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Solar photovoltaics manufacturing attraction in the Middle East

Introduction

Global energy consumption is on the rise, with all main energy sources expected to increase between now and 2045, except for coal, which most countries are actively phasing out (Figure 1)[1]. Even if still a relatively small portion of the global energy mix, renewable sources are expected to have the highest year on year growth, with an expected 7.6% compound annual growth rate (CAGR) increase between 2022 and 2045, of which **solar is a key contributor**[1].

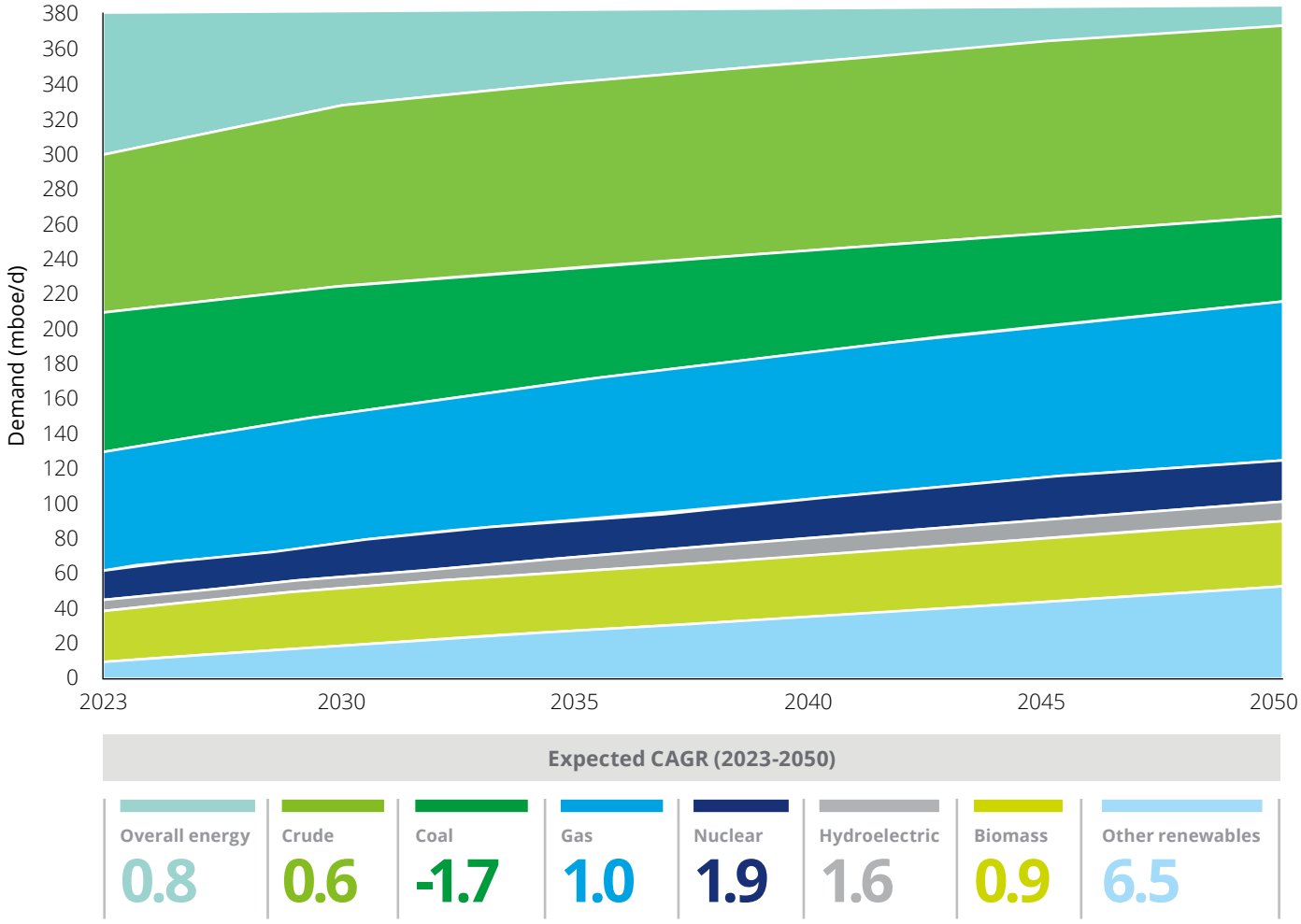


Figure 1: Global energy demand by source projected through 2023 to 2050, Source: OPEC[1]

At the same time, governments have become more sensitive to climate change and its effects and as such, have introduced ambitious decarbonization targets. In the Middle East, several countries have announced net zero targets, which work towards making international commitments on decarbonization but at the same time, align those commitments in a manner which benefits economic growth and national development.

Whilst other countries have started scaling back on their net zero ambitions, several Middle Eastern nations with the UAE are leading the way (see Figure 2), are making bold moves across the renewable energy space to transition away from fossil fuels and diversify economies further. The Middle East is aiming to shift the narrative on its overreliance on fossil fuels and become one of the pioneering forces of solar energy revolution, as both a consumer of solar energy but also a manufacturer of solar technologies.

Country	Net zero target	Renewable energy targets	Emission reduction target	National climate strategy	Other climate initiatives/ Governance entities
Bahrain	Yes, by 2060	5% by 2025 10% by 2035	N/A	No	• Joint National Committee on climate change (2007)
Kuwait	Yes, by 2060	15% by 2030	N/A	No	• Kuwait National Committee on climate change
Oman	Yes, by 2050	10% by 2025 30% by 2030	Reduce greenhouse gas emissions (GHG) by 7% relative to a business-as-usual (BAU) scenario by 2030	• National Strategy for Adaptation and Mitigation to Climate Change (before 2020-2040) • National Carbon Neutral Strategy	• Regulations for the management of climate affairs (2016) • National Climate Strategy • Oman Sustainability Centre
Qatar	No	20% by 2030	Reduce 25% of GHG emissions by the year 2030	Yes	• National Climate Change Committee (Chaired by the Ministry of Environment)
Saudi Arabia	Yes, by 2060	50% by 2030	Reduce, avoid and remove GHG emissions by 278 million tons of carbon dioxide equivalent (MtCO2e) annually by 2030	Yes (National Circular Carbon Economy Program)	• National Committee for the Clean Development Mechanism/Designated National Authority (2009) • Saudi Green Building Forum (2010) • Saudi Energy Efficiency Centre (2012) • PIF Regional Voluntary Carbon Market Company
UAE	Yes, by 2050	Clean energy 50% (44% RE, 6% Nuclear) by 2050	31% reduction compared to the business-as-usual scenario for the year 2030	Yes (2017: Green Growth Strategy/ UAE Green Agenda 2015-2030)	• Dubai Integrated Energy Strategy 2030 • Abu Dhabi Carbon trading exchange and carbon cleaning

Figure 2: Middle East net zero targets, Source: Middle East Institute

The UAE was the first country in the Middle East and North Africa (MENA) to announce a net zero target of 2050[2]. The UAE's strategy includes reducing carbon dioxide emissions in the industrial sector by 2.9 gigatons by 2050 whilst creating an anticipated 200,000 jobs across key sectors including solar, battery and hydrogen sub-sectors[3]. In January 2024, the UAE submitted its first long-term strategy (LTS) to the UNFCCC, which includes the net zero target. Saudi Arabia and other GCC countries have committed to achieving net zero emissions by 2060[4].

There are several pathways being actively considered to meet Paris commitments: 1) electrification, 2) developing sustainable fuels, 3) carbon capture and storage – see Figure 3. Of these, Middle Eastern players are active across all three. Examples include ADNOC, which electrified their offshore operations using clean onshore energy to reduce its reliance on oil and gas to power offshore operations and methane flaring. Another example is the Dubai Electricity and Water Authority (DEWA), pushing to develop solar generation capacity in the emirate of Dubai to power energy hungry data centers needed to run artificial intelligence algorithms[5] but also a wider push on installing solar generating capacity as a stepping stone to establishing the initial value chain required to produce other green energy sources (e.g. hydrogen).

