RENEWABLES FIRST

Solar Rush

in Pakistan

What's Next and Who Follows?

Muhammad Basit Ghauri

About Us

Our Mission

We aim to drive energy transition through impactful research, advocacy, and strategic communications and building the field with a focus on inclusivity and immediate accelerated action.

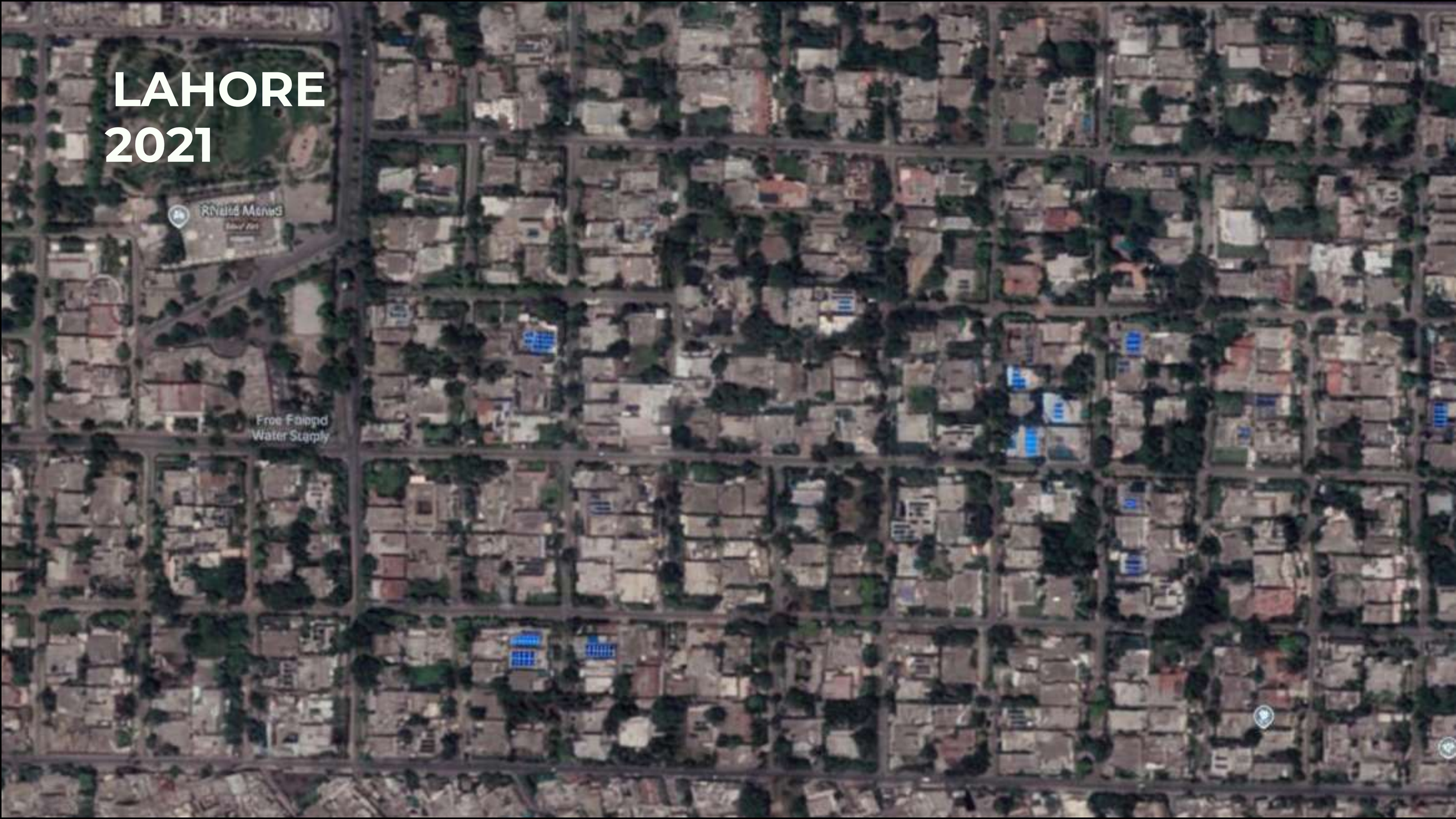
Our Core Pillars

We deploy four interconnected approaches to drive meaningful change:

- **Research:** Generating data-driven insights to inform policy and investment.
- **Advocacy:** Engaging stakeholders to promote progressive reform.
- **Field Building:** Strengthening ecosystems for innovation and impact.
- **Strategic Communications:** Shaping public discourse and driving awareness.

What this session covers

- What drove the Solar Rush, How it was financed, and What It Changed
- What Pakistan got right and What it missed
- A new transition pathway from the Global South and Who could be next
- How the conditions compare with Bangladesh and What comes next

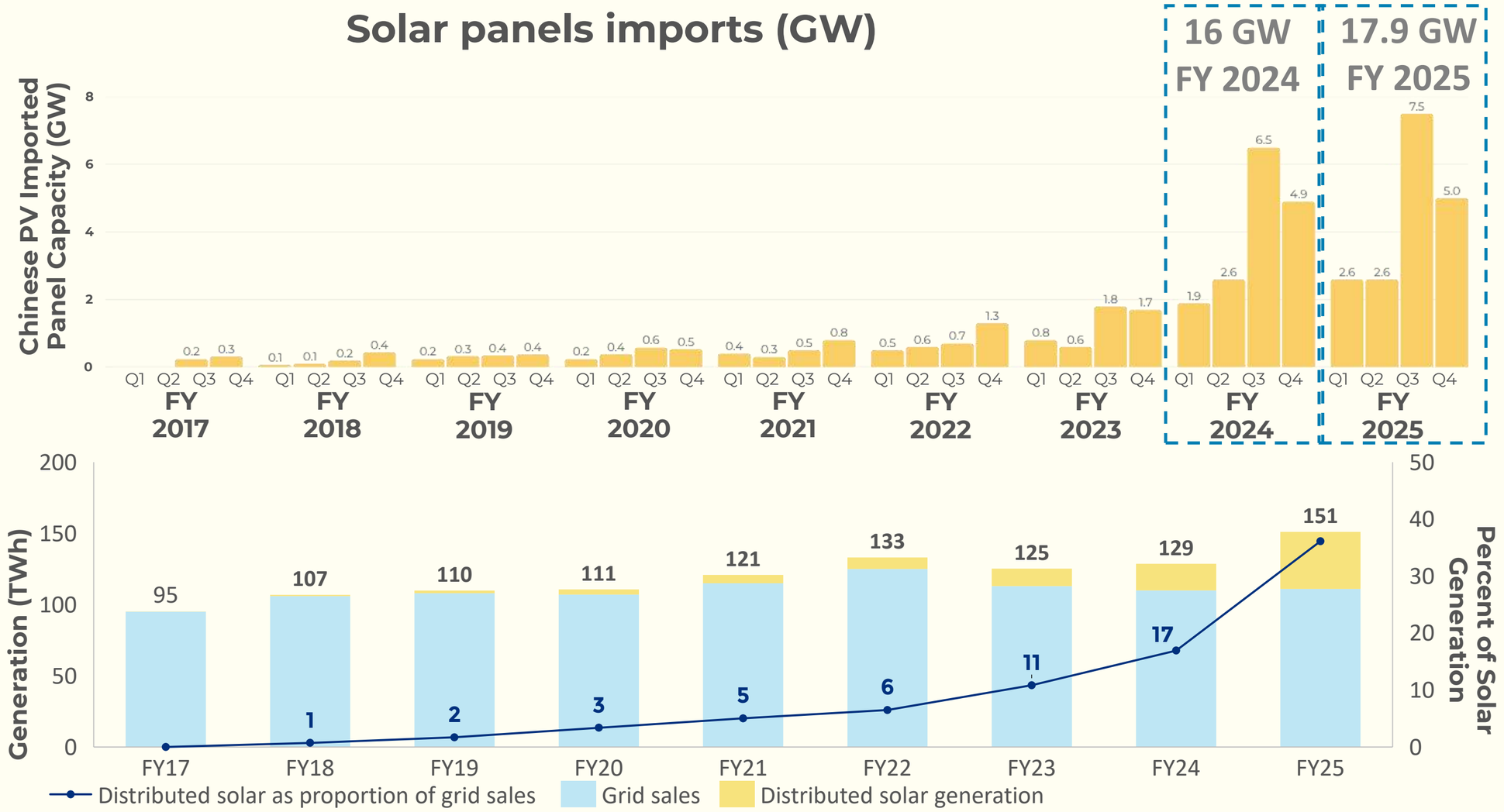

LAHORE
2021


LAHORE
2024
Free Fidosol
Weter Supply

…and the sea!

Source: Shamsi Stills (Jawad Sharif Films)

Pakistan has now imported more solar than its entire utility-scale grid capacity and the rush is not over



