MANOHAR PARRIKAR INSTITUTE FOR DEFENCE STUDIES AND ANALYSES
मनोहर पर्रिकर रक्षा अध्ययन एवं विश्लेषण संस्थान

MP-IDSA
Issue Brief

India–Saudi Arabia: Evolving Cooperation on Renewable Energy

Warisha Wasi

March 03, 2026

Summary

Energy security is an important aspect of India–Saudi Arabia bilateral relations. Saudi Arabia is the third-largest source of crude oil and petroleum products imports into India. In recent years, the energy partnership has encompassed multi-dimensional cooperation on renewable energy.

Introduction

Energy security is an important aspect of India–Saudi Arabia bilateral relations. The Kingdom of Saudi Arabia is ranked the third-largest importer of crude oil and petroleum products into India, while India is Saudi Arabia's second-largest trading partner. However, in recent years, the India–Saudi Arabia energy partnership has been marked by a transformation from hydrocarbons trade to multi-dimensional cooperation on renewable energy. As carbon markets expand and climate consciousness gains global momentum, the evolving partnership between New Delhi and Riyadh in renewable energy has assumed heightened strategic importance.

Along with conventional energy trade, bilateral cooperation in the renewable energy sector encompasses investment flows and collaboration on technologies, infrastructure and research, aligning with the national energy strategic priorities and goals of both countries. The partnership through joint ventures and investments demonstrates strategic interdependence, as knowledge exchange and grid modernisation create a symbiotic ecosystem in which Saudi capital flows accelerate India's clean energy capacity expansion. Indian technical proficiency de-risks and optimises Saudi Arabia's renewable energy infrastructure buildout.

Both countries complement each other in terms of capabilities. With a rapidly growing energy market, India presents investment opportunities for Saudi Arabia to gain market access. Saudi Arabia gains leverage by investing in and collaborating with the Indian government and private companies across various platforms to diversify its economy and achieve market access objectives, thereby fulfilling clean energy goals. As India's share of global energy consumption is expected to double by 2035, it plays a significant role in the global energy transition.[1]

The convergence of national priorities and ambitious targets presents opportunities for both countries to cooperate for mutual benefit. Large-scale renewable projects and joint ventures have been launched under the Saudi Vision 2030. Similarly, India launched the National Green Hydrogen Mission in 2023 to assume leadership in production, usage and export of green hydrogen. A key objective is to achieve 5 MMT (million metric tonnes) of green hydrogen production by 2030.[2]

Saudi Arabia's Push for Renewable Energy

Saudi Arabia, responsible for approximately 12 per cent of global oil supply, is shifting towards sustainable energy resources. The Kingdom aims to generate 50 per

[1] **"Indias Energy Landscape"**, Press Information Bureau, Government of India, 22 June 2025.

[2] **"National Green Hydrogen Mission"**, Ministry of New and Renewable Energy, Government of India, 23 January 2023.

cent of its electricity from renewable sources by 2030.[3] Saudi Arabia has a target of producing 4 million tonnes of green hydrogen per year and aims to become a global leader in hydrogen supply by 2050.[4] Nevertheless, electricity generation currently depends primarily on fossil fuels, as indicated in Table 1.

Table 1. Saudi Arabia's Electricity Generation Mix (2023–2024)

Energy Source	Generation Share (%)	Installed Capacity (GW)	2030 Target Share (%)
Natural Gas	62%	~55	72% (planned increase)
Oil (Heavy Fuel Oil, Diesel)	38%	~35	<10% (displacement)
Solar PV	<1%	3.5	Target: 40 GW
Wind	<1%	0.4	Target: 16 GW
Other Renewables (CSP, Waste-to-Energy)	<1%	0.2	Target: 2.7 GW
Total Installed Capacity	**100%**	**~94 GW**	**Target: 150+ GW**

Sources: U.S. Energy Information Administration (EIA), Saudi Ministry of Energy, Power Library Analysis (2024).

