



Institute for Energy Economics
and Financial Analysis

Policy Trends & Insights from Asian Markets

Vibhuti Garg

June 2025



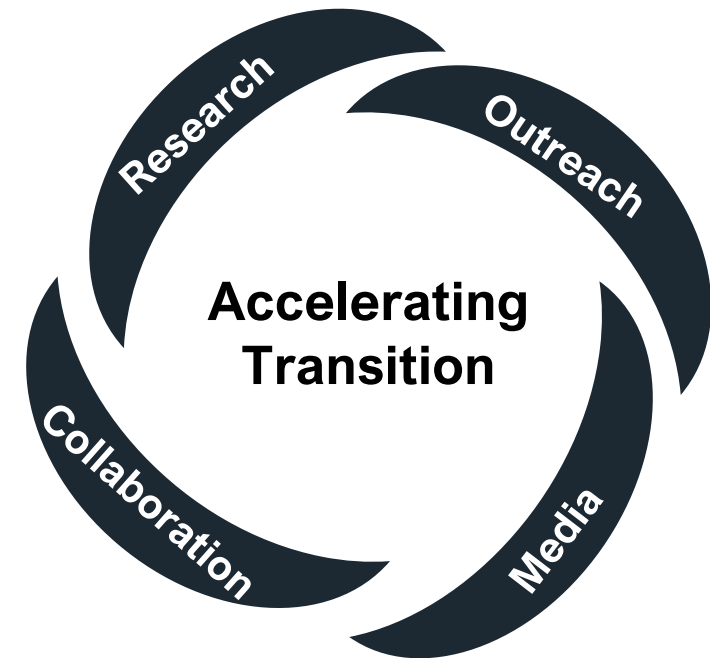


IEEFA's Mission: Accelerating the Energy Transition

The overall purpose of IEEFA's work is to **strategically conduct** and **disseminate financial analyses** to **accelerate transition** to a diverse, sustainable and profitable energy economy.

Globally, we achieve our goal through **research, outreach, collaboration and media**.

Specifically, South Asia needs policy certainty and continuity, technology innovation and government backing for existing and new technologies to derisk the flow of domestic and global capital to clean energy alternatives.

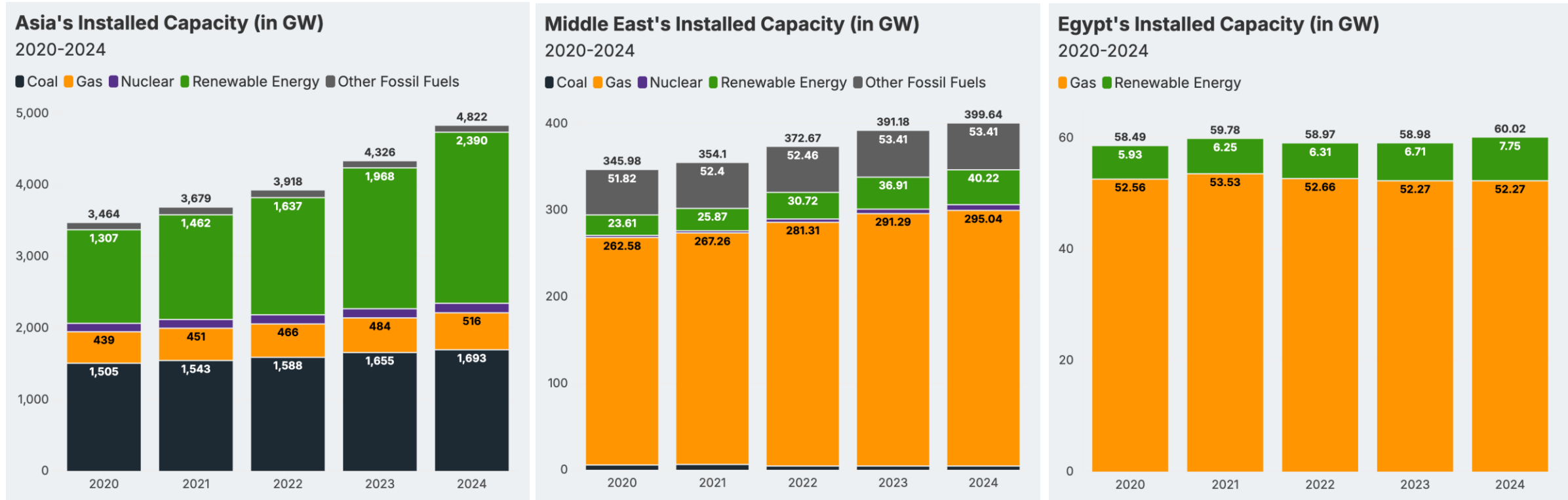


An aerial photograph of a vast wind farm. Numerous three-bladed wind turbines are scattered across a lush green landscape, which appears to be a mix of agricultural fields and natural terrain. The turbines are white with dark blades. In the background, there are rolling hills and a clear sky. The entire image has a green color overlay.

