



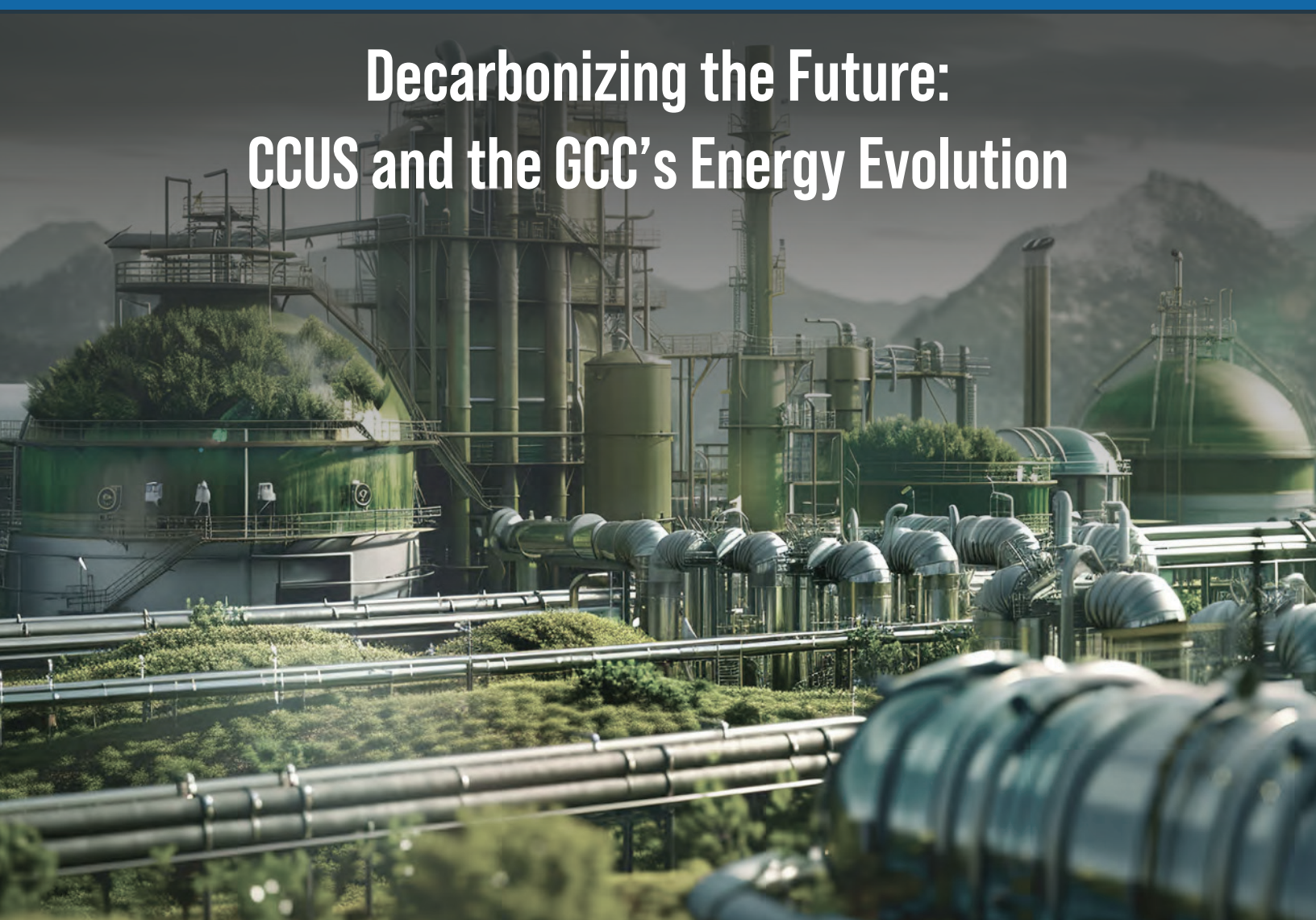
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# INSIGHTS REPORT

## Decarbonizing the Future: CCUS and the GCC's Energy Evolution



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# Introduction

As the global energy landscape undergoes a seismic shift toward sustainability, the Gulf Cooperation Council (GCC) region finds itself at a strategic inflection point in its energy transition journey. As a global leader in hydrocarbon production, the region faces the dual challenge of sustaining economic growth while aligning with global climate commitments such as net-zero goals. This calls for innovative approaches. Carbon Capture, Utilization, and Storage (CCUS) has emerged as a pivotal pathway to reduce carbon emissions from industrial processes and power generation without compromising energy security or economic development. For energy-intensive economies in the GCC, CCUS is not merely a technological choice—it is a strategic imperative.

## GCC Countries' Commitment to Net Zero Goals

In recent years, GCC nations have made bold pledges to achieve net-zero carbon emissions within this century. The United Arab Emirates (UAE) has committed to net-zero goals by 2050, becoming the first in the region to do so, followed by Saudi Arabia and Oman, aiming to achieve net-zero goals by 2060. Bahrain, Qatar, and Kuwait have also articulated ambitions to reduce emissions significantly. These national commitments, underpinned by Vision 2030 frameworks and climate action roadmaps, underscore a paradigm shift in the region's development trajectory.