Imports increased by 8x in a year

~ 28-38 GW is deployed

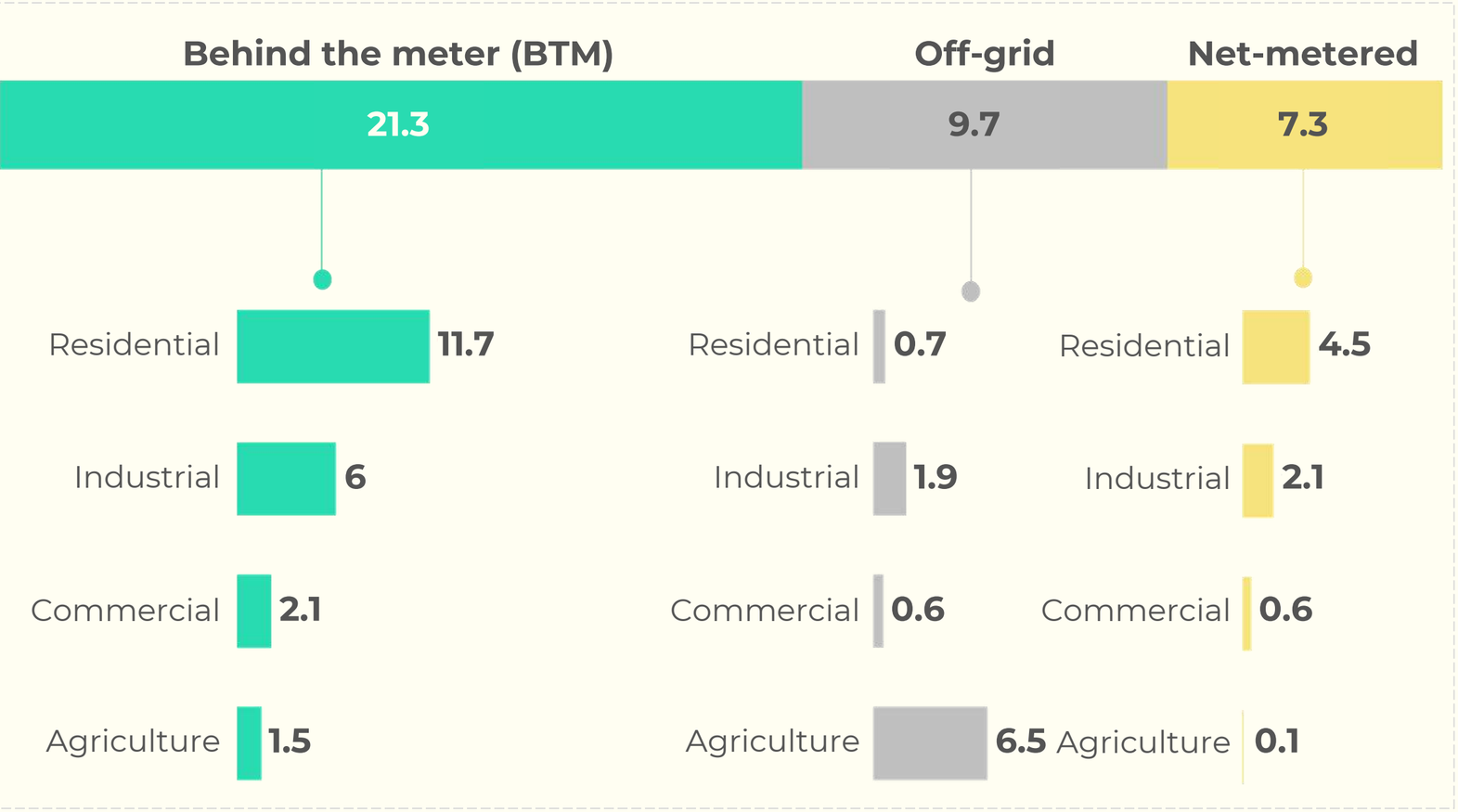
~98% deployed at distributed level

DG Solar is 46% of net grid sales

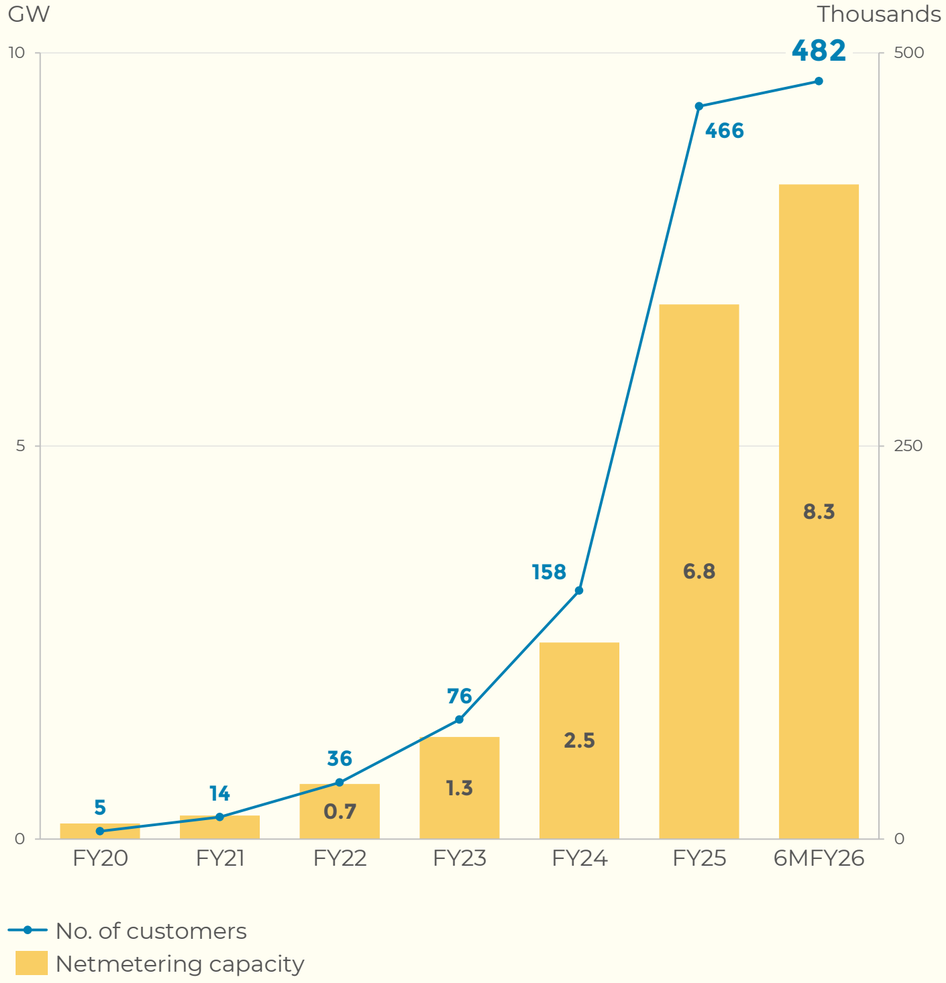
Data Source: NEPRA SIR, RF Insights

Most of this solar is being deployed behind the meter

Estimated sector-wise solar deployed, FY25



Cumulative Net-metering (GW)

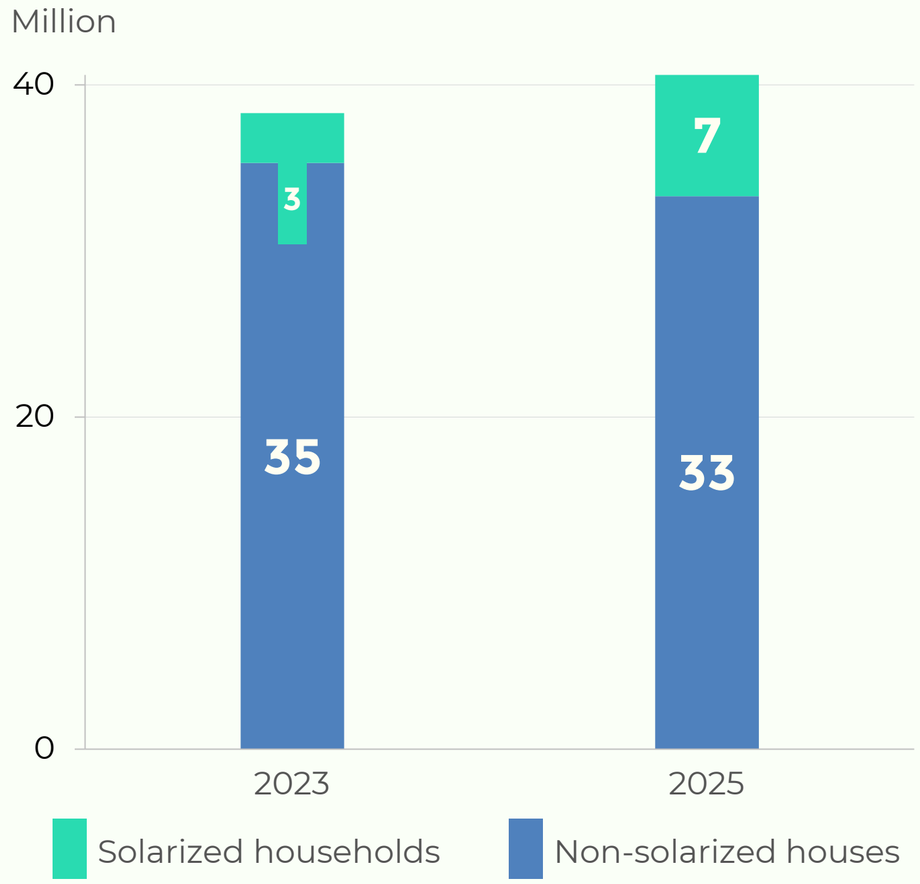


**7.3 GW includes 20% oversizing of residential net metered capacity*

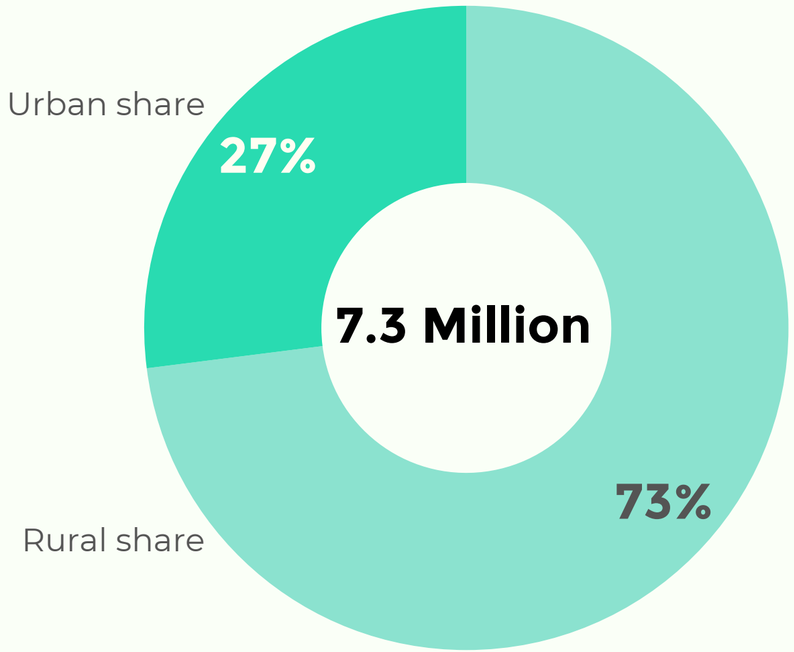
Data source: Renewables First analysis

The rush is not a niche urban trend – it is a widespread transition across rural and urban sector.

Solarized and non-solarized houses 2023 vs 2025



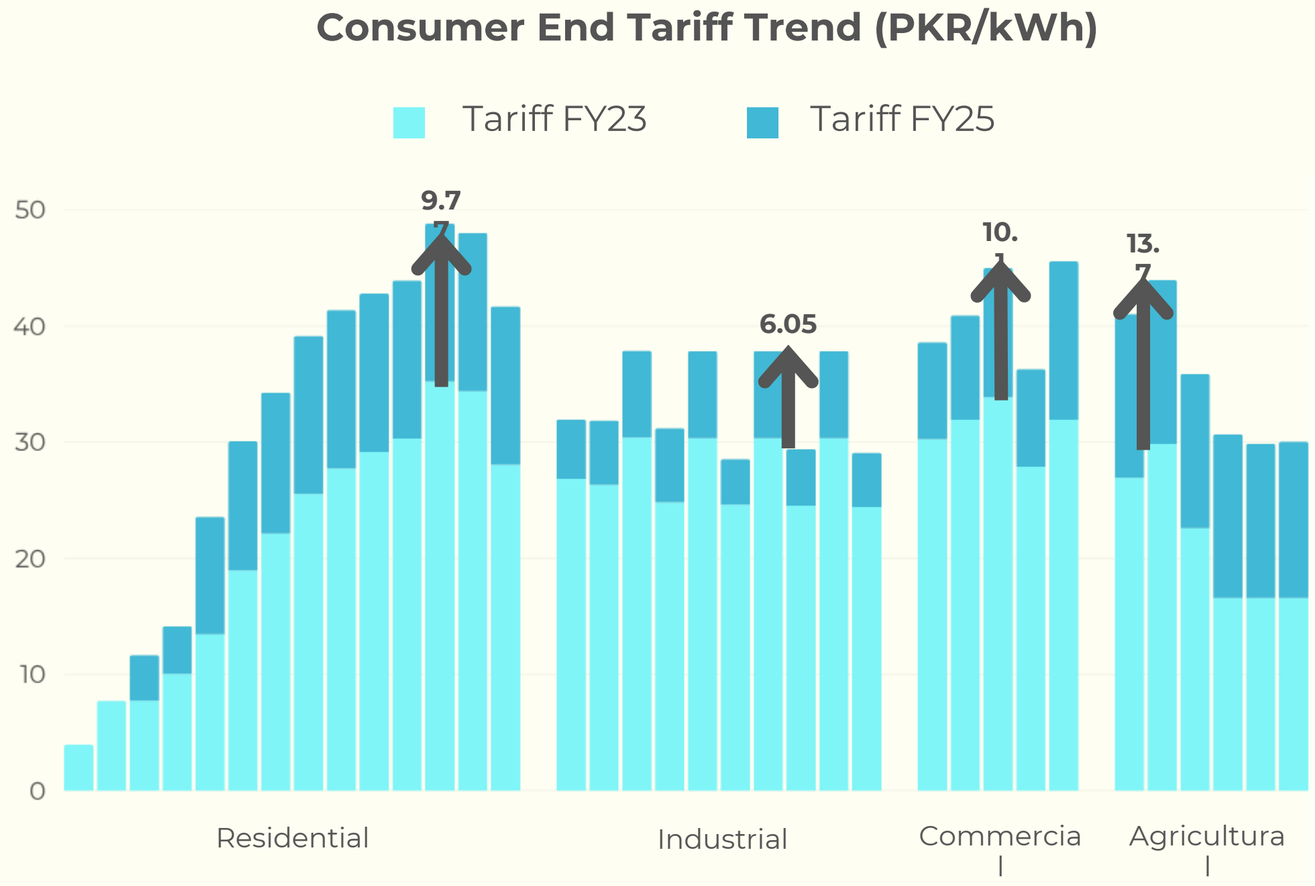
Solarized households 2025 Rural vs urban split

