

The Saudi Economy in an Era of Energy Transition

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GCC Economies in an Era of Energy Transition

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Abstract

The unfolding global energy transition presents Gulf Cooperation Council (GCC) countries with challenges and opportunities that differ from those facing other oil and gas exporters. The differences emanate from the long lifetime of their hydrocarbon reserves, the low costs and carbon footprints of their production, and the high degree of their dependence on resource revenues. The relative weight of Saudi Arabia in the global oil market and the regional economy, as well as its demographic characteristics and diversification potentials, subject it to tradeoffs and challenges that are different from other GCC countries. While the speed and patterns of the energy transition will impact world oil production, exports, and rents, the policies taken by major producers might impact the pace or smoothness of the transition. The underlying fiscal, labor, and diversification challenges will be impacted by the transition and the response policies. The GCC countries should be prepared for all possible transition scenarios and begin transitioning their economies toward more sustainability and diversification.

Introduction

In April 2016, Saudi Arabia launched Vision 2030, a comprehensive roadmap for economic, social, and cultural transformation. The vision led to sweeping changes in Saudi Arabia's society and economy. It came after four decades of indicative development planning starting in 1970 when Saudi Arabia adopted nine development plans that guided its economy through wide swings in oil prices and revenues. From 1970 to 2015, Saudi Arabia's GDP grew by an annual average rate of 4.4 percent. Its private sector GDP grew by seven percent, while its per capita income grew by nine percent annually. Oil rents have transformed the Kingdom's economy, society, and institutions as well as the state's role in the economy and society (Kinninmont, 2017).

Despite decades of development planning and remarkable improvements in human development indicators, the economy, state finances, and private sector GDP continued to depend on oil revenues. Labor market segmentations and the inefficiencies and inequities of the incentive systems continued throughout. The economic, fiscal, and labor market challenges will likely be more pronounced with the global energy transition to

decarbonization trajectories. The prospect that the energy transition might entail lower world oil demand, prices, and rents adds to the decades-long dilemma of the unsustainability of continued dependence on oil revenues.

Furthermore, the social contract that spanned decades rested on providing public sector jobs to citizens, subsidies and bonuses to businesses and citizens, and free healthcare and education. The liberal immigration policy that facilitated the employment of cheap expatriate workers in the private and household sectors impacted consumption patterns and labor market dynamics. This social contract often came under stress during prolonged periods of low oil prices, or when government diversification drive or its labor market policies impacted the subsidies or employment patterns. Over the longer run, the global energy transition is likely to put further pressure on the ongoing social contract (The Economist, 2023).

Non-oil economic activity is indirectly highly dependent on the government outlays that are financed by oil revenues, and directly through the provision of oil and gas to the residential, commercial, and industrial sectors, often at subsidized prices. During the period 2010-20, oil and gas dominated the country's energy consumption with 57 percent and 43 percent of shares, respectively. The growth of the GDP, the non-oil GDP, and other macroeconomic variables strongly correlated with oil revenues and oil GDP. During the economic downturn of 1987-99, per capita income was increasing by 1.5 percent annually and the correlations between oil revenues and nominal and real GDP were 0.81 and 0.64, respectively, in real terms.¹ Comparatively, per capita income was growing by 8.5 percent annually during the 2000-14 boom, while the respective correlations were 0.93 and 0.73 (SAMA, 2022).

Despite the booms and downturns, the economy managed to increase the share of private non-oil GDP from 11 percent in 1970 to 40 percent in 2015. However, the goal of economic diversification, highlighted in all the development plans, was dismal. The share of non-oil manufacturing in GDP reached only 9 percent in 2015. Service sectors (mainly construction, trade, transport, and finance) dominated the private GDP, and averaged 71 percent throughout the period. The [Herfindahl–Hirschman Index](#) (HHI) of export diversification averaged 0.78 compared to 0.135 and 0.204 for OECD and emerging economies, respectively. During 2007-18, the index of the share of high technology exports

¹The downturn actually started in 1982 when oil prices were declining by six percent annually until 1985, collapsing by 48 percent in 1986 and averaging USD 18 per barrel (Brent) through 1987-99, with a one percent decline rate annually.

was 0.97 compared to 19 for OECD, 30 for China, and 21 for oil exporters Norway and Mexico.²

For decades, the government, society, and businesses were preoccupied by labor market segmentations into public and private sector employment, Saudi and non-Saudi workforce, and male and female recruitment. Despite the goal of nationalizing the labor force, known as ‘Saudization,’ unemployment among nationals continued to rise. During the 2000-14 boom, when the non-oil economy was growing by an annual average of 6.7 percent, the unemployment rate among nationals averaged 10.8 percent (27 percent among females), while the rate of expatriate employment in the private sector increased by 4.7 percent. The share of non-Saudis in private sector employment increased from 68 percent in 2000 to 84 percent in 2014, and their transfers increased by seven percent annually, from USD 15.4 billion to USD 36 billion in the two years.

In 2015, Saudi nationals comprised 56 percent of the population aged 15-64 but only 38 percent of the workforce, with 42 percent of them working for the government. During 1990-2015, women’s participation rate in the workforce stood at 14 percent, the lowest in the world.³ The wage gaps between nationals and expatriates in the public and private sectors widened. The concentration of nationals in the public sector increased the government’s wage bill and undermined productivity, while the concentration of expatriates in the private sector increased their transfers abroad and impacted the external balance and the public’s attitude and perception toward the business community.

Oil revenues averaged 80 percent of government revenues throughout the years of development planning and witnessed wide swings. During periods of increasing oil revenues, more than 40 percent of the increases budgeted were absorbed by increased spending. Government spending followed oil market cycles, with capital spending bearing the brunt of adjusting to oil market downturns, due to the rigidity of the government’s wage bill. While the wide variations between budgeted and actual revenues are expected due to oil market cycles, such variations in spending undermined development planning, the fiscal process, and the credibility of their respective institutions. The resulting wide swings in

² The shares and growth rates are taken from the Saudi Arabian Monetary Authority (SAMA), and the HHI comes from the United Nations Conference on Trade and Development. They measure the degree of export market concentration and fall between zero and one. Higher values indicate a higher degree of export concentration. <https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=120>

³ Official employment data have been collected by the General Authority for Statistics (GASTAT) since 1999. <https://www.stats.gov.sa/en/814>

capital spending impacted the private sector's growth and deepened its dependence on government spending.⁴

