

# 3. Sustainability

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## Integrating sustainability into Aramco's operations

### 'Ain Dar Sulfate Removal Facility, Saudi Arabia

Aramco's sustainability framework governs how sustainability practices are integrated into its operations.

The 'Ain Dar Sulfate Removal Facility, an example of this integration, has five nano filtration trains that use sophisticated membranes to treat seawater from the Arabian Gulf before it is sent for injection at the Fazran and 'Ain Dar fields.

The use of treated seawater in upstream operations helps to conserve the Kingdom's groundwater.

# Commitment to act responsibly

Sustainability is embedded within Aramco's strategy and underpins how it engages with its people, its partners and suppliers, its host communities and the planet, while delivering value to shareholders.

The long-term sustainability of the business is driven by the Company's ability to leverage its competitive position while reducing its GHG emissions, within the context that the world needs a realistic and robust energy transition plan that emphasizes the deployment of new energies, while recognizing the continued need for conventional energy. It is Aramco's firm belief that all sources of energy are needed for the foreseeable future to meet growing energy demand, while over time adjusting the new and conventional mix according to need.

Investments across the energy ecosystem should include an intensified focus on innovation and technology to reduce GHG emissions from energy production, and Aramco is playing a role to support this aspiration.

## Sustainability governance

Aramco's sustainability governance model aligns its sustainability aspirations with its corporate business strategy and goals. The Board of Directors oversees sustainability efforts through the Sustainability, Risk and Health, Safety and Environment (HSE) Committee, which provides oversight on sustainability, risk, and HSE policies and practices to ensure they are discussed, understood, owned, and promoted at the Board level.

At a management level, accountability for sustainability lies with the President and Chief Executive Officer, and the Group Executive Committee. They are supported by the Group Health, Safety, Security and Environment Committee (GHSSE) and the Sustainability Steering Committee (SSC).

The Company's GHSSE Committee is led by the President and CEO, and establishes the Company's health, safety, security, and environmental policies and reviews key issues. This includes Company-wide safety initiatives, environmental and safety performance, compliance and conformance reviews, major HSE incidents, insurance survey results, and cybersecurity.

The SSC is comprised of Aramco Senior Vice Presidents representing business lines and administrative areas, and is led by the Executive Vice President of Strategy and Corporate Development. Reporting to the Group Executive Committee, the SSC reviews decisions and issues related to sustainability, the Company's plans to mitigate GHG emissions, and corporate risk assessments. Please refer to Section 4: Risk for more information on Aramco's risk management framework, and Section 5: Corporate governance for the Sustainability, Risk and HSE Committee Report.

