

# 4. Risk

Risk management .....70  
Risk factors .....72





▲ Abqaiq Plants,  
Saudi Arabia

## Operational resilience

Aramco, through a system based on ISO 31000 principles and guidelines, integrates managing strategic, operational, compliance and financial risks into its annual planning cycle.

The Company adds to its operational resilience through localization, and has 63.0% local content across its procurement chain, with a focus on using more sustainable materials.

During 2022, building on its exceptional history for energy supply stability, Aramco achieved 99.9% reliability.

# aramco

# Managing risk exposure

### Risk objectives

Aramco operates in an industry characterized by price volatility, hazardous operations, and uncertain project outcomes. Taking informed risks is an inherent and necessary part of doing business. Aramco manages its strategic, operational, compliance and financial risks by continuously assessing them and undertaking appropriate responses. Business decisions are made after due consideration of rewards and associated risks.

### Risk management framework

The Board of Directors provides risk oversight as a component of its strategic leadership. The Sustainability, Risk and HSE Committee of the Board oversees the risk management framework and monitors specific risks.

The primary role of the Sustainability, Risk and HSE Committee is to monitor overall management of risk and activities relating to health, safety and the environment and to assist the Board of Directors with:

- I. Leadership, direction, and oversight with respect to the Company's risk appetite, risk tolerance, risk framework, and risk strategy;
- II. Governance and management of strategic, operational, sustainability, and environmental, social and governance (ESG) related risks; and
- III. Assisting the Board and the Audit Committee to foster a culture within the Company that emphasizes and demonstrates the benefits of risk management. The Audit Committee focuses on financial risks, including financial reporting and treasury risks, as well as on internal and external compliance.

Aramco's enterprise risk management (ERM) framework follows the Three Lines Model. The operating businesses and support organizations form the first line, as risk owners, and have primary responsibility for identifying and managing their risks. The second line comprises dedicated risk management functions, responsible for monitoring and reporting on risks, and providing guidance to risk owners. Risk management functions include Loss Prevention, Environmental Protection, Information Security, Corporate Emergency Management and Continuity, Corporate Compliance, and Financial Risk Management organizations, as well as the Corporate Enterprise Risk Management group.

Internal Audit, as the third line, provides management and the Audit Committee with independent assurance on the effectiveness of internal control systems. Aramco's Global ERM Policy requires subsidiaries and operationally controlled affiliates to manage risks in a structured manner, overseen by their Boards of Directors. Aramco also encourages affiliates to apply ERM principles and practices to their management of risks.

Management-level oversight of the ERM framework is provided by the Management Committee, chaired by the President and CEO. He also chairs the HSSE Committee, which oversees health, safety, security, and environmental risk management; the Strategy Council, which reviews matters of strategic risk; and the Conflicts of Interest and Business Ethics Committee. Various other management-level committees oversee specific risk-related topics, such as the Sustainability Steering Committee and the Information Security Risk Management Steering Committee.

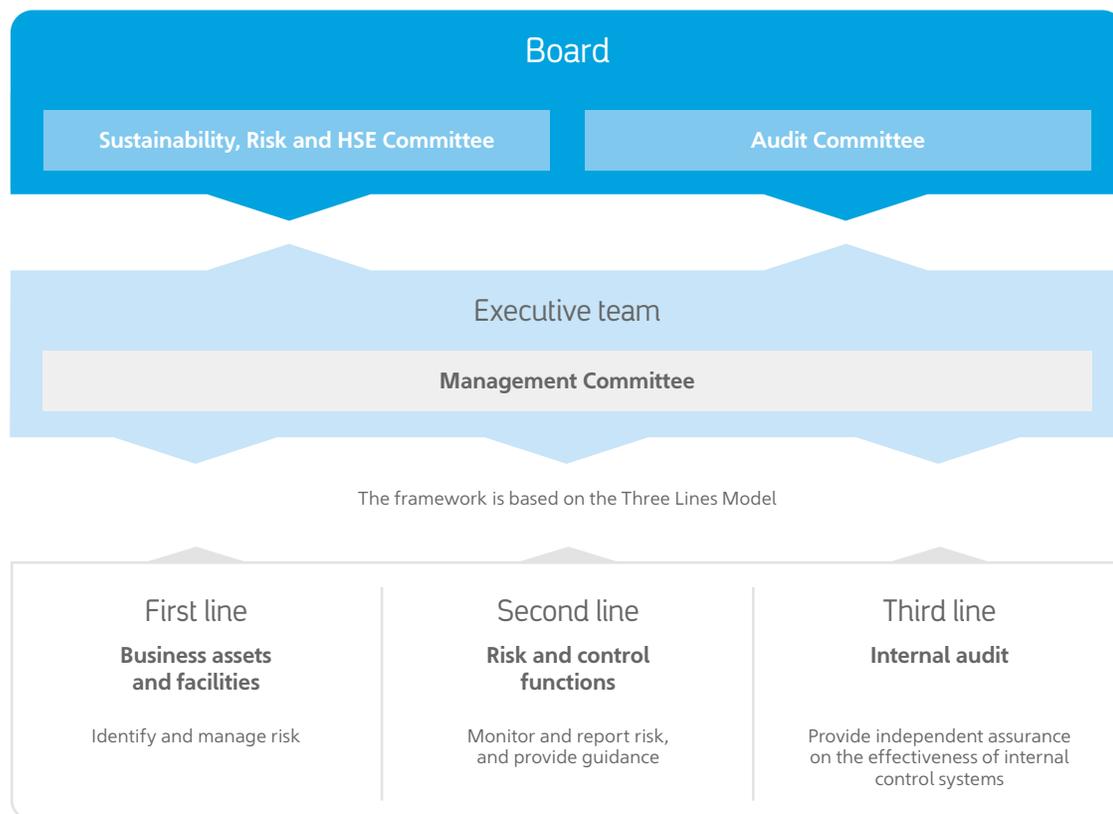
### Business risk assessment

The process by which individual organizations identify, assess, mitigate, monitor and report risks to the achievement of business objectives is integrated into Aramco's annual planning cycle through a system based on ISO 31000 principles and guidelines. This includes the escalation, as appropriate, of risk ownership through Aramco's organizational levels, resulting in a hierarchy of risks from individual departmental risks to corporate risks. Annually, the Management Committee reviews the composition of the top risks, taking into consideration risks reported from the businesses and a top-down scan for new and emerging risks. The Management Committee is updated quarterly on individual risks, and every year several risks are presented in detail to the Management Committee and the Board's Sustainability, Risk and HSE Committee.

### Decision-making

To reduce planning uncertainty and help manage the variability of outcomes, Aramco has embedded risk assessment into its strategic and investment planning. Strategic scenarios are stress-tested, and individual projects and investments pass through a gated decision process that includes risk assessments and value assurance reviews.

