



# Environmental

Globally, oil and gas remain critical sources of energy and will play essential roles in the world's pursuit of a lower-carbon future. The global energy mix of the future must include oil and gas because of this critical and ongoing importance. Halliburton delivers technologies that help reduce the emissions intensity of our own and our oil and gas customers' operations. Halliburton services growing markets such as carbon capture, utilization, and storage (CCUS) and geothermal energy through our Low Carbon Solutions business. And Halliburton continues to help innovators and entrepreneurs scale in the broader energy system through Halliburton Labs. Our efforts also go beyond carbon as we implement measures to reduce waste generation and optimize water use.

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## Emissions Reduction Progress

Halliburton understands the oil and gas industry has an important role to play to help reduce the world's emissions, and that affordable, secure energy is essential for global economic development. We are dedicated to our work to reduce emissions, improve efficiency, and advance the development of clean energy options.

You can read our [Climate Change Statement](#), [Climate Risk Scenario Analysis](#), and additional information about our emissions reduction efforts on the Halliburton website.

### Focus on Emissions Reduction

Our Chief HSE Officer has the responsibility to define and execute our emissions reduction strategy, which is overseen by the HSE Committee of our Board of Directors. This committee oversees all of Halliburton's HSE matters related to sustainability, risk-management processes, performance, and environmental impact — including climate matters.

In 2024, we continued to invest in initiatives to reduce our emissions intensity. Hydraulic fracturing accounts for 80% of our carbon footprint, and North America activity levels drove increased demand for our services in 2024. This resulted in a 2% increase in our absolute Scope 1 and 2 emissions year over year. However, since 2018 our overall emissions intensity per operating hour is down 16% thanks to continued investment in electric fracturing fleets.



Electric fracturing operations

### Our Climate Change Sustainability Commitments



- Achieve a 40% reduction of Scope 1 and 2 emissions by 2035 from 2018 baseline.
- Partner with Tier 1 suppliers to track and reduce Scope 3 GHG emissions.



We remain focused on deploying engineered fracturing equipment that gives our customers power source flexibility and operational efficiency, and reallocating legacy assets to minimize our overall emissions intensity and maximize returns. The exact shape of our absolute emissions trajectory depends upon evolving factors we do not control, including global energy demand and power source mix across our customer base. For example, even though the U.S. power grid is expected to reduce carbon emissions 52% by 2035,<sup>5</sup> the energy demand from data centers is projected to triple in that timeframe.<sup>6</sup> We continue to assess these external dynamics as we review our expected emissions trajectory.

### Facilities

Sustainability is integrated into our real estate processes. We assess and improve the efficiency of our facilities through a range of past and current initiatives and consume renewable electricity where feasible. In 2024, we reduced energy use at our facilities by more than 42 million kWh year over year, generated over 12 million kWh from on-site solar panels, and contracted renewable electricity at 25 sites that consumed more than 13 million kWh.



Halliburton Completion Technology and Manufacturing Center, Singapore (Lion Facility)

<sup>5</sup> U.S. EIA 2023 Annual Energy Outlook

<sup>6</sup> Department of Energy 2024 Report on U.S. Data Center Energy Use



# The Future of Energy

Diverse energy sources will each play a role in the world's future energy supply. At Halliburton, our work focuses in three areas:

- We develop and provide goods and services to help our customers reduce the emissions footprint of their oil and gas operations.
- We execute our core competencies to work to deliver solutions for low-carbon energy projects such as CCUS and geothermal energy.
- Through Halliburton Labs, we help early-stage companies in emergent energy sectors scale as we learn about where we can strategically engage new markets.

## Our Innovation Sustainability Commitments



- Lead the industry in innovation and stewardship of global resources.
- Provide solutions that support decarbonizing our customers' production base.



## Lowering the Carbon Intensity of Our Customers' Oil and Gas Operations

The oil and gas industry provides affordable, reliable energy that is necessary for global society and its growth. The path toward a lower-carbon future includes the more efficient, lower-carbon production of hydrocarbons. Halliburton's approach to sustainability is embedded in our new technology development process and customer collaboration. We offer leading and new technologies to customers to reduce emissions, maximize assets, and build a sustainable future.

