Investing in growth
Innovating for sustainability

Aramco
Sustainability Report 2023
We are Aramco, one of the world’s largest integrated energy and chemicals companies.

Our sustainability focus areas

- Climate change and the energy transition
- Minimizing environmental impact
- Safe operations and people development
- Growing societal value

Our vision

Aramco’s vision is to be the world’s preeminent integrated energy and chemicals company, operating in a safe, sustainable, and reliable manner.

Our mission

Aramco strives to provide reliable, affordable, and more sustainable energy to communities around the world, and to deliver value to its shareholders through business cycles by maintaining its preeminence in oil and gas production and its leading position in chemicals, aiming to capture value across the energy value chain and profitably growing its portfolio.

Our approach to sustainability reporting

In our third Sustainability Report, we present how we integrate sustainability within our corporate strategy and operations; the material sustainability issues that impact our business and stakeholders; a summary of key initiatives; and our sustainability performance during 2023.

Sustainability for Aramco is about being a responsible corporate citizen environmentally, socially and economically. This is underpinned by our four focus areas (Climate change and the energy transition, Safe operations and people development, Minimizing environmental impact, and Growing societal value), where we elaborate on what sustainability means for Aramco and set our relevant ambitions, targets and metrics.

Reporting standards

The following sections of this report have been prepared with reference to and/or guidance from the following frameworks, standards, and guidelines:

- Reporting guidelines for our Environment, Social and Governance (ESG) disclosures: Ipieca;
- Social and Governance (ESG) disclosures: Ipieca;
- Greenhouse Gas Protocol;
- Occupational Safety and Health Administration (OSHA) Standards and the American Petroleum Institute Recommended Practices.

For clarity and transparency, the specific reporting boundaries of each metric for 2023, 2022, and 2021 have been noted in detail on page 100 in the Data section of this report.

Acquisitions made during 2023 will be reportable until after the first full year of operation. Therefore, acquisitions made during 2023 will be reportable from FY2024 onwards. Any wholly owned sites that are not fully operational are excluded from reporting until effective data controls and systems are in place.

The basis of preparation on how we measure and report on the sustainability performance metrics that undergo external independent assurance can be found online.

SAIC and S-Oil’s sustainability data are not in the scope of this report. Both subsidiaries are publicly listed and issue separate annual sustainability reports.

Internal controls and data validation

All figures in this report represent the latest available, internally validated data, unless specifically referenced. Some of the totals presented may reflect the rounding-down or rounding-up of subtotals.

Aramco’s internal reporting systems capture and record the data used in this report. All data has been subject to internal validation, including data reviews by the reporting businesses and internal subject matter experts.

Third-party limited assurance

Third-party limited assurance has been sought against various key performance metrics, including OSHA 300A, in accordance with the revised International Standard on Assurance Engagements 3000 (ISAE 3000 revised). Data that has undergone assurance has been referenced throughout the report. More information on assured data and the assurance statements can be found online.

For our 2023 performance with 2022 and 2021 data, see page 100 in the Data section of this report.

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2023 at a glance

Our business performance

Operations

<table>
<thead>
<tr>
<th>Total hydrocarbon reserves¹ (billion boe)</th>
<th>Maximum sustainable capacity (MMbpd)</th>
<th>Net chemicals production capacity¹ (MMtpa)</th>
<th>Net refining capacity (MMtpa)</th>
<th>Upstream carbon intensity² (kg CO2e/barrel)</th>
<th>Scope 1 emissions¹ (MMtCO2e)</th>
<th>Scope 2 emissions² (MMtCO2e)</th>
<th>Power supplied to the national grid (gigawatts)</th>
<th>Freshwater consumption (million m³)</th>
<th>Reliability³ (%)</th>
<th>Company employees</th>
<th>Nationalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>251.2</td>
<td>12.0</td>
<td>59.6</td>
<td>4.1</td>
<td>9.6</td>
<td>9.9</td>
<td>13.0</td>
<td>1.1</td>
<td>89.9</td>
<td>94*</td>
<td>73,311</td>
<td>50+</td>
</tr>
</tbody>
</table>

Financial

<table>
<thead>
<tr>
<th>Capital expenditure² (billion)</th>
<th>Net cash³ (billion)</th>
<th>Average capital employed⁴ (billion)</th>
<th>Dividends paid⁴ (billion)</th>
<th>Return on Average Capital Employed (ROACE)⁴ (%)</th>
<th>Free cash flow⁴ (billion)</th>
<th>Net income (billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$42 SAR 158</td>
<td>$27 SAR 103</td>
<td>$545 SAR 2,043</td>
<td>$102 SAR 381</td>
<td>22.5</td>
<td>$101 SAR 380</td>
<td>$121 SAR 455</td>
</tr>
</tbody>
</table>

Outcomes and impacts

Operations

- Products produced
  - Crude oil
  - Gas
  - NGL
  - Condensate
  - Chemicals

- Refined products
- Base oils and lubricants
- Electricity
- Blue ammonia
- Nonmetals

Financial

- Net income (billion)
- Free cash flow (billion)
- Dividends paid (billion)
- Return on Average Capital Employed (ROACE)
- Financial:
  - 65.0% return on average capital employed
  - 6.0% net cash as a percentage of net income
  - 94% ROACE

A year of delivering on our strategy

Liquids-to-chemicals expansion
Aramco and its affiliate, S-Oil, commenced construction of the $7 billion Shaheen project in South Korea to develop one of the world’s largest refinery-integrated petrochemical steam crackers. This represents a significant step forward in our liquids-to-chemicals expansion.

Valvoline Inc.’s acquisition
Aramco completed the $2.76 billion acquisition of Valvoline Inc.’s global products business, accelerating the company’s vision to become one of the world’s premier integrated energy and chemicals companies.

Developing new ammonia cracking technology
Signed an agreement with Linde Engineering to jointly build a demonstration plant to test a new ammonia cracking technology in Germany.

Three blue ammonia shipments
Aramco delivered three shipments of accredited, blue ammonia through its affiliates ATC and SABIC Agri-Nutrients.

First-of-its-kind synthetic fuel demonstration plant
Aramco and ENOWA to develop first-of-its-kind synthetic fuel demonstration plant.

Powering engines through lower-carbon fuels
Aramco and Stellantis collaboration finds Aramco-provided synthetic fuel compatible with 24 engine families in Europe. The use of lower-carbon synthetic fuel can reduce CO2 emissions from existing vehicles.

MidOcean Energy acquisition
Aramco enters the global LNG business by signing a definitive agreement in September 2023 to acquire a minority stake in MidOcean, enabling Aramco to tap into international LNG opportunities.

Oil from plastic waste
Aramco, TotalEnergies, and SABIC have for the first time in the Middle East and North Africa successfully converted oil derived from plastic waste into International Sustainability and Carbon Certification (ISCC)-certified circular polymers.

Investment in solar projects
Entered into a shareholders’ agreement to develop two photovoltaic solar projects in Al Shuabah with a planned combined capacity of 2.7 GW.

World Economic Forum (WEF) Global Lighthouse
Yardu Refinery becomes fourth Aramco facility to receive the WEF Global Lighthouse Network status.

Aramco delivered three shipments of accredited, blue ammonia through its affiliates ATC and SABIC Agri-Nutrients.

Aramco and ENOWA to develop first-of-its-kind synthetic fuel demonstration plant.

Powering engines through lower-carbon fuels
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Climate change and the energy transition

We aim to provide affordable, reliable energy as one of the lowest upstream carbon intensity producers of hydrocarbon products, while we continue our ambition to achieve net-zero Scope 1 and 2 GHG emissions across wholly-owned operated assets by 2030.

For more details, see page 22

Minimizing environmental impact

We strive to conserve natural resources, apply circular models across our value chain, and to have a legacy of projects that improve both natural habitats and shared resources.

For more details, see page 64

Growing societal value

We seek to grow value wherever we operate. With our headquarters in Saudi Arabia, we have invested in the Kingdom’s oil and gas ecosystem to enhance the viability of our supply chain, providing employment and economic opportunities to thousands of Saudi nationals.

For more details, see page 78

Safe operations and people development

We aim to provide a safe and respectful working environment for all, on-site and within the community, supported by comprehensive policies, and resources. We strive to support diversity, and empower our workforce.

For more details, see page 50

2023 at a glance

Our sustainability performance

Our focus areas

Aramco has an important role in helping the world navigate the energy transition. What we do as a global community will determine the legacy we leave for future generations.

Our intention is to be a part of the solution that creates a stable energy environment that fosters innovation and growth opportunities in developing and developed countries.

We also aim to deliver a healthy, safe, and rewarding environment for our people, our suppliers and communities where we operate while rehabilitating and mitigating the impact on our natural environment.

We have four focus areas that provide an overview of how Aramco manages its sustainability performance:

• Climate change and the energy transition;
• Safe operations and people development;
• Minimizing environmental impact; and
• Growing societal value.

Underpinning these focus areas are metrics. Increasing metrics is important for us, as we would not be able to manage our sustainability performance effectively, without having meaningful metrics that measure our sustainability impact.

Therefore, we are pleased to share that in our third sustainability report, as we continue to progress on our sustainability journey, we have a 21% increase in the number of metrics in this report (74 metrics versus the 61 metrics in our 2022 Sustainability Report), and have expanded the number of metrics undergoing external assurance to 18 metrics (16 metrics in our 2022 Sustainability Report).

Net positive impact on biodiversity (%) 85.6 ** (2022: 83.7)

Hydrocarbon spills (number) 12 (2022: 10)

Freshwater consumption (m³) 89.9 ** (2022: 98.6)

For more details, see page 22

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90 years driving sustainable growth

1933-1945
The birth of Arabian oil
1933
The beginning: unlocking the Kingdom’s vast oil resources with the crude oil Concession agreement (signed with Standard Oil of California)
1940
Beyond employment: providing additional educational opportunities for Saudis
1940
Boosting agriculture: surveying land and drilling wells to provide valuable water for farmers
1943
Employee health: helping local communities to eradicate malaria

1946-1959
Setting our sustainability foundations
1946
Developing local supply chains: providing technical and financial assistance to Saudi entrepreneurs
1949
In-house training: investing in on-the-job technical and administrative training
1950s
Building leaders: offering scholarships to study in the US to top-performing Saudis

1960-1975
Taking bold leaps forward
1960
Female education: building elementary schools for girls in the Eastern Province
1975
Master Gas System: Decision made to build the Master Gas System, enabling one of the world’s largest gas markets, transforming the national energy mix toward natural gas and building the cornerstone for the economy’s industrialization
1978
Groundwater protection: Establishing the Qurayyah Sea Water Plant to support our operations and conserve groundwater

1976-1989
Becoming the world’s largest oil producer
1976
Became the world’s leading oil producer in terms of volume produced in a single year
1988
Saudi Arabian Oil Company officially established

1990-2004
Protecting resources and reducing emissions
1990s
Protecting ecosystems: responding swiftly and efficiently to the Gulf War oil spills
1993
Reduced lead content fuels: halved the lead content of produced gasoline, and ceased production of leaded gasoline, reducing emissions efficiently to the Gulf War

2005-2020
Innovative sustainable solutions
2009
Flare monitoring system: development of an in-house system driving flare reduction results
2013
Sustainable offices: the new Al-Midra offices achieves LEED platinum certification (Leadership in Energy and Environmental Design)
2015
Accelerating change: founding member of the Oil & Gas Climate Initiative (OGCI)
2016
Hawiyah carbon capture, Utilization and storage pilot: Capacity to capture 880,000 tons CO₂ per annum
2017
Domestic value creation: launch of Ithra (in-Kingdom Total Value Add) program
2018
Nurturing biodiversity: reintroduction of oryx and gazelle in Shaybah Wildlife Sanctuary
2019
Using alternatives: installing the Kingdom’s first wind turbine at the Turafú Bulk Plant
2020
Cultural enrichment: opening of ithra – The King Abdulaziz Center for World Culture
2019
Bringing hydrogen to the local market: inaugurating Saudi Arabia’s first hydrogen fueling station
2020
Blue ammonia: world first shipment of blue ammonia, opening new ways to a more sustainable future

2021-2023
Transformation and energy security
2021
Sudair renewable project: Aramco joined a consortium to develop a 1.5 GW solar plant
First Sustainability Report: Aramco issues its first sustainability report, outlining what sustainability is for Aramco and how we manage it
2022
Net-positive biodiversity: announced ambition to deliver a net positive impact, building on our work in over 185 km² of protected areas
Sustainability Fund: Aramco established a new $1.5 billion Sustainability Fund to invest in technologies needed to address climate challenges
Carbon capture and storage: Signed an agreement to construct one of the world’s largest planned carbon capture and storage hubs
Blue ammonia and blue hydrogen: Granted the first certification for blue ammonia and blue hydrogen for SASREF/SABIC AN
2023
Expanding renewable energy: Agreed to invest in the Al Shuaibah 1 and Al Shuaibah 2 photovoltaic solar projects which are expected to have a combined capacity of 2.7 GW
Circular economy: Aramco, TotalEnergies and SABIC complete MENA region’s first processing of oil from plastic waste at scale to make certified circular polymers

References:
- [Our history](#)
- [Sustainability Report 2023](#)
In 2023, we celebrated the 90th anniversary of the Kingdom signing the Concession agreement. The milestone was an opportunity to reflect on our Company’s remarkable longevity and the source of our enduring success. As we look back with pride over the past nine decades, one common thread emerged: an unwavering commitment to the long-term prosperity of our communities, our customers, and our shareholders. Throughout our history, that commitment has always required us to carefully balance short-term and long-term needs. It is a responsibility that has taken on even greater urgency with the risks posed by climate change. How to facilitate the transition toward a more climate-conscious tomorrow without disrupting the manufacturing, trade, and transportation that are so essential to billions of lives today is one of the defining challenges of our time.

Supporting the energy transition
Aramco is intent on being part of the global solution. With the world’s energy demand continuing to grow, we are striving to ensure reducing emissions—our conventional energy—which remains critical to meeting demand. We are pursuing a variety of pathways to achieve this, including by improving the energy efficiency of our operations, minimizing flaring and further reducing our GHG emissions. These efforts have helped us to attain an upstream carbon intensity that is ranked among the lowest in the industry.

Innovation for sustainability
Aramco’s role as the indispensable partner to a realistic and robust energy transition puts us in a unique position. We take the responsibility seriously and have put sustainability at the heart of our strategy. Old problems are being met with new solutions and I am proud of what we have achieved.

Collaborating to drive more sustainable solutions
Collaboration is a key part of our approach and solutions and I am proud of what we have achieved. Our partnerships also extend to our Downstream and Chemicals projects, where we are delivering unique solutions to support the Kingdom’s Vision 2030. For example, our joint venture with Saudi Aramco, Saudi Basic Industries Corporation, that has a planned investment of $50 billion, will transform Saudi Arabia into a leader in the chemicals industry, driving economic growth and job creation.

Maintaining a culture of safety
Safety is always at the front of our minds and despite a continual improvement for recorded incidents, we continue to improve our safety performance. We are committed to maintaining a culture of safety excellence.

Living our values
This year’s report demonstrates the progress we as a company are making to encourage sustainability in our operations and to support the Kingdom’s sustainable development. We want to pay tribute to those making it happen, as they demonstrate every day and know we will continue to make great strides together.

Amin H. Nasser
President and CEO
Value of oil and gas

Oil and gas: an integral part of everyday life

Oil and gas are not just reliable energy sources; they are also a key component of the thousands of everyday products we need for modern living that influence most aspects of human life.

Ensuring food security
Natural gas is the primary feedstock for synthetic ammonia that forms the basis of fertilizers, essential for high yield food crops ensuring adequate supply and nutrition.

Fueling development
Oil and gas fuel the production of cement and steel, key ingredients for development of essential infrastructure. Oil-based products are used in the manufacture and operation of construction machinery advanced polymer products, and key building materials such as paint.

Enabling global mobility
Long-haul travel remains reliant on oil and gas. Furthermore, oil-based products are essential for value chains of traditional and electric car manufacturing including durable lightweight carbon materials, which enhance energy efficiency along with rubber used in tires, gaskets, and seals.

Connecting people
Hydrocarbons are essential for modern communication. Petrochemical products (e.g., plastics) are used to build data cables that enable internet connectivity and mobile and other computer devices.

Supporting healthcare
Petrochemicals are a key ingredient in pharmaceutical, and medical equipment, from artificial limbs, to heart valves, to PPE.

Making life comfortable
From the clothes we wear, to the health and beauty products we use, to the games we play and sports we pursue, thousands of our everyday products are derived from petrochemicals.

Powering the pathways towards net-zero
A materials transition is essential to enable an energy transition. The manufacture, operation, and transportation of renewable energy infrastructure is, today, part of the oil and gas value chain. Gas is also used in the production of blue hydrogen.

8 billion people depend on stable food security, affordability, and access. Source: United Nations, 2022

4.1 billion tons of cement produced annually, as well as over 1.7 billion tons of steel. Source: Global Cement and Concrete Association, 2024

99% of pharmaceutical feedstocks and reagents are derived from petrochemicals. Source: Canadian Energy Centre, 2024

70% Synthetic fibres that use hydrocarbons make up about 60% of clothing and 70% of household textiles. Source: European Environment Agency, 2021

8 billion tons of cement produced annually, as well as over 1.7 billion tons of steel. Source: Global Cement and Concrete Association, 2024

90 MMt of crude oil equivalent: The oil products and gas required to manufacture the composite fibers needed to have 2.5 TW of installed wind power is equivalent to 90 MMt of crude oil. Source: Smil, 2016

95% of transport energy comes from fossil-derived liquid fuels. Source: Transportation Engineering, 2020

3.6 devices per person Connections per capita by 2023. Source: Cisco Internet Report 2020
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.

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 ‘material 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 CO₂ 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 resiliency 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.
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.

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.

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.

For more information, see page 22

For more information, see page 50

For more information, see page 64

For more information, see page 78

For more information, see page 94
Our approach to sustainability

Our sustainability framework presents the key areas that hold the greatest potential for our business to have long-term positive impacts, connecting the Saudi Vision 2030 and UN SDGs to our four focus areas, which incorporate the material sustainability topics stakeholders expect from us, and we feel a responsibility to address. Our sustainability focus areas and sustainability performance is overseen by governance provided by our Board of Directors.

Our material sustainability topics

Similar to previous years, in 2023, we conducted a materiality refresh to evaluate whether our sustainability focus areas, material topics, prioritized UN SDGs, and metrics remain appropriate and relevant. This assessment is a detailed analysis of the risks and opportunities that interest our stakeholders that we feel we have an influence over and serves as an important process for selecting key sustainability topics for Aramco.

This process includes:
• External stakeholder engagements (details on pages 20 and 21);
• Internal stakeholder engagements (details on page 20);
• Review of existing (e.g., Ipieca sustainability guidelines) and upcoming standards (particularly the International Sustainability Standards Board (ISSB), and regulatory requirements around the world, including Europe, Saudi Arabia, and USA); and
• Peer benchmarking.

Upon completion of our materiality refresh exercise and extensive stakeholder engagement, a summary of conclusions and subsequent actions, where appropriate, are provided below:
• Our four focus areas (plus our focus on corporate governance) are still appropriate and relevant;
• Thirteen material sustainability topics, plus a focus on corporate governance, have been identified as the issues stakeholders expect from us, and we feel a responsibility to address;
• Affirmation that Aramco’s roadmap to establish additional metrics to better monitor, manage and report on our performance under each focus area and material topic is correct. Due to the increasing maturity of existing metrics and the introduction of new metrics by relevant guidelines and regulatory requirements, we have increased the number of metrics in this report to 74 (an increase of 13 metrics from the 61 metrics in our 2022 Sustainability Report); and
• Increasing the number of our metrics in our Sustainability Report undergoing external assurance; from 16 metrics in 2022 to 18 metrics in 2023.

