EMBER

Electric Asia

How Asia is leading the electric age, powering its rise and reshaping the global order

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Executive Summary

Asia is home to half the world's people, 4% of its oil and gas, and three quarters of its electrotech production. If this is to be the Asian century, its path will be electric.

Asia is electrifying rapidly. The region generates more than half the world's electricity and accounted for three quarters of global electricity demand growth since 2000. It overtook the West on electrification in 2016 and is electrifying five times faster.

It's not just China. Southeast Asia leapfrogged the United States (US) in electrification in 2023 and EV share in 2024, and South Asia leapfrogged the US in solar share in 2022. Meanwhile, Asia excluding China is the second largest producer of both solar panels and battery components.

Asia lacks fossil fuels. It has just 4% of global oil and gas reserves, and imports $1.1 trillion of fossil fuels every year, accounting for 31% of its primary energy demand. As a result, Asia makes up 62% of global fossil imports.

But Asia is an electrotech superpower. Asia manufactures over 95% of solar panels, 85% of batteries and 75% of wind turbines. It also has enough solar and wind resources to supply at least 14 times its total energy demand and 100 times its oil and gas production.

Falling electrotech costs have opened the door to rapid change. Solar plus storage is cheaper than fossil generation across most of the region. Electric cars are now cheaper than petrol cars in many markets. Over 70% of the energy system can already be electrified using commercially available technologies. None of this was true five years ago.

The closing of Hormuz is the catalyst. In 2024, Asia imported 45% of its oil and 30% of its LNG from the Middle East, making the region uniquely vulnerable to geopolitical disruption and fuel price shocks. High prices and shortages are forcing a rethink in Asia's energy policy.

There is a new energy playbook for Asia. Lean into electrotech to regain energy sovereignty, reduce trade deficits, and build an Electro-Shield. Electrify road transport to halve oil imports and save over $300 billion a year, speed up renewable deployment to push LNG out of electricity, and electrify cooking to reduce fuel costs and indoor air pollution.

The prize is the Asian century. A trillion dollars a year, increasingly redirected from fuel imports to an electric flywheel. Cleaner air for the nine in ten Asians exposed to air pollution above WHO limits. Faster growth, greater security and a leading position in the electrotech industries the world will buy for decades.

The Great Convergence. The West built its wealth on fossil fuels, which fuelled the Great Divergence. Asia now has the chance to build its future on electrons.

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Electric Asia

01

Power is shifting to the East

For decades we have seen a shift in GDP, power and energy demand towards the East. Electricity is moving the fastest, and Asia has been responsible for three quarters of global growth in electricity demand since 2000. Asian GDP used to move with fossil fuels; since 2010 it has moved with electricity.

02

Asia is setting a new path to the electric future

Asia leapfrogged the West in electrification in 2016 when GDP per capita was at only a quarter of Western levels. Asian electrification is now materially higher than in the West (26% vs 21%), and the gap is rising; electrification in Asia has been growing at a rate 5 times faster than in the West.

03

Asia is diverse but there is a regional story as well

Asia is of course not uniform, and each country faces very different circumstances. However, there are some aspects of the energy system in the region as a whole which stand out in the global context. Within Asia, this analysis focuses on four key regions: Greater China, South Asia, Southeast Asia and Northeast Asia. It examines electricity supply, electrification and manufacturing capacity.

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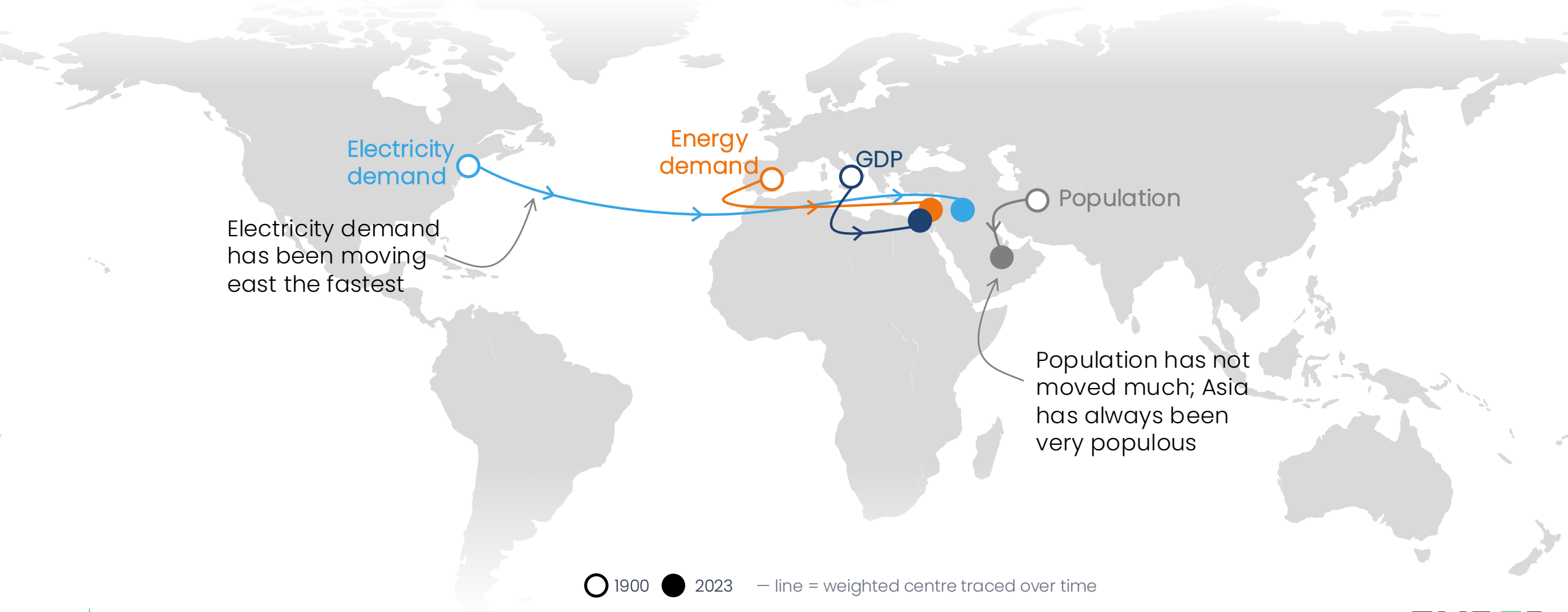
The economic centre of gravity is moving east

Electricity is moving fastest of all

Geographic centre of gravity, 1900-2023



Sources: IIASA, World Bank, IEA; Ember analysis. Note: the centre of gravity is the weighted average country coordinates of ametric.

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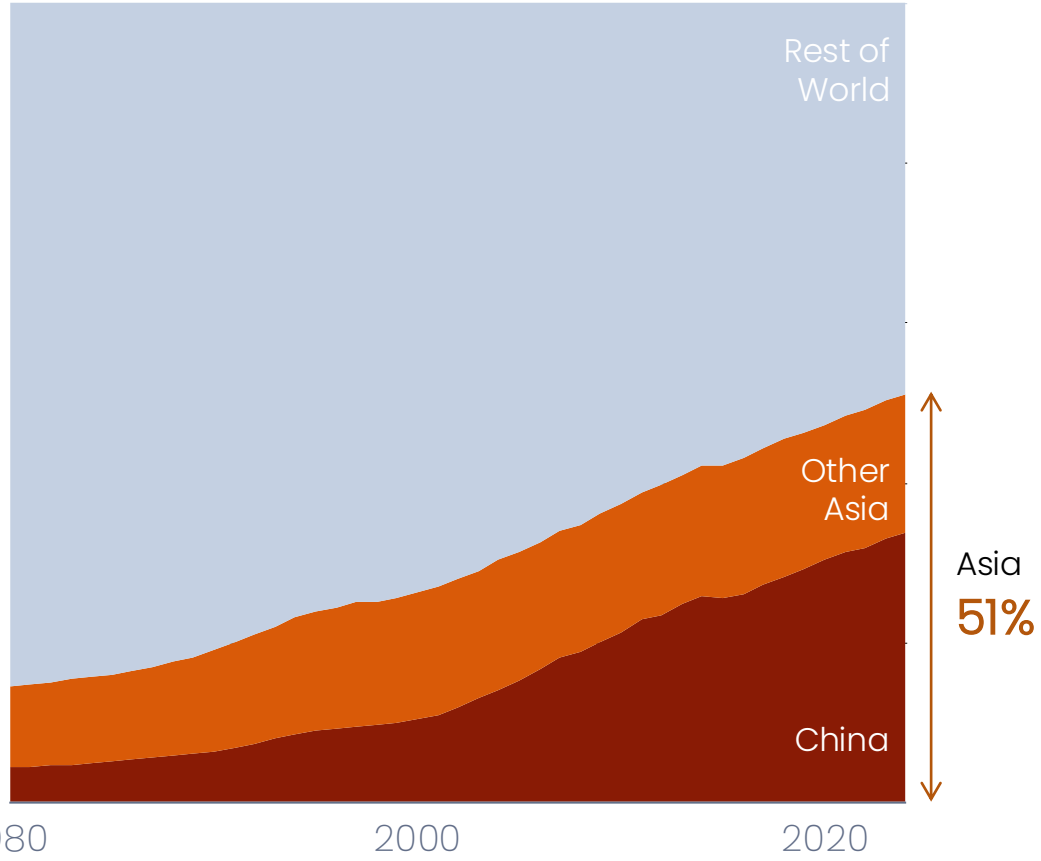
Asia dominates global electricity demand

Asia excluding China grew electricity demand by almost as much as the rest of the world combined

