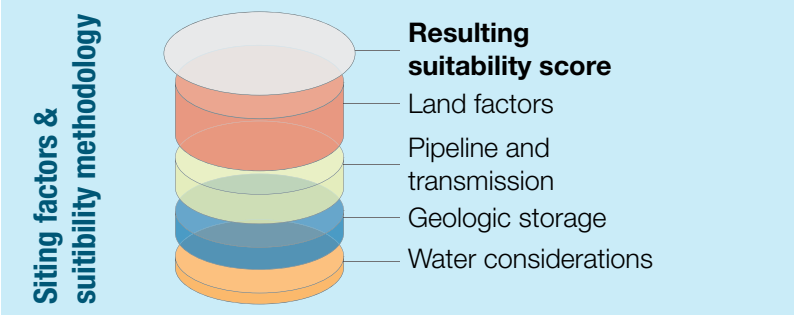
NG+CCS facilities require water for cooling and operations, making proximity to major water sources and long-term water availability important siting considerations. We considered access to major rivers, the Great Lakes, and regional surface water availability to identify where water needs are more likely to be met without adding pressure to constrained supplies.

Geologic storage opportunity

Captured CO_2 is assumed to be stored in saline formations or oil and gas fields that may support enhanced oil recovery (EOR). Saline storage receives greater weight because of its larger storage potential.

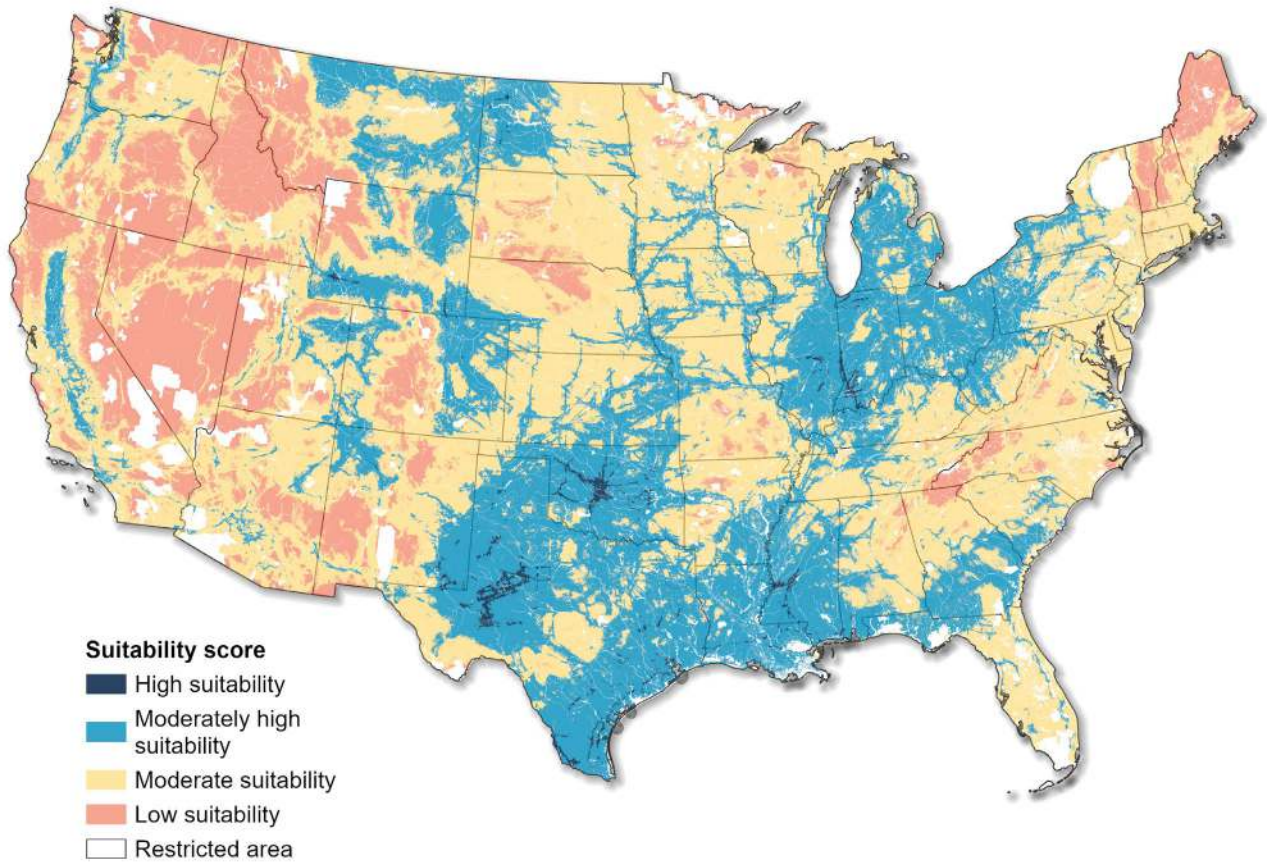
Pipelines and transmission lines

Access to existing transmission lines and pipelines can improve project economics and reduce permitting complexity. We considered proximity to high-voltage transmission lines, natural gas pipelines, and existing CO_2 pipelines. We weighed transmission and natural gas infrastructure most heavily because they are essential to siting and fuel delivery, while CO_2 pipelines can be limited by siting near storage opportunities.



Where NG+CCS deployment looks most suitable

The Baseline Scenario below identifies locations suitable for NG+CCS under general development conditions. High suitability reflects areas where available infrastructure, geologic storage access, land characteristics, and water availability overlap.



What regions stand out?

The Gulf Coast, West Texas, Oklahoma, and parts of the Midwest offer the most high-suitability locations for NG+CCS deployment. There are additional highly suitable areas in parts of the Mountain West, North Dakota, and California.

Scale of opportunity

Across the United States, the atlas identifies nearly 54,000 km^2 of highly suitable land and 2.3 million km^2 of moderately high suitability.

How to use the atlas

The atlas can be used as an early screening tool to identify regions where favorable siting conditions for NG+CCS projects overlap.

While not project specific, the results provide a practical starting point for policy makers, developers, and planners to guide more detailed analysis, infrastructure planning, project development, and policy discussions related to carbon management in the US power sector.

[1] The American Clean Power Association, U.S. National Power Demand Study (2025), https://cleanpower.org/wp-content/uploads/gateway/2025/03/US_National_Power_Demand_Study_2025_FINAL-REPORT.pdf.
[2] US Energy Information Administration, “Net Generation by Energy Source: Total,” Electric Power Annual, October 2025, https://www.eia.gov/electricity/annual/.

Learn more about our work or explore the full atlas for all scenarios and detailed results at www.carboncaptureready.org

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