1. The concept of ‘materiality’ refers to the guidance on external reporting from the Global Reporting Initiative, and does not necessarily correspond to the concept of materiality used in connection with Aramco’s financial reports.
2. For more information on our governance, relevant material topics and our governance metrics, please refer to page 94 in this report, and page 90 in the 2023 Aramco Annual Report.
### Impact levels:

#### Our business:
- Very high
- High
- Moderate

#### Our stakeholders:
- Very high
- High
- Moderate

### Mapping our material sustainability topics

#### Impact levels on:
- **Our business:**
  - Very high
  - High
  - Moderate
- **Our stakeholders:**
  - Very high
  - High
  - Moderate

#### Aspect: Climate change and the energy transition

<table>
<thead>
<tr>
<th>Material topic and impact</th>
<th>Relevant metric to monitor performance against material issue</th>
<th>SDG relevant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Climate change (including GHG emissions)</strong></td>
<td><strong>For SDG contribution see page 52</strong></td>
<td><strong>see page 22</strong></td>
</tr>
<tr>
<td>• Scope 1 emissions (market-based) (metric tons of CO₂)</td>
<td>• Energy consumption (MMBtu)</td>
<td><strong>High</strong></td>
</tr>
<tr>
<td>• Scope 2 emissions (location-based) (metric tons of CO₂)</td>
<td>• Flaring intensity (scf/boe)</td>
<td><strong>High</strong></td>
</tr>
<tr>
<td>• Scope 2 emissions (market-based) (metric tons of CO₂)</td>
<td>• Energy intensity (thousand Btu/boe)</td>
<td><strong>High</strong></td>
</tr>
<tr>
<td>• Upstream carbon intensity (location-based) (kg CO₂/boe)</td>
<td>• Energy consumption* (MMBtu/hry)</td>
<td><strong>Moderate</strong></td>
</tr>
<tr>
<td>• Upstream carbon intensity (market-based)* (kg CO₂/boe)</td>
<td>• Patents filed in sustainability technologies* (%)</td>
<td><strong>Moderate</strong></td>
</tr>
</tbody>
</table>

#### Aspect: Workforce protection

<table>
<thead>
<tr>
<th>Material topic and impact</th>
<th>Relevant metric to monitor performance against material issue</th>
<th>SDG relevant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Workforce protection</strong></td>
<td><strong>For SDG contribution see page 58</strong></td>
<td><strong>see page 22</strong></td>
</tr>
<tr>
<td>• Lost time injuries/illnesses rate (per 200,000 work hours)</td>
<td>• Number of employee volunteering hours*, 2</td>
<td><strong>High</strong></td>
</tr>
<tr>
<td>• Total recordable case rate (per 200,000 work hours)</td>
<td>• Number of Aramco facilitated community volunteers*, 2</td>
<td><strong>High</strong></td>
</tr>
<tr>
<td>• Health performance (%)</td>
<td>• Number of active suppliers</td>
<td><strong>Moderate</strong></td>
</tr>
<tr>
<td>• Fatal accident rate* (per 100,000,000 work hours)</td>
<td>• % of active suppliers signed up to Aramco’s Supplier Code of Conduct</td>
<td><strong>Moderate</strong></td>
</tr>
<tr>
<td>• Number of fatalities</td>
<td>• Number of active suppliers</td>
<td><strong>Moderate</strong></td>
</tr>
</tbody>
</table>

#### Aspect: Human rights

<table>
<thead>
<tr>
<th>Material topic and impact</th>
<th>Relevant metric to monitor performance against material issue</th>
<th>SDG relevant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Human rights</strong></td>
<td><strong>For SDG contribution see page 59</strong></td>
<td><strong>see page 22</strong></td>
</tr>
<tr>
<td>• Number of grievances raised</td>
<td>• Number of employee volunteering hours*, 2</td>
<td><strong>High</strong></td>
</tr>
<tr>
<td>• Sites with a grievance mechanism in place (%)</td>
<td>• Number of Aramco facilitated community volunteers*, 2</td>
<td><strong>High</strong></td>
</tr>
</tbody>
</table>

#### Aspect: Labor practices

<table>
<thead>
<tr>
<th>Material topic and impact</th>
<th>Relevant metric to monitor performance against material issue</th>
<th>SDG relevant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Labor practices</strong></td>
<td><strong>For SDG contribution see page 54</strong></td>
<td><strong>see page 22</strong></td>
</tr>
<tr>
<td>• Attraction rate (%)</td>
<td>• Number of people on Aramco sponsored community programs1</td>
<td><strong>High</strong></td>
</tr>
<tr>
<td>• Number of Company employees</td>
<td>• National content</td>
<td><strong>Moderate</strong></td>
</tr>
<tr>
<td>• Number of female employees</td>
<td>• Saudization (%)</td>
<td><strong>Moderate</strong></td>
</tr>
<tr>
<td>• Female (%) of total employees</td>
<td>• Saudization of construction contracts (%)</td>
<td><strong>Moderate</strong></td>
</tr>
<tr>
<td>• Female (%) of total number of new hires</td>
<td>• Saudization of service contracts (%)</td>
<td><strong>Moderate</strong></td>
</tr>
<tr>
<td>• Number of female employees in leadership positions</td>
<td>• Human rights</td>
<td><strong>Moderate</strong></td>
</tr>
<tr>
<td>• Female employees in leadership positions (%)</td>
<td>• % of active suppliers signed up to Aramco’s Supplier Code of Conduct</td>
<td><strong>Moderate</strong></td>
</tr>
<tr>
<td>• Number of contractor employees</td>
<td>• Number of active suppliers</td>
<td><strong>Moderate</strong></td>
</tr>
<tr>
<td>• Employee engagement score (%)</td>
<td></td>
<td><strong>Moderate</strong></td>
</tr>
<tr>
<td>• Total hours of training and development (per employee)</td>
<td></td>
<td><strong>Moderate</strong></td>
</tr>
<tr>
<td>• Employees acknowledging performance review meetings* (%)</td>
<td></td>
<td><strong>Moderate</strong></td>
</tr>
<tr>
<td>• Number of hirers</td>
<td></td>
<td><strong>Moderate</strong></td>
</tr>
<tr>
<td>• Number of apprentices (new intake)</td>
<td></td>
<td><strong>Moderate</strong></td>
</tr>
<tr>
<td>• Number of interns</td>
<td></td>
<td><strong>Moderate</strong></td>
</tr>
<tr>
<td>• Number of nationalities in the workforce*</td>
<td></td>
<td><strong>Moderate</strong></td>
</tr>
</tbody>
</table>

#### Aspect: Economic contribution

<table>
<thead>
<tr>
<th>Material topic and impact</th>
<th>Relevant metric to monitor performance against material issue</th>
<th>SDG relevant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Economic contribution</strong></td>
<td><strong>For SDG contribution see page 64</strong></td>
<td><strong>see page 22</strong></td>
</tr>
<tr>
<td>• Direct economic value generated and distributed ($ million)</td>
<td>• Number of employee volunteers*2</td>
<td><strong>High</strong></td>
</tr>
<tr>
<td>• Total R&amp;D spend ($ million)</td>
<td>• Number of Aramco facilitated community volunteers*2</td>
<td><strong>High</strong></td>
</tr>
</tbody>
</table>

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1. In accordance with our ongoing review of our sustainability performance data, we have determined that the metric “Employees receiving regular performance reviews (%)” reported in 2022 and 2021 should be revised to “Employees acknowledging performance review meetings (%)” in order to more accurately reflect what this metric entails.

2. Increased data management identified that in the 2022 Sustainability Report, Aramco’s volunteering hours consisted of not only employees’ volunteering hours but also members of our communities. Therefore, from 2023 onwards, Aramco will now separately report the ‘number of volunteers’ and ‘number of volunteering hours’ for both employees and members of community volunteering with Aramco.
Stakeholder engagement

Aramco recognizes that there is a social contract between our Company and the society within which it operates. Aramco interacts with a range of stakeholders to ensure that their perspectives are considered in the development of our business plans, sustainability plans, and objectives from project planning, to execution, long-term operations, and customer service. During the year, we engaged with stakeholders on a diverse range of topics.

Communication channels and examples of engagement

- **Our people**
  - Town halls
  - Employee engagement surveys
  - Employee networks
  - Young Leaders Advisory Board (YLAB)
  - Training
  - Internships
  - Human resources
  - Recognition events
  - Senior leadership meetings
  - Safety meetings
  - Quarterly engagement talks on current events
  - Management letters and emails

- **Our customers**
  - Customer feedback forms
  - Face-to-face meetings
  - Regular engagement between sales teams and our business customers
  - Customer service centers
  - Trade shows and conferences
  - Email/newsletters

- **Our suppliers, partners, and contractors**
  - Business performance reviews
  - On-boarding programs
  - Supplier facility visits
  - Workshops
  - Training programs

- **Investors, financial institutions, rating agencies, and insurers**
  - Quarterly earnings calls
  - External disclosures
  - Direct investor communication
  - Annual General Meeting
  - Annual insurance renewals
  - Revolving credit facility meetings
  - Conferences and roadshows
  - Focused investor groups

Discussion topics

- Our vision and mission
- Corporate ethics and values
- Professional development
- Career progress
- Our strategy
- Sustainability
- Remuneration
- Health, safety and environment (HSE) performance
- Industry trends, current events
- Community support/volunteering

Sustainability in action

Strengthening corporate governance across the Middle East

As part of our stakeholder engagement, Aramco is keen to work with local communities to build their capacities and capabilities.

One demonstration of this is our support in the development of effective corporate governance practices as one of the founders of the GCC Board Directors Institute (GCC BDI).

Since its inception, the GCC BDI has grown into one of the leading institutes of directors in the world, helping to improve Board effectiveness and capabilities across the region by training over 3,500 Board directors and executives, including over 2,400 in Saudi Arabia alone.
Climate change and the energy transition

Understanding the subsurface is key to finding optimal locations for geological storage of captured CO₂. CCS is one of the intended levers to reduce our upstream carbon intensity and meet our climate ambitions.
Climate change and the energy transition

There is no one-size-fits-all solution to the energy transition challenge. Instead, there must be a multi-source, multi-speed approach that recognizes the different regional starting points in the energy triad—security, affordability, and sustainability. Among our international oil and gas peers, Aramco is in a leading position with one of the lowest upstream carbon and methane intensities.

We have an ambition to achieve net-zero Scope 1 and Scope 2 GHG emissions across our wholly-owned operated assets by 2050. By 2035, we aim to reduce our upstream carbon intensity by 15% against our 2018 baseline of 9.1 kg CO₂e/boe. We aim to meet our carbon intensity ambition and mitigate 52 MMtCO₂ annually by 2035 from our business as usual forecast emissions.

In 2023, we established the New Energies organization following the endorsement of our long-term strategy to achieve lower-carbon solutions and for Aramco to meet its GHG emissions mitigation and abatement ambitions. Over the next few years, we have allocated around 10% of our capital investments in New Energies to help us progress in our GHG emissions mitigation and abatement journey.1

2023 performance

<table>
<thead>
<tr>
<th>Material issue</th>
<th>2023</th>
<th>2022</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Scope 1 and Scope 2 emissions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>(million metric tons of CO₂)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2050 net-zero ambition across wholly-owned operated assets</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>15% reduction of Scope 1 and Scope 2 upstream carbon intensity emissions by 2023</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Upstream carbon intensity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>(kg CO₂e/boe)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2023</strong></td>
<td>6.73</td>
<td>6.65**</td>
<td>6.73</td>
</tr>
<tr>
<td><strong>2022</strong></td>
<td>9.6**</td>
<td>9.3**</td>
<td>10.7**</td>
</tr>
<tr>
<td><strong>Upstream methane emissions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>(metric tons of CH₄)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2023</strong></td>
<td>27,708</td>
<td>29,193</td>
<td></td>
</tr>
<tr>
<td><strong>2022</strong></td>
<td>26,754</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** This figure has undergone external limited assurance in accordance with the SCA 2000 (rev). The assurance report can be found online on the Sustainability section of our website.
1. In 2023, along with the location-based methodology we have been reporting in our disclosures to date, we have also adopted a market-based methodology to calculate and report on our GHG emissions to avoid double counting of emissions associated with wheeled power, as per the GHG Protocol Scope 2 Guidance. Therefore, the figures reported for upstream carbon intensity and Scope 2 emissions are market-based. For 2022, the location-based figures for total Scope 1 and Scope 2 emissions and upstream carbon intensity are 7.24 MMTCO₂ and 10.7 kg CO₂e/boe, respectively. For 2023, the location-based figures for total Scope 1 and Scope 2 emissions and upstream carbon intensity are 7.13 MMTCO₂ and 10.3 kg CO₂e/boe, respectively.
2. The Jazan Refinery is excluded from our GHG reporting in 2022 and 2023. In 2023, only the stabilized units of Jazan Refinery are included in our GHG reporting.
3. Please refer to page 97 for more information on the New Energies organization.

Performance of our key metrics

Table: Performance of our key metrics

<table>
<thead>
<tr>
<th>Material issue</th>
<th>Relevant metrics</th>
<th>2023</th>
<th>2022</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scope 1 emissions</strong></td>
<td><strong>(million metric tons of CO₂)</strong></td>
<td>54.4**</td>
<td>55.7**</td>
<td></td>
</tr>
<tr>
<td><strong>Scope 2 emissions (market-based)</strong></td>
<td><strong>(million metric tons of CO₂)</strong></td>
<td>13.0**</td>
<td>13.3**</td>
<td></td>
</tr>
<tr>
<td><strong>Scope 2 emissions (location-based)</strong></td>
<td><strong>(million metric tons of CH₄)</strong></td>
<td>16.2**</td>
<td>16.1**</td>
<td></td>
</tr>
<tr>
<td><strong>Upstream carbon intensity (market-based)</strong></td>
<td><strong>(kg CO₂e/boe)</strong></td>
<td>9.6**</td>
<td>9.3**</td>
<td>Upstream carbon intensity (market-based) increased 3.2% and upstream carbon intensity (location-based) increased 3.9% compared to 2022, largely due to higher gas production, processing and storage, and lower overall carbon capture production.</td>
</tr>
<tr>
<td><strong>Upstream carbon intensity (location-based)</strong></td>
<td><strong>(kg CO₂e/boe)</strong></td>
<td>10.7**</td>
<td>10.3**</td>
<td></td>
</tr>
<tr>
<td><strong>Upstream methane emissions</strong></td>
<td><strong>(metric tons of CH₄)</strong></td>
<td>27,708</td>
<td>29,193</td>
<td></td>
</tr>
<tr>
<td><strong>Upstream methane intensity (%)</strong></td>
<td><strong>(metric tons of CH₄)</strong></td>
<td>0.05</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td><strong>Flaring intensity (scf/boe)</strong></td>
<td><strong>(scf/boe)</strong></td>
<td>5.64**</td>
<td>4.60**</td>
<td>Flaring intensity in 2023 was 5.64** scf/boe, up from 4.60** scf/boe in 2022, primarily due to increased maintenance and operational activities, as well as the inclusion of the Jazan Refinery (stabilized unit) in 2022. The 2023 GHG emissions inventory.</td>
</tr>
<tr>
<td><strong>Flared gas (Mmscf)</strong></td>
<td><strong>(Mmscf)</strong></td>
<td>21,500³</td>
<td>23,836³</td>
<td></td>
</tr>
<tr>
<td><strong>Energy intensity (thousand Btu/boe)</strong></td>
<td><strong>(thousand Btu/boe)</strong></td>
<td>15.38</td>
<td>14.62</td>
<td></td>
</tr>
<tr>
<td><strong>Energy consumption</strong> (MMBtu/hr)**</td>
<td><strong>(MMBtu/hr)</strong></td>
<td>85,649³</td>
<td>85,927³</td>
<td>Metric not disclosed previously, therefore no prior year comparative.</td>
</tr>
</tbody>
</table>

** Metric reported for the first time externally.
³ This figure has undergone external limited assurance in accordance with the SCA 2000 (rev). The assurance report can be found online on the Sustainability section of our website.
1. Acknowledging leading Climate Tech investor (Climate45).
2. Jazan Refinery was excluded from our GHG reporting in 2022 and 2023. In 2023, we began reporting associated energy metrics. In 2023, in addition to the energy metric, the stabilized units of Jazan Refinery were included in our GHG emissions and flaring metrics reporting.

Our contribution to the UN SDGs

In 2023, we planted 1.1 million native trees, and approximately 6.5 million mangrove trees in Kingdom, bringing the cumulative total to 4.7 million native trees and over 30 million mangrove trees.

Aramco is collaborating with research centers and industries, aiming to find solutions for climate challenges, and partnering with organizations with a climate focus, such as the OGCI, OGICO, Ipieca and WEF, as part of a wide range of government and private sector collaborations across numerous industries.

To support lower GHG emitting and more affordable energy, we are investing in 12 GW in solar and wind energy by 2030, expanding CO₂ storage capacity (e.g., carbon sequestration) as well as expanding gas production to displace the burning of liquids for power generation in the Kingdom. Aramco Ventures was named as a Top-10 Climate Investor globally by Climate45. Aramco invests in lower-carbon-emitting energy and materials and in finding solutions to the climate challenges facing nations through its $1.5 billion Sustainability Fund. This is expected to create jobs and contribute to economic growth.

As a major producer of oil and gas with one of the lowest upstream carbon and methane intensives among its industry peers, Aramco maintains its goal of mitigating and reducing GHG emissions across its wholly-owned operated assets through a range of initiatives, which include investments in innovative technologies. These efforts also ensure that we align with the Kingdom’s ambitions on climate change.
Climate change and the energy transition continued

Our approach to climate change

As one of the world’s largest integrated energy and chemicals producers, we have scaled our operations to meet growing energy demand across the world, which has been driven by economic growth. Aramco is always seeking ways to improve environmental performance by implementing projects to enhance energy efficiency and mitigate GHG emissions. This forms an essential component of supporting the Kingdom’s target of net-zero by 2060, and our Company’s ambition to achieve net-zero Scope 1 and Scope 2 GHG emissions across our wholly-owned operated assets by 2050.

Our strategic focus is on developing and deploying innovative solutions, optimizing operations, and adopting efficient project designs that aim to mitigate our emissions. We have allocated financial, technological, and human capital to invest at scale to deliver these plans and ambitions. Innovation and new ways of thinking are driven by all levels of Aramco.

Climate change risk and mitigation

Climate change is a top corporate priority for us and we assess this on a medium- to long-term horizon. Our response to climate change is embedded in our business strategy, supported by our climate change and energy transition framework and our five GHG mitigation levers (energy efficiency, flaring and methane reduction, carbon capture and storage, renewables, and natural climate solutions and offsets).

Our climate change and energy transition framework

Our corporate strategy anchors on four strategic themes, two of which are upstream preeminence and lower-carbon initiatives, where we produce hydrocarbons that have one of the lowest upstream production costs and one of the lowest carbon intensities per barrel of oil equivalent in the world, while working with customers along the value chain to offer products that support their ambitions for the future.

Our climate change and energy transition framework is informed by the circular carbon economy principles of reduce, reuse, recycle, and remove. We have four pillars that provide the framework for our climate change initiatives and investments:

Differentiate
A leader in lower upstream carbon intensity operations

1. For more details, view “Managing Risk Exposure” section of the 2023 Aramco Annual Report.

Sustain
Providing customers with lower emissions solutions

Diversify
Developing and growing lower emissions value chains

Enable
Investing in lower carbon emissions technologies and solutions

<table>
<thead>
<tr>
<th>Risk</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy:  Policies restricting or banning use of fossil fuels, or applying a cost on carbon</td>
<td>Climate-related demand scenarios, leveraging our lower carbon intensity and GHG mitigation initiatives, to inform business decision making</td>
</tr>
<tr>
<td>Technology:  Adoption of disruptive technologies and/or slow development of GHG reduction technologies</td>
<td>Accelerated development of our technology portfolios, including synthetic fuels, lower-carbon hydrogen production, liquids-to-chemicals, CCUS and CCS technologies</td>
</tr>
<tr>
<td>Market:  Loss of demand for hydrocarbons as customers move to achieve their GHG targets</td>
<td>Diversification into lower GHG emitting products with longer life cycles, e.g., chemicals and materials supporting the energy transition</td>
</tr>
<tr>
<td>Legal:  Potential exposure to climate-related litigation</td>
<td>Accurate and transparent reporting and disclosures with independent assurance</td>
</tr>
<tr>
<td>Reputation:  Impact on corporate reputation</td>
<td>Stakeholder engagement, including independent external consultants and subject matter experts to advise on reporting and disclosures, and explain the Company’s energy transition pathway</td>
</tr>
</tbody>
</table>
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 unwaviled 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.

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.

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 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.

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.

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.

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.

Our production wells utilize advanced valves and devices, which can detect and manage unwanted water production at the subsurface. This reduces power consumption and CO₂ emissions.

The 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 MMtCO₂e a year.

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

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 CO₂ emissions, and enhance productivity.

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%).
Our net-zero ambition

Aramco’s ambition is to continue to mitigate GHG emissions from our operations and achieve net-zero Scope 1 and Scope 2 GHG emissions by 2050 across our wholly-owned operated assets. We know that meeting our net-zero ambition while continuing to meet global energy demand will be a huge challenge.

Aramco is leveraging its R&D and technology initiatives to develop and implement innovative approaches that could help lower emissions across our industry and have potential application in other industries.

GHG emissions

We are aiming to abate 52 MMtCO₂e per annum by 2035 from our wholly-owned operated assets compared to our business-as-usual 2035 forecast emissions. This abatement will be achieved through energy efficiency projects, flare and methane minimization, carbon capture and storage, increasing renewable energy use, including the use of natural climate solutions, and using offsets to address hard to abate emissions in our operations.

The Company’s GHG emissions management program monitors Scope 1 and Scope 2 emissions from wholly-owned operated assets, in a manner consistent with the GHG Protocol. As we strive for continuous improvement in our Sustainability Reporting, we have updated our methodology in line with the most up-to-date reporting guidance, with a view to enhance transparency and accuracy, and ensure we provide relevant data. To this end, we have adopted a market-based methodology approach alongside our location-based approach to calculate applicable GHG emissions to provide a more accurate inventory.

Under the market-based methodology, for 2023 our Scope 2 emissions are 13.0** MMtCO₂e (as compared to 16.2** MMtCO₂e under a location-based method).

Our 2035 interim ambitions and associated GHG emissions targets have been developed for Scope 2 emissions based on a market-based approach.

Aramco plans to report both location-based and market-based approaches to ensure transparency in comparison with previous years.

In 2023, total Scope 1 and market-based Scope 2 GHG emissions increased by 2.9% equivalent to 1.3 MMtCO₂e in 2023 compared to the previous year. Scope 1 emissions decreased by 2.3% compared to 2022 mainly due to lower hydrogen production during the year, and the introduction of a revised CO₂ venting emissions methodology for gas processing operations to account for dynamic CO₂ concentrations, resulting in a more accurate accounting methodology. Scope 2 emissions (market-based) increased by 26.3% compared to the previous year primarily due to the inclusion of the Jazan Refinery (stabilized units) in the 2023 GHG emissions inventory, and an increase in gas production.

In 2023, we completed bottom-up assessments of our assets, to better identify and prioritize opportunities to meet our interim and 2050 climate ambitions. These assessments are supported by ongoing efforts including energy optimization and energy efficiency.

Upstream carbon intensity

An important metric for Aramco is the carbon intensity of upstream operations, which is among the lowest relative to major crude oil producers per barrel of oil equivalent and has been achieved through effective reservoir management, a low depletion rate operational model, and a focus on energy efficiency.

Our 2035 upstream carbon intensity target of 15% reduction from a 2018 baseline remains unchanged. Adopting a market-based methodology, our target is now 7.7 kg CO₂e/boe (using the 2018 baseline of 9.1 kg CO₂e/boe). Under our previously reported location-based methodology, the target was 8.7 kg CO₂e/boe (using the 2018 baseline of 10.2 kg CO₂e/boe).

In 2023, our upstream carbon intensity (market-based) was 9.6** kg CO₂e/boe (as compared to 10.7** kg CO₂e/boe under location-based method), and increased 3.2% compared to 2022, largely due to lower upstream production and other operational activities, including increased gas production and storage.

As more energy and carbon intensive to produce, yet it provides lower emitting fuel for the power sector when displacing liquids. The storage of gas which commenced in 2023, impacts the upstream carbon intensity. The gas which is produced and stored is removed from the volume of hydrocarbon marketed, and thus increases the upstream carbon intensity.

As part of our ongoing initiatives to address carbon intensity we have delivered a first pilot shipment of 2MM bbl of Arabian Light crude oil with a product level carbon emissions. This first shipment entailed the calculation of a total carbon intensity of 6.39** kg CO₂e/boe, of which the production and loading stages were 2.42** kg CO₂e/boe, demonstrating the inherent competitive advantage of our lower upstream carbon intensity.

Value chain emissions

While our focus is on the management of GHG emissions from our wholly-owned operations that are within our direct control, we also support the energy transition through developing technologies that aim to lower GHG emissions.

Our investment in hydrogen, chemicals, and renewable energy sources and the increasing share of gas in our production are intended to provide lower emissions products and energy to our customers. We continue to invest in a number of product stewardship partnerships and technologies to reduce emissions, including research and development into lower emissions transport solutions.

Our $1.5 billion Sustainability Fund, which invests in breakthrough technologies and startups to find solutions to complex climate challenges, is evidence of our holistic approach and support to the energy transition.
To mitigate 52 MMtCO₂e from our business as usual emissions by 2035, we are focusing on five key levers: energy efficiency across our upstream and downstream assets; further reductions in methane and flaring; increased use of renewable energy sources; CCS, and development or purchase of offsets to help address hard-to-abate emissions.

In 2023, detailed studies at the asset-level were completed, and have enabled Aramco to update the mix of abatement opportunities across all five levers while also supporting our 2035 mid-term ambition and its associated abatement of 52 MMtCO₂e. Furthermore, the redistributed mix of abatement across levers optimizes cost and capitalizes on synergies.

### Energy efficiency

Since energy efficiency continues to be at the heart of our work at Aramco, the planned abatement associated with energy efficiency has been refined from 11 MMtCO₂e to 7 MMtCO₂e. This reduction can be attributed to the detailed studies at the asset level completed in 2023 and Aramco’s long-standing Energy Management Program, which started in 2000 and has achieved a cumulative emissions reduction of 31.43 MMtCO₂e.