## Carbon Footprint Assessments

In 2024, we used our Carbon Footprint Assessment process to estimate emissions for several proposed large-scale, complex projects that involve multiple business lines in countries including Mexico, Norway, Iraq, and Namibia. The estimates we generated accounted for potential emissions from engines and other equipment, transport, facilities, and the carbon footprints of the Halliburton products that assist with project execution.



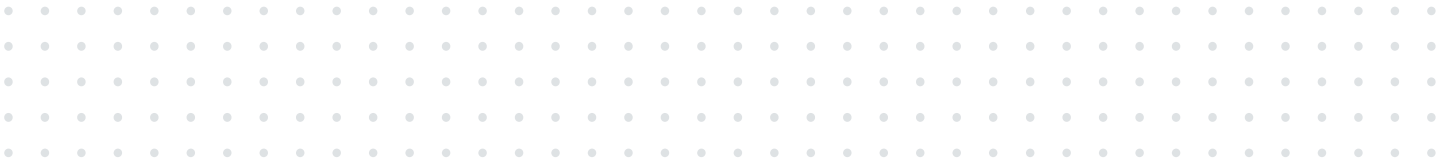
Halliburton performing a cementing operation on a rig in North Dakota



2024 Technology Sustainability Matrix

Our Technology Sustainability Matrix maps the offerings we develop to assist our customers to reduce their emissions in every stage of the well lifecycle and develop their low carbon projects. The table below highlights products and services we commercialized in 2024.

Products / Services	Operational Efficiency	Electrification	Customer Emissions Inventory Optimization	Materials and Logistics	Carbon Capture, Utilization, and Storage	Geothermal
Cementing						
CorrosaLock™ cement system					●	
Completion Tools						
OSTMZ™ sand control system	●					
XSTMZ™ xtreme single-trip multizone completion system	●					
NeoStar™ CS tubing retrievable safety valve					●	
Drill Bits and Services						
Hedron® fixed cutter PDC drill bits	●					●
Cerebro Force™ in-bit sensing	●				●	
XR Prime™ reamer hole enlargement tool	●				●	
Production Enhancement						
OCTIV® auto frac	●					
WAM Skid - Water Analysis Monitoring			●	●		
FR Selection Tool			●	●		
Production Solutions						
SandTrap® formation consolidation service	●					
Sperry Drilling						
iSTAR® intelligent drilling and logging platform generator	●			●		
Wireline and Perforating						
Automated Pump Down	●	●		●		
LOGIX™ Remote Logging	●			●		





Low Carbon Solutions

In 2024, Halliburton continued to see growth in global opportunities for carbon capture, utilization, and storage (CCUS), geothermal energy, and other existing and emerging low carbon energy markets. Our Low Carbon Solutions offerings apply our technology and understanding of subsurface conditions to support our customers design and develop wells to execute their projects.

Carbon Capture, Utilization, and Storage

Through active collaboration with our customers, we provide end-to-end fit-for-purpose technologies for the CCUS market. Our solutions include the NeoStar™ CS tubing-retrievable safety valve and CorrosaLock™ cement system for corrosive environments and ultra-low temperatures of CO<sub>2</sub> injection and containment. We also continue to build on our oil and gas technology alliances to develop and pursue integrated CCUS opportunities.

Geothermal Energy

Halliburton has long served the geothermal market. Today we use our core oil and gas competencies in conventional and direct heating geothermal projects. We help our customers through the geothermal well lifecycle, including subsurface understanding and testing, well construction, completions, and production.

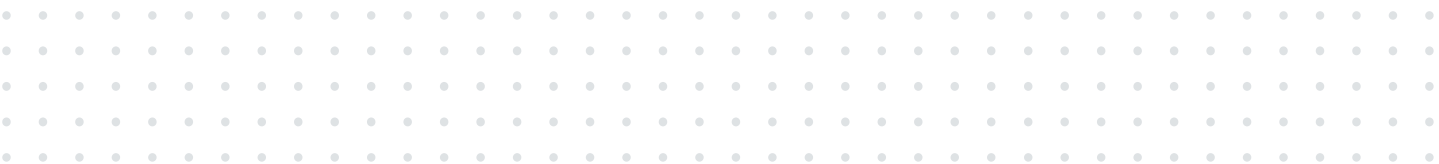
Halliburton has designed technologies, such as GeoESP® submersible borehole and surface pumps and the Thermalock™ cement system for extreme conditions of our customers' geothermal work applications. We provide solutions such as hardier drill bits, drilling fluid additives that increase effectiveness in high-temperature environments, directional drilling for complex well paths, and specialized well designs and completions to address the challenges associated with drilling at great depths.