## Four areas of focus

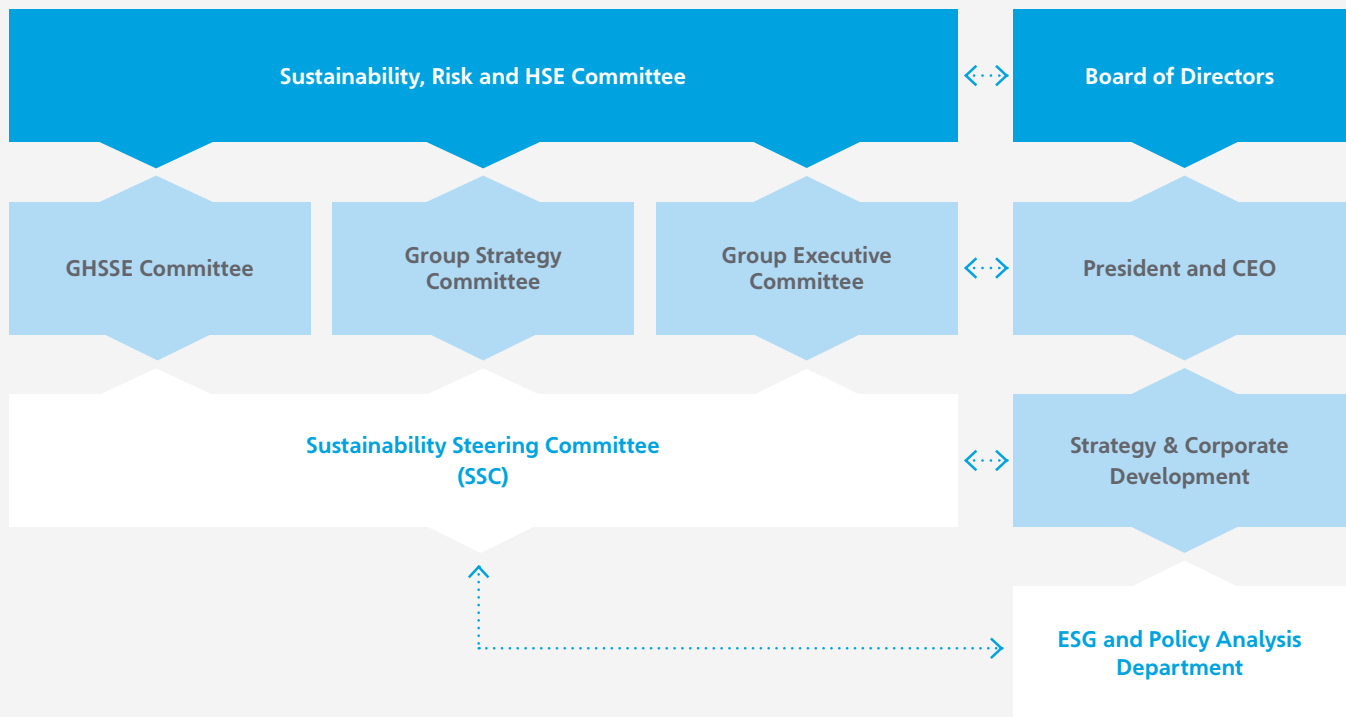
Aramco has four sustainability focus areas to oversee the Company's sustainability performance, along with relevant metrics:

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

These focus areas support Aramco's strategy and are informed by both Saudi Arabia's Vision 2030 and the relevant UN Sustainable Development Goals (SDGs), directly and indirectly. Additionally, they are informed by guidance from and in broad alignment with: Ipieca, Sustainability Reporting Guidance, the Greenhouse Gas Protocol, and the Occupational Safety and Health Administration (OSHA) Standards.

A high-level overview of the 2023 sustainability performance is provided in this section. Aramco will elaborate on its overall sustainability performance and plans in its upcoming 2023 Sustainability Report.

## Sustainability governance management framework



## Four areas of focus

Climate change and the energy transition

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Safe operations and people development

■ For more information see page 68

Minimizing environmental impact

■ For more information see page 69

Growing societal value

■ For more information see page 70

## Climate change and the energy transition

As one of the world's largest integrated energy and chemicals companies, Aramco supports energy security and affordability, and promotes sustainable practices in response to the energy transition. Aramco's strategy is based on producing hydrocarbons with one of the lowest upstream production costs and carbon intensities among major producers, and supporting an orderly global energy transition through investing in technologies and offering products such as eFuels.

The challenge is to develop and deploy technology solutions at speed and scale to provide the benefits of oil and gas for future generations, while reducing Aramco's GHG emissions from oil and gas operations. It is a complex, multidimensional, and capital-intensive challenge that will span generations. Alternatives to traditional hydrocarbon-based energy sources are progressing, but, on their own, are not yet ready to meet the world's energy demand and ensure a smooth energy transition. Aramco believes oil demand will grow for many years to come and that the world will likely continue to need oil and gas for the foreseeable future.

Hydrocarbons could also be essential to the development of potential new materials that are expected to play a significant role in the energy transition. Advanced, durable materials are critical for manufacturing wind turbines, solar panels, transportation, storage devices, and infrastructure. The production of hydrocarbons accompanied by carbon capture technology, in which Aramco is investing, could complement emerging alternatives and serve as an integral component of the future energy mix.