## Enterprise risk management framework



## Principal risk categories



# Understanding risks

The following risks do not necessarily comprise all the risks affecting Aramco. There may be additional risks that Aramco is currently not aware of, or that Aramco currently believes are immaterial, which may in the future become material or affect Aramco's business, financial position and results of operations, or the market price of the shares. As a result of these and other risks, the forward-looking events and circumstances discussed in this Annual Report might not occur in the way

Aramco expects, or at all. All forward-looking statements in this Annual Report should be considered in light of these explanations and shareholders should not put undue reliance on forward-looking statements.

The risks described in this section are not presented in order of priority based on their importance or expected effect on Aramco.

## Risks related to Aramco's operations and activities

### **Aramco's results of operations and cash flow are significantly impacted by international crude oil supply and demand and the price at which it sells crude oil.**

Sales of crude oil are the largest component of Aramco's consolidated revenue and other income related to sales, accounting for 47.0%, and 50.3% for the years ended December 31, 2021 and 2022, respectively. Accordingly, Aramco's results of operations and cash flow are significantly impacted by the price at which it sells crude oil.

International crude oil supply and demand and the sales price for crude oil are affected by many factors that are beyond Aramco's control, including the following:

- Markets' expectations with respect to future supply, demand and price of petroleum and petroleum products;
- Global economic and political conditions and geopolitical events, including any that impact international trade (including trade routes);
- Decisions regarding production levels by the Kingdom or other producing states (the Kingdom is a member country of OPEC);
- The impact of natural disasters and public health pandemics or epidemics (such as COVID-19) on supply and demand for crude oil, general economic conditions, and the ability to deliver crude oil;
- The development of new crude oil exploration, production and transportation methods or technological advancements in existing methods;
- Capital investments of oil and gas companies relating to the exploration, development and production of crude oil reserves;

- The impact of climate change on the demand for, and price of, hydrocarbons (see risk — Climate change concerns and impacts could reduce global demand for hydrocarbons and hydrocarbon-based products and could cause Aramco to incur costs or invest additional capital);
- Changes to environmental or other regulations or laws applicable to crude oil and related products or the energy industry (see risk — Aramco's operations are subject to environmental protection, health and safety laws and regulations, and increased concerns regarding the safe use of chemicals and plastics and their potential impact on the environment have resulted in more restrictive regulations and could lead to new regulations);
- Prices and availability of alternative energies, including renewable energy;
- The electrification of transportation, technological developments in the cost or endurance of fuel cells for electric vehicles, and changes in transportation-mode preferences, including ride-sharing;
- Weather conditions affecting supply and demand;
- Fluctuations in the value of the U.S. dollar, the currency in which crude oil is priced globally; and
- Crude oil trading activities.

Continued

**Aramco's results of operations and cash flow are significantly impacted by international crude oil supply and demand and the price at which it sells crude oil.**

International crude oil prices have fluctuated significantly in the past and may remain volatile. Between January 2016 and February 2020, Brent prices generally fluctuated between \$40 and \$65 per barrel. Brent prices fell below \$23 per barrel in mid-March 2020 in response to the COVID-19 pandemic and other supply and demand factors, and did not recover to above \$60 per barrel until February 2021. Since then, Brent prices have increased and rose significantly in February 2022 in response to the Russia-Ukraine conflict, related international sanctions and other macroeconomic factors, reaching

\$128 per barrel in the first half of 2022. On October 5, 2022, OPEC+ decided to cut oil production quotas by two million barrels per day starting in November 2022. As of December 31, 2022, the Brent price was \$85.9 per barrel.

Fluctuations in the price at which Aramco sells crude oil could cause its results of operations and cash flow to vary significantly. In addition, decreases in the price at which Aramco is able to sell its crude oil could have a material adverse effect on Aramco's results of operations and cash flow.

**Aramco operates in a highly competitive environment. Competitive pressure could have a material adverse impact on the price at which it sells crude oil and other products.**

The sale of crude oil outside the Kingdom is very competitive. Aramco's primary competitors for the sale of crude oil outside the Kingdom include national and international oil companies, many of which have substantial crude oil reserves and financial resources. The primary factors affecting competition are the price, reliability, quantity, quality and geographic location of crude oil produced. Increased competitive pressures could have a material adverse impact on prices at which Aramco can sell crude oil and its regional and global market share.

geographies into which they sell refined products or petrochemicals. Competitors include, but are not limited to, refining and petrochemical plants located in, or in close proximity to, relevant markets, and in the case of refining and petrochemical plants that are net importers, from other international producers. Operating efficiencies and production costs are key factors affecting competition for refined products and chemicals. Accordingly, if the operating efficiencies and production costs of Aramco's refineries are not sufficiently competitive in the geographies they serve, Aramco's business, financial position and results of operations could be materially and adversely impacted.

In addition, outside the Kingdom, refining and petrochemical plants in Aramco's downstream segment are subject to competition in the

**Climate change concerns and impacts could reduce global demand for hydrocarbons and hydrocarbon-based products and could cause Aramco to incur costs or invest additional capital.**

Climate change concerns manifested in public sentiment, government policies, laws and regulations, international agreements and treaties, lawsuits against energy companies, company net-zero ambition and other commitments, investor pressure, fossil fuel divestment campaigns and other actions may reduce global demand for hydrocarbons and hydrocarbon-based products and propel a shift toward lower carbon intensity fossil fuels, such as gas, or alternative energy sources. In particular, increasing pressure on governments, businesses, organizations and individuals to reduce GHG emissions has led to a variety of actions that aim to reduce the use of fossil fuels, including international agreements to reduce GHG emissions. For example, the Paris Agreement became effective in November 2016, and many

countries that have ratified the Paris Agreement are adopting domestic measures to meet their goals, which include reducing their use of fossil fuels and increasing their use of alternative energy sources. The landscape of GHG related laws and regulations has been in a state of constant reassessment and it is difficult to predict with certainty the ultimate impact GHG related laws, regulations and international agreements will have on Aramco. In addition, jurisdictions in which Aramco operates or its products are sold that are not currently subject to GHG regulation may become regulated and existing GHG regulations may become more stringent. A reduction in demand for hydrocarbons and hydrocarbon-based products could have a material adverse effect on Aramco's business, financial position and results of operations.

Risks related to Aramco's operations and activities continued

Continued

**Climate change concerns and impacts could reduce global demand for hydrocarbons and hydrocarbon-based products and could cause Aramco to incur costs or invest additional capital.**

In line with the Kingdom's announced aims and the Saudi Green Initiative, Aramco announced its ambition to achieve net-zero Scope 1 and Scope 2 greenhouse gas emissions across its wholly-owned operated assets by 2050, which in turn will help support the Kingdom's aim to reach net-zero emissions by 2060 through the circular carbon economy approach. Aramco may incur

substantial costs and capital expenditures to achieve its net-zero ambitions. If Aramco does not meet its announced net-zero targets, or if Aramco's efforts do not meet increasing societal or stakeholder expectations and standards, Aramco may be exposed to claims and its reputation, employee retention and business may be negatively impacted.