In December 2025, Saudi Arabia sought to increase renewable energy capacity by connecting 12.3 Gigawatt (GW) of renewable energy to its national grid.[5] Saudi Arabia is investing actively in energy storage systems. For instance, the launch of the Bisha project in January 2025 has connected battery energy storage to the grid, expanding

[3] **"Saudi Arabia's Roadmap for Renewable Energy Transition by 2030"**, Saudi Arabia Energy, 10 September 2025.

[4] **"Fostering Effective Energy Transition 2023"**, World Economic Forum, 28 June 2023.

[5] Anna Vassileva, **"Saudi Arabia Reaches 12.3 GW of Renewables, 8 GWh of Energy Storage"**, *Renewables Now,* 16 December 2025.

Riyadh's renewable energy infrastructure. Saudi Arabia targets to bring 22 gigawatt-hours of energy storage projects by 2026.[6]

To diversify revenue streams, Riyadh considers green hydrogen and ammonia exports as potential sources of revenue alongside crude oil exports. The hydrogen demand is expected to increase, replacing up to 37 per cent of global oil production by 2050, contributing to decarbonisation efforts in electricity generation.[7] In furtherance of this, the NEOM Green Hydrogen Company (NGHC) project, to produce 600 tonnes of green hydrogen daily, exemplifies the adoption of carbon-free energy for renewable solutions. The project integrates 4 GW of solar and wind power to supply and produce green hydrogen.[8] These targeted efforts to invest and develop policies to drive economic transformation reflect the Kingdom's approach to position itself as a prominent global energy player.

India's Shift towards Renewable Energy

India's renewable energy strategy emphasises leveraging abundant solar irradiation, extensive coastline for offshore wind potential and improving technological capabilities to achieve cost-effective and competitive clean energy production. As the third-largest producer of solar power, India aims to achieve a target capacity of 500 GW of non-fossil-fuel electricity by 2030.[9] Additionally, India's energy consumption is expected to increase substantially, from 6.1 per cent to 9.8 per cent of global share, by 2050.[10] The rapid growth in domestic manufacturing of solar modules, solar PV cells and wafers reflects India's innovation-driven approach.[11]

With rapidly growing energy demand, the renewable energy capacity has also grown. The total capacity of non-fossil-fuel electricity reached 262.74 GW in November 2025. Aligning with the Prime Minister's vision defined at COP-26, India has achieved 51.5 per cent of the country's total installed electricity capacity from non-fossil fuel

[6] **"Saudi Arabia Ranks Among World's Top 10 Energy Storage Markets, Advancing Leadership in Renewable Energy"**, Ministry of Energy, Saudi Arabia, 13 December 2025.

[7] **"Building the Saudi Hydrogen Economy: Global Partnerships and Market Potential"**, Saudi Arabia Energy, Government of India, 11 September 2025.

[8] **"NEOM Green Hydrogen Company Completes Financial Close at a Total Investment Value of USD 8.4 Billion in the World's Largest Carbon-free Green Hydrogen Plant"**, NEOM, 22 May 2023.

[9] **"India has been Ranked Third Largest Primary Energy Consumer in the World"**, Ministry of Petroleum and Gas, Government of India, 24 March 2022.

[10] Ibid.

[11] **"The Solar Surge: India's Bold Leap Toward a Net Zero Future"**, Press Information Bureau, Government of India, 19 August 2025.

sources.[12] Despite progressive growth in renewable energy capacity, India's current energy mix remains dominated by thermal energy.

Table 2. India's Electricity Generation Mix and Installed Capacity (2024–25)

Energy Source	Installed Capacity (GW)	Share of Total Capacity (%)	Generation Share (%)	2030 Target (GW)
Coal	226.1	44.0%	73-75%	~230 (declining share)
Gas	24.8	4.8%	2-3%	~30
Oil/Diesel	0.5	0.1%	<0.5%	Minimal
Total Thermal	**251.4**	**48.9%**	**~75%**	**~260**
Large Hydro (>25 MW)	47.1	9.2%	10-12%	73
Nuclear	8.2	1.6%	3%	22.5
Solar Power	**135.8**	**26.4%**	**6-8%**	**280**
Wind Power	**54.0**	**10.5%**	**4-5%**	**140**
Small Hydro (<25 MW)	5.1	1.0%	<1%	10
Biomass/Biogas	11.3	2.2%	<2%	20
Waste-to-Energy	0.7	0.1%	<0.5%	5
Total Renewable (excl. Large Hydro)	**206.9**	**40.2%**	**12-15%**	**455**
Grand Total	**513.6**	**100%**	**100%**	**~810**

