

Climate Change Industry Braces For More Disruption

The U.S. climate change industry grew 9% in 2024 to \$530 billion, according to Climate Change Business Journal's annual model of the climate change industry. The tables and charts in this review summarize the key numerical trends of the industry and key segments that impact overall growth. The 9% growth in 2024 is down noticeably from the previous three years as detailed by segment on the table on page 3. Declining growth rates in the sales of electric vehicles was a significant reason for the transportation segment, the industry's largest, falling below the double digit growth line and only growing 5% in 2024. Growth in renewable energy and clean power, the third largest segment, was over 20% in revenues in 2024, and improvement over the previous three years, but not enough to keep overall climate change industry growth in the United States above 10%.

These two influential segments are profiled from a statistical standpoint later in this review, and their trajectory will likely be increasingly influential to climate change industry growth for the rest of the 2020s, given the result of the 2024 presidential election. The second and fourth largest climate change industry segments, energy efficiency technology and services and green buildings, also failed to produce double-digit growth in 2024 according to CCBJ analysis. A valid argument exists that these segments could be excluded from the core climate change industry, as saving or conserving energy or producing less energy-consuming assets in the built environment may not be seen as being part of the solution, but more as just incremental efforts to minimize the problem. However, we do continue to include these segments, but also to produce segment specific breakdowns to allow more selective analysis.

Climate Change Industry Overview 2024

CCBJ's annual assessment of the climate change industry quantifies segment fluctuations and the impacts of political change. The U.S. climate change industry grew 9% in 2024 to \$530 billion, lagging recent growth but most executives remain optimistic about long term drivers in their business. Features in this edition summarize public transit, carbon markets and biogas, with executive Q&As on oil & gas carbon capture, hydrogen infrastructure, VC investment, decarbonization, restoration, climate grants, factory farms and law firms' take on energy transition

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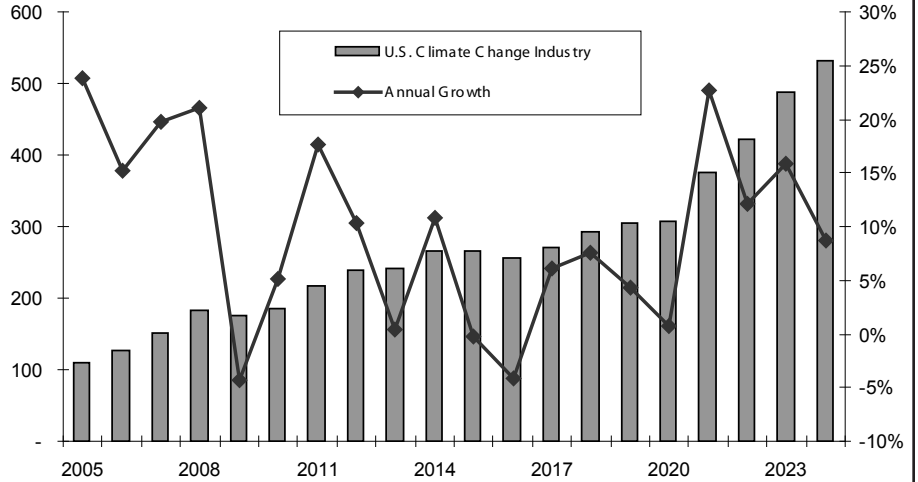
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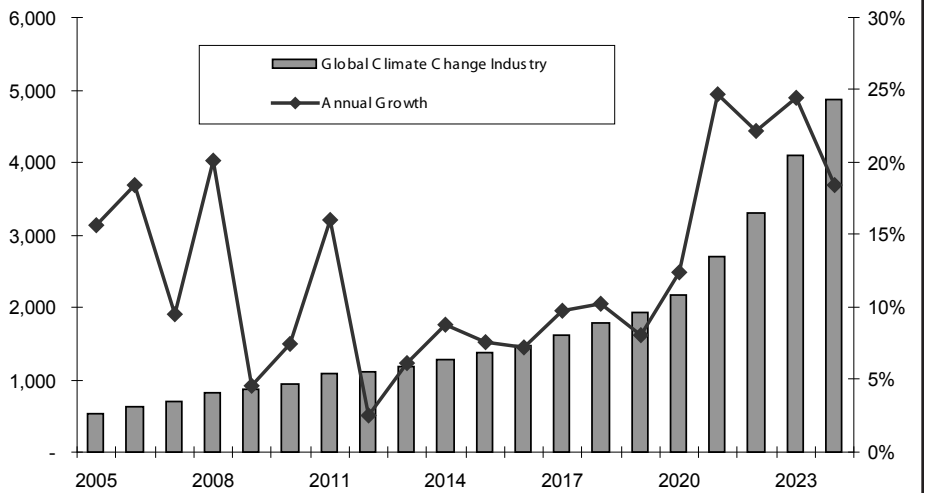
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U.S. Climate Change Industry in \$bil & Annual Growth