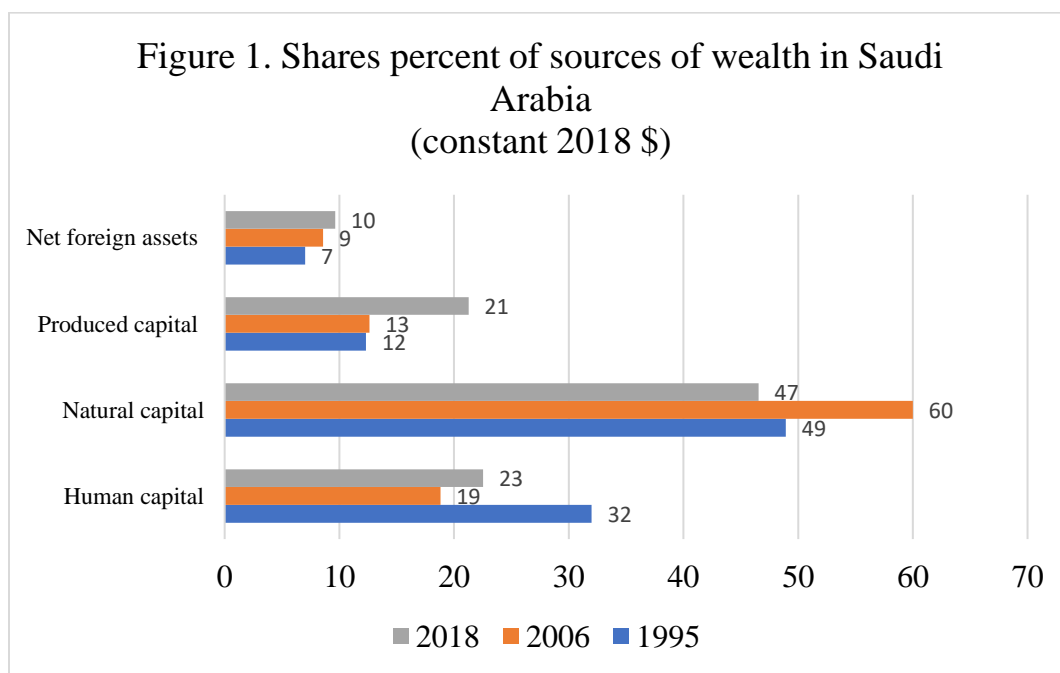
Vision 2030 sets the institutional framework for socioeconomic transformation and addresses the roles of oil, the government, and the private sector in the economy as well as in wealth creation and management. The transformation included introducing new sectors into the diversification process, enacting fiscal and labor market reforms, and setting up a framework to combat corruption. The institutional, judicial, cultural, and social reforms to improve factor productivity, innovation, entrepreneurship, and competitiveness were initiated. Sociocultural modernization reforms included women's empowerment, cultural reinvigoration, and improving the accountability of government. Although some of these endeavors were attempted during the period of development planning, they were either thwarted or lacked political will or institutional capacity. The ministry charged with drafting the development plans and following up on their implementation did not command the financial resources, entrenchment, and political reach of other ministries or government entities.

This paper aims to highlight the tradeoffs facing the Saudi economy in the global energy transition process and the implementation process of Vision-2030. This includes the prospects of diversification away from hydrocarbon rents into its value chain, the fiscal affairs of the state, and the labor market dynamics. Although the speed, patterns, and ultimate impact of the global transition to a less decarbonized world are still uncertain, the world's major economies' national decarbonization targets and policies have already been announced and some enacted. Most of the transition scenarios project a role for oil and gas in the medium term, and in power, industrial, transport, and non-combustible uses. Some of the underlying transition scenarios project a role for the oil and gas industries of the GCC countries, including Saudi Arabia. Their hydrocarbon reserves are not projected to be stranded and their industries might not become sunset industries. Instead, they might be generating value to compensate for the declining rent, the levels of which in the medium term might be used to reform the fiscal framework and the labor market as well as the systems of incentives and subsidies to transition the economy to a more sustainable path. With all the uncertainties surrounding the speed and pace of the transition, one thing is certain: the transition is ongoing. While their economies will be impacted by the global energy transition, the responses of the GCC countries to the transition might impact its speed and patterns.

⁴ Most of the adjustments during downturns were borne by government capital spending. The expanding wage bill resulted mainly from the 5.5 percent annual growth in nationals' public sector employment.

Wealth management

The share of natural capital in Saudi Arabia's total wealth followed oil market cycles, impacting the shares of the other sources of wealth. According to the [World Bank data and methodology](#), its share of wealth (measured in constant 2018 USD) averaged 49 percent when oil prices were USD 17 per barrel in 1995, increased to 57 percent when they reached USD 100 per barrel in 2014, and reached 46 percent when oil prices declined to USD 70 per barrel in 2018. The relative shares of produced capital and net foreign assets also changed accordingly. Between 1995 and 2018, produced capital doubled, and human capital grew by 21 percent (Figure 1). During this period, natural, human, and produced capital grew by annual averages of 4.7 percent, 1.5 percent, and 2.6 percent, respectively. The average contributions of natural, human, and produced capital were 54 percent, 23 percent, and 14 percent, respectively, compared to eight percent, 53 percent, and 33 percent in Norway, an important but more diversified oil-exporting economy.⁵



Source: World Bank data.

The dominance of natural capital in total wealth presents its oil-dependent economy with the challenge of changing the base and contribution of wealth from underground to above ground. Investments in healthcare and education, diversification, industrial strategies, and price and institutional reforms will change the relative contributions of human and produced capital in total wealth. The global move toward decarbonization will also change

⁵ Calculated from World Bank data: <https://databank.worldbank.org/source/wealth-accounts#>.

such contributions of wealth and pose critical trade-offs. Increasing extraction to avoid the anticipated future oil price declines, which is expected under rapid decarbonization, will reduce the value of underground assets. It may also accelerate the price decline, and prematurely reduce natural capital and, consequently, total wealth. If it chooses to maximize oil prices and rent in the short and medium terms by reigning in its oil production (unilaterally or through OPEC or OPEC+), the global energy transition might accelerate and eventually impact the levels and shares of the wealth components. Such trade-offs highlight the importance of a holistic approach to the oil, diversification, and industrial strategies of the state.

