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MINISTRY OF ENERGY

المملكة العربية السعودية
KINGDOM OF SAUDI ARABIA

Methane Emissions Mitigation in the Oil and Gas Industry in Saudi Arabia

Saudi Arabia – GMI SC Update
March 2024

www.moenergy.gov.sa

KSA has maintained an upstream methane intensity[1)] of 0.05% in 2022, which is already well below the OGCI ambition to achieve 0.20% by 2025

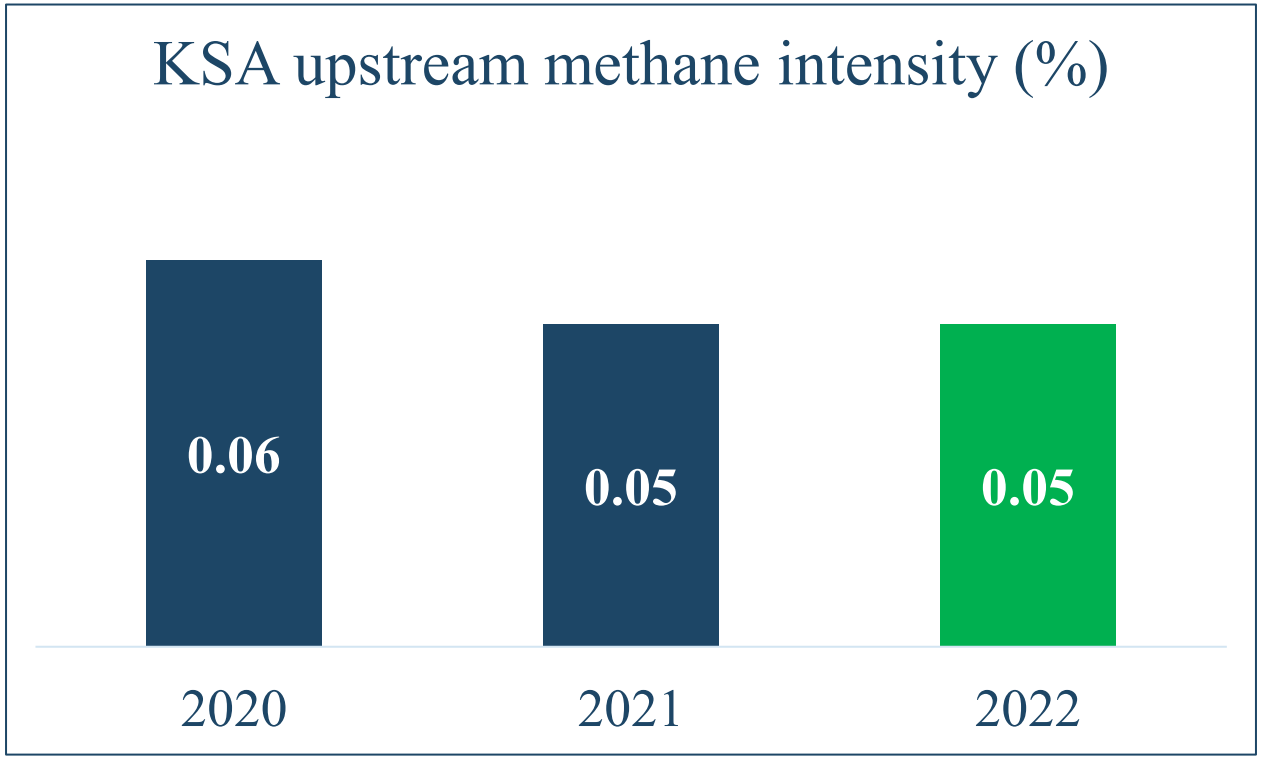
KSA's upstream methane intensity and reduction efforts

This has been achieved through:

1. Flare minimization
2. Leak detection and repair programs and deploying breakthrough technologies

And will be enhanced by:

