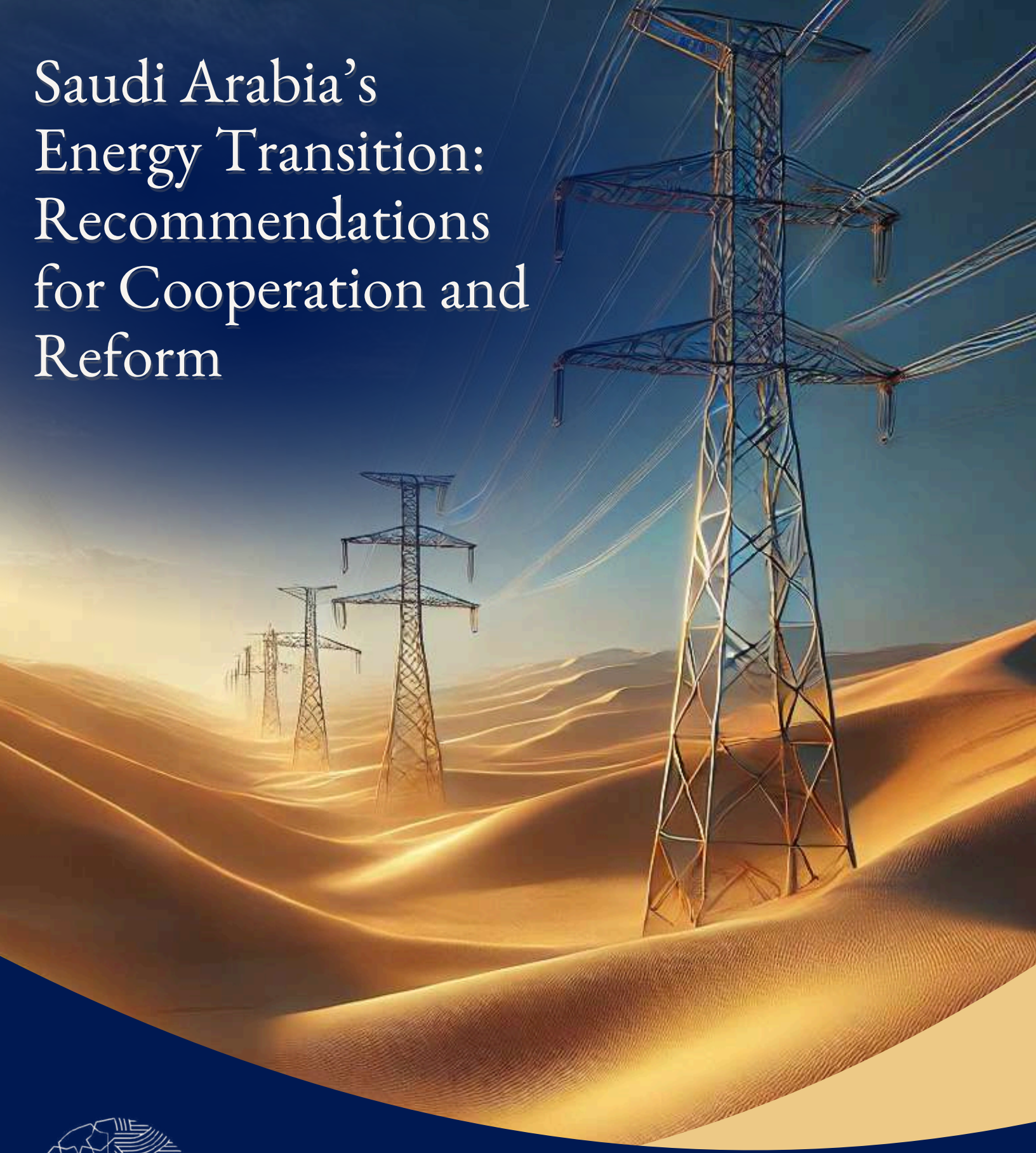
# Saudi Arabia's Energy Transition: Recommendations for Cooperation and Reform



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Andalus Committee
November 2024

