Institute for Energy Economics and Financial Analysis

Policy Trends & Insights from Asian Markets

Vibhuti Garg

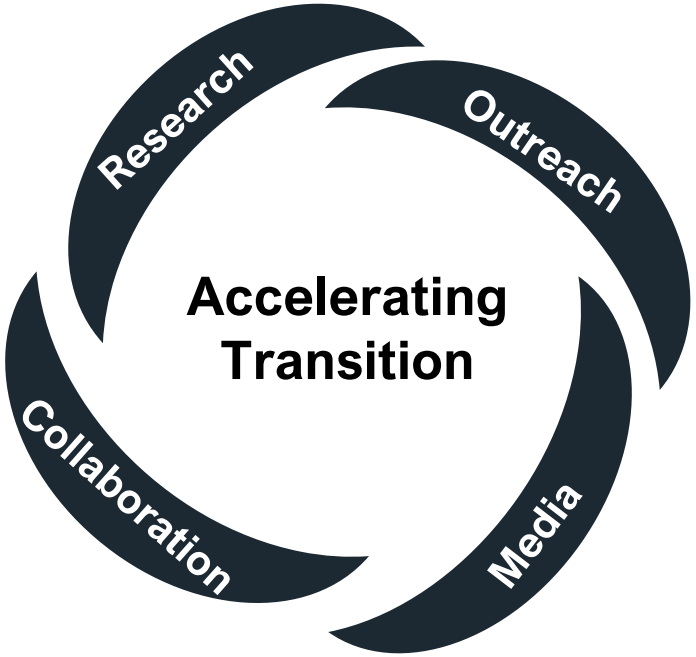
June 2025

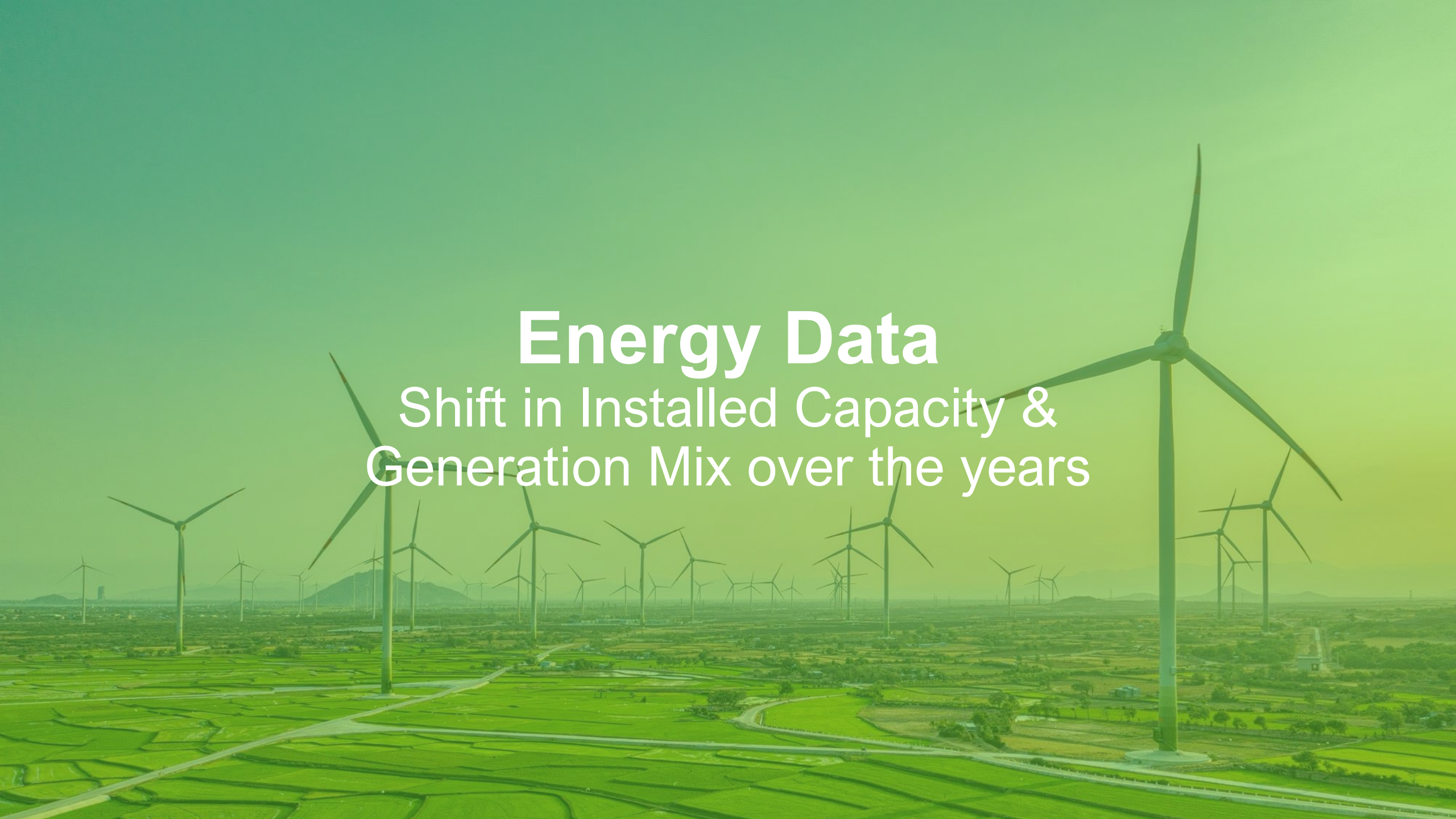
IEEFA's Mission: Accelerating the Energy Transition

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.