Energy Data

Shift in Installed Capacity & Generation Mix over the years

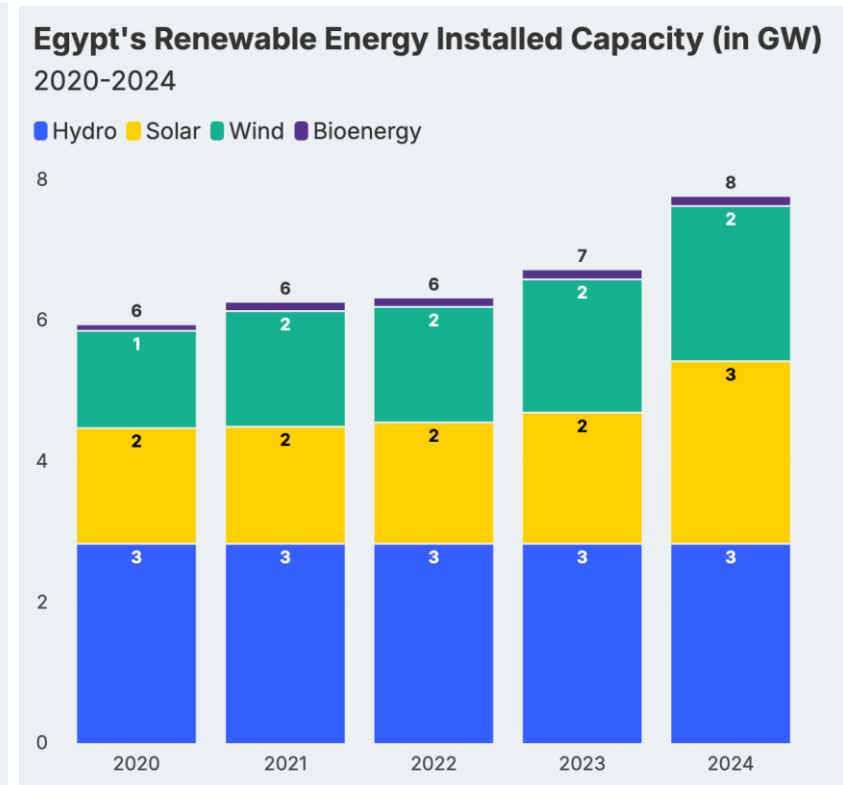
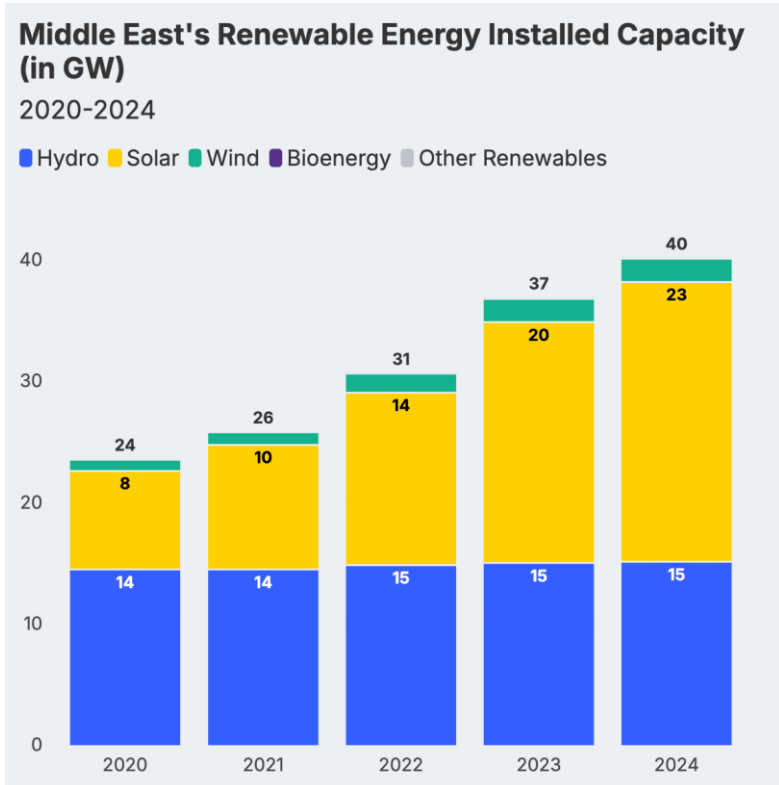
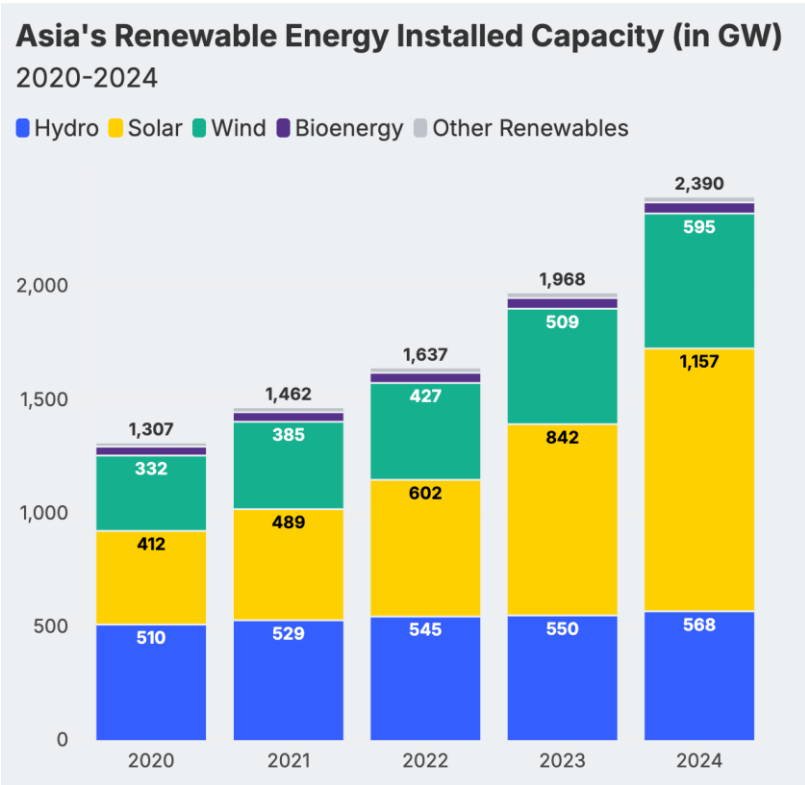
Shift in installed capacity mix in Asian, Middle East countries & Egypt from 2020 to 2024



Source: Ember

Note: Renewables includes hydro, Other Fossil generation includes generation from oil and petroleum products, as well as manufactured gases and waste

Shift in renewable energy installed capacity in Asian, Middle East countries & Egypt from 2020 to 2024

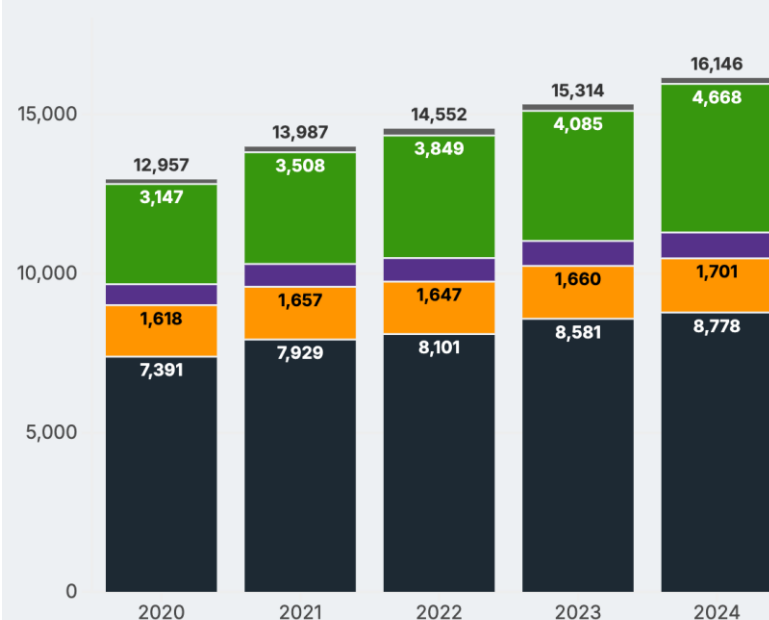


Source: Ember Note: Other Renewables generation includes geothermal, tidal and wave generation.

Shift in electricity generation mix in Asian, Middle East countries & Egypt from 2020 to 2024

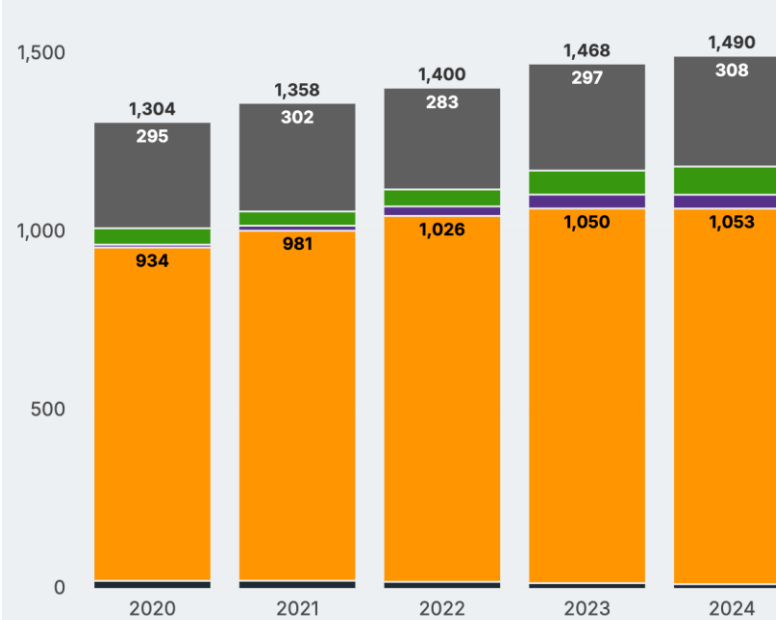
Asia's Electricity Generation (Terawatt hours)
2020-2024