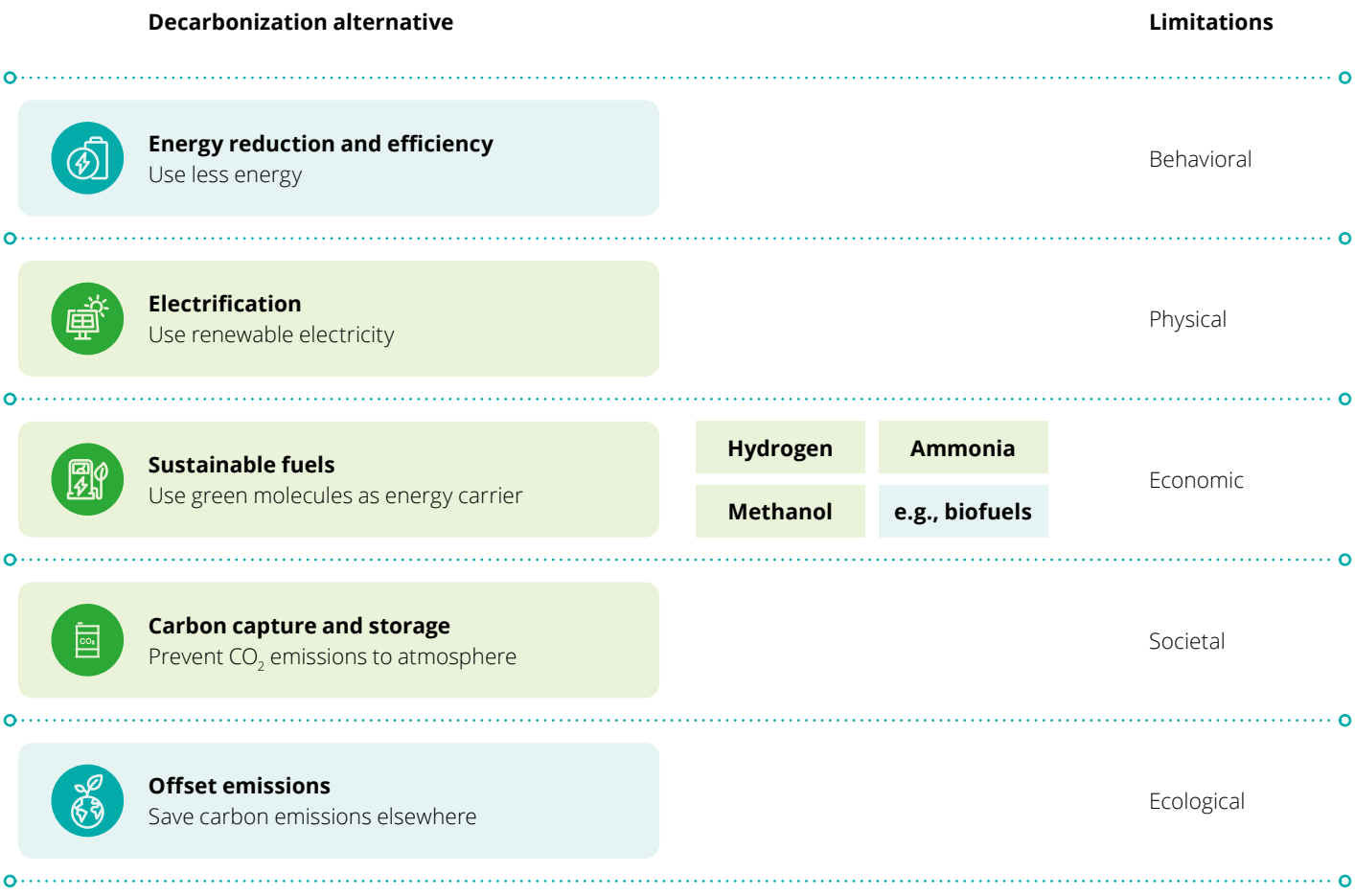


Figure 3: Pathways to meet Paris Agreement commitments. Source: Deloitte

The UAE has unveiled an ambitious initiative to establish the 'Global Energy Efficiency Alliance' during COP29, hosted in Azerbaijan[6]. This move aims to double global energy efficiency rates by 2030 with the potential to significantly curb emissions.

The key objectives of this alliance are a global knowledge exchange to establish a platform for sharing best practices, capacity building, public-private partnerships, standards, and certifications to harmonize global energy emissions and promote sustainable growth[6].

Overview of the global solar market

Solar power, as an energy source, has experienced significant growth to become a dominant source of electricity generation worldwide outside of traditional fossil fuel sources. Currently, there are 2,005 GW of solar generation capacity installed globally at the end of 2024[7]. Solar capacity installations in 2024 were estimated to be 593 GW, a growth of 71% relative to 2023. With over 50% of the global power generating capacity additions contributed by solar power plants between 2020-23, solar power has become the dominant source of new electricity generation. Further, the pace of capacity addition is increasing rapidly, and this capacity is set to grow to nearly 4,000 GW by 2028.

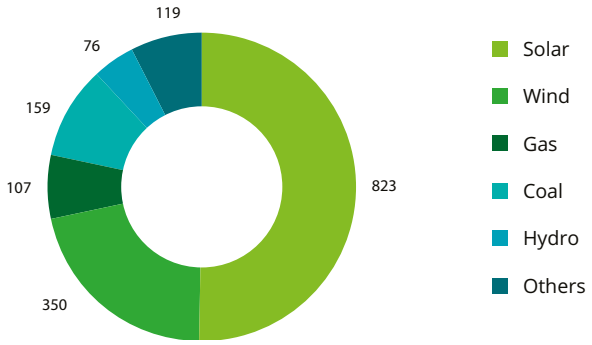


Figure 4: Global power generation capacity additions (2020-2023), Source: Deloitte analysis

The observed growth in solar generation capacity was primarily driven by China, which has seen a 36% CAGR from 2018-2024 in installed solar power generation capacity additions, eclipsing all other regions (Figure 5).

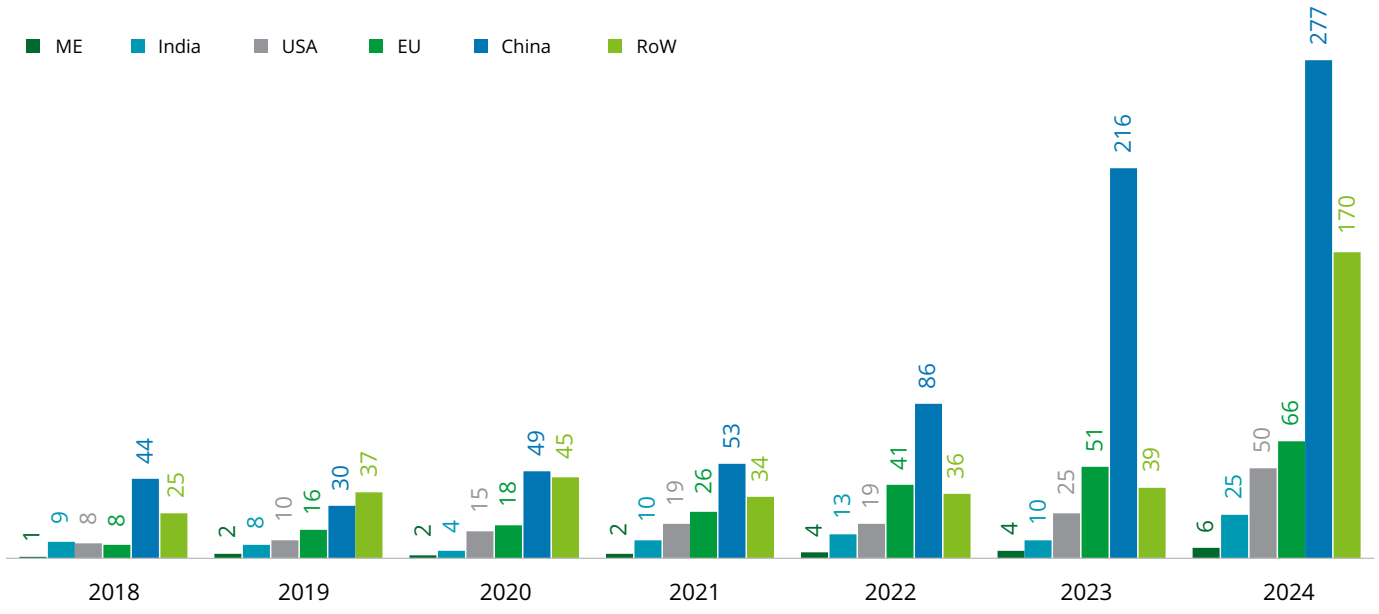


Figure 5: Solar power generation capacity additions, source: Deloitte analysis

Total Solar power installed capacity as of December 2024 (GW)

