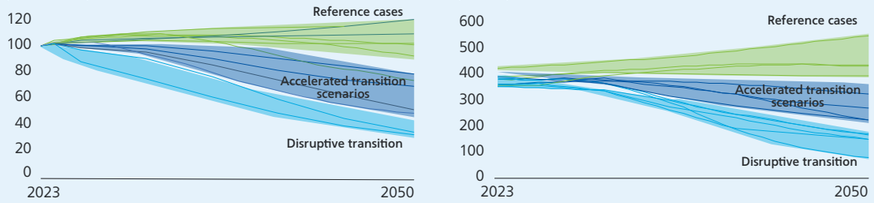
Positioning Aramco for the future

Oil and gas will play an essential role for a practical, stable, and orderly energy transition

A vast range of projections exist for global energy demand indicating that oil and gas is expected to continue to be an essential part of the mix.

Global total oil and gas demand by scenario, 2023-2050



1. These projected scenarios are based on publicly available scenarios from Energy Information Agency (EIA), S&P Global, and our peer companies.
2. These projected scenarios are based on publicly available scenarios from EIA, WoodMac, Rystad, and our peer companies.

What are these scenarios?

They are alternative pathways depicting future energy landscapes. These scenarios can broadly be categorized into three groups. Reference case scenarios depict a landscape that assumes slow incremental development in line with past trends, with new developments that have a high probability of occurring in the future and hydrocarbons continuing to play a major role in the energy mix. Accelerated transition scenarios project a phasing down of hydrocarbons which contrasts with the historical trend of adding new sources of energy, but never phasing out existing sources of energy. Disruptive transition scenarios which are a goal-seeking process of 'what needs to be done' to reach net-zero emissions by 2050 rely on technological breakthroughs and forceful displacement of existing energy systems, but lack plausibility, a key criterion for developing scenarios. Under all projected scenarios above, oil and gas is expected to continue to play an eminent role in meeting global energy demand.

Why oil and gas is expected to be part of the energy mix?

Oil has maintained the largest share in the global energy mix for almost six decades and the share of natural gas is continuing to increase. The global transportation system is almost exclusively dependent on oil, while many hard-to-abate sectors depend on oil for its superior energy-density properties. Electrification of road vehicles targets only about one-quarter of total oil demand. Despite impressive growth over the past few years, electric cars are not expected to offset energy demand growth.

Beyond a source for energy through combustion, the role of oil and gas is set to evolve in lockstep with a transition to lower emissions. A 'materials transition' will see a significant increase in demand for both existing and alternative materials, and this will be key to enabling the wider energy transition. Nonmetallic and carbon-based materials have numerous strength and lightweight benefits, and have the potential to increasingly supplement and displace materials such as steel and cement, which are more GHG emission intensive across their life-cycle.

Natural gas will help facilitate a shift to lower emissions by replacing higher carbon-emitting coal in electricity generation. Gas will also remain a critical feedstock for fertilizer production – important to meeting the world's growing demand for food as the global population continues to grow.

The continued presence of hydrocarbons in the energy mix will necessitate that emissions management play an increasingly important role going forward with investments into CO_2 removals and offsets.

How do we use scenarios?

Aramco's in-house experts develop scenarios using advanced tools and models. These scenario narratives are founded on the energy-trilemma framework developed by the World Energy Council. They not only depict the trade-offs between affordability, security, and sustainability but also find sweet spots where the trilemma can potentially converge. These scenarios help us benchmark against consensus views and evaluate their plausibility with ongoing policy developments, technological progress, and investment levels.

What do these scenarios tell us?

Scenarios tell us the window of uncertainty and possible outcomes in our business landscape. They also assist in assessing the resilience of our current business and future investments. Aramco's hydrocarbon products have one of the lowest upstream carbon intensity among its peers. As Aramco continues its efforts to enhance its reliability and upstream carbon intensity, these two factors will potentially make our operations resilient under the evaluated scenarios.

Our ambition: to be the supplier of choice for oil and gas with lower upstream production carbon intensity

With one of the lowest upstream carbon intensity and cost per barrel in the world, we will continue to demonstrate leadership in supporting a practical, stable, and orderly energy transition.

■ For more information about our strategic approach **see page 14**

Lower upstream carbon intensity

Upstream carbon intensity
(kg CO_2e/boe)
9.6**

Upstream methane intensity
(%)
0.05

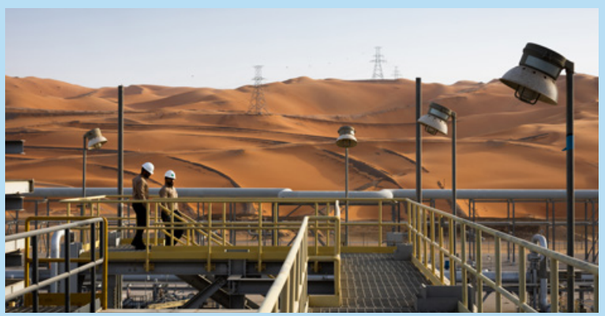
Low cost and high capacity

Total hydrocarbon reserves
(billion boe)
251.2

Maximum sustainable capacity
(MMbpd)
12.0

Reliability
(%)
99.8
product delivered within 24 hours of the scheduled time

Average upstream lifting costs
($/boe)
3.19



Beyond products

Other ways that Aramco contributes to society

People

73,311
employees

$16,088 million
wages

Governments

$205 billion
payments to the Saudi and foreign governments[1]