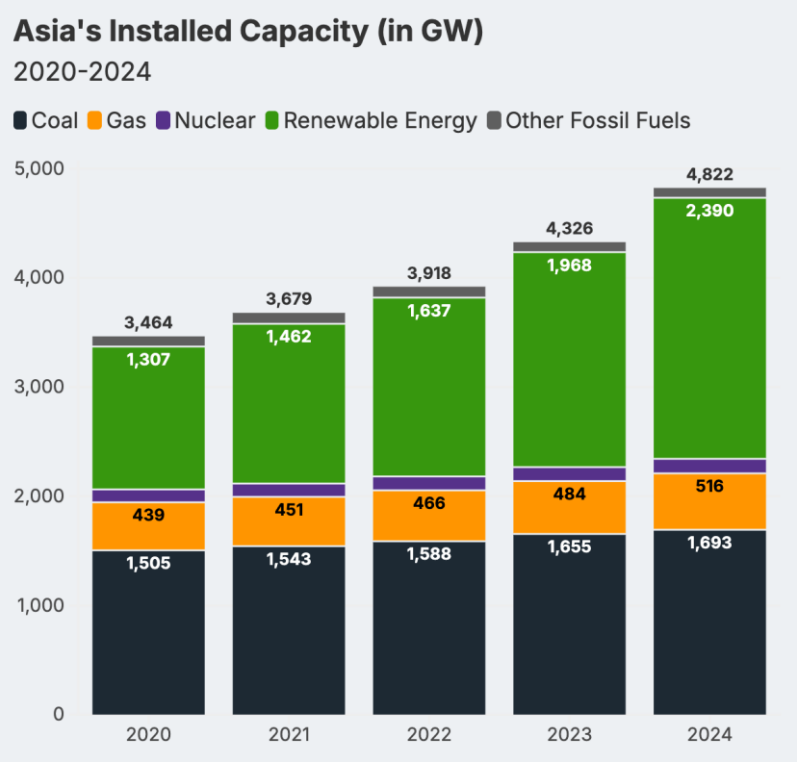


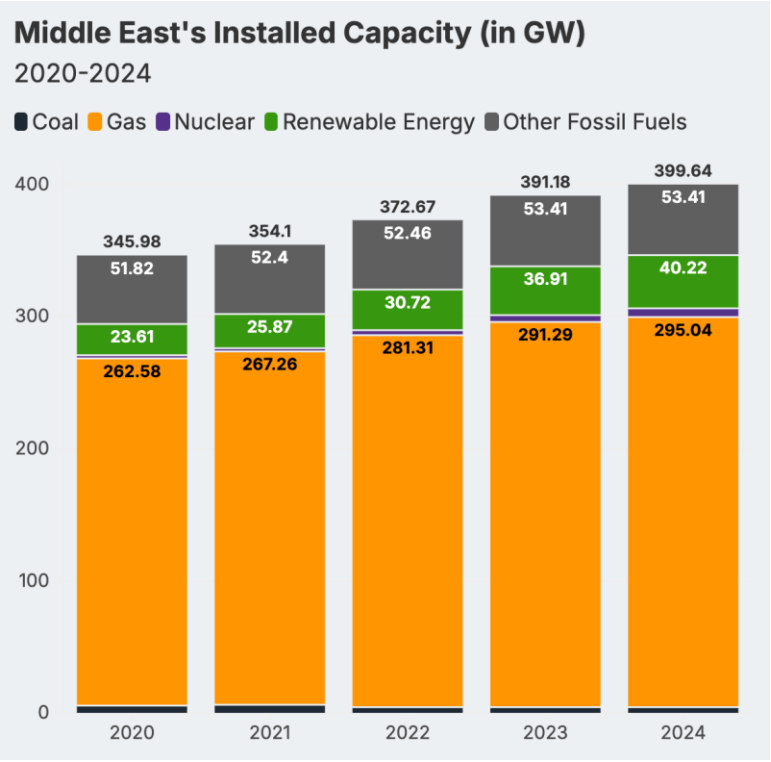


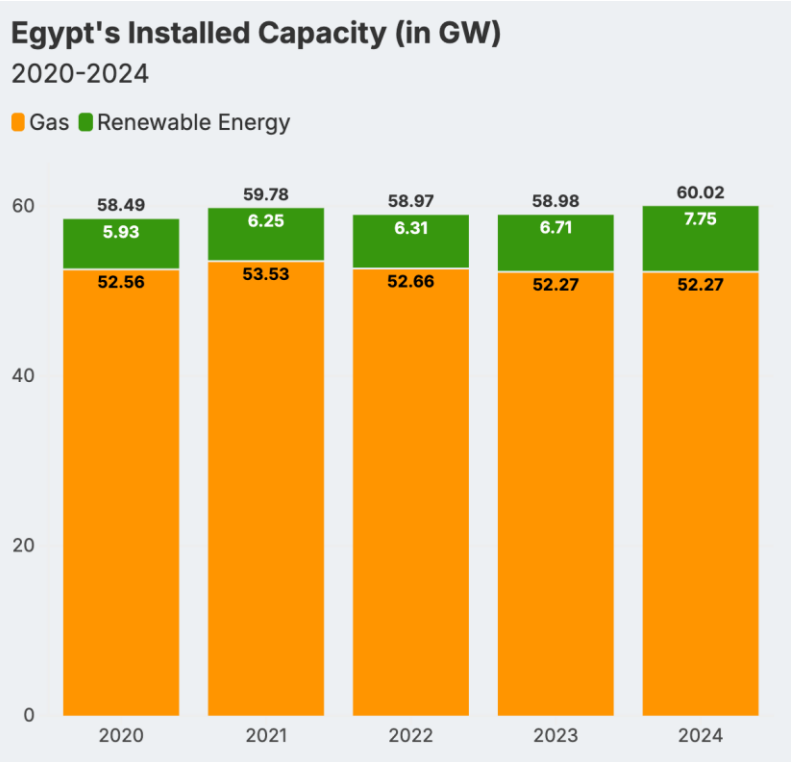
Energy Data

Shift in Installed Capacity & Generation Mix over the years

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



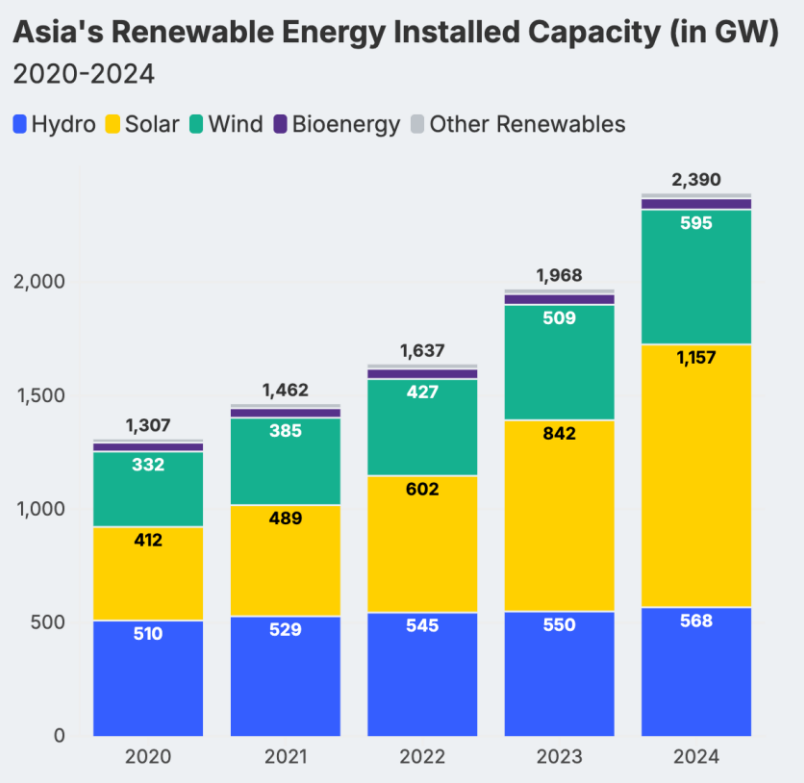


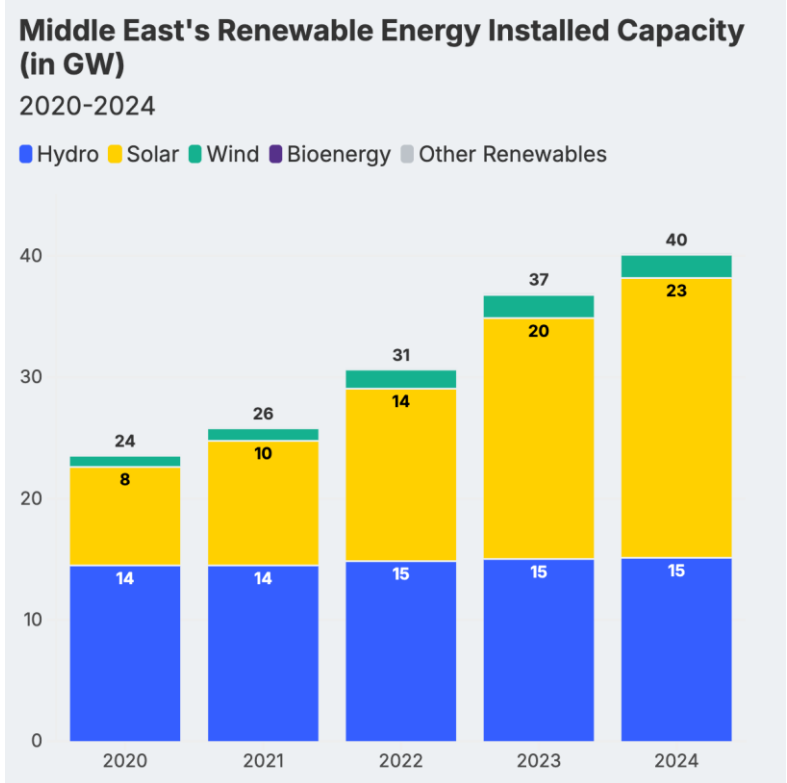


