Public Perception

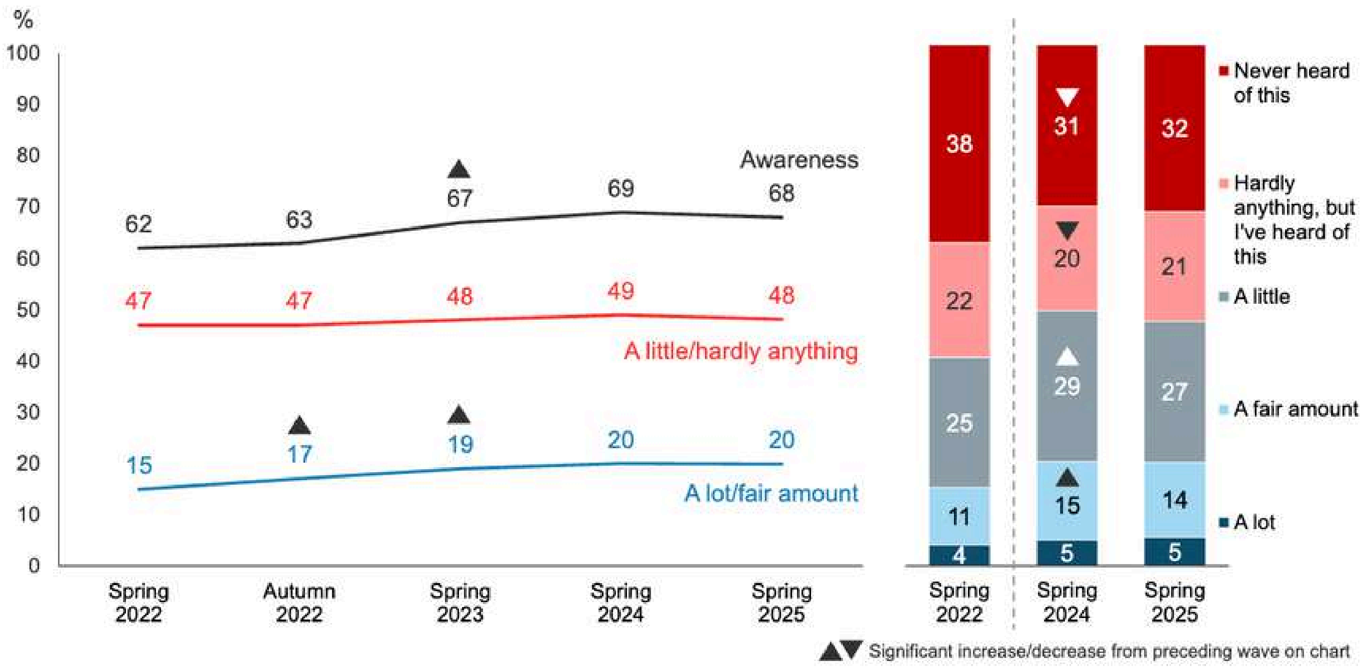
Researcher: Lan Sun. Editor: Lan Sun. Graphic Designer: Lan Sun

INTRODUCTION

As global climate mitigation efforts intensify, carbon capture technology has emerged as a pivotal yet divisive technology for net-zero goals — especially for hard-to-abate sectors like coal-fired power and steel. Unlike theoretical debates, public perception, shaped by real-world project outcomes, cost data, and institutional trust, directly determines its deployment. We will now examine different cases in different regions, on a global scale, to unpack the duality of public views on this climate technology.

PUBLIC AWARENESS: GAPS AND DEMOGRAPHIC DIFFERENCES

Research consistently highlights limited public understanding of CCUS. A 2025 survey by the UK's Department for Energy Security and Net Zero (DESNZ) found 68% of UK adults had heard of carbon capture broadly, but only 20% had a "lot or fair amount" of knowledge about its core mechanisms (post-combustion capture, direct air capture, etc.) — up from 15% in 2022. In Spring 2025, the main reason for supporting carbon capture and storage was a perception that it would help combat climate change and reduce carbon emissions (84%). Other reasons included jobs creation (32%), benefit to the UK economy (32%), providing an opportunity for the UK to be a world leader in this (30%), and re-use of existing infrastructure (29%). Even though there is a continuous growth in public awareness in the country, the knowledge gap still drives oversimplified views about the technology.



Public perception of carbon capture technology varies significantly, ranging from general acceptance in countries with high awareness, such as Norway which has an awareness rate as high as 85%, to lower awareness and lesser acceptance in other regions. However, a lack of public support may weaken political support for technology implementation, reduce deployment speed and affordability, and may limit the variety of usable storage pathways. Engaging with the public may build support for industrial carbon capture installation, improve decision making quality in the government, and foster public trust in institutions. Understanding public opinions of the technology is vital to support public engagement and public support practices.