■ Coal ■ Gas ■ Nuclear ■ Renewable Energy ■ Other Fossil Fuels



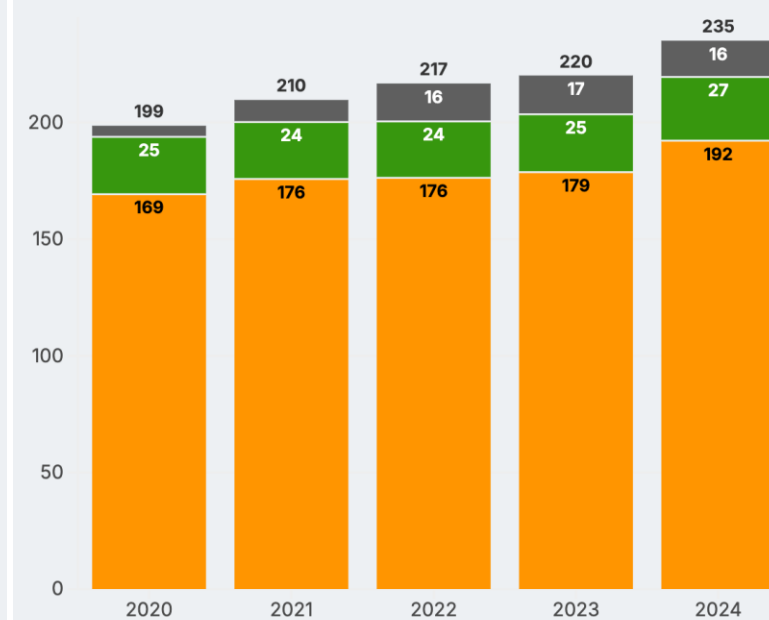
Middle East's Electricity Generation (Terawatt hours)
2020-2024

■ Coal ■ Gas ■ Nuclear ■ Renewable Energy ■ Other Fossil Fuels



Egypt's Electricity Generation (Terawatt hours)
2020-2024

■ Gas ■ Renewable Energy ■ Other Fossil Fuels



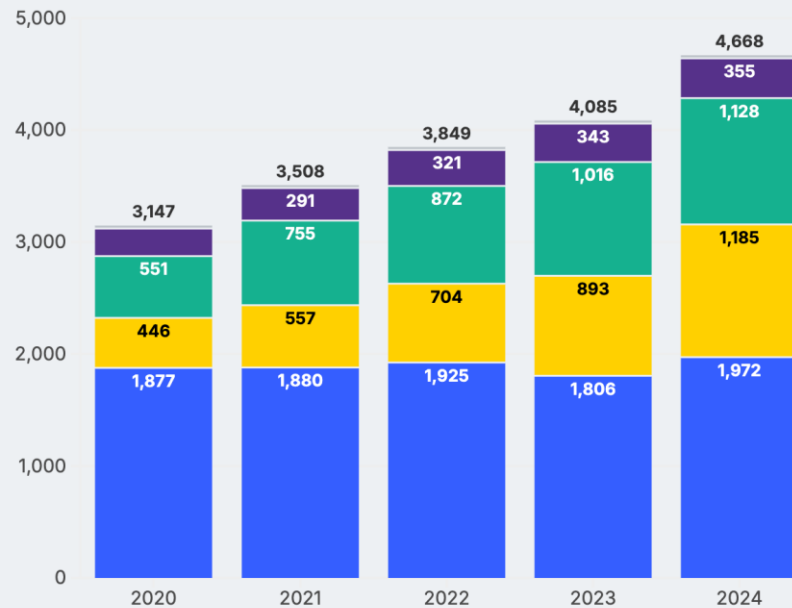
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Shift in renewable electricity generation in Asian, Middle East countries & Egypt from 2020 to 2024

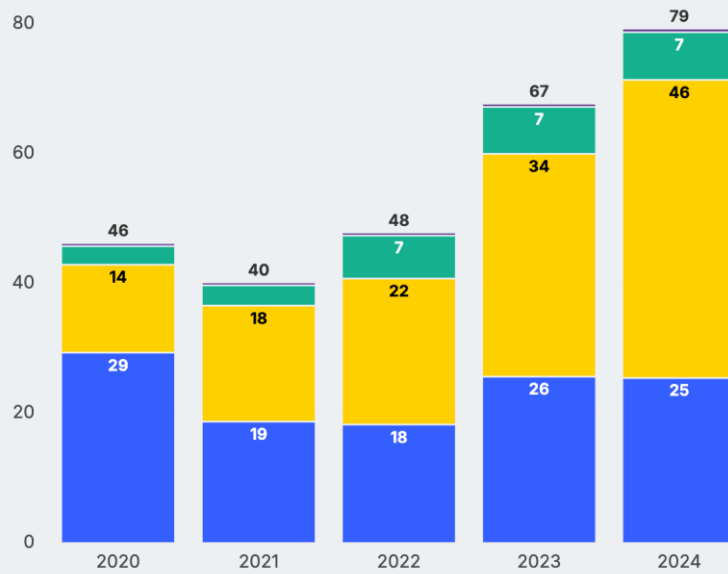
Asia's Renewable Energy Generation (in Terawatt hours)
2020-2024

Hydro Solar Wind Bioenergy Other Renewables



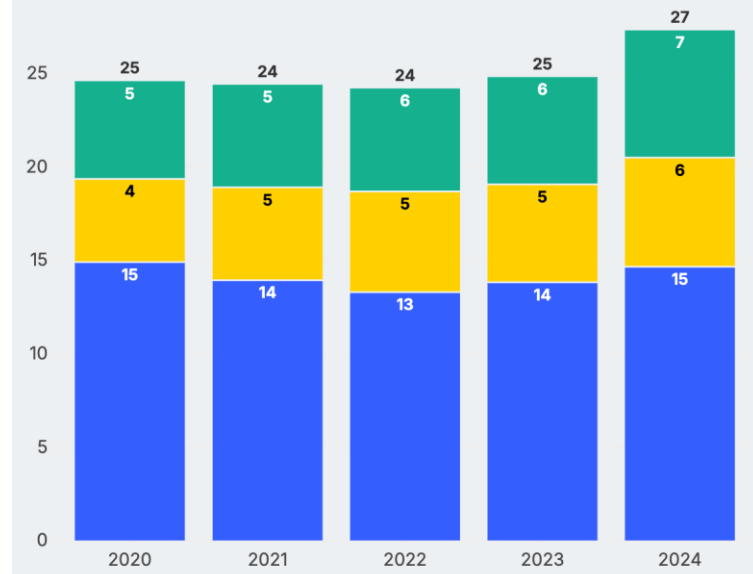
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Egypt's Renewable Energy Generation (in Terawatt hours)
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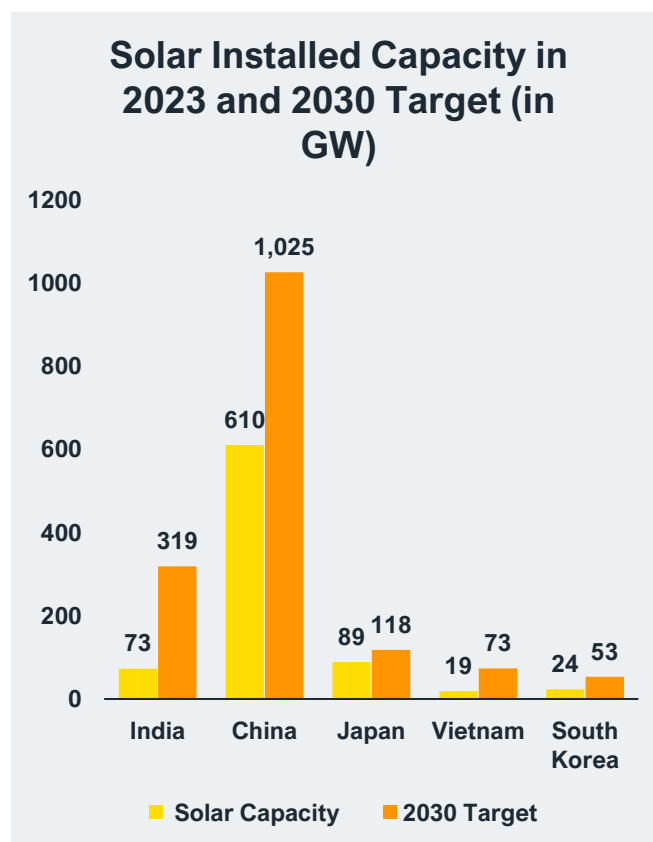
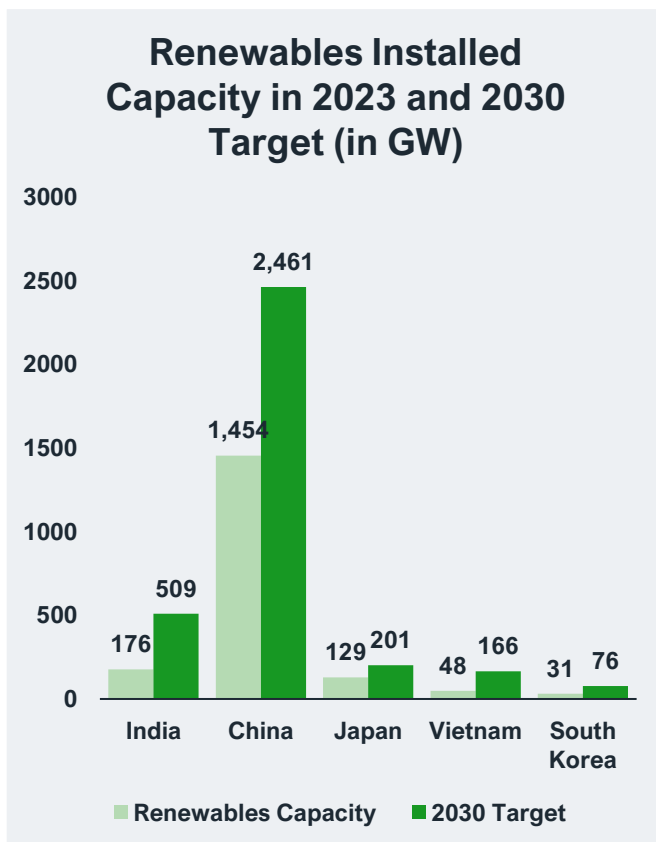
Hydro Solar Wind