**Terrorism and armed conflict may materially and adversely affect Aramco.**

Aramco's facilities have been targeted by terrorist and other attacks. In March 2022, a storage facility in Jiddah was subject to attack by unmanned aerial vehicles and missiles and, in March 2021, the Riyadh Refinery was subject to an attack by unmanned aerial vehicles. In addition, in September 2019, the Abqaiq facility and the Khurais processing facility were subject to attack by unmanned aerial vehicles and missiles. As a result of the attacks on the Abqaiq facility and the Khurais processing facility, crude oil production and associated gas production were temporarily reduced and Aramco took a number of actions to minimize the impact of lower Arabian Light and Arabian Extra Light production by tapping into Aramco's inventories located outside of the Kingdom and swapping crude oil grades of deliveries to Arabian Medium and Arabian Heavy.

Furthermore, in both May and August 2019, the East-West pipeline and the Shaybah field, respectively, were targeted by unmanned aerial vehicle attacks. These attacks resulted in a brief shutdown of the pipeline and fires and damage to the processing and cogeneration infrastructure at the Shaybah NGL facility.

Additional terrorist or other attacks or armed conflict could impact Aramco's operations and have a material adverse effect on Aramco's business, financial position and results of operations, could cause Aramco to expend significant funds and could impact the market price of the shares.

**Aramco exports a substantial portion of its crude oil and refined products to customers in Asia, and adverse economic or political developments in Asia could impact its results of operations.**

Aramco exports a substantial portion of its crude oil and refined products to customers in Asia. In 2021 and 2022, customers in Asia, including Aramco's affiliated refineries located in Asia, purchased 81% and 79%, respectively, of its crude oil exports. Aramco expects to export additional crude oil to Asia as new downstream assets in Asia commence operations. In addition, the refined, chemical, petrochemical, base oil and finished lubricant products that are produced at Aramco's joint ventures and international operations in Asia are generally sold locally and exported to other Asian countries.

Since early 2020, economic conditions in Asia have been significantly impacted by the outbreak of COVID-19. If there is a prolonged slowdown in economic growth, an economic recession or other adverse economic or political development in Asia, Aramco may experience a material reduction in demand for its products by its customers located in the region. Moreover, any such development in other parts of the world (including political and social instability or armed conflict) may result in other producers supplying surplus capacity to Asia, thereby increasing competition for customers in Asia, which could negatively impact the prices at which Aramco sells its products to customers there. A significant decrease in demand for Aramco's products in Asia could have a material adverse effect on its business, financial position and results of operations.

**Aramco is subject to operational risks and hazards that may have a significant impact on its operations or result in significant liabilities and costs.**

Aramco is subject to operational risks common in the oil and gas and petrochemical industries, including the following:

- crude oil or gas spills, pipeline leaks and ruptures, storage tank leaks and accidents involving explosions, fires, blow outs and surface cratering;
- power shortages or failures;
- mechanical or equipment failures;
- transportation interruptions and accidents;
- tropical monsoons, storms, floods and other natural disasters (including weather conditions associated with climate change);
- chemical spills, discharges or releases of toxic or hazardous substances or gases; and
- changes in laws and regulations that could require Aramco to update or modify its methods of production, processing, storage or transportation of products.

These risks could result in damage to, or destruction of, Aramco's properties and facilities, death or injury to people and harm to the environment, which could have a significant impact on its operations or result in significant liabilities and remediation costs. In addition, Aramco is not insured against all risks and insurance in connection with certain risks and hazards may not be available

(see risk — Aramco could be subject to losses from risks related to insufficient insurance). To the extent a subcontractor is responsible for the damage, Aramco's recourse to the relevant subcontractor may be limited by contract or the financial viability of such subcontractor. Such occurrences could also interrupt Aramco's operations, delay Aramco projects or damage its reputation, which could have a material adverse effect on its business.

Furthermore, the majority of Aramco's assets are located in the Kingdom and it relies heavily on a cross country pipeline system and terminal facilities to transport crude oil and products through the Kingdom. Aramco also depends on critical assets to process its crude oil, such as the Abqaiq facility, which is its largest oil processing facility and processes a significant amount of Aramco's daily produced crude oil. The East-West pipeline, the Shaybah NGL facility, the Abqaiq facility and the Khurais processing facility have been subject to attacks in 2019. If Aramco's critical transport systems or processing facilities were subject to a significant disruption, it could have a material adverse effect on Aramco's business, financial position and results of operations (see risk — Terrorism and armed conflict may materially and adversely affect Aramco).

**The resurgence of COVID-19 or outbreaks of other infectious diseases and its impact on business and economic conditions, may have negative effects on Aramco's business, financial position, cash flow, results of operations, and price of its securities.**

The COVID-19 pandemic and measures taken to combat it have had a widespread impact on business and economic conditions, including on the demand for crude oil, natural gas, refined products and petrochemicals. Public health authorities and governments at local, national and international levels implemented various measures to respond to the pandemic, including restrictions on travel, voluntary and mandatory quarantines, workforce reductions of personnel who are deemed to be nonessential and restrictions on business activities. These measures led to lower demand for crude oil, natural gas, refined products and petrochemicals which has had, and may continue to have, a direct impact on Aramco's operations. In addition, the COVID-19 pandemic has resulted in volatility in global capital markets and investor sentiment, which may affect the availability, amount and type of financing available to Aramco.

Aramco is not able to predict how long the COVID-19 pandemic will persist or if there will be further resurgences or new variants of COVID-19 or outbreaks of other infectious diseases, how long measures that are introduced to respond will be in place or if additional restrictive measures may be introduced. It also cannot predict how long the effects and the efforts to contain them will continue to impact its business after such outbreaks are under control.

In addition, if a significant percentage of Aramco's workforce is unable to work, or if Aramco is required to close facilities because of illness or government restrictions, Aramco's operations and business may be negatively affected.

## Risks related to Aramco's operations and activities continued

**Estimates of proved hydrocarbon reserves depend on significant interpretations, assumptions and judgments. Any significant deviation or changes in existing economic and operating conditions could affect the estimated quantity and value of Aramco's proved reserves.**

Aramco's reserve estimates conform to the SPE-PRMS definitions and guidelines, which are internationally recognized industry standards promulgated by the Society of Petroleum Engineers, the World Petroleum Council, the American Association of Petroleum Geologists, the Society of Petroleum Evaluation Engineers, the Society of Exploration Geophysicists, the Society of Petrophysicists and Well Log Analysts and the European Association of Geoscientists & Engineers. Reserve estimation is an inherently complex process that principally relies on a combination of knowledge, experience and judgment. Aramco's and D&M's estimates of the quantity of Aramco's proved hydrocarbon reserves depend on significant interpretations, assumptions and judgments relating to available geological, geophysical, engineering, contractual, economic and other information, and take into account existing economic and operating conditions and commercial viability as at the date the reserve estimates are made.