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HOPE ROOTED IN PROGRESS AROUND THE WORLD

Public optimism ties directly to proven project successes. China's Huaneng Gansu Zhengning Power Plant — launched in September 2025 as the world's largest coal-fired power CCUS project — captures 1.5 million tons of CO_2 annually (equivalent to removing 600,000 cars) with 90% capture rates and fully domestic equipment, boosting public confidence in its practicality. Similarly, Norway's Arctic Light CCS project began storing CO_2 in August 2025 and will scale to over 5 million tons of annual storage by 2028, reinforcing perceptions of carbon capture technology as a scalable solution to climate change.

Focusing on the world's largest coal-fired carbon capture demonstration project, China's Huaneng Gansu Zhengning Power Plant, public perception has transcended beyond citizen attitudes toward carbon capture technology. For local Chinese citizens, the use of domestic technology mitigates fears of dependency on foreign expertise or supply chains, framing the technology not just as an environmental tool but as a marker of industrial progress. This tangibility is critical: local communities and the broader public can observe the plant's day-to-day operation and witness its integration with the city infrastructure — all of which humanize the technology and reduce potential concerns often associated with emerging climate solutions. The project's scale further reinforces optimism: as the largest of its kind, it signals that CCUS is not a niche experiment but a technology capable of addressing emissions from one of the world's most carbon-intensive sectors (coal-fired power), which is central to global net-zero goals.

Similarly, Norway's Arctic Light project reinforces public perceptions of CCUS as a scalable, long-term solution to climate change by demonstrating end-to-end viability. Having begun storing CO_2 in August 2025, with plans to scale to over 5 million tons of annual storage capacity by 2028, the project addresses a core public skepticism: whether captured CO_2 can be sustainably stored at scale. For the Norwegian public, which has long prioritized environmental stewardship alongside energy security, the project's alignment with existing public values makes the project and the technology in general more relatable and trustworthy. Together, these two projects discussed — one focused on large-scale capture from coal, the other on scalable storage — create a complementary narrative: CCUS is not just technically feasible, but capable of being deployed at the scale needed to make meaningful impacts in global emission reductions, which directly fuels public optimism by turning climate anxiety into action and hope.

SKEPTISM ABOUT COST AND SAFETY

Skepticism hinges on measurable concerns that are deeply rooted in real-world data, project failures, and institutional distrust — factors that make public wariness of CCUS not just theoretical, but grounded in tangible risks and unmet expectations. Cost remains the most prominent barrier, as the technology's high price tag stands in stark contrast to more affordable climate solutions, fueling public frustration over resource allocation. According to the IEA, direct air capture (DAC) currently costs between \$140 and \$245 per ton of CO_2 captured. This is exponentially higher than the cost of solar energy, which ranges from \$30 to \$60 per megawatt-hour; to put this in perspective, capturing one ton of CO_2 via DAC costs roughly the same as powering an average household with solar energy for 2–4 months. This cost disparity leads the public to question why governments would prioritize funding for an expensive, unproven technology over cheaper, faster-acting alternatives like solar, wind, or energy efficiency measures. The UK's 2025 decision to commit £9.4 billion over 25 years to support initial CCUS projects exemplifies this tension: while policymakers frame the investment as a necessary step toward net-zero, it has already sparked significant public backlash and opposition. Critics argue that the funds could be better spent on expanding renewable energy infrastructure or supporting low-income households with energy bills. The public generally holds skepticism and untrust toward this significant investment. Moreover, in February 2025, the Parliamentary Public Accounts Committee said it was "left unconvinced" that CCUS is "the silver bullet government is betting on" to achieve net zero, following its inquiry into the technology and the government's major commitment to it.

Safety fears further amplify skepticism, as high-profile project setbacks and concerns about long-term risks have eroded public trust in CCUS's ability to operate without harming communities or the environment. These fears are not unfounded; they are grounded in concrete project failures and legitimate environmental risks. For example, Australia's 2024 Glencore CCS project was formally rejected by Queensland's Department of Environment and Science (DESI) due to credible concerns about its potential impacts on groundwater resources in the Great Artesian Basin — a vital water source for rural communities, agriculture, and ecosystems across eastern Australia. DESI highlighted that the project's proposed storage site posed a significant risk of CO_2 leakage into the basin, which can contaminate drinking water and damage soil quality, threatening local livelihoods and biodiversity. This rejection sent a clear signal to the public that CCUS is not without environmental peril, and it reinforced existing anxieties about the technology's safety.

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SKEPTISM ABOUT COST AND SAFETY

