

# BP Oman Achieves Significant Reduction in CO<sub>2</sub> Emissions for the Khazzan Project

Fit-for-basin well cleanup solution enables zero-flaring delivery of new wells to central production facility

**The use of the green completions technique in the Khazzan Field proved to be an opportunity for Schlumberger and BP Oman to collaborate on adapting a well cleanup solution to successfully reduce greenhouse gas (GHG) emissions.**

## GHG emissions reduction goal

As part of BP's commitment to advancing a low carbon future, BP operations around the world are striving to make a meaningful contribution to reduce GHG emissions. For BP Oman, a major GHG-emitting activity is associated with flaring in cleanup operations for new wells. For this scenario, BP Oman is taking the lead to identify and implement proactive ways of reducing GHG emissions in Khazzan Field for new well cleanups.

## Introducing green completions

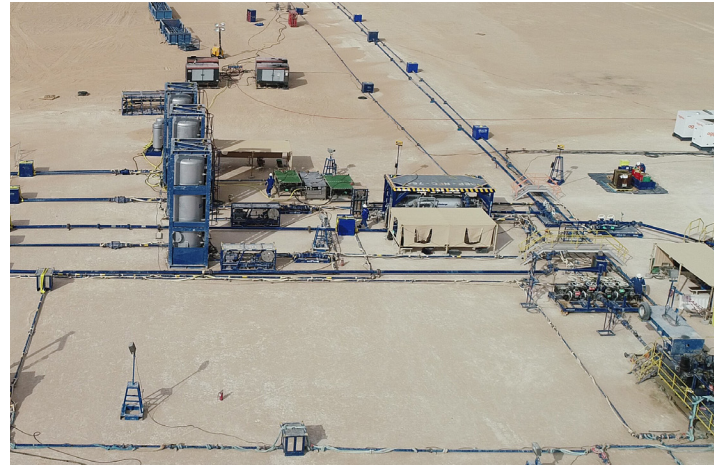
Supergiant Khazzan Field is characterized by tight reservoirs that require hydraulic fracturing to release the gas. After fracturing, wells are tested and cleaned up by the conventional method of flaring and burning the well fluids, which are gas and produced condensate. This results in the release of GHG to the atmosphere. To eliminate these emissions, BP Oman introduced green completions to Khazzan Field. The green completions technique redefines well testing from a GHG-producing activity to one that prevents GHG emissions by routing the hydrocarbons to the production facility.

## Collaborative design for challenging conditions

BP Oman engaged with Schlumberger to develop a fit-for-basin solution to clean up and produce gas from Khazzan Field after fracturing. All modifications and design were performed through the Schlumberger RapidResponse\* customer-driven product development process to enable solids-free produced hydrocarbons at optimal conditions for combination with the processing facility pipeline.

The residual solids from stimulation operations that are often present in the fluid flowstream pose a risk to system integrity and can compromise process lines and production facility equipment. To address this risk, Schlumberger designed and installed an integrated separation, filtration, and acoustic monitoring system for the well testing solution.

One challenge was the relatively high separating process pressure needed, which demanded a specific well test design that didn't exceed the process facility gathering system design pressure. A solution was developed by combining large-bore temporary pipelines and manifolds with a digitally enabled, high-capacity four-phase horizontal separator equipped with autonomous meters providing real-time measurements



*Schlumberger and BP Oman collaborated to deliver a fit-for-basin zero-flaring solution for the Khazzan Field.*

**BP's ambition is to be a net zero company by 2050 or sooner and to help the world get to net zero. Schlumberger shares BP's commitment to low carbon and is committed to set a science-based target by 2021 and update the CO<sub>2</sub> emissions footprint ambition accordingly.**

and monitoring efficient separation of the well effluent phases to deliver hydrocarbons at export specifications.

The design also enhanced process safety by incorporating 6-in safety valves in the electronic emergency shutdown system to address the high volume of hydrocarbons in the pipelines.

## Project success contributes to low carbon goals

Schlumberger well testing solutions continue to operate at Khazzan Field and have set a new bar for operational efficiency and service delivery by improving customer performance. In 2019, the green completions well cleanup technique has been applied to 10 wells for flowback to clean up for production and reservoir testing. The result is more than 80,000 t of CO<sub>2</sub> emission reduction. This is equivalent to taking nearly 18,000 cars off the road for a year.