There can be no assurance that the interpretations, assumptions and judgments utilized by Aramco to estimate proved reserves,

or those utilized by D&M for the purposes of preparing its certification letter, will prove to be appropriate or accurate. Any significant deviation from these interpretations, assumptions or judgments could materially affect the estimated quantity or value of Aramco's proved reserves. In addition, these estimates could change due to new information from production or drilling activities, changes in economic factors, including changes in the price of hydrocarbons, changes to laws, regulations or the terms of the Concession or other events. Further, declining hydrocarbon prices may cause certain proved reserves to no longer be considered commercially viable, which could result in downward adjustments to Aramco's estimates of its proved reserves, impairment of its assets or changes to its capital expenditures and production plans. Moreover, proved reserve estimates are subject to change due to errors in the application of published rules and changes in guidance. Any material reduction in the quantity or value of Aramco's proved reserves could adversely affect Aramco's business and reputation.

**The independent third-party certification with respect to the Kingdom's estimated reserves does not cover the entirety of its reserves.**

Aramco retained independent petroleum consultants, D&M, to audit, as at December 31, 2021, reservoirs Aramco believes accounted for approximately 85% of its proved oil reserves to which it has rights under the Concession and remain to be produced after December 31, 2021, but before December 31, 2077 (the end of the initial 40-year term of the Concession plus the first 20-year extension). Aramco chose this scope because of the overall scale of the Kingdom's reserves and the concentration of deposits in the major reservoirs that were assessed. Further independent assessment of the Kingdom's smaller reservoirs would have taken several years to complete. D&M's reserves estimation of 217.0 billion barrels of oil equivalent reserves for the reservoirs it evaluated was within the no material difference category (within 5% of Aramco's internal estimation for the same reservoirs) for the same Concession time period.

There is no independent third-party certification letter with respect to the balance of the Kingdom's proved oil equivalent reserves or as at a more recent date than December 31, 2021. Any material deviation in the quantity of proved reserves could have a material adverse effect on Aramco's financial condition and reputation.

**Aramco could be subject to losses from risks related to insufficient insurance.**

Aramco insures against risk primarily by self-insuring through its captive insurance subsidiary, Stellar, which provides insurance exclusively to Aramco. Aramco also obtains insurance in certain areas from third-party providers in excess of the coverage provided through Stellar.

Aramco does not insure against all risks and its insurance may not protect it against liability from all potential events, particularly catastrophic events such as major crude oil spills, environmental disasters, terrorist attacks or acts of war. In addition, it does not maintain business interruption insurance for disruptions to its

operations and certain of its operations are insured separately from the rest of its business. Furthermore, there can be no assurance that Aramco can continue to renew its existing levels of coverage on commercially acceptable terms, or at all. As a result, it could incur significant losses from uninsured risks or risks for which its insurance does not cover the entire loss. Any such losses could have a material adverse effect on Aramco's business, financial position and results of operations.

**Aramco's ability to achieve its strategic growth objectives depends on the successful delivery of current and future projects and achieving these objectives may not have the anticipated impact.**

Aramco's ability to achieve its strategic growth objectives depends, in part, on the successful, timely and cost-effective delivery of capital projects, which are carried out by Aramco or by it along with joint ventures or partners and affiliates. Aramco faces numerous challenges in developing such projects, including the following:

- fluctuations in the prices for hydrocarbons, which may impact its ability to finance its projects from its cash flow from operating activities or make projects less economically feasible or rendered uneconomic;
- making economic estimates or assumptions based on data or conditions, including demand and price assumptions, which may change;
- constraints on the availability and cost of skilled labor, contractors, materials, equipment and facilities;
- its ability to obtain funding necessary for the implementation of the relevant project on terms acceptable to it, or at all;
- difficulties in obtaining necessary permits, complying with applicable regulations and changes to applicable law or regulations;
- difficulties coordinating multiple contractors and subcontractors involved in complex projects;
- its ability to find major global industry partners and new opportunities for downstream investments globally;
- market factors outside of its control affecting its ability to fund such projects, including constraints that prevent or limit financing providers' ability to invest in hydrocarbons-related projects; and
- undertaking projects or ventures in new lines of business in which Aramco has limited or no prior operating experience.

These challenges have led and could lead to delays in the completion of projects and increased project costs. If projects are delayed, cost more than expected or do not generate the expected return, Aramco's operations and expected levels of production could be impacted. These occurrences could result in Aramco recognizing impairments on its projects, assuming liabilities of joint ventures or partners and affiliates or other consequences, any of which could have a material adverse effect on Aramco's business, financial position and results of operations.

Aramco is pursuing lower carbon intensity products and operations to address climate-related risks and opportunities, including through lowering net carbon emissions. Other oil and gas companies may benefit from governmental incentives, such as financial incentives provided by the U.S. Inflation Reduction Act enacted in August 2022 for clean energy, including hydrogen, energy storage, clean energy vehicles and carbon capture, utilization and storage. If Aramco is unable to avail itself of similar incentives, its competitive position may be impacted. In addition, Aramco's ability to develop low carbon products and solutions will also depend on the market acceptance of and regulatory support for these products.

Risks related to Aramco's operations and activities continued

Continued

**Aramco's ability to achieve its strategic growth objectives depends on the successful delivery of current and future projects and achieving these objectives may not have the anticipated impact.**

In addition, the financial impact resulting from certain of Aramco's strategic growth projects and from its ambition to achieve net-zero Scope 1 and Scope 2 greenhouse gas emissions across its wholly-owned operated assets by 2050 is uncertain. There is a risk that even if Aramco is able to achieve its strategic growth objectives, their impact on its business may not be as profitable or as beneficial as anticipated, which may have a material adverse effect on its business, financial position and results of operations.

Furthermore, many of Aramco's projects require significant capital expenditures. If cash flow from operating activities and funds from external financial resources are not sufficient to cover Aramco's capital expenditure requirements, Aramco may be required to reallocate available capital among its projects or modify its capital expenditure plans, which may result in delays to, or cancellation of, certain projects or deferral of certain capital expenditures. Any change to Aramco's capital expenditure plans could, in turn, have a material adverse effect on Aramco's growth objectives and its business, financial position and results of operations.