Aramco recognizes the need to reduce GHG emissions from its oil and gas operations and has ambitions to achieve net-zero Scope 1 and Scope 2 greenhouse gas emissions by 2050 across wholly-owned operated assets.

To achieve these targets, Aramco aims to abate 52 mmtCO<sub>2</sub>e of GHG emissions by 2035, focusing on five key levers:

- Energy efficiency across upstream and downstream assets;
- Further reductions in methane and flaring;
- Increased use of renewable energy sources;
- Carbon capture and storage; and,
- Development or purchase of offsets to help address hard-to-abate emissions.

Aramco's activities against each lever will be outlined in its forthcoming 2023 Sustainability Report.

In support of its strategy, Aramco achieved the following:

- Delivered three shipments of accredited blue ammonia through its Aramco Trading Company and SABIC Agri-Nutrients affiliates;
- Signed an agreement with Linde Engineering to build a demonstration plant to test a new ammonia cracking technology using a novel catalyst developed by Aramco in collaboration with the King Abdullah University of Science and Technology. The agreement brings together Aramco and Linde Engineering's industrial research and development capabilities, and reflects Aramco's ambition to establish a commercially viable lower-carbon hydrogen supply chain;
- Entered into a shareholders' agreement for the development of Al Shuaibah 1 and Al Shuaibah 2 photovoltaic solar projects which are expected to have a combined capacity of up to 2.66 GW. The projects, which will be jointly owned by Aramco (30.0%), PIF (34.99%), and ACWA Power Company (35.01%), have an estimated total cost of SAR 8.9 billion (\$2.37 billion). These projects align with Aramco's intention to invest in solar and wind energy in support of the Kingdom's National Renewable Energy Program;
- Reached full capacity 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. The project is jointly owned by Aramco (30%), PIF (35%), and ACWA Power Company (35%);
- Commenced operations at the Novel Non-Metallic Solutions (Novel) facility in Saudi Arabia, a joint venture between Aramco and Baker Hughes to develop and commercialize a broad range of nonmetallic products. The Novel facility produces nonmetallic reinforced thermoplastic (RTP) pipe and has an annual production capacity of 1,000 kilometers. The Novel RTP pipe is corrosion resistant, lighter, more durable, and easier to install than conventional steel pipe, reducing its cost and carbon footprint across the life cycle. Aramco has utilized RTP pipes at its facilities since 2015, and the Novel joint venture supports its efforts to localize its supply chain and help build a thriving in-Kingdom energy value chain;

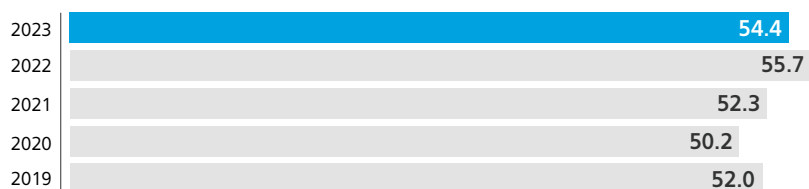
- Provided a surrogate eFuel found to be compatible with 24 engine families in Europe that can be used as a drop-in technology without powertrain modifications. The use of eFuels could potentially result in a reduction of CO<sub>2</sub> emissions from existing internal combustion vehicles by at least 70% on a life cycle basis compared to conventional fuels, once developed at scale along with the necessary infrastructure. The testing was completed through a partnership with Stellantis over several months at their technical centers across Europe. The surrogate

eFuels used in the testing exhibit the expected characteristics of the fuels to be produced at Aramco's planned synthetic fuels demonstration plants in Saudi Arabia and Spain; and,

- Participated as a lead bidder in the largest-ever voluntary carbon credit auction, held by the Regional Voluntary Carbon Market Company in Nairobi, Kenya. Over 2.2 million tons of high-quality carbon credits were sold at the auction. The purchase of carbon credits enables Aramco to offset some of its emissions, supports the establishment of a credible and functioning Saudi-based regional voluntary carbon market, and is one of the Company's five levers to achieve GHG emissions reductions by 2035.