Source: Ember Note: Other Renewables generation includes geothermal, tidal and wave generation.

2030 renewable energy target

Targets for Countries in Asia

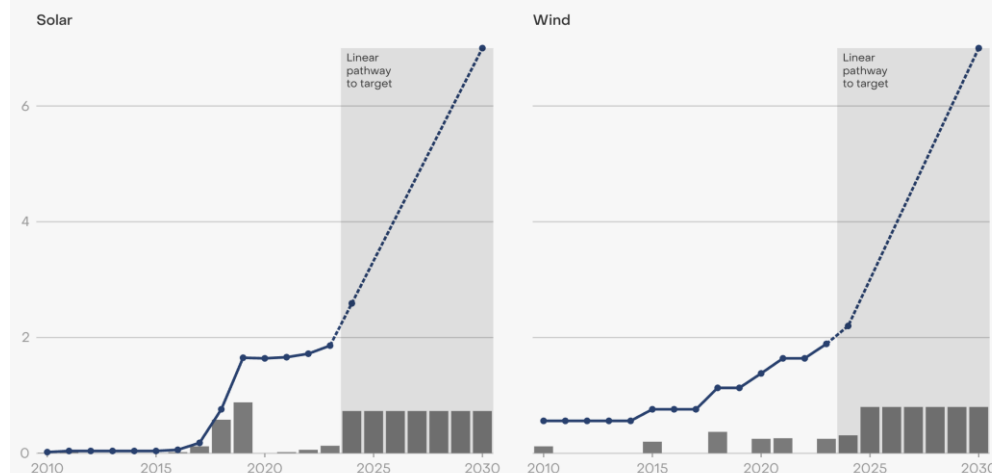


Egypt

Egypt - wind and solar capacity targets vs historic installations

Wind and solar capacity targets, and historic installations (GW)

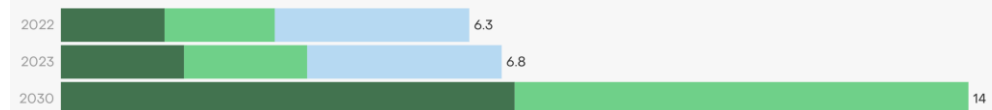
■ Total installed capacity ■ Additions



Egypt - renewables targets vs existing capacity

Current renewable capacity compared to 2030 targets (GW)

■ Wind ■ Solar ■ Hydro, bio and other renewables ■ Unspecified renewables

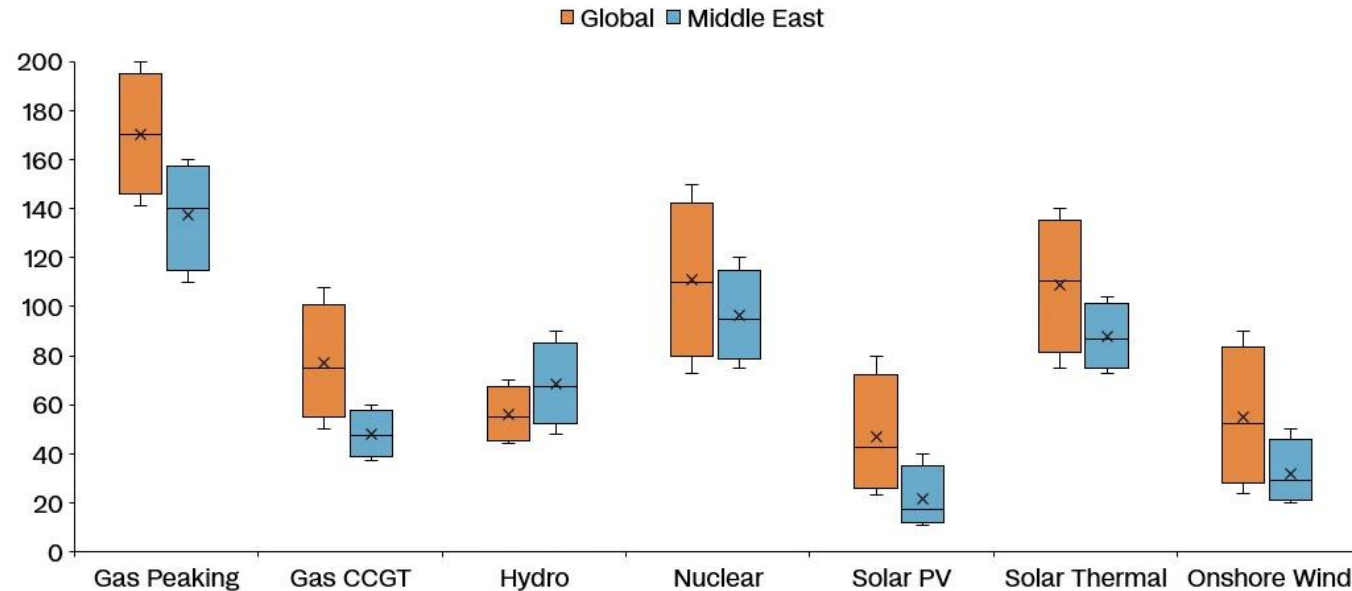


Source: Ember

Comparison of LCOE across different technologies – Solar has the least LCOE

Current LCOE* range in the Middle East compared to global average

USD per megawatt-hour



* LCOE (levelized cost of electricity) range is for capacity of over 100 megawatts and is based on the reported average LCOE in the last five years