Society

$475[2] million
social investment

$202.9 billion
cumulative iktva GDP contribution since 2015

63%
sustainability-related R&D spent

160
schools built and maintained

9 million[3]
hours spent on educating our people (training and development)

** This figure has undergone external limited assurance in accordance to the ISAE 3000 (revised). The assurance report can be found **online** on the Sustainability section of our website.
1. Includes income taxes, royalties, and dividends to the Saudi government.
2. Updated methodology: this is the first year we are reporting on the costs of running Aramco-built schools, as part of our social investment. We have also revised the prior year figure to reflect this change. With this updated methodology, the 2022 figure is now $453 million compared to $370 million under the previous methodology.
3. In line with the new methodology of calculating the training hours, the total number of training hours includes all training offered corporate-wide during the year for all employee categories in addition to trainees and contractors.

Positioning Aramco for the future

Sustainability and our strategy

Increasing shareholder and societal value

Global fossil fuel prices remain volatile. Protracted conflicts in Ukraine and the Middle East have re-emphasized the link between geopolitical risk and energy security.

This has contributed to high inflation, and geopolitical tensions have created significant global energy supply challenges.

This series of deepening shocks, crises, and tensions has underscored the need for a just, orderly, and inclusive energy transition to mitigate anthropogenic climate change while addressing the three elements of the energy trilemma: affordability, security, and sustainability.

Aramco – as one of the world's largest integrated energy companies – is uniquely positioned to address all three elements of this challenge, helping to ensure a secure and more sustainable future for all.

Our upstream carbon intensity is already among the lowest in the industry per barrel of oil equivalent, and we are working to reduce this intensity further. We are pursuing measures to reduce our upstream carbon intensity, including specific measures to reduce our gas flaring and methane intensity.

We are planning to increase our production of natural gas – with a mix of both conventional and unconventional – by more than 60% by 2030. This will support the Kingdom's drive away from crude oil and liquids for power generation.

We are also developing and scaling alternative energies and technologies that are expected to be critical to lowering emissions, including carbon capture and storage (CCS), blue hydrogen, blue ammonia, renewables, and synthetic fuels.

Through this integrated approach, we are facilitating an orderly and practical energy transition while strengthening our unique and central role to meeting the world's growing energy needs.

Our strategic themes

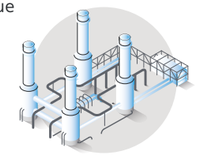
To achieve its vision, Aramco focuses on four strategic themes across its businesses:

Upstream preeminence

As the principal engine of value generation, Aramco intends to maintain its position as the world's largest crude oil company by production volume and one of the lowest-cost producers. The Company's vast reserves base, spare capacity, and unique operational flexibility allow it to respond effectively to changes in demand.

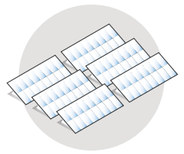
Downstream integration

Aramco has a dedicated system of domestic and international wholly-owned and affiliated refineries that are critical to monetizing its upstream production. Through continued strategic integration, the Company captures additional value across the hydrocarbon chain.



Lower-carbon initiatives

Aramco aims to lower the net GHG emissions of its operations and support the global energy transition through development of a New Energies business that includes renewable power generation and products and solutions that emit less carbon dioxide during production than traditional fossil fuels, across the energy, chemicals, and materials sectors.



Localization and the promotion of national champions

Aramco facilitates the development of a diverse, more sustainable and globally competitive in-Kingdom energy ecosystem to underpin the Company's competitiveness and support the Kingdom's economic development.

Our key enablers

Aramco's strategy requires a number of enablers to be successful, including:

People

Aramco recognizes the need to prepare its workforce of the future to ensure its capabilities match our strategic requirements. This includes advancing technical and professional skills, developing commercial and leadership competencies, supporting the progress of localization, and focusing on diversity and inclusion.

Technology

Aramco's technology program aims to develop new solutions for its upstream and downstream businesses, help diversify its product portfolio, grow its business sustainably, and reach its ambition to achieve net-zero Scope 1 and Scope 2 GHG emissions across wholly-owned operated assets by 2050. The program also aims to enable Aramco to grow its business competitively and sustainably in new areas such as new energies, advanced materials, and digital solutions.

Portfolio optimization

Aramco seeks to unlock value, enhance its capital structure, and reallocate capital to higher growth and return investments. Aramco has a comprehensive and disciplined internal approval process for capital expenditures, new projects, and debt issuance.

Our sustainability focus areas

Climate change and the energy transition

For more information **see page 22**

Safe operations and people development

For more information **see page 50**

Minimizing environmental impact

For more information **see page 64**

Growing societal value

For more information **see page 78**

Governance

For more information **see page 94**