ME	India	USA	EU	China	RoW
23.0	97.3	187.7	319.7	886.6	490.8

China has led the way in terms of solar capacity additions and is also a leader in solar module manufacturing. Almost all (>80%) of solar module manufacturing globally is in China[8]. In parallel, global solar photovoltaics (PV) manufacturing capacity has increasingly moved from Europe, Japan, and the United States to China over the last decade.

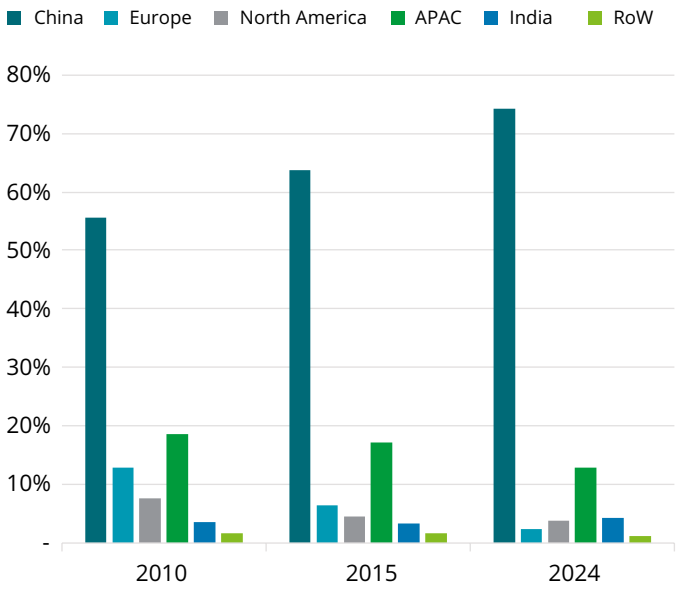


Figure 6: Solar PV module manufacturing capacity, source: Deloitte analysis

China's solar PV exports have grown at a CAGR of ~39% from 2021-24 with Europe consistently receiving over 40% of these exports annually. Over the past four years, exports to the Asia-Pacific (APAC) and Middle East regions have also increased. However, since the imposition of tariffs on imports from China in the US from 2012, there has been a decline from over 50% share in 2011 to nearly zero direct exports in 2024. Chinese manufacturers have been establishing bases in several other Southeast Asian counties like Vietnam, Taiwan etc. and partnering up with manufacturers in other countries to tackle the impact of tariffs introduced.

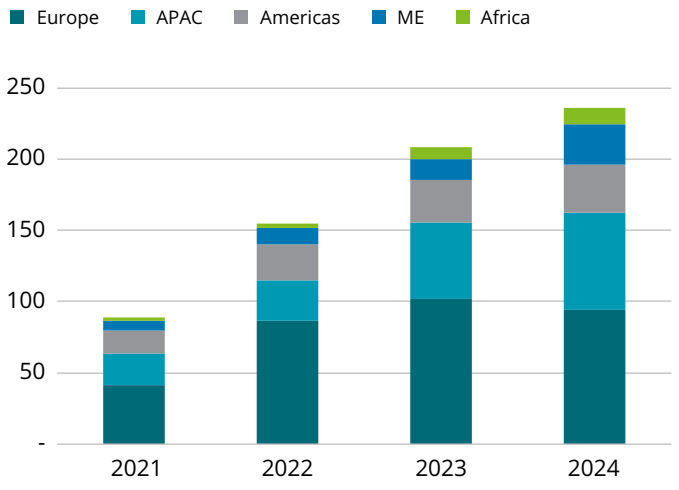


Figure 7: China solar PV exports, source: Deloitte analysis

Since 2008, China has developed policies and provided several incentives like innovation funds, exemption on land fee and electricity bills, loans at lower interest rate and several tax credits/ grants to promote domestic manufacturing, to trigger a domestic demand and internal market. In 2021, China installed 53 GW solar capacity (40% of the global total)[9] and in 2024 China ramped it up to 277 GW (47% of the global additions)[10]. This significant domestic demand supported domestic manufacturers to set up large capacities and insulated them from fluctuations in global demand and supply chain impacts. With this unprecedented pace of additions, China is expected to reach its national 2030 target for wind and solar PV installations in 2025, five years ahead of schedule.

Solar PV capacity additions in the US and EU have also risen in 2024, with the US adding over 50 GW, and EU crossed 66 GW[11]. A large part of this capacity addition was decentralized solar capacity additions at various commercial, industrial, and residential set ups. While the capacity addition in the US and EU increased, their import dependence rose drastically as well. Most of the solar PV modules were imported from Southeast Asian countries including India, South Korea, and China (in the case of the European Union).

China, being the world's largest supplier over the last decade raised eyebrows particularly in the western world. This resulted in the USA levying duties and tariffs on Chinese imports[12] e.g. Tariffs under Section 301 of the trade act imposing tariffs of 25% on solar cell and its components in 2018, and further increased to 50% in 2024. Most geographies today have come up with initiatives such as the Inflation Reduction Act (IRA in the USA), Net Zero Industry Act (NZIA) in the EU and Production Led Incentives (PLI) in India to counteract such global dominance in a key manufacturing sector.

Initiatives such as the IRA (USA), NZIA (EU), PLI (India), etc. indicate that developing a local equipment manufacturing capability is an important part of larger decarbonization goals of major economies of the world[13].

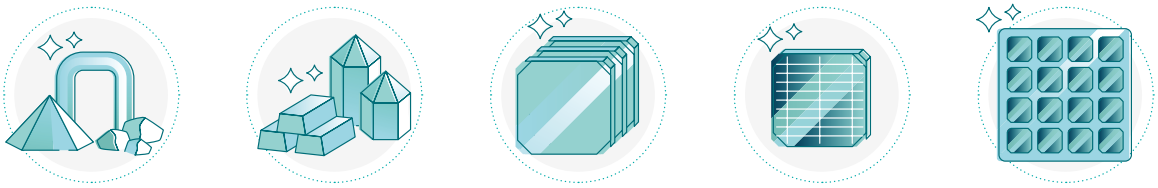
Key policy initiatives:

Country	Policy/ Guidance	Nationally determined contributions	Measures to promote local equipment manufacturing
China	14th five-year plan	• Peak carbon emission by 2030 and carbon neutrality by 2060. • Non-fossil fuel to account for 20% of primary energy consumption during 2025-2030.	• China is currently the largest manufacturer of Solar PV equipment in the world. • Its success is attributable to government subsidies, low-cost finance, availability of labor and favorable policy framework.
US	Solar Energy Industries Association (SEIA)	• 50-52% GHG reduction by 2030, net zero emissions (NZE) economy-wide by no later than 2050. • Solar to reach 30% of US electricity generation by 2030, translating into 125 GW annual installation.	• IRA implemented for production tax credits for the manufacturing of components across solar PV, wind and battery supply chains through to 2032.
Europe	European commission	• **REPowerEU:** Reduce dependence on Russian fossil fuels and fast forward the green transition; double solar capacity by 2025 and install 600 GW by 2030. • **Germany:** Clean energy making up 80% of its power mix by 2030 from 40.9% in 2022. • **Portugal:** 80% clean energy in electricity production by 2026 from 60% in 2022. • **France:** Increase renewable power installed capacity by ten times by 2050, up to 100 GW; solar power installation of 20 GW by 2023 and 31-44 GW by 2028. • **Netherlands:** Solar capacity to reach 27 GW in 2030. • **Spain:** 39 GW of solar installed in 2030. • **Italy:** 50 GW solar target in 2030, 70% renewables in electricity mix by 2030.	• NZIA adopted in the EU. • NZIA aims to boost investment in clean energy technologies by simplifying permitting procedures, enhancing the skills of the European workforce, and creating favorable frameworks to boost innovation. • The NZIA is part of the broader Green Deal Industrial Plan which aims to improve regulation, access to funding, skills building, and establish trade partnerships to boost net zero industry in the EU.
India	Ministry of New and Renewable Energy	• 500 GW of renewable energy installed capacity to be achieved by 2030, translating into ~300 GW solar. • Net zero by 2070.	• India is providing subsidies through its Production Linked Incentives scheme. • Capacities for Solar PV manufacturing, Advance Battery and cell manufacturing, and electrolyzer manufacturing have already been awarded.
Japan	Ministry of Economy, Trade and Industry	• 46% GHG reduction by 2030. • 36-38% RE mix goal in 2030 with solar accounting for 15%.	• Japan supports investments in manufacturing capacity development globally in partnership with Japanese companies and provides low-cost finance.

Concentration of solar PV manufacturing

China dominates the global production landscape across all stages of the solar PV manufacturing value chain. Other than China, there are manufacturing capacities elsewhere in the Asia Pacific region and India, but at a much smaller scale[14]. The solar PV modules manufacturing process is depicted in Figure 8.

Solar module manufacturing process can be broadly divided into 5 separate stages. Each stage consists of unique industrial processes. The initial stages require high CAPEX investment.



	Polysilicon	Ingot	Wafer	Cell	Panel/Module
Process	Solar grade polysilicon is produced by purifying silicon into trichlorosilane, then heating it to deposit pure silicon onto a seed crystal, forming a U-shaped rod.	Polysilicon is melted in a crucible, then a single crystal silicon seed is slowly pulled up, solidifying the molten silicon around it to form a single crystal ingot.	A wire saw is used to cut thin slices of ingots into silicon wafers. Weak acid is used to clean the wafers. A rough texture is given to wafers to increase their efficiency.	Wafers are treated with an electrically active dopant gas to create layers. Screen printing of silver metallization for electrical contacts is done.	Cells are arranged in a specific pattern, soldered together, and packed within EVA to protect them from environmental factors.
Typical CAPEX	**USD 250-350m per GW**			**USD 50-60m per GW**	**USD 20-30m per GW**
Technology risk	**Low** due to homogeneity of product and process			**High** as technologies (cell sizes, P/N type technology, Mono/bi-faciality, etc.) have evolved	
Competitive intensity	**Low**; Very few companies are involved in the polysilicon to wafer production due to high CAPEX requirements			**High**; Low entry barrier due to lower CAPEX requirements	
Key players	Daqo, Tongwei, GCL Tech, Xinte, OCI, East Hope, Wacker		Tongwei, Aiko Solar, Risen, JA Solar, GCL Tech, Longi, Zhonghuan, Jinko	Jinko, Canadian Solar, Q-Cells, ReneSola, JA Solar, Trina, Longi, Risen	

Most complex — **Complex** — **Fairly complex** — **Assembly operations**

Figure 8: Solar PV module manufacturing process

Macroeconomic and geopolitical trends shaping the MENA energy and water landscape are creating several ways to pay for traditional utility players

Silicon to polysilicon requires fusing sand at 1,900 degree temperatures and is an extremely complex carbon intensive process where China leads 90% + global manufacturing. China has vertically integrated manufacturing units where ingots, cells and modules are manufactured under one roof to reduce wastages and improve production efficiencies and get advantages of scale (Figure 9), leading to an extremely high concentration of global supply out of China.

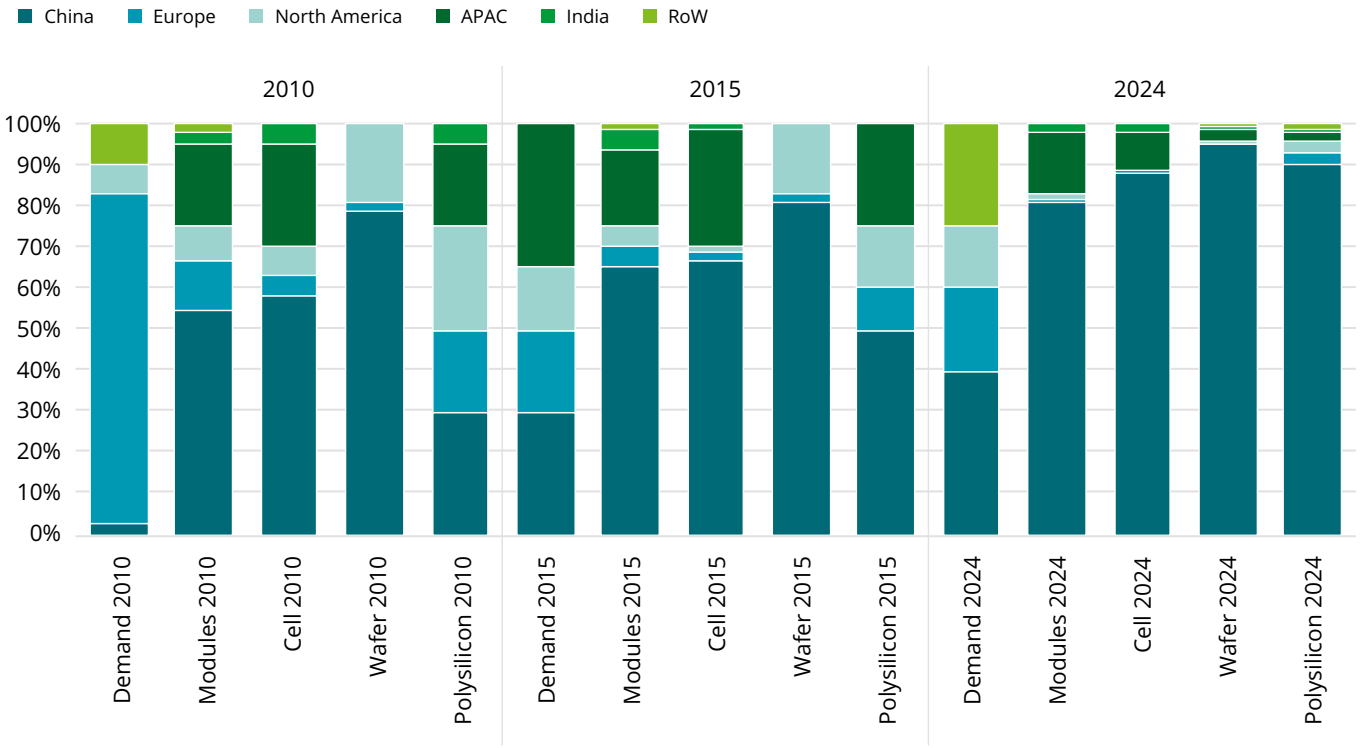


Figure 9: Vertical integration across solar PV manufacturing value chain, source: Deloitte analysis

While the global manufacturing is situated in China, the demand is spread out across various geographies with over 50% of global demand originating from outside of China (Figure 10).