GeoESP Lifting Pump Installed in Germany

In the geothermal energy field, factors such as extreme temperatures and strenuous operating conditions pose unique stress to traditional geothermal technologies, including electric submersible pumps (ESP). To address these challenges, Halliburton's GeoESP system includes high-quality, heat-resistant materials that resist scale, corrosion, and abrasion. It also includes new, innovative technologies that help address the unique demands of geothermal applications. Our modular components can help enhance safety, reduce power input costs, and improve efficiency at geothermal well sites, empowering our customers to tap into more durable, profitable geothermal options.

In 2024, we collaborated with a German geothermal operator to replace their two existing ESPs with one GeoESP that possesses a broader operational range. The successful integration of this GeoESP lifting pump established the operator's access to a durable technology solution and helped them reduce risks and realize efficiencies. It also helped them avoid power quality issues, long equipment repair delays, and disruptions.



## Halliburton Labs: The Future of Energy. Faster.™

Through Halliburton Labs, we help energy system innovators and entrepreneurs further their strategic goals by providing them with access to our capacity to scale and the vast resources in our global infrastructure and network. Participating startups include organizations engaged in industrial decarbonization, carbon capture and utilization, grid-scale and long-duration energy storage, energy generation and conversion, critical minerals recovery, hydrogen production and transportation, and circular economy.

As we support these organizations, we develop new insights and discover opportunities for exploration, investment, and growth. We also gain institutional knowledge that will enable us to collaborate and engineer solutions to maximize asset value in the energy systems of the future.

Halliburton Labs continued to grow in 2024. We closed out the year with 38 participant and alumni organizations that represent all facets of energy production, storage, distribution, and efficiency, as well as the industrial decarbonization and waste-to-value sectors. The increase in participants is a reflection of our growing profile, and today most participants approach us through referrals and recommendations.

# 38

Halliburton Labs  
Participant and Alumni  
Organizations



### Halliburton Labs Gives Clean-tech Startups Visibility

We hosted two Finalists' Pitch Day events in 2024 to showcase 18 startups who innovate solutions throughout the energy landscape. Our March event was held in collaboration with New Orleans Entrepreneur Week, which further expanded Halliburton Labs' and our finalists' reach, visibility, and networks.

Halliburton Labs was a founding partner for the inaugural Houston Energy and Climate Startup Week, which took place in September 2024 and showcased Houston's momentum in helping transform the energy industry while driving a sustainable, low-carbon energy future.

Halliburton Labs also hosted our second Company Showcase in June 2024. An audience of clean-tech venture investors attended live pitches from 14 of our participant startups and we curated more than 200 individual meetings between startups and relevant investors.

### Participant Achievements

In 2024, many Halliburton Labs participants achieved important milestones in their work to scale their operations.

- SunGreenH2 and Cache Energy hosted demonstrations at Halliburton facilities
- Ayrton Energy raised \$6.8 million and was included in Cleantech's 2024 50 to Watch list
- NanoTech Materials was recognized as one of Houston's top 5 fastest-growing companies by Innovation Map, and their Insulative Ceramic Particle was recognized by TIME as one of 2024's Best Inventions
- The EU's Horizon Europe funding program granted the Ondas de Peniche (ONDEP) project €19 million to deploy a 2 MW array of AW-Energy WaveRoller converters in Portugal
- Momentum Technologies, Disa Technologies, Ayrton Energy, and NanoTech Materials all moved into larger facilities as they made progress on their efforts to scale



Halliburton Labs team at Halliburton Labs Finalists Pitch Day in New Orleans, LA on Tulane University campus

## Environmental Management

Work done at Halliburton — which includes our environmental management work — is guided by the policies, business practices, and procedures that are detailed in the Halliburton Management System (HMS). The HMS embeds our environmental risk mitigation into daily work activities, as well as the environmental evaluations within real estate processes and in the due diligence phase of every potential M&A transaction.