Sources: Ministry of Power, Ministry of New and Renewable Energy (MNRE), Central Electricity Authority, PIB Press Releases (December 2025.

[12] **"2025 Marks Highest-Ever Renewable Energy Expansion in India's Energy Transition Journey"**, Press Information Bureau, Ministry of New and Renewable Energy, Government of India, 29 December 2025.

As demonstrated in Table 2, the contribution of renewable energy installed capacity has been the highest ever, with solar power emerging as India's largest renewable energy source. Despite holding a 40.2 per cent share of installed capacity, renewables account for only 12–15 per cent of power generation. The gap between energy capacity and generation underscores the need for energy storage and grid modernisation to reflect the increased power generation capacity.

To meet the 2030 objective of achieving 500 GW of non-fossil fuel capacity, the Indian government has commissioned multiple large-scale renewable energy projects, such as the 2025 Kilokri BESS (Battery Energy Storage System) project. The system is expected to increase energy generation capacity with a 20-MW (40 MWh) BESS.[13] India's renewable energy potential exceeds 1,200 GW, providing opportunities to scale further towards achieving 500 GW targets by 2030.

Cooperation on Renewable Energy

India–Saudi Arabia cooperation on renewable energy has evolved through the establishment of formal collaboration mechanisms. The Delhi Declaration in 2006 laid the groundwork for an energy partnership between India and Saudi Arabia. Both sides agreed to establish a mutually beneficial energy partnership through joint ventures, cooperation on clean technologies and investments.[14] The bilateral ties were further strengthened through the 2010 Riyadh Declaration, with cooperation encompassing defence, security and the renewable energy sector.

Saudi Arabia's signing of the International Solar Alliance (ISA) in 2019 signalled Riyadh's interest in investing in renewable energy and paved the way for collaboration, with Riyadh's commitment to invest over US$ 100 billion across various sectors.[15] At the same time, cooperation in the energy sector was formalised through the establishment of the 2019 strategic partnership council (SPC) and strengthened by bilateral agreements, high-level exchanges and ministerial visits.

The signing of the Memorandum of Understanding (MoU) in September 2023 on energy cooperation marked a major landmark in this emerging partnership. The agreement aimed to co-produce green hydrogen, facilitate electricity exchange, and build a reliable supply chain for materials used in the renewable energy sector.[16] The

[13] **"South Asia's 'Largest' Battery Energy Storage System Inaugurated at Delhi's Kilokari"**, *The Economic Times*, 29 May 2025.

[14] **"Delhi Declaration"**, Embassy of India, Riyadh, Saudi Arabia, 27 January 2006.

[15] Rezaul H. Laskar**, "India, Saudi Arabia To Speed Up Kingdom's $100-Billion Investment Plan"**, *Hindustan Times*, 11 September 2023.

[16] **"India and Saudi Arabia Sign Agreement on Cooperation in Energy Sector"**, Press Information Bureau, Ministry of New and Renewable Energy, Government of India, 11 September 2023.

two-day state visit of Prime Minister Narendra Modi to Saudi Arabia in April 2025 redefined India's strategic priorities encompassing economic, energy and security aspects. During this visit, Prime Minister Modi and Crown Prince of Saudi Arabia Muhammad bin Salman co-chaired the second meeting of the Strategic Partnership Council (SPC). The major outcome was the signing of an agreement to establish two oil refineries in India. There were discussions on securing energy supplies by prioritising cooperation in clean energy and supply chain development.[17]