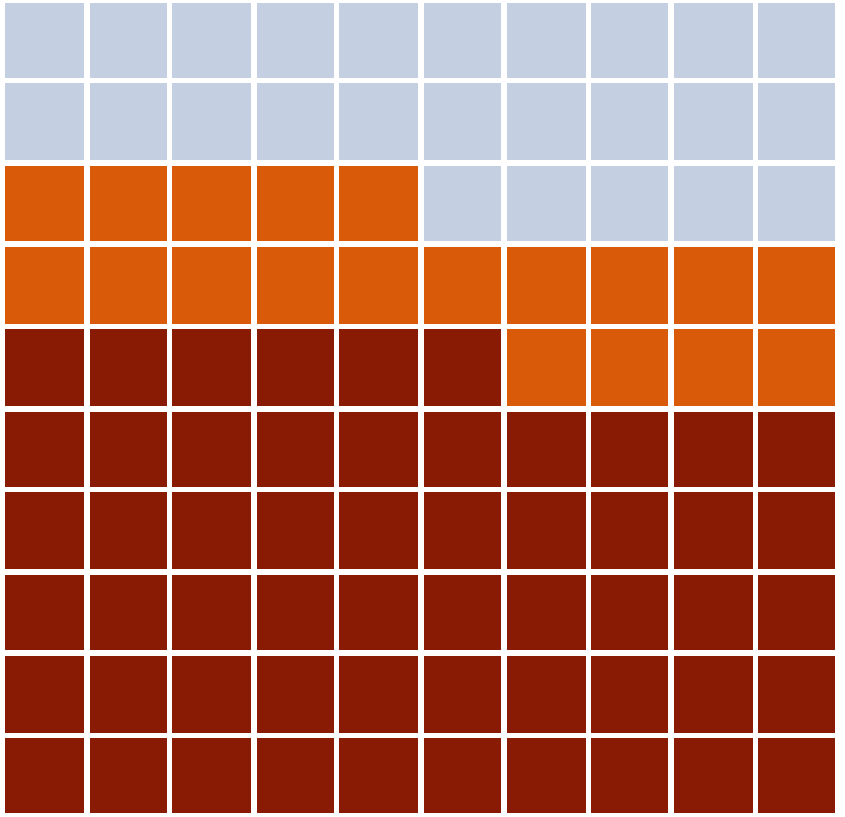
Asia's share of global power

Share of world electricity generation, 1980-2024



Asia's share of the growth in global power

Share of +15,650 TWh growth over 2000-2024



The rest of the world **combined** added about the same as Asia excluding China

75%
came from **Asia**

56%
from **China alone**

Sources: IEA, Ember

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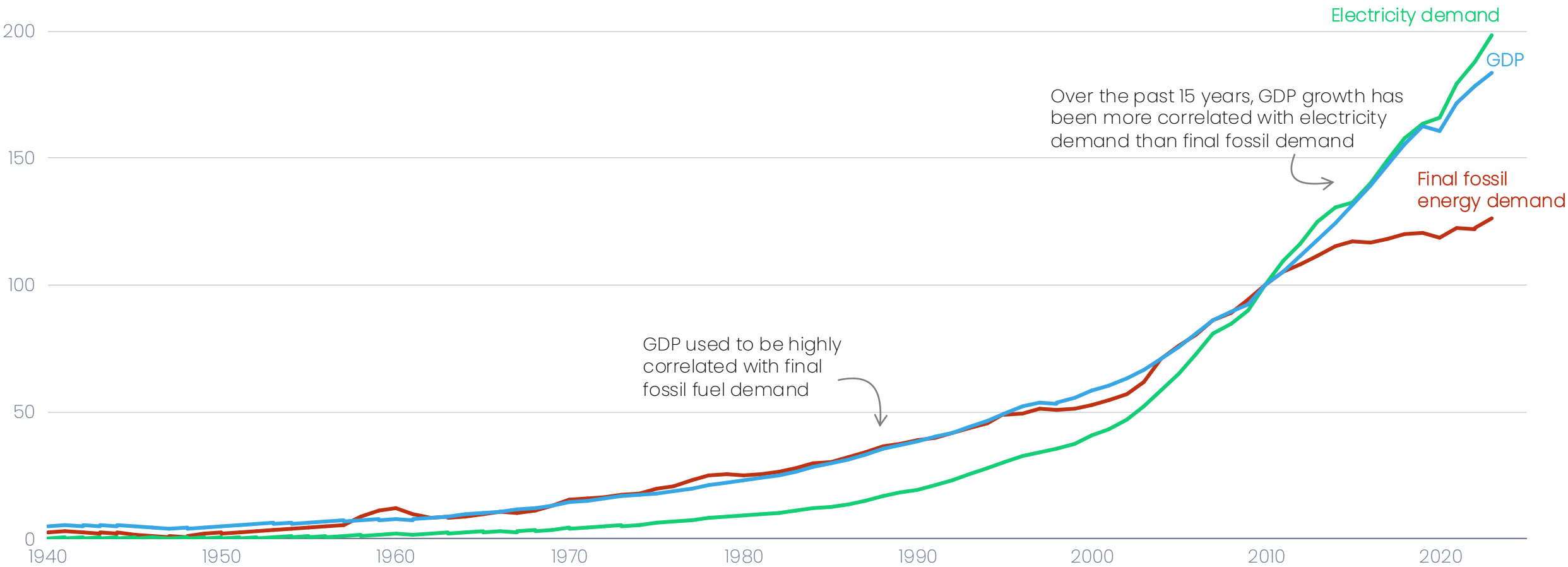
Electricity drives growth

Asian GDP once tracked fossil fuels; now it tracks electricity

Asia GDP, electricity, and final fossil demand growth

2010=100



Sources: IIASA, IEA, World Bank; Ember analysis

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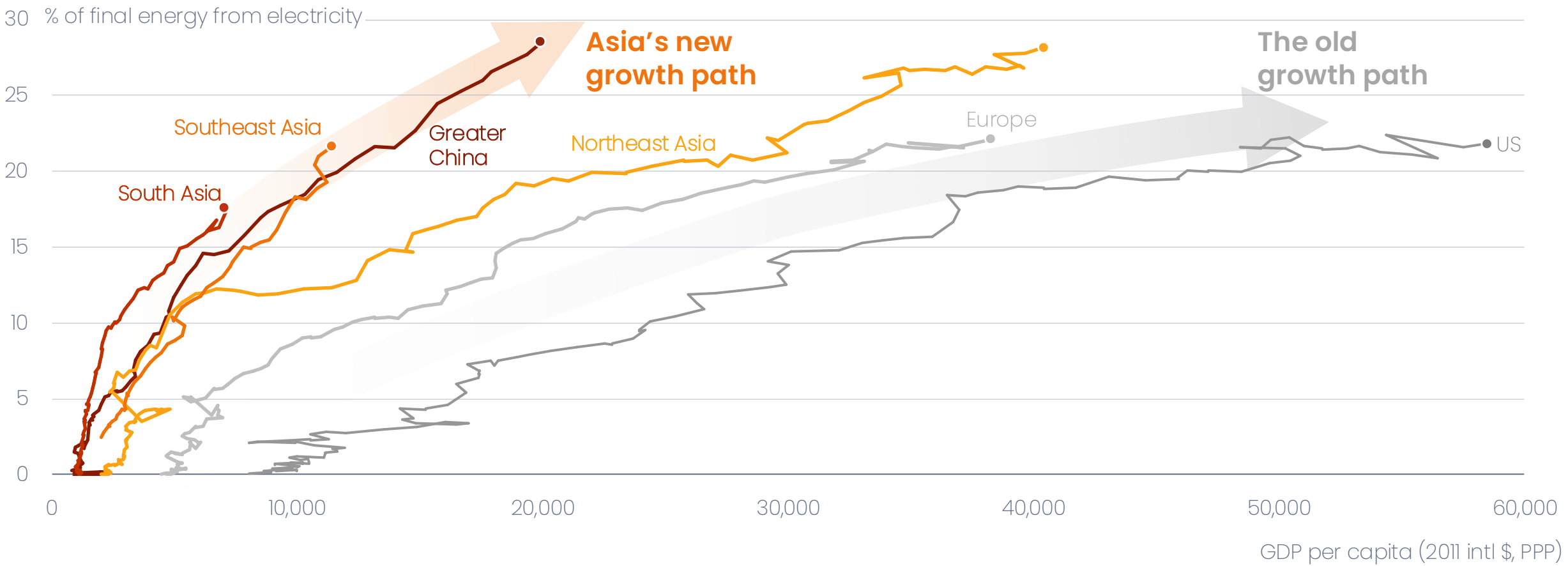
Asia is charting a new path

Asian electrification is taking place at much lower levels of GDP per capita than in the West

Electrification vs GDP per capita (1900-2022)



Sources: IEA, IIASA, Maddison Project Database; Ember analysis

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Asia in four parts

There is a holistic story of the energy transition to be told for Asia

How we define Asia in this report

The Asian energy system

Lacks oil and gas	**4%** of global oil and gas reserves	**62%** of global fossil fuel imports	Recipient of **80%** of the oil and gas exports from Hormuz
Dominates electrotech	**75%** of global growth in electricity since 2000	**75%** of electrotech manufacturing capacity	**84%** is ahead of the US in electrification
Key to the energy future	**54%** of the global population	**56%** of global GDP growth through 2050	**57%** of the expected growth in energy demand through 2050

Sources: World Bank, IMF, IEA, UN Comtrade, Ember. Note: the boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by Ember.

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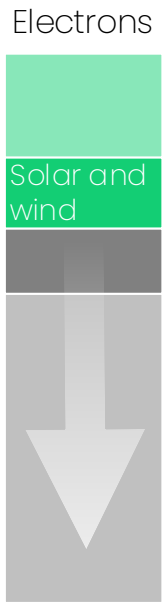
Three vectors of opportunity for Asia

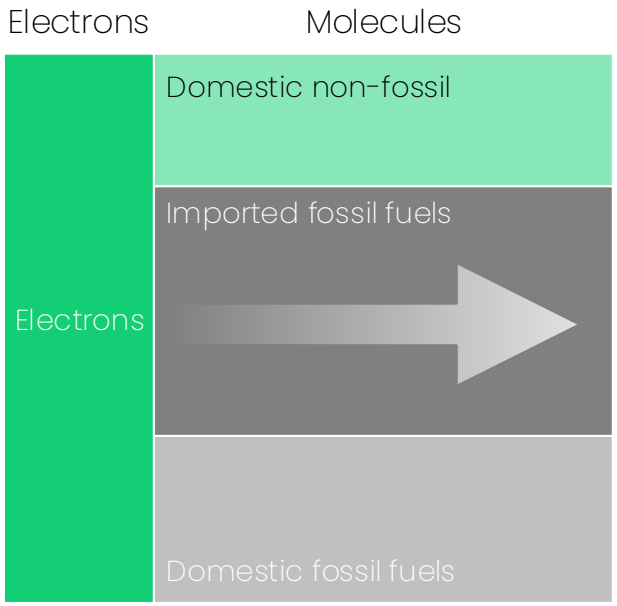
Deploy renewables, electrify the economy and export electrotech to the world

01 Deploy renewables



Expand domestic supply of electrons with renewables

02 Electrify the energy system



Use domestic electrons across the economy

03 Manufacture and export electrotech to the world

Source: IEA; Ember analysis. Note: numbers shown for 2023.

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Part 1

Asia is ahead on electrotech

01

Asia has the largest renewable deployment

Asia has deployed over 60% of global solar and wind capacity. Solar deployment is soaring across the region, and 79% of Asia's electricity demand is in countries where solar's share of power generation is higher than in the United States. The volume of Chinese solar exports and anecdotal evidence from the field suggest that solar deployment is materially higher than official numbers indicate.