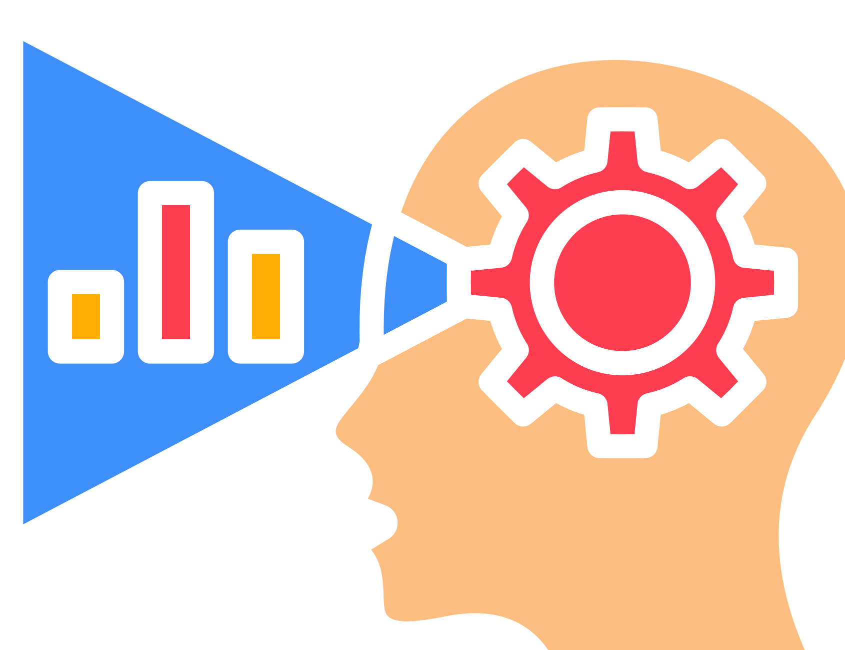
Beyond storage risks, there is public anxiety about CO_2 pipeline leaks, as pipelines are the standard method for transporting captured CO_2 from industrial sites to storage reservoirs. A major leak of CO2 from an ExxonMobil pipeline in Louisiana exposes dangerous safety gaps that should halt the planned multibillion-dollar carbon capture industry, environmental advocates say. An estimated 2,548 barrels of carbon dioxide (CO2) leaked from the Exxon pipeline in Sulphur in Calcasieu parish on 3 April, 2024, triggering an emergency response and alarm among residents who live in close proximity to scores of polluting pipelines, petrochemical and fossil fuel facilities. Pipeline leaks could cause asphyxiation, soil contamination, or even explosions in extreme cases. As a result, 50 residents living in close proximity required hospital treatment afterward. While industry data counters these fears indicates most properly managed storage sites have no leaks, the statistics can do little to reassure the public when the media focuses on such failures to grasp readers' attention and exploit this to drive traffic. Thus, in the long term, even occasional failures, when amplified by media reports, will potentially create a skewed public perception, framing CCUS as inherently risky and overshadowing the industry's safety record.

Greenwashing suspicions persist as a key driver of skepticism, with many members of the public viewing CCUS as a "delay tactic" by fossil fuel companies. Since fossil fuel firms often bankroll CCUS, the public questions their motives — suspecting the technology allows these companies to continue extracting and burning fossil fuels while claiming to be "climate-friendly," rather than transitioning to renewables. This aligns with public concerns that CCUS only treats emissions symptoms (capturing them after production) instead of addressing the root cause: reducing fossil fuel use. Critics note many CCUS projects are tied to existing or new fossil fuel power plants, letting these facilities operate under a "low-carbon" label. This perceived greenwashing erodes public trust in both the technology and the institutions promoting it, as people demand genuine systemic change over incremental fixes that protect the status quo.

CONCLUSION

Carbon capture technology remains a polarizing yet indispensable tool for global net-zero goals, its public perception split between cautious optimism fueled by tangible project progress and deep skepticism rooted in cost, safety, and greenwashing concerns. Proven successes — such as China's Huaneng Gansu Zhengning Power Plant, a landmark in large-scale coal-fired CCUS, and Norway's Arctic Light project, demonstrating scalable CO_2 storage — have built public confidence in the technology's practicality and future promise, while regional disparities in awareness highlight how informed understanding shapes support. Yet this optimism is undermined by valid public worries: exorbitant DAC costs relative to renewables, backlash over large government investments like the UK's £9.4 billion commitment, high-profile safety failures including the rejected Glencore project and ExxonMobil pipeline leak, and suspicions that CCUS is a fossil fuel industry delay tactic, all of which erode trust in the technology and the institutions backing it.

The future of carbon capture hinges on reconciling these dual views through targeted, transparent action: centering public engagement to fill knowledge gaps, balancing CCUS investment with renewable energy expansion to address cost concerns, enforcing rigorous safety standards for infrastructure to alleviate community fears, and decoupling carbon capture technology from fossil fuel business-as-usual to counter greenwashing claims. As a complement — not a replacement — for renewables, carbon capture cannot reach its full decarbonization potential without full-scale public support. By addressing public concerns while amplifying the technology's proven value for hard-to-abate sectors, policymakers and industry can turn skepticism into public support, ensuring carbon capture plays a meaningful, unifying role in the global climate transition.



Carbon Capture - Future Career Outlook

Researcher: Aayush.   Editor: Lan Sun. Graphic Designer: Lan Sun

INTRODUCTION

Scientists have reached a consensus about carbon capture's ability to decrease greenhouse gas emissions. An opportunity has emerged because countries and companies continue to establish goals for achieving net-zero emissions. The upcoming years will see an increased requirement for experts who specialize in carbon capture, utilization, and storage (CCUS) technologies. The field will continue to develop new pathways, which will lead to success for dedicated and skilled people.