**Aramco's historical results of operations may not be directly comparable from year to year.**

In recent years, the Government has adopted a number of changes to the fiscal regime under which Aramco operates. These changes have a material impact on Aramco's results of operations and make its consolidated financial statements for certain periods less directly comparable, particularly with respect to revenue and other income related to sales, production royalties, other taxes, income taxes and zakat. Accordingly, Aramco's historical results of operations are not

necessarily determinative of its likely future cash flows, results of operations or rate of growth, and its past performance should not be relied upon as an indication of its future performance. For a more detailed discussion of the fiscal regime changes and their effect on Aramco's consolidated financial statements, see Section 2: Results and performance, Section 6: Additional financial and legal information, and Section 7: Consolidated financial statements.

**Aramco may not realize some or all of the expected benefits of recent or future acquisitions, including the acquisition of a 70% equity interest in SABIC.**

Aramco has engaged in, and may continue to engage in, acquisitions of businesses, technologies, services, products and other assets from time to time. Any such acquisition entails various risks, including that Aramco may not be able to accurately assess the value, strengths and weaknesses of the acquisition or investment targets, effectively integrate the purchased businesses or assets, achieve the expected synergies or recover the purchase costs of the acquired businesses or assets. Aramco may also incur unanticipated costs or assume unexpected liabilities and losses in connection with any business or asset it acquires, including in relation to the retention of key employees, legal contingencies (such as contractual, financial, regulatory, environmental or other obligations and liabilities) and risks related to the acquired business, and the maintenance and integration of procedures, controls and quality standards.

These difficulties could impact Aramco's ongoing business, distract its management and employees and increase its expenses which could, in turn, have a material adverse effect on its business, financial position and results of operations.

On June 16, 2020, Aramco acquired the PIF's 70% equity interest in SABIC for total consideration of SAR 259.1 billion (\$69.1 billion). For the acquisition to be successful for Aramco, it will need to manage its ownership stake in SABIC in a manner which supports the optimization of SABIC's performance. The realization of such benefits may be affected by a number of factors, many of which are beyond Aramco's control. Failure to realize some or all of the anticipated benefits of the acquisition may impact Aramco's financial performance and prospects, including the growth of its downstream business.

**Aramco is exposed to risks related to operating in several countries.**

A substantial portion of Aramco’s downstream operations are conducted outside the Kingdom. Risks inherent in operating in several countries include, without limitation:

- complying with, and managing changes to and developments in, a variety of laws and regulations, including, without limitation, with respect to price regulations, data privacy, cybersecurity, the environment, forced divestment of assets, expropriation of property and cancellation or forced renegotiation of contract rights;
- complying with tax regimes in multiple jurisdictions and the imposition of new or increased withholding or other taxes or royalties;
- the imposition of new, or changes to existing, transfer pricing regulations or the imposition of new restrictions on foreign trade, investment or travel;

- adverse changes in economic and trade sanctions, import or export controls and national security measures resulting in business disruptions, including delays or denials of import or export licenses or blocked or rejected financial transactions;
- conducting business with subsidiaries, joint operations and joint ventures and their potential challenges implementing policies and procedures consistent with the Company’s policies and procedures; and
- fluctuations in foreign currency exchange rates.

Operating in several countries also requires significant management attention and resources. The occurrence of any of these risks may be burdensome and could have a material adverse effect on Aramco’s business, financial position and results of operations.

**Aramco is dependent on Senior Management and key personnel.**

Aramco operates in a competitive environment, and its success depends upon its ability to identify, hire, develop, motivate and retain highly-qualified Senior Management and other key personnel. Aramco’s Senior Management and other key personnel may voluntarily terminate their employment with Aramco or leave their positions due to reasons beyond Aramco’s control. If Aramco experiences a large

number of departures of its oil and gas experts in a relatively short period of time, attracting and retaining a sufficient number of replacement personnel may be challenging. If Aramco is unable to hire and retain Senior Management and other key personnel with requisite skills and expertise, it could have a material adverse effect on Aramco’s business, financial position and results of operations.

**Aramco’s operations are dependent on the reliability and security of its IT systems.**

Aramco relies on the security of critical information and operational technology systems for, among other things, the exploration, development, production, storage and distribution of hydrocarbons, the processing, use and security of financial records, proprietary information, intellectual property, personal information and operating data, and communications with management, personnel and business partners. Cyber incidents may negatively impact these or other functions and, particularly in relation to industrial control systems, may result in physical damage, injury or loss of life and environmental harm. Aramco’s systems are a high-profile target for sophisticated cyberattacks by nation states, criminal hackers and competitors, and it routinely fends off malicious attempts to gain unauthorized systems access. While Aramco seeks to maintain a secure network infrastructure to protect against critical data loss and to ensure operational integrity and continuity, there is a risk that determined

attackers with access to the necessary resources could successfully penetrate its systems. Attempts to gain unauthorized access to Aramco networks have been successful in the past, including a 2012 cyberattack in which Aramco resorted to manual procedures for certain nonoperational related matters while the breach was contained. To date, none of these attempts have been material to Aramco’s financial performance or reputation. Nonetheless, the nature and breadth of any potential future cyberattack remain unknown and technology that has allowed an increase in remote working arrangements may increase the risk of cybersecurity incidents, data breaches or cyberattacks. Such incidents could result in significant costs, including investigation and remediation expenses, regulatory scrutiny, legal liability and the loss of personal or sensitive business or third-party information, and could have a material adverse effect on Aramco’s operations and reputation.

## Legal and regulatory risks

### **Aramco is and has been subject to significant litigation and other actions.**

Aramco is and has been subject to significant litigation, primarily in the United States and the Kingdom. Some of the most significant U.S. litigation has involved allegations of violations of antitrust laws arising, in part, from the Kingdom's membership and participation in OPEC. Such antitrust litigation sought extensive relief, including treble damages, divestiture of assets in the United States and disgorgement of profits. If granted, this relief could have had a material adverse impact on Aramco. To date, the OPEC-related antitrust lawsuits have been dismissed on the basis of various sovereign defenses under U.S. law. However, there is no assurance that Aramco will prevail on the basis of these defenses in the future in connection with OPEC-related or other lawsuits, and Aramco and its affiliates could be subject to similar claims elsewhere in the future where it may not have similar defenses. In addition, there is a risk that laws could be enacted in the future that would expressly remove or weaken certain sovereign defenses.

In addition, increasing attention on climate change risks may result in increased litigation against Aramco and its affiliates. Claims relating to climate change matters have been filed against companies in the oil and gas industry by private parties, shareholders of such companies, public interest organizations, state attorneys general, cities and other localities, especially in the United States and Europe. These lawsuits seek a variety of remedies, including financial compensation for alleged past and future damages resulting from climate change and court orders requiring energy companies to reduce GHG emissions. Furthermore, oil and gas companies have been subject to a growing number of lawsuits alleging damages from the companies' contributions to climate change, failure to protect the environment from the effects of their operations, concealing information about the consequences of the use of their products on climate change and similar matters. Motiva has been named in several of these lawsuits, and Aramco and its affiliates may be named in similar lawsuits in the future.