**Our actions in 2023**
- Implemented 110 energy efficiency initiatives resulting in energy savings of 6.700 GWh, and the avoidance of 0.73 MMtCO₂e.
- Implemented an ambitious cogeneration transformation program to improve operational efficiency, reducing corporate energy intensity by 23% and recognized as a best practice case study by the World Economic Forum.
- Developed an advanced demand forecasting solution for 26 operational facilities.
- Optimization of operation and controls for gas processing, gas turbines, and compressors.
- Enhanced boiler and pump efficiencies.
- 40 Aramco organizations have received the ISO 50001 certification for their energy management systems.

### Flaring and methane

Aramco is among industry leaders in both upstream methane and flaring intensities due to decades of investments in digital and engineering solutions.

**Our actions in 2023**
- 8.9 billion scf of flare gas was recovered in 2023 due to more efficient operations of FGR systems across several facilities.
- Maintained upstream methane intensity of 0.05% despite expansion in gas production.
- Enhancements in flaring minimization roadmaps resulted in avoidance of 527 MMscf from Midyan and Uthmaniya Gas Plants.
- As part of Leak Detection & Repair program, millions of components were surveyed across our facilities, identifying potential methane leaks, and 1,800 repairs were conducted.
- Deployed a satellite methane monitoring campaign for key upstream assets to monitor methane emissions.

### Carbon capture and storage

Aramco is advancing technologies for both CO₂ capture and storage, and investing in world-scale CCS capabilities. We plan to store up to 14 MMtCO₂e by 2035 – contributing towards the Kingdom reaching its goal of 44 MMtCO₂e of CCS by 2035.

**Our actions in 2023**
- The CCS lever has been increased from 11 MMtCO₂e to 14 MMtCO₂e, as Aramco is seeking opportunities to scope-optimization to enhance the CCS lever.
- Continued development of CCS, Aramco has a target to store 14 MMtCO₂e by 2035, of which 6MMtCO₂e is planned at the Jubail CCS Hub. Phase 1 of the project targets to store up to 8 MMtCO₂e by 2027, of which 6MMtCO₂e is dedicated to Aramco and 3MMtCO₂e to non-Aramco facilities.
- Pilot a novel CO₂ geological sequestration solution in collaboration with KAUST, using in-situ mineralization by injecting in basalt formation, permanently converting CO₂ into carbonate rocks.
- Established collaboration with Siemens, to develop a Direct Air Capture unit in Dhahran. The unit is expected to be completed late in 2024.

### Renewables

Aramco has a target to invest in up to 12 GW of solar and wind energy by 2030, and is exploring for geothermal energy in the Kingdom. We are also investing in advancing renewables technology.

**Our actions in 2023**
- Reached full capacity and commercial operation at the Sudair Solar PV plant, one of the largest solar plants in the region with a capacity of 1.5 GW, in January 2024.
- Entered into an agreement for two solar PV projects – Al Shuaibah 1 and Al Shuaibah 2, which will generate an aggregate capacity of over 2.7 GW of renewable electricity. Commercial operations are expected to commence in 2025.
- Continuing exploring geothermal energy opportunities and identified three potential areas on the west coast of Saudi Arabia.
- Deployment of solar PVs as the power source in remote drill sites and offshore platforms.

### Natural climate solutions and offsets

Aramco continues to assess opportunities to expand our in-Kingdom mangrove planting efforts and is now evaluating the suitability of inland mangrove planting within the Kingdom. Beyond this, Aramco is evaluating additional opportunities for planting mangroves outside the Kingdom, and will continue to complement our plantation efforts with high quality carbon credits as feasible to build a portfolio of carbon offsets that aim to address hard-to-abate emissions.

**Our actions in 2023**
- Planted approximately 6.5 million mangrove trees in-Kingdom, which brings the cumulative total to over 30 million mangrove trees. Third-party validated total carbon stock of planted and existing mangroves equals nearly 485,000 tons of CO₂e cumulatively since we started our mangroves plantation in 1993.
- Participated as a lead bidder in the largest voluntary carbon credit auction in Nairobi, Kenya and purchased one million credits of recent vintages.
- Retired around 500,000 carbon credits, equivalent to 0.5 MMtCO₂e, against corporate emissions.

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1. For solar energy projects: Sudair Solar plant’s capacity 1.5 GW AC is equal to 1.8 GW DC, capacity of Al Shuaibah 1 and Al Shuaibah 2 solar PV projects is 2.7 GW AC, which is equivalent to 3.2 GW DC.
Energy management and energy efficiency

Aramco started its energy management program to improve energy performance in 2000. Since then, Aramco operations’ energy intensity has improved by 13.4% to 2023.

In 2023, Aramco’s energy intensity was 5.2% higher than in 2022. It is noteworthy that the accounted increase in energy demand is not coupled by an increase in accounted production associated with refineries and some affiliates. There was a 6.5% increase in energy demand at our operationally controlled affiliates. Additionally, Izan refinery’s stabilized units were also added to the measured energy demand in 2023. The increase in gas production, processing, and storage impacted the energy intensity, along with lower overall production.

Energy efficiency actions:
- Commissioning of combined cycle steam turbine generator at Shaybah Producing facility avoiding 75.6 MTCO2e per year.
- Reduction of steam reserve at Albaqiq Plants avoiding 44 MTCO2e per year.
- Optimization of chilled-down operation at Berri Gas Plant avoiding 22.6 MTCO2e per year.
- Energy Efficiency Enhancement Study to optimize production. The Phase-II is expected to be completed by 2025.

Energy consumption from the Kingdom’s national grid. In order to drive operational efficiency improvements across our operations, we are implementing an ambitious cogeneration transformation program to improve operational efficiency, by utilizing the energy of waste heat, thereby reducing energy consumption from the Kingdom’s national grid.

Aramco has historically relied on Saudi Arabia’s national power grid for power. In order to drive operational efficiency improvements across our operations, we are implementing an ambitious cogeneration transformation program to improve operational efficiency, by utilizing the energy of waste heat, thereby reducing energy consumption from the Kingdom’s national grid.

Aramco has developed an advanced Energy Demand Forecasting Solution. The solution utilizes the latest 4IR digital capabilities such as artificial intelligence, advanced analytics, and machine learning for the purpose of forecasting future energy demand and associated CO2 emissions. The program has installed 17 high-efficiency cogeneration plants (fleet size 8MW) significantly reducing the Kingdom’s overall CO2 emissions, it contributes to our Company’s Scope 1 emissions as well as to the grid, lowering the Kingdom’s overall grid emission factor.

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Cogeneration
Our investments in cogeneration facilities have contributed to significant improvements in energy efficiency for both our operations and the national grid, where we export some of the generated power. Highly efficient cogeneration plants enable us to produce electricity for our operations utilizing what would otherwise be wasted heat/energy, and are enabling self-sufficiency in electrical power generation for our own operating plants. We analyze the real-time data of the power generated, which allows us to further enhance energy efficiency. We are harnessing what would otherwise be waste energy by maximizing the conversion of energy released from the combustion of fuel into power and steam to achieve improved thermal energy efficiency and reduce overall GHG emissions. In 2023, we achieved an average thermal efficiency of 71.0% (70.7% in 2022) in our interconnected cogeneration facilities. Several energy optimization studies were carried out for the existing facilities and capital projects. The studies identified energy efficiency initiatives including optimum driver options, heat integration, and deployment of waste heat recovery technologies.

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Flaring

Although flaring is required at oil and gas processing facilities for safety purposes, for decades we have been creating solutions to reduce such flaring, from larger infrastructure such as our Master Gas System and installing flare gas recovery systems at many of our plants, to developing innovative digital solutions.

Our flare monitoring system is one example. It addresses the challenges related to monitoring and reducing flares. The solution provides Company-wide, real-time monitoring capabilities of all flare sources at an asset level.

Our flaring intensity in 2023 was 5.64** scf/boe, up from 4.60** scf/boe in 2022, primarily due to increased maintenance and operational activities, as well as the inclusion of the Jazan Refinery’s stabilized units in the 2023 GHG emission inventory and flaring metrics reporting.

** Flaring intensity in 2022 was 4.78 scf/boe.

### Highlights

- Aramco FGR systems in several facilities were performing with high availability and reliability which resulted in the recovery of 8.9 billion SCF of flared gas in 2023.
- Continuous implementation of Flaring Minimization Roadmaps, which lay out site-specific priorities across Aramco operations to further reduce flaring. In 2023, the roadmaps resulted in avoidance of 527 MMscf from Mifdiyan and Uthmaniya Gas Plants.
- Investing in and developing innovative flaring reduction technologies.
- Implementing new FGR projects for applicable operational facilities – a major technology for flare minimization. The implementation and further enhancement of FGR system at Fadhili Gas Plant and Manifa Producing Plant avoided flaring of 1,396 MMscf.

### Methane

Methane is a potent GHG with a higher global warming potential than CO2 and thus managing it is a priority for Aramco and the oil and gas industry. As part of the OGCI, members set a target to reduce methane emissions from oil and gas operations. We have surpassed the 2025 OGCI target of well below 0.20% already (we are at 0.05%) and continue to take actions to further drive down our methane intensity.

Our upstream methane emissions decreased by 5.1% despite an increase in natural gas production. This was due to cumulative process efficiency enhancements, including the installation of FGR systems, high efficiency flare systems and adoption of strict Flare Minimization Plans to reduce flaring volumes and the rate of process gas sent to the flare, thereby maintaining optimal combustion efficiency at flare headers and reducing methane emissions. Other process enhancements included application of Advanced Process Control (APC) systems to optimize system efficiency and energy demand, minimizing fuel gas consumption and associated combustion related methane emissions.

Furthermore, our comprehensive Leak and Detection and Repair (LDAR) program contributes significantly to reducing fugitive methane emissions through the systematic identification and repair of continuous minute gas leaks. This year all Upstream assets were surveyed and millions of components were monitored to identify equipment that need repairs.

A total of 1,800 repairs were conducted in 2023 for both Upstream and Downstream assets. The reduction in absolute methane emissions is also attributed to enhancements in the methane emissions methodology to account for actual activity data, and the ongoing LDAR program.

### GHG Satellite Monitoring

Aramco is constantly seeking ways to enhance GHG emissions monitoring and mitigation. The GHGSat Satellite Constellation, a network of satellites, is currently being deployed after extensive trials and a program launched in 2023 to identify and monitor methane emissions from Aramco’s in-Kingdom operations. As part of our aim to monitor emissions, we are using this cutting-edge space-based sensor technology to identify and mitigate emissions sources at a very detailed level of accuracy while supporting LDAR activities.

<table>
<thead>
<tr>
<th>Year</th>
<th>Flared gas (MMscf)</th>
<th>Upstream methane intensity (%)</th>
<th>Upstream methane emissions (metric tons of CH₄)</th>
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<td>23,818</td>
<td>0.05</td>
<td>29,193</td>
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<tr>
<td>2023</td>
<td>27,506</td>
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</tr>
</tbody>
</table>

### Sustainability in action

**Haradh gas plant reduces flaring by 11%**

Haradh gas plant reduced plant flaring by 11% as a result of the following initiatives:

- Purge gas optimization study.
- Optimized the Hydrocarbon Thermal Oxidizer maintenance duration and reduced the flared amount during the maintenance by 70 Mmscf.
- Mitigated leaks from flare control valves.
- Deployed online cleaning methodology for stabilization system reboilers that eliminate equipment isolation and depressurization.

**Sustainability in action**

**New methane emissions detection technology piloted**

In 2023, two new technologies were piloted at Hawliyah NGL Plant for continuous monitoring of methane emissions:

- A Tunable Diode Laser Absorption Spectroscopy Methane Detection System
- A remote sensing Fourier Transform Infrared spectroscopy system.

The newly piloted technologies will further increase our expertise in the field of continuous methane emission monitoring, while enhancing our performance in the LDAR Program, and prioritizing methane mitigation actions at our operating facilities. Continuous methane monitoring is a fast-evolving field in the oil and gas industry with multiple new emerging methane detection and quantification technologies.
Providing customers with lower emissions solutions

**Fuels and transport technologies**

Transportation is a core element of the energy transition. Aramco is exploring the development of synthetic fuels that produce lower GHG emissions and maintain the same levels of performance. Aramco’s lower carbon intensity crude and investment in GHG emissions mitigation initiatives in our refineries enable production of fuels with lower embedded carbon. We are also exploring ways to improve the efficiency of the internal combustion engine.

We recognize that achieving successful GHG emissions mitigation of the automotive industry necessitates a combination of various technologies. These could include highly efficient internal combustion engines (ICE), hybrid, synthetic fuels, hydrogen, and electric vehicles (EVs). To effectively reduce GHG emissions from transportation, it is crucial to invest in enhancing the efficiency of ICE vehicles, considering that by 2050, approximately 56% of vehicles are expected to still rely on this technology. Lower-carbon emission ICE vehicles and alternative fuels technologies have the potential to reduce emissions by 50-75%. Furthermore, lower-carbon emissions ICE vehicles and alternative fuels technologies are expected to play a key role in lowering GHG emissions in regions where the power grid relies heavily on coal as well as helping to alleviate strains on critical minerals supplies and grid capacity associated with electrification.

Our Transport R&D team have presence all around the world, including in Paris, Detroit, and Shanghai, and our research centers act as technology hubs to leverage the respective innovation ecosystems in each region. Scientists and technologists across the centers are working closely with technology providers and automakers to advance practical solutions for a more sustainable mobility future.

In 2023, at the Bahrain Grand Prix races, Aramco supplied fuels containing 55% bio components for the first competitive use, which were used in Formula 2 and Formula 3 cars. This is a transitional step as the championships work toward ambitions by 2027. Our intention is to introduce synthetic components to the formulation from 2025 onwards.

Aramco and ENOWA, NEOM’s energy and water company, signed a joint development agreement to construct and establish a first-of-its-kind synthetic fuel demonstration plant. The project will be located in ENOWA’s Hydrogen Innovation and Development Center (HIDC) and aims to demonstrate technical feasibility and commercial viability of synthetic gasoline from renewable-based hydrogen and captured carbon dioxide. The demonstration plant in NEOM is the result of intensive research and development efforts aiming to optimize the production of synthetic fuels.

In Bilbao, Spain, Aramco and Repsol are exploring the production of synthetic diesel and jet fuel for automobiles and aircrafts.

We have also been carrying out extensive research into the potential of algae-based biofuel, and have produced the first batch of biocrude from microalgae. Our efforts are part of a wider exploration of how we can make more use of nature-based solutions in our operations. For example, we are exploring how algae-based products could potentially be used in our upstream operations, including drilling. We are exploring ways to convert algal biocrude into drilling fluids, such as oil-based muds.

**Low carbon aviation fuel**

As the global aviation industry works towards addressing its GHG emissions and net-zero ambitions, aviation fuels, notably Sustainable Aviation Fuels (SAF) may account for a 65% share of measures to address this ambition. However, there are current challenges with scaling the production and deployment of SAF required to meet industry targets. For example, the cost of SAF is currently 3 to 5 times the cost of jet fuel and substantial upfront investment costs will be required for SAF facilities.

Aramco is working towards being a provider of lower carbon aviation fuels (LCAF), which have lower carbon intensity compared to the global average for jet fuel and are compatible with existing fueling infrastructure. This could offer a viable transitional and complimentary to SAF solution while also providing the added benefit of having 10% lower GHG emissions compared to conventional jet fuel. LCAF can be incorporated as a fossil-based aviation fuel that meets the United Nations International Civil Aviation Organization, Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).

Hydrogen and ammonia

Aramco is championing the Kingdom’s ambition to be a world-leading producer of efficient fuels, through a plan to produce 11 MTPA of blue ammonia by 2030. Aramco’s development is instrumental to both production of hydrogen and the resulting CO2 being captured and sequestered, and facilitating the Kingdom’s GHG emissions mitigation ambitions.

In 2023, a first shipment of independently-certified blue ammonia was delivered to Japan for use as fuel in power generation with the resulting CO2 being captured and sequestered.

The shipment was the result of a successful multi-party collaboration across the lower-carbon ammonia value chain. The ammonia was produced by SABIC Agri-Nutrients with feedstock from Aramco, and sold by Aramco Trading Company to the Fuji Oil Company. Mitsui O.S.K. Lines was tasked with shipping the liquid to Japan, then the ammonia with the resulting CO2 being captured and sequestered was transported to the Sodegaura Refinery for use in co-fired power generation, with technical support provided by Japan Oil Engineering Co.

Ammonia is significantly more convenient, practical and cost-effective than hydrogen in its transport, both in terms of the required temperatures and pressure conditions. We are helping chart a course for this vital commodity, which is also an important energy source in its own right that will help to mitigate GHG emissions in key sectors.

Aramco contributes to a credible hydrogen market

The Open Hydrogen Initiative is led by GTI Energy, S&P Global Commodity Insights, and in partnership with the United States Department of Energy to lay the foundation for hydrogen markets by creating objective, peer-reviewed, and open-sourced tools to measure and assess the carbon intensity of hydrogen production at the facility level.

In line with the Company’s strategic theme of pursuing lower-carbon initiatives, Aramco is collaborating with more than 40 other organizations spanning industry, environmental NGOs, academia, and government entities to develop a first-of-a-kind framework to advance efforts to reduce carbon emissions of this energy sector and be a player in supporting a transparent, credible, and harmonized hydrogen market.
Natural gas

Natural gas is a key enabler for the energy transition, as it is highly compatible with intermittent renewable energy for power generation, and provides more efficient power than other conventional forms of non-renewable energy. Our gas investment is key to the Kingdom’s plan to diversify its energy mix by cutting its use of higher emitting liquid hydrocarbons for power generation, and build on the Company’s strategy to produce valuable feedstock for the petrochemical industry.

We are supporting the Kingdom’s Liquid Displacement Program, which aims to displace about 1 MMbopd of liquids by sales gas, renewable deployment and efficiency improvements by 2030. Aramco’s Master Gas System Phase III Expansion (MGS III) facilitates this major program by expanding the gas supply capacity to the central and western regions, and extending the network to the southern region. In addition to supplying gas to utility plants, MGS III also extends the network to 11 industrial clusters in the Kingdom, enabling fuel switching, industrial growth, and lowering GHG emissions.

Renewable energy

The Kingdom’s utilities sector is positioned to undergo a major transformation driven by the Saudi Green Initiative (SGI), which aims to have 50% of the Kingdom’s power generation capacity from renewables, with the balance of 50% from gas. This policy has a multi-fold impact of more efficient power generation for gas compared to liquid burning, and significantly lower-GHG emissions.

Aramco has a pivotal role in facilitating this transition both through the Company’s gas expansion plans, and equity participation in Public Investment Fund’s (PIF) renewable projects. The Saudi government has established a National Renewable Energy Program, in 2016, with the goal of increasing the generation capacity of renewable energy sources. Aramco supports the Kingdom on this journey as a part of a partnership with PIF in its renewable energy program.

Solar

In 2023, the 1.5 GW1 Sudair solar plant, the first project developed by a consortium with PIF and ACWA Power, has received the full commercial operation certification from the power offtaker, and the entire contracted capacity is now in full operation.

The consortium has achieved financial close of Al Shuaibah 1 and Al Shuaibah 2 solar PV projects with an aggregate capacity over 2.7 GW. The commercial operation for Al Shuaibah projects is expected to commence in 2025. Aramco plans to use the allocation of renewable energy certificates (RECs) from these investments. Aramco continues to assess other opportunities to advance its progress in renewable energy.

Geothermal

We are undertaking activities led by the exploration arm of the Company to evaluate the potential of geothermal energy in the Kingdom. Three potential locations on the Western coast of Saudi Arabia have been identified and mapped using sophisticated subsurface technologies, and steps are underway to assess the extent of geothermal resources at each location. Alternative potential areas will be considered in the future to add to the Kingdom’s portfolio of alternative energy sources.

1. For solar energy projects: Sudair solar plant’s capacity 1.5 GW AC is equal to 1.8 GW DC; capacity of Al Shuaibah 1 and Al Shuaibah 2 solar PV projects is 2.7 GW AC, which is equivalent to 3.2 GW DC.
Value chains and the materials transition

The materials transition

Reducing emissions in energy generation has been a core focus of climate mitigation efforts to date. However, another key lever to achieving a transition to lower emissions will be that of evolving how we use, produce and dispose of the materials which form the building blocks of the 21st century economy. This “materials transition” will cover the entire product value chain, and will be critical to meeting surging demand for minerals, metals and materials projected to take place in the coming decades, driven by population and economic growth.

A viable materials transition will be key to unlocking an orderly energy transition by redefining the materials of modern life and mitigating emissions as the world’s energy demand grows. On the production side, hydrocarbons will be increasingly be used without combustion, providing essential feedstocks to the innovative new materials needed in the energy transition.

For instance, each megawatt of installed solar and increasingly be used without combustion, providing essential feedstocks to the innovative new materials needed in the energy transition.

Further sustainability will then be achieved through a process of materials circularity, whereby materials and their emissions are recycled and reused in products and in the form of alternative energy. One notable initiative that Aramco is pursuing in this regard is through the development of an advanced circular polymer through our affiliate, SABIC.

The materials transition creates significant challenges and opportunities, but among the latter is the chance to drive this materials transition, leveraging our position as one of the world’s largest integrated energy and chemicals companies.

Materials transition could strengthen and complement existing programs to reduce emissions across the supply chain and push the boundaries of innovation through global collaboration. Material substitution has a high potential to reduce carbon emissions across the supply chain. Alternative materials have the necessary properties to suit the given application. Material substitution is likely to be driven by emission savings and cost. Durable hydrocarbon-based materials can contribute to reduced carbon emissions compared to most metals.

Examples of material substitution include EV light weighting (reducing the weight of EV by substituting certain structural elements) which can alleviate pressure on battery value chains; and copper substitution with its’ conductive properties used in order to protect battery and value chains, as well as reduce carbon emissions. Aramco is pursuing a number of initiatives along the value chain to drive this materials transition, leveraging our position as one of the world’s largest integrated energy and chemicals companies.

Sustainability in action

New materials for lower emission construction solutions

Engineered Cementitious Composites (ECC) are a special class of high-performance fiber-reinforced concrete with many potential uses, as ECC are more durable than conventional concrete when applied in pavement, pipes, and structure.

Its use has many benefits, for example ECC pavement, for medium-traffic use, is anticipated to have up to 50% lower CO₂ emissions compared to conventional concrete pavement. Aramco is collaborating with the University of Michigan, where the first demonstration of ECC materials as road pavement has been performed, and Aramco conducted a pilot demonstration in Dhahran as well.

Liquids-to-chemicals

As part of the wider materials transition, petrochemicals are set to be the primary engine of oil demand growth in the coming years, and Aramco is investing heavily in this sector as we continue to diversify our portfolio into new, lower-emissions value chains.