02

Asia has a clear lead in electrification

Northeast Asia has long been ahead of the West in electrification. China leapfrogged the West in 2012, and Asia as a whole in 2016. Southeast Asia leapfrogged in 2023, and South Asia is on track to overtake shortly.

As battery prices fall, Asia is electrifying transport rapidly. More than three quarters of Asia is ahead of the US in electric vehicles as a share of sales.

03

Asia dominates electrotech manufacturing

Asia makes over 95% of the solar panels, 85% of the batteries, and 75% of the wind turbines. And invests more than twice as much in electrotech as in fossil fuels.

This is not just a China story: take out China, and the rest of Asia is still a larger producer of solar and battery material than the rest of the world combined. Meanwhile, electrotech manufacturing investment is pouring out of China into Southeast Asia.

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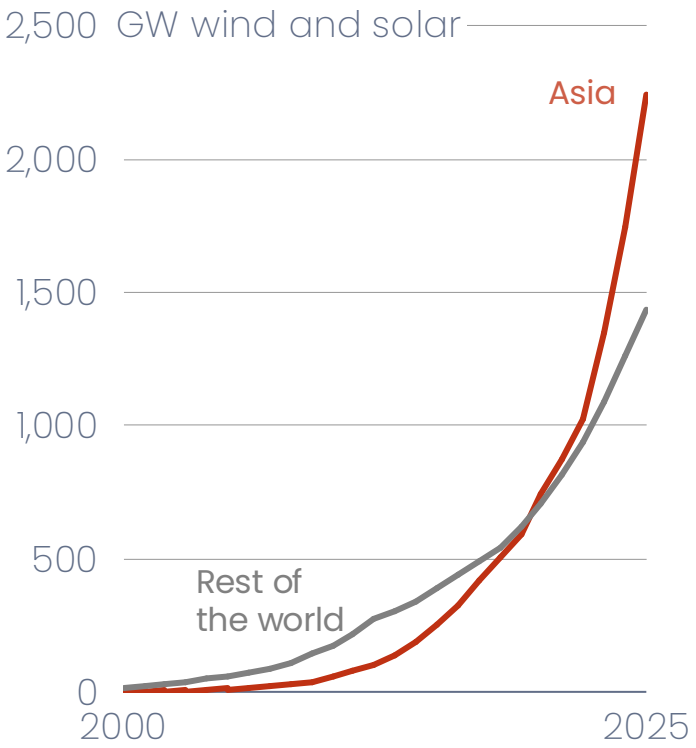
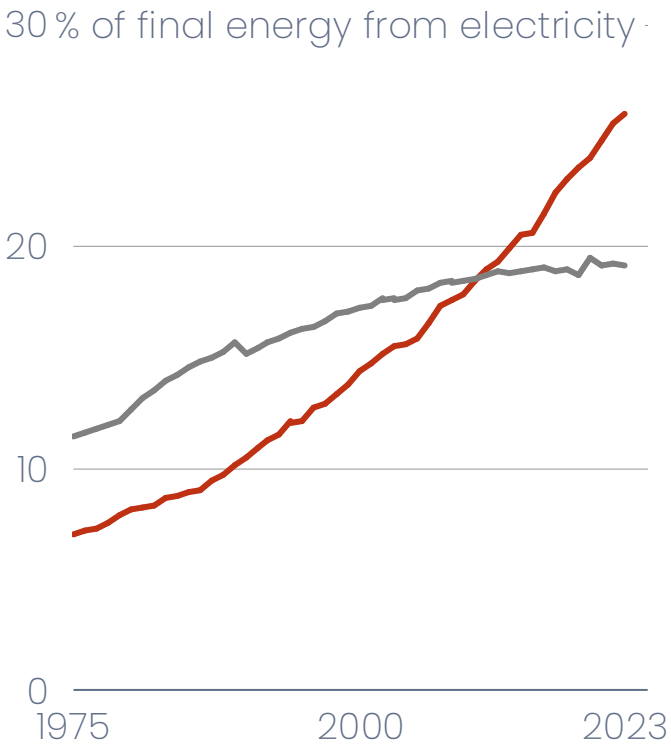
Asia is running ahead of the rest of the world on electrotech

Asia has 60% of the renewables, is rapidly electrifying, and is dominant in manufacturing

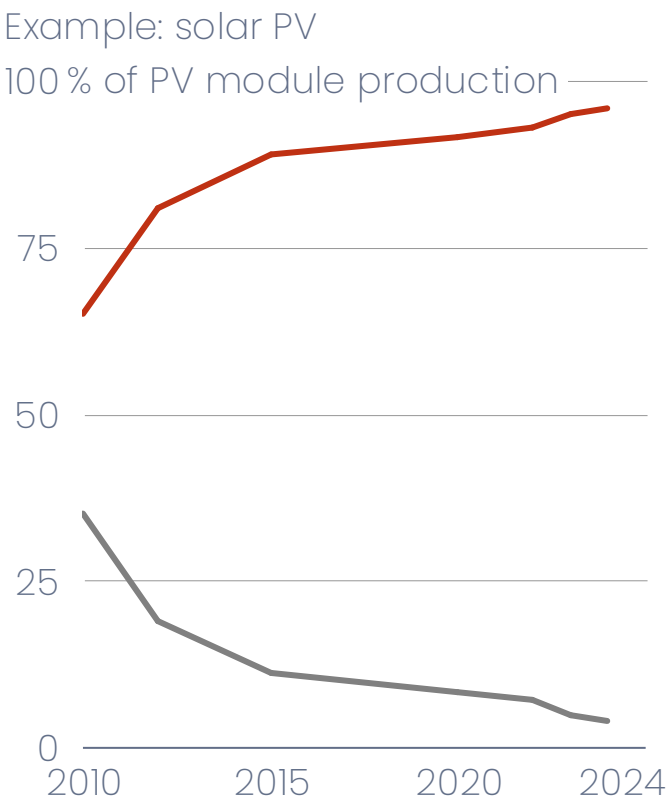
01 Deploy renewables



02 Electrify the energy system



03 Manufacture electrotech



Sources: IRENA, IEA, IEA PVPS; Ember analysis. Note: data covers all of Asia (including China), up to the most recent year with full data.

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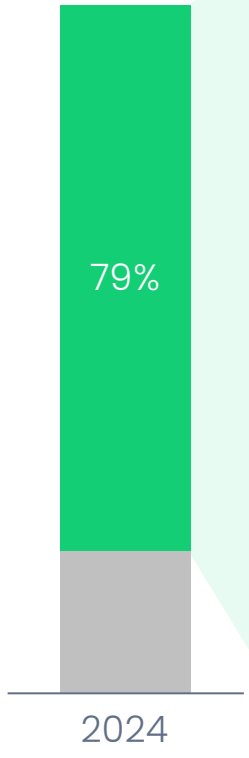
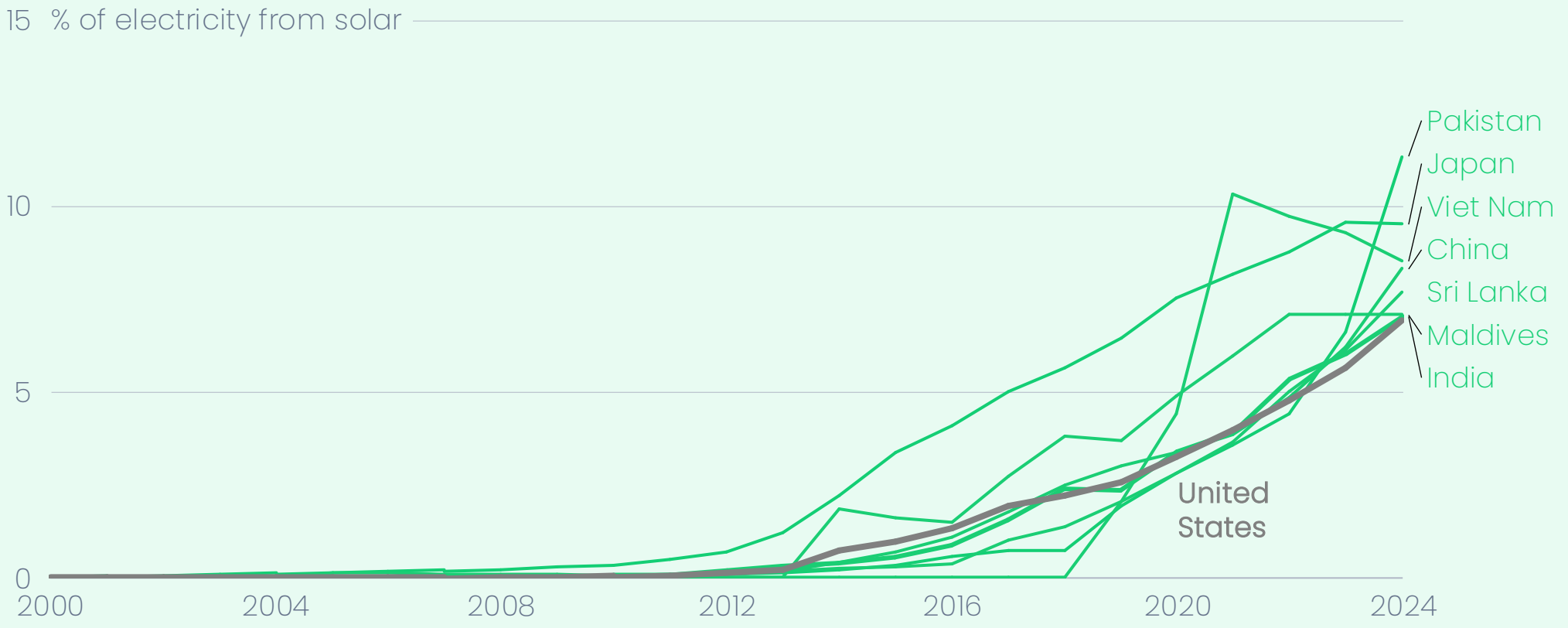
The Asian solar leapfrog

Some 79% of Asia has overtaken the United States in solar adoption

Share of Asian generation ahead of US on solar



Asian economies that have leapfrogged the US



Source: Ember; Ember analysis. Note: 2024 selected as 2025 data is incomplete.

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Solar deployment is growing faster than official statistics can track

Centralised statistics likely underestimate the scale of the solar surge in Asia

Reported solar generation versus implied generation from imported Chinese solar panels

Sources: Ember China's Solar PV Export data, Ember Electricity Data Explorer; Ember analysis. Note: some solar panels may be re-exported, so the gap is indicative and each country merits more detailed analysis to understand the facts on the ground.