# SAUDI ARABIA'S ENERGY TRANSITION: RECOMMENDATIONS FOR COOPERATION AND REFORM

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## Abstract

*Fossil fuel-dependent Middle Eastern producer economies face growing challenges as global energy dynamics shift. As the push for clean energy intensifies globally, these nations must navigate the complex transition towards economic diversification and major infrastructural adjustments. Saudi Arabia, the Middle East's largest oil producer, illustrates the dual pressures of maintaining fiscal stability while simultaneously mobilizing capital for renewable energy deployment. Despite ambitious targets to build out clean energy technology, barriers like market-distorting fossil fuel subsidies, fiscal dependency on fossil fuel revenues, and infrastructure deficits threaten progress. This article examines Saudi Arabia's domestic ambitions and challenges, as well as the potential for regional energy cooperation. It also offers policy recommendations, including a thorough review of subsidy structures, strategic use of freed-up capital for clean energy investments, and enhanced regional cooperation in transmission development. By balancing fiscal prudence with long-term energy agendas, Middle Eastern producer economies like Saudi Arabia can position themselves as leaders in the region's clean energy transition while mitigating their vulnerability to global energy market fluctuations.*


## Contextualization: A Regional Glance

Middle Eastern producer economies are defined as those for which fossil fuels make up a substantial portion of revenue and exports (Al-Saffar 2021). These states lead the globe in metric tons of crude oil production and thus critically depend on oil as a commodity (Figure 1.0). In the International Energy Agency's (IEA) New Policies Scenario, major Middle Eastern producer economies' mean yearly per-capita income from natural gas and oil rises significantly in the period between 2025-2040 (Figure 1.1)—when American tight oil production levels and "the world again becomes more reliant on the major conventional oil resource-holders to balance the market" (IEA 2018). However, the aforementioned years are also marked by unpredictable global oil demand, raising concerns about the long-term viability of Middle Eastern producers' economic models.

Although dwindling oil reserves in other regions could increase global reliance on Middle Eastern producers, many are initiating projects like Saudi Arabia's Vision 2030 to foster economic diversification in light of the "growing momentum behind energy transitions" (IEA 2018).

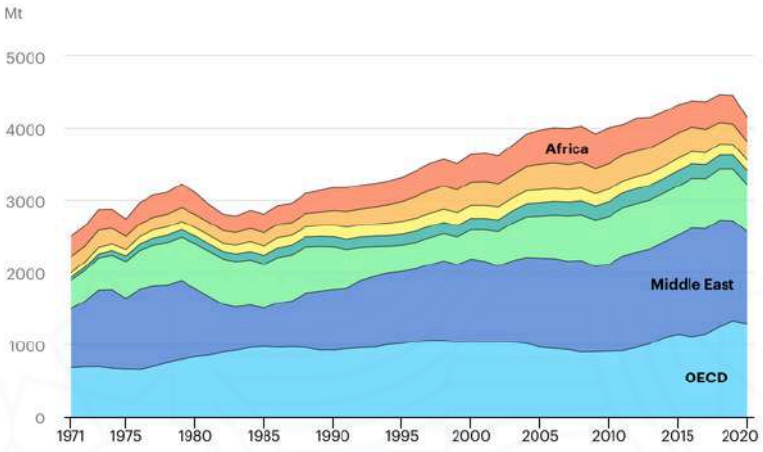


***Figure 1.0*** *World crude oil production by region (in metric tons), 1971-2020 (IEA, 2021).*

Saudi Arabia, for instance, has the most ambitious ramp-up plan for renewable energy buildout in the region: The Kingdom is set on increasing its renewable energy portfolio from 2% of the total energy mix to 50% by 2030. The United Arab Emirates (UAE) and Oman are equally ambitious, aiming to expand renewable energy generation to meet 32% and 20% of their energy mixes by 2030, respectively.

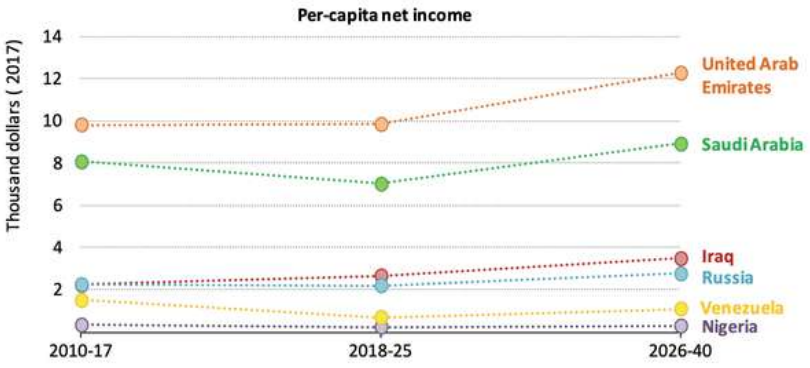


***Figure 1.1*** *Per-capita net income from oil and natural gas in the IEA New Policies Scenario (IEA, 2018).*

To reach these targets, Middle Eastern and North African (MENA) states, and wealthy producer economies in particular, will have to accelerate investment across renewable assets and transmission network expansion (for electricity imports and exports). If done with intentionality, transforming domestic energy systems could enhance regional energy cooperation, shrink gaps in energy access, and minimize fossil-fuel related fiscal constraints and environmental externalities. Nonetheless, there are a few key barriers to address first.