In 2023, Aramco celebrated the groundbreaking of the $7 billion Shaheen petrochemical project, in partnership with S-Oil, in South Korea. Shaheen is among Aramco’s biggest international downstream investments, representing a significant and sizeable step forward in our liquids-to-chemicals expansion. It is expected to be one of the largest integrated steam crackers in the world. It is also the first major commercial deployment of Aramco’s thermal crude-to-chemicals technology developed in collaboration with Lummus Technology that aims to increase chemical yield with less energy intensity. In addition to this, we have continued to advance on our liquids-to-chemicals strategy in Asia, acquiring a 10% interest in Rongsheng Petrochemical in July 2023.

Nonmetallic deployment

Nonmetallic materials reduce carbon emissions by up to 60% compared to equivalent steel solutions. They also promote the Circular Economy by adding to local nonmetallic product manufacturers and service providers.

Our Unconventional Resources program was the first in the Kingdom to deploy the Reinforced Thermosetting Plastics (RTP) flowline in sweet gas services covering more than 1,000 km of RTP flowlines and is deploying further increments, which will reach a total of 15,000 km of RTP lines across all areas of the Kingdom.

Award

Yanbu Refinery achieves recognition in the World Economic Forum Global Lighthouse Network

Aramco has received the World Economic Forum Global Lighthouse Network recognition under WEF’s Shaping the Future of Advanced Manufacturing and Production Platform. The award recognizes Aramco’s use of the latest 4IR technologies to help produce energy with lower emissions.

In 2023, Yanbu Refinery was Aramco’s fourth facility to be included, joining the Company’s Abqaiq oil processing and stabilization facility, Uthmaniyah Gas Plant, and Khurais Oil Complex. Yanbu Refinery is one of 21 new facilities added to the prestigious Network which now includes a total of 153 manufacturing facilities around the globe. We are the only international energy company globally to be represented by more than two facilities.

1. Energy Intelligence Whitepaper: Building Blocks of the Energy Transition (October 2020)
Investing in lower carbon emissions technologies and solutions

We believe that digital technologies can be a key enabler for Aramco and the energy industry's future by allowing the optimization of operations, and enhancing sustainability. With this in mind, Aramco has established a Digital Sustainability Flagship Program to streamline all the digital efforts across the Company related to climate and sustainability.

Strategic technologies being developed to enable emissions mitigation or displacement include renewables and energy storage, hydrogen production technologies, nonmetallic applications development, Thermal Crude-to-Chemicals deployment at our subsidiary S-Oil, lower-carbon fuels, engine technologies, as well as CCS, including stationary carbon capture and direct air capture.

In addition, as a member of the OGCI, we also contribute financially to Climate Investment (CI), an independently managed, specialist investor. Its mission is to drive near-term GHG emissions mitigation through investment and market adoption of our portfolio company innovations across a network of investors and global partnerships. Over the past six years, it has built a portfolio of 38 companies with innovative products and services, operating in the energy, transportation, built environment, and industry sectors.

Research and development

In 2023, sustainability-related R&D was $540 million, which equated to 63% of total 2023 R&D spend of $861 million. Our R&D spend encompassed sustainability-focused solutions to improve our business and energy efficiency, enhance company circularity, as well as supporting the global energy transition.

In 2023, 20% of the new patents filed were in sustainability technologies, an increase from 15% the year before.

Examples of ongoing R&D initiatives include:
- CO₂ mineralization to calcium and magnesium carbonates utilizing cement and steel waste materials;
- An initiative called PowerSense, which conserves and reduces energy by measuring the amount of electrical flow of each component at the rig;
- In-situ generation of hydrogen in subsurface formations; and
- Development of digital platforms to drive efficiency that can reduce Aramco’s GHG emissions.

Carbon capture and storage

With our deep understanding of the subsurface, and utilizing advanced technologies, Aramco continues its journey to become one of the key players in the CCS industry. The Company has continued its efforts to avoid CO₂ sequestration capacity, performing several assessments to identify and develop new potential CO₂ storage sinks.

Throughout 2023, site screening activities and viability assessments continued with a view to identify potential storage sites through data acquisition programs, including 3D seismic activities.

Jubail CCS hub progress

Following the collection of all the required subsurface data, an advanced 255 million cell simulation model was constructed to drive further optimization in the development plans for the Jubail CCS hub project. Phase 1 of the CCS project aims for up to 9 MMtpa CO₂ by 2027 (from which up to 6 MMtpa will be supplied from Aramco and remaining 3 MMtpa from non-Aramco facilities), supporting the Kingdom’s goal to sequester 44 MMtpa of CO₂ by 2035.

Natural climate solutions

Natural climate solutions continue to play a complementary role where emissions abatement is challenging. In line with our interim target to plant 300 million mangroves in-Kingdom by 2035, Aramco planted 6.5 million mangrove trees in-Kingdom in 2023, bringing its cumulative total to over 39 million. These trees have been planted since 1993 when the Company started mangrove plantation programs at Abu Ali Island. We also had an independent carbon stock assessment done on Saudi Arabia’s mangrove plantation initiatives to quantify the carbon sequestered to date of its planted and existing mangroves. A third-party validated the total carbon stock of planted and existing mangroves of almost 445,000 tons of CO₂.

The majority of mangroves (26.5 million) were planted over the last three years as part of our efforts to develop natural climate solutions as part of our GHG emissions mitigation program. As mangroves mature, they sequester increasingly higher amounts of CO₂, which projects a promising trajectory for CO₂ sequestration by Aramco’s mangrove plantations over the coming decades. In 2022 and 2023, Aramco’s mangrove plantations sequestered 11,800 and 27,500 tons of CO₂, respectively.
**Sustainability in action**

Aramco’s first verified carbon offset crude cargo

In 2023 we launched a strategic initiative for a pilot project to deliver Arabian Light crude oil with a product level carbon emissions intensity and an emissions management plan in line with PAS2060 – using a cradle-to-gate partial lifecycle assessment approach, as the first of its kind in the Middle East.

This first pilot shipment entailed the calculation of total carbon intensity like carbon capture, synthetic fuels, and building energy efficiency. The Sustainability Fund is among the largest sustainability focused venture capital funds in the industry.

Due to the absence of an internationally unified standard, we use existing, reputable frameworks and benchmarks to ensure offsets are high quality. These include the Integrity Council’s Core Carbon Principles and CORSIA-eligible credits. We have also developed additional internal quality criteria that would allow us to contribute to the Kingdom’s NDCs.

We intend to invest in projects with diverse economic and social development benefits that promote broader sustainable development goals, such as access to clean and affordable energy, job creation, enhanced biodiversity and women empowerment. Aramco continues to play a leading and enabling role in supporting the development of the Renewable Voluntary Carbon Market Company in Saudi Arabia (RVCMC). We participated in RVCMC’s second auction, the world’s largest of its kind, with the auctioning of over 2 million CORSIA-eligible and Verra-registered carbon credits, of which one million were purchased by Aramco.

During the year, Aramco Ventures invested in UK’s OXCCU catalytic technology to convert hydrogen and carbon dioxide into sustainable aviation fuel, in addition to providing financing for Parallel Carbon, a company that uses renewable energy for hydrogen production. Recently, we have allocated an additional $4 billion to Aramco Ventures, increasing its total investment capabilities from $3 billion to $7 billion between 2024 and 2027.

During the year, Aramco Ventures was named as a Top 10 Climate Investor globally by Climate50 and an annually published list that aims to recognize the world’s top 50 most impactful climate investors, and as a ‘Top 100 Innovator in the Energy Transition’ by Reuters.

**Aramco’s Sustainability Fund**

At Aramco, we invest in breakthrough technologies and startups to find solutions to complex climate challenges. As hydrocarbons remain a significant part of the world’s energy supply, we believe investment should be proportionate to the challenges in ensuring a stable and inclusive energy transition. This is why in October 2022, we launched the $1.5 billion Sustainability Fund through our global venture capital arm, Aramco Ventures.

The Sustainability Fund’s portfolio includes 27 investments with a total committed amount of $394 million. In 2023, the Sustainability Fund committed $238 million and closed investments in 17 companies. This has facilitated innovation in areas like carbon capture, synthetic fuels, and building energy efficiency. The Sustainability Fund is among the largest sustainability focused venture capital funds in the industry.

**Impactful climate investing**

Aramco Ventures manages five funds. These are a Digital/Industrial Fund investing in technologies of strategic importance to Aramco; the Prosperity7 Funds I and II investing in disruptive technology; the Sustainability Fund, which invests in startups with potential to support Aramco’s Climate ambitions and the Late Stage Venturing Fund supporting later stage investments. Aramco Ventures has offices in Saudi Arabia, the USA, Europe, and China.

**Fund Structure**

- 5 Funds under 3 Venturing Programs ($7 billion)
  1. Early-Stage Strategic Venturing
  2. Early-Stage Diversified Venturing
  3. Prosperity7 Fund I
  4. Prosperity7 Fund II

**Early-Stage Strategic Venturing**

Invest in startups to accelerate their development and deployment in Aramco, At Aramco, we invest in breakthrough technologies and startups to find solutions to complex climate challenges. As hydrocarbons remain a significant part of the world’s energy supply, we believe investment should be proportionate to the challenges in ensuring a stable and inclusive energy transition. This is why in October 2022, we launched the $1.5 billion Sustainability Fund through our global venture capital arm, Aramco Ventures.

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**Early-Stage Strategic Venturing**

Invest in startups to accelerate their development and deployment in Aramco, Aramco Ventures

**Early-Stage Diversified Venturing**

Invest in disruptive start-ups that help support Aramco’s long-term diversification

**Prosperity7 Fund I**

$1 billion

**Prosperity7 Fund II**

$2 billion

**Late-stage Venturing**

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**Late-Stage Venturing Fund**

$2 billion

**Spotlight on Aramco Ventures**

**Digital/Industrial Fund**

$0.5 billion

**Sustainability Fund**

$1.5 billion

**Prosperity7 Fund I**

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**Prosperity7 Fund II**

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**Later-stage investments creating strategic options for Aramco**

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Supporting the energy and materials transition through developing solutions and products

Lower carbon aviation fuels
Aramco aims to be a provider of LCAFs, which have lower carbon intensity compared to the global average for jet fuel and are compatible with existing fueling infrastructure. Aramco is working towards LCAF certification for its jet fuel production from some of its refineries as per the CORSIA requirements. LCAF aims to address the immediate challenges associated with scaling the production and deployment of sustainable Aviation Fuels required to meet aviation industry targets.

Hydrogen
Hydrogen has a lower life-cycle carbon intensity than traditional fossil fuels and could help reduce emissions in hard-to-abate sectors such as heavy-duty transport and industrial applications. In October 2023, Aramco entered into an engineering agreement with Topsoe to construct a lower-carbon hydrogen production demonstration plant at the Shaybah Natural Gas Liquids (NGL) recovery site in Saudi Arabia. The demonstration plant will use renewable electricity in electrolyzed steam reforming of hydrocarbons to produce hydrogen for use in power generation, with the resulting CO₂ being captured and sequestered.

Renewables
Aramco has ambitious plans to invest in 12 GW of solar and wind energy by 2030, and is also evaluating geothermal energy resources in Saudi Arabia. In efforts to advance renewable energy projects, Aramco has invested in Solar Park A, Saudi Arabia’s largest solar photovoltaic power plant, and will continue development, drilling, and evaluation activities, to establish a wide portfolio of subsurface assets across the Kingdom. In partnership with Linde and SLB, Phase 1 of the Jubail CCS hub is expected to be one of the largest in the world with a capacity of 9 MMtpa. Aramco’s share of CO₂ capture from its facilities is set to reach up to 6 MMtpa by 2027.

Carbon capture and storage hubs
If commercially scalable, CCS could be a key technology to enable the Company’s emissions mitigation ambitions. Aramco is investing in world-scale CCS capabilities, and will continue development, drilling, and evaluation activities, to establish a wide portfolio of subsurface assets across the Kingdom. In partnership with Linde and SLB, Phase 1 of the Jubail CCS hub is expected to be one of the largest in the world with a capacity of 9 MMtpa. Aramco’s share of CO₂ capture from its facilities is set to reach up to 6 MMtpa by 2027.

Mobile carbon capture
Aramco is striving to mitigate the emissions of the internal combustion engine, and our mobile carbon capture technology aims to achieve this by capturing CO₂ at the point of emission. Over the past decade, Aramco Transport Technologies R&D team has road-tested prototypes for an array of vehicles and trucks, generating more than a dozen granted patents and has licensed the technology to Daphne Technology for carbon capture in marine vessels.

CO₂ mineralization
Aramco is developing novel methods for permanently sequestering CO₂ through mineralization. We have demonstrated one such method through a pilot technology that stored up to 200 kg of CO₂ per ton of cement while curing precast concrete. We have demonstrated one such method through a pilot technology that stored up to 200 kg of CO₂ per ton of cement while curing precast concrete. The demonstration plant at the Shaybah Natural Gas Liquids (NGL) recovery site in Saudi Arabia. The test unit, which is expected to be completed in 2024, is intended to pave the way for a larger pilot plant. Captured carbon dioxide can be utilized as part of a circular carbon economy.

Nonmetals
The energy transition will rely in part on a concurrent materials transition, which will see a massive increase in demand for both existing and alternative materials. In addition to developing technologies to capture carbon dioxide at the point of emissions, we are also researching and testing solutions to reduce the cost of capturing carbon dioxide directly from the atmosphere, via Direct Air Capture (DAC). Aramco is collaborating with Siemens Energy to develop a DAC test unit in Dhahran, Saudi Arabia. The test unit, which is expected to be completed in 2024, is intended to pave the way for a larger pilot plant. Captured carbon dioxide can be utilized as part of a circular carbon economy.
Safe operations and people development

Workforce protection and process safety .................. 54
Human rights .......................................................... 58
Labor practices ......................................................... 60

Captured within the dynamic environment of Aramco’s operations, a female technical professional embodies the Company’s steadfast commitment to safety.
2023 performance

<table>
<thead>
<tr>
<th>Number of female employees</th>
<th>2023</th>
<th>5,294</th>
</tr>
</thead>
<tbody>
<tr>
<td>2022</td>
<td>4,503</td>
<td></td>
</tr>
<tr>
<td>2021</td>
<td>3,802</td>
<td></td>
</tr>
</tbody>
</table>

Number of female employees in leadership positions

| 2023 | 233 |
| 2022 | 176 |
| 2021 | 136 |

Aramco is home to 73,311 employees

Total hours of training and development (per employee)

| 2023 | 952 |
| 2022 | 176 |
| 2021 | 136 |

There are 94* different nationalities represented in Aramco’s workforce

<table>
<thead>
<tr>
<th>Performance of our key metrics</th>
<th>Material issue</th>
<th>Relevant metrics</th>
<th>2023</th>
<th>2022</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workforce protection</td>
<td>Number of fatalities</td>
<td>3**</td>
<td>0.047*</td>
<td>0.047*</td>
<td>3**</td>
</tr>
<tr>
<td></td>
<td>Lost time injuries/illnesses rate (number of LTI cases x 200,000 /total work hours)</td>
<td>0.018**</td>
<td>0.018**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total recordable case rate (total recordable incidents x 200,000/ total work hours)</td>
<td>0.042</td>
<td>0.050</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Health performance (%) (number of overdue major health findings x 100 /total number of open major health findings)</td>
<td>19**</td>
<td>10**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process safety and asset integrity</td>
<td>Number of Tier 1 process safety events</td>
<td>15</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human rights</td>
<td>Number of grievances raised</td>
<td>230</td>
<td>293</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sites (%) with a grievance mechanism in place</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labor practices</td>
<td>Attrition rate (%)</td>
<td>2.2</td>
<td>2.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female (%) of total employees</td>
<td>9.2</td>
<td>6.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female employees in leadership positions (%)</td>
<td>4.8</td>
<td>3.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of contractor employees</td>
<td>8,125</td>
<td>7,639</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of hired graduates</td>
<td>1,665</td>
<td>1,459</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of apprentices (new intake)</td>
<td>2,200</td>
<td>1,728</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of interns</td>
<td>3,201</td>
<td>3,100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Our contribution to the UN SDGs | **Aramco has various health and safety and well-being programs for its employees. These include mental health initiatives, workplace standards and technology to minimize exposure of our workers to unnecessary risks. Aramco believes in lifelong learning and development. We continue to provide world-class learning experiences that drive both personal growth and effective operations at all levels of the Company through innovative platforms such as corporate e-Learning, the Hosted University Program, Advance Development Programs and others.** |
|--------------------------------|**Aramco is improving the gender balance of its workforce via a range of female empowerment initiatives. In Saudi Arabia, Aramco funds the STEM program for school-age girls, offering university scholarships for science, technology, engineering and mathematics degrees.** We have strong policies and processes to manage our ethics, bribery and corruption risks, and ensure a suitable working environment for our workforce.** |

* Metric reported for the first time externally.
1. 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.
2. Total hours of training and development (per employee) metric consists of total training offered by the Company during the year for all participants including Aramco employees, contractors and average levels of trainees.

** This figure has undergone/undergoes external limited assurance in accordance to the ISAE 3000 (revised). Upon completion of assurance, the assurance report will be made available on the Sustainability section of our website.

1. Scope expanded to include additional employee types.

Safe operations and people development.

Our talented workforce is our greatest asset and we continue to invest heavily in developing people. We employ an array of both traditional and innovative platforms and programs to ensure our employees and contractors can realize their full potential safely and securely.

This approach is essential to our long-term success and is underpinned by our utilization of the latest digital and AI technologies. Our aim is to continuously improve the capabilities of our people, enhance the sustainability and reliability of our operations, and protect our workforce, assets, and communities.

In 2023, we delivered over 9 million hours of training, increased the apprentice intake by 27.3%, raised hired graduates by 14.1%, diversified our leadership with 26.3% growth in the percentage of females in leadership positions, and improved our safety performance by achieving a 16.0% reduction in total recordable case rate.

We remain steadfast in maintaining a strong culture of fostering a world-class pool of talent, developing future leaders and ensuring the safety of our operations. These are fundamental strategic priorities for us to achieve our long-term objectives.
Workforce protection and process safety

Safety is integral and paramount to our operations at Aramco; it is ingrained in our values to safeguard our people, assets, and the environment.

In Aramco we operate under a “total workforce concept”, where our ambitions are built on the foundation of a robust safety culture and safe environment across our employees, contractors, and suppliers. We strive to prevent all incidents that have the potential to harm people, damage assets, or negatively impact the environment.

Our focus on safety is complemented by our digital transformation initiatives which enable innovative safety solutions that drive safety performance, elevate emergency readiness, and enhance our safety governance.

For over 40 years, the Executive Management Safety Review program has been a steadfast initiative. Each month, corporate management alongside an executive management team, visit one of the Company’s major operational areas to review their HSE performance and engage directly with employees and contractors to discuss safety matters.

Aramco’s safety management system (SMS) provides a framework that integrates occupational and process safety, and assists business units in meeting safety expectations.

Our SMS was developed following comprehensive benchmarking with industry peers. It is aligned with requirements outlined in Occupational Health and Safety Management System ISO 45001:2018, and has been evaluated by an independent third party to ensure alignment with international best practices.

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All Aramco organizations are assessed against SMS guidelines through our internal corporate safety assessment program. With over 50 SMS assessments performed in 2023, this program has been expanded to include in-Kingdom and international affiliates.

Sustainability in action

Aramco’s fleet of vehicles transport our workforce safely to remote areas

Safety on the road

Our operations are widely spread, sometimes in remote places. Aramco used over 11,000 road vehicles covering more than 240 million kilometers, and over 500 buses, covering over 23 million kilometers to transport our people for business in 2023.

We continue to closely monitor and support the safety of our people on the road. In addition to mandatory traffic training and education, we use digital solutions aimed at improving traffic safety.

Safety at sea

We operate over 350 maritime vessels, with over 8,000 members of our workforce. Aramco’s marine operations span the Kingdom’s coastlines from the Arabian Gulf to the Red Sea, providing safe, reliable, and cost-effective integrated marine solutions.

This supports the Company’s offshore operations such as exploration, drilling, production, exportation, crew transfer, oil spill response, subsea repairs, offshore logistics, and offshore security.

In 2023, 56 offshore marine employees participated in safety leadership courses, demonstrating a commitment to fostering a strong safety culture and effective leadership, while adhering to the latest international regulations and industry standards such as the International Maritime Organization (IMO) requirements.

Safety in the air

Aramco operates one of the world’s largest corporate aviation fleets, via its wholly-owned subsidiary Mukamalah. The fleet of 52 owned and leased, fixed wing and rotary aircrafts, annually transport nearly a million passengers. Our flights support Aramco’s operations by providing transportation, geological surveying, special missions, search and rescue, and evacuation services.

In 2023, Mukamalah reached a new record of over 51,000 flight hours due to growth and fleet size optimization. The flight crew receive over 3,000 hours of in-house training annually. Additionally, over 200 pilots participate in semi-annual training sessions with certified providers to meet safety requirements according to industry best practices.

11,000+
Number of Aramco road vehicles

350+
Number of Aramco maritime vessels

50+
Number of Aramco helicopters and airplanes
Workforce protection and process safety continued

Our safety performance

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<thead>
<tr>
<th>2023</th>
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<th>2021</th>
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<tbody>
<tr>
<td>Fatal accident rate*</td>
<td>0.305**</td>
<td>Metric not disclosed previously</td>
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* Metric disclosed for the first time.
** This figure has undergone/ is undergoing external limited assurance in accordance to the ISAE 3000.

Any loss of life is never acceptable and we aspire to achieve zero fatalities. Regrettably, Aramco had three contractor fatalities during the year: one contractor fell from height while installing scaffolding; a second contractor was struck by a mooring rope while disconnecting a marine vessel from a single point mooring system; and a third contractor was struck by hoisting hardware on an offshore rig.

During this year, we introduced a new metric, which measures our fatal accident rate, representing the ratio between the number of recordable workforce fatalities per 100,000,000 and the total work hours. In 2023, our fatal accident rate was 0.305**.

Aramco has thoroughly evaluated these incidents to identify root causes and has initiated corrective actions, including employee awareness and increased supervision, to avoid such accidents in the future.

Lessons from these incidents have been shared with all relevant departments and stakeholders, and remedial actions continue to be implemented. We continue to partner with our contractors to build a strong safety culture across our value chain and continually enhance their safety performance.

We also introduced two additional health compliance programs: Radiation Protection Assessment and Hazardous Materials Communication Assessment into our health key performance indicators.

Contractor safety
Aramco aims to ensure the safety and welfare of its contractors. Our approach centers on strong field presence, performance assessment, and implementing effective governance measures. We use bespoke tools to monitor contractor safety performance and compliance to corporate safety requirements. The Construction Safety Index (CSI) monitors contractor safety compliance with construction requirements and assesses the safety environment of our contractors. In 2023, 4,077 CSI inspections (2022: 3,300 CSI inspections) were conducted on 87 prime contractors.

Aramco utilizes the Turnaround Safety Index (TSI) that is focused on contractors’ safety performance during turnaround and inspections. In 2023, 1,090 TSI inspections were completed (2022: 670).

Inspired by the continued success of CSI and TSI, the Rig Safety Index (RSI) was launched in Q4 2022 to monitor onshore and offshore drilling rig contractor safety performance. During 2023, 92 RSI inspections were completed, covering 17 prime drilling contractors.