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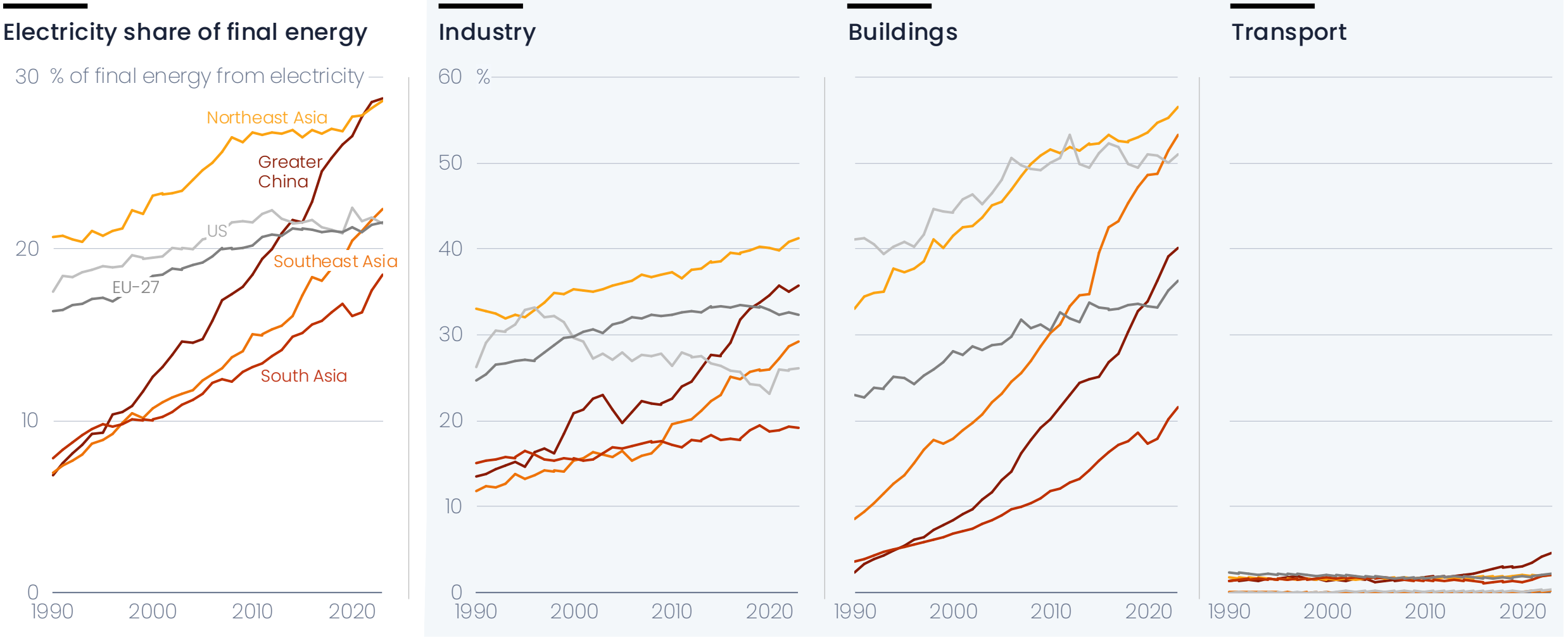
Asia leads the world on electrification

It overtook the West in 2016 and is electrifying five times faster



Source: IEA; Ember analysis. Note: Asian electrification since 2000 has been growing at 0.5 percentage point a year versus 0.1 percentage point in the West.

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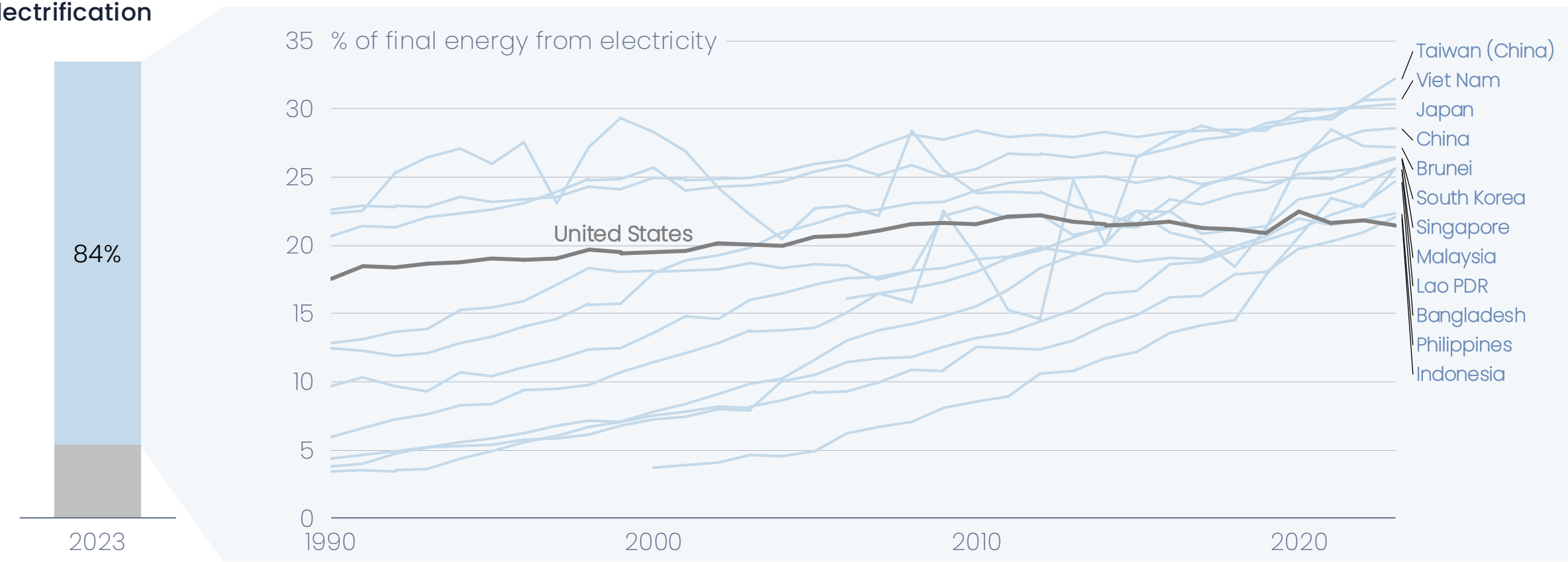
The Asian electrification leapfrog

84% of Asia has leapfrogged the United States in electrification

Share of Asia ahead of the US in electrification

Asian economies that have leapfrogged the US



Source: IEA; Ember analysis. Note: 2023 selected as most recent year available at time of publication.

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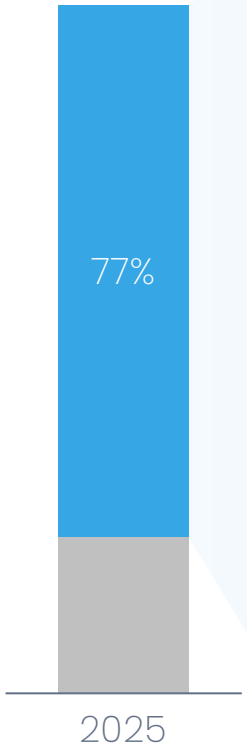
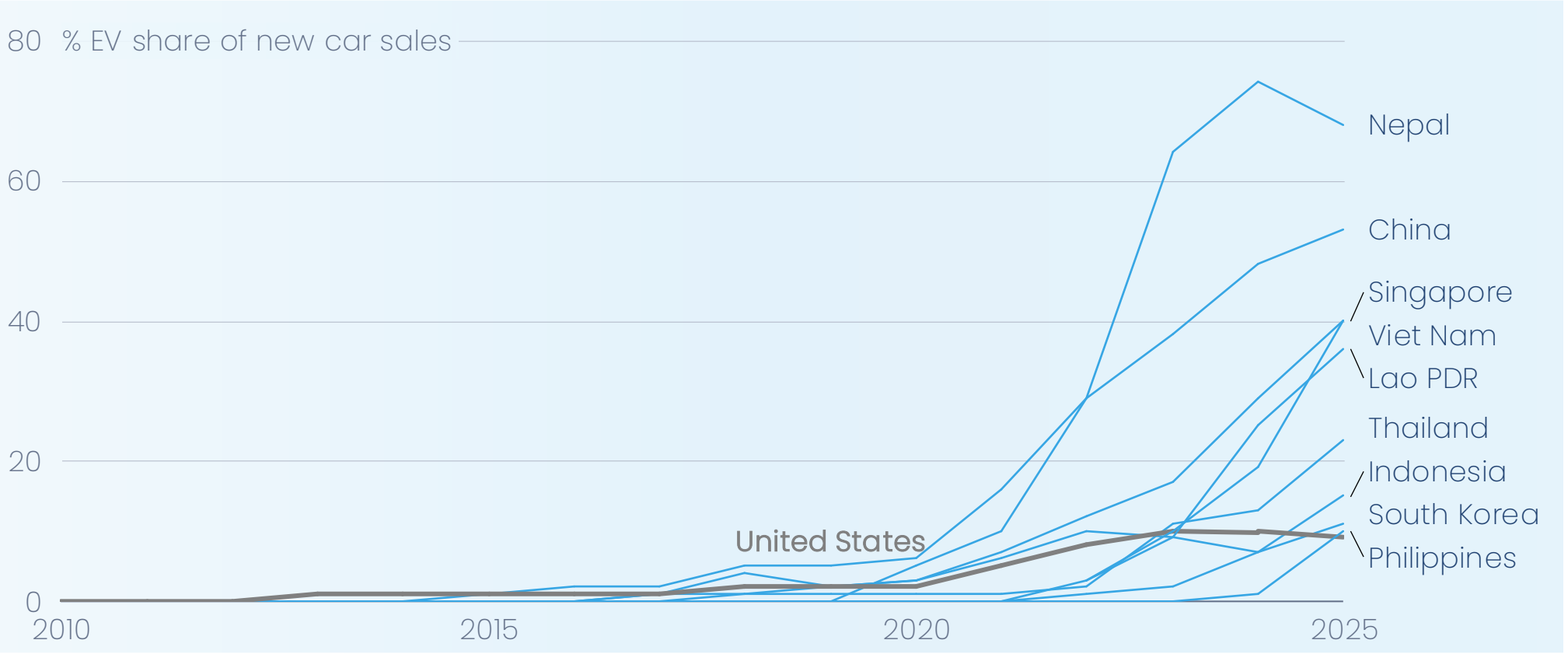
The Asian EV leapfrog

Electric car sales are rising rapidly across Asia, with 77% of Asia now ahead of the US