LOCAL + GLOBAL DEVELOPMENT

The International Energy Agency states that we must capture over 1.6 billion tonnes of CO_2 emissions annually until 2030 to achieve net-zero targets. A large team of highly skilled workers develops the solution to this problem. The field is expanding rapidly because it provides work options to all professionals who work as chemical engineers for developing capture systems, geologists who create storage facilities, entry-level technicians who assist project managers and data scientists, and policy specialists.

The engineering field plays an essential role in sustaining the industry throughout its upcoming years. Chemical and mechanical engineers develop and maintain direct air capture (DAC) systems and post-combustion capture units through their engineering work. Materials scientists advance carbon-capturing technology to achieve both higher efficiency and lower cost. The need for environmental scientists and remote sensing specialists has increased because monitoring and verification processes will determine whether sequestered CO_2 remains in storage for extended periods.

The increase in demand for educational programs has prompted universities and technical colleges to develop new training programs. Universities now establish dedicated CCUS programs which exist together with their conventional engineering programs while professional certifications for carbon accounting and project management achieve widespread recognition from employers. Workers from oil and gas power generation and mining industries can acquire CCUS roles through basic retraining since their existing skills in subsurface geology and process operations and safety management enable them to do so. The carbon capture technology serves as the most straightforward method for transitioning to clean energy within the energy sector.

Table 2: Direct employment and number of new jobs by sector, by scenario, 2022-2035

	Sector	Employment in 2022A	Current Measures		Opportunity	
			Estimated employment in 2035F	# of new jobs and % change	Estimated employment in 2035F	# of new jobs and % change
	TOTAL	**184,440**	**226,080**	**41,640 (23%)**	**230,940**	**46,500 (25%)**
Established energy sectors	Conventional E&P	73,250	92,990	19,740 (27%)	95,050	21,810 (30%)
	Oil sands	24,650	22,770	-1,880 (-8%)	22,770	-1,880 (-8%)
	Energy services	62,130	80,570	18,440 (30%)	81,750	19,620 (32%)
	Pipelines	13,700	15,650	1,950 (14%)	15,750	2,050 (15%)
	Petroleum refining	8,830	9,040	210 (2%)	9,040	210 (2%)
Emerging energy sectors	Biomass-based fuels	1,750	3,910	2,150 (123%)	4,430	2,670 (153%)
	Low-carbon hydrogen	minimal*	340	340 (all new jobs)	850	850 (all new jobs)
	LNG	minimal*	450	450 (all new jobs)	700	700 (all new jobs)
	CCS	130	370	240 (185%)	600	470 (362%)

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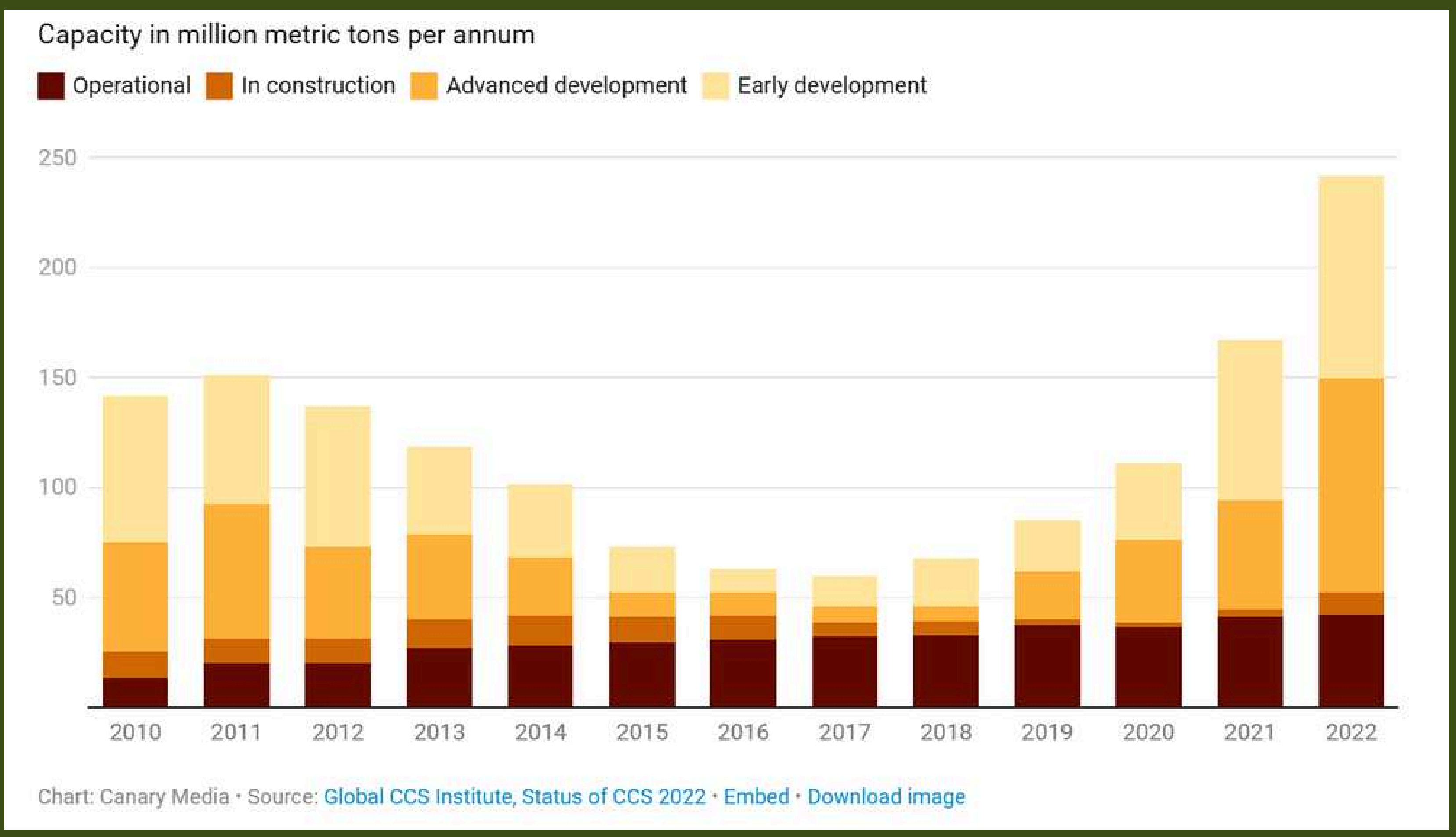
The carbon capture business needs both technical workers and people who develop financial, legal, and policy frameworks for its operations. Carbon markets are becoming increasingly complex, opening opportunities for analysts who understand both climate science and financial aspects. Environmental regulation experts and commercial attorneys who specialize in environmental law create the legal profession's expertise for renewable energy regulation.