In addition, oil and gas companies are also increasingly subject to lawsuits based on allegations that certain public statements regarding environmental, social and governance (ESG) matters or net-zero or carbon neutrality targets are made without clear plans, exaggerate spending on energy that comes from sources other than fossil fuels, lack details or factual support or rely too heavily on carbon or other offsets or technologies that are not yet viable or scalable and therefore are false and misleading "greenwashing" campaigns or that climate-related disclosures made by companies are inadequate. Aramco could be subject to such lawsuits if it makes these types of statements and its customers or investors believe they have been harmed as a result. Motiva is subject to this type of lawsuit where a state government in the United States alleged that Motiva engaged in greenwashing and misled consumers about the consequences of the use of its products on climate change.

Litigation could result in substantial costs (including civil or criminal penalties, or both, damages or the imposition of import trade measures) and require Aramco to devote substantial resources and divert management attention, any of which may have a material adverse effect on its business, financial position and results of operations.

Moreover, exports of crude oil, refined products and petrochemicals by Aramco or its affiliates to foreign countries may be affected by litigation, regulatory actions, investigations, disputes or agreements that lead to the imposition of import trade measures, including anti-dumping and countervailing duties, safeguard measures, import licensing and customs requirements, and new or increased tariffs, quotas or embargoes. The possibility and effect of any such measures will depend on the laws governing the foreign country to which the applicable products are being exported and applicable international trade agreements. Foreign countries may take such measures for political or other reasons, including reasons unrelated to Aramco actions or operations. Because the majority of Aramco's products are exported, any such measures may have a material adverse effect on Aramco's business, financial position and results of operations.

Continued

**Aramco is and has been subject to significant litigation and other actions.**

In addition, the Kingdom is a party to international trade agreements, such as World Trade Organization agreements, that include commitments by the Kingdom with respect to the composition of its laws, regulations and practices that impact international trade. The Kingdom may become a party to other such agreements in the future. Compliance by the Kingdom with any such commitments may directly or indirectly impact Aramco and could cause it to alter its operations in a manner that

is costly or otherwise has a material adverse effect on its business, financial position or results of operations. If the Kingdom fails to comply with these commitments, Aramco's business operations could be exposed to scrutiny and Aramco or its affiliates' exports could be subject to potential remedial measures, such as duties, which could have a material adverse effect on Aramco's business, financial position and results of operations.

**Aramco operates in a regulated industry and its business may be affected by regulatory changes.**

The oil and gas industry in the Kingdom is a regulated industry. Any change in the Kingdom's laws, regulations, policies or practices relating to the oil and gas industry could have a material adverse effect on Aramco's business, financial position and results of operations. In addition, although the Concession provides for an initial period of 40 years, which will be extended by the Government for 20 years provided Aramco satisfies certain conditions commensurate with current operating practices (and may be

amended and extended for an additional 40 years thereafter subject to Aramco and the Government agreeing on the terms of the extension), there is no assurance that the Government will not revoke the Concession in whole or in part or adversely change Aramco's rights in respect of the Concession, which would have a significant adverse effect on Aramco's business, financial position and results of operations.

**Violations of applicable sanctions and trade restrictions, as well as anti-bribery and anti-corruption laws, could adversely affect Aramco.**

Aramco currently conducts business, and could in the future decide to take part in new business activities, in locations where certain parties are subject to sanctions and trade restrictions, as well as anti-bribery and anti-corruption laws, imposed by the United States, the European Union, the United Kingdom and other sanctioning or regulatory bodies. Laws and regulations governing sanctions, trade restrictions and bribery and corruption are complex and are subject to change. For example, sanctions activities against Russia and individuals and companies connected to the Russian government or its officials have increased following the start of the Russia-Ukraine conflict and additional sanctions could be imposed in the future that may adversely impact Aramco's businesses.

There can be no assurance that Aramco's corporate governance, compliance and ethics policies and procedures (including with respect to sanctions and trade restrictions, anti-bribery and anti-corruption) will protect it from the improper conduct of its employees or business partners, which conduct could result in substantial civil or criminal penalties. If Aramco were to be sanctioned in the future, as a result of its transactions with other parties or otherwise, such sanctions could result in asset freezes against Aramco, restrictions on investors trading securities issued by Aramco or other adverse consequences. Such penalties or sanctions could have a material adverse effect on Aramco's business, financial position and matter of operations.

Legal and regulatory risks continued

**Aramco is required to obtain, maintain and renew governmental licenses, permits and approvals in order to operate its businesses.**

The rights granted to Aramco under the Concession represent Aramco's licenses, permits and approvals necessary to conduct business in the Kingdom with respect to hydrocarbons operations and related activities. However, Aramco is required to obtain and renew any license, permit or approval that is required under the Hydrocarbons Law, GSPR (which is replaced by the Energy Supplies Law) or with respect to certain other activities unrelated to hydrocarbons operations. There can be no assurance that the

relevant authorities will issue any such licenses, permits or approvals in the time frame anticipated by Aramco, or at all. Any unforeseen failure to renew, maintain or obtain the required permits and approvals, or the revocation or termination of existing licenses, permits and approvals, may interrupt Aramco's operations, could result in financial and other penalties and could have a material adverse effect on Aramco's business, financial position and results of operations.

**Aramco's operations are subject to environmental protection, health and safety laws and regulations and increased concerns regarding the safe use of chemicals and plastics and their potential impact on the environment have resulted in more restrictive regulations and could lead to new regulations.**

Aramco's operations are subject to laws and regulations relating to environmental protection, health and safety. These laws and regulations govern, among other things, the generation, storage, handling, use, disposal and transportation of hazardous materials, the emission and discharge of hazardous materials, groundwater use and contamination and the health and safety of Aramco's employees and the communities in which it operates. Compliance with these obligations can result in significant expenditures. If Aramco fails to comply with applicable laws and regulations, it could be subject to fines or the partial or total shutdown of related operations. Aramco has, from time to time, shutdown certain facilities in order to ensure compliance with applicable laws and regulations.

The implementing regulation for air quality was issued pursuant to the resolution of the Minister of Environment, Water and Agriculture number (512258/1/1442) dated 24/09/1442H (corresponding to May 6, 2021) in accordance with the Environmental Law issued by Royal Decree No. M/165, dated 19/11/1441H (corresponding to July 10, 2020), and became effective on January 13, 2021. The implementing regulation for air quality imposes significantly more stringent limits on emissions from various types of facilities, compared to earlier regulations, and the Company is currently engaged in discussions with the regulator to clarify or reconsider certain requirements set out under this regulation. Depending on the outcome of the Company's discussions with the regulator, there is a risk that significant costs could be required to bring Aramco's facilities into compliance with this regulation.