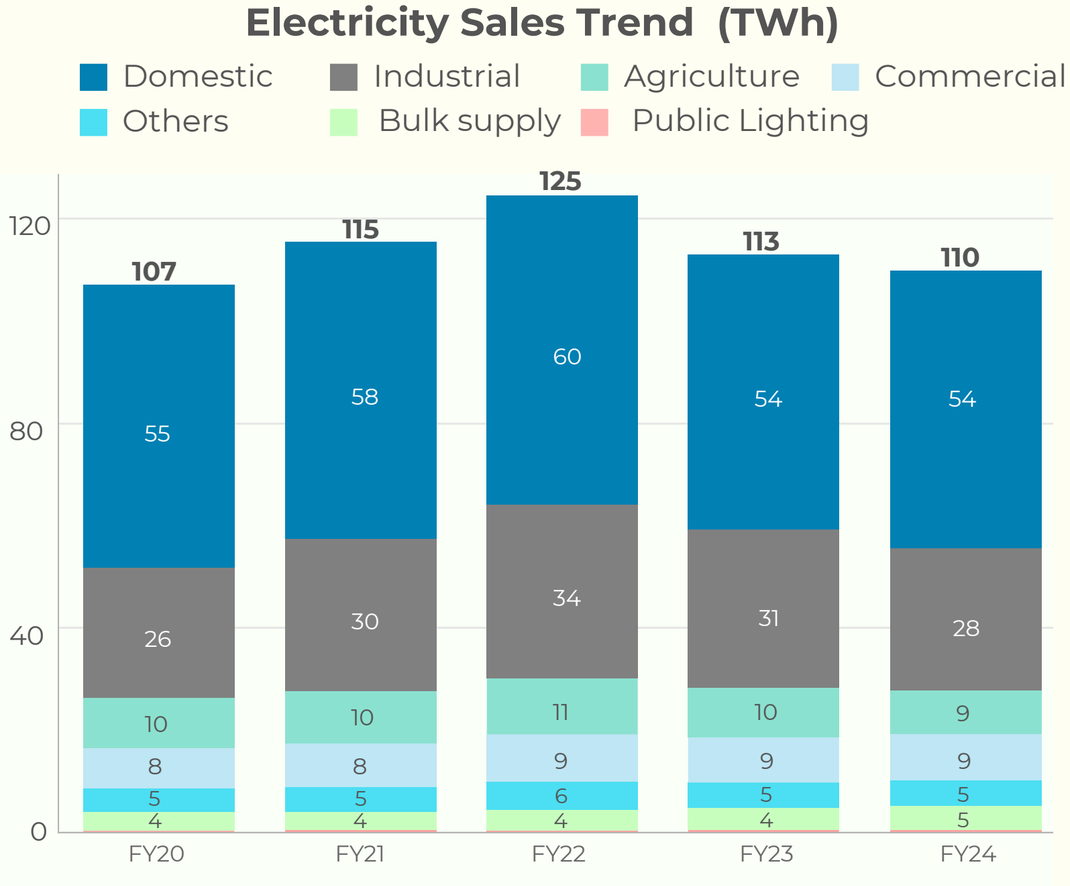


Data source: Renewables First analysis

Inside the Perfect Storm

In crisis, the grid priced itself out of the market





Demand contraction despite GDP

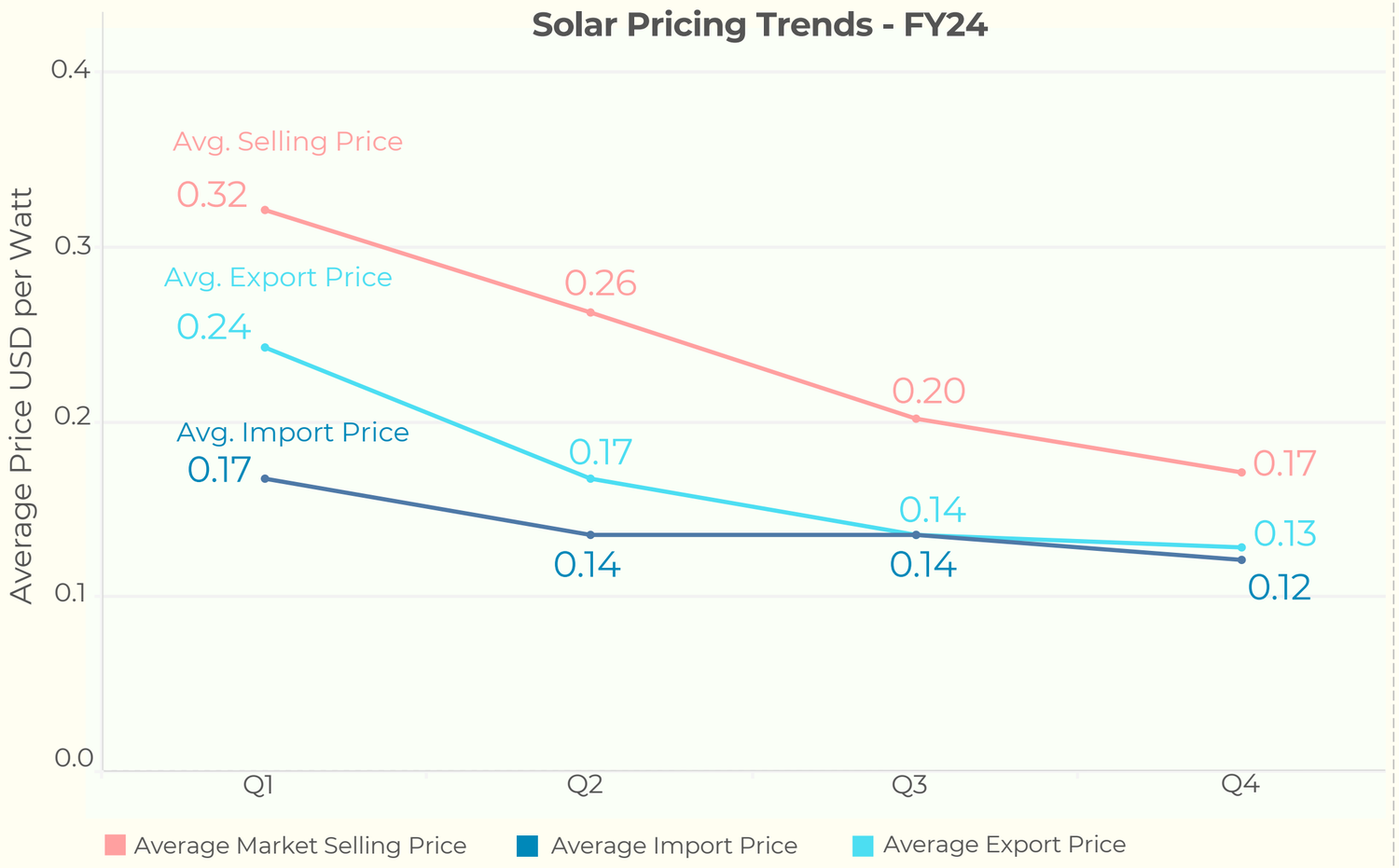
Trust erosion in grid

Tariff shock escalation

Solar as cost hedge

Data Source: NEPRA SIR, RF Insights

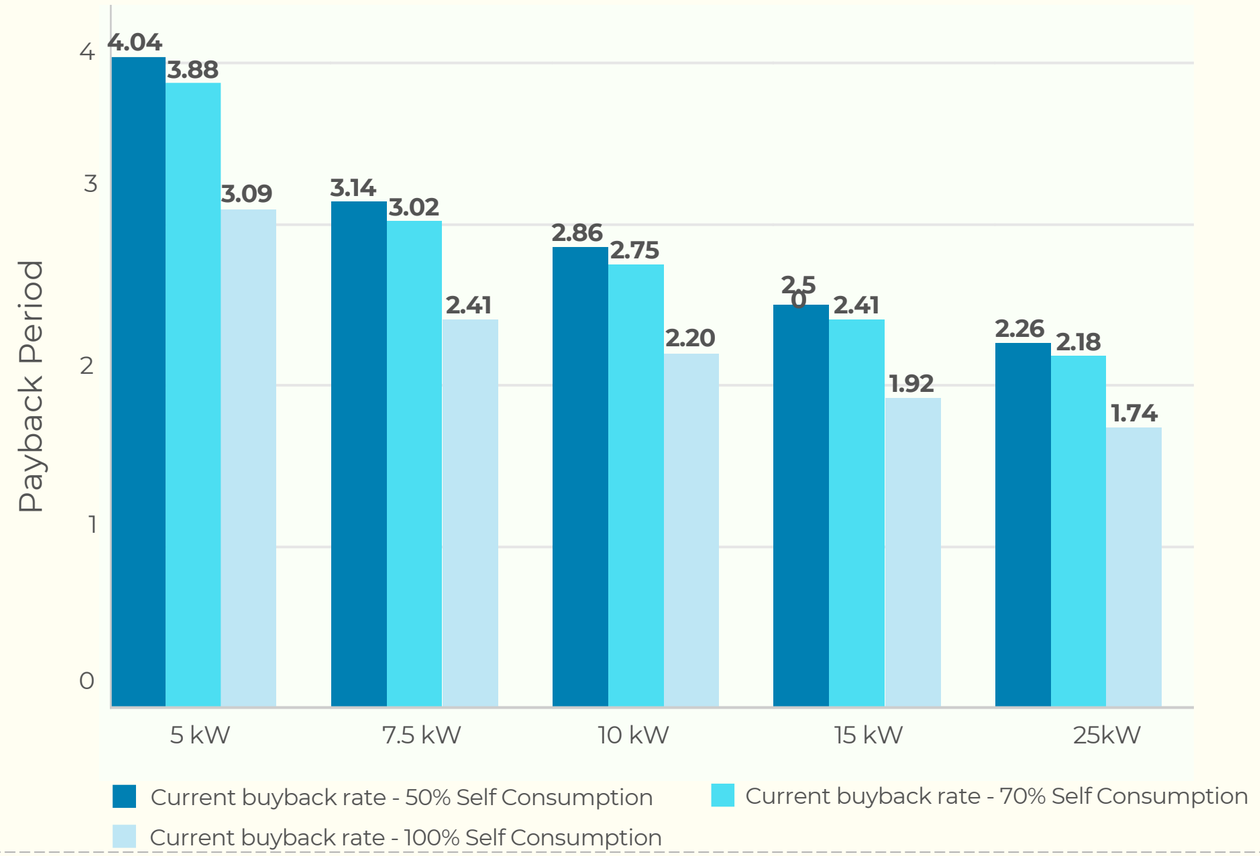
China flooded the market; Prices collapsed; Pakistan absorbed it.