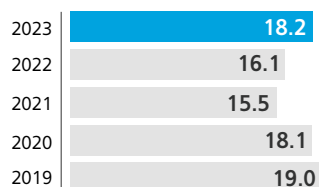
### Scope 1 emissions<sup>1,2,3</sup>

(million metric tons of CO<sub>2</sub>e)



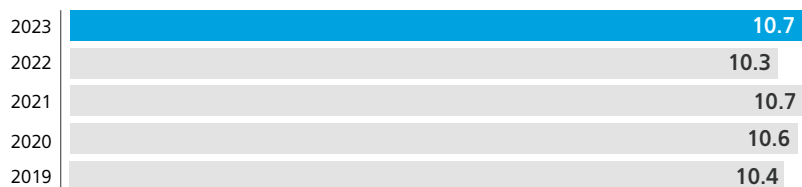
### Scope 2 emissions<sup>1,2,3</sup>

(million metric tons of CO<sub>2</sub>e)



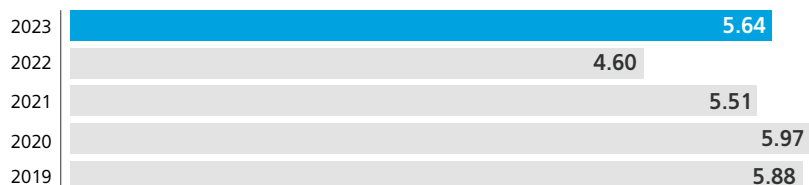
### Upstream carbon intensity<sup>3</sup>

(kg of CO<sub>2</sub>e/boe)



### Flaring intensity<sup>2,3</sup>

(scf/boe)



### GHG emissions

In 2023, Scope 1 emissions decreased by 2.4% compared to 2022 mainly due to lower hydrocarbon production during the year, and a revised CO<sub>2</sub> venting emissions methodology for gas processing operations to account for dynamic CO<sub>2</sub> concentrations, resulting in a more accurate accounting methodology. Scope 2 emissions increased 13.0% compared to the previous year primarily due to the inclusion of the Jazan Refinery in the 2023 GHG emissions inventory.

An important metric for Aramco is the carbon intensity of upstream operations, which is among the lowest of major crude oil producers per barrel of oil equivalent and achieved through effective reservoir management, a low depletion rate operational model, and a focus on energy efficiency. In 2023, upstream carbon intensity increased 3.9% compared to 2022, largely due to lower upstream production and other operational activities.

Aramco also strives to reduce flaring across its business through investment in flare gas recovery systems and programs to improve asset integrity, energy efficiency, leak detection, and repairs. Flaring intensity in 2023 was 5.64 standard cubic feet per barrel of oil equivalent (scf/boe), up from 4.60 scf/boe in 2022, primarily due to the inclusion of the Jazan Refinery in the 2023 GHG emission inventory, and increased project and operational activities.

1. The Company's GHG emissions reporting is based on the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD) GHG protocol guidelines. The Company reports emissions using the operational control basis for measurement.

2. The Company's GHG emissions inventory includes emissions from the Saudi Arabian Oil Company in-Kingdom wholly-owned operated assets, SASREF, Motiva, and ARLANXEO. GHG emissions and flaring inventories from 2019 to 2022 exclude the Jazan Refinery and the Fadhili Gas Plant.

3. The 2023 figures for Scope 1 emissions, Scope 2 emissions, upstream carbon intensity, and flaring intensity have undergone ISAE3000 (revised) limited assurance. Assurance results will be published on the Aramco website in Q2 2024. Prior year figures have undergone external limited assurance and can be viewed online at <https://www.aramco.com/en/sustainability/sustainability-report>.

## Safe operations and people development

### Safety performance

Safety is at the heart of Aramco and is a core value that shapes how it protects its people, assets, and environment.