Decarbonizing hydrocarbon-heavy economies is a complex undertaking. The challenge is compounded by the centrality of oil and gas to national revenues. In this context, CCUS offers a realistic and effective solution. It provides a mechanism to decarbonize hard-to-abate sectors such as oil and gas, cement, steel, and petrochemicals, without dismantling the economic scaffolding of the region.



# The Role of CCUS in Decarbonization Efforts

CCUS technology captures carbon dioxide (CO<sub>2</sub>) emissions from industrial sources and either reuses it in various applications or stores it underground to prevent its release into the atmosphere. This technology is particularly relevant for the GCC region, where industrial activities are a significant source of emissions. CCUS can be integrated into existing infrastructure, making it a viable solution for reducing emissions without disrupting economic activities.

Industries such as cement, steel, and petrochemicals are major contributors to CO<sub>2</sub> emissions. CCUS technology can capture up to 90% of emissions from these sectors, thereby significantly reducing their carbon footprint.<sup>1</sup> For example, the UAE's Al Reyadah project, the first commercial-scale CCUS facility in the Middle East, captures CO<sub>2</sub> from a steel plant and injects it into oil fields for enhanced oil recovery (EOR). This not only reduces emissions but also boosts oil production, creating a win-win scenario for the economy and the environment.

## Preserving the Role of Oil and Gas in a Low-Carbon Economy

The GCC region's vast oil reserves present a unique opportunity for the deployment of CCUS. Oil and gas companies can leverage CCUS to decarbonize upstream operations, extend the lifespan of assets, and enhance their license to operate in an increasingly carbon-conscious market. By injecting captured CO<sub>2</sub> into oil fields, the region can enhance oil recovery (EOR) while simultaneously storing CO<sub>2</sub> underground. This method, known as CO<sub>2</sub>-EOR, has been successfully implemented at Saudi Arabia's Uthmaniyah field since 2015, where it has improved oil recovery rates and reduced emissions.<sup>2</sup> Such projects demonstrate the dual benefits of CCUS in supporting both economic and environmental goals.

## Decarbonizing Hard-to-Abate Industrial Sectors

Industries such as steel, cement, and petrochemicals are vital to the GCC's industrial diversification agendas but are notoriously difficult to decarbonize. CCUS offers a viable pathway by capturing process emissions that cannot be eliminated through electrification or efficiency improvements.

Saudi Arabia has initiated plans to establish a circular carbon economy, integrating CCUS across industrial hubs such as NEOM, Yanbu, and Jubail.

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1 IEA: CCUS in the transition to net-zero emissions

2 KAPSARC: Saudi Arabia seen achieving its CCUS Goals, May 2024

## Enabling Blue Hydrogen and New Value Chains

The hydrogen economy is central to the GCC's energy transition strategy. Producing blue hydrogen — hydrogen derived from natural gas with carbon emissions captured — requires large-scale CCUS infrastructure.

QatarEnergy, leveraging its vast natural gas resources, is exploring CCUS to decarbonize its LNG and blue hydrogen production. The North Field expansion project, combined with CCUS integration, signals Qatar's ambition to lead in low-carbon gas exports.

In collaboration with global players such as Shell and Petroleum Development Oman (PDO), Oman is drafting regulatory and infrastructure frameworks to support future CCUS hubs and blue hydrogen.



## Upcoming CCUS Projects: Momentum Across the Region

A number of high-impact CCUS projects are underway, setting the foundation for a robust CCUS ecosystem in the GCC, showcasing the region's commitment to scaling up this technology. The region's growing number of CCUS projects reflects a shift from pilot-scale initiatives to infrastructure-scale investments.



<sup>3</sup> KAPSARC: Saudi Arabia seen achieving its CCUS Goals, May 2024

<sup>4</sup> MEED: QatarEnergy LNG prepares to receive decarbonisation bids, March 2025

# Unlocking Opportunities

Building a scalable CCUS infrastructure opens new business models around CO<sub>2</sub> transport, storage, and utilization. Engineering firms, technology providers, and logistics companies can position themselves as critical enablers within emerging carbon management ecosystems. Moreover, the development of CCUS clusters and industrial hubs — which pool shared infrastructure across multiple emitters — presents a particularly compelling investment thesis for infrastructure developers and financiers seeking scalable, future proof projects, particularly as global carbon markets expand.

CCUS also serves as a foundational pillar for the emerging hydrogen economy, especially the blue hydrogen production, carbon-derived products, and enhanced oil recovery. These synergies can diversify export portfolios, establish new trade flows, and strengthen the region's role in global energy security.



## CONCLUSION

CCUS technology is no longer a peripheral option — it is a central pillar of the GCC's net-zero pathway. For the energy industry professionals in the current times, the challenge is to move fast, scale smart, and build systems that convert emissions into economic opportunities.

With a vast geological storage potential, competitive energy resources, and ambitious national visions, the GCC is uniquely positioned to lead the global CCUS frontier. The time to invest, collaborate, and innovate is now — because the path to net-zero in the Gulf runs straight through CCUS.

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