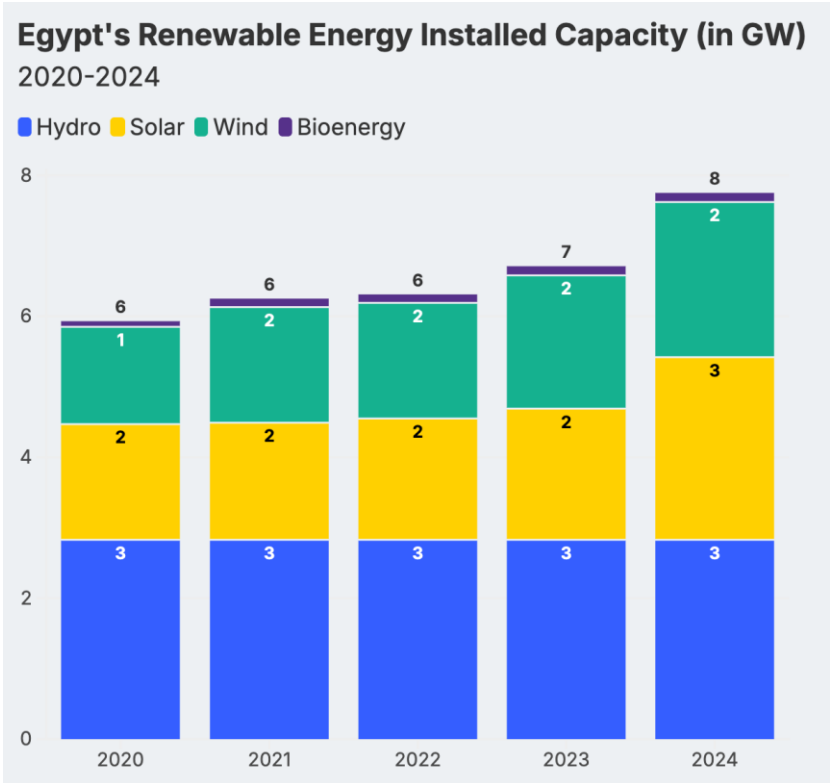
Source: Ember

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

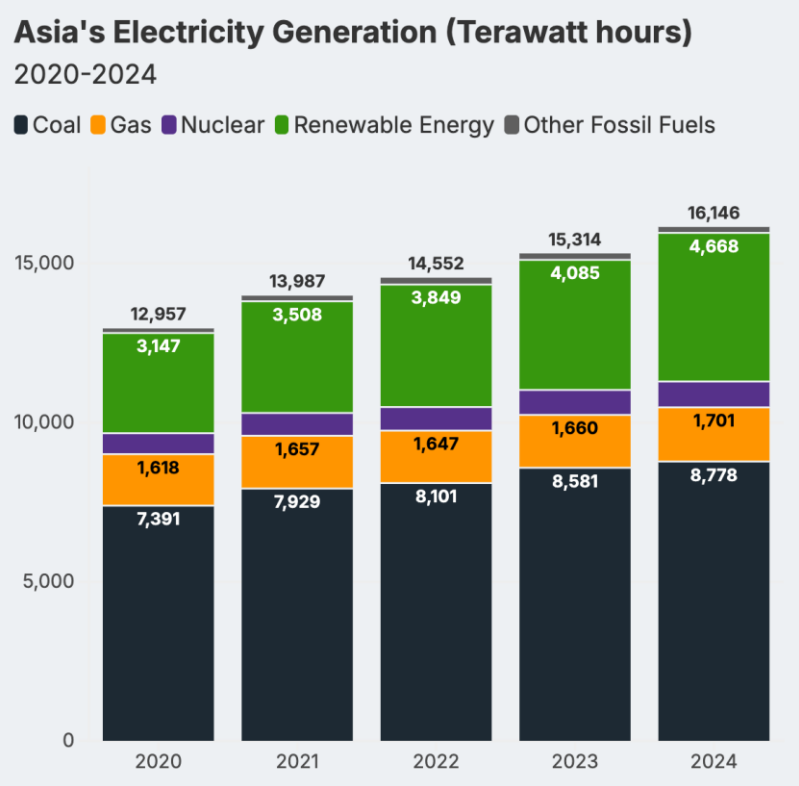


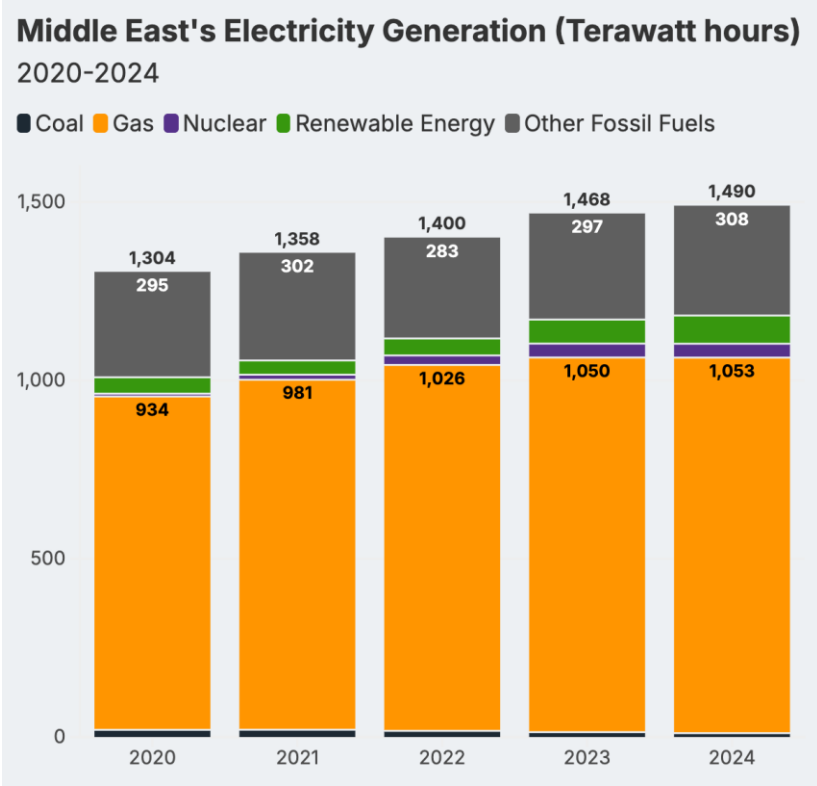


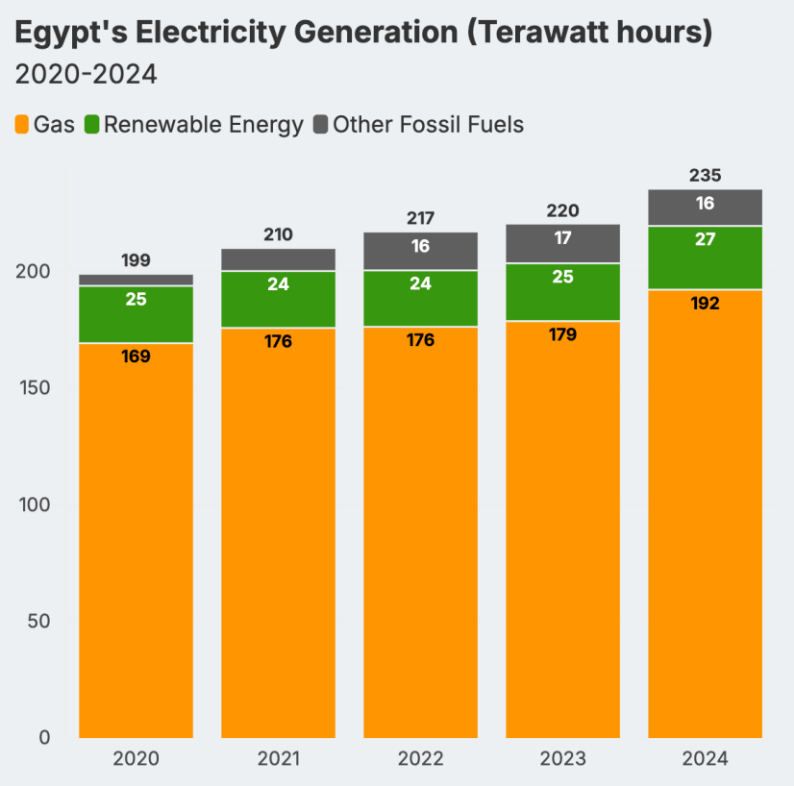


Source: Ember Note: Other Renewables generation includes geothermal, tidal and wave generation.