Aramco is committed to a strong safety culture across its employees, contractors, and suppliers. The Group Health, Safety, Security, and Environment (GHSSE) Committee, led by the President and Chief Executive Officer, provides governance and oversight for all HSSE-related matters, while Aramco's Safety Management System sets clear expectations for how safety is managed. The Company prioritizes the

training of its workforce to perform their jobs safely, while also promoting an open reporting culture. Aramco has a robust emergency management program and takes proactive measures to prevent emergency situations. A dedicated Corporate Emergency Management Taskforce ensures resilience and readiness through pre-planning and risk-based site-specific emergency response plans.

Aramco regrettably had three contractor fatalities in 2023. Aramco has thoroughly evaluated these unfortunate cases, learnings have been shared with relevant organizations, and remedial actions were implemented to prevent recurrence.

	2023 <sup>1</sup>	2022 <sup>1</sup>	2021 <sup>1</sup>	2020 <sup>2</sup>	2019 <sup>2</sup>
Tier 1 process safety events	15	11	11	9	4
Total recordable case rate <sup>3,4</sup>	0.042	0.050	0.054	0.044	0.059
Lost time injuries/illness rate <sup>3,4,5</sup>	0.018	0.014	0.017	0.011	0.016
Number of fatalities <sup>3,5</sup>	3	5	1	1	6

1. The Company and its operationally controlled entities.
2. The Saudi Arabian Oil Company (the Company).
3. Total workforce (employees and contractors).
4. Per 200,000 work hours.
5. 2023 figures are undergoing ISAE3000 (revised) limited assurance and may be subject to change. Assurance results will be published on the Aramco website in Q2 2024. Prior year figures have undergone ISAE3000 limited assurance and assurance results can be viewed at <https://www.aramco.com/en/sustainability/sustainability-report>.

### Training and development

Aramco empowers its people to reach their full potential by providing a safe, respectful, and professionally challenging working environment. The Company is committed to respecting and protecting the rights of every worker, and cooperates and supports its contractors and suppliers to do the same. A key objective of its people strategy is to support the development of women and people with disabilities to create a workplace where all employees can truly thrive.

Aramco has a decades-long history of educating and training Saudi nationals, both employees and non-employees, and providing development opportunities for all of its people. The Company believes it has one of the world's largest corporate-supported education programs, with offerings covering all segments of the workforce, and includes pre-employment, secondary, tertiary, post-graduate, and technical/vocational training.

### Diversity and inclusion

Aramco is committed to fostering a culture of diversity and inclusion (D&I) at all levels of its organization.

The Company embraces its employees' differences and fosters an inclusive workplace culture where every employee feels valued, respected, and heard. Aramco strives to ensure that all employees are provided equitable access to resources and opportunities. The Company aims to become a global role model for D&I by creating inclusive work environments and promoting initiatives that empower people.

In response to this commitment, Aramco has extended significant efforts to increase the representation of women and people with disabilities at every level, from interns and sponsored students, enhancing hiring efforts and supporting their progression from entry-level to leadership roles. These efforts are driven by a clear vision and include not only developmental opportunities, but also policy enhancements and mentorship programs. As a result of these initiatives, in 2023 the number of female employees increased by 12.5% and the number of females in leadership positions increased by 26.3% compared to the previous year.

	2023	2022	2021	2020	2019
Company employees <sup>6</sup>	73,311	70,496	68,493	66,800	69,867
Female employees <sup>6</sup> (%)	7.2	6.4	5.6	5.1	4.9
Female employees in leadership positions <sup>6</sup> (%)	4.8	3.8	3.1	2.7	2.1

6. Applies to the Saudi Arabian Oil Company (the Company).

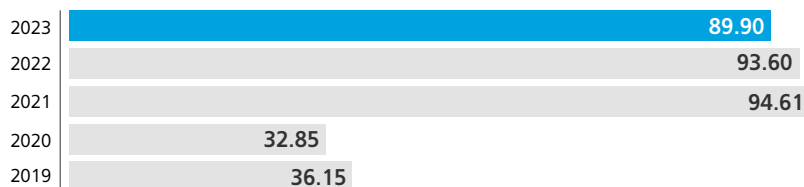
## Minimizing environmental impact

In 2023, Aramco achieved 100% ISO 14001 certification at its 52 Upstream and Downstream asset-based organizations enrolled in Aramco's Environmental Management System (EMS). This was achieved through preparing all relevant organizations via a third-party consultant who conducted EMS audits in preparation for the external certification exercise.