The trajectory of carbon capture careers depends on two main factors: policy ambition and investment, which both show increasing progress. The development of bioenergy with carbon capture and storage (BECCS) and ocean-based carbon removal technologies will create new fields that need to develop new skill sets. This opportunity provides early career starters with two benefits: job security and the chance to influence a vital 21st century industry. The field offers opportunities to all who have backgrounds in science, engineering, business, or law because their work creates vital impact.



As global warming continues to rise, the need for effective capturing techniques will rise simultaneously. With that, many opportunities will continue to arise with increasingly important roles in the process of ensuring effective carbon capture.

Review Test

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1. Science (Multiple Choice)
Which of the following is NOT a primary method of carbon capture used in commercial CCS projects?
A) Pre-combustion capture (fuel gasification + syngas separation)
B) Mid-combustion capture (CO2 removal during fuel ignition)
C) Post-combustion capture (chemical solvent separation of flue gas)
D) Oxyfuel capture (fossil fuel combustion in pure oxygen)

2. Comparison (Short Answer)
Name two key environmental benefits of CCS that make it a unique complement to renewable energy (solar/wind) for climate mitigation, especially in hard-to-abate sectors.

3. History (Short Answer)
What is the name of the world's first large-scale commercial CCS project, when was it launched, and where was it located?

4. Risks (Short Answer)
Identify three major environmental/operational risks associated with underground CO2 storage for CCS, and briefly explain one ethical/economic risk of widespread CCS adoption.

5. Future (Essay, 3–4 sentences)
Explain how AI and IoT can address key technical challenges of CCS (e.g., efficiency, safety, storage). Also, note one barrier to integrating these digital technologies with CCS.

6. Politics (Multiple Choice)
The 45Q Tax Credit (U.S.) and CCUS ITC (Canada) are key policy supports for CCS. What core financial incentive do both programs provide to companies adopting CCS/CCUS?
A) A complete ban on carbon taxes for CCS-equipped facilities
B) Tax credits/rebates for CCS equipment and CO2 storage/utilization
C) Free geological surveying for CO2 storage sites
D) Mandatory government funding for all CCS pilot projects

7. Econ 1 (Short Answer)
List three primary barriers that prevent the mass global adoption of CCS technology (related to affordability, manufacturing, infrastructure, or expertise).

8. Econ 2 (Multiple Choice)
What is the projected global CCUS market size by 2030, and what is its expected compound annual growth rate (CAGR)?
A) $17.75 billion, 25% CAGR
B) $80 billion, 6% CAGR
C) $5.82 billion, 30% CAGR
D) $430 billion, 14% CAGR

9. Real-World Applications (Short Answer)
Name two hard-to-abate industrial sectors where CCS is critical for decarbonization, and describe one key CCS application in power generation that enables negative emissions.

10. Public Perception (Short Answer)
Identify two main drivers of public skepticism toward CCS, and one example of a successful CCS project that has boosted public optimism about the technology's scalability.

11. Future Career (Short Answer)
List four distinct career paths/professional roles that are in high demand for the growing CCS industry (cross technical, scientific, and policy/business fields).

Review Test

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1. Science
Answer: B
Explanation: Mid-combustion capture is not a recognized commercial CCS method; the three primary approaches are pre-combustion, post-combustion, and oxyfuel capture.