- China's PV panel **oversupply** has triggered record module price drops.
- PV module costs fell from 24 ¢/W to ~13 ¢/W in FY24, a **43% decline in 2023** alone.

Data Source: EMBER, RF Insights

The government opened the door and stepped aside.

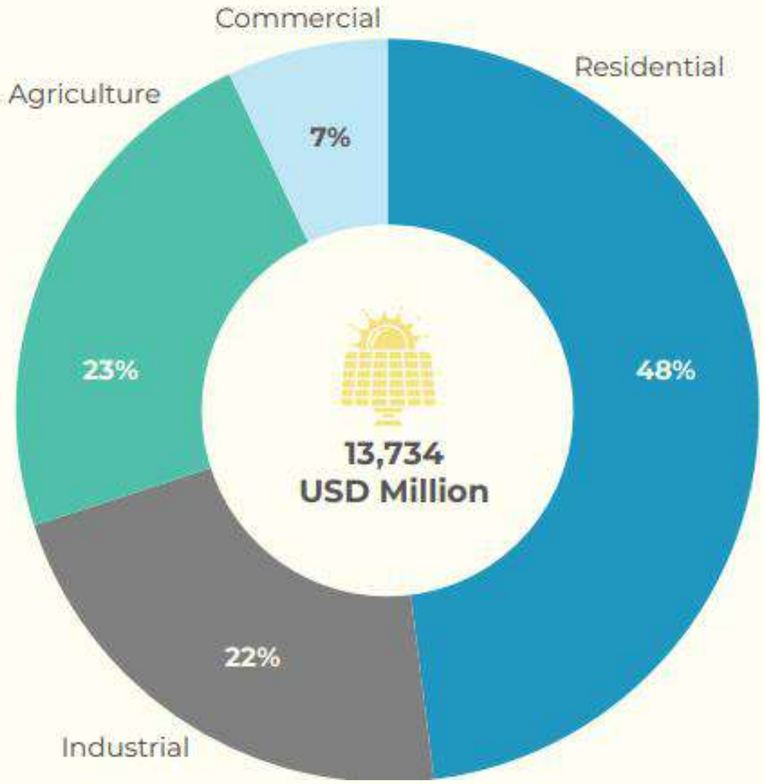


- **Net-metering policy** enabled consumers to become prosumers, with simplified licensing for systems <25 kW.
- **State Bank's concessional RE scheme** (2016–24) financed 4,500 projects, adding 2,061 MW at 6% fixed interest through PKR 94.7 billion in loans.
- **Lucrative buyback rates** (~9 c/kWh) exceeding regional peers, reduced **payback periods** to 2–4 years, increased project returns, and fueled mass adoption.

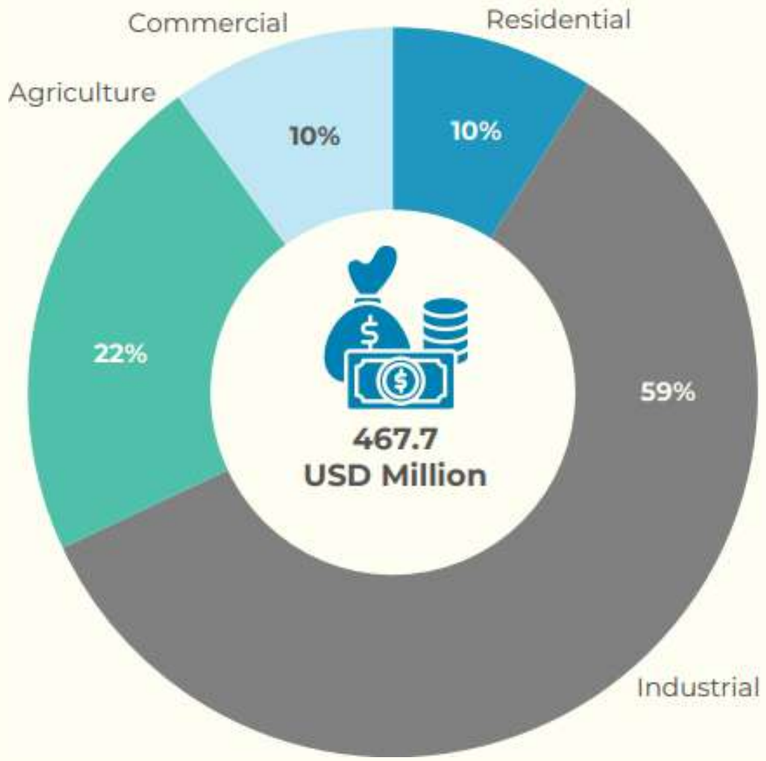
Data Source: IEEFA, RF Insights

Conventional transitions wait for capital markets. This one was funded out of pocket.

Cost of Solar deployment Sector wise, FY25



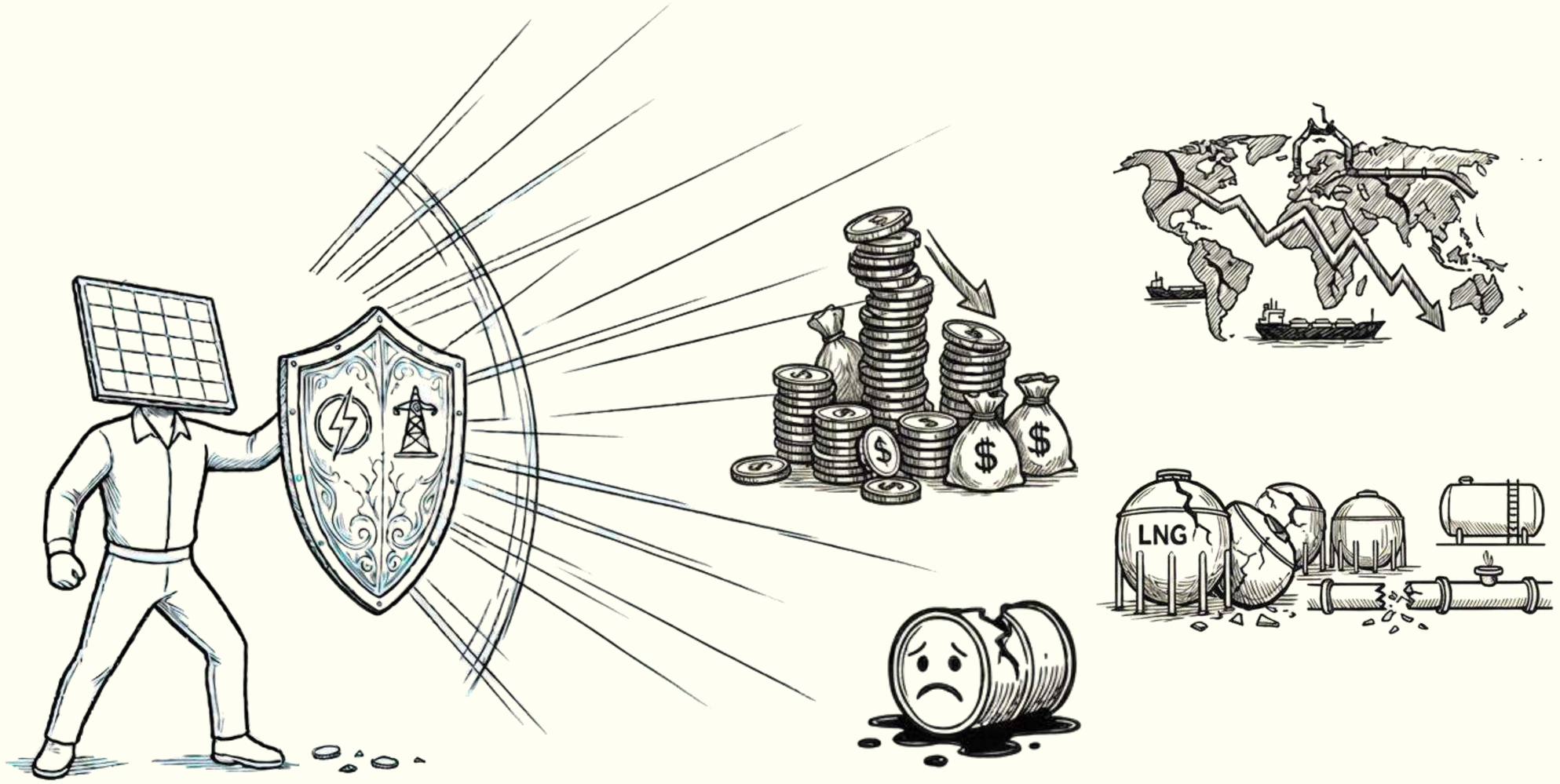
Formal financing share Sector wise FY25



USD 2.1B solar imports in FY24 — ~**22% of foreign reserves** at the time

96.6% of solar adoption is **self-financed** by consumers

More than half of formal financing went to **industry**



What Worked, What Could Work Better

Pakistan' solar rush =

Estimated 35 million tons CO_2-eq

emissions' avoided in **FY25**

Thermal utilization collapse

imported coal plant usage fell from **78%** to **11%** in two years

300,000 direct & 200,000 indirect

jobs in Pakistan

Approx. 15 billion USD

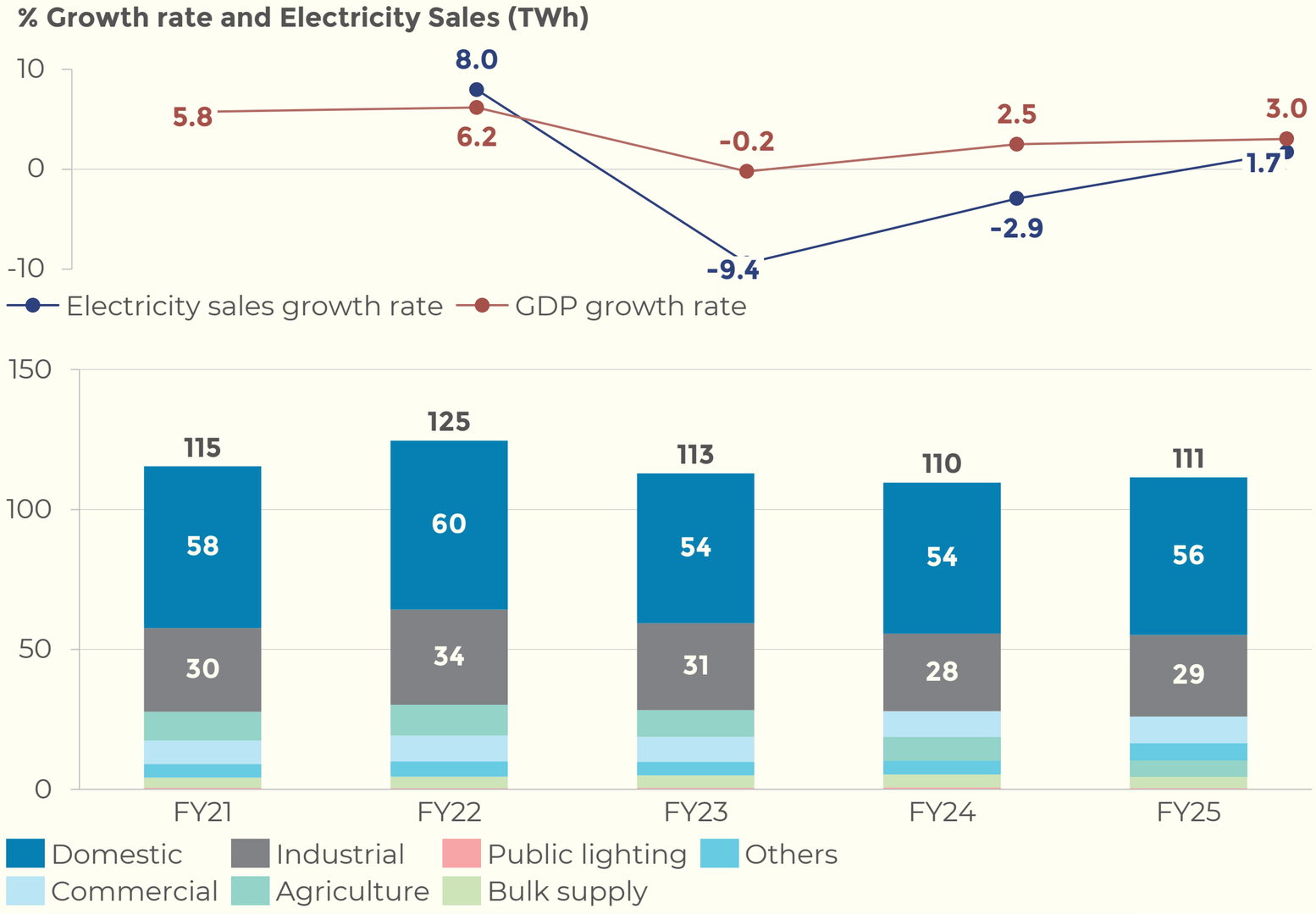
mobilization in private capital in **9** years