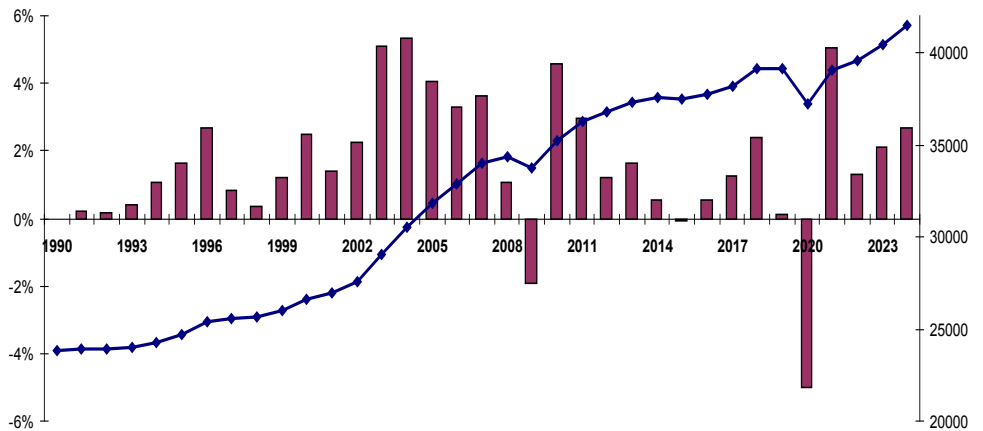


Global Climate Change Industry in \$bil & Annual Growth



Source: Climate Change Business Journal; Environmental Business International, Inc., San Diego, Calif.

Global Emissions in CO2e & Annual Change from 1990-2024



Source: CCBJ derived from Energy Institute Statistical Review of World Energy

Milestone Environmental Builds Out Oil & Gas Waste Sequestration Business in Texas With a Dedicated Service and Key Assets in Landfills and Injection Wells

Milestone Environmental Services, headquartered in Houston, Texas, is a leading environmental services and carbon management company and the largest energy waste sequestration company in the United States. Milestone operates a leading integrated network of waste infrastructure that reduces the carbon impact of its customers by permanently sequestering hydrocarbon waste over a mile below the surface, preventing greenhouse gas emissions and water and ground contamination. Since 2014, Milestone has sequestered more than 3 million tons of CO₂e through its injection process. Milestone subsidiary, Milestone Carbon, is devoted to helping multiple types of emitters meet their decarbonization goals by developing and operating injection sites that permanently and securely sequester CO₂ below the surface. In October 2023, Milestone became a portfolio company of **SK Capital Partners**, a sector-focused, growth-oriented private investment firm.

Carolina Ortega, VP of Sustainability and Communications. Ms. Ortega oversees all aspects of carbon accounting, sustainability performance metrics, and communications, as well as leads Milestone's organizational culture and values initiatives. She is responsible for the development and roll-out of the company's proven environmental and sustainability strategy and champions Milestone's sustainability programs to all stakeholders. In 2024 she was named an Influential Woman in Energy by Hart Energy.

CCBJ: Can you discuss any recent technological advancements that Milestone has implemented or developed in the field of hydrocarbon waste sequestration?

Ortega: Drilling fluids, production wastes, and other waste types are inevitable byproducts in the exploration, development, and production of oil and gas. This waste is regulated at the state level by agencies, including the Texas Railroad Commission (TXRRC) and the New Mexico Oil Conservation Division (NMOCD), and is exempt from hazardous designation under the Resource Conservation and Recovery Act of 1978 (RCRA). Regardless of this designation, when not handled properly, these waste streams can do harm. They contain hydrocarbons, water, chlorides, and heavy metals that can contaminate soil and groundwater, and they emit greenhouse gases when exposed to air and sunlight.

While most technologies and processes at drilling sites have advanced, waste management practices have not. E&P companies habitually employ the antiquated prac-

tice of reserve pits and land application to dispose of waste. Although regulations in certain states permit these practices, these outdated methods pose enormous environmental and economic risks to our E&P customers and the communities near their operations. E&P companies frequently dump liquid and incidental solid wastes in reserve pits near drilling sites. These pits often have no protective liners, no plan/controls for leachate management, and are not continually monitored for integrity.

The other outdated method is land application, or landfarming. Energy waste is sprayed onto the surface of nearby farm or ranchland and tilled into the soil. This common practice can emit over 300 MT CO₂ e per new well drilled.