2. Comparison
Answers (any two):
1. CCS reduces emissions from existing hard-to-abate industrial facilities (cement, steel) that cannot easily switch to renewables alone.
2. CCS requires less additional land than large solar/wind farms (it retrofits existing industrial/power plants, reducing habitat disruption).
3. CCS enables negative emissions when combined with bioenergy (BECCS), actively removing CO_2 from the atmosphere (renewables only reduce emissions).
4. CCS bridges the energy transition gap by lowering emissions from fossil fuel power plants while renewable infrastructure is scaled up.

3. History
Answer: The Sleipner Project; launched in 1996; located in the North Sea (Norway).

4. Risks
Environmental/operational risks (any three):
- CO_2 leakage (gradual/sudden) leading to toxic gas formation (e.g., hydrogen sulphide) or groundwater contamination
- Induced seismic activity/tremors/earthquakes from underground CO_2 injection
- Pipeline corrosion (from CO_2 + water = carbonic acid) increasing leakage risk
- Harm to local ecosystems/wildlife from accidental CO_2 releases near facilities

Ethical/economic risk (one):
- CCS may be a "quick fix" that delays the transition to renewables, with public funding/tax hikes for CCS diverting resources from permanent climate solutions.
- High federal funding for CCS leads to increased taxes for citizens (criticized as economically unviable by opponents).

5. Future - Sample Answer:
AI algorithms improve CCS capture efficiency by optimizing process parameters (e.g., circulation rates, absorber pressure) and reducing energy penalties, while IoT enables real-time monitoring of CO_2 storage sites to detect leaks or seismic anomalies. AI simulation software also models CO_2 behavior in geological formations to identify safer storage locations. A key barrier is the need for high-quality, cross-domain data for AI/IoT systems — CCS data is often fragmented across industrial, geological, and operational domains, limiting algorithm accuracy.

6. Politics
Answer: B
Explanation: The 45Q Tax Credit (U.S.) offers per-ton tax credits for permanent CO_2 storage/utilization (up to $180/ton for DAC), and Canada's CCUS ITC provides 50–60% tax rebates for CCS/CCUS equipment.

7. Econ 1 - Answers (any three):
- Extremely high capital/operational costs
- Manufacturing limitations (specialized materials/solvents for capture systems are hard to produce at scale)
- Inadequate infrastructure (limited dedicated CO_2 pipeline networks and verified geological storage sites, amassing mostly in North America).
- Lack of technical expertise + weak regulatory frameworks)
- Energy penalty (CCS systems require significant additional energy, reducing plant efficiency and increasing indirect emissions).

8. Econ 2
Answer: A
Explanation: The 2025 global CCUS market is valued at $5.82 billion, with a projected growth to $17.75 billion by 2030 at a 25% CAGR.

9. Real-World Applications
Hard-to-abate sectors: Cement, steel, oil...
Negative emissions power generation application: BECCS (Bioenergy with Carbon Capture and Storage).

10. Public Perception
- High costs of CCS relative to cheaper renewables
- Safety fears (CO_2 leakage, pipeline failures...)
- Greenwashing suspicions

Successful optimistic project (one):
- China's Huaneng Gansu Zhengning Power Plant (2025)
- Norway's Northern Lights Project

11. Future Career
- Chemical/mechanical engineer
- Geologist/geoscientist
- Environmental scientist/remote sensing specialist
- Materials scientist
- CCS policy specialist/regulatory expert

Works Cited

"78% of Carbon Capture Projects Are Used to Boost Oil Production." Euronews, 25 Nov. 2023, www.euronews.com/green/2023/11/25/high-cost-low-profitability-and-storage-challenges-is-carbon-capture-a-realistic-climate-s.

Admin. "Carbon Capture and Storage (CCS): A Comprehensive Overview - UPPCS MAGAZINE." UPPCS MAGAZINE, 16 Mar. 2025, uppcsmagazine.com/carbon-capture-and-storage-ccs-a-comprehensive-overview/. Accessed 31 Mar. 2026.

---. "Carbon Capture, Utilisation and Storage for the Steel Industry." Carbonclean.com, Carbon Clean, 21 July 2021, www.carbonclean.com/insights/steel-carbon-capture.

"Boundary Dam 3 Carbon Capture & Storage Facility: A Case Study." Ccsknowledge.com, CCS Knowledge Centre, 16 Dec. 2025, ccusia.ccsknowledge.com/insight-accelerator/boundary-dam-3-carbon-capture-storage-facility/.

Broecks, Kevin, et al. "How Do People Perceive Carbon Capture and Storage for Industrial Processes? Examining Factors Underlying Public Opinion in the Netherlands and the United Kingdom." Energy Research & Social Science, vol. 81, Nov. 2021, p. 102236, https://doi.org/10.1016/j.erss.2021.102236.

Brown, Aston. "Queensland Rejects Glencore Carbon Capture and Storage Proposal for Great Artesian Basin." The Guardian, The Guardian, 24 May 2024, www.theguardian.com/australia-news/article/2024/may/24/queensland-glencore-carbon-capture-storage-proposal-rejected-great-artisan-basin.

