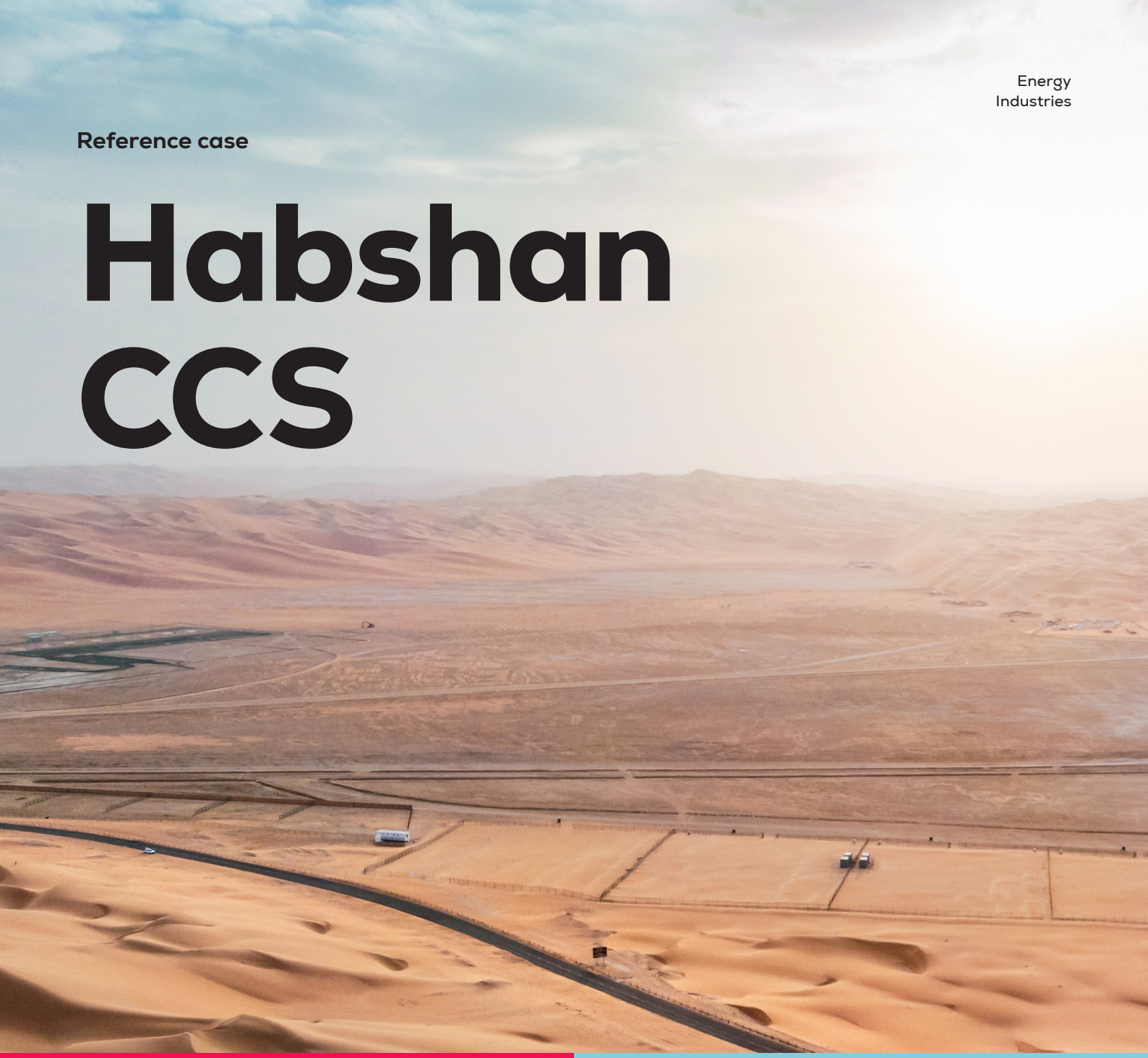
Reference case

Habshan CCS



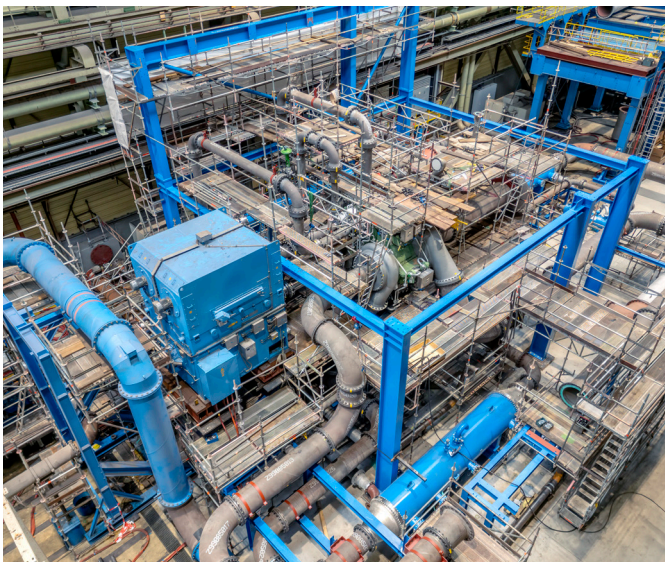
ADNOC is advancing one of the largest carbon capture and storage (CCS) projects in the Middle East and Africa (MEA) region, capturing 1.5 metric tons of CO_2 per year as part of its strategy to reach net zero by 2045. Everllence plays a key role in this flagship decarbonization project, delivering high-performance integrally geared (RG) compressor technology that ensures reliable, efficient CO_2 compression for permanent storage