=

Clean | **Competitive** | **Economic**

& indigenous source of energy

The conventional link between grid demand and energy growth no longer holds as consumers move off-grid

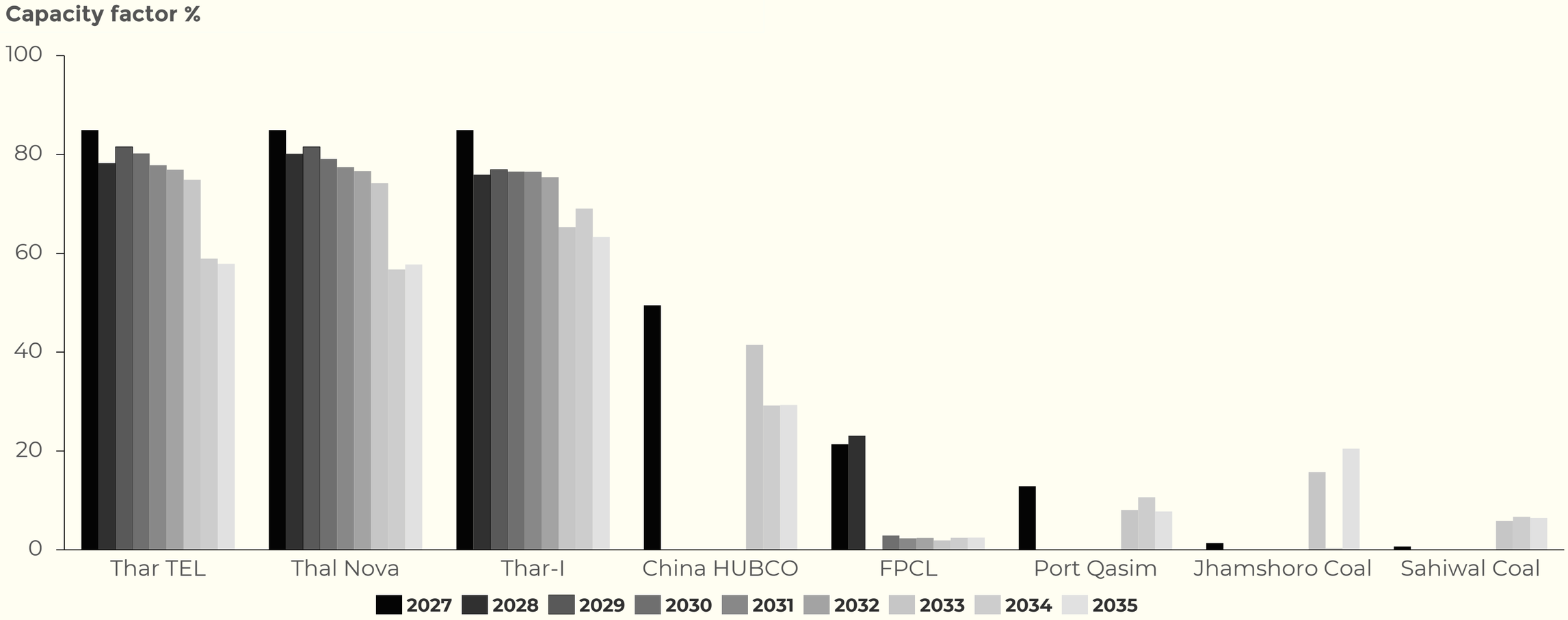


Despite population growth, urbanization, and continued economic expansion, measured energy consumption has shown little growth in recent years -

> **Official data fails to capture 19 TWh of electricity**

Falling grid sales are changing power plant economics, crowding out the RLNG and imported coal-based projects

Plant-wise capacity factor (%) of coal-based plants, FY27 – FY35

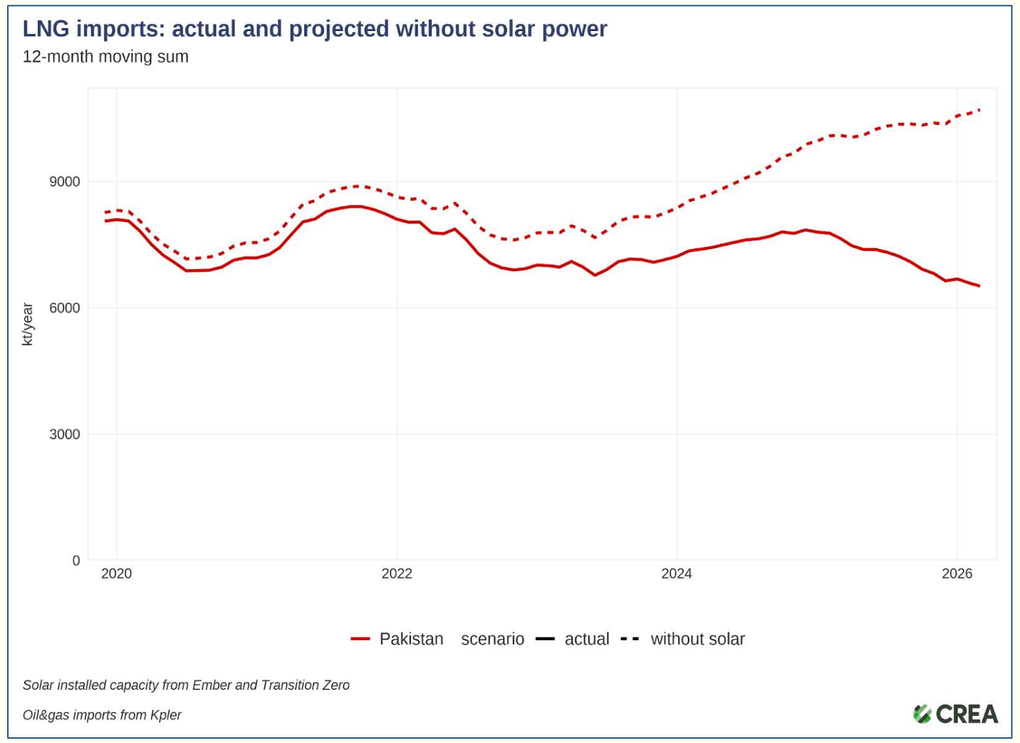


Data source: IGCEP-2025-35 and Renewables First's calculations

Low reliance on fossil fuel helped cushion the country against global fuel price shocks

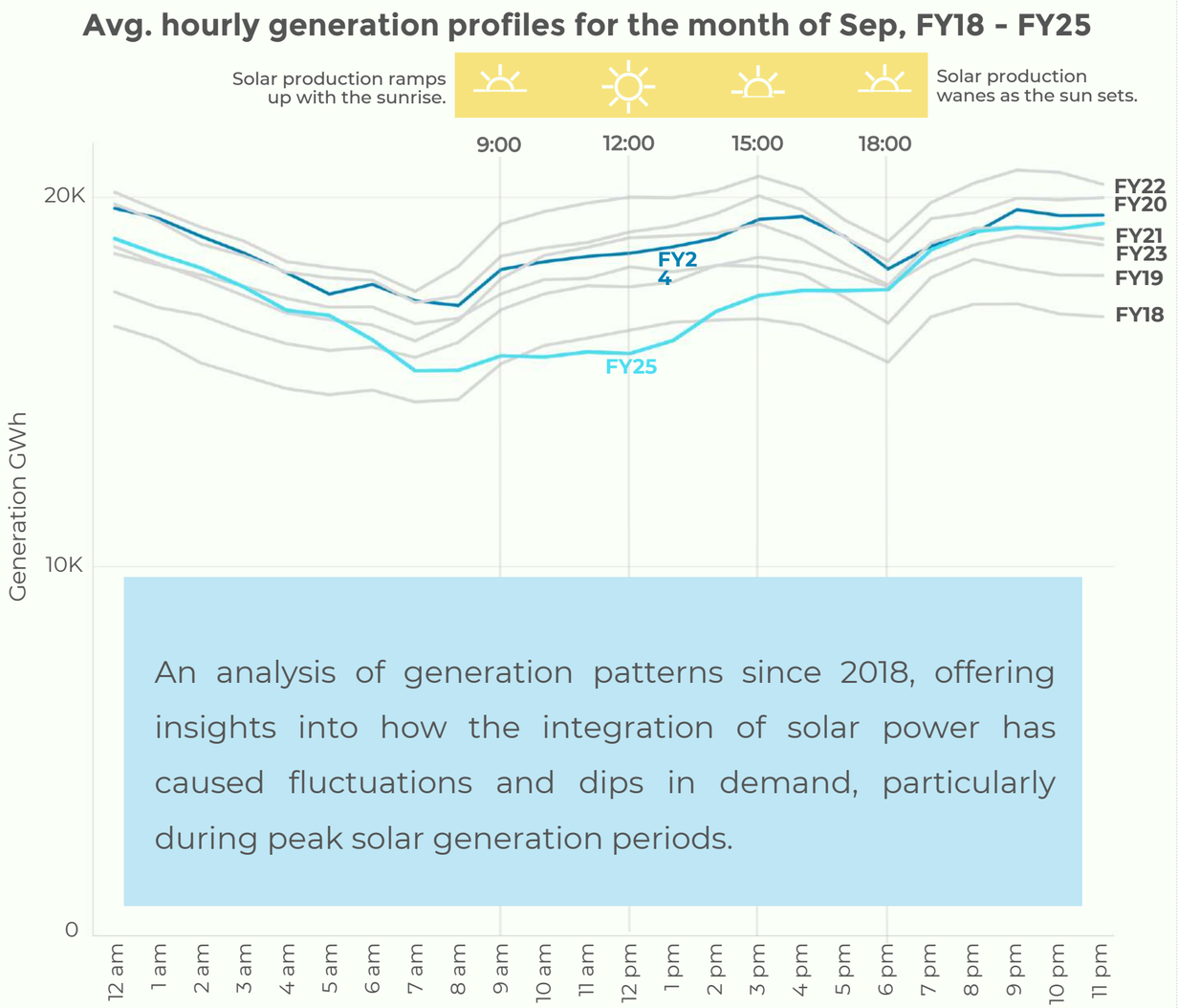
Pakistan has avoided more than USD 12 billion in oil and gas imports due to solar as of Feb 2026. It could save further 6 Billion USD by end of 2026.