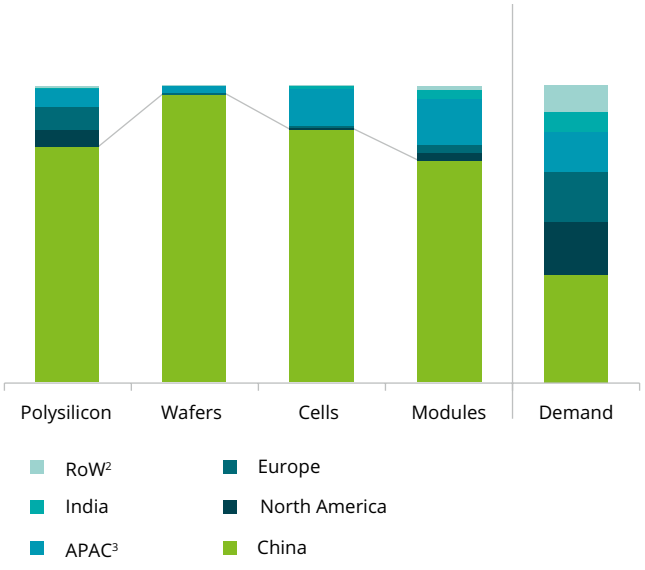


Figure 10: Global demand/supply balances, source: Deloitte analysis

This skewed demand supply balance created significant headwinds during COVID-19. The over-dependence on China shook the world resulting in supply chain bottlenecks, commodity prices rising and pushing overall installations to be at an all-time low. According to the International Energy Agency (IEA), the value of China's solar PV exports in 2021 was over USD 30 billion, almost 7% of China's trade surplus over the last five years. In addition, Chinese investments in Malaysia and Vietnam also turned these countries into major exporters of PV products, accounting for around 10% and 5% respectively of their trade surpluses since 2017. The total value of global PV-related trade – including polysilicon, wafers, cells and modules – exceeded USD 40 billion in 2021, an increase of over 70% from 2020.

Looking at the above and the challenges faced during the COVID-19 pandemic, Western countries (mainly the US and EU) over the course of time have imposed several tariffs and duties on Chinese imports to reduce trade flows from China and spur domestic manufacturing and job creation, but China still holds majority share in the solar PV components manufacturing globally.

2024-25

Demand-supply gap amid trade barriers
Despite efforts to mitigate the impact of trade barriers, such measures have resulted in a significant demand-supply gap within the solar industry, further expected to rise with US doubling tariffs up to 50% on Solar PV components.

2023-24

Moratorium Ends and higher duties levied
The moratorium on import duties from Southeast Asia ended in June 2024, leading to changes in sourcing strategies and market dynamics as import costs rose again.

2021-22

US domestic manufacturing incentives
Inflation Reduction Act (IRA) was implemented to bolster domestic manufacturing in the US solar industry, aiming to reduce reliance on imports and stimulate domestic production capacity.

2020-21

US Moratorium on SEA Module Duties
To encourage sourcing from Southeast Asia, the US implemented a two-year moratorium on import duties specifically targeting modules from these countries, providing temporary relief for importers and encouraging trade diversification.

2018-19

Investigation of Chinese Players in SEA
Concerns arose about Chinese companies potentially circumventing trade barriers by relocating production facilities or establishing partnerships in Southeast Asian countries to maintain access to the US market.

2012-17

Rise in SEA Imports to US
Following the imposition of trade barriers on Chinese imports, there was a notable increase in imports from Southeast Asian countries such as Cambodia, Vietnam, Malaysia, and Thailand, as US buyers sought alternative sources for their solar module needs.

2012

Chinese module tariffs imposed
Anti-dumping duties (ADD) and countervailing duties (CVD) were imposed on certain Chinese-made modules, alleging unfair pricing practices and government subsidies, making them less competitive in the US market.

Figure 11: Timeline: Global solar PV trade barriers, Source: Deloitte analysis

Except for trade flow challenges, the other reason for the world to look more internally was the number of jobs lost due to an over-reliance on imports. As per IEA, most of the employment generated in the solar industry benefits China over other countries.

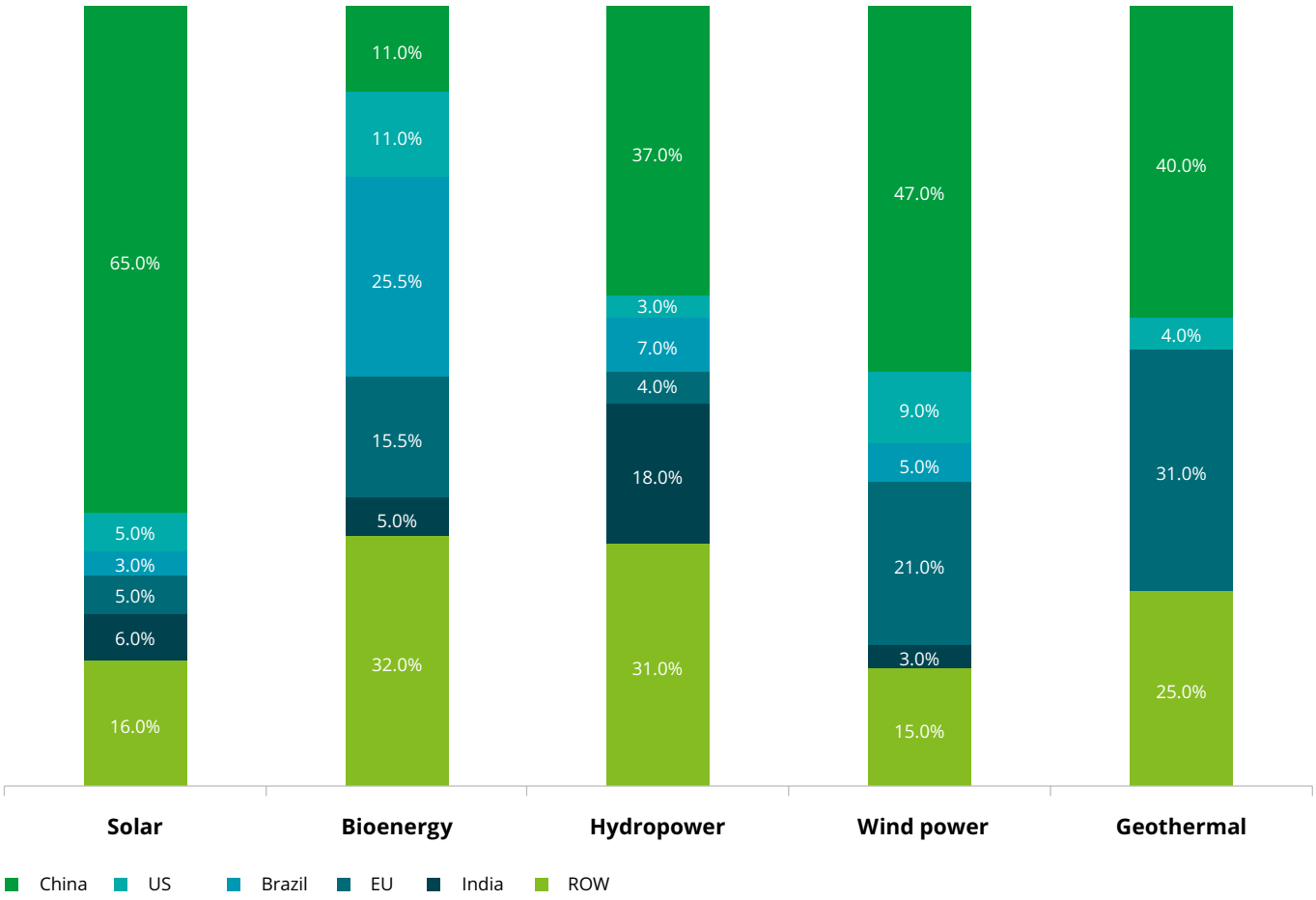


Figure 12: Employment (direct and indirect) in renewable energy by country/region, Source: Deloitte analysis

The MENA region is in a crucial phase of transformation, progressively integrating renewables into its energy mix to enhance sustainability and stability.