To manage their oil wealth, many oil and gas producers have established commodity funds for revenue stabilization or intergenerational savings. These funds can reduce macroeconomic volatility and transform natural resources into financial assets. By 2021, more than 30 such funds existed, with assets under management (AUM) estimated at USD 4.9 trillion, dominated by the GCC countries with a 63 percent share. These oil and gas funds constituted 47 percent of the total assets of all sovereign wealth funds (SWFs) worldwide.⁶ These funds differ in their objectives, asset accumulation strategies, withdrawal mechanisms, investment horizons, institutional and legal structures, openness, and risk tolerance. The rationale for such funds and their relative success in managing wealth or stabilizing revenues have been widely debated in literature. Studies have investigated the role of stabilization funds in reducing fiscal procyclicality and smoothing government expenditures, promoting transparency in the budgetary process, and separating resource-related revenues from other types of revenues. The studies found that the records of the stabilization funds on achieving such objectives were mixed (Coutinho et al., 2013; Frankel et al., 2013; Sugawara, 2014; Wills, 2018). The studies further found that stabilization funds are no substitute for budgetary discipline, efficient spending, and non-oil revenue enhancement.

Oil producers can also reduce their exposure to volatile oil prices by adopting medium-term spending plans or hedging against large oil price drops. Since 2001, Mexico was the only oil-producing country to pursue an oil hedge program. Its cumulative hedges through 2016 are estimated to have netted USD 2.4 billion in profits when it exercised its options following three price collapses. Mexico's experience shows that timing, flexibility, transparency, and efficient execution are critical to successful hedging. A study that explored whether other producers, such as Saudi Arabia, can execute a similar oil hedging strategy concluded that the size of Saudi Arabia's production, the role of oil in its economy, and its institutional framework make such a strategy unfeasible. Such a strategy would

⁶ Data from <https://www.swfinstitute.org/fund-rankings/sovereign-wealth-fund>

likely turn Saudi Arabia or other OPEC producers into fixed-volume producers, undermining the group's quota distribution mechanism and ability to influence global prices (Blas, 2017; Bouchouev and Fattouh, 2020; Marques, 2020).

Other types of SWFs are savings funds that aim to mitigate the risk of resource depletion by creating a store of wealth for future generations. These funds tend to invest in non-resource-related and diversified financial instruments, emphasizing long-term, high-return, and high-risk assets. Most intergenerational savings funds opt to invest abroad to avoid crowding out private investments. However, some funds aim to create wealth abroad and in their home countries through investment in national development projects. The designs of these funds and their relationships with other national institutions differ. They face trade-offs between accumulating domestic and foreign assets and balancing the targeted sectors for each type of asset. They face the challenge of reconciling the impact of their investments on public finances, the balance of payments, domestic financial markets, and monetary conditions (Gelb et al., 2014).

Saudi Arabia's approach to revenue stabilization and intergenerational equity evolved with the Kingdom's institutional and political organizations, the economy's development potential, and the fiscal affairs of the state. The government began accumulating financial reserves during the boom in the 1970s, reaching a maximum of SAR 527 billion in 1982 (almost equal to the then 525 billion GDP). These reserves then declined by 5.2 percent annually until 2001 but gradually recovered to an all-time high of SAR 2.75 trillion (USD 730 billion) in 2013.

The bulk of the financial reserves were managed by Saudi Arabia's central bank, the Saudi Arabian Monetary Authority (SAMA), as a parking fund or stabilization mechanism. They were channeled into short-term liquid investments abroad. Compared to other oil-exporting countries in the region that established dedicated SWFs for intergenerational equity, Saudi Arabia opted for another approach. It set up the [Public Investment Fund](#) (PIF) in 1971 to finance strategic, commercially driven, and government-sponsored projects. It also established specialized credit institutions (SCIs) in agriculture, industry, social, and real estate as sectoral financing mechanisms under the control of the Ministry of Finance. The role of the SCIs as sectoral financing government institutions continued and transformed over the years.

Impacted by the completion of its financed projects, the decline in oil revenues, the development of the private sector, and the deepening of the financial sector, the PIF's role evolved over time. It became the custodian of the government's stakes in the companies it

financed or set up. It also managed its shares in other local enterprises in banking, agriculture, real estate, insurance, cement, and others. Its shares of these companies reached around SAR 313 billion in 2016, constituting 3.8 percent of the Saudi stock market. Since then, the Ministry of Finance's oversight of the PIF and SCIs ended, and the strategies and governance of these funds changed. SCIs expanded to include infrastructure, tourism, culture, mining, and SMEs all grouped under the overall umbrella of the National Development Fund. The PIF was transformed to become the state's SWF and its development and diversification agent. It was mandated to invest in promising sectors of the economy and hold diversified investment portfolios abroad. Through indigenous growth and different government injections into its resources, its AUM increased from USD 150 billion in 2015 to USD 650 billion in 2023. [Its shares in the Saudi Stock market-TADAWUL- increased to SAR 1.2 trillion](#) in 2023, representing 17.2 percent of the market. In the meantime, SAMA continued its role of stabilizing revenues and managing the state's financial surpluses, estimated to have reached SAR 1.7 trillion in 2022.

Over the past few decades, Saudi Arabia's oil wealth has been used to employ Saudi nationals in the public sector and provide healthcare, education, housing, and cheap energy, as well as building infrastructure. This has contributed to sustained relationships among the state, society, and business. However, other demographic, economic, fiscal, and energy market challenges persisted. The growth and development model, the formal and informal rent distribution networks, and the relationship between businesses and the state could not improve productivity and diversification, nor address labor market dualities and income inequality. Oil continued to dominate the GDP, exports, and government finances, which impacted growth, productivity, fiscal sustainability, employment, economic resilience, and the external balance.

The wealth management model will certainly be impacted by the speed and pattern of the energy transition and the Kingdom's responses to it. The [International Monetary Fund](#) projects that the energy transition may cause the oil producers' financial assets to be drawn down by 2034, when some might borrow to finance their growing deficits (Mirzoev et al., 2020). The patterns of developing human and produced capital will be indirectly impacted. The PIF's in-Kingdom and foreign investment strategies might also be changed accordingly. The faster the world transitions to a less decarbonized one, the more Saudi Arabia's environmental credentials and oil policies would be scrutinized. The more its economy is integrated into the world economy and its enterprises tap into the global financial markets, the more they will be subject to the Environment, Social, and Governance (ESG) framework and matrices.