Read more on the HSE policy and HMS within the [Safety](#) section of this report and on the [HMS](#) page of the Halliburton website. Visit the [Environment](#) page of our website to learn about our chemical stewardship.

### Our Environmental Management Sustainability Commitment



- Identify and execute waste and water management initiatives at locations globally to deliver activity-based reductions.



### Environmental Facility Certifications

The HMS applies globally and complies with industry-standard certification programs — including the International Organization for Standardization (ISO) 14001 and API RP 75 — as do all the processes and procedures it contains. In addition to global HMS compliance, many of Halliburton's facilities are externally certified to support business requirements. In 2024, 60 Halliburton facilities held ISO 14001 certifications.

## Biodiversity

Halliburton recognizes that finding ways to reduce our impact on biodiversity plays a role in sustainability and we include this work in our environmental management system. Our efforts in this area include environmental evaluations to help reduce our impacts on our land; facility designs that meet regulatory requirements and are energy- and water-efficient; promotion of circularity in materials use; targeted water use and waste reduction programs; engagement with local communities to protect and restore sensitive habitats; and cultivation of a responsible supply chain in collaboration with suppliers.

Halliburton respects World Heritage sites and the protections afforded to them.



Lab employee in Saudi Arabia





Water Stewardship

Halliburton works to conserve water and advance sustainable, cost-effective water management processes for ourselves and our customers where we are able. We offer solutions to optimize water use practices at well sites, where customers own water purchases and control. We report water-use data for Company-owned and Company-leased locations in the U.S., Canada, and most of Halliburton's global facilities.

In 2024, we executed water stewardship projects in 16 locations around the world. Our locations use water consumption data and established water-use reduction toolkits to identify and engage opportunities to reduce their water use. These opportunities include improving efficiencies in auxiliary processes, domestic water use, and / or landscape irrigation.

Our water-use reduction strategies include, but are not limited to, improvements to leak awareness and identification; replacement or enhanced maintenance for older water-consuming appliances and fixtures; adoption of drought-friendly vegetation and xeriscaping; and implementation of systems that recycle and reclaim water.



Reducing Wastewater in Indonesia

Our Real Estate team in Indonesia identified an opportunity to reuse wastewater at local Halliburton sites. The team installed tanks that capture and process domestic wastewater along with a meter to measure how much water the tanks save. The treated water is then reused for irrigation.

Water Withdrawal Intensity

m³ / Operating Hours



A test vial of liquid undergoing analysis as part of our water stewardship efforts

Waste Management and Reduction

Halliburton's waste management program employs processes that manage waste from generation to final disposal. These processes include vendor management and the identification, classification, storage, tracking, and minimization of waste. In 2024 we also launched a Waste Management Awareness Training course to help employees who are responsible for waste management understand and comply with Halliburton's waste management standards.

Proper identification and tracking of waste streams enable us to focus our efforts on ways to minimize the volume of waste produced or alternate disposal methods that can reduce our environmental impact. In 2024, we implemented tools and processes to help identify high-impact opportunities and track waste streams at our facilities. Vendor management is also a critical part of our program. We follow an established process to review compliance by vendors who engage in waste transportation, recycling, treatment, and / or disposal on our behalf.

Our 2024 waste generation data encompass all manufacturing locations, all U.S. locations, and any non-U.S. locations with building footprints larger than two acres (8,092 m²) or that facilitate activities with the potential to generate high levels of waste.

Waste Disposal Intensity

MetricTons / Operating Hours



Recycling Oil Waste in Colombia

Our Colombia locations established a collaborative relationship with a vendor who recycles used oil to prevent it from reaching landfills. Since the project began in 2023, our efforts have reduced oil waste directed to landfill by 29% and resulted in recycling 98% of used oil generated.



Angola Sites Work to Minimize Waste

In 2024, our Angola locations took action to reduce waste. They reused wooden packaging and tool crates, replaced disposable dishware with reusable alternatives, reused chemical drums, and collaborated with procurement to identify waste vendors who can help facilitate additional recycling disposal routes.

The Halliburton site in Malembo gave particular focus to reducing wood and plastic waste. The new measures Malembo introduced enabled the site to reduce disposable wood waste by 99% in 2024.