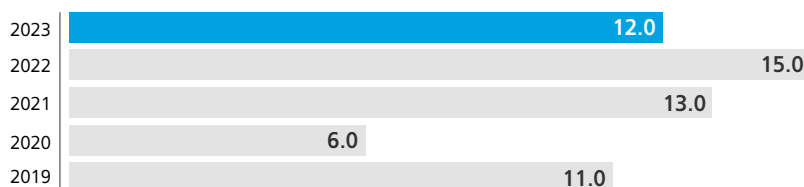
### Water management

With many of its operations in a hyper-arid environment, Aramco has long recognized the value of each molecule of water. Aramco's comprehensive water conservation efforts entail supplementing water supply with alternative sources, implementing water-efficient practices, maximizing wastewater reuse, and minimizing water losses at operating facilities and communities.

### Freshwater consumption<sup>1,2</sup> (million cubic meters)



### Number of hydrocarbon spills<sup>3,4</sup>



### Volume of hydrocarbon spills<sup>3,5</sup> (barrels)



- Freshwater consumption data for 2019 and 2020 applies to the Saudi Arabian Oil Company (the Company). Freshwater consumption data from 2021 to 2023 reflects the expanded boundary which includes the Saudi Arabian Oil Company in-Kingdom wholly-owned operated assets, SASREF, Motiva, and ARLANXEO.
- The 2023 figure for freshwater consumption has undergone ISAE3000 (revised) limited assurance. Assurance results will be published on the Aramco website in Q2 2024. Prior year figures have undergone external limited assurance and can be viewed online at <https://www.aramco.com/en/sustainability/sustainability-report>.
- Applies to the Saudi Arabian Oil Company in-Kingdom wholly-owned operated assets, SASREF, Motiva, and ARLANXEO.
- Oil spill incidents with volume greater than one barrel.
- The 2023 figure for volume of hydrocarbon spills has undergone ISAE3000 (revised) limited assurance. Assurance results will be published on the Aramco website in Q2 2024. Prior year figures have undergone external limited assurance and can be viewed online at <https://www.aramco.com/en/sustainability/sustainability-report>.

Aramco produces large volumes of wastewater and recognizes the need for responsibly managing and treating wastewater prior to returning it to the environment. Its approach to wastewater and discharges to water are informed by relevant national and international frameworks or standards, including Saudi Arabia Government Environmental Standards, Executive Regulations for the Protection of Aquatic Environments from Pollution, and Ipeca's oil and gas industry guidance on voluntary sustainability reporting – discharges to water.

In 2023, freshwater consumption was 89.90 million cubic meters, down 4.0% compared to 2022, due to effective water conservation efforts in Aramco's upstream and petrochemical operations.

### Spills to the environment

Aramco operates across a vast area and many sites are remote. This introduces challenges to the detection of spills, particularly across the country's enormous deserts. To meet its target of zero spills, the geographic challenges are mitigated by employing rigorous inspection programs to assess the integrity of assets, putting fail-safe measures in place, and training employees and utilizing advanced technologies to predict possible failures for rapid decision making and action.

In 2023, the number and volume of hydrocarbon spills decreased compared to 2022. During the year, 12 hydrocarbon spills<sup>3,4</sup> occurred reflecting a decrease of 20.0% 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 as a result of a damaged pipeline and with a volume of 8,335 barrels accounted for over 97.0% of the total volume of hydrocarbons spilled.