## Current Challenges: The Case of the Kingdom of Saudi Arabia

This section explores some key roadblocks to clean energy infrastructure development in MENA producer economies through an in-depth analysis of Saudi Arabia's case. In 2023, renewable energy accounted for only 1% of Saudi Arabia's total power generation. The IEA projects this share to reach 13% by 2030, undershooting its target by 13 gigawatts (GW). Saudi Arabia's renewables capacity is mainly driven by utility-scale solar PV construction, as seen in Figure 1.2.

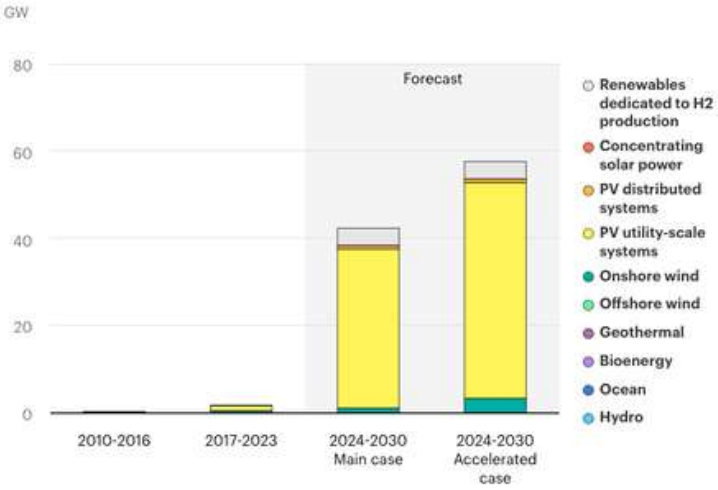


***Figure 1.2*** *"Capacity growth by generation technology, Saudi Arabia" (IEA).*

Saudi Arabia's main incentives to deploy renewable energy are to cut oil-powered electricity generation domestically—opening up petro-resources for trade—and to develop renewables export capacity to other MENA states. The primary drivers of renewable energy infrastructure development in the Kingdom are unsolicited bilateral contracts between Saudi's sovereign wealth fund and the government-owned utility.

Despite the Kingdom's apparent ambitions, there are several insidious barriers to renewable energy development which hinder the aforementioned goals. As an illustration, in 2012, Saudi Arabia's leaders shared a plan to roll out 41 GW of solar within the subsequent two decades. However, The mega-project relied heavily on state fiscal budgets, which were severely impacted by the 2014 global oil price plunge, leading to a decade-long delay. As such, MENA producer economies' clean energy plans cannot be viewed in isolation from their rentierest political-economic models; we must dissect their centralized fiscal structures to understand the impediments to decarbonization infrastructure targets.

One element of the MENA producer economy is the pervasiveness of market-distorting energy subsidies; explicit subsidies occur when fossil fuel products are sold below their supply costs, including production and distribution expenses. Implicit subsidies, on the other hand, result from underpricing the environmental costs of fossil fuels and the associated loss of tax revenue. International Monetary Fund (IMF) data suggest that the MENA region spent nearly 20% of its GDP on fossil fuel subsidies in 2022, falling only behind the Commonwealth of Independent States. Saudi Arabia is not alien to these structural challenges. As shown in Figure 1.3 (IMF data), the Kingdom spent over 20% of its GDP in 2024 on explicit and implicit subsidies for fossil fuels and electricity. Moreover, Saudi Arabia has among the highest explicit subsidy rates—around 8%—as a percentage of GDP among several MENA producer economies.

Consumer prices for all energy sources, including liquid fuels and electricity, remain below supply costs, underscoring the persistent fiscal burden of government subsidization; the gaps are even lower when considering the underpricing for externalities (i.e., climate change, air pollution, vehicle externalities, foregone revenue).