Key facts

- End customer: ADNOC Gas
- Location: Habshan, Abu Dhabi, UAE
- Project scope: 1x RG 90-8
- Application: CO_2 transport and storage for enhanced oil recovery;
- CO_2 capture capacity: 1.5 metric tons per year
- Project status: under construction on site

Everllence

Driving net zero through industrial-scale CCS





ADNOC's road to net zero by 2045

Through the Habshan 5 CO_2 recovery and injection project, ADNOC aims to industrialize CCS as a core pillar of its long-term decarbonization strategy. The project is designed to capture large volumes of CO_2 directly from industrial point sources, safely compress the gas, and permanently store it in deep geological formations. In doing so, ADNOC addresses a significant share of the hard-to-abate process emissions associated with gas processing and energy production.

By scaling up integrated CCS projects such as Habshan 5, ADNOC will substantially increase its installed carbon capture capacity while systematically reducing the greenhouse gas intensity of its operations. The project contributes directly to ADNOC's target of reducing GHG emissions intensity by 25 % by 2030 and represents a key building block on the company's road to net zero by 2045. Habshan 5 demonstrates how ADNOC is translating its climate ambitions into robust, large-scale industrial infrastructure with measurable and lasting impact.

Performance data

- Medium: CO_2 mix
- Mass flow: 205,000 kg/h
- Suction pressure: 1.32 bar(a)
- Discharge pressure: 141 bar(a)
- Coupling power: 22,000 kW
- Driver: electric motor

Customer challenge

Carbon capture projects in the oil and gas industry present demanding technical and operational challenges. Large and fluctuating CO_2 volumes must be compressed reliably across multiple stages while managing complex pressure ratios and ensuring stable long-term operation in a critical production environment.

For ADNOC, the objective was to integrate the carbon capture and storage infrastructure seamlessly into existing gas processing operations without compromising plant reliability or performance. This required a highly efficient compression solution capable of delivering industrial-scale performance, high availability, optimized energy consumption, and low maintenance requirements throughout the plant lifecycle. As a critical component of the CCS value chain, the compressor system also had to meet the stringent reliability, safety, and operational standards required within ADNOC's oil and gas infrastructure.

Contributing to a climate-friendly future

Everllence compressor solutions play an active role in enabling more sustainable and environmentally responsible industrial processes. By providing efficient and reliable compression technology for CCS applications, Everllence helps reduce CO_2 emissions at the source and enables captured CO_2 to be prepared for permanent geological storage. This avoids a significant portion of otherwise hard-to-abate emissions from industrial gas processing and contributes to the protection of natural resources.

By supporting large-scale CCS infrastructure, Everllence helps reduce the environmental footprint of industrial facilities and creates tangible benefits for operators, employees, and society. In this way, the company contributes to resilient, future-ready infrastructure that helps deliver global climate goals and supports the transition toward a low-carbon energy system.

Main technology features

The Everllence compressor solution for large-scale CCS applications combines efficiency, reliability, and scalability. At its core is an RG centrifugal compressor that enables individually optimized compression stages and high aerodynamic efficiency across a wide operating range. Engineered for continuous operation at high CO_2 mass flows and pressures, the technology meets the demanding boundary conditions of industrial carbon capture and injection projects.

Its compact layout, mechanical robustness, and low vibration characteristics support long-term operational stability and safe plant operation. Together, these features make the Everllence solution a proven and future-ready choice for customers seeking to scale CCS infrastructure with reliable compression technology.

Everllence compressor expertise

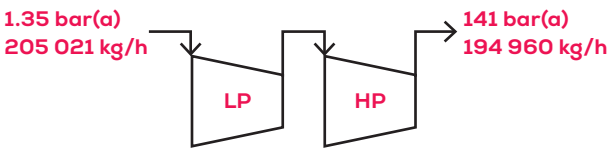
For the Habshan 5 CO_2 recovery and injection project, ADNOC selected an Everllence RG centrifugal compressor specifically engineered for large-scale, continuous CO_2 service. The multi-stage compression design efficiently conditions high CO_2 mass flows to injection pressure and forms a reliable backbone of the CCS value chain from capture to permanent storage.

Everllence assumed responsibility for engineering, integration, testing, and performance validation, ensuring full compliance with API 617 requirements. For ADNOC, the solution provides reduced energy consumption per metric ton of CO_2, high availability, and stable operation under changing process conditions. The proven technology enhances operational safety, minimizes lifecycle costs, and provides a dependable working environment for operators. It also supports the scalable, efficient, and reliable expansion of ADNOC's CCS infrastructure, contributing directly to the company's environmental targets and long-term net zero ambitions.

Everllence CO_2 compressor RG90-8

The CO_2 compression unit receives an inlet stream consisting of approximately 90 % CO_2 and 10 % water vapor from the upstream process. The stream enters an eight-stage RG compressor driven by an electric motor, where the pressure is increased from approximately 1.35 bar(a) to 141 bar(a). The compressor is divided into two sections. The first section consists of five compression stages with interstage coolers installed between each stage. As the gas is cooled after each compression step, water vapor condenses in the coolers and connecting piping and is subsequently separated from the process stream.

Before entering the second compression section, which consists of three additional stages, the remaining moisture is removed in the drying unit. This ensures that the gas entering the high-pressure section is essentially free of water, preventing condensation and protecting downstream equipment. After final compression, the resulting gas stream contains more than 99.9 % CO_2 and is discharged at approximately 141 bar(a) for further processing or transportation.



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