A leader in lower upstream carbon intensity operations

Our upstream low carbon intensity provides Aramco with an inherent competitive advantage in the future energy landscape. It is the result of our unrivaled initiatives, which start at the subsurface.

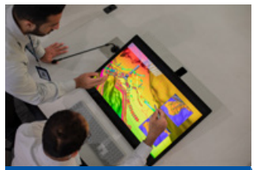
These endeavors range from how we manage our reservoirs and the technologies we use to aid in water management, to our investment in megaprojects, infrastructure and digital solutions which help us reduce and manage our emissions at the surface.

Oil and gas reservoirs are thousands of feet below the surface. They are complex, made of different rocks and fluids, and are therefore dynamic. The technologies it takes to map, navigate and target specific zones in the subsurface is our specialty.

We devise field development plans to ensure the health and sustainability of our reservoirs using the latest technologies, while keeping our energy and emissions intensity in mind.

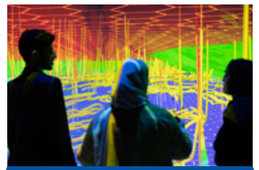
Managing emissions begins at the subsurface

All of our production strategies have enabled outstanding water management performance throughout our reservoirs over many decades. Produced water management plays a key role in lowering carbon intensity, by reducing energy demand to lift fluids, separate, treat, and dispose or reinject the produced water.



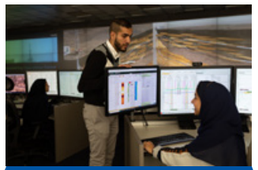
Sustainable reservoir management

Our philosophy of sustainable reservoir management is what sets us apart. Instead of maximizing production from our fields, we prioritize the long-term health of our reservoirs, and opt to produce at lower rates, which prevents premature water breakthrough and can potentially and irreversibly damage reservoirs.



Advanced reservoir modeling (TeraPOWERS)

To optimize our well placement and field development plans, we use advanced simulators, such as TeraPOWERS, which can predict water movement within the reservoir and help to optimize production efficiency.



Geosteering and multilateral wells

Using real-time data, our engineers and scientists can steer multilateral wells with maximum reservoir contact, resulting in precise well placement. This helps target hydrocarbon zones, while minimizing the energy-intensive production of associated water.

Advanced smart well completions

Our production wells utilize advanced valves and devices, which can detect and manage unwanted water production at the subsurface. This reduces power consumption and CO_2 emissions.

Investing in infrastructure, technologies, and digital solutions

Our investments in infrastructure to capture and reduce flared gas, along with our continuous development and deployment of digital solutions to monitor, manage, and reduce our energy intensity and flaring emissions sets us apart from most producers. In 2019, Aramco was benchmarked[1] with the lowest energy intensity among major oil and gas producers, and we have maintained a flare volume of <1% of total raw gas production since 2012.

Master Gas System

Launched in 1975, the Master Gas System is one of the biggest projects in Aramco's history, and has been integral to transforming the Kingdom's energy mix. The system allows the Company to utilize the gas it produces, rather than flaring it, and has resulted in an estimated annual avoidance of flared gas equivalent to 100 $MMtCO_2e$ a year.

Flare gas minimization and recovery

All our facilities have flare minimization roadmaps, and many of our plants are equipped with Flare Gas Recovery (FGR) systems to further reduce flaring.

Digital solutions and real-time monitoring

Aramco deploys a vast array of digital solutions to optimize energy efficiency, including technologies of the Fourth Industrial Revolution (4IR), such as cloud computing, AI, and Big Data. These solutions allow us to monitor and mitigate flaring, reduce CO_2 emissions, and enhance productivity.

Leak Detection & Repair (LDAR)

The LDAR is a robust program to proactively monitor and repair methane leaks. Millions of points are surveyed annually in every producing facility to ensure that we identify and swiftly repair any potential leaks. This is one of the reasons we achieved and continue to maintain our low upstream methane intensity (0.05%).

1. Benchmark by Solomon Associates