India–Saudi Arabia cooperation on solar energy possesses the potential to increase investment and collaboration opportunities. With over 40-fold increase in solar capacity in the last decade and 129.92 GW installed capacity by October 2025, India ranks third in solar energy production.[18] Solar is emerging as the fastest-growing contributor to renewable energy capacity portfolios of both India and Saudi Arabia. The High-Level Task Force was established in 2024 to strengthen economic partnership by facilitating bilateral investment flows.[19] Moving beyond traditional energy partnerships, both India and Saudi Arabia emphasise long-term collaboration on shared goals to shape the future energy landscape of both countries. Partnering with Haritika, an NGO, Aramco India (a wholly owned subsidiary of Saudi Aramco) facilitated the installation of solar-powered irrigation systems across 20 villages in Uttar Pradesh and Haryana.[20] This collaboration reflects a push towards a long-term growth strategy.

While the private sector is emerging as a major player in establishing strategic partnerships, public and semi-public organisations in both countries collaborate to form joint ventures for industrial localisation and domestic manufacturing. In 2023, to establish an Original Equipment Manufacturer (OEM) supply system for PV cell manufacturing, the Indian private company Goldi Solar entered into a partnership with the Saudi-based company Desert Technology.[21] The evolving partnership in the solar sector now encompasses technology collaboration and infrastructure development, with collaborative models and projects contributing to their long-term sustainable energy security goals.

Although wind energy collaboration between India and Saudi Arabia is at a nascent stage, it is emerging as a significant sector through equipment manufacturing, technology transfer and a strategic investment framework. With a substantial

[17] Kavitha, **"Saudi Arabia, India Strengthen Ties on Green Hydrogen, Oil Stability, and Climate Cooperation"**, *Solar Quarter*, 24 April 2025.

[18] **"India's Solar Momentum"**, Press Information Bureau, Government of India, 6 December 2025.

[19] **"India-Saudi Arabia: Economic and Commercial Brief"**, Embassy of India, Riyadh, Saudi Arabia, July 2025.

[20] **"Energising Community & Society"**, Aramco.

[21] **"Goldi Solar, Desert Technologies of Saudi Arabia Sign Pact to Explore Green Energy"**, *Energy World,* 12 September 2023.

increase in onshore wind deployment, India's wind energy capacity has reached 53.99 GW in November 2025.[22] There has been significant growth in the export of wind turbines, reflecting India's expanding capabilities in the wind equipment trade. Meanwhile, the Saudi Arabian wind energy sector aims to install 16 GW under the National Renewable Energy Program (NREP).[23]

Corporate investment is a crucial aspect of collaboration in the wind energy sector. Senvion India, owned by Saudi Arabia's Alfanar, plans to set up a new facility in Gujarat, which will become operational in March 2026.[24] The supply chain linkage will prove mutually beneficial for both countries. Moreover, the ongoing India–Saudi collaboration, aimed at increasing manufacturing capacity and enhancing technology, will improve India's wind energy ecosystem.

Table 3. Operational Joint Ventures and Investment Flows (Existing and Planned)

Company/ Entity (Origin)	Investment in Partner Country	Project/ Venture Type	Capacity /Scale	Investment Value	Status (Jan 2026)	Strategic Significance
ACWA Power (Saudi Arabia)	India - Various States	Potential solar park JVs with NTPC	5-10 GW (target)	$4-6 billion (estimated)	MoU signed Oct 2025; Project identification ongoing	Largest Saudi renewable energy developer entering the Indian market; Could become anchor investor
Saudi Electricity Company (Saudi Arabia)	India - Pan-India	Strategic partnership with NTPC for renewable energy, O&M, and modernisation	Framework agreement	TBD (project-specific)	MoU signed Oct 2025; Joint venture structuring phase	Institutionalises Saudi-Indian power sector cooperation; Enables technology transfer

[22] **"2025 Marks Highest-Ever Renewable Energy Expansion in India's Energy Transition Journey"**, Press Information Bureau, Ministry of New and Renewable Energy, Government of India, 29 December 2025.

[23] **"Saudi Arabia Reaches Financial Close on 15 GW of Wind and Solar Projects"**, *Enerdata*, 3 December 2025.