What solar did for the grid, electrification can do for transport, which currently stays exposed to global price shocks



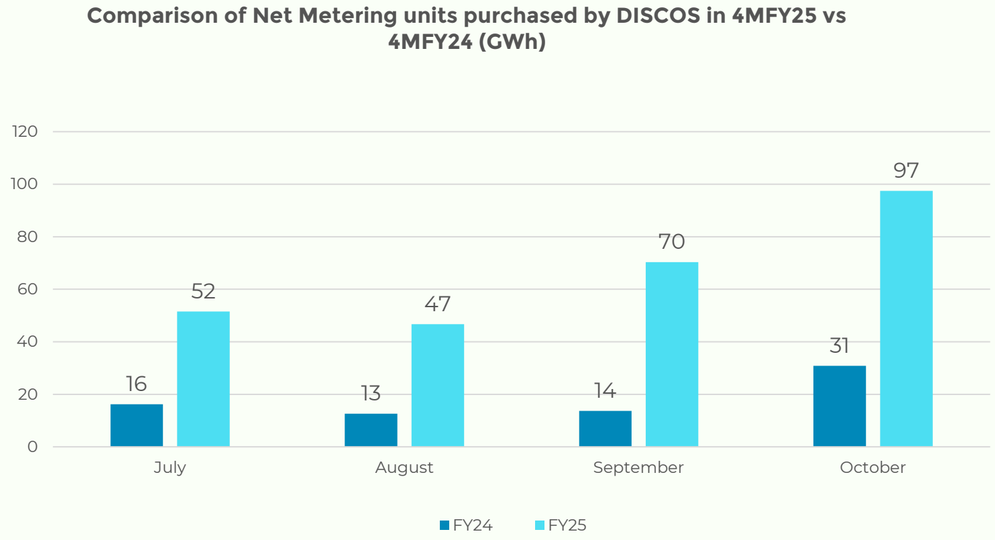
Data Source: IEEFA, RF Insights

The Grid and Utilities are lagging behind in this transition story



An analysis of generation patterns since 2018, offering insights into how the integration of solar power has caused fluctuations and dips in demand, particularly during peak solar generation periods.

- **Midday Demand Drop (9:00 to 12:00):** Consumers benefit from solar energy during peak sunlight hours.
- **Afternoon Demand Rise (12:00 to 15:00):** Grid demand increases as solar generation declines, with net-metered consumers switching back to grid power.
- **Evening Demand Surge (15:00 to 18:00):** A sharp rise in demand occurs, typical of solar-heavy grids, challenging the system operator to ramp up generation quickly.

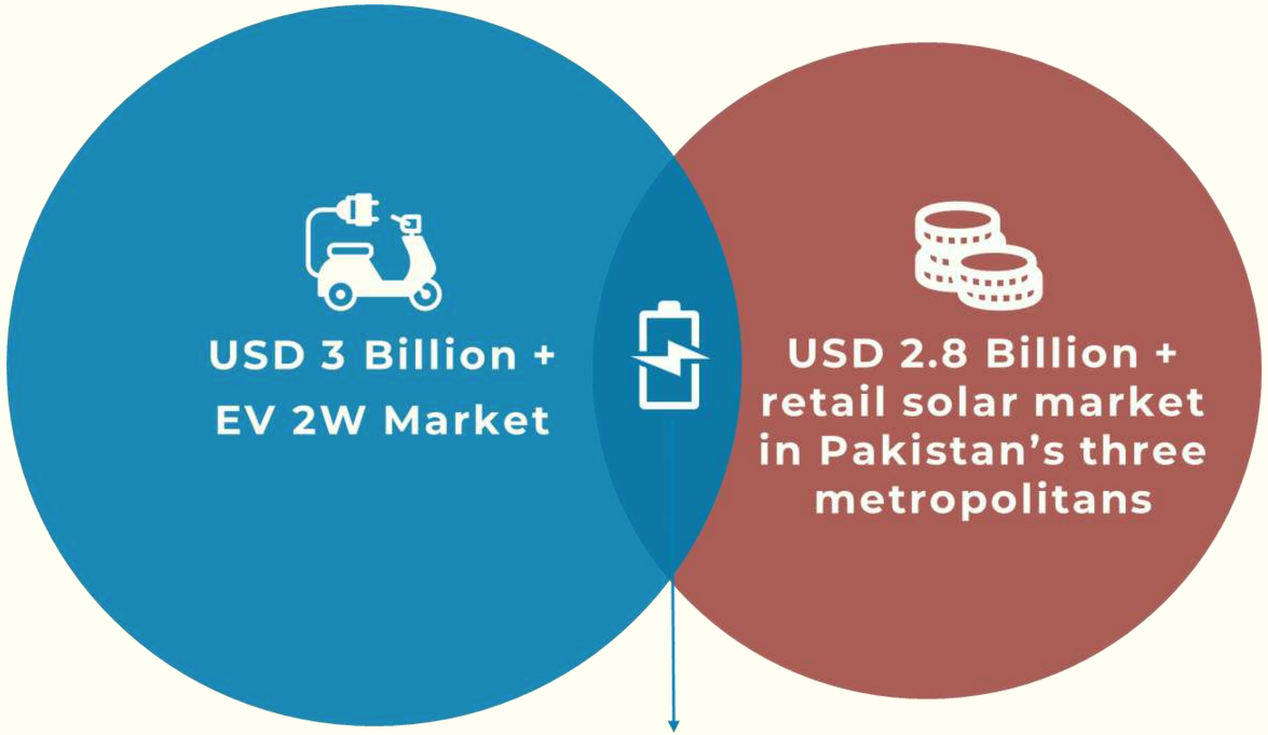


Data Source: NEPRA, CCPA-G & Renewables First Calculations

Utilities will only catch up if they catch the storage wave

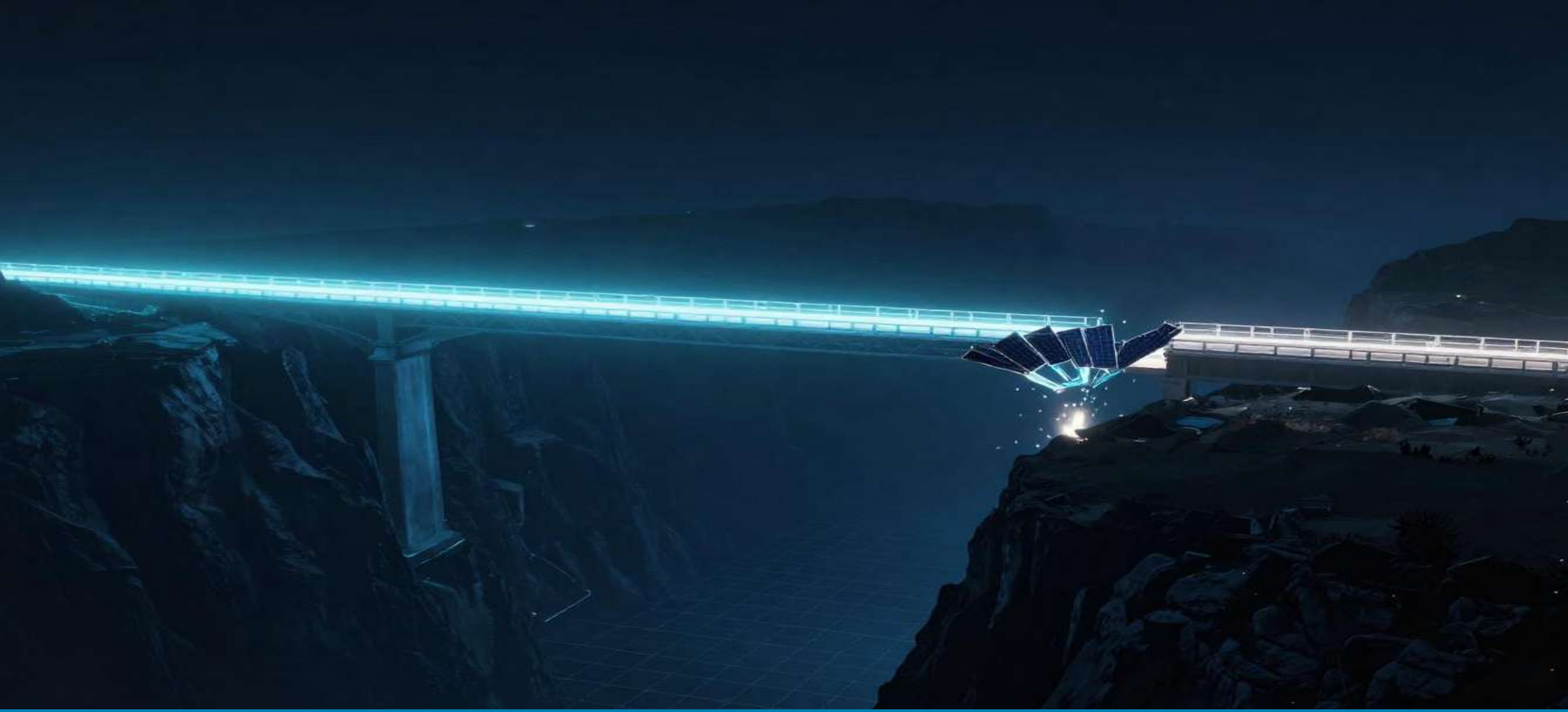
- Solar's adoption arc is proving less anomaly than blueprint for the broader sector.
- Pakistan’s battery industry imports from China exceeded USD 310 million in 2025, with **Lithium-ion batteries capturing 95% volume at USD 294 million**.
- Almost a **3x surge** is also witnessed in the demand of **EV 2-wheelers**, which crossed 90,000 units in 2025

Solar growth raced ahead of industrial capability. The next wave of storage and clean tech must be built alongside it, not after it



Finance **Technology** **Flexibility**

- The **emerging battery rush** in Pakistan after the Great Solar Rush creates opportunity to localize BESS, grid flexibility solutions, and power electronics through joint ventures and licensing.
- The transition must evolve from deployment-led growth to industry-led development



Who Follows — and What the New Playbook Looks Like

Pakistan Is Not an Outlier — It Is the First Mover

50 countries set all time records for Chinese solar imports in march 2026

WHY ASIA — FOUR STRUCTURALLY DISTINCT CASES

Bangladesh

The Structural Mirror

Shares Pakistan's overcapacity trap, IMF pressure, fossil import dependence — but erected 11–58% import duties Pakistan never had. Recent budget bring it down to 0.

Philippines

The Archipelago Paradox

Highest tariffs in SE Asia ($0.22/kWh) and extreme grid parity — but 7,641 islands fragment the supply chain needed for viral adoption.

Thailand

The Non-Crisis Test

No energy crisis, but the region's most advanced solar manufacturing. Can electrostates emerge from prosperity?

Indonesia

The Institutional Fortress

4th-largest population, solar cheaper than coal — but PLN monopoly abolished net metering entirely in Feb 2024.