Milestone solutions allow E&P companies to mitigate the risk of soil and groundwater contamination and reduce operational carbon impacts. Our business gives energy companies a path to go beyond minimum regulatory compliance with a cleaner, more responsible way to address this waste. Milestone manages a variety

of energy waste streams for its customers, including drilling fluid (mud), drill cuttings, other slurries, produced and flowback waters, production tank bottoms, and contaminated soils. Milestone's customers primarily generate these waste streams in the drilling, completion, and production phases of the oil and gas extraction lifecycle.

Our patented and proprietary slurry injection process is a proven, environmentally secure, and economically efficient method for energy waste management. Our process differs from traditional saltwater injection because we are able to inject slurries with incidental solids that are uninjectable with traditional methods. Milestone's superior facility design and engineering, along with active, routine maintenance of our wellbores, enhances the durability and safety of our injection wells.

We have provided this low-cost, environmentally secure energy waste management solution to our customers since our inception in 2014. We receive RCRA-exempt, non-hazardous liquid and slurry waste streams, including drilling muds, tank bottoms, flowback, dirty water, and produced saltwater at our conveniently located surface facilities.

We inject these waste streams into deep, geological strata thousands of feet below the earth's surface and usable groundwater. The injection area is contained by solid, impermeable layers of rock or shale called the confining zone. Together the confining zone and the thousands of feet of earth and rock above it protect critical groundwater sources.

During initial construction of the injection well, once we've reached target depth, multiple layers of steel casing are installed down the length of the wellbore and cemented in place. These measures create a secure, impermeable barrier isolating the wellbore from groundwater and other surrounding strata. Milestone's operational procedures and testing protocols support the long-term integrity of our wellbores.

Our landfills are positioned to minimize potential Scope 3 emissions associated with the transport of waste from our slurry injection sites. Milestone landfills are designed and operated to minimize wait times and optimize truck traffic flow to save time, reduce transportation emissions, and decrease costs. Our landfills are built using the most advanced protective technologies and materials. All details, including redundancy liners, leak detection systems, and groundwater monitoring wells, meet or exceed the latest permitting requirements to keep waste streams in the landfill and out of the surrounding environment. In short, Milestone's landfill design is comparable to the same industry standards as RCRA Class 2, non-hazardous waste. We adhere to rigorous maintenance standards to help ensure our landfills remain in top-tier condition.

CCBJ: How do evolving carbon accounting standards influence Milestone's strategy and operations, particularly in terms of sustainability reporting and compliance?

Ortega: Helping our customers achieve net-zero goals requires effective carbon accounting and data collection processes to help them make decisions to manage their energy waste that align with good environmental stewardship objectives.

Over the last few years, we have worked towards refining our carbon accounting and data collection methods to accurately measure and communicate the benefit we provide to customers.

In 2020, Milestone conducted a sequestration analysis of samples collected from our slurry injection stream to determine the average total petroleum hydrocarbon (TPH) content. The analysis examined the carbon dioxide equivalent sequestration impact of our slurry injection disposal practices in comparison to the traditional practice of land application disposal. Through collaboration with an independent third-party consulting firm, we developed a methodology for estimating this comparison.

SK Capital Announcement of its 2023 Milestone Transaction

In October 2023 **SK Capital Partners** acquired Milestone Environmental Services, a leader in environmental services and carbon management. Headquartered in Houston, Texas, Milestone operates a leading integrated network of waste management infrastructure that reduces its customers' carbon impact by permanently sequestering hydrocarbon-containing energy waste, preventing greenhouse-gas emissions and water and ground contamination through its proprietary slurry injection process.

SK pursued the investment because, in addition to expanding its leadership in existing energy production waste markets, Milestone has the strategy, capabilities, and operating track record to play a major role in the rapidly growing carbon capture and sequestration (CCS) market. Leveraging its core competencies in waste sequestration, complex permitting and regulatory compliance, subsurface rights leasing, and geology analysis, Milestone's CCS subsidiary, Milestone Carbon, is focused on enabling a broad range of industrial CO₂ emitters to meet decarbonization goals by developing and operating injection sites that permanently and securely sequester CO₂.

Milestone President and CEO Gabriel Rio continues to serve in that role and retained significant ownership in the company after the 2023 deal. Rio founded Milestone in 2014.

SK Capital is a private investment firm with a disciplined focus on the specialty materials, ingredients, and life sciences sectors. The firm seeks to build resilient, sustainable, and growing businesses that create substantial long-term economic value. SK Capital aims to utilize its industry, operating, and investment experience to identify opportunities to transform businesses into higher-performing organizations with improved strategic positioning, growth, and profitability as well as lower operating risk. SK Capital's portfolio of businesses generates revenues of approximately \$17 billion annually, employs more than 25,000 people globally, and operates more than 200 plants in over 30 countries. The firm currently has approximately \$7.9 billion in assets under management.