Source: Rystad Energy's Renewables & Power Solution; May 2024

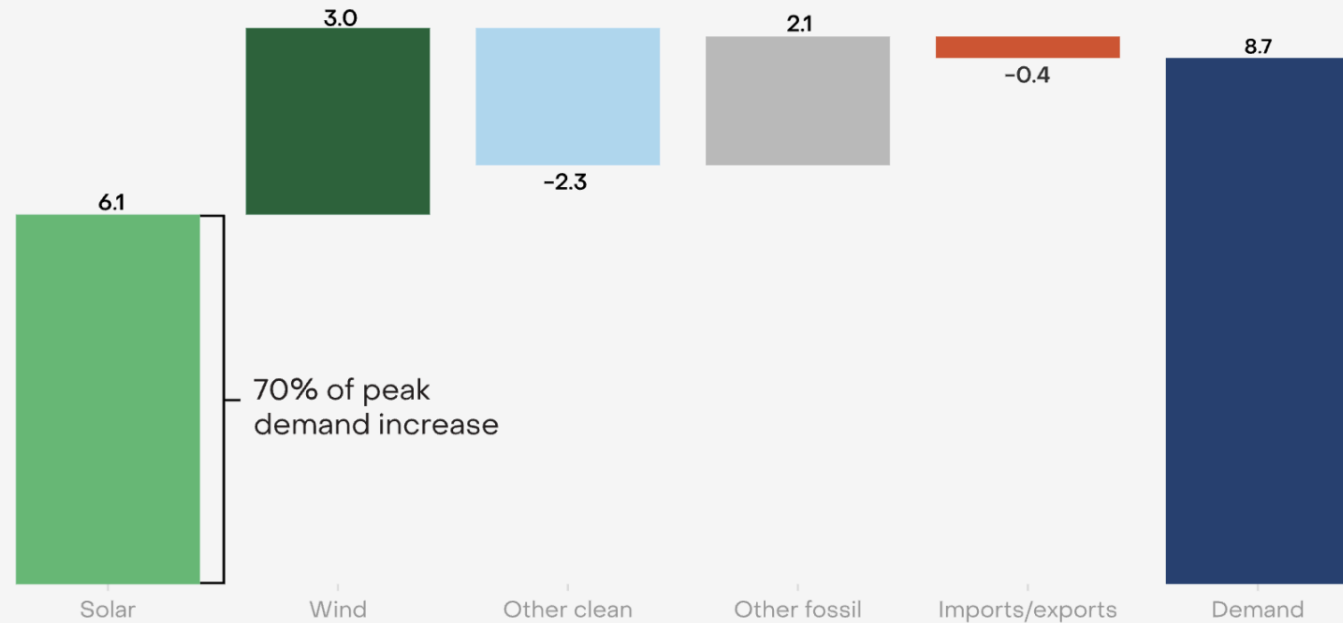
A Rystad Energy graphic

Source: Rystad Energy

Solar can meet the peak demand effectively

Since 2019, solar has met 70% of Türkiye's peak demand increase

Change in electricity production during peak hours from 2019 to 2024 (GWh)



Source: EPIAŞ

EMBER

Source: Ember

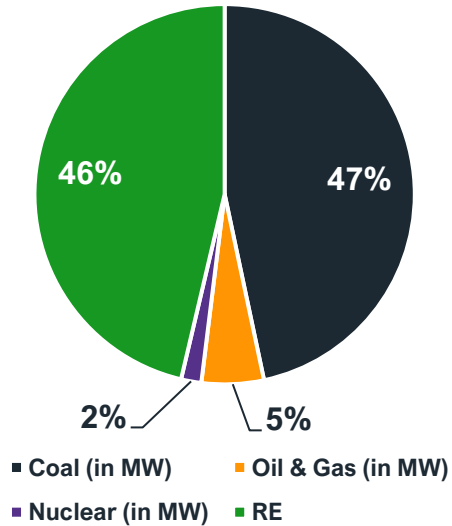


India

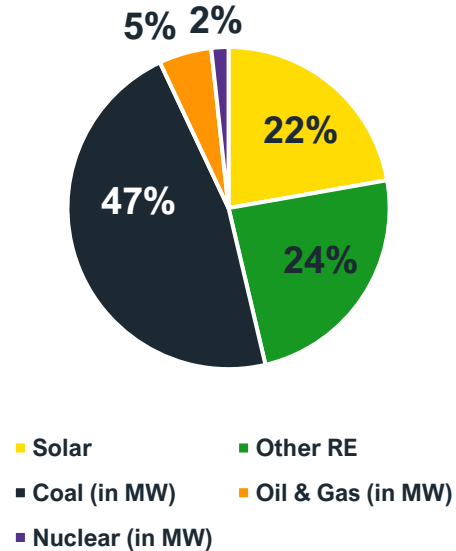
Case Study

India's share of renewables in total installed capacity & electricity generation

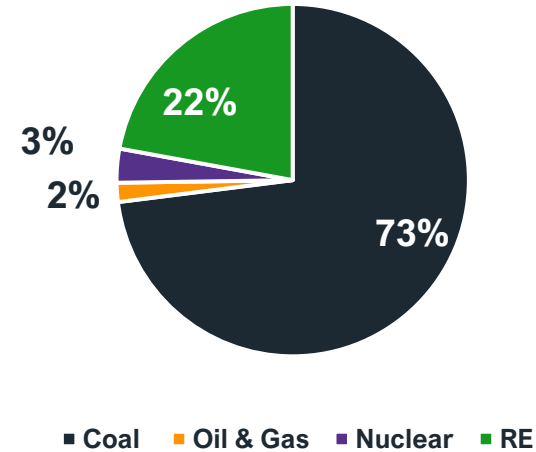
Installed Capacity (FY2025)



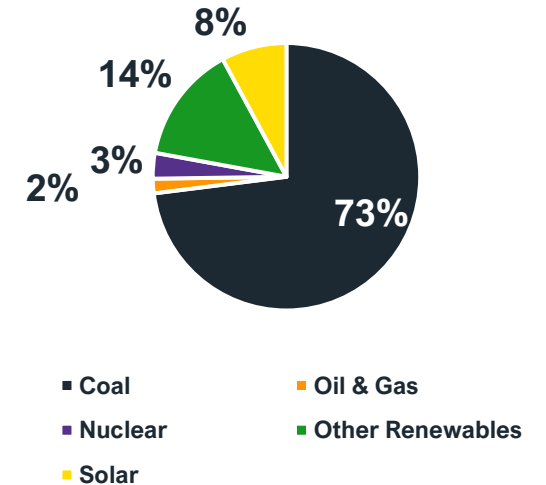
Share of Solar in Total Installed Capacity (FY2025)



Electricity Generation (FY2025)



Share of Solar in Electricity Generation (FY2025)



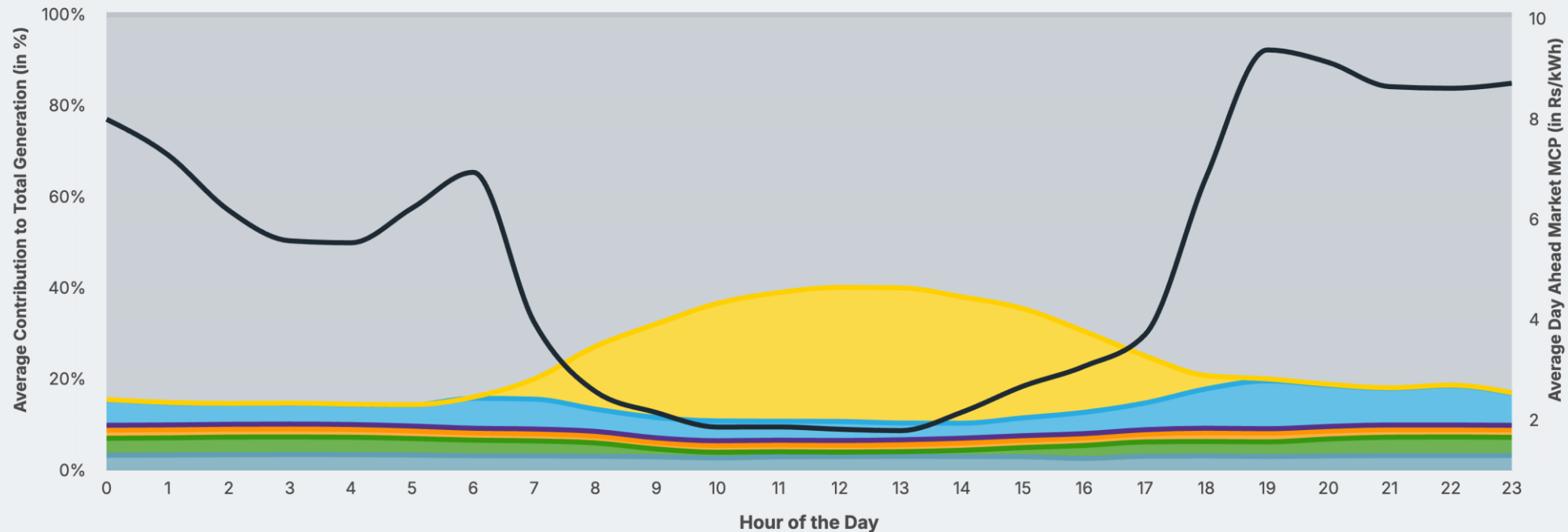
Source: Niti Aayog

Solar can meet the peak demand effectively & economically

Rising solar generation helps temper electricity markets during the daytime in April