We hosted the Project Management Contractor Safety Excellence Award that recognizes outstanding contractor performance in multiple categories, including wellness, technology deployment, and safety compliance.

Aramco launched the ‘Line of Fire’ campaign to address risks associated with danger zones at construction sites. The campaign targeted the contractor site workforce, elevating their safety awareness and capabilities to identify work site hazards and enhance their safe behavior.

Emergency preparedness
Aramco takes proactive measures to prevent emergency situations and maintain a robust emergency preparedness program. Aramco’s Corporate Emergency Management Taskforce ensures resilience and readiness pre-planning, as well as risk based, and site-specific emergency response plans. A quarterly forum for emergency preparedness coordinators from all Company stakeholders is held to continually improve emergency readiness. A major program improvement this year included an enhancement to the Company’s digital safety system – SafeLife – that enables a corporate-wide tracking of emergency exercise schedules, as well as drill critique items until closure in a unified system.

Contractor Health and Safety
Aramco develops comprehensive programs to effectively manage the health and safety risks of its contractors. We continue to partner with our contractors to build a strong safety culture and continually enhance their safety performance.

Sustainability in action
Cultivating a strong safety culture across our global operations
Aramco continues to reasonably support our subsidiaries in maintaining and improving a strong safety culture across our operations. The established Global Safety policy governs our approach, supporting long-term success and resilience within the Aramco Group, promoting the welfare of our workers, the community, and the environment. Supporting the Global Safety Policy, the Company has developed and implemented an Affiliate Safety Oversight strategy to improve performance across the Aramco Group by focusing on governance, performance monitoring, assessment, engagement, and capability building. In 2023, we hosted the second Global HS&E forum, which attracted over 700 attendees from our subsidiaries around the world. This forum is among a number of initiatives that support our affiliates.

We continued our journey of conducting assessment of our affiliates across the globe, supporting the reinforcement of their safety management systems through the recommendations we provided. We are building the capabilities of the affiliates by providing them with the necessary resources, training, and guidance to improve and continually enhance their safety performance.

Expanding safety training programs
Aramco worked closely with five National Training Centers (NTCs) to evaluate and enhance existing Safety Diploma Programs and to establish new ones. The NTCs were selected as they harbor the necessary infrastructure to deliver safety diploma programs efficiently, targeting high school graduates, to equip them with the required skills to be competent field safety officers.

Since inception of the new Safety Diploma Programs, the National Industrial Training Institute (NITI) graduated 135 participants, 97 males and 38 females, to be Field Safety Officers.

Additionally, in February 2023, Maharaj Construction Training Center’s Construction Safety Associate Diploma Program was inaugurated. The total number enrolled in the program during 2023 was 189 participants from different sponsoring companies.
Human rights

Our people

For over 90 years, we have embraced diversity in our workforce. Today, the Aramco workforce is comprised of over 73,000 employees from more than 90 different countries. In Saudi Arabia, we are aiming to further promote female employment, multiculturalism and inclusion of people with disabilities (PwD). Our workforce is expanding by increasing female representation, adding employees from diverse backgrounds, and providing a workplace that caters to various needs.

At Aramco, our people are offered a safe environment and opportunities to develop personally and professionally. We cherish the benefits that diversity creates in our community and business, and celebrate our history and legacy of people development.

Human rights in the workplace

Ensuring dignity and respect for all is paramount. We are dedicated to upholding human rights in the workplace, recognizing our role as a responsible corporate citizen. Our ambitions involve fostering a positive culture aligned with these values, with a strong stance against abusive or inhumane practices, modern slavery, exploitation, and child labor.

We engage stakeholders to proactively prevent incidents that could compromise human rights. Striving to make enduring positive contributions, we focus on governance, transparency, rule of law, and social and economic development.

Our adherence to these values extends to compliance with local laws and respect for international human rights principles.

Code of Business Conduct
Aramco strives to ensure employees feel respected and safe. We rely on people in every part of our business to speak up on issues and act with integrity. To maintain an ethical working environment, our people are encouraged to report any suspected non-compliance with the law, Aramco policies, or our Code of Business Conduct. Aramco provides several avenues for employees to ask questions and raise concerns, including escalation to management, calling an anonymous hotline and/or contacting Human Resources, Internal Audit or the Compliance departments.

Grievances
The Company has a formal grievance process that is overseen by our Human Resources department. Our adherence to these values extends to compliance with local laws and respect for international human rights principles.

The positive impact of our engagement efforts is demonstrated by our low attrition rates and a consistently high engagement score of 85%. In 2022 and 2020. The survey is done on a bi-annual basis, the next survey will take place in 2024.

In October 2022, the corporate-wide bi-annual Employee Engagement Census Survey was launched across Aramco to over 75,000 employees and contractors. In response to the results of the survey (disclosed in our 2022 report), we undertook the following actions:

- Ensured widespread reach and compliance, over 28,000 toolkits were sent to all leaders and advocates in the Company.

Employee Experience Awards: As part of the 2023 President & CEO Excellence Awards, the top three performing departments in Employee Engagement were awarded Gold, Silver and Bronze awards by Aramco’s President and CEO and the Senior Vice President of Human Resources.

Enhanced Well-Being Model: In response to employee needs, Aramco updated the Corporate Well-Being Program Model to focus on nine dimensions of well-being: physical, social, occupational, intellectual, financial, digital, environmental, emotional, and spiritual.

Number of grievances

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of grievances</th>
</tr>
</thead>
<tbody>
<tr>
<td>2023</td>
<td>230</td>
</tr>
<tr>
<td>2022</td>
<td>293</td>
</tr>
<tr>
<td>2021</td>
<td>236</td>
</tr>
</tbody>
</table>

Sites with a grievance mechanism in place

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>2023</td>
<td>100</td>
</tr>
<tr>
<td>2022</td>
<td>100</td>
</tr>
<tr>
<td>2021</td>
<td>100</td>
</tr>
</tbody>
</table>

* Metric reported for the first time externally.

1. In accordance with our ongoing review of our sustainability performance data, we have determined that the metric “Employees acknowledging performance review meetings (%)” reported in 2022 and 2021 should be renamed “Employees acknowledging performance review meetings (%)” in order to more accurately reflect what this metric entails.
To support the growth of the Kingdom’s economy, as well as to provide a robust pipeline of qualified local labor, Aramco began the National Training Centers (NTCs) initiative in 2008. The NTCs are the product of a strategic partnership between Aramco, select government entities, and the private sector to train young Saudis in critical and emerging industries.

To date, over 57,900 students have graduated from the NTCs in more than 80 different disciplines, with over 11% women. Given this record, the centers remain on track to meet their target of 100,000 graduates by 2030.

Investing in our workforce

To ensure we attract talent from both within Saudi Arabia and globally, we held recruitment workshops across Africa, Asia, Europe, and North America. To prepare for the future of our workforce, Aramco has hired a steady stream of exceptional Saudi candidates into its professional development programs.

Aramco has also boosted its cooperation with local universities through a strong and growing internship program. By supporting the growth and development of young Saudis, Aramco is contributing not only to its strategic goals, but also to the Kingdom’s vision.

Sustainability in action

Our National Training Centers bring Aramco’s vocational training legacy to local communities

To support the growth of the Kingdom’s economy, as well as to provide a robust pipeline of qualified local labor, Aramco began the National Training Centers (NTCs) initiative in 2008. The NTCs are the product of a strategic partnership between Aramco, select government entities, and the private sector to train young Saudis in critical and emerging industries.

To date, over 57,900 students have graduated from the NTCs in more than 80 different disciplines, with over 11% women. Given this record, the centers remain on track to meet their target of 100,000 graduates by 2030.

Labor practices

Diversity and inclusion

Aramco is fostering a culture of diversity and inclusion within our organization. We embrace our employees’ differences and foster an inclusive workplace culture where every employee feels valued, respected, and heard. We strive to ensure all employees are provided equitable access to resources and opportunities. A key objective in our people strategy is to increase the number of women and people with disabilities in the Company and create a workplace where they, and all employees, can thrive.

<table>
<thead>
<tr>
<th>2023</th>
<th>2022</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of female employees</td>
<td>5,294</td>
<td>4,503</td>
</tr>
<tr>
<td>Female (%) of total employees</td>
<td>7.2</td>
<td>6.4</td>
</tr>
<tr>
<td>Female (%) of total number of new hires</td>
<td>24.1</td>
<td>28.4</td>
</tr>
<tr>
<td>Number of female employees in leadership positions</td>
<td>233</td>
<td>176</td>
</tr>
<tr>
<td>Female employees in leadership positions (%)</td>
<td>4.8</td>
<td>3.8</td>
</tr>
</tbody>
</table>

** This figure has undergone external limited assurance in accordance with the ISAE 3000 (revised). The assurance report can be found online on the Sustainability section of our website.
Advancing career development opportunities for our people

At Aramco, we continue to excel at providing unique learning offerings to our workforce. Our Hosted University Program expands advanced-degree opportunities for our employees seeking master’s degrees from top-tier universities while remaining on the job. The program brings the knowledge and expertise of leading global universities and institutions to the Kingdom to deliver customized, business-centered academic degrees. The program is predominantly face-to-face sessions conducted in Kingdom with a 7-week out of Kingdom duration at the university’s main campus location. This leads to a more capable and adaptive workforce to assist in achieving the strategic goals of the Company.

By 2023, the Company has completed more than 35 hosted programs, successfully graduating more than 900 employees. Notably, the Company signed agreements with top-tier business schools like Harvard, London Business School, and Wharton to focus on employee development and diversify opportunities, ensuring alignment between employees’ aspirations and the Company’s overall corporate strategy with over 2,000 participants to date. We have also introduced Harvard Manage Mentor Cafes to provide interactive sessions on soft skills, analytical competence, and leadership development; over 1,800 employees have benefited from this program.

In 2023, the Company has completed more than 35 hosted programs, successfully graduating more than 900 employees. Notably, the Company signed agreements with top-tier business schools like Harvard, London Business School, and Wharton to focus on employee development and diversify opportunities, ensuring alignment between employees’ aspirations and the Company’s overall corporate strategy with over 2,000 participants to date. We have also introduced Harvard Manage Mentor Cafes to provide interactive sessions on soft skills, analytical competence, and leadership development; over 1,800 employees have benefited from this program.

First cohort of female pilots

Aramco has graduated its first cohort of female pilots in 2023, marking a significant milestone in the Company’s aviation program. The program, which has been in development for over a decade and includes two years of university study, aims to ensure these pilots serve as role models and encourage more women to join the program. The graduates’ backgrounds in engineering (civil and electrical) and computing have made them well-equipped to become the Company’s pioneering female pilots.

With one of the largest corporate fleets in the world, Aramco’s aviation department offers these women, and those who will follow in their footsteps, an opportunity to follow their passion and achieve equal opportunity to venture into a field with low female participation. In this way, it offers not only a dynamic and well-paid career, but also a chance for them to realize their dreams.

Workforce well-being

A healthy working environment is critical for employee health, positive engagement, and operational safety. To support our employees, dependents, and their families, medical services (including mental health) are provided across all Aramco sites and made easily accessible to our people.

In addition, Aramco supports the well-being of its contractor workforce through a dedicated Corporate Contractor Well-Being Program. Various free services are available to contractors in multiple languages, including a 24/7 hotline, video counseling, online resources and awareness materials. Also, well-being and stress management engagement sessions have been conducted across the Kingdom. Furthermore, a Contractor Passport Solution that monitors key well-being parameters has been deployed Company-wide.

Spotlight on training and development

Sustainability in action

Number of hired graduates

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2023</td>
<td>1,645</td>
</tr>
<tr>
<td>2022</td>
<td>1,459</td>
</tr>
<tr>
<td>2021</td>
<td>1,447</td>
</tr>
</tbody>
</table>

Number of interns

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2022</td>
<td>3,201</td>
</tr>
<tr>
<td>2021</td>
<td>3,190</td>
</tr>
</tbody>
</table>

Number of apprentices (new intake)

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2023</td>
<td>2,000</td>
</tr>
<tr>
<td>2022</td>
<td>1,728</td>
</tr>
<tr>
<td>2021</td>
<td>1,369</td>
</tr>
</tbody>
</table>

Aramco launched its "Supporting Well-Being for Leaders" course in 2022 to support the mental well-being of employees. Since its inception, it has been delivered to over 2,500 leaders in Aramco.
Minimizing environmental impact

Biodiversity and ecosystem services .............................................. 68
Local environmental impact .......................................................... 72
Water management ........................................................................ 74
Product stewardship and waste management .............................. 76

The Arabian Sunbird is regionally native to Arabian Peninsula and present on Aramco BIPAs in the western side of the Kingdom. The Arabian Sunbird geographical range spans from west of Arabia to Yemen further south. Sunbirds are not just beautiful – they are an important pollinator of native plants.

Photographer
Philip Roberts
Minimizing environmental impact

Aramco has operated for more than 90 years in Saudi Arabia’s desert sands, and the overwhelming need to protect groundwater has fostered a culture of preservation in all the sectors in which we do business. From air, to water, to waste – we are applying circular economy principles to reduce impact, restore ecosystems and increase biodiversity.

This year we met and exceeded our 2025 target, two years in advance, to increase the biodiversity net positive impact by (NPI) 30% against our base year (2022). In 2023, we achieved an 85.6%** NPI because of the inclusion of additional Biodiversity Protection Areas (BPAs) in Saudi Arabia and significant expansion (over 700 km²) of our existing BPA in Shaybah.

### Performance of our key metrics

<table>
<thead>
<tr>
<th>Material issue</th>
<th>Relevant metrics</th>
<th>2023</th>
<th>2022</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biodiversity and ecosystem services</strong></td>
<td>Net positive impact (%)</td>
<td>85.6**</td>
<td>53.0**</td>
<td>In 2023, we exceeded our 2025 target, two years in advance, to increase the NPI by 30% against our base year. In 2023, we achieved a 85.6%** NPI because of the inclusion of additional BPAs in Saudi Arabia and significant expansion of over (700 km²) of our existing BPA in Shaybah. As a result, the total area covered by BPAs is over 1,700 km².</td>
</tr>
<tr>
<td><strong>Local environmental impact</strong></td>
<td>Number of hydrocarbon spills</td>
<td>12</td>
<td>15</td>
<td>In 2023, the number and volume of hydrocarbon spills decreased significantly (20.2% fall in number of hydrocarbon spills, and 94.2% decline in volume of hydrocarbon spills) compared to 2022. All of the spills were quickly halted and thorough cleanup efforts were carried out to mitigate further environmental impacts. One onshore oil spill in the Riyadh area with a volume of 8,333 barrels that was the result of a damaged pipeline accounted for over 97% of the total volume of hydrocarbons spilled.</td>
</tr>
<tr>
<td></td>
<td>Volume of hydrocarbon spills (barrels)</td>
<td>8,164**</td>
<td>142,885</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recovered hydrocarbon (%)</td>
<td>88%</td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hydrocarbon discharge to water (barrels)</td>
<td>14.3**</td>
<td>16.4**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SOx emissions (metric kilotons)</td>
<td>146**</td>
<td>167**</td>
<td>A series of measures, such as continuous improvement in sulfur recovery, operational efficiency, ready availability of Sulfur Recovery Units, and lower production, resulted in an overall decrease in sulfur oxides emissions from 2022.</td>
</tr>
<tr>
<td><strong>Water management</strong></td>
<td>Number of sites with ISO 14001 certification (%)</td>
<td>100**</td>
<td>98**</td>
<td>In 2023, we achieved 100% ISO 14001 certification at facilities under our operational control, i.e., the 52 upstream and downstream asset-based organizations enrolled in our Environmental Management System.</td>
</tr>
<tr>
<td></td>
<td>Freshwater consumption (million m³)</td>
<td>89.9**</td>
<td>93.6**</td>
<td>In 2023, freshwater consumption was 89.9** million m³, down 4.9% compared to 2022, due to effective water conservation efforts in Aramco’s upstream and petrochemical operations.</td>
</tr>
<tr>
<td></td>
<td>Freshwater withdrawal (million m³)</td>
<td>135.7</td>
<td>136.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Freshwater intensity* (m³/barrel) (total freshwater consumed relative to our hydrocarbon production)</td>
<td>0.02</td>
<td>Metrics not disclosed previously</td>
<td></td>
</tr>
<tr>
<td><strong>Product stewardship and waste management</strong></td>
<td>Industrial waste disposed (metric tons)</td>
<td>481,561</td>
<td>318,656</td>
<td>In 2023, Aramco generated 481,561 metric tons of industrial waste, which was disposed of in compliance with regulations and standards. While our efforts to minimize waste have improved, the observed increase in industrial waste from 2022 was attributed to the Company’s expanded operations and our efforts in improving industrial waste reporting system.</td>
</tr>
<tr>
<td></td>
<td>Industrial waste recycled (%)</td>
<td>35.7**</td>
<td>39.3**</td>
<td></td>
</tr>
</tbody>
</table>

### 2023 performance

| S0x emissions (metric kilotons) | 85.6**% | 146 | 167** |
| Freshwater consumption (million m³) | 0.02 m³/barrel* | 89.9 | 93.6 |
| 100%* | Number of sites with ISO 14001 certification |

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* Metric reported for the first time externally
** 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.

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### Our contribution to the UN SDGs

Given water scarcity in Saudi Arabia, Aramco has a large seawater treatment and injection network of facilities. Seawater is used as the primary source of water for oil production and to ensure clean water is available for our workforce and local communities.

Embracing circular economy principles and business models across our operations and activities, to date, we have trained and certified over 2,800 employees from different segments of our business in circular economy. This is supported by a circular economy guidebook and circularity maturity assessment to guide organizations across the Company in their circularity journey. Over 200 circular economy initiatives have been implemented, adopting circular business models aiming to optimize resources utilization and minimize environmental impact. For more information, please refer to Aramco’s circular economy section on our website.

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### Aramco’s approach

Aramco has systems in place to manage all discharged water to the sea, meeting Government requirements by investing in maintenance and monitoring systems while proactively managing operations to avoid hydrocarbon leaks and spills by maintaining asset integrity throughout the life cycle.

Aramco aims to deliver biodiversity net gain in support of Vision 2030, 100% of and the Saudi Green Initiative.

Partnering with organizations, such as Epica and WEF, to help promote good industry practice and better environmental performance. We are also working closely with our suppliers and creating incentives to reward them for improvements in their environmental performance.
**Biodiversity and ecosystem services**

**Net positive impact by 2030**

**Net positive impact**

In alignment with the G7F, Aramco strives to achieve a net positive impact on biodiversity and ecosystem services by 2030. NPI occurs when biodiversity gains through conservation projects outweigh negative impacts on biodiversity as a result of operations. We measure our NPI by comparing the surface area of our Biodiversity Protection Areas (BPAs) against that of our operational footprint.

An interim target was set in 2022, to achieve a 30% improvement in our NPI by 2025. However, in 2023, we achieved a 61.5% improvement in the year, taking our overall score to 85.6%**. This improvement in our performance was achieved due to changes in our BPAs in Saudi Arabia. The inclusion of three new BPAs and significant expansion (over 705 km) of the existing BPA in Shaybah led to a large increase in the total land in our protected areas. The Shaybah Wildlife Sanctuary expansion was undertaken to match an increase in the number of native animals that are planned to be located in the sanctuary.

**Biodiversity**

The planet continues to experience a decline in biodiversity due to human activity, and this is increasingly recognized as a significant risk to humanity. The UN Biodiversity Conference (COP 15, 2022) concluded with 196 countries, including Saudi Arabia, signing up to the Kunming-Montreal Global Biodiversity Framework (GBF). The GBF aims to address biodiversity loss, restore ecosystems, and protect indigenous rights, providing a refreshed roadmap for delivering the Global Goal for Nature to halt and reverse nature loss by 2030 and to become nature positive.

This principle sits at the heart of Aramco’s biodiversity policy and our use of the mitigation hierarchy. These provide the responsibilities and framework to safeguard biodiversity wherever the Company operates and to restore degraded areas, and in so doing, maintain and increase biodiversity and ecosystem services.

Aramco’s activities overlap and potentially impact areas of high biodiversity value. To compensate for this, the Company has developed initiatives intended to ensure impactful contributions to biodiversity conservation, which are aimed at identifying opportunities and addressing associated risks.

---

**Governance framework for biodiversity**

**Avoid**

- We avoid operating in high-quality habitat

**Minimize**

- We minimize our impacts

**Restore**

- We restore degraded habitat

**Offset**

- What we cannot avoid, minimize, or restore, we offset

---

**Our biodiversity mitigation hierarchy**

- **Our policy is not to operate in designated UNESCO World Heritage sites, strict nature reserves or wilderness areas classified by IUCN, and aims to ensure our operations result in no net loss of biodiversity and ecosystem services in national parks and Key Biodiversity Areas.**

- **During 2023, we designated additional Biodiversity Protection Areas; we now have 14 BPAs covering almost 1,705 km². Together, these sites protect more than 700 species of plants and animals.**

- **In 2023, Aramco supported restoration projects, and planted more than 350,000 native trees in three Saudi Reserves.**

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**We map and monitor to understand the biodiversity around us**

Aramco’s Natural Wetland Strategy aims to restore natural wetlands (more details in case study on next page) to promote biodiversity recovery and ecosystem service provision. An exhaustive remote-sensing, mapping, and prioritization exercise has identified natural wetlands on Company land.

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**We conduct applied research**

Aramco conducts applied research aimed at ensuring its activities do not cause undue impacts on biodiversity, including collaborative research partnerships with King Fahd University of Petroleum and Minerals and King Abdulaziz University of Science and Technology. For instance, in 2023, we tagged and released nine sea turtles (three juvenile and eight adult) for satellite tracking as part of ongoing studies.

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**We invest in biodiversity education and awareness**

Aramco hosts a Sea Turtle Rescue Center near our Ras Tanura terminal that saves, treats, and releases sea turtles, and educates the local community.
Spotlight on Biodiversity at Aramco

Delivering net positive impact

At Aramco, we aim to achieve a net positive impact on biodiversity by 2030. In 2023, we achieved a 86.5%** NPI, which is a 61.5% increase compared to the prior year, and exceeded, two years in advance, our 2025 NPI target.

Central to achieving NPI is the Biodiversity Protection Area program. In 2023, we designated new terrestrial areas in Riyadh and Dammam, and Harqis Island in the Arabian Gulf as BPAs, bringing the total number of BPAs to 14 covering over 1,700 km². These new sites were assessed based on the International Union for Conservation of Nature (IUCN) criteria. Additionally, the Shaybah Wildlife Sanctuary was expanded in 2023.

Our BPA network is supported by assessment of the contribution to conservation objectives and delivery of the Company's biodiversity aims to achieve NPI on biodiversity and ecosystem services. As new sites are added, new species are being recorded. Aramco’s BPAs provide a secure habitat for around 40% of all bird species in the Kingdom, including numerous migratory species. Overall, our BPAs have recorded over 730 plant and animal species, including several globally Threatened and Near Threatened species under the IUCN Red List.