Canada Revenue Agency. "Carbon Capture, Utilization, and Storage (CCUS) Investment Tax Credit (ITC) - Canada.ca." Canada.ca, 2022, www.canada.ca/en/revenue-agency/services/tax/businesses/topics/corporations/business-tax-credits/clean-economy-itc/carbon-capture-itc.html.

Carbon Capture Overview. "Carbon Capture and Storage (CCS) Facts." Carbon Capture and Storage (CCS) Facts, 2019, www.carboncapturefacts.org/storage-overview. Accessed 31 Mar. 2026.

Center for Climate and Energy Solutions. "Carbon Capture." Center for Climate and Energy Solutions, 11 Apr. 2018, www.c2es.org/content/carbon-capture/.

Clean Air Task Force. "L'énergie Nucléaire à Grande Échelle : Une Nouvelle Voie Pour Relever Le Défi Du Climat et Du Développement Humain." Clean Air Task Force, 2023, https://doi.org/1092132/cropped-icon-512-32x32.

Department for Energy Security and Net Zero. "DESNZ Public Attitudes Tracker: Energy Infrastructure and Energy Security, Spring 2025, UK." GOV.UK, 3 July 2025, www.gov.uk/government/statistics/desnz-public-attitudes-tracker-spring-2025/desnz-public-attitudes-tracker-energy-infrastructure-and-energy-security-spring-2025-uk.

Edvardsson, Malin. "CCS, BECCS and DAC - What Is the Difference?" Www.biolinscientific.com, 10 Mar. 2020, www.biolinscientific.com/blog/what-is-the-difference-between-ccs-beccs-and-dac.

"Five Fast Facts about Carbon Capture and Storage (CCS)." Taxpayers for Common Sense, 26 May 2023, www.taxpayer.net/energy-natural-resources/five-fast-facts-about-ccs/.

Forrukh, Mohammad, et al. "Advancements toward Carbon Neutrality for a Sustainable Tomorrow—a Review." International Journal of Low-Carbon Technologies, vol. 20, Oxford University Press, Jan. 2025, pp. 1728–48, https://doi.org/10.1093/ijlct/ctaf106.

Fortune Business Insights. "Carbon Capture and Sequestration Market Size | Global Report [2027]." Www.fortunebusinessinsights.com, Dec. 2021, www.fortunebusinessinsights.com/industry-reports/carbon-capture-and-sequestration-market-100819.

Global CCS Institute. GLOBAL STATUS of CCS 2025 Contents. 2025, www.globalccsinstitute.com/wp-content/uploads/2025/10/Global-Status-of-CCS-2025-report-9-October.pdf.

Global Market Insights. "Carbon Capture and Storage Market, Size Analysis Report 2032." Global Market Insights Inc., Feb. 2025, www.gminsights.com/industry-analysis/carbon-capture-and-storage-market.

Guardian staff reporter. "Carbon Can Be Captured, but It Isn't Worth the Cost." The Guardian, The Guardian, 5 Mar. 2025, www.theguardian.com/environment/2025/mar/05/carbon-can-be-captured-but-it-isnt-worth-the-cost.

Guo, Hui, et al. "World's Largest Coal-Fired Carbon Capture Demonstration Project Begins Operation in Gansu Province, China." China Geology, vol. 8, no. 4, Elsevier, Nov. 2025, pp. 871–72, https://doi.org/10.31035/cg2025151.

IEA. "Carbon Capture, Utilisation and Storage - Energy System." International Energy Agency, 25 Apr. 2024, www.iea.org/energy-system/carbon-capture-utilisation-and-storage.

---. "CCUS in Clean Energy Transitions – Analysis." IEA, 2020, www.iea.org/reports/ccus-in-clean-energy-transitions.

---. "Net Zero by 2050." International Energy Agency, May 2021, www.iea.org/reports/net-zero-by-2050.

Iltaf, Khawaja. "Carbon Capture and Storage: The Past, Present, and Future." TWA, 12 July 2024, jpt.spe.org/twa/carbon-capture-and-storage-the-past-present-and-future.

International Maritime Organization. "Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter." Www.imo.org, 2019, www.imo.org/en/OurWork/Environment/Pages/London-Convention-Protocol.aspx.

Kolbert, Elizabeth. "Climate Solutions: Is It Feasible to Remove Enough CO2 from the Air?" Yale E360, 15 Nov. 2018, e360.yale.edu/features/negative-emissions-is-it-feasible-to-remove-co2-from-the-air.

Lakhani, Nina. "'Wake-up Call': Pipeline Leak Exposes Carbon Capture Safety Gaps, Advocates Say." The Guardian, 19 Apr. 2024, www.theguardian.com/us-news/2024/apr/19/exxon-pipeline-leak-carbon-capture-safety-gaps.

Lebling, Katie, et al. "7 Things to Know about Carbon Capture, Utilization and Sequestration." World Resources Institute, Nov. 2023, www.wri.org/insights/carbon-capture-technology.

"London Convention and London Protocol: International Treaties to Prevent Marine Pollution | US EPA." US EPA, 10 July 2015, www.epa.gov/marine-protection-permitting/london-convention-and-london-protocol-international-treaties-prevent.