More investment in battery storage can help meet evening, night and early morning demand sustainably, while keep electricity prices in check

■ IEX DAM MCP (Rs/kWh) ■ Nuclear ■ Wind ■ Gas ■ Others* ■ Hydro ■ Solar ■ Thermal (Coal/Lignite)



Source: Grid India, Indian Energy Exchange (IEX) and IEEFA Analysis •

Note: *Others includes (i) Biomass from Punjab (ii) Some of the state sector IPP & non-conventional generation in SR (small capacity) (iii) Solar generation in Odisha(manually punched).



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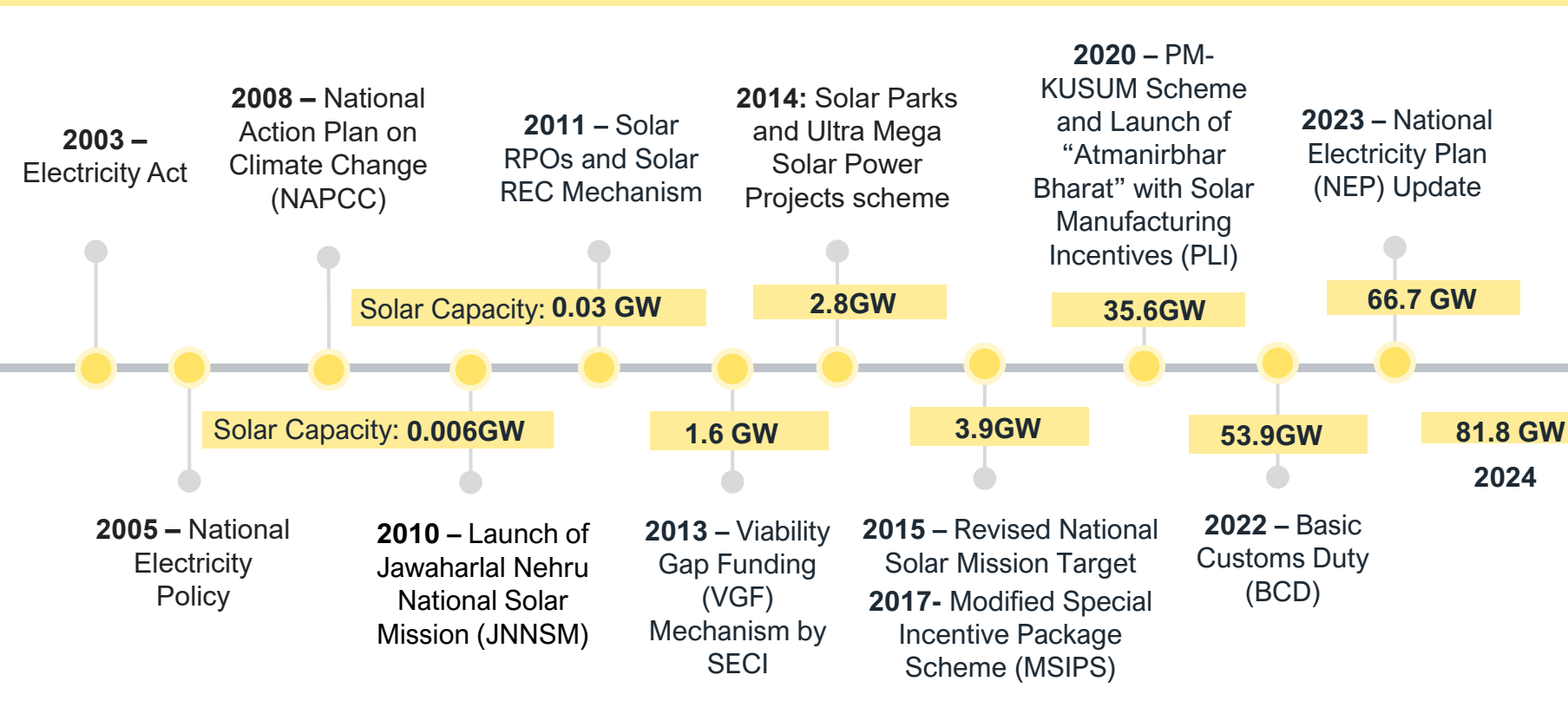
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Policies driving solar deployment

Key Enablers

Policy	JNNSM, NAPCC, NEP 2023, PM-KUSUM	Market Mechanisms	Competitive bidding, RECs, GTAM, VGF	Financial Support	Capital subsidies, PLI for manufacturing, concessional loans	Regulations	RPOs, Green Open Access, Grid codes
						Institutions	SECI, IREDA, NTPC, State Nodal Agencies



2024 and Beyond

1. Focus on solar-plus-storage, round-the-clock (RTC) renewable power, solarization of agriculture
2. Implementation of National Green Hydrogen Mission (2023)
3. Union Budget 2025: Increased Renewable Energy Allocation
4. GST on Solar Components Remains at 12%
5. Expansion of the Solar Park Scheme
6. Rooftop Solar Incentives Under 'PM-Surya Ghar: Muft Bijli Yojana'

FY2025 Solar Capacity - 105.6 GW

Market mechanisms



Net Metering:

Allows homeowners to sell excess solar electricity back to the grid, making solar energy more financially attractive.



Feed-in Tariffs (FiTs):

FiT schemes provide a fixed rate for electricity generated from solar, ensuring a reliable revenue stream.



Green Term Ahead Market (GTAM):

Facilitates the sale of renewable energy, including solar power, through exchanges.



Standard Bidding Guidelines:

Competitive bidding for solar power procurement helps lower electricity tariffs and promote cost-effectiveness.



Waiver of ISTS charges:

Waiving Inter-State Transmission System (ISTS) charges for solar and wind projects incentivizes inter-state power sale.



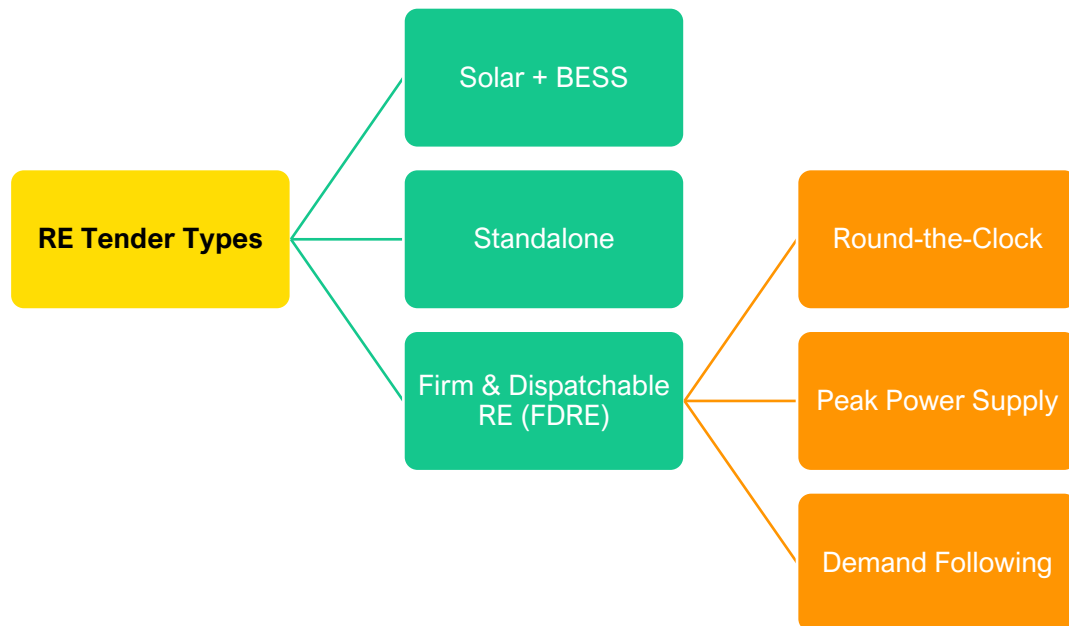
Green Open Access Rules

Simplified procedures and reduced thresholds for consumers to buy solar power directly from developers.