### Natural climate solutions

Natural climate solutions are actions that protect, sustainably manage, and restore natural and modified ecosystems. Aramco planted 6.5 million mangrove trees in-Kingdom in 2023, bringing its cumulative total to over 30 million. The third-party validated total carbon stock of the planted and existing mangroves is equal to nearly 445,000 tons of CO<sub>2</sub>e.



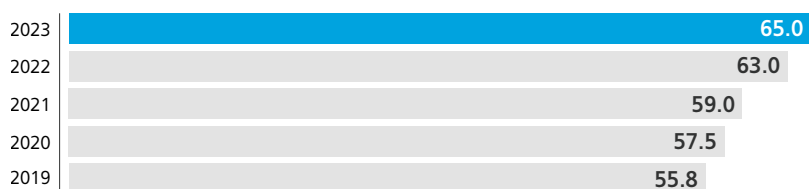
## Growing societal value

From its first oil discovery in 1933, Aramco has sought to create sustainable opportunities for the welfare of the Kingdom and the global communities where it operates. Citizenship, and contributing to growing societal value, is a firmly established principle toward which Aramco dedicates resources and capabilities. In line with relevant UN SDGs and Saudi Vision 2030, Aramco seeks to support local content and develop innovative opportunities for the future.

Aramco believes its commitment and investment in training, skills development, and nurturing of in-Kingdom partnerships has contributed to the development of the labor force in Saudi Arabia, while adding robustness to the Company's supply chain through localization.

Aramco supports the development of new industries in the Kingdom under its Namaat industrial investment program. During the year, the Company signed a shareholders' agreement to establish an integrated steel plate manufacturing complex in Ras al-Khair Industrial City. Together with Baoshan Iron & Steel Company Limited (Baosteel) and PIF, the joint venture complex will be the first facility of its kind in the region and is expected to create jobs and contribute to the Kingdom's economic growth and diversification. By supporting steel plate manufacturing in Saudi Arabia, Aramco aims to further localize its supply chain and reduce reliance on imported steel, in line with iktva's objectives to maximize local content and strengthen the local supply chain resilience.

iktva<sup>1,2</sup>  
(%)



1. Percentage of total procurement expenditures locally sourced.
2. Applies to the Saudi Arabian Oil Company (the Company).