Trade-offs in the energy transition

The global energy transition is characterized by the rapid development and penetration of renewable energy and electric vehicles (EVs).⁷ It involves the electrification and digitization of mobility, energy efficiency improvements, technological advances, changes in social preferences, and the very role of energy in the economy. It is perceived to contribute to the fight against climate change, end the geopolitics of the old energy order, and create new sectors and industries. By the end of 2022, around 140 countries, including GCC countries, announced net zero targets, covering close to 88 percent of global emissions. The investment needed to reach such ambitious targets is estimated to reach USD 2-4 trillion per annum until 2030, compared to USD 755 billion today (Al-Sarihi, 2023). Nevertheless, the IPCC warned that the nationally determined contribution (NDCs) emission reduction pledges made will not be enough to limit warming below 2°C” without additional commitments and actions.

There are multiple uncertainties as to whether the transition will be slow or fast, smooth, or chaotic, and geopolitically more secure or not, but forecasts generally indicate that it will gradually lead to a slowdown in oil demand growth along with the other fossil fuels. Some scenarios project declines in the level of demand precipitously from its current level of 100 million barrels per day (MBD). For example, the IEA’s stated policies scenario (STEPS) projects an eight percent growth in oil demand between 2021 and 2050, while its announced pledges scenario (APS) projects a 37 percent decline in world oil demand by 2050. Its more ambitious net zero emissions (NZE) scenario projects a whopping 76 percent decline in oil demand and 15 times increase in renewables by 2050. If we discounted the extreme NZE scenario, the STEPS and APS scenarios, project a three- and six-fold increase in renewables generation capacity by 2050. It estimates a cumulative investment of USD 150 trillion between 2023 and 2050 to transition to a 1.5°C scenario (IEA, 2022b). These scenarios may impact the global oil market and the hydrocarbon-exporting countries’ long-term investment and development plans. The COVID-19 pandemic offered a preview of the economic vulnerability that they may face when hydrocarbons demand, prices, production, and revenues collapse.

⁷ Due to the complexity of the energy system and the paths of the transition, it is becoming clear that the world will face multiple energy transitions. This involves “additions” of renewables and hydrogen into the mix of energy resources. It also entails changes in the relative shares of fossil fuels in some regions in the medium term, with substitution from coal to gas, nuclear, or renewables in the power sector in some regions and from oil to gas and/or renewables in others. There may also be multiple transitions in the developing versus developed world (see Arent et al., 2017).

The speed of these projected changes differs across regions and sectors and across fossil fuels. If recent past is an indicator, the transition is already underway. Investments in renewables and electric vehicles and batteries have increased from USD 1.1 trillion in 2017 to USD 1.44 trillion in 2022, while investments in fossil fuels declined from USD 886 billion in 2017 to USD 680 billion in 2021 and recovered slightly to USD 852 billion in 2022 (IEA, 2022a). Investments in green energy have been surpassing those in fossil fuels since 2016 with the gap widening from USD 160 billion in 2019 to USD 615 billion in 2022. Such investments depend on many factors, including energy prices and costs, carbon prices, government regulation and incentives, and consumer behavior. Even when the world was short of oil and gas supplies and their prices were surging following the Ukraine crisis in 2022, global capital spending on renewables exceeded investments in upstream oil and gas for the first time.

Although many countries have set targets and enacted policies to reach net zero carbon emissions before or after 2050, the likelihood of reaching such goals is debated. China's green ambitions and achievements in renewables, EVs, and batteries have added to the optimism about a speedy global energy transition. However, it also heightened new energy security concerns emanating from the concentration of reserves and processing of critical metals needed for renewables, EVs, and batteries in China and a few other countries and regions. In a net zero emissions scenario, it is estimated that global trade in critical minerals might triple by 2050, with China dominating the scene.

All GCC states except Qatar have set net-zero carbon emission targets – by 2050 for the UAE and Oman; and 2060 for Saudi Arabia, Bahrain, and Kuwait. The GCC countries face different challenges than other oil-exporting countries due to the size, characteristics, lifetime, organization, and potential of their hydrocarbon sectors. Saudi Arabia, along with the GCC, commands some 30 percent of global oil and 21 percent of global gas reserves, lasting at current production levels for around 76 and 98 years, respectively. They hold more than 70 percent of the global spare oil production capacity. The cost of hydrocarbon production and their carbon intensity are the world's lowest, and their potential production and export capacities are the world's highest. Saudi Arabia's crude oil production costs are estimated to be less than USD 4 per barrel, its flaring intensity is less than one percent of total gas production, and its methane intensity is 0.06 percent (Masnadi et al., 2018). However, given their relatively high per capita income, industrialization and urbanization rates, mobility, and energy consumption, their emissions per capita are among the world's highest.

Consequently, the trade-offs they face differ from the other hydrocarbon producers, which interact to influence the speed and timing of the global transition itself. For example, if Saudi Arabia perceives the energy transition to be fast and opts to accelerate its oil extraction to avoid being left with stranded assets, oil prices may fall. Since Saudi Arabia's economy is less diversified, falling oil prices will, in turn, create fiscal and socioeconomic consequences. Pursuing such an option and relying on its relatively low oil production costs may be undermined by its high fiscal breakeven oil price (Dale and Fattouh, 2018).

The energy transition may also impact Saudi Arabia's plans to expand and utilize its crude oil production capacity. For decades, the level of that capacity and its rate of utilization have been detrimental to the global oil market, OPEC's performance, and Saudi Arabia's role in both. Saudi Arabia has maintained a capacity of 12 MBD for over a decade and is expanding it to 13 MBD by 2027. If it chooses to adapt to a speedy energy transition framework and maximize its short-term production, its excess capacity may decline. In this case, oil prices might decline in the short to medium run and it may lose its ability to influence prices and its geopolitical status. If it instead chooses to reign in its production and increase its spare capacity, oil prices and revenues will likely rise and may contribute to a speedy transition. The transition itself may reduce oil prices or production in the long run while adapting to it through oil production, and capacity adjustments will impact Saudi Arabia's role in the global oil market and the role of the oil sector in its economy. Currently, the Kingdom appears to be addressing these trade-offs by transforming its hydrocarbon industry, economy, and society to respond to the long-run energy transition. In the short to medium term, it is still leading the efforts of OPEC and its partners to reign in volatility, and maintain high to reasonable rents by managing production, which entails shutting in some capacity.⁸

The longevity of its oil reserves and the eventuality of the energy transition may provide opportunities to integrate oil into the economic diversification process by capturing additional value throughout the hydrocarbon value chain. Saudi Arabia can find ways to reduce the industry's carbon footprint and enhance the non-combustible uses of oil. Since the beginning of its petrochemical industrialization in 1970s, the share of exports of such industries in total exports increased from 6 per cent during 1984-2009 to 14 percent average during 2010-2020. Developing products that are close to the product space that it already exports enhance its diversification potential (Hidalgo and Hausmann, 2008, Balland et al., 2022)

⁸ During the 23 years from 2000 to 2022, Saudi Arabia reduced its annual production in 11 years and increased it in 12 years, with an average capacity utilization of 85 percent.