MENA is a key player in the global energy sector, supplying a major portion of the world's conventional energy. The past three decades have seen the Middle East emerge as a critical supplier of global energy, mostly from fossil fuels[15], (Figure 13).

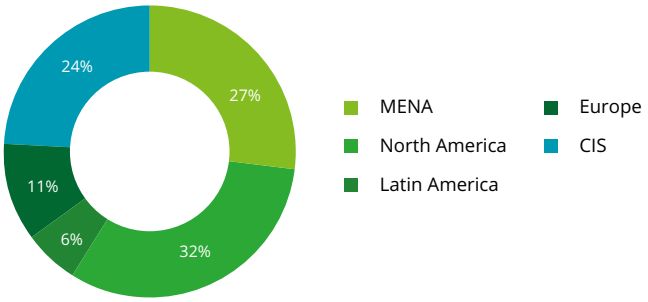


Figure 13: Global primary energy supply (%), source: Deloitte analysis

Renewable energies are set to represent a much larger share of the MENA region's energy mix by 2040, reflecting the global trend toward diversified and sustainable energy sources. Despite the increase in renewables however, investments in existing energy infrastructure indicate a continued reliance on conventional energy (mostly gas) to meet the MENA region's demand and ensure a stable transition[15]. The strategic adoption of renewables in MENA is expected to supplement, rather than rapidly replace, conventional energy systems, recognizing the critical role they play in ensuring the continuity of energy supply.

The UAE and Saudi Arabia are driving regional transformation through launching large-scale solar farms such as the Noor Abu Dhabi Solar Plant and the Al Dhafra Solar Plant investing across the entire solar value chain to boost industry localization and job creation. This transformation agenda offers a long-term pathway to a greener future, helping to achieve decarbonization objectives while also unlocking substantial economic and social opportunities for the region.

MENA power demand:

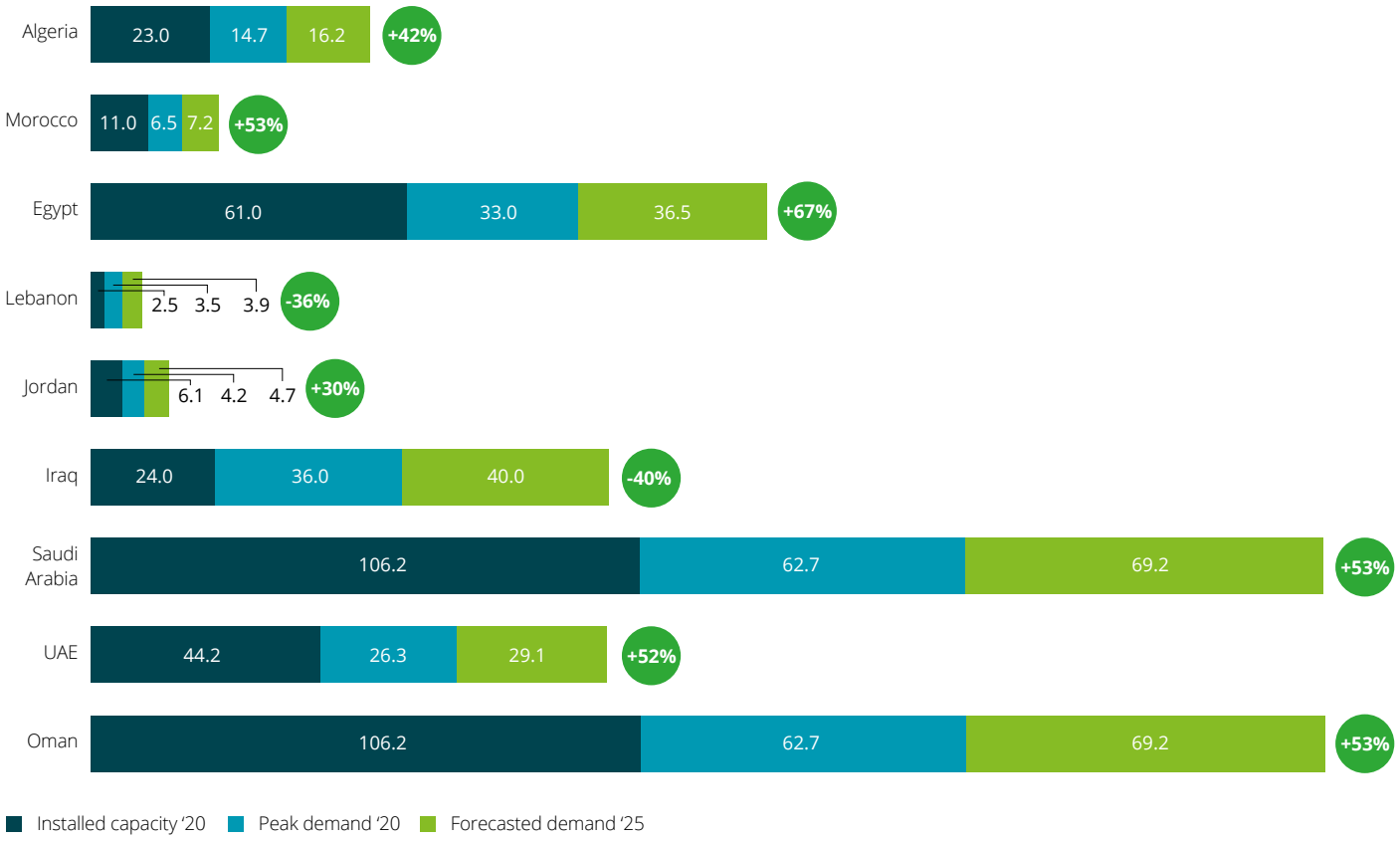


Figure 14: MENA installed power capacity and demand (GW), source: Deloitte analysis

Macroeconomic and geopolitical trends shaping the MENA energy and water landscape are creating several ways to play for traditional utility players

Power generation – Conventional

- **Regulatory and social drivers**
  Adoption of Carbon Capture and Storage (CCS) and other emission-reducing solutions is key for conventional power plants to meet stringent global emission standards.
- **Cost reduction in technology**
  Gas-fired power plants have evolved to offer flexible operation, supporting the fluctuating nature of renewable resources and ensuring rapid responsiveness in power generation to maintain grid stability.
- **Market and grid integration**
  Conventional power generation is diversifying its fuel mix with co-firing techniques that blend coal, natural gas and biomass, cutting reliance on any single energy source by up to 20% and enhancing energy security.

Power generation – Renewables

- **Emission control technologies**
  Renewable energy is increasingly driven by social preferences and regulatory initiatives, with governments setting ambitious net-zero targets and investing in innovation in green technologies.
- **Flexibility in generation**
  Technological advances, particularly in photovoltaic efficiency and wind turbine design, have significantly reduced the cost of renewable energy, making it more competitive with traditional energy sources.
- **Diversified fuel mix**
  Improved grid integration capabilities and energy storage solutions are key trends, allowing renewables to be more easily integrated into the existing energy infrastructure.

Power transmission and distribution

- **Infrastructure development**
  The expansion of renewable energy sources necessitates significant investment in T&D infrastructure to handle variable loads and ensure uninterrupted power flow.
- **Smart grid advancements**
  Smart grid technologies, including advanced sensor networks and automation, are being deployed to increase efficiency, reduce outages, and support the integration of renewable energy.
- **Energy storage and stability**
  The role of large-scale energy storage is becoming increasingly pivotal (T&D), providing the necessary buffer to maintain grid stability amidst the fluctuating supply from renewable sources.

Water production

- **Desalination efficiency**
  Advances in desalination technology, particularly in energy-efficient reverse osmosis, are significantly reducing energy requirements and operational costs for water production.
- **Reclamation and recycling**
  In MENA water reclamation and recycling projects can increase freshwater use by up to 40%, a vital initiative for a region where over 60% of the population lives in high water stress areas.
- **Distribution innovation**
  Investment in the water sector is growing not only in production, but also in distribution efficiency, with smart systems improving the delivery and management of water resources.