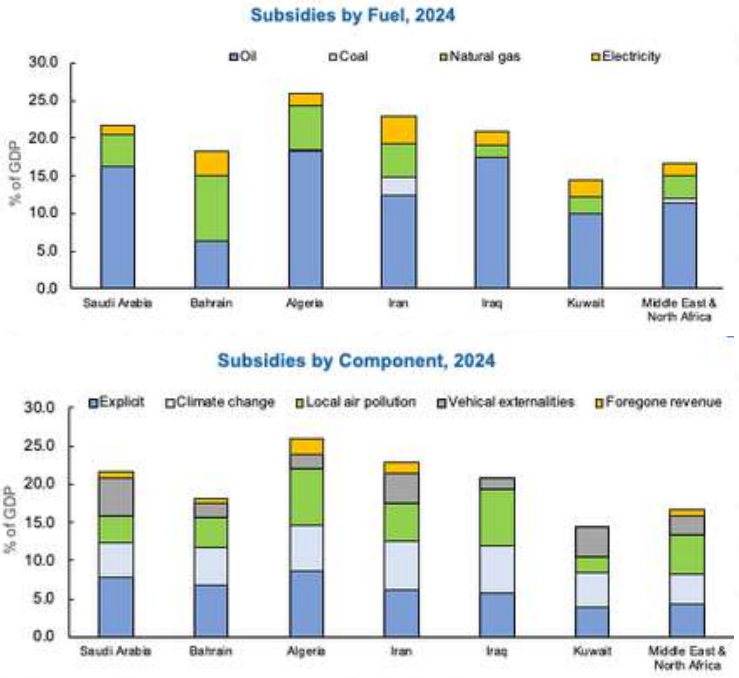


***Figure 1.3*** *Subsidies by fuel and component (selected MENA states), 2024 (IMF).*

Explicit fossil fuel subsidies in Saudi Arabia have been declining steadily since 2017 and have leveled out at around 8% of GDP (including 2025 projections), or around USD 66 billion , as shown in Figure 1.4.

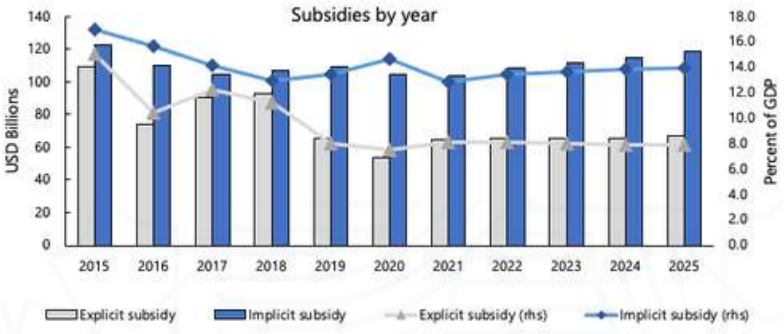


***Figure 1.4*** *Explicit and implicit fossil fuel subsidies in Saudi Arabia, 2015–2024 (IMF).*

In addition to acting as a drain on government budgets and a contributor to severe environmental externalities, fossil fuel subsidies exacerbate susceptibility to international fossil fuel price volatility and undermine competitive market incentives to direct capital towards clean energy technologies (see Coady et al., 2017; Clements et al., 2014). This is all the more concerning as Saudi Arabia's fiscal breakeven oil price (FBOP) reached $96.2 per barrel in 2024 (more than $20/barrel more than international prices), indicating the need for elevated oil prices to sustain fiscal expenditure domestically. For Saudi Arabia and MENA more broadly, fossil fuel subsidies continue to undermine fiscal stability, budget optimization, and accelerated state incentives for clean energy development.

## Cooperation Avenues

This section seeks to identify potential linkages between MENA states—connecting supply and demand to provide mutually beneficial solutions. As noted above, Saudi Arabia, along with other Gulf Cooperation Council (GCC) states, is interested in eventually exporting electricity from renewable power to its neighbors given that its current export-import ratio is zero on net. We also know that there is significant demand: Egypt, for instance, has recently struggled with natural gas and electricity deficits. Iraq, another potential market for Saudi Arabia, has seen a 362% rise in electricity imports between 2004–2022, making it the biggest electricity importer in the Middle East; these imports made up nearly 11% of the country's total electricity supply in 2022. Iraq purchases USD 4 billion worth of electricity and natural gas annually from Iran.