IUCN Red List

Endangered Vulnerable Near Threatened

List of BPAs:

1. Shaybah Wildlife Sanctuary
2. Rahimah Bay Mangrove Eco-Park
3. Abu Ali Island
4. Tanajib Biodiversity Protection Area
5. Abqaiq Wetlands
6. Uthahayah Biodiversity Protection Area
7. Abu Ali Island
8. Bahra Biodiversity Protection Area
9. Madina Biodiversity Protection Area
10. Khurais Biodiversity Protection Area
11. Baga Bird Oasis
12. Riyadh Biodiversity Protection Area
13. Qassim Biodiversity Protection Area
14. Harqis Island

Secure habitats provided by Aramco’s BPAs for the following:

- **Mammals**: 46
- **Invertebrates**: 79
- **Reptiles**: 30
- **Plants**: 386
- **Birds**: 189

Nature-based solutions

To nurture, protect, and restore our environment, Aramco invests in nature-based solutions. Beyond the potential climate benefits of these solutions acting as carbon sinks, nature-based solutions, like mangroves, provide a home to many diverse wildlife species, a nursery for infant marine life, and a vital natural line of defense against natural disasters including shoreline erosion, and storms.

In 2023, we planted approximately 6.5 million mangroves and 1.1 million native trees in the Kingdom. This brought the total number of planted native trees to 41 million. To date, our cumulative total of planted mangroves is over 30 million, while the carbon stock of the planted and existing mangroves was validated to be equal to almost 445,000 tons of CO₂.

Coral reefs

Coral reefs are one of the most diverse ecosystems in the world and we have been proactively promoting the growth of marine life with artificial reefs. Along with our offshore oil and gas facilities acting as artificial reefs by providing substrate for marine communities; Aramco continues to work with the Okinawa Coral Reef Conservation Consortium in Japan. This initiative ensures the future of endangered coral reefs around Okinawa.

Building on 11 years of research, we have conducted studies on how to restore the coral reefs, and have run educational programs reaching out to school children to nurture understanding, as well as appreciation for the natural environment. We are currently scaling up our efforts to focus more directly on coral revitalization by cultivation and planting.

Seaweed

The Yanbu seaweed pilot project to harness the potential of seaweed cultivation was completed in 2023. We have cultivated different genes of seaweed such as Sargassum and Kappaphycus, which are native to the Red Sea in the Western Region. Furthermore, an algae market survey has been completed, to further support potential future seaweed projects. These surveys provide comprehensive data that enable the assessment of investment viability and market potential for evaluating investment opportunities in the algae industry.

Wetlands initiatives

Aramco is cognizant of the ecological significance of wetlands (including their role in carbon sequestration), with many located on its land. Aramco’s wetlands strategy focuses on the restoration and protection of natural wetlands on our land, and the creation of constructed wetlands, a cost-effective, energy efficient, and more environmentally benign alternative to traditional wastewater treatment methods.

The top priority natural wetlands will be explored for designation as BPAs, adding to the almost 1,700 km² already protected by Aramco across Saudi Arabia.
Local environmental impact

**Air emissions**

Since 2012, our operations have been supported by Aramco’s Environmental Management System (EMS), which provides a systematic and planned approach to achieve compliance with local environmental regulations and support for adoption of international good practices. In 2023, we achieved 100% ISO 14001 certification at facilities under our operational control that is the 52 upstream and downstream asset-based organizations enrolled in our EMS, of which 50 organizations are in Saudi Arabia, and two organizations are located outside of the Kingdom.

We conducted more than 43 environment and health site assessments during 2023 to manage and mitigate any negative environmental and health risks of our operations around the world.

**SOx emissions (metric kilotons)**

<table>
<thead>
<tr>
<th>Year</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOx</td>
<td>146</td>
<td>167</td>
</tr>
</tbody>
</table>

**Abqaiq Plants achieves 1st place in the 2023 King Khalid Foundation Sustainability Award**

Abqaiq Plants achieved Gold status in the 2023 King Khalid Foundation Sustainability Award for its commitment to sustainability in governance, social responsibility, economic practices, and environmental stewardship. Abqaiq Plants also adopted advanced technology, including Unmanned Aerial Vehicle (UAV) drone programs for improved environmental monitoring.

**Spills to the environment**

To meet our aspirational target of zero spills, Aramco employs rigorous inspection programs to assess the integrity of assets, putting fail-safe measures in place, training employees to ensure they are familiar with good practices and procedures.

Some of our key oil spill detection procedures include:

- Utilization of technologies to predict possible failures for rapid decision making and action;
- Regular oil spill drill procedures for hydrocarbon handing facilities;
- An oil spill trajectory prediction system to provide efficient response to oil spill emergencies in the marine environment.

The prediction system offers user-friendly interfaces for forecasting oil spills through real-time online queries with their outputs streamed to a dashboard for visualization and analysis;

- Technologies that monitor and enable rapid response to oil spills;
- Local and international knowledge sharing; and
- Collaboration to share lessons learned from incidents and share good practice.

In the event of any spills, we have response plans that enable rapid mitigation. Our management processes focus on mitigating the impacts of hazardous chemicals and air, water, and soil contamination.

In 2023, the number and volume of hydrocarbon spills fell significantly (a 20.0% fall in number of hydrocarbon spills, and a 94.0% decline in volume of hydrocarbon spills compared to 2022).

While we aspire for zero oil spills, we did regrettably have 12 oil spills, which led to a volume of 8,566 barrels being spilled. Following our significant recovery efforts, we were able to recover 88% of hydrocarbons.

Of these 12 spills, nine were onshore with a cumulative volume of 8,551 barrels and three offshore spills in the Arabian Gulf.

All spills were rapidly halted by the response team and the impacted sites were rehabilitated to eliminate further environmental impacts. One onshore oil spill with a volume of 8,335 barrels that was due to a damaged pipe in the East-West pipeline was responsible for more than 97% of the total oil spills. The affected area was remediated.
Water management

Our approach to water

With the country’s arid environment, and Saudi Arabia ranked as the eighth most water-stressed country in the world, Aramco has long recognized the value of water. Since recording measurements began in 1978, Aramco has been able to conserve more than 160 billion gallons of groundwater. More than 1,600 groundwater monitoring wells in 63 facilities assess groundwater quality.

As disclosed in our 2022 Sustainability Report, Aramco is pursuing a water neutrality aspiration to conserve water naturally resources and reduce dependency on non-renewable water supplies (groundwater). To achieve this goal, across our businesses in Saudi Arabia and abroad, we are reducing our extraction of groundwater by using non-traditional water sources such as seawater, treated sewage effluent, and treated reject streams.

We measure water conservation performance through:

- Reviewing water conservation data and key performance metrics;
- Conducting water optimization studies on capital projects;
- Assessing Company operating facilities for compliance and engineering standards;
- Following good industry standards and water conservation technologies.

In 2023, freshwater withdrawal fell by 0.7% compared to the prior year. This reduction was due to effective water conservation efforts in our operations. While our freshwater withdrawal fell, our freshwater consumption was 89.9 million m3 in 2023, which is a 4.0% reduction compared to prior year.

During the year, we introduced a new metric to measure freshwater intensity (m3/boe). The metric measures the total freshwater consumed relative to our hydrocarbon production. In 2023, our freshwater intensity was 0.02 m3/boe. There are no prior year comparatives.

<table>
<thead>
<tr>
<th></th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
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</thead>
<tbody>
<tr>
<td>Freshwater consumption (million m3)</td>
<td>89.9**</td>
<td>91.6**</td>
<td>94.6</td>
</tr>
<tr>
<td>Freshwater withdrawal (million m3)</td>
<td>135.7</td>
<td>136.6</td>
<td>137.3</td>
</tr>
<tr>
<td>Freshwater intensity* (m3/boe)</td>
<td>0.02</td>
<td>Metric not disclosed previously</td>
<td></td>
</tr>
</tbody>
</table>

Wastewater and discharges to water

By virtue of its large operations, Aramco produces significant volumes of wastewater. A comprehensive wastewater effluents management program is implemented to protect the environment and public health.

This is achieved through the following measures:

- Developing and updating the Company’s wastewater compliance and engineering standards;
- Optimizing the design of wastewater facilities to adequately treat wastewater; and
- Maintaining a vigilant wastewater discharge monitoring program.

Our approach to wastewater and discharges to water are informed by relevant national and international frameworks or standards, including the Executive Regulations for the Protection of Aquatic Media from Pollution, among other Saudi Arabia Government Environmental Standards; and SPE’s Oil and Gas Industry Guidance on Voluntary Sustainability Reporting – Discharges to Water.

Hydrocarbon discharge to water (barrels)

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<th></th>
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<th>2022</th>
<th>2023</th>
</tr>
</thead>
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<tr>
<td>Hydrocarbon discharge to water</td>
<td>16.4**</td>
<td>14.5</td>
<td>10.7</td>
</tr>
</tbody>
</table>

Sustainability in action

Aramco’s progress towards its water neutrality aspiration

Below are some selected case studies of the various water management initiatives taking place across Aramco in pursuit of our water neutrality aspirations.

Embracing digitization to conserve groundwater

Aramco piloted digital technology to enhance the recovery of the reverse osmosis process at one of our facilities in 2023. Captured data revealed that more than 10% groundwater (i.e. 0.6 million m3 per year) could be conserved by real-time monitoring through alerts and forecasts generated by the tool.

Optimizing water usage with enhanced data systems

Our Drilling & Workover team delivered an enhanced water data gathering and analysis system. All onshore and offshore departments can now monitor and report their water data for drilling, workover and water well rigs in a common electronic platform. This data is used to optimize water usage.

Utilization of ultrasonic technology to conserve groundwater

In our South Ghawar production facility – part of the largest conventional oil field in the world – Aramco demonstrated the application of ultrasonic cleaners as an alternative to conventional high-pressure jetting cleaning of valves and piping.

This demonstrated that efficient utilization of an ultrasonic cleaner can potentially result in substantial groundwater savings.

Groundwater conservation in Abqaiq

We are replacing the use of aquifer water with seawater injection for reservoir pressure maintenance. Upon completion in 2024, the project is expected to supply 76% of the injection volumes from seawater. This share is expected to increase to 100% by 2029.

Achieving water neutrality at Al-Jazan

At the Al-Jazan Refinery Complex, industrial and sanitary wastewater is treated in a centralized wastewater treatment plant equipped with technologies for total reuse, to achieve substantial reduction in groundwater use. The facility manages both the Al-Jazan Refinery pre-treated industrial effluent and sanitary wastewater from the refinery, marine terminal, and our integrated gasification combined cycle power plants.

** Metric reported for the first time externally.
** 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.

Award

North Ghawar Producing Department wins the 2023 Manufacturing Leadership Award for its Hybrid Produced Water Treatment Technology

North Ghawar Producing Department has won the International Manufacturing Leadership Award under the engineering and production category. The National Association of Manufacturers’ Manufacturing Leadership Council recognizes world-class manufacturing companies and individual leaders for their outstanding efforts and projects.
**Product stewardship and waste management**

**Industrial waste management**

In 2023, we made progress in meeting key milestones in our corporate waste management strategy to minimize and divert landfill waste. Aramco’s operating facilities have been conducting waste minimization assessments to identify opportunities to reduce industrial waste generation and enhance the implementation of environmentally sustainable practices across our operations.

We have continued to implement automatic crude oil tank cleaning technologies to recover hydrocarbons from oily sludge tank bottoms, a practice that is contributing to enhanced industrial waste management system and operational efficiency. We are also collaborating with potential off-takers for spent catalysts for reuse and recovery purposes.

The Company is developing novel circular technology solutions in partnership with its subsidiary SABIC and applying them at scale to reduce single-use plastic waste and meet recycling regulations. These solutions include integrating mixed plastic waste into fillers to produce circular products and creating large-scale plastic sinks such as plastic waste in asphalt.

In 2023, the Company generated 481,561 metric tons of industrial waste, which was disposed of in compliance with regulations and standards. While our efforts to minimize waste have improved, the increase in industrial waste from 2022 was attributed to the Company’s expanded operations and our efforts in improving the industrial waste reporting system.

As part of our industrial waste management contractor monitoring program, we have conducted technical site visit assessments to our industrial waste management third-party service providers to ensure that our waste is being managed in line with our industrial waste management standards and as per governmental regulations. The Company has completed the revalidation of existing industrial waste management service providers currently available in the Company’s Qualified Supplier List, which included 22 third-party industrial waste management and transport service providers for sustainable management of our generated industrial waste.

**Sustainability in action**

**Repurposing waste into sustainable concrete**

In 2023, we conducted a pilot scheme whereby abrasive materials waste (such as copper slag) was reused to create a more sustainable concrete to minimize waste generation. This concrete provides a higher compressive strength than conventional concrete. It can prevent thousands of tons of blasting materials waste from being sent to landfills, by reusing them in Aramco projects for non-structure applications such as walkways, wheel stops, or concrete traffic barriers.

**Corporate circular economy roll-out**

We continue to roll-out the circular economy program across the Company value chain from design and engineering followed by procurement, construction, operation, services, to digitalization and information technology. To date, we have trained and certified over 2,800 employees from different segments of our business in circular economy. This is supported by a circular economy guidebook and circularity maturity assessment to guide organizations across the Company in their circularity journey. Over 200 circular economy initiatives have been implemented, adopting circular business models aiming to optimize resources utilization and minimize environmental impact.

**Drilling and Workover (D&W) circularity program**

During 2023, D&W/O implemented adopting circular business models aiming to optimize resources utilization and minimize environmental impact. Circular economy initiatives focused on materials, chemicals consumption, assets utilization, water conservation, and waste minimization in drilling and workover operations.

In 2023, we recycled and reused over 3.9 million barrels of drilling fluids, refurbished over 2,000 wellheads and pieces of well control equipment, reutilized more than 6,000 repaired drilling assets, and refurbished over 8,500 metric tons of oil country tubular goods. We implemented closed loop drilling practices in 257 well sites, which allowed us to reduce water consumption at these wells by 13 million barrels and to reduce wastewater by 3 million barrels.

**Procurement and Supply Chain Management (P&SCM) circularity program**

We continue to implement circular economy principles in our procurement and supply chain by adopting circular business models, such as circular procurement and reverse logistics, sharing, and asset’s life extension. The P&SCM circularity program consists of circular initiatives that align with our circular economy principles, strategies, and corporate policies. The program includes reverse engineering spare parts, shelf-life extension, refurbishment programs, and scrap recycling.

During 2023, P&SCM circularity programs recycled more than 85,000 tons of materials such as ferrous scrap, plastic drums, and aluminum.
Growing societal value

The King Abdulaziz Center for World Culture

Aramco’s flagship social initiative, the King Abdulaziz Center for World Culture (Ithra—meaning “enrichment” in Arabic) aims to make a tangible and positive impact on human development by inspiring passion for knowledge, creativity and cross-cultural engagement while delivering world-class experiences.

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Community and society............................................88
Economic contribution............................................. 93
### Performance of our key metrics

<table>
<thead>
<tr>
<th>Material issue</th>
<th>Relevant metrics</th>
<th>2023</th>
<th>2022</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor practices</td>
<td>Number of people on Aramco sponsored community programs</td>
<td>15,099</td>
<td>12,160</td>
<td>The number of people in our sponsored community programs increased by over 24.2% compared to 2022, demonstrating our firm strategy to building capacity and capabilities of local people in Saudi Arabia.</td>
</tr>
<tr>
<td>National content</td>
<td>Saudization ( % of Saudi nationals as part of Aramco’s workforce)</td>
<td>90.3</td>
<td>90.9</td>
<td>Aramco continues to contribute to the Kingdom’s Saudization program, whereby 90.3% of all employees are Saudi nationals. Compared to the prior year, there was a year-on-year increase in the Saudization of our third-party contractors, with the Saudization of construction contracts reaching 29.7% (versus 28.0% in 2022).</td>
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<td>Saudization of construction contracts (%)</td>
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<td></td>
<td>Cumulative iktva GDP contribution** ($ billion)</td>
<td>202.9</td>
<td>166.0</td>
<td>Aramco’s total domestic spending is estimated to have contributed $202.9 billion in GDP since iktva’s inception, when considering the direct and indirect supply chain contribution to the Kingdom’s economy. This result was driven by an increase in in-Kingdom spending, growth in local investments and increased supplier contributions across all iktva components.</td>
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### Economic contribution

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<td>Total number of volunteers†</td>
<td>7,037</td>
<td>4,941</td>
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<td>Total number of volunteering hours†</td>
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### Our contribution to the UN SDGs

- **Sustainable Industry**: Aramco prioritizes a top-tier local supply chain for more sustainable energy solutions.
- **Diverse Infrastructure**: Aramco’s Kingdom-wide infrastructure contributes span natural gas, roads, educational facilities, and cultural centers.
- **Partnering with governments, suppliers, nonprofits, and education institutions**: During 2023, $475 million was invested in various social initiatives, supporting more than 30 non-profit organizations around the world.

### Aramco’s volunteering and giving mindset

- Aramco fosters a volunteering and giving mindset among both employees and community members, across a range of programs and initiatives. As a result, the total number of volunteers and total number of volunteer hours increased compared to 2022.

### 2023 performance

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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 $475 million compared to $370 million under the previous methodology.
3. Aramco promotes lifelong learning and development by building schools and establishing market-driven training centers for a skilled Saudi workforce. The Company also supports education centers for individuals with disabilities, such as the Hiba Center for Down Syndrome and the Abdullatif AlFozan Autism Center.
4. Sustainable Industry: Aramco focuses on education for sustainable development, with a particular emphasis on science and technology, through partnerships and initiatives.
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Labor practices and national content

Building the local workforce and supply chain in the Kingdom of Saudi Arabia

With our headquarters in Saudi Arabia, we have a proud, decades-spanning history of educating and training Saudi nationals, as well as our international workforce. From investing in schools to supporting national technical training centers across Saudi Arabia to sponsoring tens of thousands of employees and students in undergraduate and post-graduate education, we believe we run one of the largest corporate-led training and education programs in the world. This has delivered the enormous benefit of a highly skilled workforce of Saudi men and women to our Company and to the Kingdom.

Saudization
Aramco aims to localize the rig-building business and create jobs for Saudi citizens, with the Saudization of construction contracts reaching 29.7% (versus 28.9% in 2022).

Localizing the supply chain where we operate
From Aramco's inception more than 90 years ago, we have played a central role in supporting the development of local businesses in Saudi Arabia with localization of our supply chain being the underpinning strategic theme. From assisting SMEs during startups, to helping companies expand regionally, Aramco has developed a Saudi-based energy ecosystem. Today, our multi-billion dollar in-Kingdom Total Value Add (iktva) program sits at the center of these efforts, helping domestic energy-related industries to flourish and become globally competitive.

Through a series of integrated localization programs, we are expanding our in-Kingdom support beyond energy, assisting the Kingdom’s Vision 2030 by investing in, and nurturing, SMEs and larger enterprises across multiple domains, particularly in new technology and digital innovation, sustainability, and manufacturing.

Sustainability in action
Broadening educational opportunities for our youth
In 2023, we achieved several milestones in educating our youth and supporting our communities through Aramco-sponsored community programs. From 2021 to 2023, the number of participants in these programs grew by 68%.

Through the University Internship Program, we worked with our supply chain to increase the number of internship students, with 61% placements in JV, vendors and National Training Centers (NTCs), and achieving 45% female participation. The program works with over 3,000 students. The Tomooh program aims to enhance skills of high-performing secondary school students, preparing them for university placement. In 2023, nearly 1,000 students improved their scores on SAT (Scholastic Aptitude Test) subjects, IELTS (International English Language Testing System), and 21st-century soft skills, along with an introduction to the Company’s core business.

The Advantage Academy is a community initiative aimed at empowering over 600 underprivileged youth by offering training in relevant programs such as English, math, science, pre-college test preparation, and life skills. It also provides advisory and counseling services, as well as edutainment such as cultural and sports.

In 2023, we increased training and recruitment efforts for people with disabilities (PwD), achieving the highest level of students in our apprenticeship programs. We boosted our intake six-fold and implemented new policies, partnering with the Arizona Centers for Comprehensive Education and Life Skills (ACEEL) schools to provide individual support and development plans. The center is located in Ajyal community, Dhahr’an, and has a capacity of 320 students.

Our iktva program
Our iktva (In-Kingdom Total Value Add) program has been a critical enabler of the Saudi domestic energy industry ecosystem and we are on track to meet our iktva target of having 70% of all our procurement spend in-Kingdom by the end of 2025. In the seventh edition of the iktva Forum, which showcases all our partners under one roof, we reached more than 85,000 visitors. The Forum showcased more than 200 investment opportunities with an annual market share of $16 billion, and included the signing of more than 100 localization memoranda-of-understanding (MoUs). Through iktva, the local content of our overall 2023 procurement spend across our supply chain stood at 65.9% (2022: 63.0%). By bringing our supply chain closer to our operations, we are embedding resilience and ensuring we remain one of the most reliable suppliers of energy to the world. This is being achieved through attracting investment and cultivating partnerships with top global energy, logistics, and manufacturing companies, to localize suppliers’ manufacturing capabilities and eliminate supply chain risks.

The iktva program is opening up investment opportunities that can help drive the creation of products and innovations that are not only in demand, but can also play a role in lowering the carbon emissions of the industry. Iktva is also a platform through which we implement the adoption of industry standards and best practices in both operations and labor practices via our supplier assessments.

In 2023, 32 new local manufacturers were established, allowing the introduction of items manufactured for the first time in the Kingdom, including: sub-surface safety valves, safety footwear, coalescing filters, and specialty coatings for drilling equipment. During the year, Aramco entered into 86 in-Kingdom corporate purchase agreements with an estimated value of $3.3 billion to build long-term collaborative relationships with strategic local suppliers.

Aramco’s procurement of domestically produced goods and services has benefited the Kingdom’s economy. Aramco’s total domestic spending is estimated to have contributed $202.9 billion in GDP since iktva’s inception, when considering the direct and indirect supply chain contribution to the Kingdom’s economy. This result was driven by an increase in in-Kingdom spending, growth in local investments, and increased supplier contributions across all iktva components.

Sustainability in action
Building the first locally manufactured offshore rig
International Maritime Industries (IMI), the largest shipyard in the MENA region, built the first Aramco Rowan Offshore Drilling (ARO Drilling) offshore rig built in Saudi Arabia.

ARO Drilling and IMI collaborated to develop advanced localized capability with the new jack-up rig, “Kingdom-1”, equipped with the latest technology to enhance operational excellence and safety.

Both companies are Aramco joint ventures and are products of Aramco’s iktva program. Kingdom-1 is part of a bigger industrialization program that aims to localize the rig-building business and create jobs for Saudi citizens, providing them with valuable experience and training.

$202.9 billion
GDP contribution since iktva’s inception

Cumulative iktva GDP contribution* ($ billion)

<table>
<thead>
<tr>
<th>Year</th>
<th>iktva</th>
<th>iktva procurement spend in-Kingdom</th>
</tr>
</thead>
<tbody>
<tr>
<td>2023</td>
<td>202.9</td>
<td>63.0</td>
</tr>
<tr>
<td>2022</td>
<td>136.0</td>
<td>59.0</td>
</tr>
<tr>
<td>2021</td>
<td>166.0</td>
<td></td>
</tr>
</tbody>
</table>

1. These programs include the Vocational College Internship Program (VCIP), University Internship Program (UIP), Summer enrichment program, Tomooh program, Advantage program, and Arizona Centers for Comprehensive Education and Life Skills (ACEEL) International Ajyal Center.