Saudi Arabia's green initiatives

- Pledging to reduce emissions by 278 million tons of carbon equivalent per year by 2030 (from 586 million tons in 2021) to achieve carbon neutrality by 2060.
- Nature-Based Solutions (NBS) which includes planting 10 billion trees in Saudi Arabia and 40 billion trees across the Middle East.
- Installing 58.7 GW of renewables by 2030 to contribute half of the national power supply by 2030, with natural gas covering the other half. Thus far, 17 renewables projects are under development, with a total capacity of 13.76 GW.
- Plans to build two nuclear power reactors, with total Capacity of up to 3.5 GW.
- During its G20 presidency in 2020, Saudi Arabia introduced and the Summit-endorsed Circular Carbon Economy (CCE) as a framework for managing and reducing emissions. It is a closed loop system involving four 'R's: reduce, reuse, recycle, and remove. It established a regional center to enhance and adopt CCE.
- A \$5 billion green hydrogen project between Acwapower, Air Products and Meom in northwest Saudi Arabia to produce 600 tons of clean hydrogen per day and 1.2 MT/y of green ammonia by 2026 to reduce CO2 by 5 MT/Yr
- The PIF:
 - Developed a Green Finance Framework until 2025 and issued two green bonds to finance climate and environmental projects that comply with ESG requirements. It
 - Established a voluntary platform for trading carbon certificates in MENA. It also created a voluntary regional carbon market company to help companies and sectors in the region achieve carbon neutrality.
 - Has a 65percent share in Lucid Motors to assemble EV cars in KAEC in Saudi Arabia and sell 50,000- 100,000 EVs to the Saudi government.
- Aramco:
 - Plans to produce 11 million tons of blue hydrogen and blue ammonia from natural gas per year by 2030. It launched CCS hub to capture 44 mn tons CO2 by 2035
 - Launched a \$1.5 billion sustainability fund to invest in technologies to support its carbon neutrality objective by 2050. It plans to invest in CCUS, greenhouse gas emission reductions, energy-efficiency advancements, natural climate solutions, digital sustainability strategies, hydrogen, low-carbon ammonia, and synthetic fuels.
 - Aims to reduce carbon emissions from the exploration and production sectors by 15 percent by 2035. It plans to eliminate more than 50 million metric tons of CO2 equivalent emissions annually, in addition to capturing, using, or storing 11 million metric tons of CO2 equivalent per year by the same year.
 - Plans to produce 11 million metric tons of blue ammonia annually and generate 12 GW of electricity from solar and wind power.
 - Signed a deal with Siemens to develop a small-scale direct air capture DAC "test unit" to help decarbonize oil and gas operations to be completed in 2024.
- Saudi Energy Efficiency Center (SEEC) aims an improvement in the overall new vehicle fleet average fuel economy of 4percent annually, an industrial energy intensity reduction of 6.2percent.

See <https://www.vision2030.gov.sa/en/projects/saudi-green-initiative/>

While oil will likely continue to generate gradually reduced rent, Saudi Arabia can find ways to extend the value chain and create new industries within its traditional energy sector. Thus, economic diversification entails not only the development of non-oil sectors but also leveraging the comparative advantage of the hydrocarbon sector itself. If diversification succeeds, the economy may become more resilient and gain increasing rates of return from a barrel of oil produced besides the dwindling rent. It will also be allowed to pursue flexible and proactive oil policies. Conversely, failing to diversify fiscal revenues and its economy, the Kingdom will continue relying on rent and will likely pursue higher oil prices, which may accelerate the global energy transition. (Fattouh and Sen, 2019).

In the context of the energy transition framework, neither current market trends nor base forecasts point to a rapid fall in oil and gas prices by 2050. Global oil demand may peak sometime in the future, depending on the trajectory of decarbonization. However, a decline in global oil demand may not necessarily lower the demand for low-cost Saudi oil nor undermine its industry. As it continues to defend oil rents, Saudi Arabia may adopt various strategies to secure crude oil export outlets and hedge against oil demand reductions. These strategies include enhancing the competitiveness and resilience of the energy sector, promoting energy efficiency, exploring other non-combustion uses of hydrocarbons beyond the traditional ones, and reforming domestic energy prices. Saudi Arabia can also increase the domestic use of gas and renewables and promote diversification within the hydrocarbon value chain. The Kingdom can promote and utilize carbon capture, utilization, and storage (CCUS) technologies, thereby entering the promising blue and green hydrogen technologies and markets.

Strategies to decarbonize oil and gas production entail additional costs, which may reduce oil rents. However, they can transform the oil and gas industry from focusing only on rent to also value generation and realizing margins. Additionally, the global demand for petrochemicals is growing more rapidly than the GDP. The petrochemical industry in general, and specifically in Saudi Arabia, is diversified and sophisticated and produces many consumer and manufacturing materials. Some of these materials are crucial components for the energy transition, especially solar panels, wind turbine blades, thermal insulation, batteries, and other electric vehicle parts. Thus, the Saudi oil and petrochemical industries can be integrated into the national diversification agenda and the global energy transition process.

Furthermore, the amount of oil available for export is likely to increase due to national renewables objectives; the reform of energy incentives and subsidies; the replacement of gas for oil in power generation and water desalination; and the improvements in energy

efficiency. Although the 2018 energy price reforms reduced the explicit and implicit energy subsidies, fuel subsidies are still among the highest in the world on a per capita and GDP basis, estimated to be USD 4548 per capita and 22 percent of the GDP (Bordoff, 2020; Luciani, 2020; Poudineh and Fattouh, 2020, Parry et al., 2021).

Saudi Arabia announced its goal of achieving carbon neutrality by 2060 while Aramco, its national oil company (NOC), announced that it would decarbonize its operations by 2050. These ambitious goals involve investments in renewables and nuclear reactors as well as oil-to-gas switching in the power and water desalination sectors, carbon capture and storage, gas-to-hydrogen substitution, oil to chemicals, and the circular carbon economy (CCE) framework. Since utilities and industry each account for 40 percent of emissions while transportation accounts for 19 percent, decarbonization will entail structural changes in these sectors and the associated services.

