



**Industrial
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a partnership between Great Plains Institute and
World Resources Institute



Bipartisan Infrastructure Investment and Jobs Act (H.R. 3684)

Carbon Management & Industrial Decarbonization Provisions

The Infrastructure Investment and Jobs Act, which was passed on November 5 and signed by President Biden November 15, includes groundbreaking provisions needed to commercialize carbon management, industrial decarbonization technologies and infrastructure at the scale required to meet midcentury climate goals, foster domestic energy and industrial production, protect and create skilled jobs that consistently pay above prevailing wages, and provide environmental and economic benefits to affected communities.

Carbon Capture:

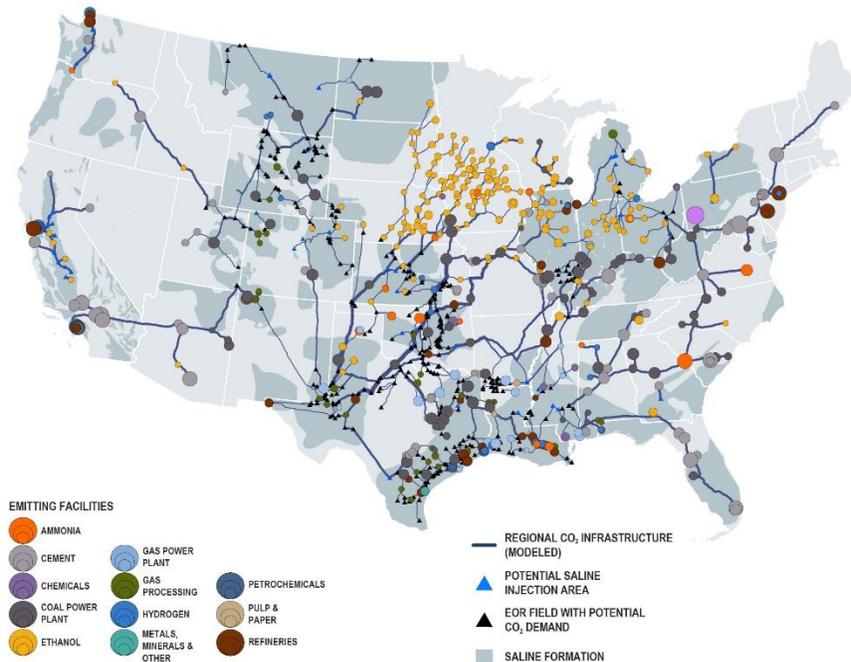
Included in the bill are transformative measures to scale deployment of carbon capture, removal, utilization and associated CO₂ transport and storage infrastructure. This includes full funding of the authorizations for large-scale carbon capture pilot projects and demonstration programs that were enacted as part of the bipartisan 2020 Energy Act late last year, as well as authorization and funding to establish, for the first time, regional direct air capture hubs.

Large-scale pilot and demonstration projects are key to achieving our emissions reduction objectives and to driving near-term job creation and economic activity, while spurring additional project development.

Bipartisan Infrastructure Investment and Jobs Act: Carbon Management Provisions	
Large Scale Pilot Projects	\$937 M over four-year period
Demonstration Programs	\$ 2.54 B over four-year period
Direct Air Capture Technologies Prize Competitions	a) Precommercial: \$15 M for fiscal year 2022 b) Commercial: \$100 M for fiscal year 2022
Carbon Utilization Program	\$310 M over five-year period
Carbon Capture Technology Program (Front-end engineering and design program)	\$100 M over five-year period
SCALE Act (financing for CO ₂ transport and storage infrastructure)	\$4.6 B over five-year period to carry out activities authorized by the SCALE Act
Direct Air Capture Hubs (creates 4 regional DAC hubs)	\$3.5 B over five-year period
Total funding for carbon management	\$12.1 B over five-year period

The Storing CO₂ and Lowering Emissions (SCALE) Act:

The infrastructure bill also includes the bipartisan Storing CO₂ and Lowering Emissions (SCALE) Act to support the buildout of regional CO₂ transport and storage infrastructure network needed to enable commercial deployment of carbon capture, direct air capture and carbon utilization. Similar to the buildout of other forms of infrastructure to support deployment of low- and zero-carbon technologies over the next 30 years, scaling a national CO₂ transport and storage system is a necessary component to meeting midcentury climate goals. Much like the development of other infrastructure systems, the SCALE Act positions the federal government to partner with private capital to invest in both regional and national CO₂ transport and storage infrastructure networks.