Share of Asia ahead of the US on EV uptake



Asian economies that have leapfrogged the US



Sources: IEA, National Statistics; Ember analysis

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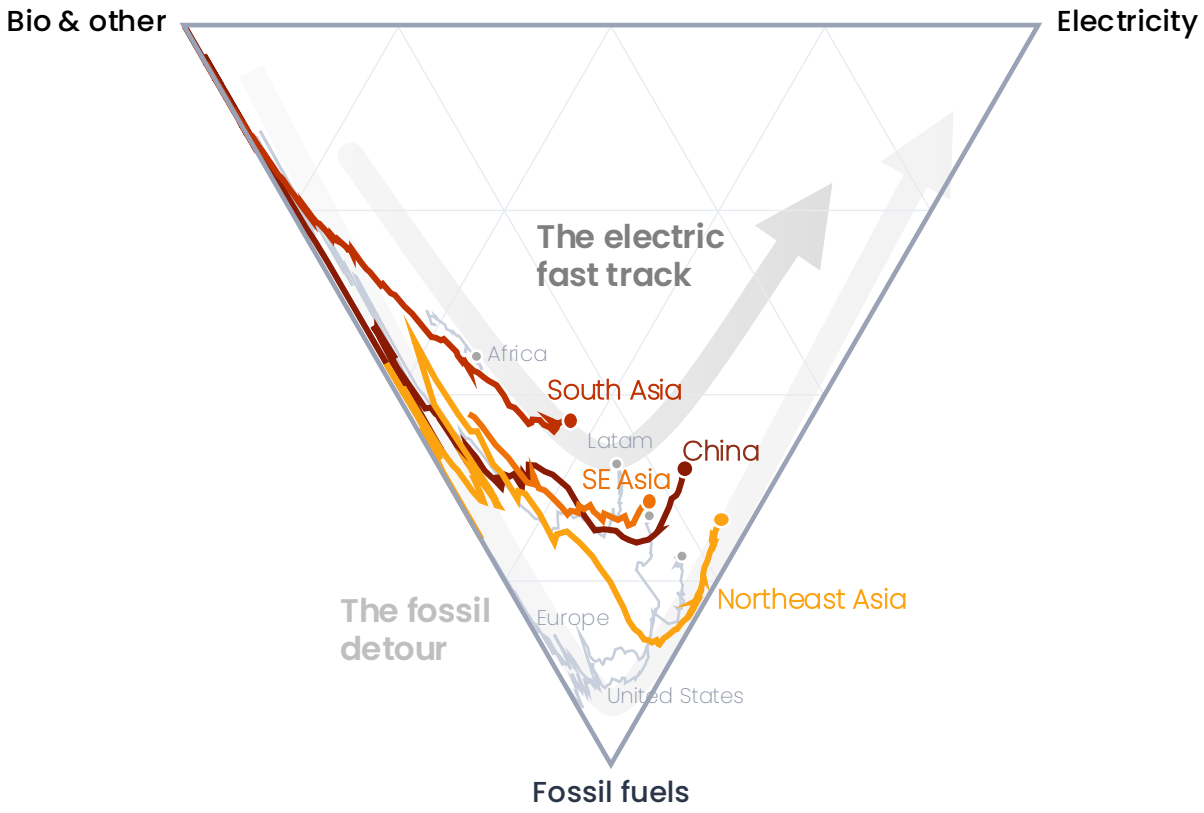
The two deployment races

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

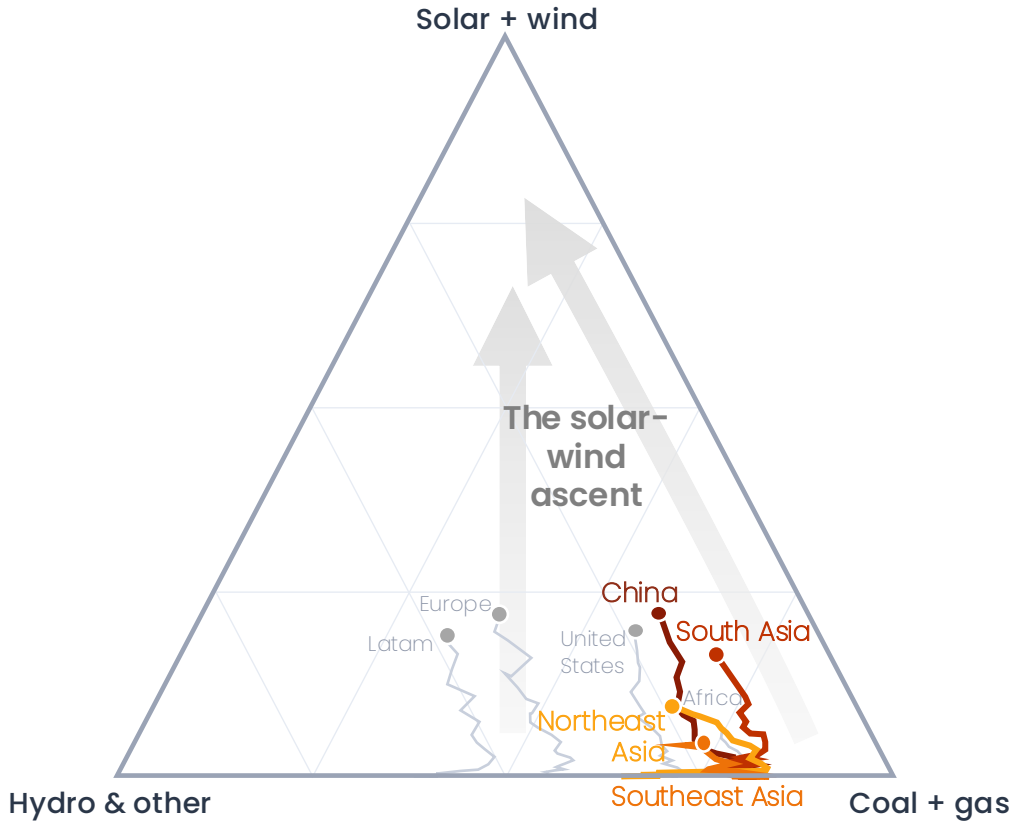
Share of final energy demand, 1900-2023



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

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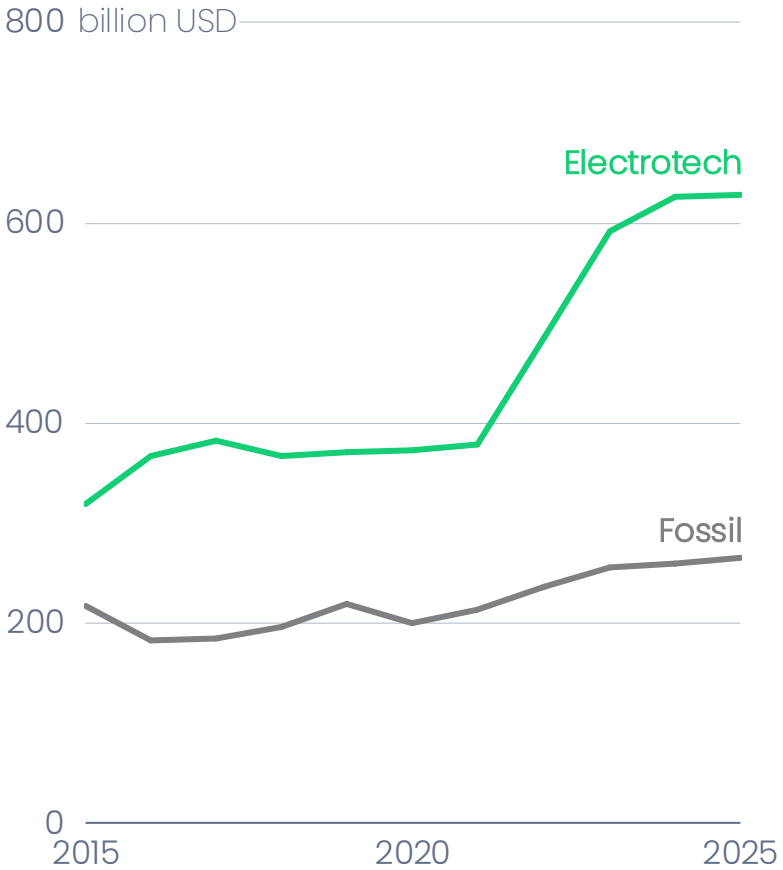
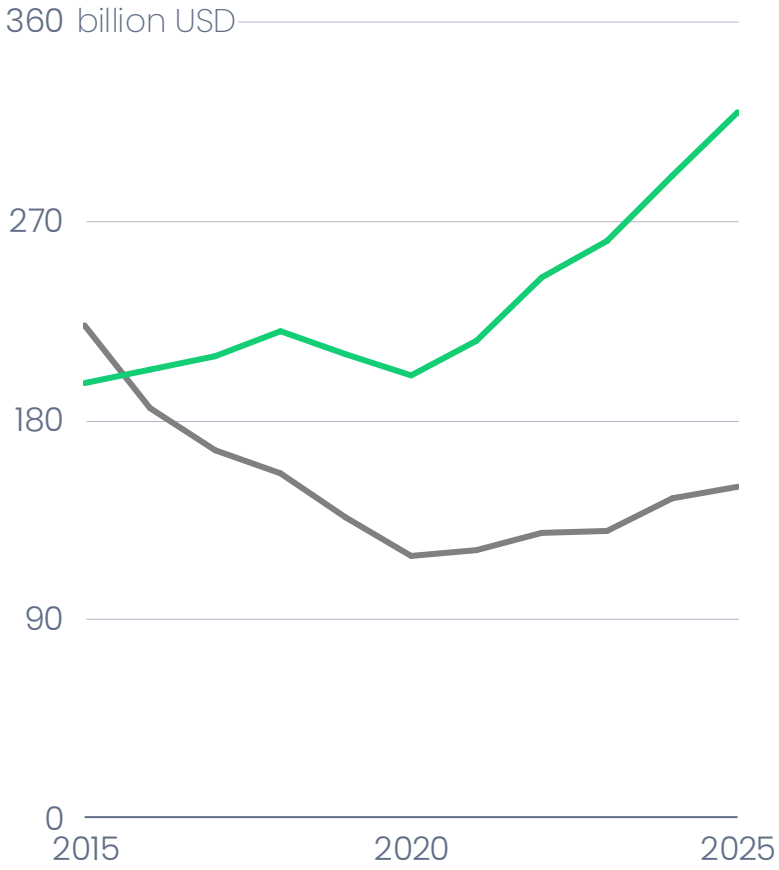
Asian electrotech investment is twice as high as fossil fuel investment