3. Commitments and pledges



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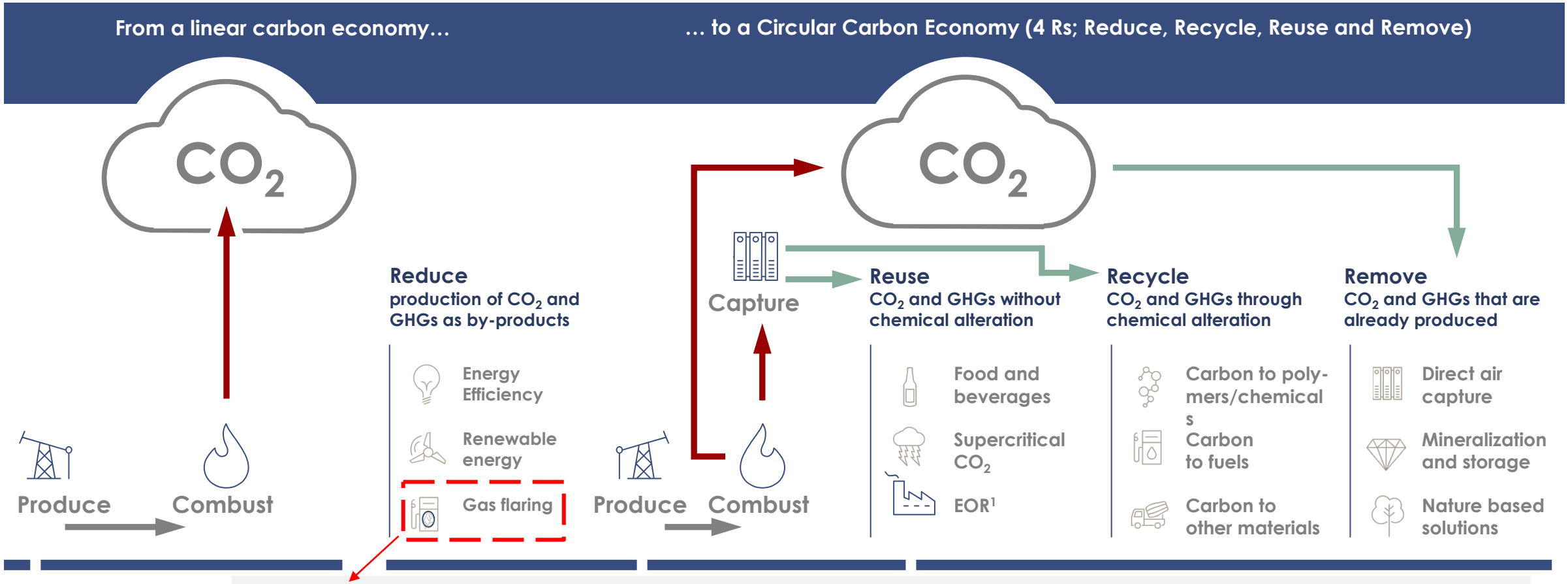
1) Methane emissions from upstream operations per volume of marketed natural gas

Why flaring? KSA has adopted the Circular Carbon Economy (CCE) approach in 2020 to achieve net-zero by 2060. Monitoring flaring "Reduces" emissions.



Flaring can also result in methane emissions in the case of incomplete combustion and therefore it is important in the context of methane emissions.

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1) EOR: Enhanced Oil Recovery

KSA has reduced its flaring intensity[1] in 2022 to 4.61 scf/boe (the lowest ever) compared to 5.51 scf/boe in 2021 – And is committed to reach ZRF[2] by 2030