In addition to helping meet 2050 climate targets, building out an interconnected CO₂ transport and storage infrastructure network will preserve and enhance existing jobs and create new, highly skilled jobs that pay above prevailing wages. It's estimated that the SCALE Act can create approximately 13,000 direct and indirect jobs per year through the bill's five-year authorization.

Figure 1: Optimized CO₂ Transport and Storage Network

These provisions enacted by the infrastructure package, in tandem with proposed bipartisan enhancements to the 45Q tax credits in separate climate and energy legislation, would result in an estimated 13-fold increase in carbon management capacity and annual CO₂ emissions reductions of 210-250 million metric tons by 2035.



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Industrial Decarbonization:

For the hard-to-decarbonize industrial sector, the bill advances several technologies and policies to support industrial decarbonization. It contains provisions to expand the deployment of clean hydrogen, improve industrial energy efficiency, and reform the Title 17 DOE loan guarantee program.

Bipartisan Infrastructure Investment and Jobs Act: Industrial Decarbonization Provisions	
Regional Clean Hydrogen Hubs	\$8 B over a five-year period
Clean Hydrogen Manufacturing and Recycling Program	\$500 M over a five-year period
Green Hydrogen Demonstration, Commercialization, and Deployment Program	\$1 B over a five-year period
Industrial Research and Assessment Centers	\$550 M over a five-year period
Smart Manufacturing Leadership	\$50 M over five-year period
Total funding for industrial decarbonization	\$10.1 B over five-year period

Regarding hydrogen, the bill calls for the development of a national strategy for a clean hydrogen economy and provides \$8 billion over five years for the development of at least four clean hydrogen hubs featuring different pathways for producing low and zero-carbon hydrogen integrated with transport and storage infrastructure and commercial end uses. These hubs will help create a market for clean hydrogen and give certainty to developers and investors. The bill also includes a demonstration, commercialization, and deployment program aiming to decrease the cost of hydrogen production from electrolyzers.

The bill re-establishes and expands the DOE’s hydrogen research and development program to advance the demonstration and commercialization of clean hydrogen production, processing, delivery, and end-use application technologies. Furthermore, it creates a clean hydrogen manufacturing and recycling program to support a clean hydrogen supply chain. This program, along with others, will be coordinated by the Clean Hydrogen Program at DOE established by the bill.

There are also several provisions to foster greater industrial energy efficiency. Facility audits or assessments are often the starting point for advancing efficiency measures, and the bill builds on existing relationships between industry and higher-education research and assessment centers. It provides funding to identify opportunities for optimizing energy efficiency and environmental performance at industrial facilities, including opportunities for smart manufacturing. It establishes a grant program to fund recommended upgrades for small- and medium-sized manufacturers. The bill also directs the Office of Energy Efficiency and Renewable Energy to provide technical assessments for manufacturers as a part of the



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sustainable manufacturing initiative. Additionally, the bill establishes a program to provide funding to states to invest in smart manufacturing technologies.

To further the deployment of first-of-a-kind projects, the bill expands eligibility for the Title 17 loan guarantee program, increases the domestic supply of critical minerals, and makes certain state energy financing entities eligible.

Conclusion:

The inclusion of these elements in the Bipartisan Infrastructure Investment and Jobs Act provide a critical down payment on the investments required to scale technologies across industries to achieve net-zero carbon emissions, meet midcentury climate goals and to drive near-term jobs creation and economic activity.