In 2021, we continued this collaboration to implement a comprehensive waste sampling protocol that offers Milestone and our customers improved insight in understanding the GHG impact of all E&P waste. We collected, analyzed, and verified samples categorized by waste types, i.e., produced water, flowback, oil-based mud, water-based mud, tank bottoms, etc.

Based on analysis of these samples, the average barrel of slurry waste (i.e., excluding produced saltwater and flowback water) injected by Milestone contains approximately 49 kilograms of CO₂ e per barrel (kg CO₂ e/bbl). One hundred percent of the TPH contained in our injection stream is perma-

nently sequestered in deep, further refined, secure formations. During 2022, Milestone further refined the implemented program, with the help of nationally recognized environmental consultants, to align our process and procedures with international best carbon accounting practices. We also expanded the role of our financial accounting firm, who performed certain agreed upon procedures as part of our triple-verified process.

CCBJ: What are the key components of Milestone's proven environmental and sustainability strategy, and how have these strategies evolved under your leadership?

Ortega: We believe that Sustainability efforts must be measured on their ability to create or protect value. We are deliberate and strategic on the ESG initiatives we put in place. We believe this is the only way to build a resilient business that embraces and advances the energy transition.

As we endeavored to define our value-creation approach to Sustainability, we noticed that existing ESG reporting frameworks were insufficient to demonstrate value-creation to the extent we needed. So, we created our own. We sourced publications and frameworks from renowned global organizations and integrated the best elements to create a bespoke approach to define and articulate the value Milestone creates – including financial value, environmental value, and value linked to sustainable development.

Milestone has always been a leader in energy waste sequestration, but we've also challenged ourselves to be thought leaders in the ESG and Sustainability conversation. Why? Because we have much to contribute. We know that contractors in the oil and gas supply chain have a role to play in helping our industry reduce Scope 3 emissions. We also know it's important to demonstrate that a company like ours can be sustainable and profitable at its core, if designed with value-creation objectives in mind.

CCBJ: How have changes in environmental regulations affected Milestone's business model, particularly regarding carbon sequestration and waste management?

Ortega: The current regulatory requirements governing energy waste management in Texas were established in 1984, before the significant technological advances the oil & gas industry enjoys today.

These standards do not protect land and groundwater sufficiently. The Railroad Commission of Texas is currently reviewing the standards in Statewide rule 8. We hope that the standards regarding reserve pits are significantly improved. ⚙️

Milestone Business Profile & Recent Transactions

Milestone Environmental Services, headquartered in Houston, Texas, is a leading environmental services and carbon management company specializing in energy waste sequestration. Established in 2014, Milestone has developed a proprietary slurry injection process that permanently sequesters hydrocarbon waste over a mile below the Earth's surface, preventing greenhouse gas emissions and protecting water and soil from contamination.

Services and Operations: Slurry Injection: Milestone's primary method involves injecting energy waste deep underground, ensuring safe and permanent sequestration without the need for secondary treatment.

Landfills: The company operates state-of-the-art landfills designed as "carbon sinks" to securely contain solid energy waste, utilizing advanced protective technologies that exceed regulatory requirements.

Carbon Capture and Sequestration: Through its subsidiary, Milestone Carbon, the company assists various industrial emitters in achieving decarbonization goals by developing and operating injection sites for permanent CO₂ sequestration.

Recent Developments:

Expansion: Since its inception, Milestone has expanded its operations across key energy-producing regions, including the Permian Basin and the Eagle Ford and Haynesville Shale regions. As of 2024, the company operates multiple slurry injection facilities and landfills in Texas and New Mexico.

Milestone Environmental Services is a leading environmental infrastructure and carbon management company specializing in energy waste sequestration. The company operates a network of advanced slurry injection facilities and energy waste landfills across key energy-producing regions in the United States.

Landfills and Disposal Assets:

Slurry Injection Facilities: Milestone operates 11 full-service slurry injection facilities, with nine located in the Permian Basin. These facilities utilize proprietary slurry injection technology to permanently sequester hydrocarbon waste deep underground, preventing environmental contamination.

Energy Waste Landfills: The company manages three energy waste landfills in the Permian Basin. These landfills are engineered with advanced protective technologies, including redundant liners, leak detection systems, and groundwater monitoring wells, to securely contain solid energy waste and function as permanent carbon sinks.

Recent Acquisitions:

In August 2024, Milestone acquired three slurry injection facilities from Return Disposal, expanding its network and enhancing service capabilities in the Permian Basin.

In January 2022, the company acquired an active slurry injection facility in Center, Texas, along with permits for additional energy waste landfills, extending its services to the Haynesville Shale region.