A higher ratio than anywhere else except Europe

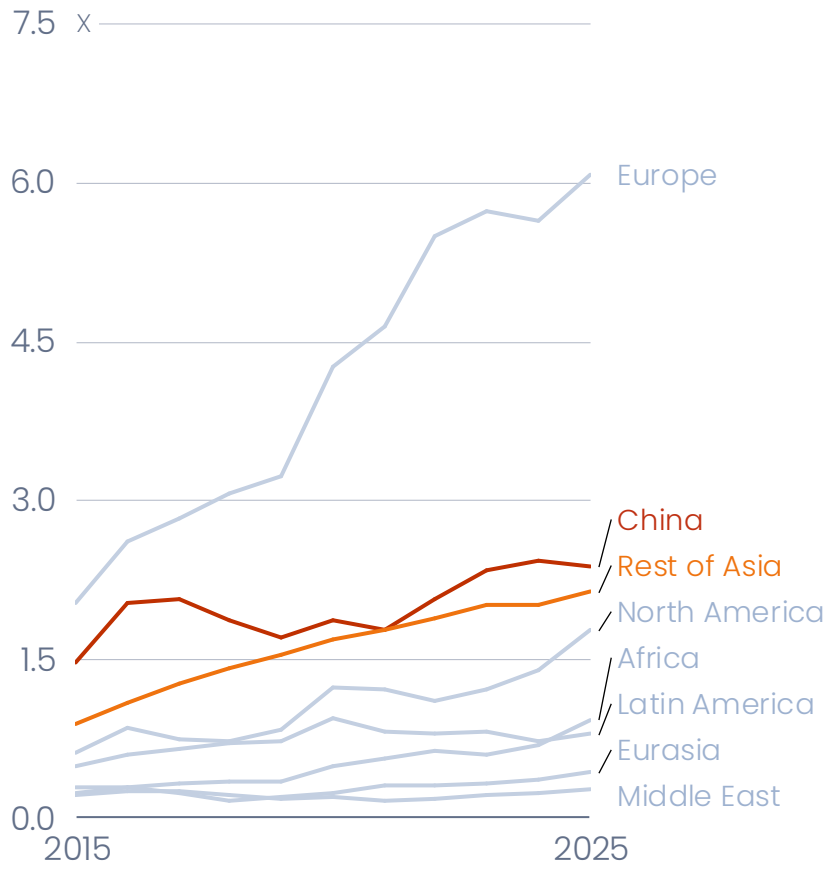
China



Rest of Asia



Electrotech-to-fossil capex ratio



Source: IEA; Ember analysis. Note: electrotech here is defined as all non-fossil investment.

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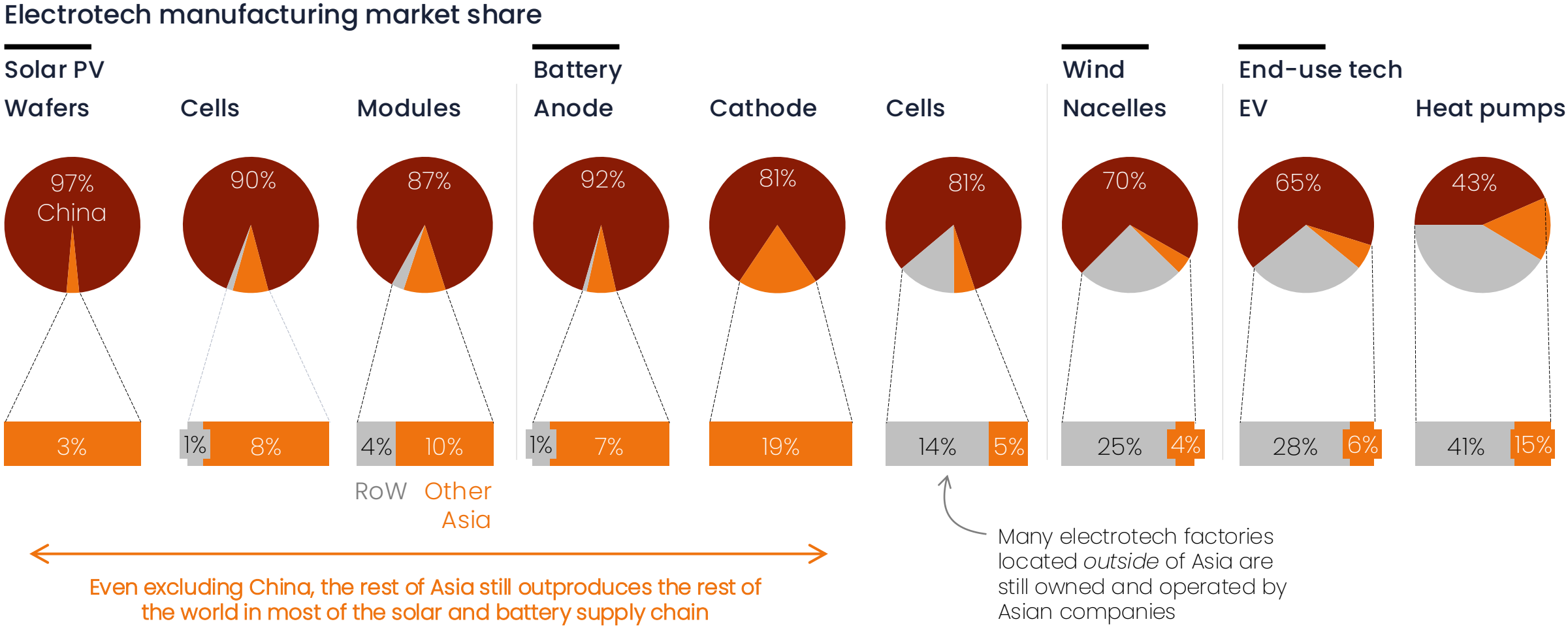
Asia dominates electrotech manufacturing

Even excluding China, the rest of Asia outproduces the rest of the world on solar and batteries



Sources: IEA PVPS, IEA ETP 2024; Ember analysis. Notes: in 2023, 75% of clean energy technology manufacturing was in Asia. Percentages may not always add up to exactly 100% due to rounding. EV = electric vehicles. RoW: Rest of the World.

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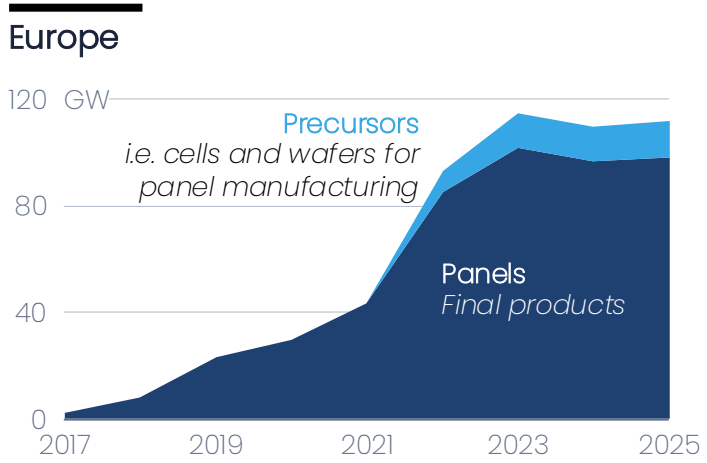
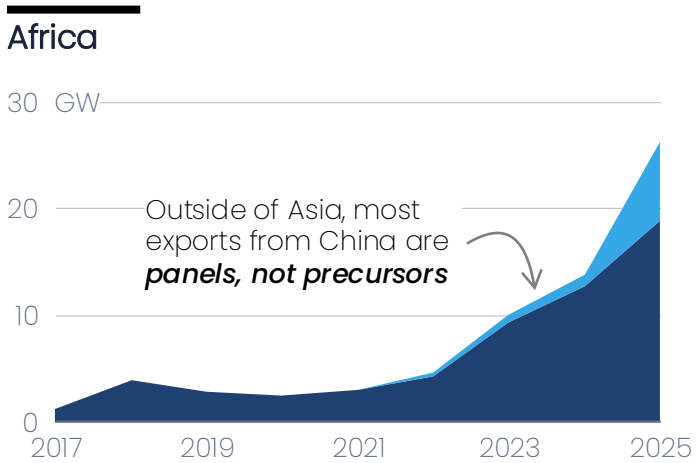
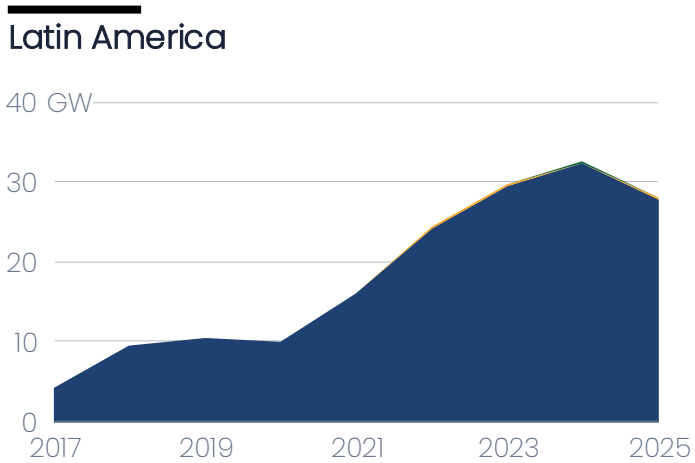
Manufacturing is spreading from China to Asia

Most markets just import Chinese solar panels; Asia buys precursors to manufacture panels itself