[24] G. Balachandar, **"Senvion India Ramps Up Capacity, Eyes 20per cent-25per cent Share"**, *The Times of India*, 30 October 2025.

Alfanar (Saudi Arabia)	India - Multiple States	Existing wind and solar investments	~500-800 MW (estimated cumulative)	$400-600 million	Operational projects; Expansion under consideration	Pioneer Saudi investor in Indian renewables; Track record demonstrates viability
Aljomaih Energy & Water (Saudi Arabia)	India - Potential Future	Exploring renewable energy projects	TBD	TBD	Exploratory discussions	Experience with Total Energies' partnership in Saudi Arabia is transferable to India.
Public Investment Fund (PIF) (Saudi Arabia)	India - Infrastructure/Manufacturing	Potential investments in solar manufacturing under the PLI scheme	5-10 GW manufacturing capacity	$1-2 billion	Under negotiation; Part of broader $100B Saudi investment commitment to India	Strategic positioning in the Indian supply chain reduces dependence on Chinese imports.
ACME Solar Holdings (India)	Oman - Duqm SEZ (GCC region, relevant for India-Saudi cooperation framework)	Green hydrogen and ammonia production facility	2,200 MT/day green ammonia (0.9 MMT hydrogen /year)	$2.5 billion	Under construction; $488M financing secured; First production expected 2026-27	Demonstrates Indian capabilities in mega-hydrogen projects; creates a precedent for Gulf-India ammonia trade.
Indian Oil Corporation (India)	Saudi Arabia - Potential	Exploration of joint hydrogen/ammonia off-take agreements	0.5-1 MMT annually (potential)	Long-term contracts (pricing TBD)	Early-stage discussions following the Sep 2023 energy MoU	Creates bankable demand for Saudi green hydrogen; Reduces India's grey hydrogen imports
Reliance Industries (India)	Saudi Arabia - Manufacturing	Potential electrolyser manufacturing facility	500-1,000 MW annually	$200-400 million	Concept stage; Reliance is	Position Indian manufacturing in the

		supply for Saudi projects		(estimated)	developing electrolyser capabilities under NGHM	Gulf market; Revenue opportunity for PLI beneficiaries
Larsen & Toubro (L&T) (India)	Saudi Arabia - Jubail	Carbon capture and storage project for Saudi Aramco	9 million tonnes CO2 annually (CCUS capacity)	$1.5 billion (EPC contract)	Awarded Feb 2025; Under execution	Demonstrates Indian EPC capabilities in Saudi energy transition; Relevant for blue hydrogen cooperation.
Tata Power (India)	Saudi Arabia - Potential	Discussions on O&M services for renewable projects	Various scales	Service contracts	Exploratory; TPREL (Tata Power Renewable Energy) international expansion strategy	Indian operational expertise supporting Saudi asset base; Knowledge transfer

Sources: Company press releases, bilateral government announcements, Mercom India, GCC Business Watch, PIB Press Releases.

Ammonia is expected to play a critical role in decarbonising fertiliser production, shipping and industrial processes. Saudi Arabia is the second-largest supplier of ammonia to India.[25] For India, it enhances energy security while supporting emission reduction targets; for Saudi Arabia, it creates opportunities to leverage its resource base and emerging renewable capacity to become a global exporter of clean fuels.

Institutional integration is considered a significant driver in fostering collaboration across multiple sectors. The Saudi Electricity Company signed an MoU with India's National Thermal Power Corporation Limited (NTPC) in September 2025 to collaborate on power plant operation. The establishment of a joint venture company in the Middle East to provide power plant services in the region is being considered

[25] **"Ammonia in Saudi Arabia"**, Observatory of Economic Complexity, 2024.

as a milestone in energy cooperation.[26] With avenues for long-term investment returns, the strategic logic for cooperation extends beyond renewable energy security considerations. In 2020, the Public Investment Fund (PIF) acquired a 2.32 per cent equity stake in Jio Platforms to gain technological and economic leverage by investing in the Indian digital economy.[27]