The MENA region's power demand is expected to increase steadily due to unique market structures and differing energy consumption patterns[15]. To maximize energy production, maintain excess capacity for local populations and grow export potential, this region will be looking to diversify and balance their energy mix. The countries with additional capacities may look at using these as strategic leverage in building key relationships with neighboring countries.

The UAE has already progressed significantly with its ambition to generate 50% of its power demand from renewable sources by 2050 with projects such as the Mohammed bin Rashid Al Maktoum Solar Park[16], which aims to become one of the world's largest solar plants.

Like the UAE, Saudi Arabia has set itself a goal to invest $110 billion in renewable energy projects by 2050, with an aim to achieve

50% of the country's energy mix composed of renewables[17]. The government launched the Renewable Projects Development Office (REPDO) to fast-track the design and implementation of clean energy initiatives, by having a full control on managing clean energy initiatives and projects end-to-end. In parallel, the Kingdom has large scale projects already underway including the construction of a single site solar plant in Mecca[18], which aims to overtake the UAE's plant and become the world's largest with a generation capacity of 2,060 MW.

Oman has set a short-term target of generating 10% of its electricity from renewable sources by 2025[19]. Oman has also initiated several solar-related initiatives which include the Mirbat Solar Power Plant, which, when completed will be one of the largest power plants in the Middle East.

Similarly, Qatar has launched a strategy to increase renewable power generation to 200MW by 2030[20]. This increase would allow Qatar to reach 18% of its energy mix sourced from renewables from 5% in 2024 to meet goals of reducing greenhouse gas emissions by 25% by 2030[19].

Kuwait detailed a strategy focused on renewables aiming to install 22GW of renewable energy by 2030 in conjunction with providing incentives to the local population for installing solar panels and allowing them the right to sell excess energy back to the government[21].

Bahrain has outlined a Vision 2030 aiming to achieve 5% of their energy mix through renewables by 2025, and 10% by 2035[22]. In order to meet the required targets, Bahrain will produce 280 MW of electricity through renewables by 2025 and 710 MW by 2035 with solar energy being the lead driver of the transformation.

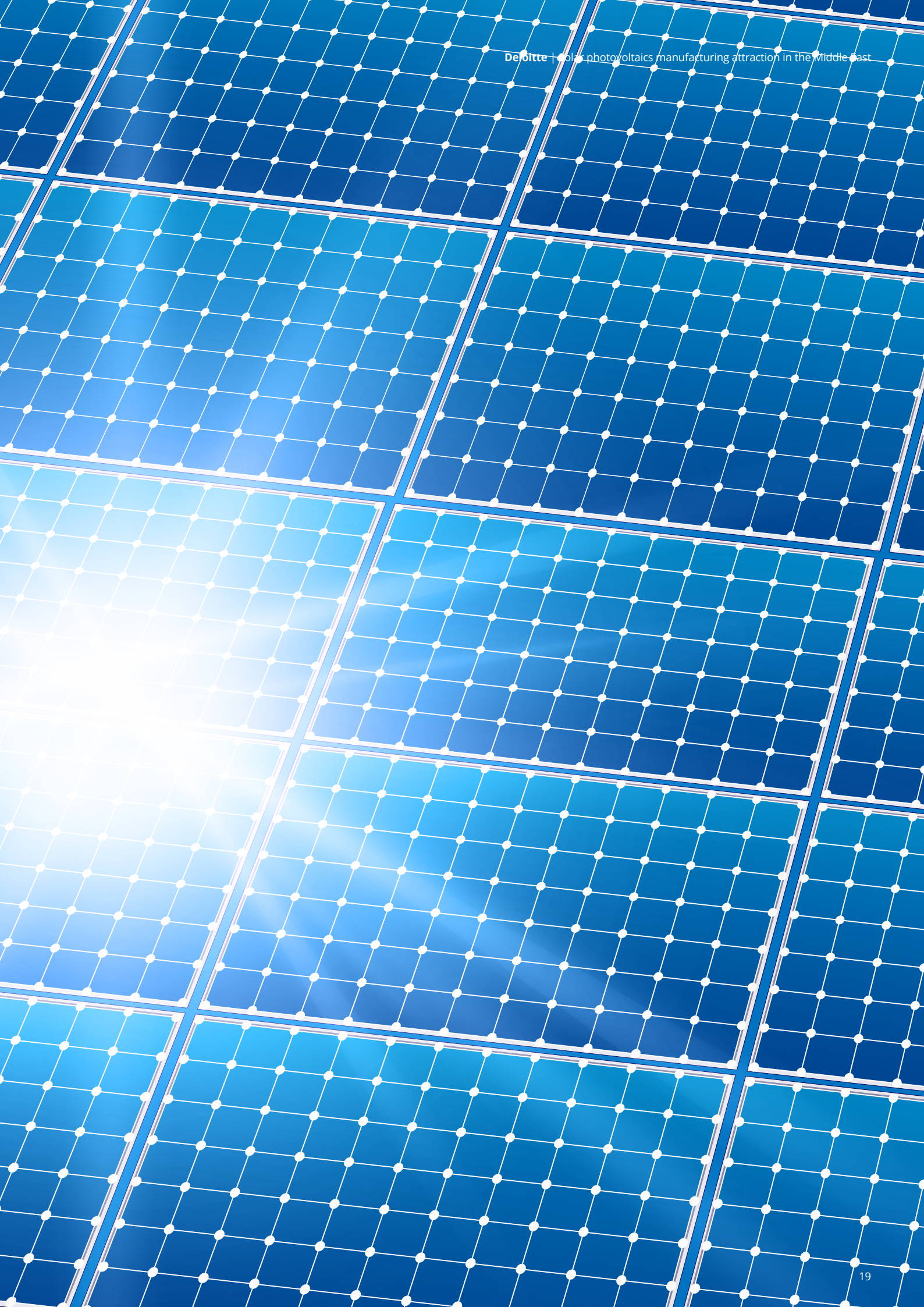
As a critical step to promote energy transition, most MENA countries have targeted to increase the contribution of renewable energy to over 30% by 2030…

The rising trend of renewable energy systems in MENA is driven by ambitious national targets, with Morocco and Jordan leading the way in deployment. Despite the high potential of renewables, the speed of adoption in MENA will depend on the level of government commitments, evolution of regulatory frameworks and financing availability from both private and public sectors. Execution and capital costs of renewable projects are expected to increase in the short term due to market volatility[23], with potential implications for project pricing and tendering in future phases.

Renewable energy targets in selected MENA countries

Country	Renewable energy policy targets	Progress (2022)
Saudi Arabia	10% of generation by 2025, 50% by 2030	<1% of generation
UAE	44% of generation mix by 2050 (federal)	≈5% of generation (federal)
Oman	10% of generation by 2025, 30% by 2030	<3% of generation
Qatar	20% of generation by 2030	≈1% of generation
Kuwait	15% of generation by 2030	<1% of generation
Jordan	31% of generation mix by 2030	≈23% of generation
Iraq	5% of generation by 2025, 20% by 2030	≈2% of generation
Lebanon	30% of generation mix by 2030	≈45% of installed capacity
Egypt	20% of generation by 2022, 42% by 2035	≈12% of generation
Morocco	52% of installed capacity by 2025, 70% by 2040	≈40% of installed capacity
Algeria	37% of installed capacity by 2030	<1% of installed capacity

Figure 15: Renewable energy targets and progress (2022) for select MENA countries, source: IEA



Several drivers pave a path for the Middle East's growth in the solar transition

Focused efforts to transition from an oil-based economy

Focus on renewable energy has been a central part of economic diversification and sustainability strategies across the GCC. The region is leveraging abundant sunlight and investing heavily in renewable energy projects to reduce their dependence on oil and gas. Policies such as the UAE Vision 2021, Abu Dhabi Economic Vision 2030, Saudi Arabia's Vision 2030, Qatar National Vision 2030 are frameworks guiding these transformations.