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







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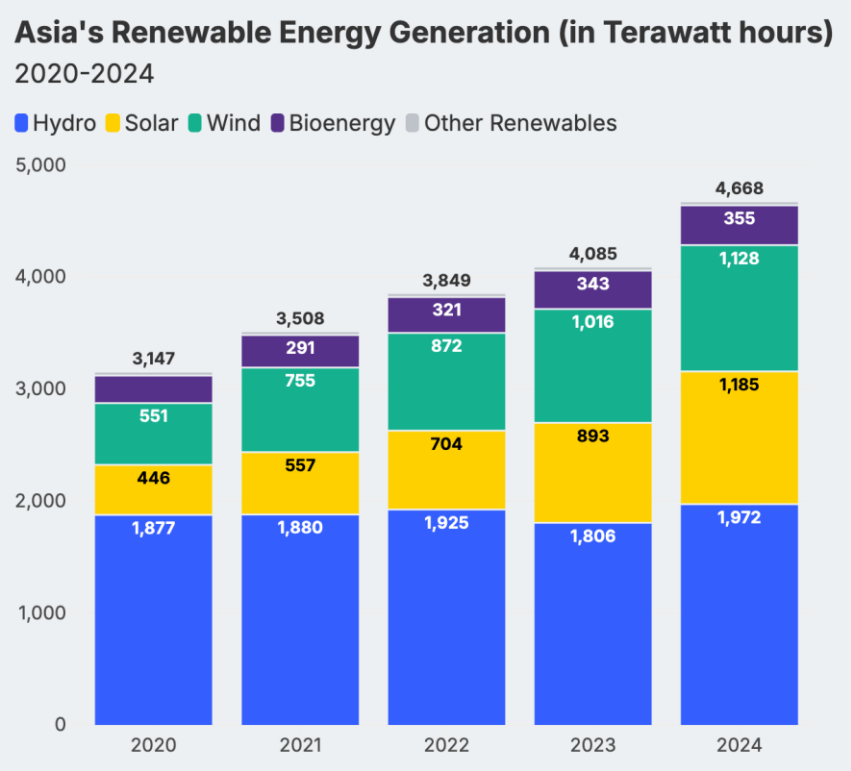

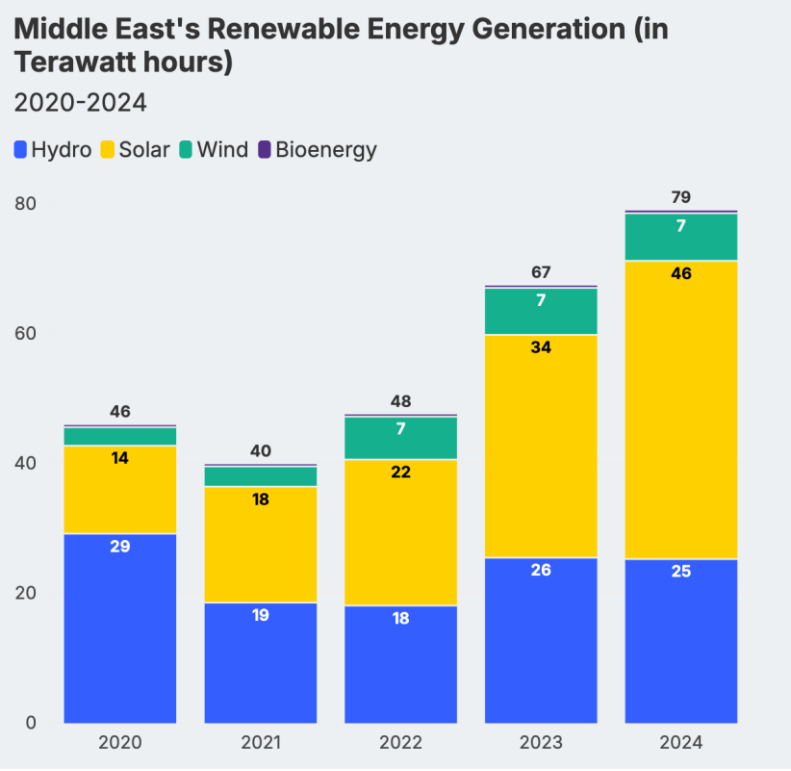

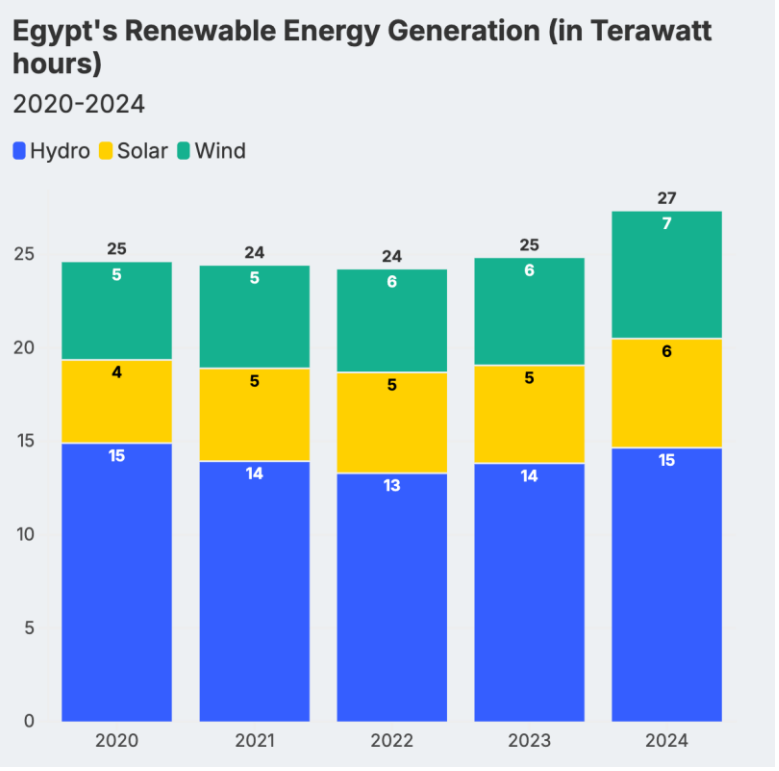

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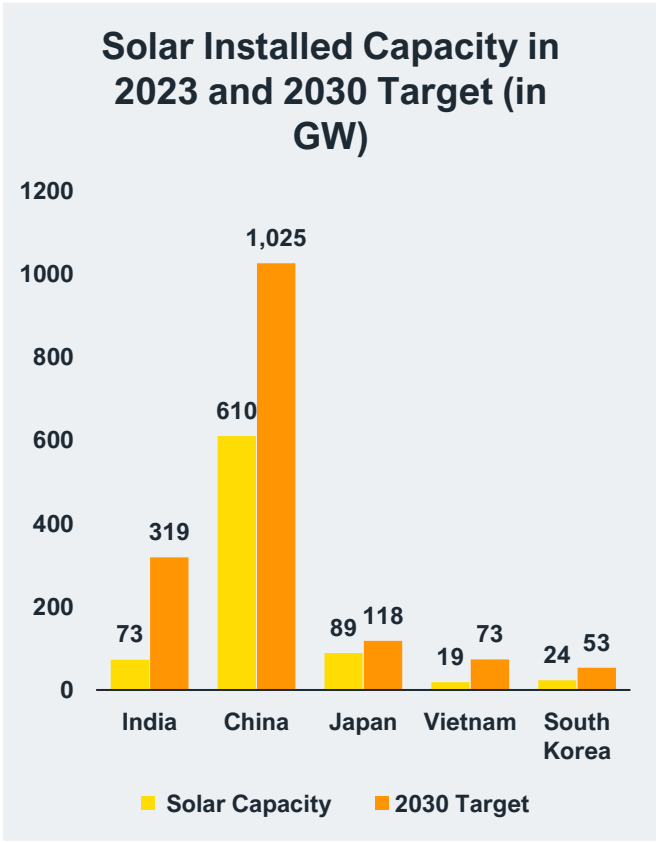
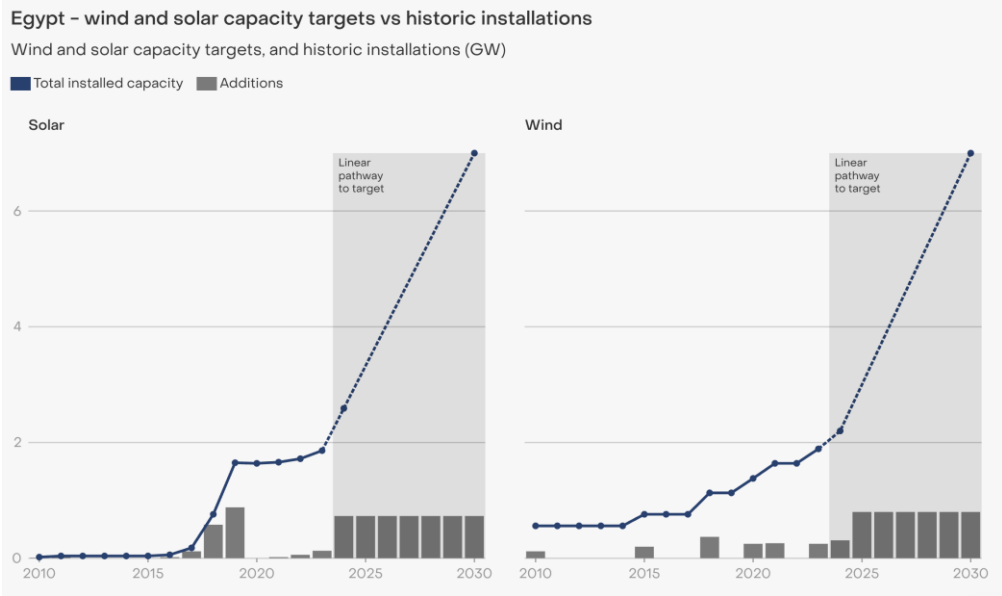
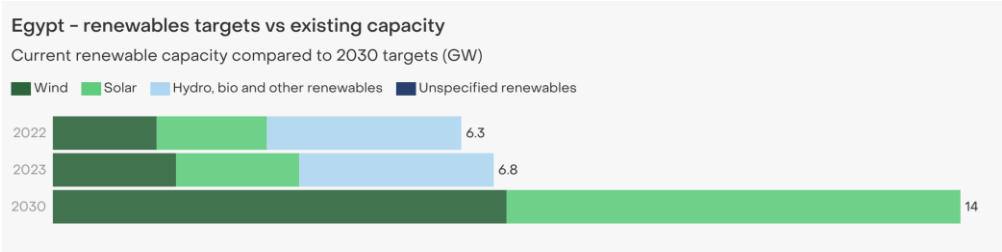
2030 renewable energy target