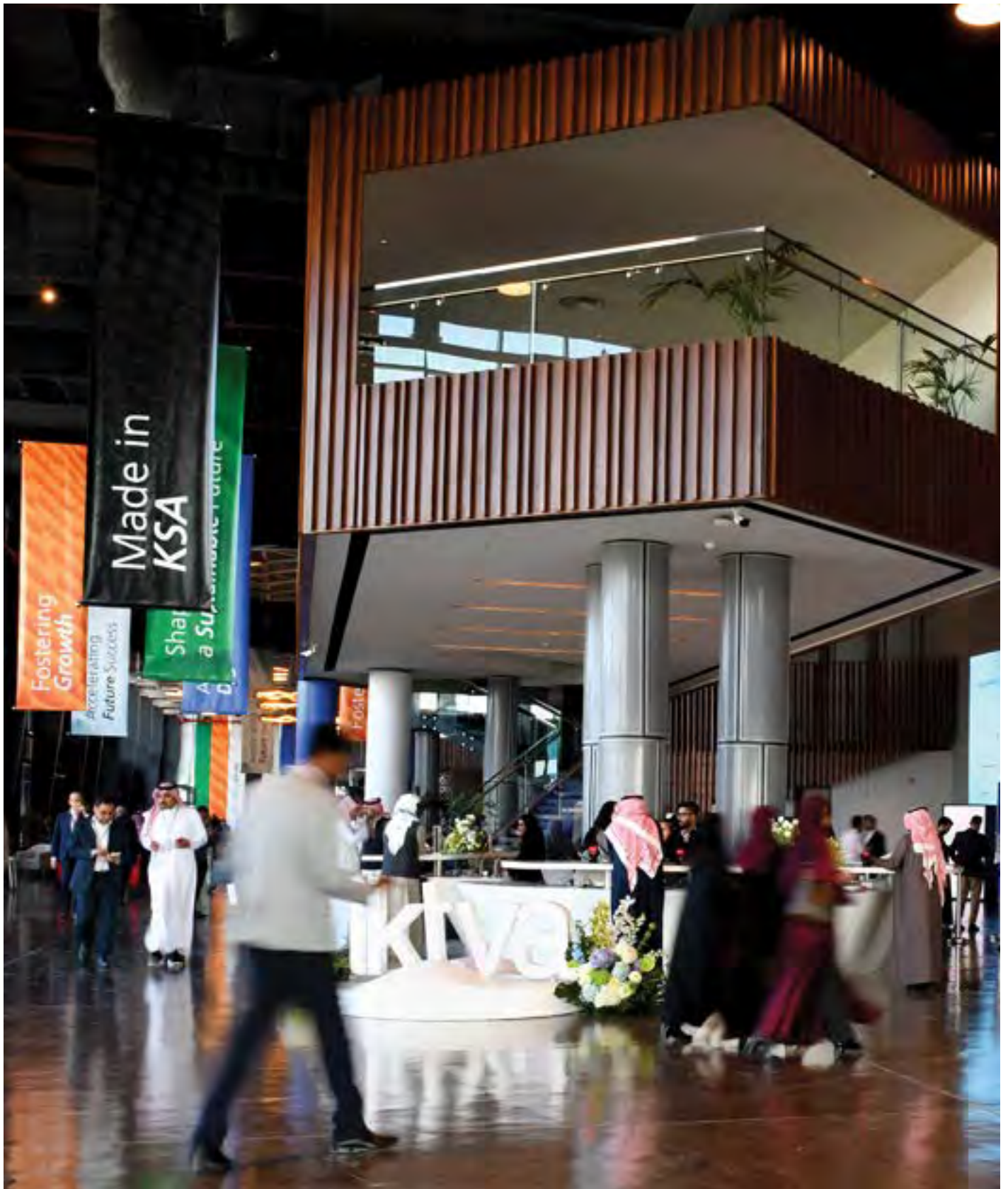
Aramco's National Champions program encompasses a set of unique programs focused around five strategic domains – sustainability, digital, industrial, manufacturing, and social innovation – that drive development from an initial idea to a small- and medium-enterprise through to global businesses, and aligns with the Kingdom's Vision 2030 and its Shareek Private Sector Partnership Reinforcement Program (Shareek).

The Company's iktva program is an ongoing success. Through the program, the local component of the Company's overall expenditure across its supply chain now stands at 65.0%, with a target to grow to 70.0% by 2025. Billions of dollars in economic activity that historically would have left the Kingdom instead remained to serve the interests of the Company and support the local economy. In 2023, Aramco entered into 86 corporate purchase agreements valued at SAR 12.2 billion (\$3.3 billion) to build long-term collaborative relationships with strategic local suppliers.

The Company also supports 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.

Aramco is further extending its significant citizenship activities through its Global Citizenship Signature Programs (GSPs). Launched in September 2023, the GSPs serve as platforms to address key societal issues in a way that allows the Company to make a global impact. The programs are expected to draw on the skills of multiple partners across a number of years.

Currently, there are two GSP programs. The first focuses on STEM (science, technology, engineering, and mathematics) education and includes a partnership with Network for Teaching Entrepreneurship, a nonprofit organization dedicated to empowering global youth through entrepreneurship education. This is a team-based virtual challenge focused on Saudi Arabia, China, and India, with the intention to expand into new regions in the coming years. The second GSP focuses on energy access, and through a partnership with Envirofit International, a leading social enterprise, more than 18,000 clean cooking stoves were distributed to schools and individual homes in India. Additional Global Citizenship Signature Program initiatives and partnerships are expected to be announced in the future.



▲ In-Kingdom Total Value Add (iktva)  
Saudi Arabia