* Metric reported for the first time externally.
National Champions

Aramco’s National Champions program is envisioned to be a world-class cluster of innovation that drives business and job creation, and supports national economic growth. In this program, we act as an incubator to convert lucrative business ideas into investment opportunities into thriving National Champions, enabling job creation and economic growth.

Local successes

Both in Saudi Arabia and abroad, we have established different initiatives to continue to grow societal value wherever we operate. Some notable examples of our National Champions’ recent efforts are presented over the next three pages.

Spotlight on National Champions

Supporting economic diversification in Saudi Arabia

Aramco’s National Champions program is unique in its scale of contribution to a local economy. Since the inception of our National Champions program, we have managed to finalize investments that are projected to create over 46,400 jobs and potentially contribute over $14.3 billion to Saudi Arabia’s GDP.

The program is focused around four domains – manufacturing, industrial, sustainability and digital – to drive development from an initial idea through to a global business.

Our program focuses on four domains:

- Manufacturing
- Industrial
- Sustainability
- Digital

LAB7

The LAB7 Innovation and Product Development Center aims to encourage the growth of the innovation ecosystem and targets the development of disruptive technology-based startups. LAB7 was established to be a quality-feed venture builder that generates high-worth startups for the Kingdom’s venture capital (VC) ecosystem.

There are four sectors identified that LAB7 focuses on to enhance the innovation ecosystem in the Kingdom:

- Sustainability e.g., lower energy, GHG emissions mitigation, renewables, and energy storage;
- Manufacturing e.g., nonmetallics, nanotechnology, and additive manufacturing;
- Digitalization e.g., AI, machine learning, cyber security and data analytics; and
- Industrial e.g., advanced robotics.

'$46k

Potential jobs creation

+$14 billion

Potential impact to Saudi Arabia’s GDP

Wa’ed Ventures

Now a decade old, Wa’ed Ventures is Aramco’s $500 million venture capital fund designed to support the startup ecosystem in Saudi Arabia by investing in local tech-based startups and localizing pioneering global innovations.

In 2023, it launched a Sustainability Venture Builder to diversify the fund’s investment portfolio and the Kingdom’s local pipeline for startups in the sustainability field. Wa’ed-supported startups include those addressing carbon credit issuance, real-time monitoring for energy, emissions optimization, and the circular economy. It has also advanced localization of four global deals in AI, space, cybersecurity, and 3D printing modular construction.

Some of the notable transactions included:

- Invested $5 million in Tenderd, which provides AI-generated insights to increase fleet optimization and reduce emissions, targeting capital-intensive industries, such as construction and logistics;
- Invested $1 million in Excess Materials Exchange, which is a circular economy platform that aims to find circular uses for excess materials and waste streams to reduce their environmental footprint; and
- Invested $0.5 million in Mighty Buildings, which is a construction technology company that creates sustainable high-quality homes using materials science, 3D printing, and robotics.
Human rights in the supply chain

Aramco requires its suppliers to share our values and respect human rights. Our Code of Business Conduct applies to our workforce, and our Supplier Code of Conduct (SCoC) applies to our suppliers. The SCoC sets out what we expect our suppliers to conform to in relation to ethical sourcing, labor conditions and human rights.

All of our active suppliers in Saudi Arabia have signed the SCoC, which requires Aramco’s suppliers to ensure and respect human rights in Saudi Arabia, such as providing a safe, sanitary, and healthy residential and living environment for all their employees, conducting safety training for employees, providing them with adequate safety equipment and ensuring all the supplier practices comply with the local labor laws.

Our suppliers are prompted to notify Aramco when they become aware of any actual, or potential, violation of the SCoC and communicate plans to correct and remedy such violations.

Aramco routinely assesses its businesses, joint ventures, suppliers, government relationships, acquisitions, mergers, and disposals to ensure adoption of our values, ethics, and standards.

We deliver ethical awareness and SCoC training to our suppliers. Aramco’s procurement teams perform inspections of some of our suppliers, especially in high-risk locations, to check for any non-conformance to our SCoC and/or agreed contractual arrangements, such as contractors being provided unsafe accommodation and/or workers being paid below the national minimum wage.

Active suppliers signed up to Aramco’s Supplier Code of Conduct

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2021</td>
<td>100%</td>
</tr>
<tr>
<td>2022</td>
<td>100%</td>
</tr>
<tr>
<td>2023</td>
<td>100%</td>
</tr>
</tbody>
</table>

Labor practices and national content continued

Taleed
Taleed supports scalable and sustainable job growth for small and medium-sized enterprises (SMEs) by providing growth acceleration services, including partnership and network building, business development, and investment attraction.

In 2023, Taleed developed a Carbon Net-Zero Support program for the Kingdom’s SMEs. The program provides educational workshops and in-person training sessions to SMEs to raise awareness on GHG emissions estimation and mitigation possibilities.

In 2023, over 500 SMEs benefitted from this program.

Namaat
Namaat, Arabic for ‘growth’, works together with major global and local partners collaborating on large-scale investment opportunities, and enables partnerships that support the growth of new, unicorn-scale companies.

In 2023, Namaat successfully developed and obtained Final Investment Decision (FID) for nine transactions, adding $6.5 billion to our capital enablement figures, resulting in a projected future increase in Saudi Arabia’s GDP of $5.4 billion and projected creation of more than 21,700 jobs.

First steel manufacturing complex in Gulf region
Aramco, along with Baoshan Iron & Steel Co. Ltd. and Saudi Arabia’s Public Investment Fund, intend to establish an integrated steel plate manufacturing complex in Saudi Arabia. The first facility of its kind in the Kingdom and the Gulf region when completed, the project aims to enhance the domestic manufacturing sector through localizing the production of heavy steel plates. The facility is expected to have a steel plate production capacity of up to 1.5 million tons per year. It would produce natural gas-based direct reduced iron using an electric arc furnace, which aims to reduce CO2 emissions from the steel-making process by up to 60% compared to a traditional blast furnace.

Additionally, with some modifications, the plant would be compatible with hydrogen as a fuel source potentially reducing CO2 emissions by up to 90%, subject to hydrogen availability.

Amiral petrochemical facility
Aramco and TotalEnergies awarded engineering, procurement, and construction contracts valued at $11 billion for the ‘Amiral’ complex, a future world-scale petrochemicals facility expansion at the SATORP refinery in Jubail. This expansion is expected to attract more than $4 billion in additional investment in a variety of industrial sectors, including carbon fibers, lubes, drilling fluids, detergents, food additives, automotive parts, and tires. It is also expected to create around 7,000 local direct and indirect jobs.
Community and society

Aramco has contributed positively to the Kingdom’s development since its inception. Our early efforts between the 1930s and 1970s focused on the Kingdom’s infrastructure and industrial development. These efforts were driven by business requirements, but Aramco has increasingly taken a more proactive approach to voluntary citizenship activities. In line with the Kingdom’s push to develop a knowledge-based society, the bulk of our citizenship effort today is focused on people’s development and environmental stewardship.

We believe that the most important source of energy is people, and their ability to create change that benefits them, their local communities, and the environment. Our citizenship activities span multiple fronts: from investing in knowledge and creativity, to conserving the biodiversity of our environment, to supporting the development of local communities and micro-industries.

Social investment

Over many decades, we have delivered social investment programs in Saudi Arabia. From infrastructure, to cultural assets, such as Ithra, to supporting the establishment of sustainable micro-industries, to health and education programs, our investments have made a positive impact on millions of people in the Kingdom.

We are drawing on this experience to support communities and citizens across the globe, mirroring the expansion of our commercial business. Our newly launched Global Citizenship Signature Programs (GSPs) will bring additional scale and impact to Aramco’s social investment efforts.

In 2023, we made social investments of $475 million in Saudi Arabia and abroad.

Global Citizenship Signature Programs

Aramco is extending its citizenship activities through its GSPs. Launched in September 2023, the GSPs serve as platforms to address important societal issues in a way that allows the Company to make an impact. These programs will draw on the skills of multiple partners across a number of years.

Currently, there are two GSPs. The first focuses on STEM education.

Under this program, Aramco, in partnership with the Network for Teaching Entrepreneurship (NFTE), created a challenge titled ‘Aramco Connected Cities Challenge’, championed by Ahmad Al-Khowaiter, Executive Vice President of Technology & Innovation. Aramco’s challenge attracted the highest number of registrations, with 462 submissions totaling more than 1,688 student participants. Innovation Days were held in India and Saudi Arabia with local non-profit organizations and schools, where students were mentored by Aramco employees to design solutions using emerging technologies and STEM skills to develop more efficient, accessible, or sustainable transportation infrastructure in their communities.

The second GSP focuses on energy access – in particular, providing modern, safe, and efficient cooking stoves to communities in need. In 2023, in partnership with Envirofit International, a leading social enterprise, more than 18,000 energy-efficient cooking stoves were distributed to communities in need. In 2023, in partnership with Envirofit International, a leading social enterprise, more than 18,000 energy-efficient cooking stoves were distributed to schools and individual homes in India in 2023. Additional GSPs and partnerships are expected in the future.

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Global citizenship

During 2023, Aramco contributed $475 million of social investment in the Kingdom and around the world across various initiatives. The case studies below present some highlights of our projects during the year, in and outside of Saudi Arabia.

Sustainability in action

A snapshot of our social investment projects around the world

Our social investment has two pillars

- Planet: investment activities prioritize biodiversity, including reforestation, and coral reef regeneration.
- People: social investments focus on two key areas of support, knowledge, and creativity and social economic development.

Saudi Arabia

While we have highlighted other projects on previous pages in Saudi Arabia, here we present two additional projects that we supported in 2023.

Rub’ al-Khali

Rub’ al-Khali Restoration

Aramco continued its restoration of the Rub’ al-Khali to its natural state by preventing key threatening processes (such as off-road driving, hunting), and reintroducing locally extinct species (including ostriches) within a natural, functioning ecosystem maintained at equilibrium and free of non-native species.

Dhahran

Ithra Read Program

The Ithra Reading Program (iRead) is a book review competition and is one of the flagship programs of Ithra. The program aims to celebrate the love of reading among youth in the Arab world and promote knowledge-seeking through various activities such as competitions and public enrichment events. In 2023, it received more than 125,000 book reviews from participants and it expanded beyond Saudi Arabia and into the Arab world.

Asia

In Asia, Aramco has supported 10 organizations across China, India, Japan, Malaysia, South Korea, Singapore, and Vietnam, with various environmental, educational, social, and medical initiatives.

South Korea

Urban Metropolitan Council

We supported Ulsan Metropolitan Council on Social Welfare’s recycling education program through the manufacturing of chairs and benches made by blending high-strength concrete and 28 tons of used plastic collected through a five-month-long plastic recycling campaign. The recycled chairs and benches are to be installed at eight major touristic locations across Ulsan, including the Taehwa-River National Riverside Park in Ulsan.

India

Life Lab Science Program

We upgraded the physical infrastructure of government schools by installing bio-cost mini science learning centers in 100 schools, benefiting approximately 10,000 students across districts in India.

China

Typhoon Relief: total donation amount $3 million

Pakistan, Gaza Relief Campaign: 21,711 employees raised more than $3.4 million. With Company match, total combined donation is $6.8 million.

Sudan, Humanitarian Relief: 12,180 employees raised $11 million dollars. Aramco matched these donations resulting in total combined donations of $2.2 million.

Europe

In Europe, Aramco has supported 11 non-profit organizations across the Netherlands, Italy, Poland, Spain, and the UK.

The Netherlands

The Friends of Floating Farm Foundation

The Friends of Floating Farm Foundation is working in collaboration with different stakeholders and innovative organizations researching circular business models in agriculture. Aramco has supported the Floating Farm since 2019 and, through its 2023 donation, continues to back research and development into more sustainable and innovative farming techniques. This includes developing a sustainable water desalination unit providing clean freshwater for food production. It serves the Rotterdam area of around 750,000 local residents.

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Poland

Perspektywy Foundation

Perspektywy is a foundation established to promote and support education. In this partnership, Aramco has assumed patronage of two esteemed and highly popular programs initiated by the Foundation: ‘Girls as Engineers!’ and the ‘Perspektywy Women in Tech Summit’—one of the biggest conferences for women in technology, science, and innovation in Europe.

United States

Feeding America

Feeding America stores emergency food supplies throughout the country for quick distribution in the event of a disaster. Our support has helped to provide over 250,000 meals across the US.

South Texas, United States

Galveston Bay Foundation

Helps to clean bay waters from pollutants and protect shorelines from hurricanes. With Aramco’s support, the Foundation has planted over 20,000 marsh grass across 1,056 acres of wetlands, with a projected carbon sequestration of approximately 2.3 tons of carbon dioxide annually. Several acres of wetlands have also been seeded for future plantings.

Disaster Relief

Complementing our social investment, we have a matched giving program where Aramco matches any donations that our employee makes. Collectively, over $18 million of donations were given to disaster relief efforts in four countries.

Turkey and Syria, Earthquake Relief: 23,895 employees raised $3.2 million. Aramco matched these donations resulting in total combined donations of $6.3 million.
Volunteering

Aramco fosters a volunteering and giving mindset among both employees and community members across a range of programs and initiatives. This includes:

- Ramadan supplies Care Box volunteer program;
- Company matched giving programs;
- Partnership with Al Fozan Academy to train students and teachers in volunteering;
- Corporate Blood Donation Campaign;
- Ithra, Aramco’s largest social initiative, offers significant volunteering opportunities to both employees and community members; and
- Globally, in markets where Aramco operates, there are multiple Aramco sponsored volunteer programs.

In 2023, Aramco’s employees completed 18,179 volunteering hours.1

The total number of volunteers increased by 43.4% in line with greater awareness of our volunteering program and our ambition to continue increasing our community engagement.

### Community and society.

<table>
<thead>
<tr>
<th>Years</th>
<th>Number of employee volunteers</th>
<th>Number of Aramco facilitated community volunteers</th>
<th>Total number of volunteers</th>
<th>Total number of volunteering hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>2023</td>
<td>20</td>
<td>11</td>
<td>31</td>
<td>171,633</td>
</tr>
<tr>
<td>2022</td>
<td>20</td>
<td>11</td>
<td>31</td>
<td>168,590</td>
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<tr>
<td>2021</td>
<td>15</td>
<td>11</td>
<td>26</td>
<td>136,284</td>
</tr>
</tbody>
</table>

### Economic contribution

**Economic contribution**

Operating in over 30 countries and engaging across the entire value chain, Aramco strives to create value and foster positive economic impacts in every location we serve. In addition to our cumulative Iktva GDP contribution of $202.9 billion in Saudi Arabia, we have made $475 million1 in social investments supporting a range of social and environmental initiatives around the world. Our payments to governments in the various countries where we do business reached $205 billion.2

#### Promoting sports in our local community

Al-Qadsiah Club, founded in 1967 in Khobar (close to our head office in Dhahran), is a Saudi sports club. The Ministry of Sports’ announcement of Aramco’s full acquisition of Al-Qadsiah Club as part of the Kingdom’s privatization program, in support of the Kingdom’s vision to build a world-class local sports environment, has positively impacted the club and catapulted it into a leading position in the Kingdom, on and off the pitch, making it a source of excitement and pride for the local community.

Post announcement, we have already made progress in achieving our vision during the past six months.

Our women’s sports offered at Al-Qadsiah Club have nearly quadrupled, from three to 11 sports, with the number of players increasing substantially, from 33 to 137. The men’s multi-sports section has also expanded by over 25% from 15 to 19 sports, resulting in an increase of players from 427 to 725 players.

The club’s facilities transformation is ongoing, with major upgrades in the sports and administrative facilities, including but not limited to purchasing of over 100 new sets of gym equipment, 35 sets of medical equipment, building a new multisport training pitch, expanding the youth accommodation, and refurbishing the club’s store.

The club and its facilities continue to make progress in achieving our vision during the past six months. Post announcement, we have already made progress in achieving our vision during the past six months.

Our efforts have borne fruit with our female football team currently ranked second in the Women’s Premier League and our male football team ranking first in the Saudi First Division League. Across various national and international competitions, our female athletes have won 22 bronze, 18 silver, and 21 gold medals in several sports, including judo, swimming, and cycling. Our male athletes have also won 34 bronze, 18 silver, 35 gold medals across several sports.

### Summary

<table>
<thead>
<tr>
<th>Year</th>
<th>Social investments ($ million)</th>
<th>R&amp;D spend ($ billion)</th>
<th>Cumulative Iktva GDP contribution ($ billion)</th>
<th>Payments to Saudi and foreign governments ($ billion)</th>
<th>Dividends ($ billion)</th>
<th>Net income ($ billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2023</td>
<td>475</td>
<td>1.41</td>
<td>202.9</td>
<td>205</td>
<td>102</td>
<td>121</td>
</tr>
</tbody>
</table>

1.Metric reported for the first time externally.
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’s figure to reflect this change. With this updated methodology, the 2022 figure is now $433 million compared to $750 million under the previous methodology.
3. This figure covers entities under Aramco Group.
4. Dividends paid includes dividends to shareholders and non-controlling interests in subsidiaries.
The Board of Directors is responsible for the overall management and supervision of the Company, and oversees effective governance, risk, and compliance standards.
**Governance**

As a leading oil and gas company, we recognize the importance of good governance, which is integral to fostering transparency, accountability, and ethical conduct across all facets of our business. Our commitment to sound governance practices not only safeguards the interests of our stakeholders, but also enhances our operational efficiency and long-term sustainability.

By maintaining a robust governance structure, we aim to build trust with our investors, partners, and communities while promoting a culture of responsible decision making and strategic planning. Through effective governance, we aspire to navigate the dynamic challenges of the industry, drive innovation, and deliver value to our shareholders and the broader society.

The Board of Directors (Board) of Aramco oversees the Company’s management, providing strategic leadership and guidance, as well as assessing business opportunities, risks, and risk mitigation controls. The Board oversees the Company’s governance, risk, compliance regime, and sustainability performance. The Chairman of the Board is H.E. Yasir O. Al-Rumayyan. The current members of the Board include high-ranking Saudi Government officials and former senior executives from the international oil and gas, chemical, petroleum refining, petrochemical, and finance industries.

The Board Sustainability, Risk and HSE Committee provides leadership, direction, and oversight with respect to environmental, social, and governance matters. The Committee provides advice on sustainability, risk, and HSE-related matters to ensure comprehensive discussion, understanding, ownership, and promotion of these matters on the Board. The Committee, meeting quarterly, assesses HSE performance, including health and safety incidents, and endorses our sustainability reports.

### Sustainability in action

**Establishment of the New Energies Organization**

To ensure we progress in our sustainability ambitions, it’s imperative our corporate and organizational governance is agile and fit-for-purpose.

Thus, in 2023, the New Energies organization was established following the endorsement of the long-term strategy to achieve the Company’s ambitions for lower carbon solutions to meet its GHG emissions mitigation ambition. New Energies has so far consolidated three new energies verticals, covering Renewables, Hydrogen, and Carbon Capture & Storage. Moreover, New Energies aims to nurture robust and more sustainable new energies businesses locally and globally, capitalizing on emerging opportunities to develop capabilities and revenues in strategic growth markets.

Over the next few years, we have allocated around 10% of our capital investments in New Energies to help us progress in our GHG emissions mitigation and abatement journey.

### Our sustainability governance

**Our Board**

Our Board members and senior executives exercise oversight over the Company’s financial and sustainability strategy and performance. In 2023, Board meetings achieved full attendance, with all Board members attending each meeting. The Company has 11 Board members, with five out of 11 members being independent.

<table>
<thead>
<tr>
<th>2021</th>
<th>2022</th>
<th>2023</th>
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<tbody>
<tr>
<td>Board composition by average age</td>
<td>61.45</td>
<td>62.45</td>
</tr>
<tr>
<td>Board composition by average tenure</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Board members’ average attendance (%)</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Number of independent Board members</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Board diversity (number of females on the Board)</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

1. For the 2023 Sustainability Report, the average age for 2023, 2022, and 2021 is calculated for each corresponding calendar year (i.e., January 1 – December 31). In previous years, the reporting time period extended beyond the calendar year; therefore, figures for previous years have been recalculated herein to reflect this update of the reporting period.
Corporate committees
Responsibility for sustainability at the Company rests with the President and CEO, the Group Executive Committee, and the Group Strategy Committee, reinforced by the Group Health, Safety, Security, and Environment Committee and the Sustainability Steering Committee.

The Company’s GHSE Committee, led by the President and CEO, shapes Aramco’s health, safety, security, and environmental policies, scrutinizing material issues, such as safety initiatives, environmental and safety performance, compliance reviews, major incidents, insurance survey outcomes, and cybersecurity.

Sustainability Steering Committee (SSC)
Under the guidance of the Executive Vice President of Strategy and Corporate Development, the SSC reports to both the Group Strategy Committee and the Group Executive Committee. Comprising Senior Vice Presidents representing key Business Lines and Administrative Areas, the SSC reviews and guides decisions and strategies related to sustainability, and enables the Company to assess potential impacts on long-term value creation for stakeholders and the business.

The SSC evaluates the Company’s GHG mitigation plans and corporate risk assessments for items related to sustainability. Outcomes from these evaluations are presented to and endorsed by the Group Executive Committee before final approval by the Board.

Executive remuneration
Senior executive remuneration is linked to the Company’s sustainability performance, featuring a framework that incorporates fixed and variable components. The variable remuneration aligns with the market and is contingent upon meeting predefined performance goals, including sustainability metrics such as GHG emissions intensity, flaring, and safety.

Two distinct variable pay plans are employed: the Short-Term Incentive Plan (STIP), an annual cash-based initiative rewarding performance in financial, operational, safety, and sustainability areas, and the Long-Term Incentive Plan (LTIP), designed to recognize key financial, strategic, and environmental sustainability achievements over a three-year period.

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Ethics and compliance
Anti-bribery and anti-corruption
The Company has a zero-tolerance policy for unethical behavior, expecting employees and business partners to adhere strictly to the principles outlined in its policy, covering anti-bribery, anti-corruption, and anti-fraud.

Code of Business Conduct
Aramco’s Code of Business Conduct encompasses principles regulating anti-bribery and anti-corruption. Aramco mandates an enterprise-wide online training program for Code of Business Conduct compliance, supported by detailed policies, implementing procedures, and guidelines. These procedures operationalize and support our anti-bribery and anti-corruption policies, including provisions for third-party due diligence, gifts, meals, entertainment, and travel.

Aramco provides an anonymous 24-hour hotline, the General Auditor Hotline, accessible to employees, suppliers, and stakeholders for reporting suspected misconduct, including allegations related to bribery or corruption. This hotline, detailed on Aramco’s website, facilitates reporting through various channels, including email, telephone, or the Aramco Intranet. Aramco maintains a zero-tolerance stance against any form of retaliation for good-faith reporting of suspected misconduct. As part of continuous program enhancements, committees review findings of misconduct, ensuring the prompt implementation of appropriate and consistent remedial measures.