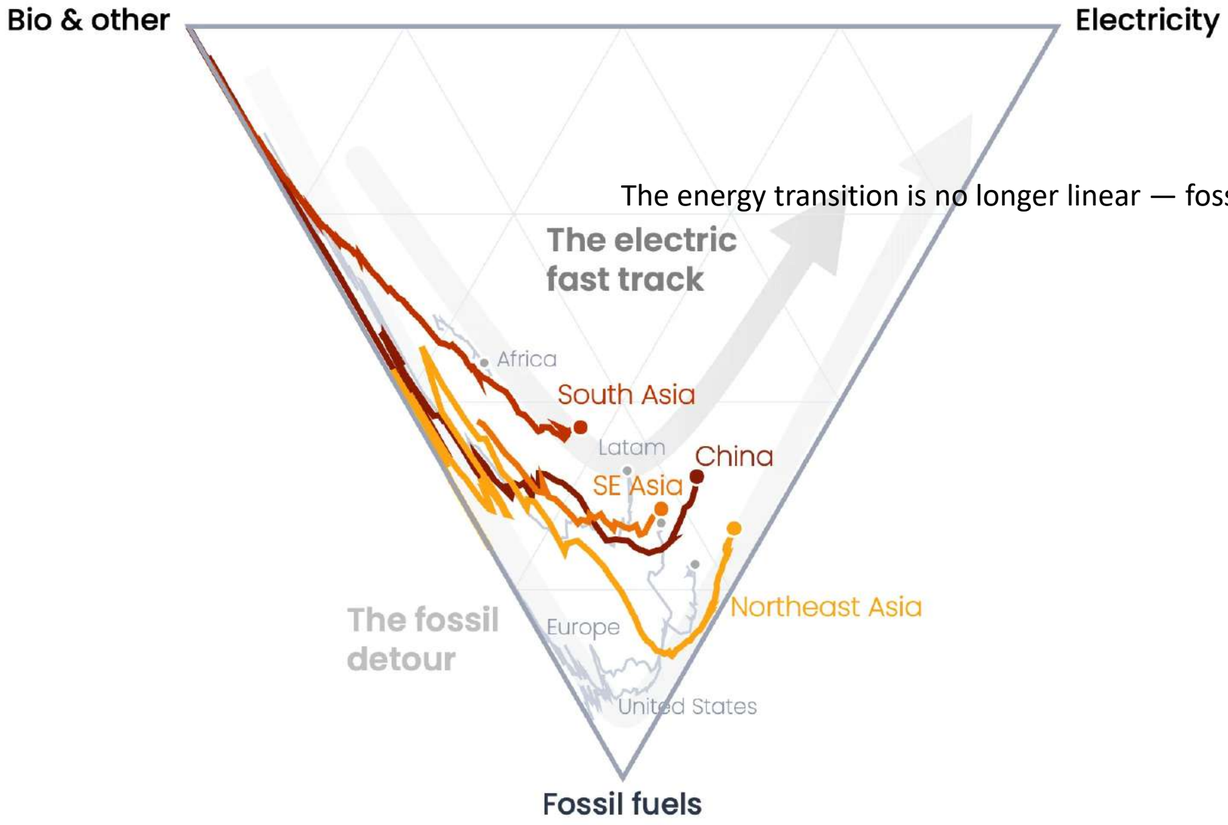
The two deployment races

Asian countries are taking a fast track to an electrified economy powered by renewables

Demand: The electric fast track

Most of Asia is not yet as deeply committed to the fossil system as the West, and can therefore skip fossils and go straight to electricity

Share of final energy demand, 1900-2023

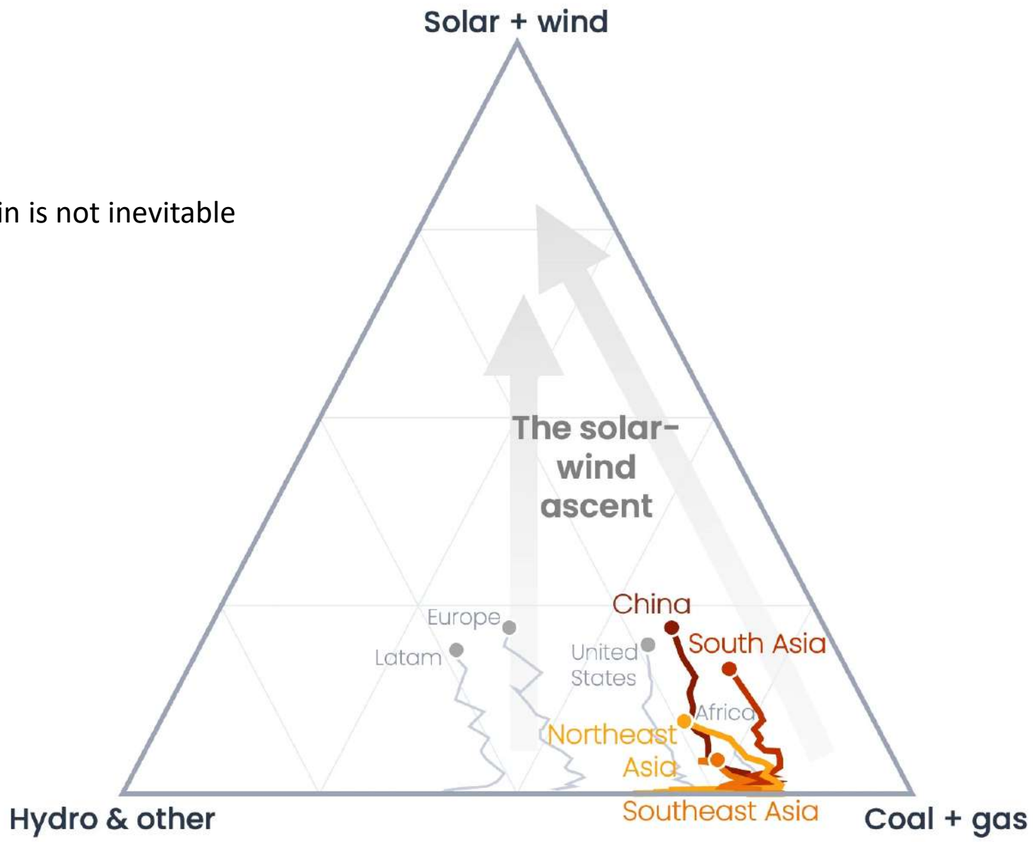


The energy transition is no longer linear — fossil fuel lock-in is not inevitable

Supply: The solar-wind ascent

The recent upsurge in solar and wind generation can power this new demand growth

Share of electricity generation, 2000-2025



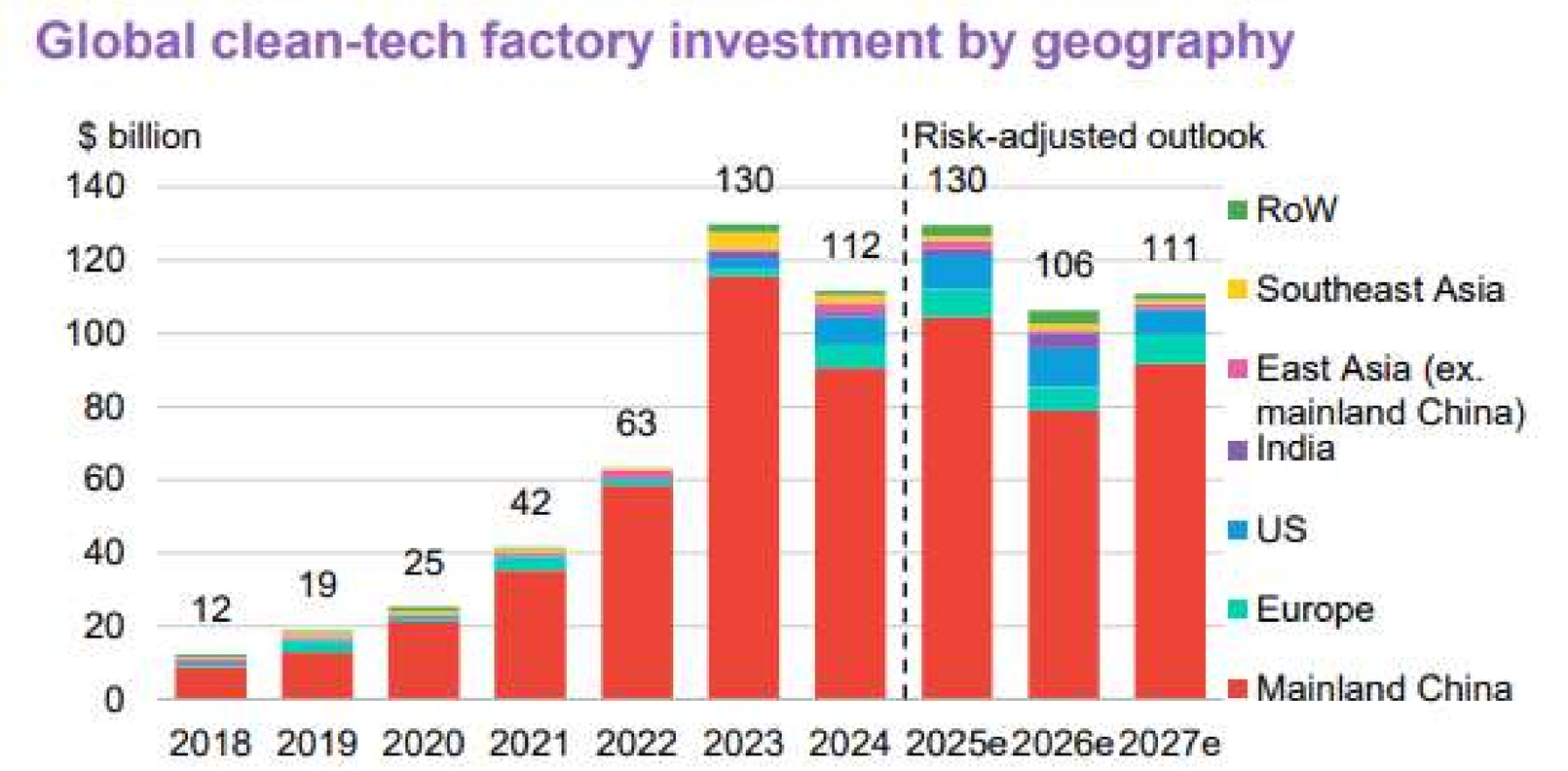
Sources: IIASA, IEA, Ember; Ember analysis