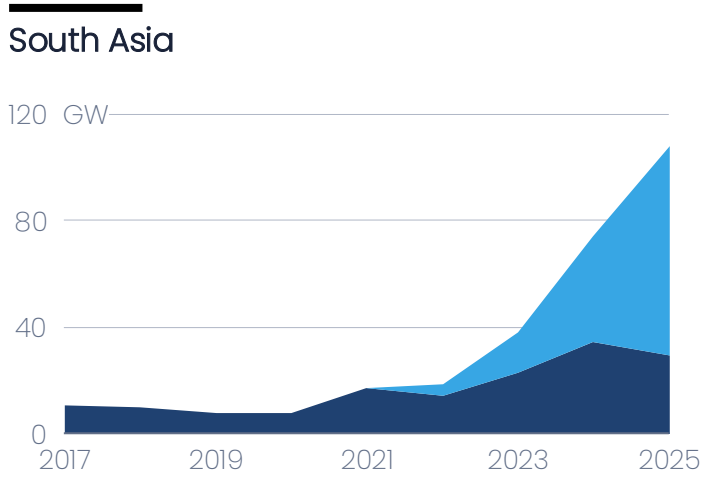
Chinese exports to non-Asian markets

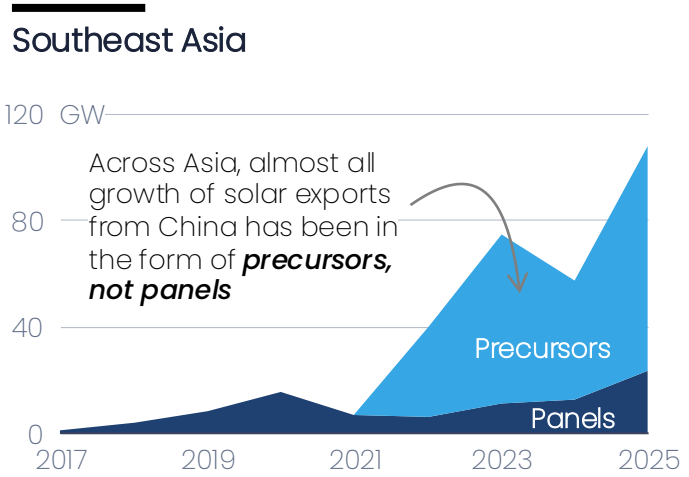


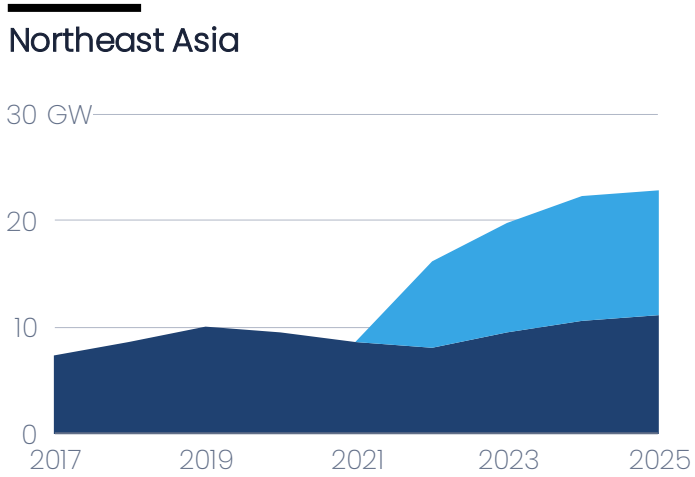




Chinese exports to Asian markets







Source: Ember China's Solar PV Export data; Ember analysis

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Part 2

Asia's geography favours electrotech

01

Asia lacks oil and gas

With 54% of the global population, Asia has just 2% of global oil reserves, 8% of global gas reserves and 26% of global coal reserves. Over 99% of people in Asia live in net oil importing countries. The result has been rising fossil import dependency, and in 2024 Asia imported $1.1 trillion of fossil fuels at a cost of 3.2% of GDP. Asia now endures a very high level of import dependency, at 31% of its primary energy demand. Asia has grown to be the net importer of 62% of all fossil fuels, and is the key growth target of the fossil system.

02

Asia is the workshop of the world

Asia dominates global manufacturing of electronics and electrotech, enabling the region to manufacture its own energy. And Asia has plenty of renewable resources, sufficient to supply between 14 times its energy demand on conservative assumptions and 29 times on more aggressive assumptions. To give an idea of scale, local Asian solar and wind potential is 100 times larger than Asian oil and gas production.

03

And can electrify 70% of its energy demand

Asia can already electrify 70% of its final energy demand, and the ceiling of what is possible rises every year as costs fall and innovation rises. With the world's cheapest manufacturing costs and low electricity prices, the region is set to supply its own energy.

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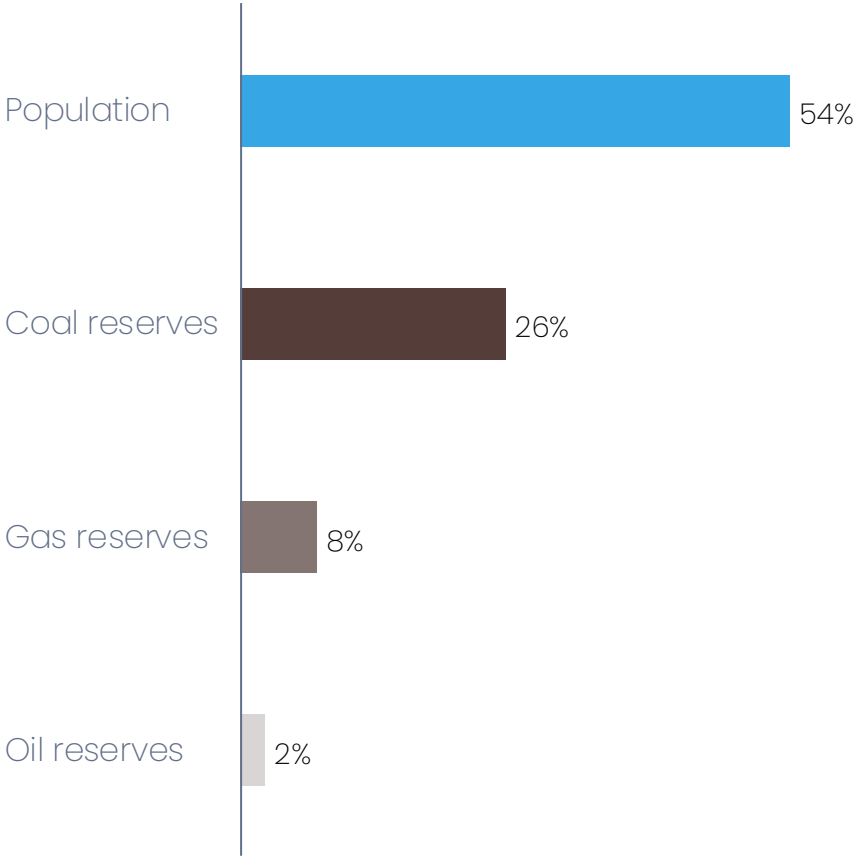
Asia lacks fossil fuel reserves, especially oil and gas

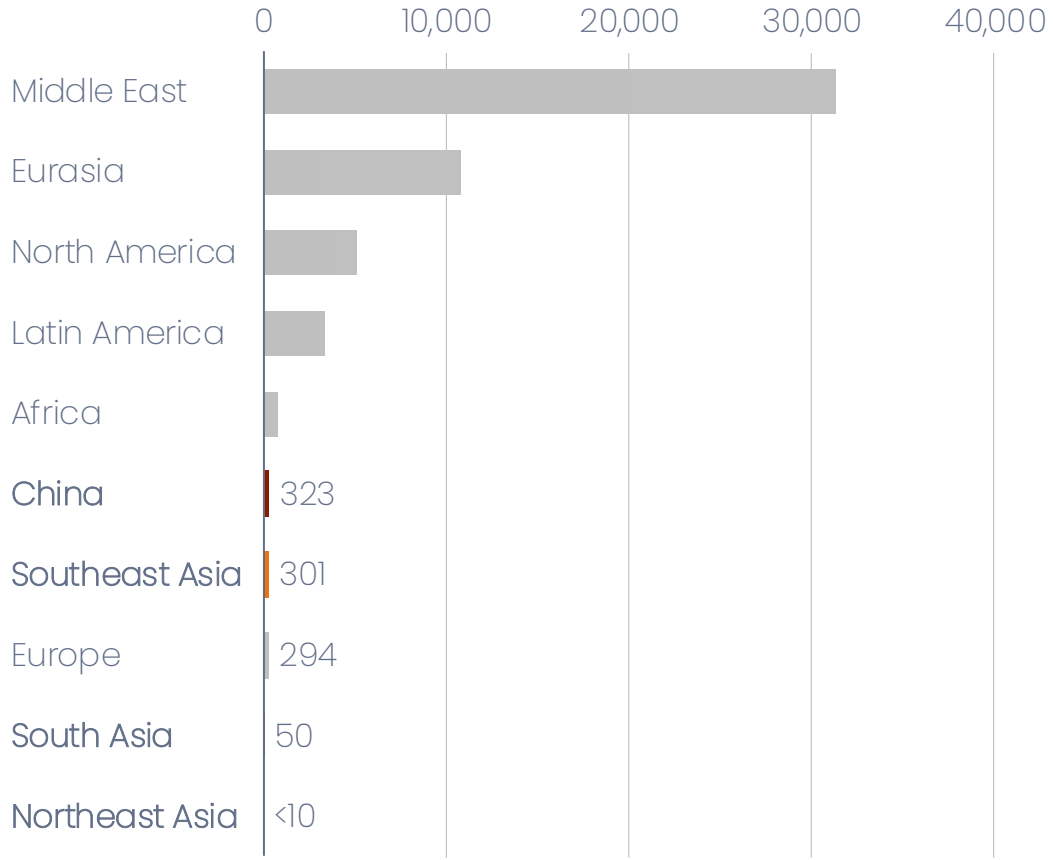
Asia is 54% of global population, yet has just 2% of global oil reserves and 8% of gas reserves

Asia share of world, population vs reserves



Oil and gas reserves per person

GJ per person



Years of per capita OECD-level oil and gas consumption

~290 years

~100 years

~48 years

~31 years

~8 years

~3 years

~2.8 years

~2.7 years

<1 year

<1 year

Sources: Energy Institute, World Bank; Ember analysis. Note: years of OECD-level consumption tracks how many years of typical OECD oil and gas consumption could be sustained by reserves.