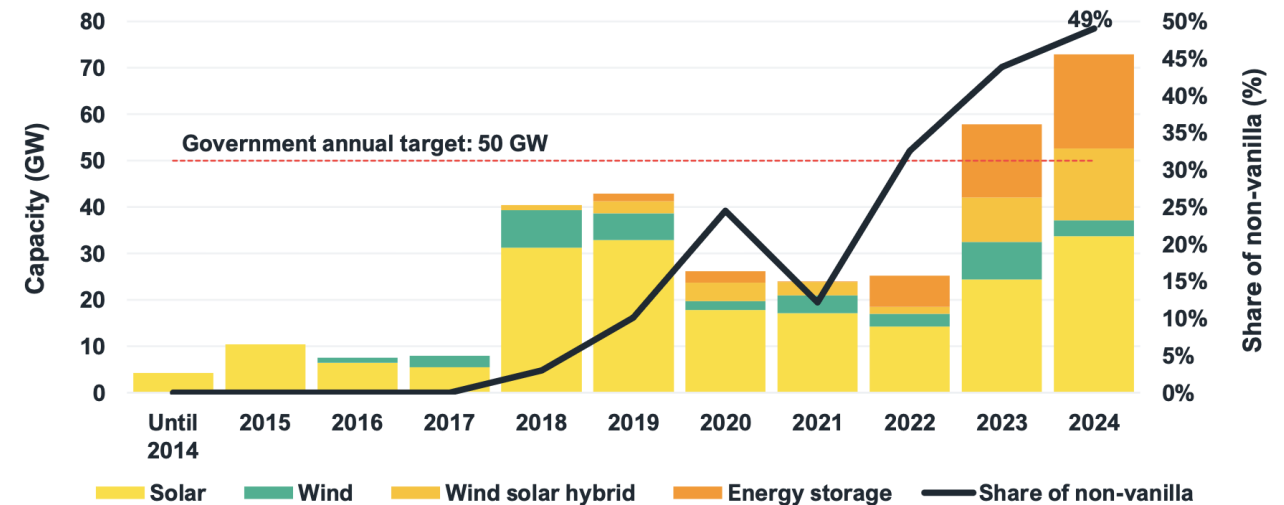


Tender evolution

ESS Tender Types Under Utility-scale Applications



Renewable Energy Issuance, Annual Trend

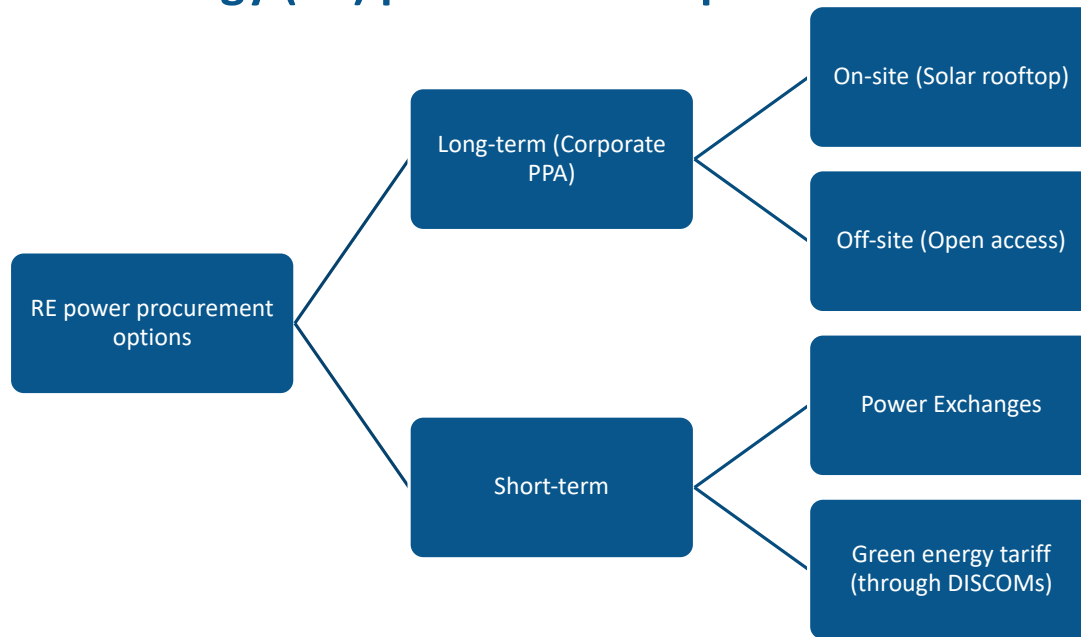


Source: JMK Research database

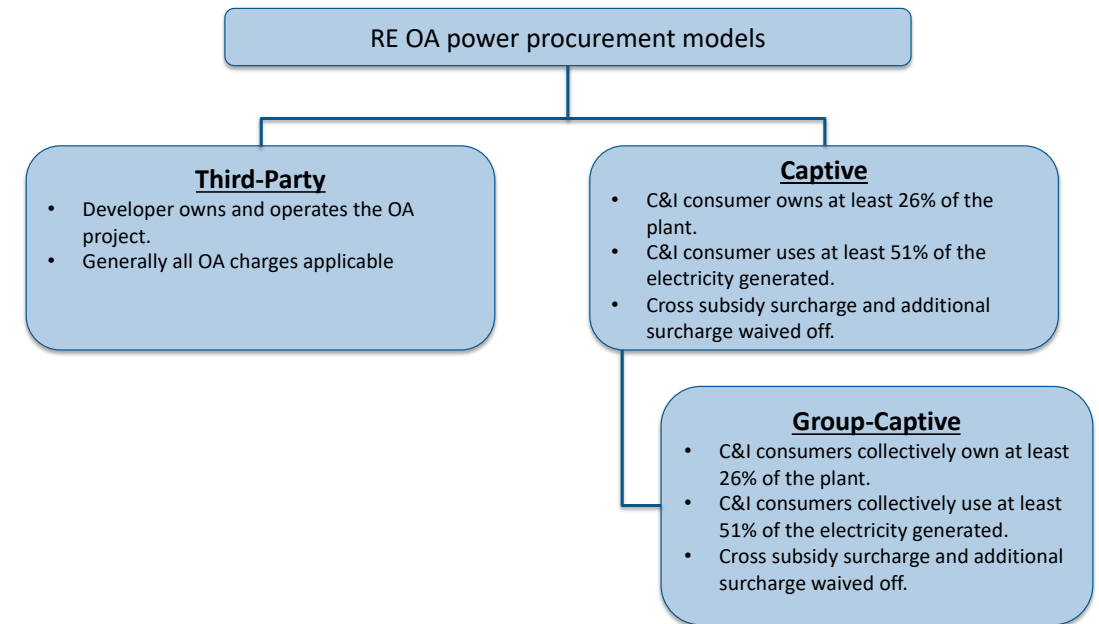
Note: Energy storage capacity includes WSH (with storage), Solar + ESS and firm and dispatchable renewable energy (FDRE). It does not include standalone storage.