Rapid growth in infrastructure boosts electricity demand

Ongoing rapid development in infrastructure and real estate across the GCC is increasing the demand for electricity and other manufactured goods. Strategic projects like Saudi Arabia's NEOM and transport electrification projects, such as the Riyadh Metro in Saudi Arabia and the Dubai Electric Vehicle Strategy are key examples.

Increase in pace of tendering

The commitment of governments across the GCC to advancing the renewable sector is clearly demonstrated by the accelerated pace of tendering and procurement for renewable energy. This proactive approach guarantees a consistent flow of projects, creating a stable and predictable environment for investments in module manufacturing.

Figure 16: Growth drivers of Middle East's solar transition, source: Deloitte analysis

Capacities awarded and steps showing results

Country	Utility/Authority	Project name	Capacity	Description
Saudi Arabia	Saudi Power Procurement Co. (SPPC)	Fifth Round Renewable Energy Program	3.7 GW	Awarded solar capacity as part of the government's renewable energy tender program.
UAE (Abu Dhabi)	Emirates Water and Electricity Company (EWEC)	Khazna Solar Power Project	1.5 GW	Invited bids for this major solar power project.
Bahrain	Electricity and Water Authority (EWA)	Al Dur Solar PV Power Stations	90-100 MW	Initiated a tender for solar PV power stations.
Oman	Oman Power and Water Procurement Co. (OPWP)	500 MW Solar Park	500 MW	Launched a tender to select independent power producers (IPP).
Kuwait	Kuwait Authority for Partnership Projects (KAPP)	Al-Shaqaya Solar Project	1,100 MW	Launched a tender to build a large solar project near Kuwait City.

Figure 17: Upcoming renewable energy projects in Middle East, source: Deloitte analysis

Why manufacture in the Middle East?

The Middle East is positioned in a strategic location with well-established port infrastructure and efficient shipping routes to globally renowned demand centers like Europe and the US as well as emerging demand centers like APAC, Africa etc.

Figure 18: Major demand centers: China, Europe, North America, APAC, India, source: Deloitte analysis

For instance, the UAE's various strategies and programs, such as the flagship 'Make it in the Emirates' campaign, the National In-Country Value (ICV) Program, and the National Program to Transform Technology, have played a pivotal role in driving the growth of the manufacturing sector.

Launched in 2021, Operation 300bn aims to elevate the industrial sector's role in the UAE economy, with a target of increasing its contribution to gross domestic product (GDP) from AED 133 billion in 2021 to AED 300 billion by 2031[24]. The initiative focuses on establishing an attractive business environment for both local and international investors, fostering the growth of national industries, and enhancing global competitiveness.

In parallel, Abu Dhabi's Industrial Strategy, backed by six transformational programs targeting the circular economy, talent development, ecosystem growth, and value chain enhancement, aims to double the manufacturing sector's size to AED 172 billion[25]. The strategy also targets the creation of 13,600 skilled jobs and a 143% increase in Abu Dhabi's non-oil exports, reaching AED 179 billion by 2031. Abu Dhabi has created an attractive eco-system for players to consider manufacturing activities in the Emirate (Figure 19).

Regulatory requirements for local partnership in the infrastructure business

- Foreign direct investment (FDI) law: Allows 100% foreign ownership in renewable energy sectors, promoting international investment
- Joint ventures: In strategic sectors like energy, local partnerships are often encouraged, with local entities typically holding a 51% ownership percentage
- Free zones: Operating in areas like KIZAD allows for 100% foreign ownership and provides incentives specific to renewable energy projects

Policies supporting domestic manufacturing

- Abu Dhabi Economic Vision 2030: Aims to increase the contribution of renewable energy to the total energy mix to 50% by 2050
- Incentives: Includes tax exemptions, subsidies on utilities, and long-term leases at competitive rates in industrial zones like KIZAD to attract renewable energy manufacturers
- Employment Initiatives: Government and private sector collaboration to create over 20,000 new jobs in the renewable energy sector by 2030 including target to increase the proportion of UAE nationals in the renewable energy sector to 10% by 2025

Strategic location and favorable bilateral ties for trading

- Abu Dhabi is strategically positioned at the crossroads of the East and the West, providing access to major global markets in the west
- Proximity to major ports like Khalifa Port and Jebel Ali, established freezones with good infrastructure and sea/road/air connectivity is a prime advantage
- The UAE has robust trade agreements with numerous countries, enhancing import-export operations

Strong financing and investor interest

- Presence of large global equity investors and lenders willing to invest in the region's renewable energy sector bolsters the manufacturing ecosystem
- Stable economy and progressive legal/regulatory system, open to inbound investment and innovation
- Abu Dhabi's high sovereign credit rating attracts global investors and ensures financial stability

Figure 19: Abu Dhabi's competitive advantage, source: Deloitte analysis

The UAE's robust and stable economy, along with its growing population, makes it an attractive destination for investors. Its strategic location at the crossroads of Europe, Asia, and Africa, offers seamless connectivity to global markets, which enables efficient distribution of products to a wide range of customers and end-users. Further, the UAE's strong logistics and infrastructure, absence of trade sanctions, and a growing number of free trade agreements with streamlined, duty-free access to the GCC and MENA markets, make it an attractive location for establishing manufacturing bases. This favorable trade environment, combined with the ease of obtaining commercial and industrial licenses and access to world-class services and amenities, encourages international investment and expansion.

In parallel, Saudi Arabia is also exploring the establishment of a solar PV manufacturing cluster, spear-headed by its Public Investment Fund (PIF). Through joint ventures, the Fund has reached two major deals with the Chinese suppliers JinkoSolar and TCL Zhonghuan Renewable Energy to bring 30 GW of solar PV manufacturing capacity to the Kingdom. These contracts for The Renewable Energy Localization Company (RELC) and Vision Industries (VI) cover all aspects of the solar manufacturing value chain, from ingots to modules. One contract has Lumetech, subsidiary of TCL Zhonghuan, constructing a 20GW ingot and wafer plant while the other has JinkoSolar integrating 10 GW n-type solar cell and module fabrication. The joint ventures established by Lumetech, JinkoSolar, and RELC will be 40% owned by each company, sharing 20% of the rest with Vision Industries[26].

As part of PIF's efforts to integrate sophisticated renewable technologies into the country's infrastructure, the Saudi Arabian government aims to localize 75% of the parts by 2030. This initiative enables further development of domestic renewable energy requirements while turning Saudi Arabia into a center for renewable technology exportation. Furthermore, there are other notable solar manufacturing agreements in the area such as the joint venture between GameChange Solar and Jiangsu Zhenjia[26].

Conclusion

The Middle East is fast emerging as an important global destination for developing solar photovoltaics generation capacity, driven by ambitious national targets and substantial investments in renewable energy projects.

Solar capacity requirements are continuing to grow in the region, with the costs of solar photovoltaics reducing over time. Global players have started to consider the Middle East as a new manufacturing base given strong local demand, a growing global market for PV technologies but also as a result of tariffs which disrupted global supply chains and trade flows, for products originating in Asia in particular. The UAE for example offers a strong value proposition, with excellent infrastructure, logistics connectivity, business-friendly environment, an attractive regulatory landscape and incentives to further industrialize the country.

As GCC countries continue pushing ahead with their industrialization strategies and increase foreign direct investments, it is expected that national value propositions will be continuously tuned through various mechanisms to attract innovative players keen to localize activities in the region and establish manufacturing joint ventures. Governments should focus on further integrating renewable energy and associated targets into their national strategies, ensuring regulatory frameworks that support sustainable growth. Initiatives such as Saudi Arabia's Public Investment Fund (PIF) joint ventures with major Chinese suppliers are pivotal in establishing solar PV manufacturing clusters.

Expanding programs such as the UAE's 'Make it in the Emirates' will drive innovation and job creation, solidifying the region's role in the global renewable energy landscape. By maintaining this momentum, the Middle East can achieve its ambitious energy goals, contributing to a greener and more sustainable future.

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