LSE. "What Is Carbon Capture and Storage and What Role Can It Play in Tackling Climate Change?" Grantham Research Institute on Climate Change and the Environment, 13 Mar. 2023, www.lse.ac.uk/granthaminstitute/explainers/what-is-carbon-capture-and-storage-and-what-role-can-it-play-in-tackling-climate-change/.

Maqui, Diane Mariella, and Angelo Earvin Sy Choi. "Carbon Capture, Utilization, and Storage: Scientific Basis, Practical Applications, and Climate Role." Chemical Engineering Journal Advances, vol. 25, Mar. 2026, p. 101049, https://doi.org/10.1016/j.ceja.2026.101049. Accessed 30 Jan. 2026.

Markets and Markets. "Carbon Capture Utilization and Storage Market Share, Size | 2022 - 2027." MarketsandMarkets, Sept. 2025, www.marketsandmarkets.com/Market-Reports/carbon-capture-utilization-storage-market-151234843.html.

Mordor Intelligence. "Carbon Capture and Utilization Market Size & Share Analysis, 2031." Mordor Intelligence, 20 Jan. 2026, www.mordorintelligence.com/industry-reports/carbon-capture-and-utilization-market.

Nagireddi, Srinu, et al. "Carbon Dioxide Capture, Utilization, and Sequestration: Current Status, Challenges, and Future Prospects for Global Decarbonization." ACS Engineering Au, vol. 4, no. 1, American Chemical Society, Dec. 2023, https://doi.org/10.1021/acsengineeringau.3c00049.

National Grid. "What Is Carbon Capture and Storage?" National Grid, 26 Mar. 2024, www.nationalgrid.com/stories/energy-explained/what-is-ccs-how-does-it-work.

"New Study Finds Carbon Capture Ineffective and Costly Compared to Investing in Renewable Energy." Environment America Research & Policy Center, 24 Feb. 2025, environmentamerica.org/center/updates/new-study-finds-carbon-capture-ineffective-and-costly-compared-to-investing-in-renewable-energy/.

Olano, Maria Virginia. "Chart: Carbon Capture and Removal Projects Hit a Record High in 2022." Canary Media, canarymedia, 19 May 2023, www.canarymedia.com/articles/carbon-capture/chart-carbon-capture-and-removal-projects-hit-a-record-high-in-2022.

Parker, Grace. "Carbon, Capture, and Storage: History, Current State, and Obstacles for the Future (Part 1) | Environmental Law Institute." Www.eli.org, 27 Dec. 2021, www.eli.org/vibrant-environment-blog/carbon-capture-and-storage-history-current-state-and-obstacles-future-part.

Pashby, Tom. "Spending Review: £9.4bn for Carbon Capture, Usage and Storage Projects | New Civil Engineer." New Civil Engineer, 11 June 2025, www.newcivilengineer.com/latest/spending-review-9-4bn-for-carbon-capture-usage-and-storage-projects-11-06-2025/.

Priya, A. K., et al. "Artificial Intelligence Enabled Carbon Capture: A Review." Science of the Total Environment, vol. 886, Aug. 2023, p. 163913, https://doi.org/10.1016/j.scitotenv.2023.163913.

PS Market Research. "Carbon Capture, Utilization, & Storage Market Report, 2030." P&S Intelligence, 2026, www.psmarketresearch.com/market-analysis/carbon-capture-and-storage-market.

Rasool, Muhammad Hammad, and Syed Abdul Moiz Hashmi. "Carbon Capture and Storage: An Evidence-Based Review of Its Limitations and Missed Promises." Petroleum Research, Elsevier, Oct. 2025, https://doi.org/10.1016/j.ptlrs.2025.09.005.

Rhode, Emily. "Carbon Capture and Storage (CCS) Pros and Cons." Treehugger, 13 Aug. 2021, www.treehugger.com/carbon-capture-and-storage-ccs-pros-and-cons-5120005.

Shawky, Farrah. "New Study Confirms Strong Energy Jobs Growth in Canada to 2035, Biomass-Based Fuels Jobs Set to Double - Advanced Biofuels Canada." Advanced Biofuels Canada, 26 Mar. 2024, advancedbiofuels.ca/cie-workforce-reports/.

SOG. "SynergenOG." SynergenOG, 22 May 2025, synergenog.com/what-is-carbon-capture-utilization-and-storage.

Sverre Alvik. "Carbon Capture and Storage Is at a Turning Point. Here's Why." World Economic Forum, 5 Aug. 2025, www.weforum.org/stories/2025/08/carbon-capture-storage-decarbonization-pivotal-moment/.

"U.S. Carbon Capture and Storage Deployment Fact Sheets." Clean Air Task Force, 12 Feb. 2025, www.catf.us/carbon-capture/us-deployment-fact-sheets/.

Yu, Xiaoming. "World's Largest Coal-Fired Carbon Capture Project in Operation." Chinadaily.com.cn, 2025, www.chinadaily.com.cn/a/202509/25/WS68d4e9a6a3108622abca2e4c.html. Accessed 31 Mar. 2026.