In addition, a stricter interpretation of existing laws and regulations, any changes in these laws and regulations or the enactment of new laws and regulations may impose new obligations on Aramco or otherwise adversely affect Aramco's business, financial position and results of operations.

Aramco may also (i) incur significant costs associated with the investigation, clean up and restoration of contaminated land, water or ecosystems, as well as claims for damage to property and (ii) face claims of death or injury to persons resulting from exposure to hazardous materials or adverse impacts on natural resources and properties of others resulting from its operations (including potentially from the transportation of hazardous substances and products, feedstock or chemical pollution). Any such costs or liabilities could have a material adverse effect on Aramco's business, financial position and results of operations. In particular, in the United States, Motiva and other companies in the petroleum refining and marketing industry historically used MTBE as a gasoline additive. Motiva is a party to pending lawsuits concerning alleged environmental impact associated with historic releases of MTBE in the United States, many of which involve other petroleum marketers and refiners. Plaintiffs in these MTBE lawsuits generally seek to spread liability among large groups of oil companies and seek substantial damages. Additional lawsuits and claims related to the use of MTBE, including personal-injury claims, may be filed in the future. Motiva could be subject to material liabilities relating to MTBE claims.

Continued

**Aramco’s operations are subject to environmental protection, health and safety laws and regulations and increased concerns regarding the safe use of chemicals and plastics and their potential impact on the environment have resulted in more restrictive regulations and could lead to new regulations.**

Moreover, concerns regarding chemicals and plastics, including their safe use and potential impact on the environment, and how plastics contribute to climate change, reflect a growing trend in societal demands for increasing levels of product safety, less plastic use, environmental protection and recycling. These concerns have led to more restrictive regulations and could lead to new regulations. They could also manifest themselves in shareholder proposals, delays or failures in obtaining or retaining regulatory

approvals, increased costs related to complying with more restrictive regulations, delayed product launches, lack of market acceptance, lower sales volumes or discontinuance of chemicals or plastics products, continued pressure for more stringent regulatory intervention and increased litigation. These consequences could also have an adverse effect on Aramco’s business, financial position, results of operations and reputation.

**The mechanism for equalization compensation Aramco receives from the Government in respect of domestic sales of certain hydrocarbons may be changed.**

The Concession requires Aramco to meet domestic demand for certain hydrocarbons, petroleum products and LPG through domestic production or imports. In addition, pursuant to the Kingdom’s regulatory regime, Aramco is required to sell crude oil and certain refined products to third parties in the Kingdom at the Government’s regulated prices. The regulated prices for these products have historically generated less revenue for Aramco than if the same products had been sold for export.

No assurance can be given that either equalization mechanism will not be revoked or amended on terms less favorable to Aramco than the existing mechanism. In addition, in the event that the equalization price is less than the regulated price, in the case of liquids, or the Blended Price is less than the Domestic Gas Price, in the case of natural gas, the difference would be due from Aramco to the Government. Any such event could have a material adverse effect on Aramco’s earnings, cash flow, financial position and results of operations.

Pursuant to an equalization mechanism, the Government compensates Aramco for the revenue it directly forgoes as a result of selling these products in the Kingdom at regulated prices. Under this mechanism, Aramco receives compensation for the difference between regulated prices and equalization prices in respect of such sales.

Furthermore, in the Kingdom, natural gas prices are regulated by the Government and the price that domestic customers pay is traditionally set by the Council of Ministers. Effective September 17, 2019, the Government implemented an equalization mechanism to compensate Aramco for the revenue it directly forgoes as a result of selling Regulated Gas Products in the Kingdom at Domestic Gas Prices, in the event that the Government does not adjust the Domestic Gas Prices to meet the pricing of the gas projects in order to ensure Aramco receives a commercial rate of return on each project. Under this mechanism, Aramco receives compensation for the difference between Domestic Gas Prices and Blended Prices in respect of such sales.

## Legal and regulatory risks continued

**Aramco is required to separate its downstream business into an independent legal entity within a certain time period as a condition of the Government allowing the general corporate tax rate to apply to Aramco's downstream business.**

Effective January 1, 2020, the tax rate applicable to Aramco's downstream activities is, for a five-year period, the general corporate tax rate of 20% that applies to all similar domestic downstream companies under the Income Tax Law, rather than the 50% to 85% multitiered structure of income tax rates that previously applied to domestic oil and hydrocarbon production companies. In order for the general corporate tax rate to apply to Aramco's downstream business, Aramco is required to separate its downstream activities (from the oil and hydrocarbon production activities)

into an independent legal entity before December 31, 2024. If Aramco does not comply in separating its downstream business within this five-year period and is not granted an extension, Aramco's downstream business will be taxed retroactively on an annual basis for such five-year period in accordance with the multitiered tax rates applicable to domestic oil and hydrocarbon production companies. In such case, Aramco may be required to pay the difference in taxes due to the Government, which could adversely affect its financial position.

## Risks related to the Kingdom

**The Government determines the Kingdom's maximum level of crude oil production and target MSC.**

The Government determines the Kingdom's maximum level of crude oil production in the exercise of its sovereign prerogative. Accordingly, the Government may in its sole discretion increase or decrease the Kingdom's maximum level of crude oil production at any time based on its sovereign energy security goals or for any other reason, which may be influenced by, among other things, global economic and political conditions and their corresponding impact on the Kingdom's policy and strategic decisions with respect to exploration, development and production of crude oil reserves.

In order to facilitate rapid changes in production volumes, the Government requires Aramco to maintain MSC in excess of its then current production in accordance with the Hydrocarbons Law and has the exclusive authority to set MSC. MSC refers to the average maximum number of barrels per day of crude oil that can be produced for one year during any future planning period, after taking into account all planned capital expenditures and maintenance, repair and operating costs, and after being given three months to make operational adjustments. Aramco incurs substantial costs to maintain MSC and has historically utilized a significant amount of this spare capacity. However, there can be no assurance that it will utilize spare capacity in the future. The Government has decided in the past and may in the future decide to increase MSC.

MSC was 12.0 million barrels of crude oil per day from January 1, 2019, to December 31, 2022. In line with the Government's 2020 mandate for MSC to be increased to 13.0 million barrels of crude oil per day, Aramco is proceeding with its plans to reach the mandated MSC by 2027. Future increases in MSC could require Aramco to incur significant additional capital expenditures.

The Government's decisions regarding maximum level of crude oil production and MSC, and Aramco's costs of complying with such decisions, may not maximize returns for Aramco. For example, Aramco may be precluded from producing more crude oil in response to either a decrease or increase in prices, which may limit its ability to generate additional revenue or to increase its production of downstream products. Any of these actions could have a material adverse effect on Aramco's business, financial position and results of operations.