Saudi Arabia has multiple advantages in pursuing its green agenda. Besides its low cost of oil production and low carbon intensity in its hydrocarbon production, its oil rent provides the needed investment capital to maintain its competitive edge in hydrocarbon production as well as investment in green technologies. Its decarbonization advantages include financial resources, land mass, and climatic advantages for renewable energy. It has an edge in the availability of feedstocks, the geology for carbon storage, the concentration of geographically clustered emission sources, and the human skills it built over the years (Krane, 2022).

Targeting net zero emissions by 2060 allows the Kingdom to reign in the growth of its own oil demand and divert it to exports and higher value uses. It also allows it to continue its energy efficiency improvements and energy price reforms. Although the energy price reforms of 2016 and 2018 slowed down after COVID-19, they contributed to reducing oil and gas use by one percent annually until 2021 (from an average growth of 5.4 percent during 2000-15 to less than one percent since 2016). Continuing the energy price reforms would align Saudi energy prices with world prices, encouraging efficiency and technology switching. It would also reduce the estimated carbon price to reach the stated decarbonization goals.⁹ But it would impact industrial, services, and household sectors and a trade-off that adds to the other fiscal, industrial and energy transition trade-offs.

⁹ Before the energy price reforms of 2018, an IMF paper used a partial equilibrium welfare analysis to estimate the “efficient carbon price” for Saudi Arabia at USD 291 per ton of CO₂, concluding that if fuel prices were reformed, the efficient carbon price would fall to USD 130 per ton. See Parry et al. (2014).

Carbon pricing provides price signals to reduce emissions and shift to low-carbon fuels, incentivize energy investment and innovation, and mobilize revenues. It can take the form of carbon taxes or emissions trading systems (ETEs). [Carbon taxes](#) have advantages in administration, price certainty, exploiting fiscal opportunities, and application to broader emissions sources. As of 2022, 130 countries, covering 90 percent of GHGs, have set or proposed zero net emissions targets for or around mid-century, 30 countries of which have implemented carbon taxes, varying from USD 5 to USD 100 per ton.

Different levels of pricing and underlying ambitions create challenges for businesses operating in multiple regions, which may result in carbon leakage, thereby impacting competitiveness and industrial policies. The European Green Deal of 2019, which includes policy initiatives to reduce GHG and achieve carbon neutrality by 2050, proposes a [Carbon Border Adjustment Mechanism](#) (CBAM) to equalize the carbon price paid by EU producers operating under the EU ETEs and the one for imported goods. The CBAM is expected to be launched in 2026 and covers most emission-intensive sectors: iron and steel, cement, fertilizers, aluminum, electricity production, and hydrogen. The initiative has been criticized by BRICS countries as being discriminatory with a unilateral trade barrier that violates the common but differentiated responsibilities of the UNFCCC. Others point to the possible conflict with the US Inflation Reduction Act (IRA) which includes a subsidy of \$85 per ton of carbon dioxide captured from industrial processes. The impact of such border taxes and their coverage on the oil and gas exports to the EU and on their energy-intensive traded industries, and the World Trade Organization (WTO) rules need further analysis to map out their policy choices.

An [IMF/OECD report](#) argues that the legal and administrative infrastructure already exists to integrate carbon taxes in the fuel taxes (and subsidies) framework in many countries. It estimates that the average G20 implicit oil tax in power is around USD 28 per ton of carbon, compared to 76 in industry, 105 in transportation, and 69 in buildings. It estimates that a USD 50 carbon price would cut CO₂ emissions in G20 countries by around 15-35 percent below BAU levels by 2030, which is still below commitments many countries have made in their nationally determined contributions (NDCs) under the 2015 Paris Agreement. While such a level is estimated to raise revenues of about 0.5 to two percent of the GDP in 2030, it will put downward pressure on hydrocarbon demand and prices as well as investments. However, carbon taxes still face technical choices in their design, administration, price levels, and relation to other mitigation instruments. The use of revenues to address efficiency and distributional objectives, the supporting measures to

address competitiveness concerns, as well as the coordination at the global level, are also of concern.¹⁰

Demographic challenges and labor market reforms

Saudi Arabia has been facing demographic challenges since the discovery of oil and its subsequent impact on population movement within the country and immigration into it. As of mid-2023, nationals aged 15-44 account for 75 percent of the total working-age population. The total population dependency rate is 39 percent, and that for nationals is 53 percent. The demographic characteristics and trajectories are projected to reduce such rates to 23.2 percent and 28.4 percent, respectively (Violi, 2016). Around 46 percent of the working population are aged 15 to 34 years old, and 66 percent of them are unmarried. By 2030, the number of Saudis aged 15 years and older is estimated to increase by about six million, with at least four million working-age Saudis expected to enter the labor market by then. The Kingdom [will need to create almost three times](#) as many jobs for Saudis as it did during the 2000-14 boom.

By mid-2023, and excluding domestic workers, foreign labor accounts for 67 percent of Saudi Arabia's total workforce, around 85 percent of which are employed by the private sector. This was influenced and reinforced by a widening gap between the wages of expatriates and nationals, with the average wages of expatriates estimated to be around 37 percent of those of Saudi nationals in 2021. Since the launch of labor market reforms, the labor participation rate among women rose from 19 percent in 2016 to 35 percent in 2023, exceeding the 30 percent target of Vision 2030, and raising the overall labor participation rate to 63 percent.¹¹

However, the structural issues of education attainment, inequities of the incentive systems, and the expanding role of the state remain. Since the state employs two-thirds of the national workforce, the system of higher education (dominated by free public universities) has reinforced expectations of state employment, emphasizing humanities and social sciences. Saudi nationals were therefore attracted toward white-collar employment in the public sector rather than the more blue-collar jobs in the private sector. The expansion of employment in the public sector (especially during the long boom of 2000-14) and the reliance on expatriate workers in the private sector have resulted in lower labor productivity, unsustainable growth, and sociopolitical instability. Decades of restricting the mobility of foreign labor allowed employers to extract economic rents, allied the interests

¹⁰ See Parry et al. (2022) and Al-Attayah Foundation (2023).

¹¹ The data from GASTAT (<https://www.stats.gov.sa/ar/814>).

of businesses and related bureaucrats, and complicated labor market reforms. Nevertheless, the private sector's reliance on foreign and labor-intensive technologies in the service sector has contributed to its growth and benefited households (Elbadawi and Makdisi, 2020; Hertog, 2017).

