ENERGY
Carbon Capture, Utilization and Storage

Years of talk about Carbon Capture, Utilization and Storage (CCUS) are finally translating into billions of dollars of business action. Integrated oil and gas companies (IOCs) have announced at least six major carbon capture initiatives in recent months and have committed to as much as 60 percent of capital expenditures in the coming years on low carbon or alternative energy sources.

As Bloomberg Businessweek recently reported, "There are fortunes to be made in the carbon capture gold rush." The time to embrace carbon capture, utilization and storage is now.

Despite international agreements like the Kyoto Protocol and Paris Accords, decades passed with lackluster action by governments. Coupled with advancing technology and increased statutory incentives for climate action, the last five to 10 years saw the private sector step in to fill the void. Businesses and regulators have been eyeing carbon capture as a key catalyst to address global emissions, particularly from 'hard to abate' sectors. For oil and gas (O&G) companies, carbon capture is particularly attractive given its potential to diversify revenue streams during the energy transition, capitalize on tax benefits and incentives and build community goodwill, all while leveraging existing subsurface and engineering capabilities native to the industry.

In response to the demand for O&G companies to deliver on their lower-carbon initiatives, market activity is ramping up quickly. Air Products Inc. recently announced a $4.5 billion hydrogen and carbon capture project in Louisiana that would be one of the largest in the world. Other IOCs have announced major carbon capture deals in recent months including ExxonMobil, Shell, TotalEnergies and Woodside. Meanwhile, BP's recent acquisition of bioenergy leader Archaea for $3.3 billion in cash—a 38 percent premium to Archaea's 30-day volume weighted average share price—serves as the latest evidence of rising investment in the energy transition sector more broadly.

To achieve a 2°C climate scenario, we need to remove CO2 from the atmosphere, and CCUS is one of the few proven removal technologies available. The International Energy Agency's (IEA) sustainable development scenario (SDS) estimates 15 percent of all emissions abatement, or ~5,600 Mtpa, will need to come from CCUS. Global CCS Institute cites there are currently 30 operational facilities with a capture capacity of 42.5 Mtpa. Reaching the IEA SDS would necessitate an increase of more than a hundred times the current operational capacity by 2050. Based on these estimates, the CCUS industry would require more than a $1 trillion of additional investment.

European O&G companies are the early movers in this space, with 35 projects in development globally. Companies in Saudi Arabia, the UAE and other Middle Eastern countries are also accelerating carbon capture and storage investment plans.

Though U.S. O&G companies launched CCUS initiatives later than their European and Middle Eastern counterparts, they are moving quickly and leveraging the Inflation Reduction Act (IRA) to bolster projects. Under the IRA, tax credits for CCUS increased substantially, driving renewed attention to the space in the United States. We estimate the U.S. market size to be upwards of $230B based on current tax incentives of $85 per ton, offering an unusually promising backdrop for carbon capture with ample storage capacity and an abundance of emissions-intensive industrial centers, particularly in areas such as the Gulf Coast.

Trends to Watch

Mergers and acquisitions are an increasingly attractive way for energy majors to quickly boost carbon capture expertise: We believe companies that take a proactive approach to deal flow origination and management will be better positioned to succeed in new energy markets. Screening potential merger and acquisition targets in this new sector is not always straightforward. Companies may need to review hundreds of deals before finding a few that fit with their own goals and culture. Because competition is intense for high-quality opportunities, companies must be able to move quickly and decisively in today's market if they expect to succeed.

Risk appetite will dictate the leaders and followers: Given that the industry is still in its early days, participants need to be realistic about their appetite for risk. As with any emerging market, the first movers and fast followers bear the burden of de-risking the market with the aim of capturing high returns and creating both an economic and capability moat. For companies who can stomach the risk of immature markets and technology, CCUS offers an opportunity to diversify traditional business lines.

The CCUS market, today, is reminiscent of wind and solar in the early 2000s. Pioneering companies with risk appetite entered early and captured the best returns. A decade later, when the asset class became mainstream and attracted more conservative investors, returns had compressed substantially. As wind and solar returns continued to drop, investors were forced to move up the risk curve into development in order to capture sufficient returns. The big difference with CCUS is that O&G companies, who are typically more risk averse, are moving early.

Cultivation of high-performing teams and emerging market flexibility will define a company's ability to compete: From the O&G perspective, a significant advantage of carbon capture is that relevant technical expertise is already on staff within the upstream segment. Nevertheless, winning CCUS teams will need to embrace a startup mentality to ensure their success. Unlike opportunities in traditional O&G, right-sized processes and procedures for CCUS must be developed from the ground up. Additionally, the segment lacks contractual and commercial precedent that companies can lean on. Agility and adaptability in the evolving market will be essential.

Value chain entry points and models will force decisive strategies and continued partnerships: Despite the challenges, this new market offers multiple entry points across the value chain. Companies have successfully established businesses in areas of physical capture of carbon at wellheads and smokestacks; the engineering technology to deploy that capture; the purification and treatment of that carbon; the transportation of carbon via pipeline as well as shipping; and the design, construction and operation of carbon storage facilities.

Organizational Continuums – Traditional O&G vs. CCUS

Traditional O&G	CCUS
Managerial	Entrepreneurial
Risk Managers	Risk Explorers
Rigid	Agile
Returns Driven	Strategy Driven
Process and Structure	Creativity and Innovation
Engineer Led	Commercial Led
Subject Matter Experts	Value Chain Generalist
Bias for Maintaining Control	Partnership Oriented

Because carbon capture projects require significant capital at risk, many companies are creating partnerships and alliances. This strategy of building an ecosystem of partners ensures optimal CCUS infrastructure buildouts to protect margins, creates a sales network across partners and compliment capabilities and skillsets that an individual company may not have.

At Alvarez & Marsal, we translate strategic intent into actionable progress. We guide companies on go-to-market execution, high-performing teams, origination processes and key performance indicators to measure progress.

We tailor every solution to fit company capabilities and talent while designing systems that align with the investment strategy and have the proven track record and specific expertise in this field to successfully guide clients through the birth and expansion of an exciting new business.

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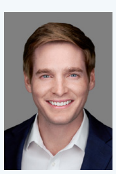

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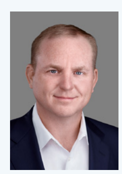

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