As part of our ongoing improvements to our compliance program, we have committees to evaluate findings of misconduct committed by personnel and/or third parties to ensure timely execution of appropriate remedial actions.

In 2023, there was a 22.6% increase (2023: 27,674 versus 2022: 22,575) in the anti-bribery and anti-corruption training hours provided to our workforce. This is in line with our goal to constantly keep our workforce vigilant of bribery and corruption risks.

The number of allegations received from Aramco employees increased in 2023 in comparison to 2022. The proliferation of digital technology and data analytics tools across the Company, coupled with increased awareness programs, enables our employees to voice concerns and allegations.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of allegations received</th>
</tr>
</thead>
<tbody>
<tr>
<td>2021</td>
<td>539</td>
</tr>
<tr>
<td>2022</td>
<td>655</td>
</tr>
</tbody>
</table>

1. Effective January 1, 2023, the Corporate Development business line title was updated to Strategy & Corporate Development.
The following table presents Aramco’s sustainability metrics for the years 2023, 2022, and 2021. Reporting boundaries for each metric and for each year are shown for transparency, and where possible, comparability. There are three common terms used in reference to the metrics’ reporting boundaries and the definitions of the commonly used terms are:

- **Company in-Kingdom** — Saudi Arabian Oil Company in-Kingdom wholly-owned operated assets.
- **Operational control** — Saudi Arabian Oil Company in-Kingdom wholly-owned operated assets, SASREF, Motiva, ARLANXEO, Aramco Trading Company (ATC), Aramco Services Company (ASC), Aramco Overseas Company B.V. (AOC) and Saudi Aramco Asia Company Ltd. (SAAC).
- **Group** — Saudi Arabian Oil Company, together with its consolidated subsidiaries, and where the context requires, its joint operations, joint ventures and associates.

Data

The following table presents Aramco’s sustainability metrics for the years 2023, 2022, and 2021. Reporting boundaries for each metric and for each year are shown for transparency, and where possible, comparability. There are three common terms used in reference to the metrics’ reporting boundaries and the definitions of the commonly used terms are:

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**Climate change and the energy transition**

**Metric**

<table>
<thead>
<tr>
<th>Material topic</th>
<th>2023 actual</th>
<th>2023 boundaries</th>
<th>2022 actual</th>
<th>2022 boundaries</th>
<th>2021 actual</th>
<th>2021 boundaries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scope 1 emissions</strong> (million metric tons of CO₂e)</td>
<td>3.4**</td>
<td>Operational control excluding ATC, ASC, AOC, and SAAC</td>
<td>3.5**</td>
<td>Operational control excluding ATC, ASC, AOC, and SAAC</td>
<td>3.2**</td>
<td>Operational control excluding ATC, ASC, AOC, and SAAC</td>
</tr>
<tr>
<td><strong>Scope 2 emissions</strong> (million metric tons of CO₂e)</td>
<td>19.2**</td>
<td>Operational control excluding ATC, ASC, AOC, and SAAC</td>
<td>16.5**</td>
<td>Operational control excluding ATC, ASC, AOC, and SAAC</td>
<td>19.5**</td>
<td>Operational control excluding ATC, ASC, AOC, and SAAC</td>
</tr>
<tr>
<td><strong>Flaring intensity</strong> (volume of flaring gas flared per barrel of stabilized oil equivalent,ינות)</td>
<td>5.6**</td>
<td>Operational control</td>
<td>4.6**</td>
<td>Operational control</td>
<td>5.5**</td>
<td>Operational control</td>
</tr>
<tr>
<td><strong>Process safety and asset integrity</strong></td>
<td>17.4</td>
<td>Operational control</td>
<td>16.5</td>
<td>Operational control</td>
<td>17.5</td>
<td>Operational control</td>
</tr>
<tr>
<td><strong>Attrition rate (%)</strong></td>
<td>0.4</td>
<td>Operational control</td>
<td>0.2</td>
<td>Operational control</td>
<td>0.0</td>
<td>Operational control</td>
</tr>
<tr>
<td><strong>Health performance</strong></td>
<td>1,670 Company in-Kingdom</td>
<td>Operational control</td>
<td>1,665 Company in-Kingdom</td>
<td>Operational control</td>
<td>1,665 Company in-Kingdom</td>
<td>Operational control</td>
</tr>
<tr>
<td><strong>Employee engagement score (%)</strong></td>
<td>86 Company in-Kingdom</td>
<td>Operational control</td>
<td>85 Company in-Kingdom</td>
<td>Operational control</td>
<td>86 Company in-Kingdom</td>
<td>Operational control</td>
</tr>
<tr>
<td><strong>Attrition rate (%)</strong></td>
<td>0.3</td>
<td>Operational control</td>
<td>0.1</td>
<td>Operational control</td>
<td>0.1</td>
<td>Operational control</td>
</tr>
<tr>
<td><strong>Health performance</strong></td>
<td>19,626 Company in-Kingdom</td>
<td>Operational control</td>
<td>18,876 Company in-Kingdom</td>
<td>Operational control</td>
<td>19,321 Company in-Kingdom</td>
<td>Operational control</td>
</tr>
<tr>
<td><strong>Employee engagement score (%)</strong></td>
<td>92 Company in-Kingdom</td>
<td>Operational control</td>
<td>93 Company in-Kingdom</td>
<td>Operational control</td>
<td>93 Company in-Kingdom</td>
<td>Operational control</td>
</tr>
</tbody>
</table>

**Safe operations and people development**

**Workforce protection continued**

<table>
<thead>
<tr>
<th>Metric (unit of measure)</th>
<th>2023 actual</th>
<th>2023 boundaries</th>
<th>2022 actual</th>
<th>2022 boundaries</th>
<th>2021 actual</th>
<th>2021 boundaries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of fatalities</strong></td>
<td>3**</td>
<td>Operational control</td>
<td>5**</td>
<td>Operational control</td>
<td>5**</td>
<td>Operational control</td>
</tr>
<tr>
<td><strong>FATAL ACCIDENT RATE</strong></td>
<td>0.200**</td>
<td>Operational control</td>
<td>0.200**</td>
<td>Operational control</td>
<td>0.018**</td>
<td>Operational control</td>
</tr>
<tr>
<td><strong>Lost time/recorded absence rate</strong></td>
<td>0.018**</td>
<td>Operational control</td>
<td>0.018**</td>
<td>Operational control</td>
<td>0.018**</td>
<td>Operational control</td>
</tr>
</tbody>
</table>

**Metric reported for the first time externally.**

1. **As we progress on our reporting journey and our controls around ESG data mature,** for this metric from 2022 onwards, we have expanded the reporting boundary from Company in-Kingdom to operational control. The 2021 figure is a Company in-Kingdom level only.

2. **This metric is not applicable to our office-based entities:** ATC, ASC, AOC, and SAAC.

3. **Operational control** excluding ATC, ASC, AOC, and SAAC.

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**Note:**

- **Updated methodology:** in 2023, a ministerial decision was issued mandating that any establishment with 50 employees and above shall disclose its training data annually as per a specific methodology. As a result, the figures reported in this year’s report may not be comparable to those reported in our Sustainability Report for 2022. The training data reported in the Sustainability Report for 2022 was based on a different methodology. Please refer to footnote 2 below for details.

- **Operational control** excluding ATC, ASC, AOC, and SAAC.

- **Operational control** including Global Research Centers.

- **Operational control** including ATC, ASC, AOC, and SAAC.

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## Minimizing environmental impact

### Local environmental impact

- **Number of hydrocarbon spills**: Total number of accidental releases of liquid petroleum hydrocarbon into the environment, where the spill incidents is > 1,000.
  
  - **2023 actual**: 12
  - **2022 actual**: 15
  - **2023 boundaries**: 13

- **Volume of hydrocarbon spills**: (barrels) Total volume of liquid petroleum hydrocarbon accidentally released into the environment, where the spill incidents is > 1,000.
  
  - **2023 actual**: 8,566
  - **2022 actual**: 142,855
  - **2023 boundaries**: 14,447

- **Recovered hydrocarbon** (%): Percentage of liquid petroleum hydrocarbon recovered from the environment via recovery methods.
  
  - **2023 actual**: 88
  - **2022 actual**: 9

- **Hydrocarbon discharge to water** (barrels): The total of hydrocarbons that are systematically released to surface water through regulated industrial wastewater discharges.
  
  - **2023 actual**: 14.3
  - **2022 actual**: 18.4

- **SOx emissions (metric ktons)**: Quantity of sulfur oxide including sulfur dioxide (SO2) and sulfur trioxide (SO3) expressed as SO2 equivalent.
  
  - **2023 actual**: 144

- **Sewer with ISO 4001 certification** (%):
  
  - **2023 actual**: 105

### Water management

- **Water consumption (million m3)**: The difference between the volume of water removed from the environment, ex: surface water, groundwater, for use in operations, and freshwater returned to the source. The total dissolved solids (TDS) concentration of this type of water is up to 2,000 mg/l.
  
  - **2023 actual**: 83.9

- **Freshwater withdrawal (million m3)**: Freshwater consumed as part of Aramco’s workforce.
  
  - **2023 actual**: 135.7

- **Freshwater intensity (m3/m3)**: Total freshwater consumed relative to our hydrocarbon production.
  
  - **2023 actual**: 0.02

### Product stewardship and waste management

- **Industrial waste disposed** (%): Total amount of industrial waste, hazardous and nonhazardous, generated from operating facilities, not including waste recycling, reuse, and recovery.
  
  - **2023 actual**: 441,561

- **Industrial waste disposed – Upstream** (%):
  
  - **2023 actual**: 35.7

- **Industrial waste disposed – Downstream** (%):
  
  - **2023 actual**: 35.7

### Community and society

- **Number of employees volunteering hours**:
  
  - **2023 actual**: 18,179

- **Number of Aramco facilitated community volunteering hours**:
  
  - **2023 actual**: 153,454
## Abbreviations, terms, and glossary

### Currencies
- **Currency conversion**: All financial amounts in SAR and USD in this Report are reported in line with the exchange rates reported in Aramco’s 2023 Annual Report.

#### SAR/Saudi Riyal
- Saudi Arabian Riyal, the lawful currency of the Kingdom

#### $/USD/$Dollar
- US dollar

### Units of measurement
- **Barrel (Bbl)**: Barrels of crude oil, condensate or refined products
- **Bbl**: Billion standard cubic feet
- **Bt**: Billion standard cubic feet per day
- **Btu**: British thermal unit
- **GW**: Gigawatts
- **Mboed**: Million barrels of oil-equivalent per day
- **MMb**: Million barrels of oil-equivalent per day
- **MMscf**: Million standard cubic feet
- **MMtpa**: Million metric tons per annum
- **MMthe**: Million metric tons of carbon dioxide equivalent
- **MW**: Megawatts
- **kg CO₂e/pd**: Kilogrammes of carbon dioxide equivalent per day

### Transport
- **Vehicles**: Kilogrammes of carbon dioxide equivalent per vehicle

### Board diversity
- **Company**: Company in-Kingdom
- **Group**: A set of technologies that can mitigate CO₂ emissions from various sources; the transport of the captured and compressed CO₂ in rock formations that contain tiny openings that CO₂ in rock formations that contain tiny openings.

### Conversion factors
- **CO₂e**: Carbon dioxide equivalent (CO₂e)

### Carbon credits
- **CO₂e**: Carbon dioxide equivalent (CO₂e), a metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential (GWP).

### Terms and glossary
- **Affiliate**: A company that presents itself as an affiliate but is essentially powerful enough to be considered an entity in its own right.

### Aramco subsidiaries
- **ATC**: Aramco Trading Company, a wholly-owned subsidiary of Aramco
- **ARLANXEO**: Arlanxeo Holding B.V., a wholly-owned specialty chemicals subsidiary
- **BPA**: Biodiversity Protection Area

### Carbon capture and storage (CCS)
- **CO₂**: Carbon dioxide (CO₂), a naturally occurring gas, and also a byproduct of burning fossil fuels and biomass, as well as land-use changes, and other industrial processes. It is the principal greenhouse gas that affects the Earth’s radiative balance. It is the reference gas against which other greenhouse gases are measured and therefore has a Global Warming Potential of 1.

### Carbon dioxide (CO₂)
- **GWP**: Global warming potential (GWP), a metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential (GWP). Carbon dioxide equivalents are commonly expressed as “millions of metric tons of carbon dioxide equivalent (MMTCO₂e).” The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated GWP (MMTCO₂e or million metric tons of a gas) x (GWP of the gas).

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### Methane
- **MMT**: Million metric tons
- **MMtCO₂**: Million metric tons of carbon dioxide

### CO₂ capture and storage (CCS)
- **CO₂**: Carbon dioxide (CO₂)

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Abbreviations, terms, and glossary

Carbon intensity A measure of greenhouse gas emissions in carbon dioxide (CO₂) equivalent per barrel released to produce oil equivalent.

Carbon markets Two types of carbon market exist: (1) Regulatory compliance markets: used by companies and governments that by law have to account for their GHG emissions. It is regulated by national, regional or international carbon reduction regimes. (2) Voluntary markets – the trade of carbon credits is on a voluntarily basis.

Carbon offset Mitigation credits generated in one location that are transferred to another location or entity, and are usually denominated in metric tons of a reduced emission or MWh of renewable energy produced.

CHP Combined Heat and Power.

Circular carbon economy A circular carbon economy is a framework for managing and reducing emissions. It is a closed loop system involving 4Rs: reduce, reuse, recycle, and remove.

Circular economy A circular economy is an economic system designed and built to retain the highest value of companies by utilizing sustainable and environmental business models.

Climate Usually defined as the “average weather,” or more rigorously, in terms of the mean and variability of relevant quantities over a period of time ranging from months to millions of years.

Climate change Any significant change in the measures of climate lasting for an extended period of time. Climate change includes major changes in temperature, lasting for an extended period of time. Climate change is on a voluntarily basis.

COD Carbon dioxide.

CO₂ Carbon dioxide equivalent.

Condensate Light hydrocarbon substances produced with raw gas, which condense into liquid at normal temperatures and pressures associated with surface production equipment.

Direct Air Capture (DAC) Technologies and processes that extract CO₂ directly from the atmosphere. The CO₂ can be permanently stored in geological formations or used as a feedstock in the production of fuels, chemicals, building materials, and other products containing CO₂.

Domestic Refers to the Kingdom of Saudi Arabia.

Emissions The release of a substance (usually a gas when referring to the subject of climate change) into the atmosphere.

Emissions reduction Carbon reduction projects result in a net reduction in absolute CO₂/GHG emissions relative to current emission levels or relative to a historical baseline.

Energy efficiency Using less energy to provide the same service. Energy efficiency is one of the core strategies for reducing greenhouse gas emissions from fossil fuels.

Energy intensity An index for measuring the total energy consumed to generate a unit of product, represented in thousand Btu per total production in barrel of oil equivalent.

Energy transition A significant structural change in an energy system.

Environment The natural world, as a whole or in a particular geographical area, especially as affected by human activity.

ESG Environmental, social, and governance.

Flaring intensity Volume of gas flared per barrel of oil equivalent produced (scf/bbl).

Freshwater Groundwater or surface water with total dissolved solids concentration up to 2,000 mg/l.

G20 Group of Twenty is an intergovernmental forum comprising 19 countries and the European Union (EU).

GDP Gross domestic product. The broadest quantitative measure of a nation’s total economic activity, representing the monetary value of all goods and services produced within a nation’s geographic borders over a specified period of time.

Greenhouse gas (GHG) Any gas that absorbs infrared radiation in the atmosphere rather than allowing it to radiate into space. Greenhouse gases include CO₂, methane, nitrous oxide, ozone, chlorofluorocarbons, hydrochlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

GHG avoidance The avoidance of GHG emissions that would otherwise occur without the protective actions implemented by an offset project.

GHG emission mitigation The process of reducing CO₂/GHG emissions from the Company’s operations.

GHG reduction A quantified absolute decrease in GHG emissions specifically related to/originating from an activity.

GHG removal Withdrawal of a GHG and/or a precursor from the atmosphere by a GHG sink or GHG removal technology.

Government The Government of the Kingdom of Saudi Arabia (and “Governmental” shall be interpreted accordingly).

Greenhouse gas (GHG) emissions Any gaseous compound in the atmosphere that is capable of absorbing infrared radiation. Generally, consists of water vapor, CO₂, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride. Aramco’s inventory includes CO₂, methane and nitrous oxide.

Greenhouse Gas Protocol The GHG Protocol establishes comprehensive global standardized frameworks to measure and manage greenhouse gas emissions from private and public sector operations, value chains and mitigation actions. It is a product of the collaboration between the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD).

Group Saudi Arabian Oil Company, together with its consolidated subsidiaries and, where the context requires, its joint operations, joint ventures and associates.

HSSE Health, Safety, Security and Environment.

Hydrocarbons Substances containing only hydrogen and carbon. Fossil fuels are made up of hydrocarbons.

Hydrocarbons law Law governing hydrocarbons, hydrocarbon resources, and hydrocarbon operations existing within the territory of the Kingdom, enacted by Royal Decree No. M/37, dated 2/4/1439H (corresponding to December 20, 2017), as amended.

IFRS International Financial Reporting Standard(s) that are endorsed in the Kingdom and other standards and pronouncements endorsed by Saudi Organization for Chartered and Professional Accountants (SOCPA).

Ibta In-Kingdom Total Value Add. The Company’s program to promote the development of a localized energy/industrial ecosystem.

Income tax law/tax law Income Tax Law issued under Royal Decree No. M/1 dated 15/1/1425H (corresponding to March 6, 2004) and its Implementing Regulations issued under Ministerial Resolution No. 1535 dated 11/6/1425H (corresponding to August 11, 2004), as amended from time to time.


IPO Initial public offering.

ISO International Organization for Standardization.

Joint venture/JV The term joint venture, as defined by IFRS, means a type of joint arrangement whereby the parties that have joint control of the arrangement have rights to the net assets of the joint arrangement.

KUAST King Abdullah University of Science and Technology.

KFUPM King Fahd University of Petroleum and Minerals.

Kingdom Kingdom of Saudi Arabia.

LTI Lost-time injuries/illnesses.

Master Gas System (MGS) An extensive network of pipelines that connects Aramco’s key gas production and processing sites throughout the Kingdom.

Ministry of Energy, Industry, and Mineral Resources Ministry of Energy of the Kingdom. Successor to MEIM.

Methane (CH₄) A hydrocarbon that is a greenhouse gas with a global warming potential most recently estimated at 25 times that of carbon dioxide (CO₂). Methane is produced through anaerobic decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Motiva Motiva Enterprises LLC – located in the US.
Nitrogen oxides (NOx) are chemical compounds that are produced as a result of the burning of fossil fuels. They are classified as greenhouse gases (GHG) due to their ability to trap heat in the Earth’s atmosphere, contributing to global warming. NOx emissions are a critical factor in determining a company’s carbon footprint and have significant health implications.

Nitrogen oxides can contribute to the formation of smog, a type of air pollution that is formed when sunlight interacts with emissions from vehicles, power plants, and industrial processes. This can result in respiratory issues, eye irritation, and other health problems. Additionally, NOx emissions are responsible for a significant portion of the Earth’s warming, as they absorb and emit infrared radiation, trapping heat in the atmosphere.

In the context of a company’s sustainability strategy, reducing NOx emissions involves implementing measures to decrease the use of fossil fuels and improve energy efficiency. This can include upgrading equipment, adopting cleaner technologies, and investing in renewable energy sources. By doing so, companies can not only reduce their carbon footprint but also contribute to the global effort to mitigate climate change and protect public health.

In conclusion, NOx emissions are a significant concern for environmental and public health reasons. Companies must prioritize the reduction of these emissions as part of their sustainability initiatives to ensure a healthier planet and future for generations to come.
Forward-looking statements

This Sustainability Report (the “Report”) may contain certain forward-looking statements with respect to Aramco’s financial position, results of operations and business and certain of Aramco’s plans, intentions, expectations, assumptions, goals and beliefs and include all matters that are not historical fact and generally, but not always, may be identified by the use of words such as “believes,” “expects,” “are expected to,” “anticipates,” “intends,” “estimates,” “should,” “strive,” “will,” “shall,” “may,” “is likely to,” “plans,” “targets,” “goals,” or similar expressions, including variations and the negatives thereof or comparable terminology. These statements include, among other things, statements about expectations in connection with Aramco’s sustainability and environmental, social and governance (“ESG”) initiatives, including the targets and goals set forth in this Report.

Prospective investors should be aware that forward-looking statements are not guarantees of future performance and that Aramco’s actual performance may differ significantly from those made in or suggested by these forward-looking statements. Factors that could cause actual results to differ materially from Aramco’s expectations, including our goals related to ESG and mitigating our environmental impact, safe operations and people development and growing societal value within the Kingdom, include, among other things, the following:

- the inability to successfully meet the targets set forth in this Report, including through the management of GHG emissions; the inability to meet our plastic waste and water management targets or successfully protect biodiversity; the inability to develop and deploy technology solutions to allow us to deliver the benefits of oil and gas hydrocarbons for future generations;
- global supply, demand and price fluctuations of oil, gas and petrochemicals;
- global economic market conditions;
- competition in the industries in which Aramco operates;
- climate change concerns, weather conditions and related impacts on the global demand for hydrocarbons and hydrocarbon-based products;
- risks related to Aramco’s ability to successfully meet its ESG targets, including its failure to fully meet its GHG emission reduction targets by 2050;
- conditions affecting the transportation of products;
- operational risk and hazards common in the oil and gas, refining and petrochemicals industries;
- the cyclical nature of the oil and gas, refining and petrochemical industries;
- political and social instability and unrest and actual or potential armed conflicts in the MENA region and other areas;
- Aramco’s exposure to inflation, interest rate risk and foreign exchange risk;
- risks related to operating in a regulated industry and changes to oil, gas, environmental, health, safety or other regulations that impact the industries in which Aramco operates;
- Legal proceedings, international trade matters, and other disputes or agreements; and
- Other risks set forth in our 2023 Annual Report available on our website.

In light of these risks, uncertainties and assumptions, the forward-looking statements described in this Report may not occur in the manner described or may not occur at all. These forward-looking statements speak only as of the date of this Report. We undertake no obligation to update or revise any forward-looking statement, whether as a result of new information, future events or otherwise. All subsequent written and oral forward-looking statements attributable to us or to persons acting on our behalf are expressly qualified in their entirety by the cautionary statements referred to above and contained elsewhere in this Report. Undue reliance should not be placed on the forward-looking statements.

Except where noted, the information covered in this Report highlights the company’s performance and initiatives in fiscal year 2023. The inclusion of information in this Report should not be construed as a characterization regarding the materiality or financial impact (or potential impact) of that information. Sections of this Report have been prepared with reference to and guidance from various reporting frameworks, standards and guidelines, as outlined at the start of this Report. The Company’s application of the various frameworks, standards and guidelines is based on its interpretation and judgment.

This Report may contain references to links to or information from other internet sites. Such links and information are not endorsements of any products or services in such sites, are not being incorporated by reference herein, and no information in such sites has been endorsed or approved by Aramco.