Targets for Countries in Asia



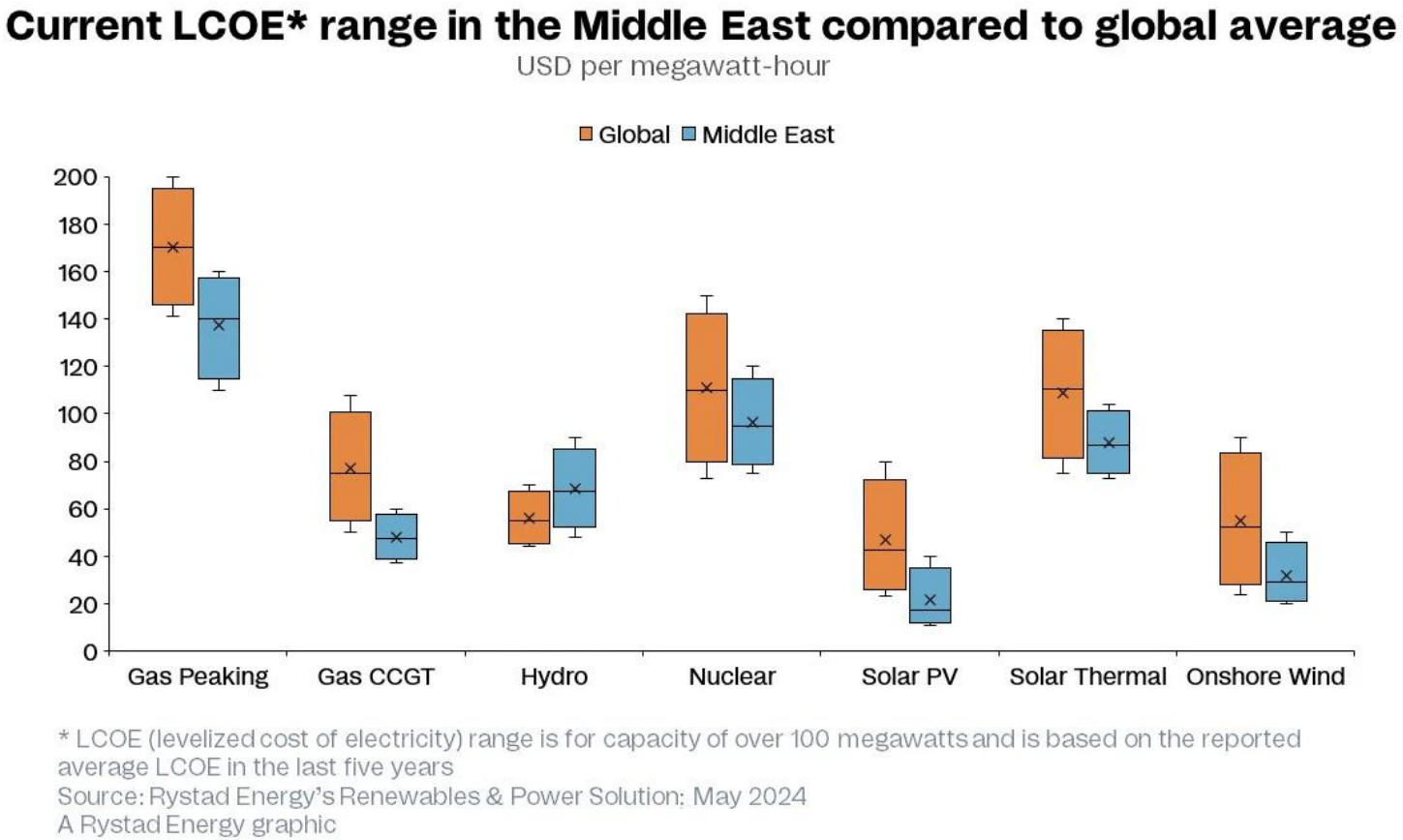
Egypt





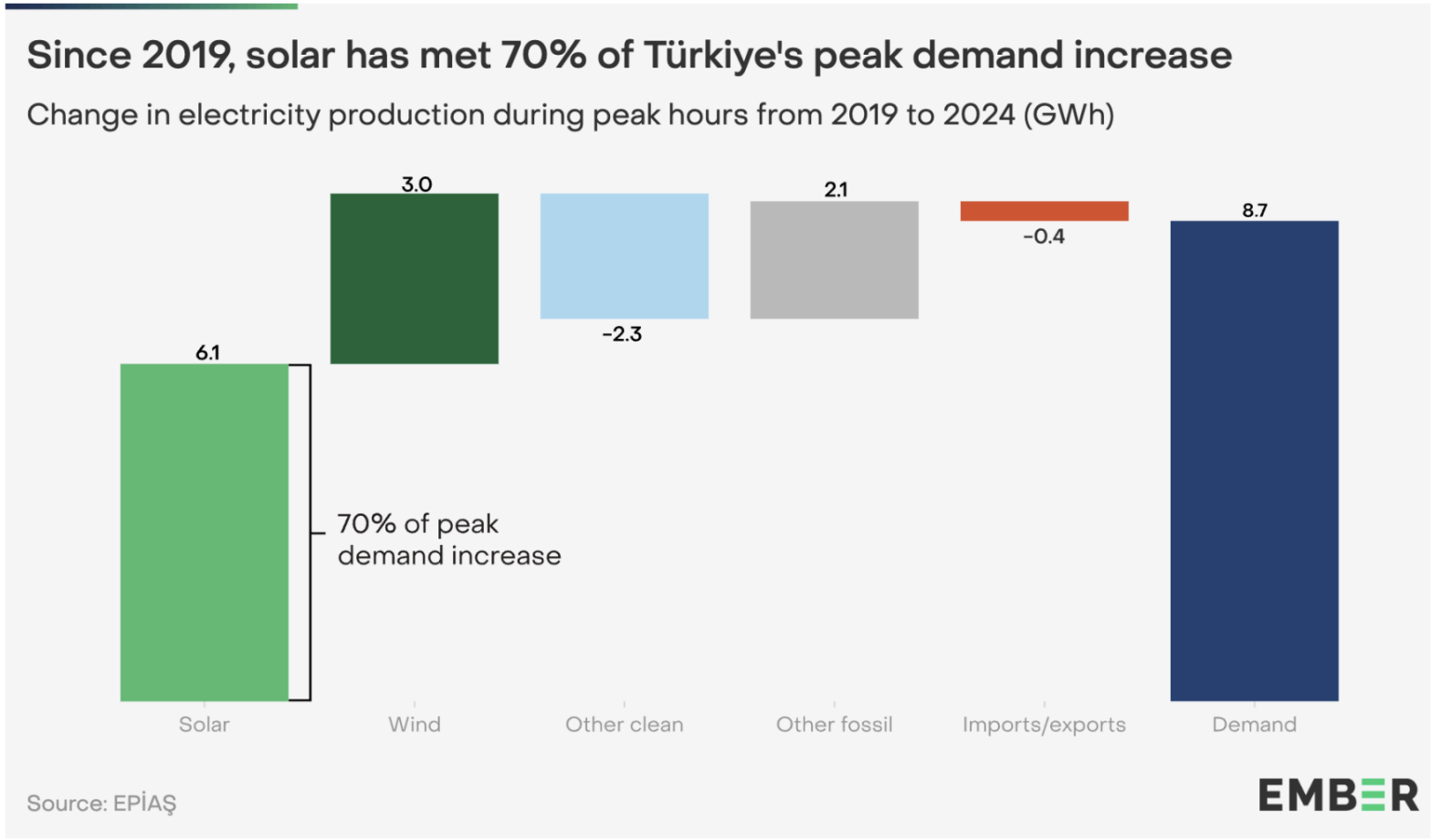
Source: Ember

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



Source: Rystad Energy

Solar can meet the peak demand effectively

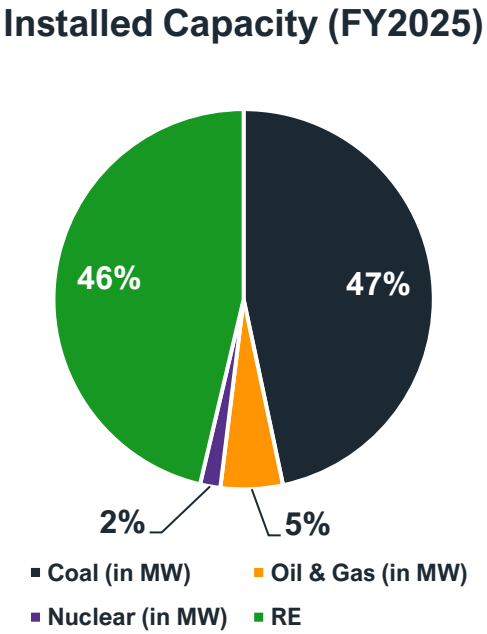


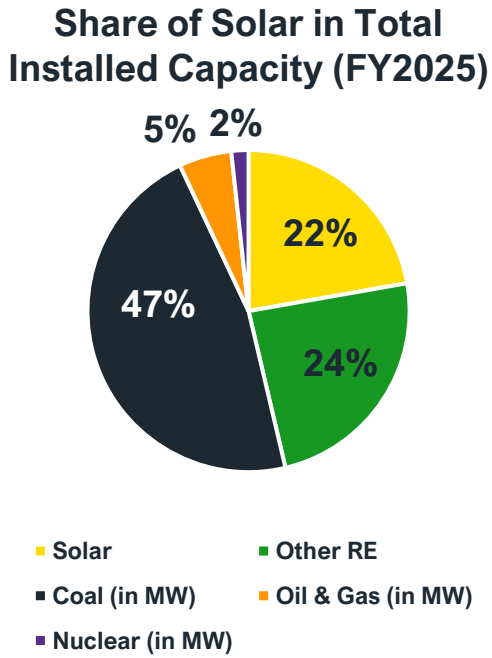
Source: Ember

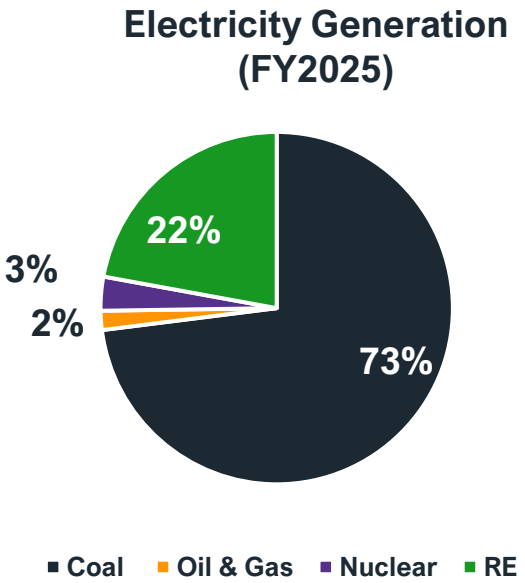
India