The labor market reforms started in 2000 and focused on imposing fees on expatriate labor importation and their employment renewals, restricting their use in certain occupations, subsidizing the training of the Saudi workforce in the private sector, and increasing the minimum wage level of nationals in that sector. The [Human Resource Development Fund](#) (HRDF) was set up as a vehicle to receive the fees on foreign labor importation and earmark them for the training and hiring of nationals. When such reforms could not reduce the unemployment rate among nationals, the government resorted to a quota system in 2011 known as *Nitaqat* that aims to increase the employment of Saudi nationals in the private sector. It uses a rating system that classifies companies into four color zones and requires employers in the private sector with more than nine employees to hire a certain percentage of Saudi nationals, depending on the company's industry and the number of its employees. Due to the manipulation of the system and its inherent shortcomings, it went through different changes to simplify the compliance rules for businesses, reclassify business establishments, and increase the minimum wage level.

Since 2016, labor market reforms were integrated into the overall socioeconomic and fiscal reforms. The imposed fees varied depending on the number of nationals working in the firm, its size, and the type of sector in which it operates. The reforms also included changes in the educational and incentive systems, the rate of hiring in the public sector, empowering women, and improving expatriate labor and job mobility. Lifting restrictions on the coed system in higher education and the co-mixing of genders in the workplace contributed to doubling female labor participation and increasing the employment rate of females from 66 percent to 76 percent between 2017 and 2023.¹² This expanded the competition arena, from expatriate/national males to include male/female nationals. The freeze on the hiring of nationals in the public sector contributed to increasing the rate of nationals' hiring in the private sector but might have impacted the age structure of the public sector's employees toward the more than 40 years age group. These changes in employment patterns might lead to further socio-economic changes (Hertog, 2021)

¹² It was estimated that the wage gap between Saudi and foreign male employees with a college degree narrowed by around 33 percent and by 47 percent for the total wage gap between 2017 and 2022 (third quarter). On Vision 2030 labor regulatory reforms, women's employment, and taxes on labor importation, see Alkhowaiter (2021 and 2023).

The government is generally faced with a trade-off between nationalizing the workforce on the one hand and promoting the role of the private sector and its contribution to the GDP and employment on the other. Since the private sector mainly employs expatriates, the rapid nationalization of the workforce may reduce private sector investment and growth owing to the limited substitutability of nationals for expatriate workers, at least in the short term. Alternatively, continuing the decades-long employment and growth models will add new jobs for low-skilled expatriate workers at the expense of nationals. This old model contributed to the growth of the private sector's capital formation, expatriate employment, and GDP of 10.6 percent, 5.5 percent, and 7.6 percent, respectively, since 2000. Nevertheless, it indirectly led to unemployment among nationals, the expansion of the public sector, and an increase in its wage bill by annual averages of 10.8 percent, 4.7 percent, and 10 percent, respectively. However, integrating labor market reforms with socioeconomic, fiscal, and institutional reforms contributed to the decline in unemployment among nationals from 12 percent in 2016 to 8.3 percent in 2023 (from 33.7 percent to 15.7 percent for females).

The impact of the energy transition on labor market reforms will depend largely on its impact on diversification. This itself depends on many factors such as the quality of institutions and infrastructure, trade openness, human development, macroeconomic stability, and financial conditions (Karanfil and Omgba, 2023). It will also depend on the fiscal affairs of the state and the trade-offs that the transition poses on such affairs.

Energy transitions and fiscal challenges

The dependence on volatile oil revenues has been the main challenge facing fiscal authorities. During the 2000-2014 boom, oil revenues averaged 35 percent of GDP annually, while non-oil revenues only eight percent. The base for non-oil revenues itself varied depending on economic growth, which depended on the state's spending that depended on oil. Current spending, largely composed of the public sector's salaries and allowances, averaged 79 percent of total government spending and 63 percent of the non-oil GDP. Conversely, private sector salaries to Saudis and expatriates comprised eight percent and 19 percent, respectively, of the non-oil GDP.

In other tax-based economies, fiscal spending can increase the tax base through the multiplier effect. In contrast, Saudi Arabia's fiscal multiplier in relation to private non-oil GDP is relatively low owing to the leakages via imports of goods and services and transfers

of the expatriate workers.¹³ One study estimated the short- and long-run current spending multipliers for the period 1983-2018 at 0.13 and 0.32, respectively, making the growth spillovers of fiscal policy relatively low (Al-Moneef and Hasanov, 2020).

Vision 2030 fiscal reforms seek to rationalize the government's current and capital spending, reform energy prices and subsidies, overhaul the incentives system, and freeze government employment. On the revenues front, the reforms redesigned expatriate levies and non-oil taxes by imposing health and value-added taxes (VAT) to achieve efficiency and macroeconomic and labor market objectives. Ultimately, these measures affected consumption and investment, while impacting businesses and the public.¹⁴

Despite fluctuations in oil revenues, the government refrained from imposing income taxes on citizens. Such taxes were unfeasible in the pre-oil era because of low personal income levels and institutional limitations. The discovery of oil eliminated the need for income taxation owing to the high and increasing external oil rent. Instead, the government focused on building institutions to tax the oil concessionaire, establishing networks to re-distribute oil rent and integrate the oil sector into the economy. The continued flow of oil income, the underdeveloped economy, and the demographic and geopolitical challenges maintained this status quo. The provision of state employment to nationals, free education and healthcare, and generous government subsidy schemes made imposing even a progressive income tax unfeasible. Besides, since a large segment of the citizens works in the public sector, imposing such a tax would pressure the government to increase public sector wages to offset the tax.

Imposing an income tax on nationals in the private sector, if not compensated by the employers, would lessen the wage gap between nationals and expatriates in that sector. However, it would widen the existing wage gap between the public and private sectors, further restricting nationals' employment. An income tax on expatriates would be passed on to employers, who would be forced to raise wages to compensate for such a tax. Similar taxes have been indirectly implemented through various levies on the importation of expatriate labor and the renewal of their residence. Therefore, so long the oil rent is stabilized or expanded, an income tax on citizens and/or expatriates is unlikely to be

¹³ The promotion of new sectors, such as tourism and entertainment, as well as the increasing female labor participation rates associated with the reforms and the enactment of VAT and other taxes and fees, will likely impact these estimates of the spending multiplier.

¹⁴ A VAT of five percent in 2018 contributed SAR 60 billion to non-oil revenues. Of these, 64 percent came from domestic sources and 36 percent came from the sale of imported goods. Following the outbreak of the COVID-19 pandemic, the VAT increased to 15 percent.

included in the policymaking agenda for the foreseeable future (Jewell et al., 2015; Luciani, 2020).