**If growth in domestic gas demand is less than expected, Aramco may not receive its expected return on its gas infrastructure investments.**

The Concession requires that Aramco meet domestic demand for gas and, according to IHS Markit, domestic demand for gas is expected to grow by a CAGR of 4.0%. In response to the expected increase in demand for gas in the Kingdom, Aramco is undertaking several projects to grow its gas supply. Aramco's gas infrastructure investment costs may include costs related to well drilling, upgrades to existing facilities and the construction of new facilities to handle additional volumes, including gas processing facilities, pipelines and distribution networks including MGS, and storage facilities. Aramco is compensated for its sales of natural gas to domestic consumers based on usage.

Therefore, if the forecasted growth in domestic demand for natural gas is less than expected, Aramco may not receive its expected return on its gas infrastructure investments, which may have a material adverse effect on its business, financial position and results of operations.

**The Kingdom's public finances are highly connected to the hydrocarbon industry.**

The oil sector accounted for 38.6% and 40.9% of the Kingdom's real GDP in the years ended December 31, 2021 and 2022, respectively. In addition, oil revenues accounted for 58.2% and 68.2% of the Government's total revenues in the years ended December 31, 2021 and 2022, respectively.<sup>1</sup> The Government is expected to continue to rely on royalties, taxes, dividends from Aramco and other income from the hydrocarbon industry for a significant portion of its revenue. Any change in crude oil, condensate, NGL, oil product, chemical and natural gas prices or other occurrences that negatively affect

Aramco's results of operations could materially affect the macroeconomic indicators of the Kingdom, including GDP, balance of payments and foreign trade and the amount of cash available to the Government. A shortfall in funding to the Government or a decision to seek more revenue from hydrocarbons may lead the Government to change the fiscal regime to which hydrocarbon producers in the Kingdom, including Aramco, are subject. Any such change could have a material adverse effect on Aramco's business, financial position and results of operations.

**Political and social instability and unrest and actual or potential armed conflicts in MENA may affect Aramco's results of operations and financial position.**

Aramco is headquartered and conducts much of its business in MENA. The MENA region is strategically important geopolitically and has been subject to political and security concerns and social unrest. For example, in recent years, a number of countries in the region have witnessed significant social unrest, including widespread public demonstrations and, in certain cases, armed conflict, terrorist attacks, diplomatic disputes, foreign military intervention and change of government. Such social unrest and other political and security concerns may not abate, may worsen and may spread to additional countries. Some of Aramco's facilities, infrastructure and reserves are located near the borders of countries that have been or may be impacted. No assurance can be given that these political or security concerns or social unrest will not have a material adverse effect on Aramco's business, financial position and results of operations.

In addition, the majority of Aramco's crude oil production is exported using international supply routes. In particular, the Strait of Hormuz and the Suez Canal are key shipping routes for Aramco's crude oil and are located in areas subject to political or armed conflict from time to time. For example, in May 2019, four oil tankers, including two owned by the National Shipping Company of Saudi Arabia (Bahri), were sabotaged near the Strait of Hormuz and, in July 2019, a British oil tanker was seized by Iranian forces in the Strait of Hormuz. In addition, in April and July 2018, Yemen's Houthi group attacked tankers operated by the National Shipping Company of Saudi Arabia (Bahri) off the coast of Yemen. Any political or armed conflict or other event, including those described above, that impacts Aramco's use of the Strait of Hormuz, Suez Canal or other international shipping routes could have a material adverse effect on Aramco's business, financial position and results of operations.

1. General Authority for Statistics, Kingdom of Saudi Arabia.

Risks related to the Kingdom continued

Continued

**Political and social instability and unrest and actual or potential armed conflicts in MENA may affect Aramco's results of operations and financial position.**

Moreover, the majority of Aramco's assets and operations are located in the Kingdom and accordingly, may be affected by the political, social and economic conditions from time to time prevailing in or affecting the Kingdom or the wider MENA region. Any unexpected changes in political, social or economic conditions may have a material adverse effect on Aramco, which could in turn have a material adverse effect on Aramco's business, financial position and results of operations or investments that Aramco has made or may make in the future.

Furthermore, any of the events described above may contribute to instability in MENA and may have a material adverse effect on investors' willingness to invest in the Kingdom or companies that are based in the Kingdom, which may in turn adversely affect the market value of the shares.

**Aramco's financial position and results of operations may be adversely affected if the Kingdom stops pegging the SAR to the U.S. Dollar.**

Aramco has determined that the U.S. Dollar is its functional currency because a substantial amount of its products are traded in U.S. Dollars in international markets. A portion of Aramco's capital expenditures and operating expenses are denominated in Saudi Riyals, while a significant portion of its revenues and long-term liabilities are denominated in U.S. Dollars. The Saudi Riyal has been pegged to the U.S. Dollar in the Kingdom since 1986. If the Kingdom's policy of pegging the SAR to the U.S. Dollar were to change in the future and the SAR were to become stronger relative to the U.S. Dollar, Aramco may experience an increase in the SAR denominated costs of its operations. Such an increase could have a material adverse effect on Aramco's business, financial position and results of operations.

In addition, Aramco pays dividends to the Government, in its capacity as a shareholder of the Company, in U.S. Dollars and to other shareholders in SAR. If the SAR is no longer pegged to the U.S. Dollar and the SAR were to become stronger relative to the U.S. Dollar, Aramco may be required to expend additional cash to fund its SAR denominated dividends. Such changes could have a material adverse effect on Aramco's financial position.

**The Government may direct Aramco to undertake projects or provide assistance for initiatives outside Aramco's core business, which may not be consistent with Aramco's immediate commercial objectives or profit maximization.**

The Government has directed, and may in the future direct, Aramco to undertake projects or provide assistance for initiatives outside Aramco's core business in furtherance of the Government's macroeconomic, social or other objectives, leveraging Aramco's know-how, resources and operational capabilities. For instance, the Government has previously directed Aramco to develop and construct large infrastructure projects and provide management, logistical and other technical assistance for certain Government initiatives. The Concession requires that all Aramco contracts with any Government agency or any arrangement for the furnishing of hydrocarbons, services or otherwise shall be on a commercial basis and, on September 5, 2019, Aramco and the Government entered into a framework agreement to govern the furnishing of services by Aramco to the Government.

While these projects and initiatives have generally been of national importance to the Kingdom and in Aramco's long-term commercial interests, they have often been outside of Aramco's core businesses and have not always been consistent with its immediate commercial objectives or profit maximization. If the Government directs Aramco to undertake future projects other than on a commercial basis, Aramco's financial position and results of operation may be materially and adversely affected.