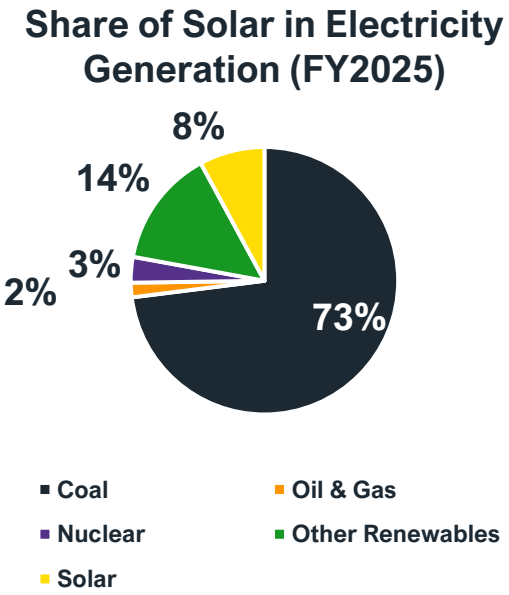
Case Study

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







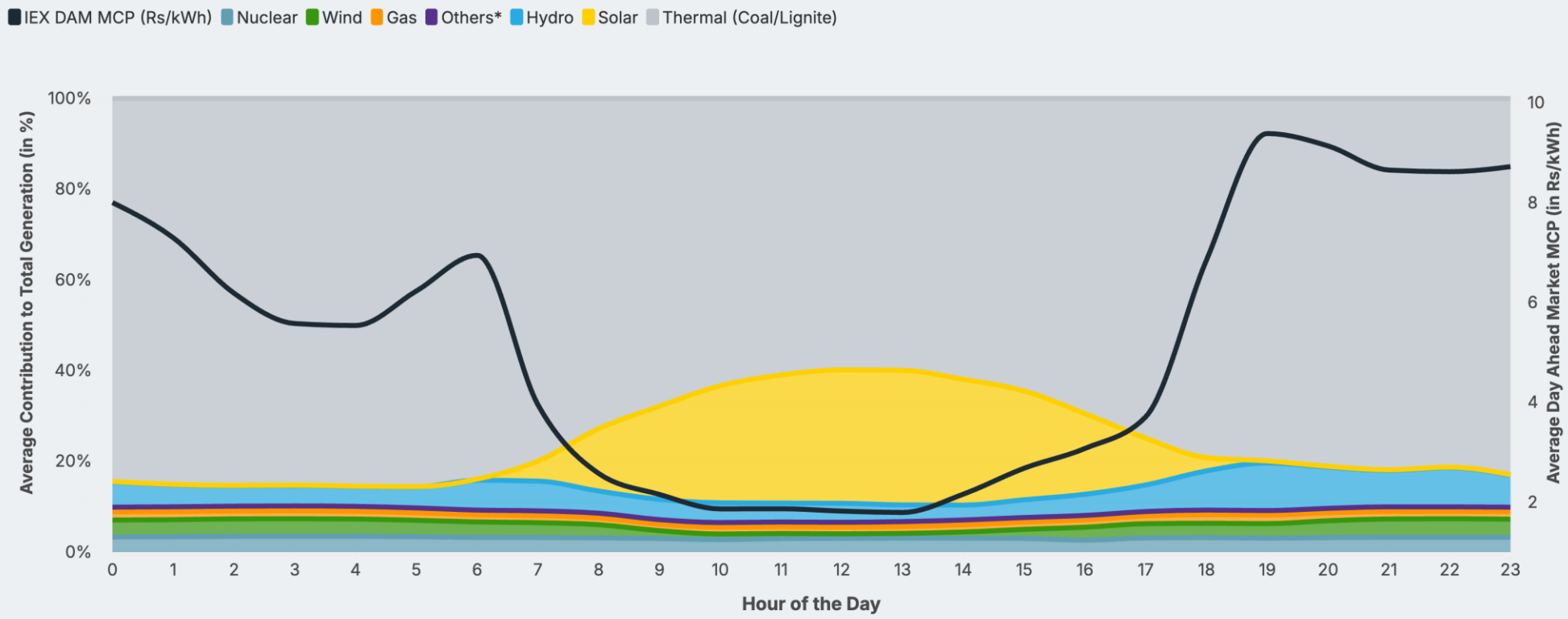


Source: Niti Aayog

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



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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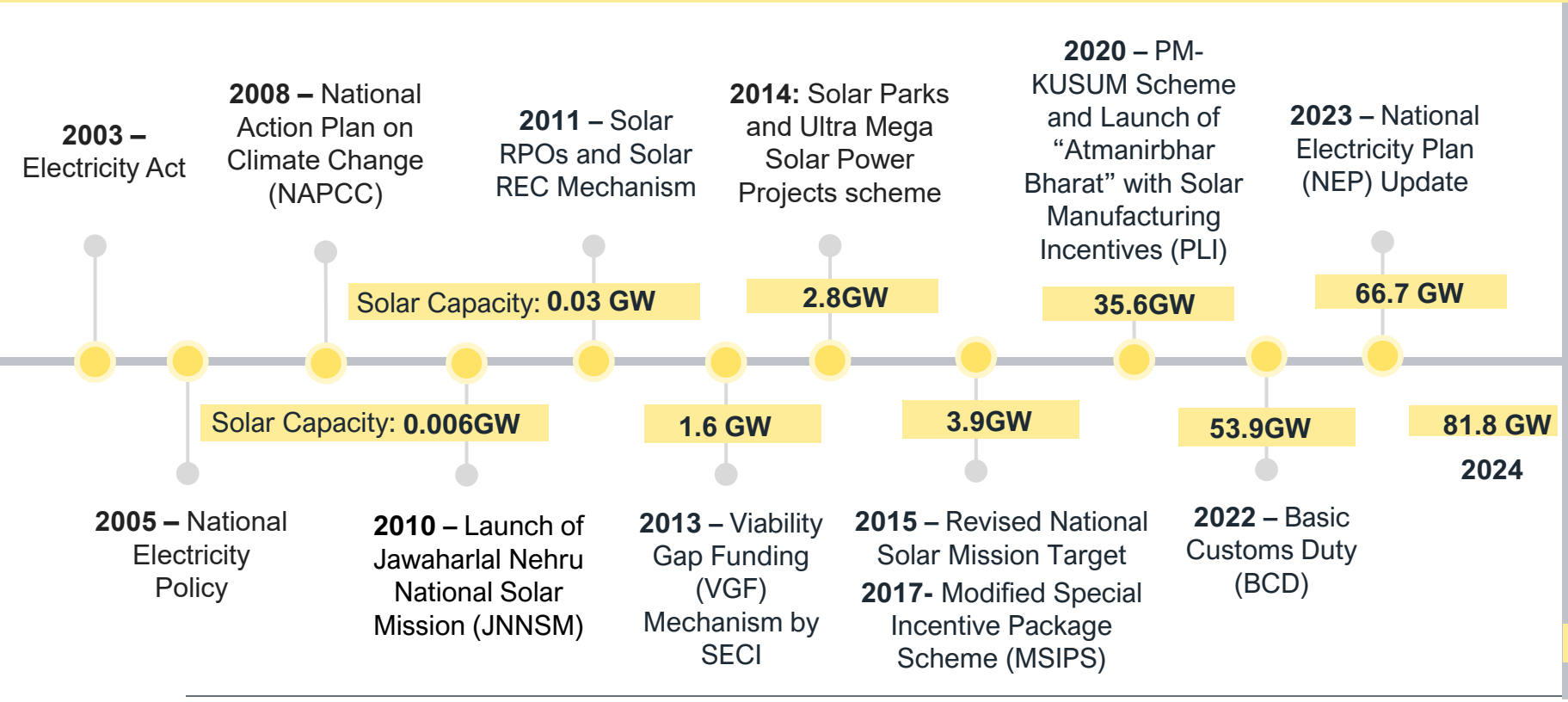
Policies driving solar deployment

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.