Saudi Arabia currently collects the religious obligation payments (*zakat*) from Saudi and GCC nationals and companies. It also imposes a corporate income tax of 20 percent on the net income of foreign entities or on their shares in joint ventures. The capital gains from sales and asset transfers are treated as normal business income and are subject to *zakat* or taxes. While the current FDI tax rate is modest compared to global practices, with the Vision 30 framework incentivizing such investment. The lower the carbon footprint of the economy and its exports, the more this would be conducive for foreign investors to target the Saudi market, seeking low-emission supply chains to contribute to minimizing their emissions, with all the associated rewards and risks involved (Krane, 2022).

Access to cheap energy, well-developed infrastructure, free social services, and other externalities have allowed the private sector to accumulate wealth and large locational economic rents. Non-oil private GDP grew by six percent and capital formation grew by eight percent annually in real terms during the past twenty years since 2000. Private investment has averaged 34 percent of the non-oil private GDP, suggesting that overall profitability levels are high, as evidenced by more than 100 percent ratio of credit to that sector since 2005.

If the government chooses to unify the corporate income tax (considering *zakat* obligations), the private sector will likely resist. Resistance is even more likely if the indirect costs of hiring expatriate labor continue to grow as part of the labor market reforms. In this case, private capital formation will be impacted, as will be the objective of promoting the private sector's role in the economy and the diversification drive. Businesses that rely on government contracts may indirectly incorporate higher taxes into their bids for government projects. Owing to their sizes, areas of activity, and credit access, small and medium enterprises (SMEs) are less able to absorb such taxes compared to large corporations. Thus, additional taxes will impede Vision 2030's objective of promoting the role of SMEs.

Saudi Arabia's development and welfare model over the past five decades has contributed to economic well-being and non-oil GDP growth. However, it has widened income, employment, and wealth disparities across income groups and regions.¹⁵ In other countries, wealth taxes, especially property taxes, are widely used because of their appeal from the perspectives of political economy and administrative capacity. They offer a potentially

¹⁵ Since 2002, the number of beneficiaries eligible for social security has increased three-fold, reaching 1.14 million in 2019. The disbursed benefits increased seven-fold, reaching SAR 19 billion in that year.

large base and are relatively efficient to collect owing to their relation to physical location. Taxes on land and real estate are relatively simple to introduce and can address wealth inequality directly and income inequality indirectly. However, they require substantial investments in administrative infrastructure, a land and property registration system, a valuation mechanism, and effective enforcement. However, as the decades-long debate and delayed implementation of the modest idle land tax in urban areas suggest, property taxes (though not yet in the public domain) may face stronger political opposition.

Generally, the base and rate of any form of tax depend on the government's interrelated goals. These include increasing factor productivity, enhancing competitiveness and efficiency, addressing income and wealth inequality, rationalizing spending, and diversifying the economy and fiscal revenues. They also include reducing public sector employment and the share of wages in the government's current spending and promoting the role of the private sector. Properly designed, implemented, and administered taxes can improve intergenerational equity, perceptions of fairness, and budget planning and execution. They can enhance transparency in public resource use, establish a link between governments and citizens, encourage accountability in fiscal and economic management, and support state building (Luciani and Moerenhout, 2020; Jewell et al., 2016).

The impact of the global energy transition on fiscal policy will largely depend on the state's perception of the speed of the transition, its patterns, and its oil and industrial policies toward it. This, in turn, is impacted by the interaction between fiscal, industrial, diversification, and monetary policies. The relatively high rent per capita, high foreign reserves, and institutional capacity have enabled Saudi Arabia (and other GCC countries) to maintain the strong currency's peg to the dollar and gave it the capacity to implement at times countercyclical fiscal policy. Since 1986, this longstanding policy of rigid currency peg policy has proven to be a credible anchor of monetary and financial stability. It kept the inflation rate relatively low at 1.6 percent during 2013-2023, and provided certainty to private investments. This policy has been supported by the IMF in its subsequent [Article IV consultation](#), maintaining that external buffers are adequate enough to maintain the peg. It has been suggesting the continued appropriateness of the peg and the need to regularly review its impact on diversification. Once the energy transition exerts its full impact on the external balance and depending on the relative success in diversifying the sources of wealth and government finances, the fixed currency peg might also be reassessed.¹⁶

¹⁶ See Elbadawi et al. (2019) and IMF (2022).

Until now, it seems that the advent of the energy transition has contributed to the depth, intensity, and public support of the fiscal reforms of Vision 2030. The energy crisis that followed the post-COVID-19 recovery and the Ukraine-Russian conflict since 2022 might have convinced policymakers that the energy transition will be slower and more volatile than anticipated. Saudi Arabia's leadership role within OPEC+ in oil production management during 2020-23 kept oil prices and rents high enough to generate revenues, which helped enact the reforms of Vision 2030 as well as the green agenda. The Kingdom seems to direct part of the oil windfall to invest in oil and gas capacities as well as in the green economy.

Conclusion

The global energy transition and the move toward a decarbonized world may ultimately reduce oil demand and rent. Depending on the speed and patterns of this transition, it may impact Saudi Arabia's finances and its oil-dependent, government-led economy. Although oil demand growth is projected to decelerate, oil will remain an important energy source, and Saudi Arabia will be a major global supplier. Oil rents may decline in absolute and relative terms, but its industry in Saudi Arabia will continue to grow and diversify across the hydrocarbon value chain. The industry will incorporate new energy sources, such as renewables, and will gradually shift from rent to value generation. The Kingdom's advantages include its reserve base, low cost of production, low carbon intensity, and the level of development of its oil industry. It will be able to monetize CCUS technologies; increase non-combustion uses of hydrocarbons, such as petrochemicals; and develop renewables and hydrogen.

The labor market and fiscal reforms launched by Vision 2030 will be impacted by the speed and patterns of the energy transition. In the short and medium terms, the oil revenues will be critical to the smooth implementation of the ambitious goals of Vision 2030. Saudi Arabia's demographic characteristics both provide dividends and present challenges to the economy and society. More nationals are being employed, women's labor force participation is increasing, and the wage gap between the private and public sectors is gradually narrowing. Incentive systems are being reformed, and citizens' expectations are aligning with market needs and dynamics. Fiscal reforms include rationalizing spending, addressing the high government wage bill, generating new revenue sources, making the state's finances more sustainable, and ensuring that the state institutions are more accountable. These changes will strongly impact the economy and the role of the government, from being the dominant player in the economy to becoming a regulator and

enabler. The labor market and fiscal reforms will ultimately transform the state's relations with citizens and businesses.

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