EMBER

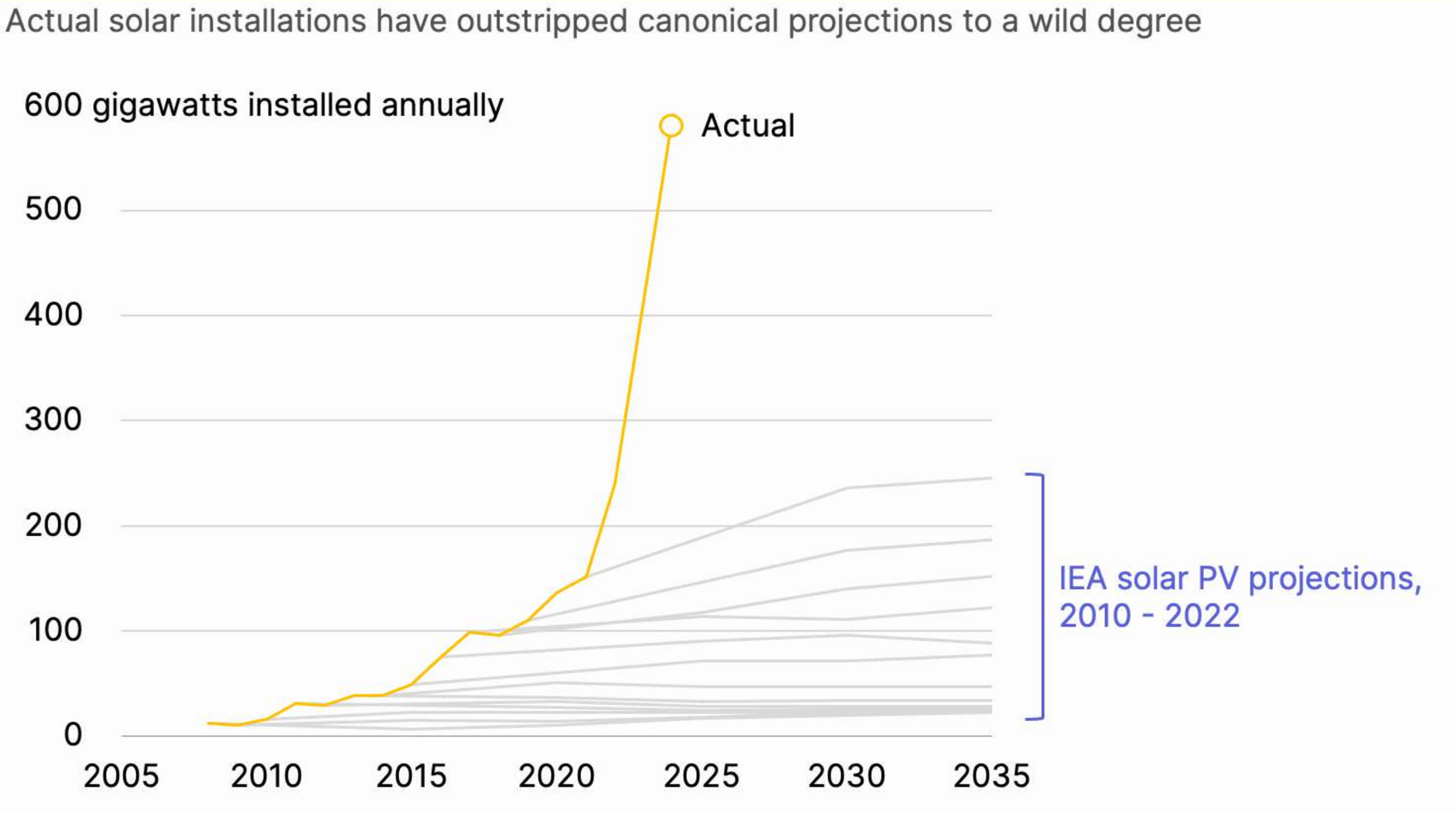
The China Variable — why the Global South can't tell and live this story without it

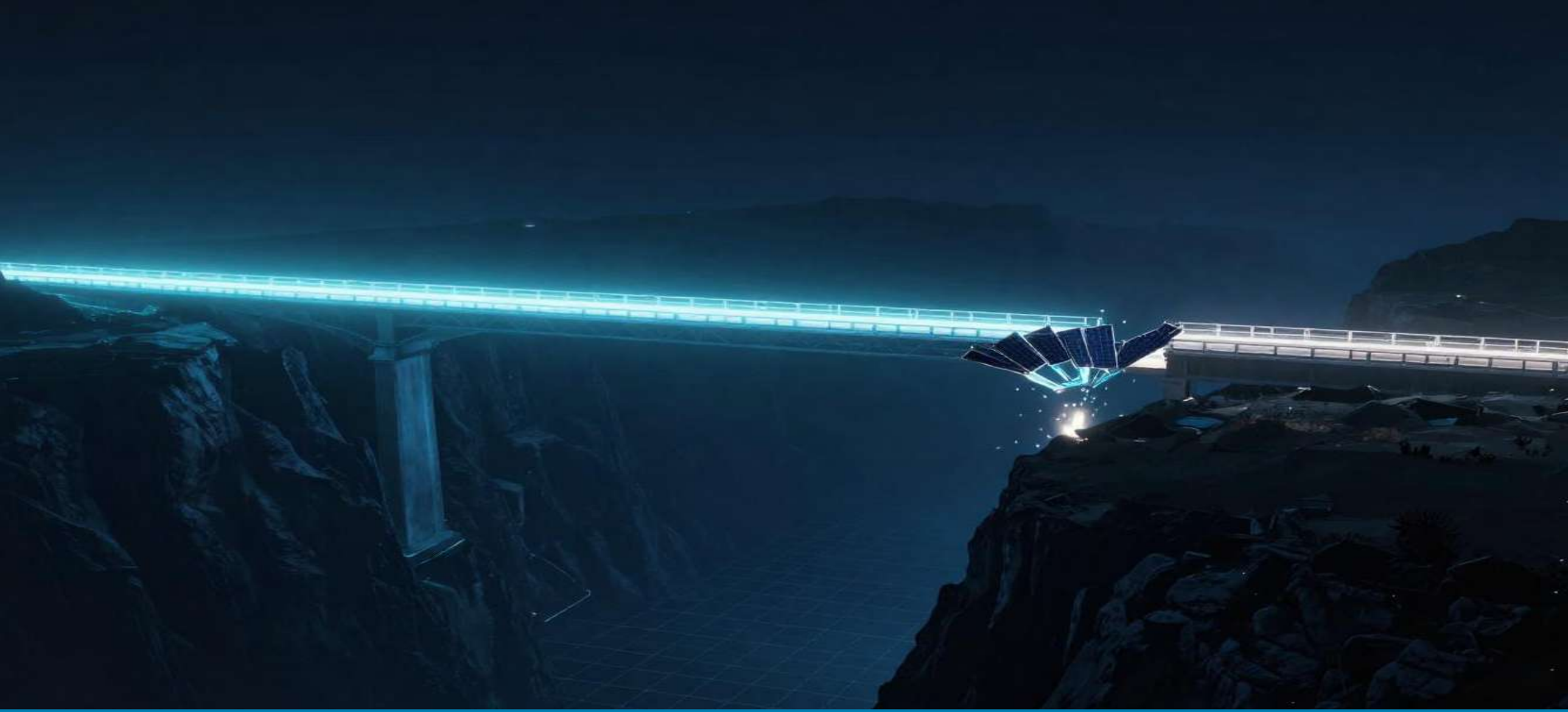
The enduring supply-chain leadership

- Clean-energy supply chains, covering equipment manufacturing, component factories, and battery-metal processing — attracted **USD 130 billion in 2024.**
- Mainland China accounted for **76% of global clean-tech factory investment in 2024**, remaining the world's central manufacturing hub.



Forecasting models are no longer keeping up with solar growth. Transition models need revision

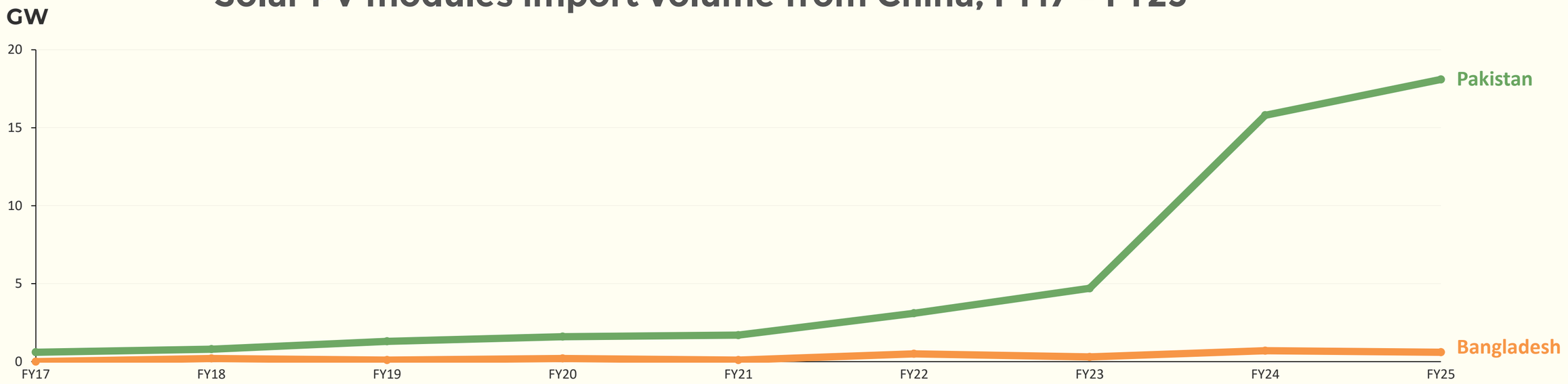




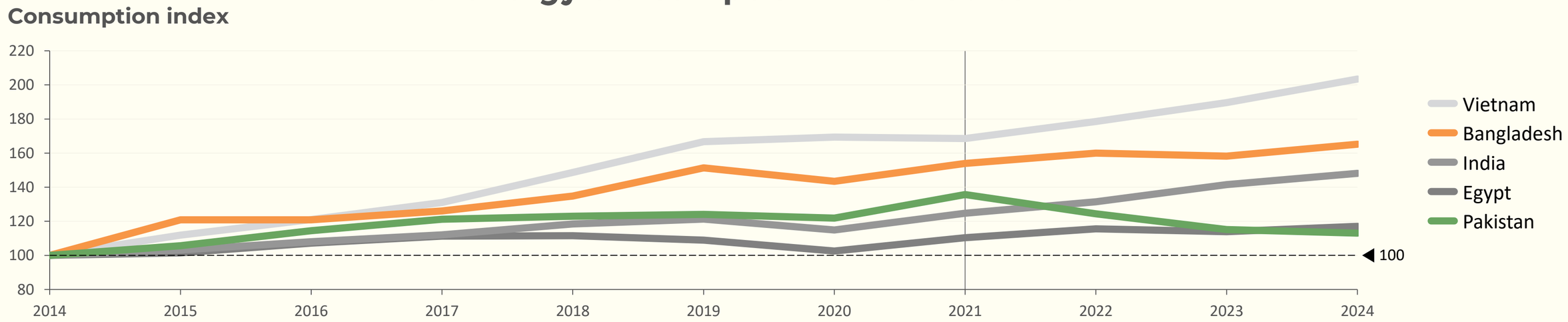
The Bangladesh Question

Is Bangladesh Next? The Checklist Before the Rush

Solar PV modules import volume from China, FY17 – FY25



Final energy consumption – indexed to 2014



THE DISTRIBUTED REVOLUTION FRAMEWORK — FOUR TIERS

TIER 1

Push Factors

Why consumers flee the grid

Tariff level & trajectory · Grid reliability · Power-sector financial distress · Fossil fuel import dependency

TIER 2

Pull Factors

Why solar becomes viable

Solar irradiance · Grid parity gap · Net metering policy · Battery storage trajectory

TIER 3

Supply Chain & Cost

Whether consumers can actually buy panels

Chinese module access · Import duties · Landed module cost · Installer & financing ecosystem

TIER 4

Enabling Conditions

Whether adoption can go viral

Population scale · Middle-class self-financing · Regulatory friction · Social proof

BANGLADESH · THREE TAKEAWAYS

1

BARRIERS ARE SELF-INFLICTED

Import duties of 11–58% are the single most impactful — and removable — lever. The current budget is hopeful but must ensure incentives are accessible to all.

2

PAKISTAN'S PLAYBOOK, PRE-TIPPING POINT

The capacity trap is identical. Only absolute tariff levels lag. IMF-driven hikes could likely breach the $0.08–0.10/kWh threshold.

3

SHS IS ASSET AND CONSTRAINT

6M SHS units gave Bangladesh unmatched grassroots awareness and a rural installer workforce. But rooftop solar needs different equipment, skills, financing and regulation. Build on the foundation — don't assume transfer.

THANK YOU