As Saudi Arabia is emerging as India's top Gulf strategic partner, the launch of the India–Middle East–Europe Economic Corridor (IMEC) in 2023 presents a comprehensive connectivity trade route linking India, the Gulf and Europe. The proposed initiative is expected to redefine trade mechanisms to foster global connectivity by building a secure trade route.[28] Aimed at promoting green energy and sustainable infrastructure projects, including the proposal for HVDC (High Voltage Direct Current), IMEC can facilitate India to gain access to renewable energy from the Gulf region at lower logistics costs and reduced transportation time. During his recent visit to India in August 2025, the top Italian diplomat, Francesco Talo, emphasised India's significant role in the IMEC project as a 'protagonist' in the transfer of goods, energy and data.[29]

Challenges

Despite its potential, the India–Saudi renewable energy partnership faces several critical impediments. Cooperation in bilateral clean energy projects is emerging from policy-level dialogue, but the implementation gaps pose limitations. Despite having institutional mechanisms, technical barriers remain paramount in the development of these projects. Both nations require massive investments in BESS and HVDC transmission networks to manage intermittent renewable supply.

Financial constraints pose significant scaling challenges. While Saudi Arabia's Public Investment Fund allocated over US$ 9 billion to clean energy initiatives in 2024,[30] India's 500 GW target by 2030 demands investments exceeding US$ 250 billion.[31] Harmonising regulatory frameworks, streamlining approval processes, and creating bankable project structures beyond government commitments remain unresolved.

---

[26] **"Saudi Electricity Company, India's NTPC Sign Strategic Partnership MoU to Enhance Cooperation"**, *Saudi Press Energy,* 27 March 2025.

[27] **"PIF Invests Approximately $1.5 Billion in India's Jio Platforms"**, Public Investment Fund, 18 June 2020.

[28] **India-Middle East-Europe Economic Corridor (IMEC)**.

[29] **"India is Certainly Crucial in IMEC Project: Italy's Envoy Francesco Talo'"**, *The Economic Times*, 10 August 2025.

[30] **"Allocation and Impact Report"**, Public Investment Fund, October 2025.

[31] **"India Needs $225-250 Billion Investment to Meet its 2030 Renewable Energy Target: Moody's"**, *The Economic Times*, 13 June 2022.

Geopolitical uncertainties threaten IMEC, which is central to renewable connectivity. Regional instability in the Red Sea and Gulf region could disrupt supply chains and delay critical infrastructure projects. The corridor's security architecture requires multilateral coordination mechanisms extending beyond bilateral cooperation.

Supply chain vulnerabilities create strategic dependencies. India's solar manufacturing remains reliant on Chinese polysilicon and wafer imports despite Production-Linked Incentive schemes, while Saudi Arabia's green hydrogen ambitions depend on imported electrolyser technology. Technological gaps in seawater electrolysis, high-temperature solar efficiency, and offshore wind technology demand sustained collaboration and standardised protocols.

Conclusion

The India–Saudi renewable energy partnership represents a shift from transactional hydrocarbon dependency to a multi-dimensional strategic alliance. As global energy architecture undergoes a profound transformation, this partnership positions both nations as architects of the post-carbon order. The collaboration's maturation from aspirational frameworks to executable projects signals a new era in bilateral cooperation between the two countries.

About the Author

Ms. Warisha Wasi is Research Intern at the Manohar Parrikar Institute for Defence Studies and Analyses, New Delhi.

Manohar Parrikar Institute for Defence Studies and Analyses is a non-partisan, autonomous body dedicated to objective research and policy relevant studies on all aspects of defence and security. Its mission is to promote national and international security through the generation and dissemination of knowledge on defence and security-related issues.

Manohar Parrikar Institute for Defence Studies and Analyses
1, Development Enclave, Rao Tula Ram Marg
New Delhi 110 010 India
T +91-11-2671 7983 F +91-11-2615 4191
www.idsa.in
Twitter @IDSAIndia
www.facebook.com/ManoharParrikarInstituteforDefenceStudiesAnalyses