Procurement through open access route picking momentum

Commercial & industrial (C&I) renewable energy (RE) procurement options in India



Renewable energy Open Access (OA) power procurement models



Private sector led the solar growth story

India's solar transformation has been made possible by:

Entrepreneurial leadership in deployment and innovation

Robust financing ecosystem aligned with risk-return expectations

Policy push with private execution — a true public-private partnership model

Metric	2014	2024 (Est.)
Installed Solar Capacity	~3 GW	~85 GW
Lowest Solar Tariff	₹6–7/kWh	₹1.99–2.50/kWh
Private Sector Share	<40%	>75%

- Over \$20 billion in FDI in solar since 2014
- Strong growth in Open Access solar, rooftop adoption, and green finance flows

ROLE OF PRIVATE SECTOR COMPANIES & FINANCIAL INSTITUTIONS IN SOLAR GROWTH IN INDIA

Private Sector Companies



Project Developers
Adani Green, ReNew Power, Tata Power Solar, ACME, Azure Power

Large-scale utility projects, rooftop solar deployment, hybrid and RTC projects



Technology Providers & EPC Firms
Sterling & Wilson, L&T Vikram Solar

Engineering, procurement construction¹ domestic module manufacturing



Corporate Off-takers (C&I segment)
Infosys, Amazon

Driving demand through Open Access and captive solar procurement



Startups & Innovators

Digitizing rooftop-solar, solar financing tools, AI/IoT integration

Financial Institutions



Development Finance Institutions (DFIs)

World Bank, ADB, KIW, AIIB

Low-cost debt, risk guarantees, credit lines via IREDA and commercial banks



Domestic Banks & NBFCs
SBI, PFC, REC

Project financing, rooftop solar loans, securitization of solar assets



Green Bonds & Capital Markets

ReNew, Greenko have raised international green bonds



Sovereign & Institutional Support

SECI Payment Guarantees, IREDA Refinance Scheme Clean Energy Funds (NCEF)

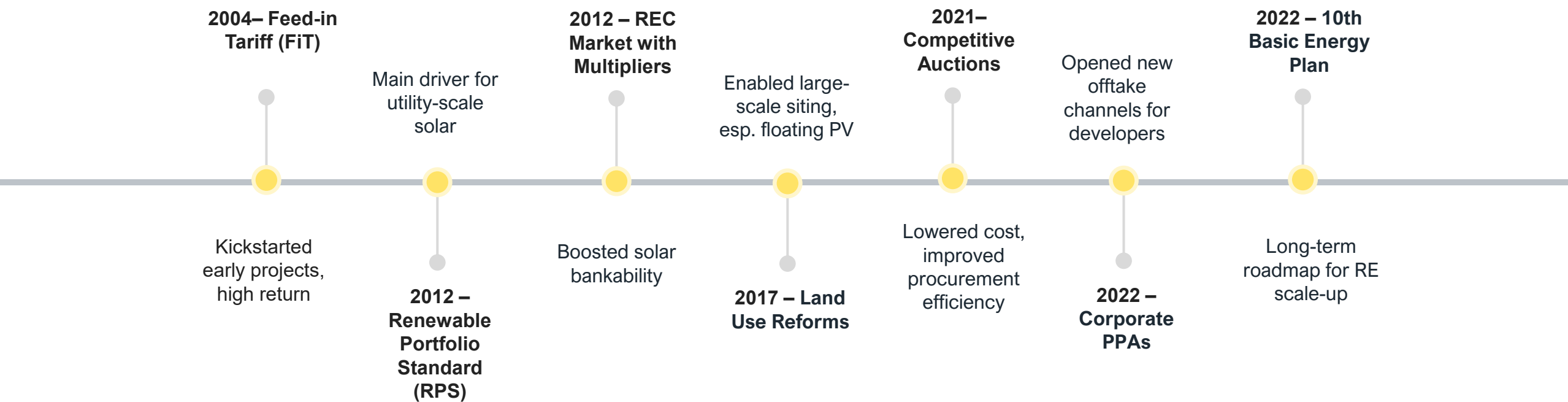


The image shows a vast landscape filled with wind turbines. In the foreground, there are large, green, rectangular agricultural plots, possibly rice fields, separated by narrow paths. Several large wind turbines are prominent, with their three blades clearly visible. The turbines are distributed across the landscape, extending towards the horizon. The sky is a pale blue, and the overall lighting suggests a bright, sunny day. The text "Other Asian Countries" is written in a large, white, sans-serif font, and "Case Study" is written below it in a smaller, white, sans-serif font. The text is centered horizontally and partially overlaid by the blades of a wind turbine on the right side of the image.

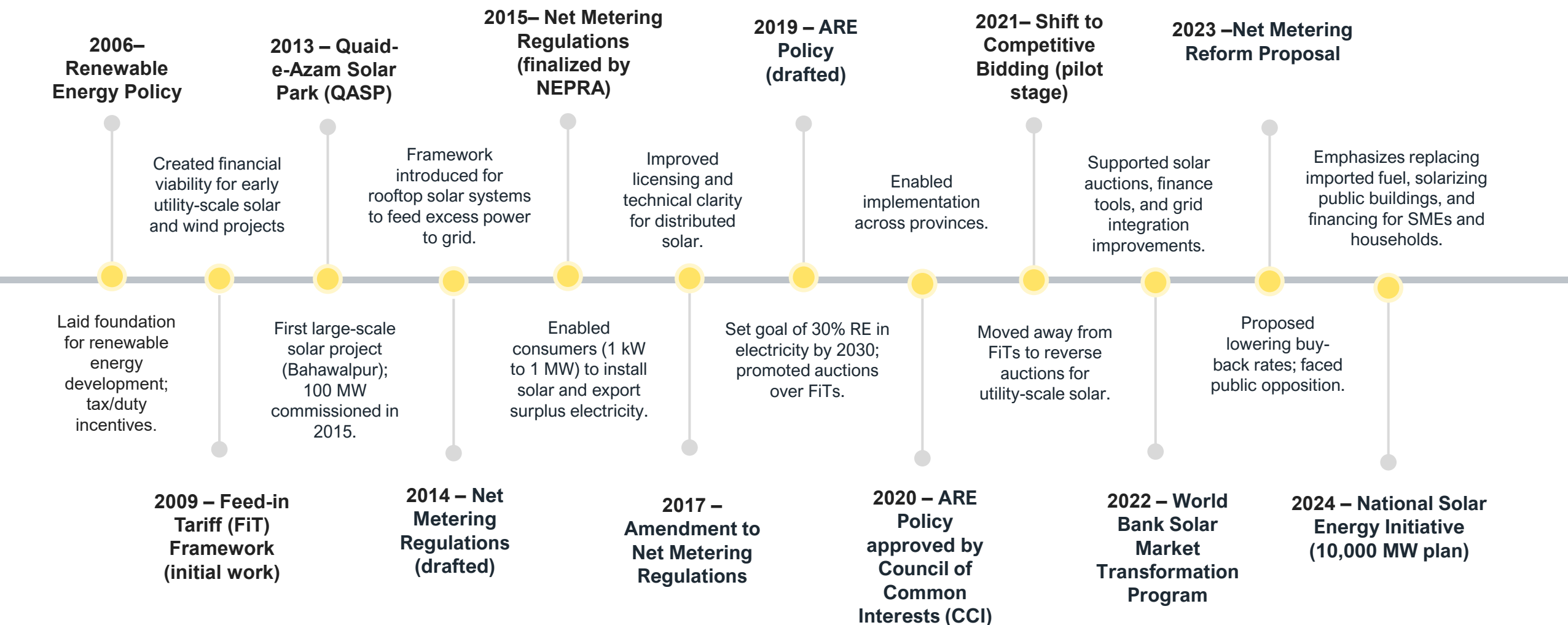
Other Asian Countries

Case Study

South Korea: Solar policy tools



Pakistan: Solar policy tools





Thank you

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