Flare minimization achievements and targets

The master gas system

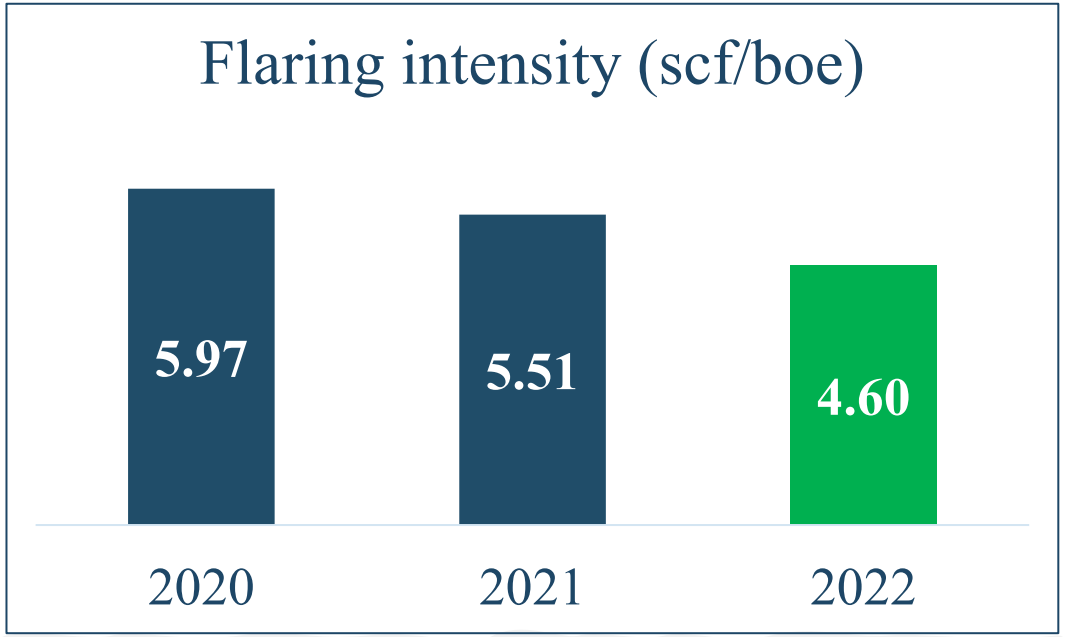
Developed in the 1970s to capture and reuse gas, which eliminated associated gas flaring

The flare minimization roadmaps

A comprehensive flare minimization roadmap has identified priorities, plans and targets for all facilities, which led to maximized flaring reduction

The flare gas recovery systems (FGRS)

Significant investments, installations and improved operations of in-house FGRS across several facilities. Two new FGRSs were installed in 2022



A flare volume of < 1% of total raw gas production has been maintained since 2012

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1) Volume of hydrocarbon gas flared in the oil and gas industry per barrel of oil equivalent produced; 2) ZRF = Zero Routine Flaring

In addition, a comprehensive LDAR (leakage, detection and repair) program covering all operating facilities and tagging millions of components is deployed

Methane leak detection and repair program

The leak detection program…

Detect & quantify

Repair leaks

Verify leak reduction

…is exhaustive by design

- LDAR was applied to **all operating facilities in KSA and thousands of points** (valves, flanges, connectors, pumps, compressors, and tanks) were surveyed to minimize methane leaks
- The LDAR program was launched on all oil and gas operating facilities in **2018**

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1) LDAR = Leak Detection and Repair

Implementing LDAR (leakage, detection and repair) program has several benefits and some challenges that can be overcome by complementing technologies

Methane leak detection and repair program

1 | **Reduction of fugitive emissions**

2 | **Reduction of product losses**

3 | **Assurance of health and safety for facility workers and operators**

Challenges: LDAR is a highly demanding program since it entails manual data collection, reporting, and is labor-intensive. It can be complemented by technologies like satellite, drones, etc.

1) LDAR = Leak Detection and Repair

Striving for even more, KSA pledged to reduce upstream methane emissions to near zero and to participate in the efforts to cut 30% of methane emissions by 2030

KSA's methane commitments and pledges

Near zero-methane initiative

OIL AND GAS CLIMATE INITIATIVE

Saudi Aramco is an **establishing member** of the **zero-methane initiative**

The global methane pledge

Global Methane Pledge

Saudi Arabia is a **participant** in the **global methane pledge**

Zero Routine Flaring initiative

THE WORLD BANK
IBRD • IDA

Saudi Aramco is committed to the World Bank's **"Zero Routine Flaring by 2030"**

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Thank You

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