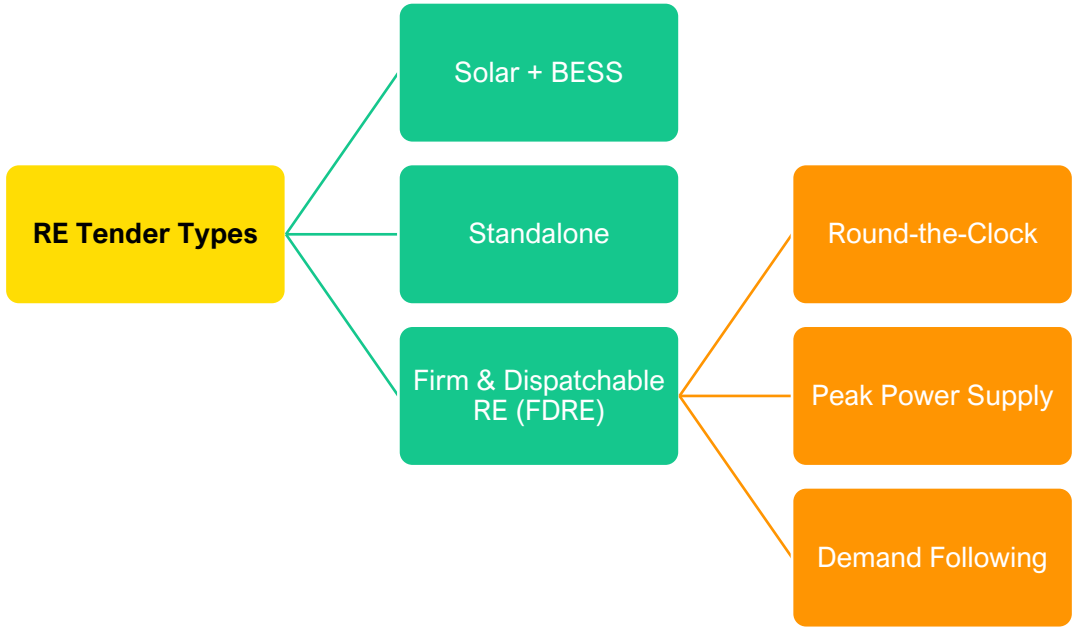
Standard Bidding Guidelines:
Competitive bidding for solar power procurement helps lower electricity tariffs and promote cost-effectiveness.

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

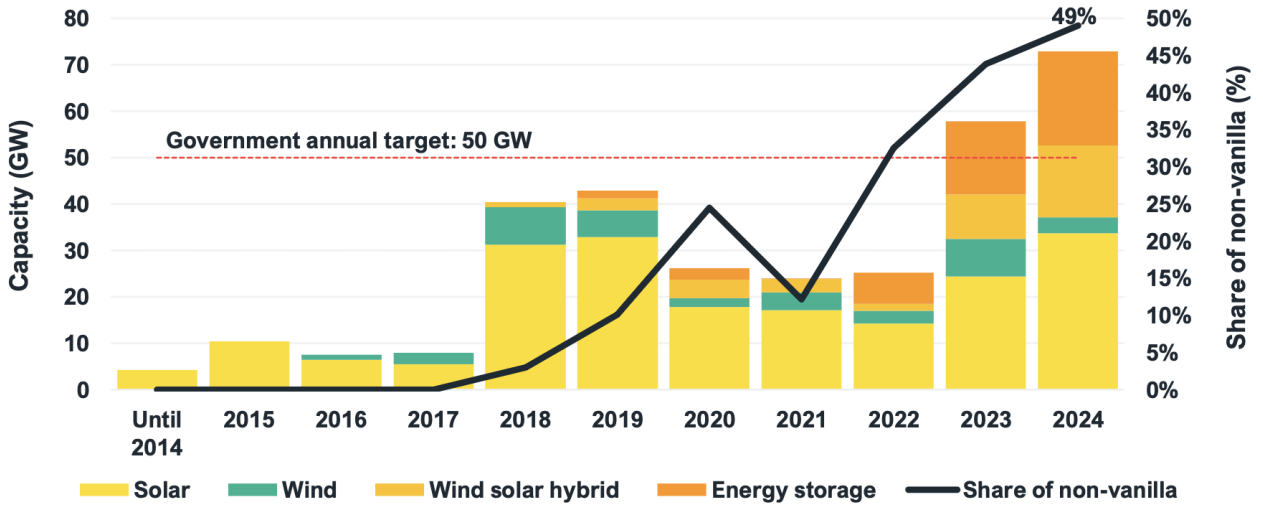
Green Open Access Rules
Simplified procedures and reduced thresholds for consumers to buy solar power directly from developers.