This dependence complicates its relationship with the U.S., as sanctions-avoidance waivers are required to bypass sanctions and settle debts with Iran. The waivers are conditioned on Iraq pursuing distancing measures from Iran's energy exports, such as advancing grid linkages with the GCC network (a long-delayed project). Thus, importing electricity from Saudi Arabia and the GCC could provide an opportunity for Iraq to remove itself from the financial and administrative burden of energy ties with Iran.

Saudi Arabia is currently pursuing two major bilateral interconnection projects with Egypt and Iraq, paving the way for stronger regional integration and futurenetwork linkages. In 2022, Saudi Arabia and Iraq signed an executive memorandum to construct a more than 300 kilometer-long, 400 kV line (1 GW) capacity) between the two states, targeting electricity needs in Iraq's Basra governorate. The Saudi Minister of Energy, Prince Saud bin Naif bin Abdulaziz, called this project an "integral component of the comprehensive Arab electrical interconnection project." Additionally, a Saudi-Egyptian interconnection project announced in 2022 aims to transfer 3 GW of electricity through a 1,350 km line and subsea cable by 2026. According to the IEA, this project will be "the first ever large-scale high-voltage direct current (HVDC) interconnection link in the Middle East and North Africa." The required capex for the transmission line is expected to be around USD 1.8 billion.

These infrastructure projects exemplify how energy diplomacy can address regional electricity deficits, foster integration, and reduce reliance on contentious energy partnerships. However, grid buildout will be incredibly capital-intensive, creating heightened fiscal pressure as states like Saudi Arabia balance massive expenditures, driven by decarbonization plans, and thus growing FBOPs. The following section considers how improving fiscal efficiency might offer financial synergies for grid integration projects.

## Recommendations

The following recommendations for Saudi Arabia summarize the key takeaways from the preceding economic analysis and can be applied (with caution) to other producer economies with decarbonization ambitions:

**1. Conduct an in-depth review of current explicit fossil fuel subsidies in the Kingdom.** Saudi Arabia could assess the gaps between consumer prices and supply costs for each fossil fuel product. Next, the Kingdom could consider whether subsidy removal would reduce its vulnerability to international fossil fuel price fluctuations amid shifting global supply and demand. Finally, Saudi leadership could consider the domestic consequences of subsidy removal. It is important to note that the analysis presented in this report only briefly addresses the immense domestic sensitivities associated with fossil fuel subsidy removal, for price distortions often underpin the very social contract in rentier states. The aforementioned steps could take the form of a formal Ministry of Energy review, or the Kingdom could hire an external consultancy.

**2. Consider the extent to which fiscal revenue from fossil fuel subsidy removal could free up capital for renewable energy investments.** As outlined in the report, explicit subsidies in Saudi Arabia currently amount to USD 66 billion, which is 91% of the Middle East's total clean energy capex between 2022–2024. Once the Kingdom identifies the optimal degree of subsidy reform, it could mobilize unlocked capital to scale up solar PV deployment.

**3. View domestic renewable energy electricity generation targets in the context of regional needs.** Saudi Arabia could align its zealous solar energy generation plans with grid network development. This export-oriented approach will generate additional revenue for Saudi Arabia and contribute to balancing the state's budget. The Kingdom could sign bilateral agreements, like its executive memorandum with Egypt, with its import-dependent neighbors to share the build-out capex for transmission infrastructure.

**4. Capitalize upon the opportunity to enhance regional diplomatic leadership and legitimacy.** Saudi Arabia's decarbonization plans are lauded internationally, but there are also concerns over the nation's sincerity as it simultaneously pursues expanded oil production. The Kingdom could strengthen its position as a regional broker in energy integration by, for instance, hosting a regional or GCC dialogue on mobilizing incumbent subsidies for the clean energy transition.

## Conclusion

*This report has painted a surface-level picture of a region at a crossroads. Many of its hydrocarbon producer economies are over-reliant on oil and gas exports for fiscal revenue, and in the case that fossil fuel prices decline with an accelerated global energy transition, continued hydrocarbon dependence could be catastrophic for these countries' economies and citizens. Evidently, tackling MENA's cross-cutting energy policy challenges requires prudence, multi-stakeholder engagement, and diplomatic cooperation, especially as the region confronts war on multiple fronts. As countries like Saudi Arabia navigate the implications of high FBOPs, major infrastructure investment campaigns, and a growing need for regional grid integration, we must urgently take a hard look at areas to improve efficiency. Fossil fuel subsidy removal in the Kingdom and elsewhere could unlock critical capital for renewable energy development and regional electric interconnection—without which the region risks fiscal stress and a sluggish transition.*

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