Tender evolution

ESS Tender Types Under Utility-scale Applications



Renewable Energy Issuance, Annual Trend

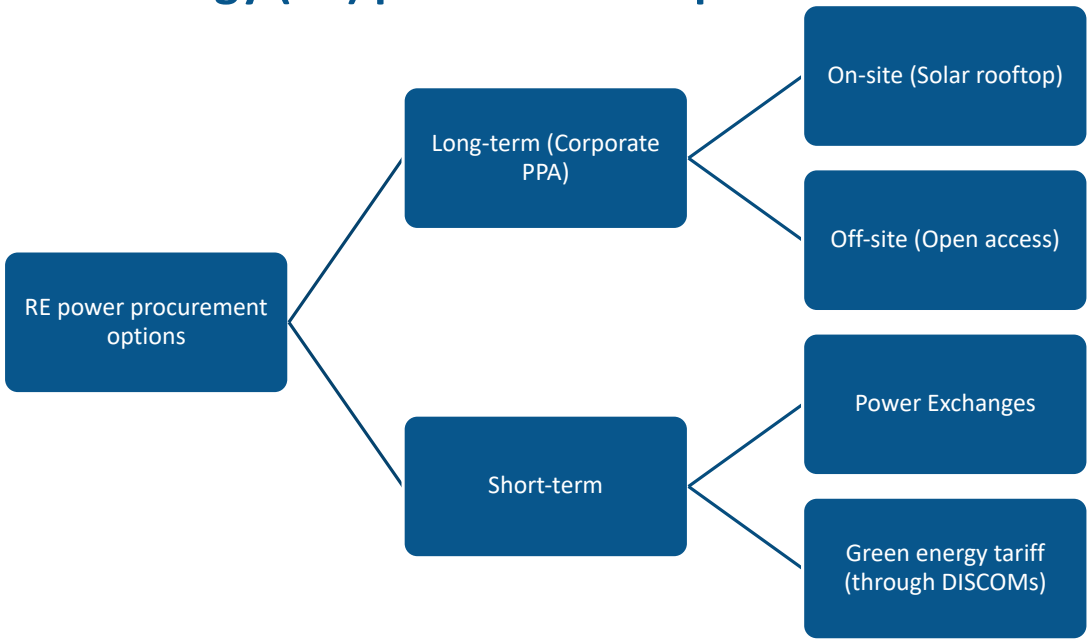


Source: JMK Research database

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

RE OA power procurement models

Third-Party

- Developer owns and operates the OA project.
- Generally all OA charges applicable

Captive

- C&I consumer owns at least 26% of the plant.
- C&I consumer uses at least 51% of the electricity generated.
- Cross subsidy surcharge and additional surcharge waived off.

Group-Captive

- C&I consumers collectively own at least 26% of the plant.
- C&I consumers collectively use at least 51% of the electricity generated.
- Cross subsidy surcharge and additional surcharge waived off.

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 construction' domestic module manutacturing

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, secoritization of solar assets

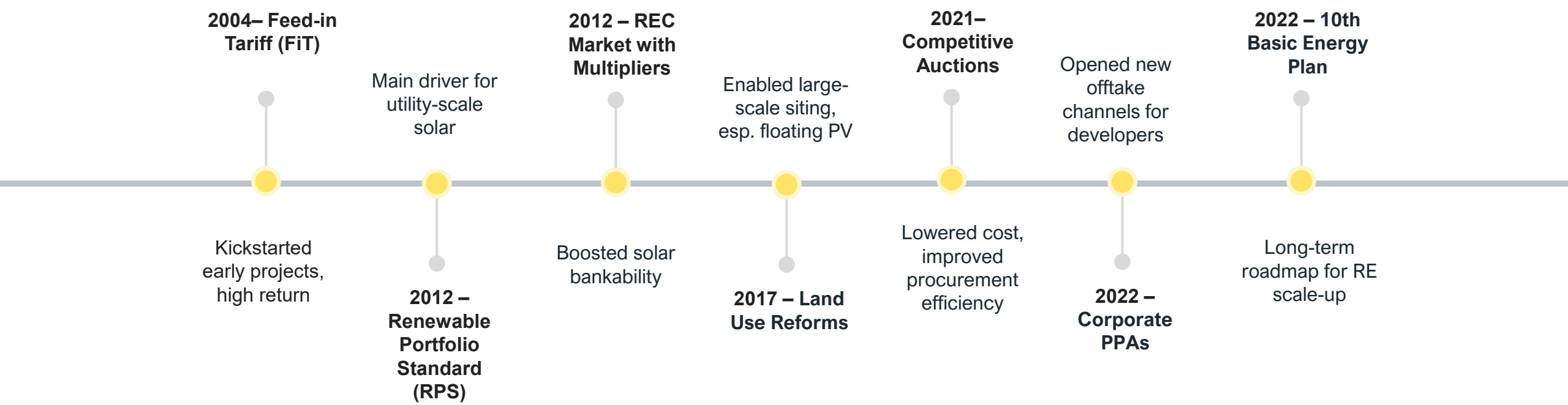
Green Bonds & Capital Markets
ReNew, Greenko have raised international green bonds

Sovereign & Institutional Support
SECI Payment Guarantees, IREDA Refinance Scheme
Clean Energy Funds (NCEF)

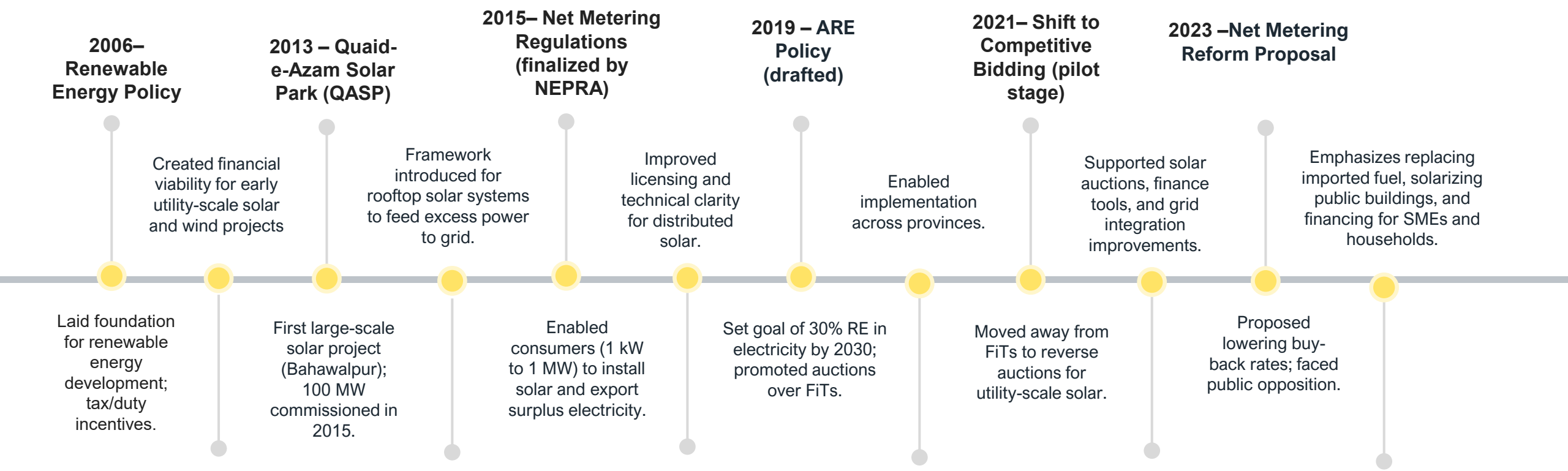
Other Asian Countries

Case Study

South Korea: Solar policy tools



Pakistan: Solar policy tools



Thank you

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