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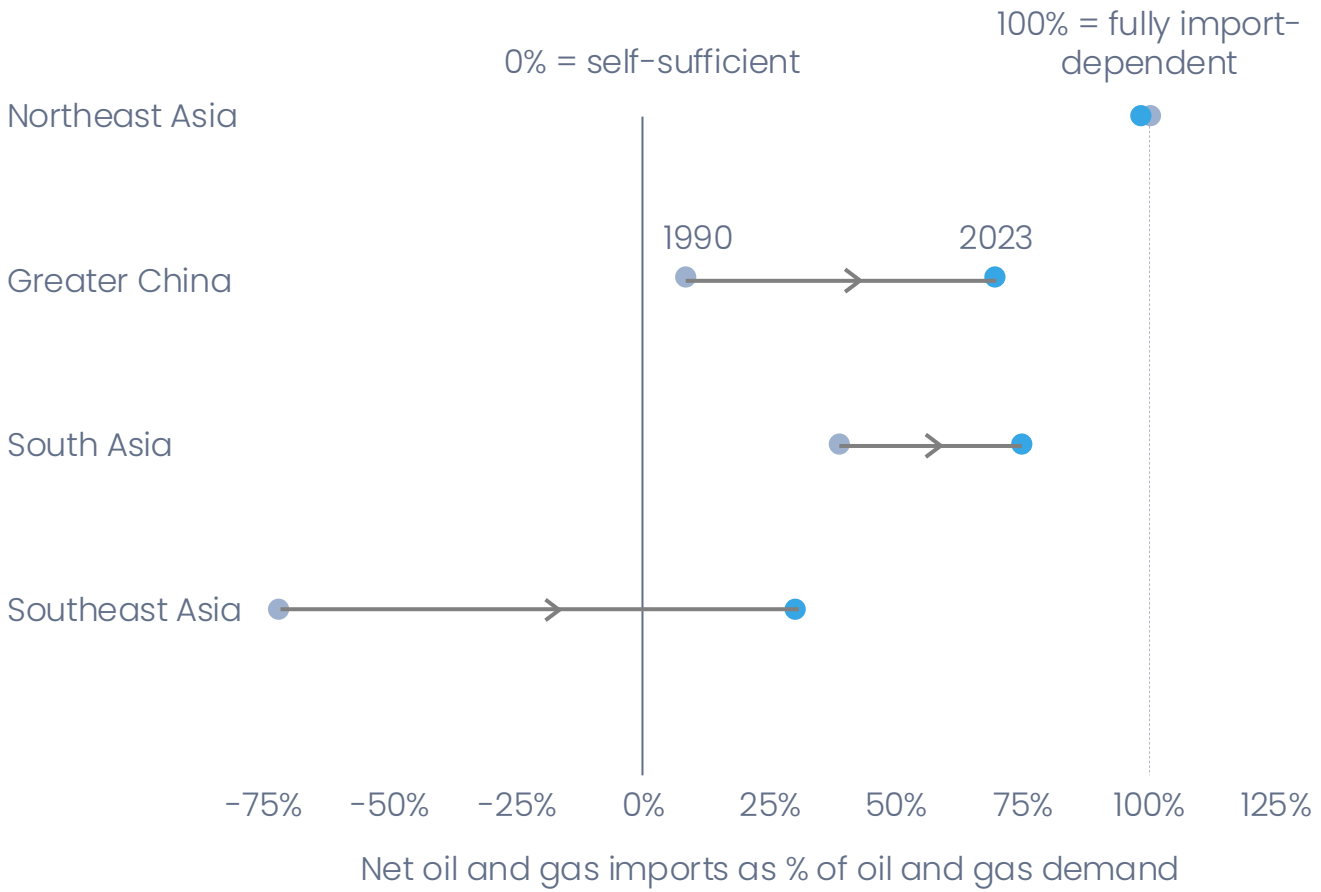
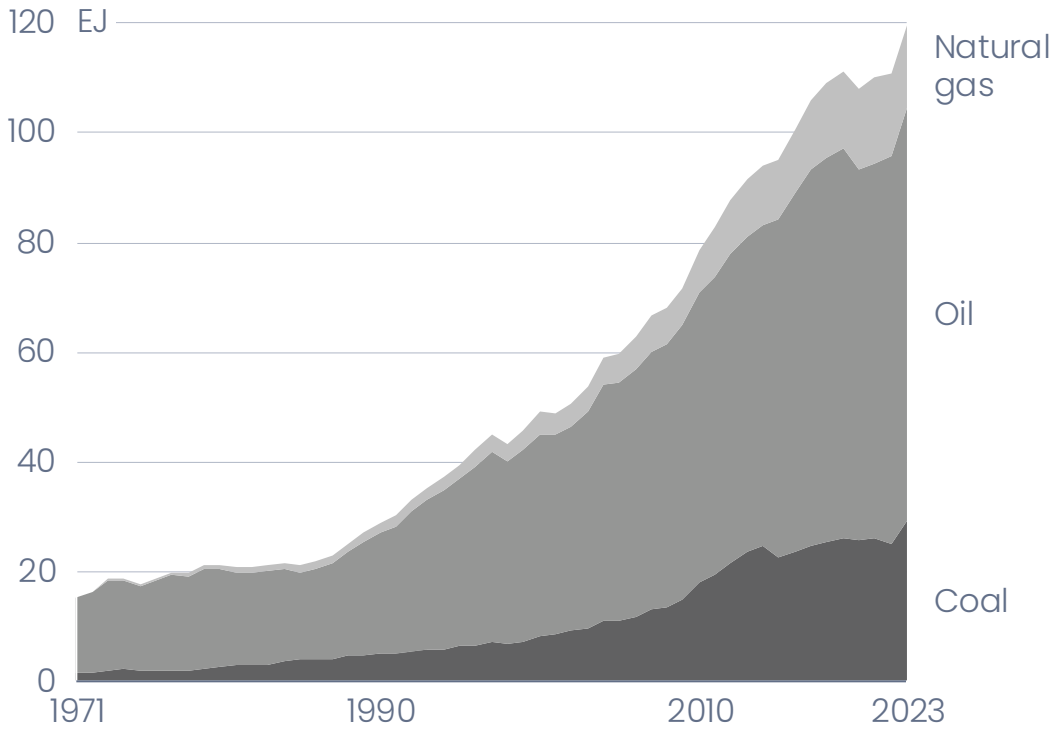
So economic growth required deepening import dependency

As Asia gets richer, it needs more energy. In the past that meant rising fossil fuel imports

Oil and gas net imports as a share of demand



Asia fossil fuel imports, gross



Source: IEA; Ember analysis

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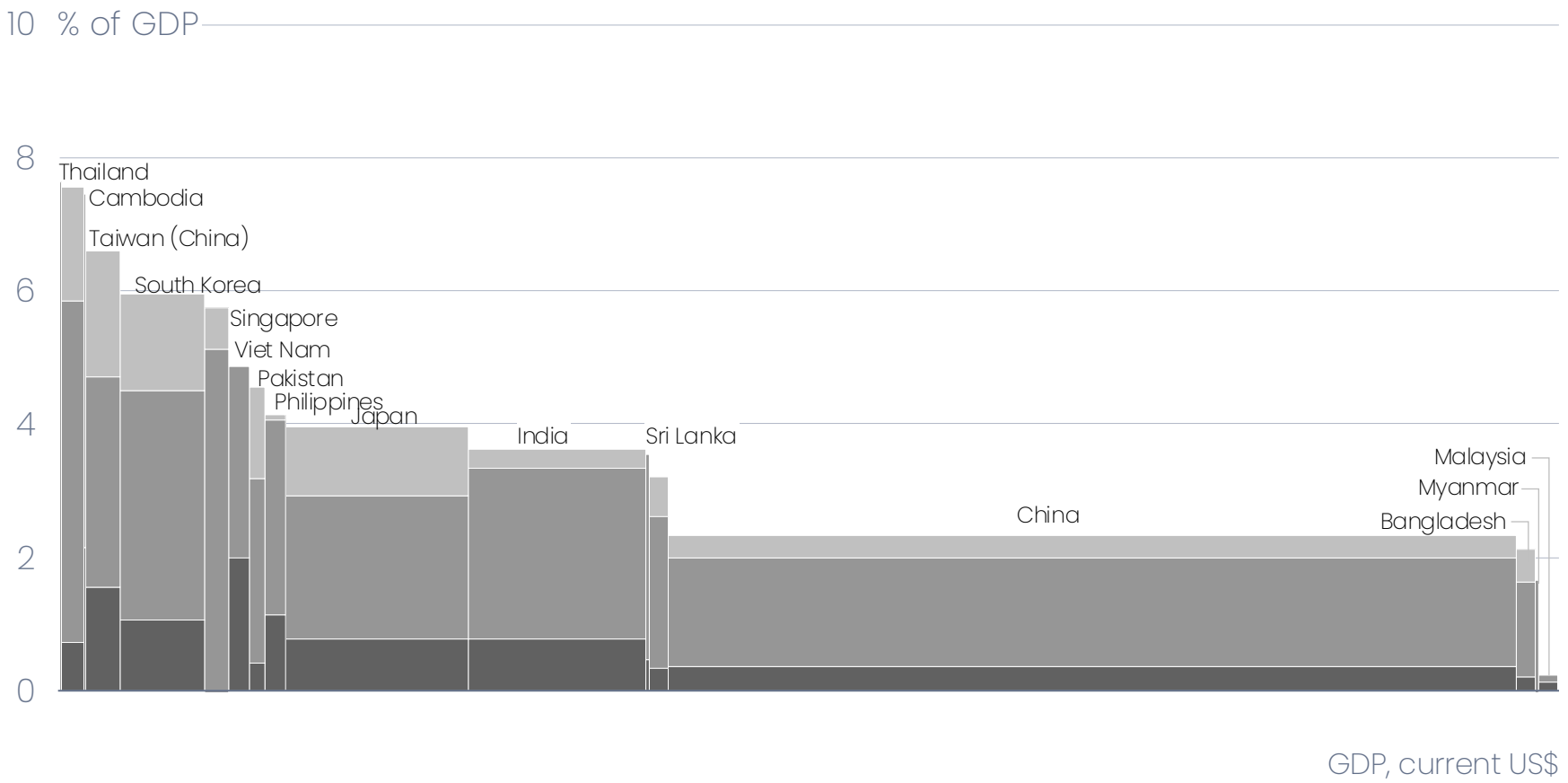
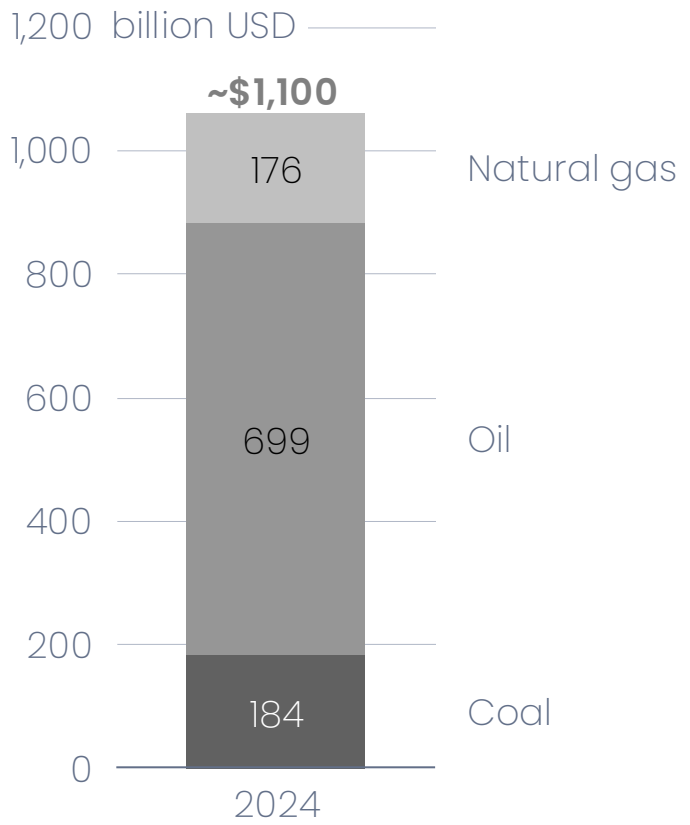
This import dependency is very expensive

Asia imports over $1 trillion a year of mainly oil and gas at a cost of over 3% of regional GDP

Fossil fuel net import cost by fuel, as share of GDP – Asian net importers (2024)



Asian net importers' fossil import bill



Sources: UN Comtrade, World Bank. Note: most recent data taken when 2024 is not available.

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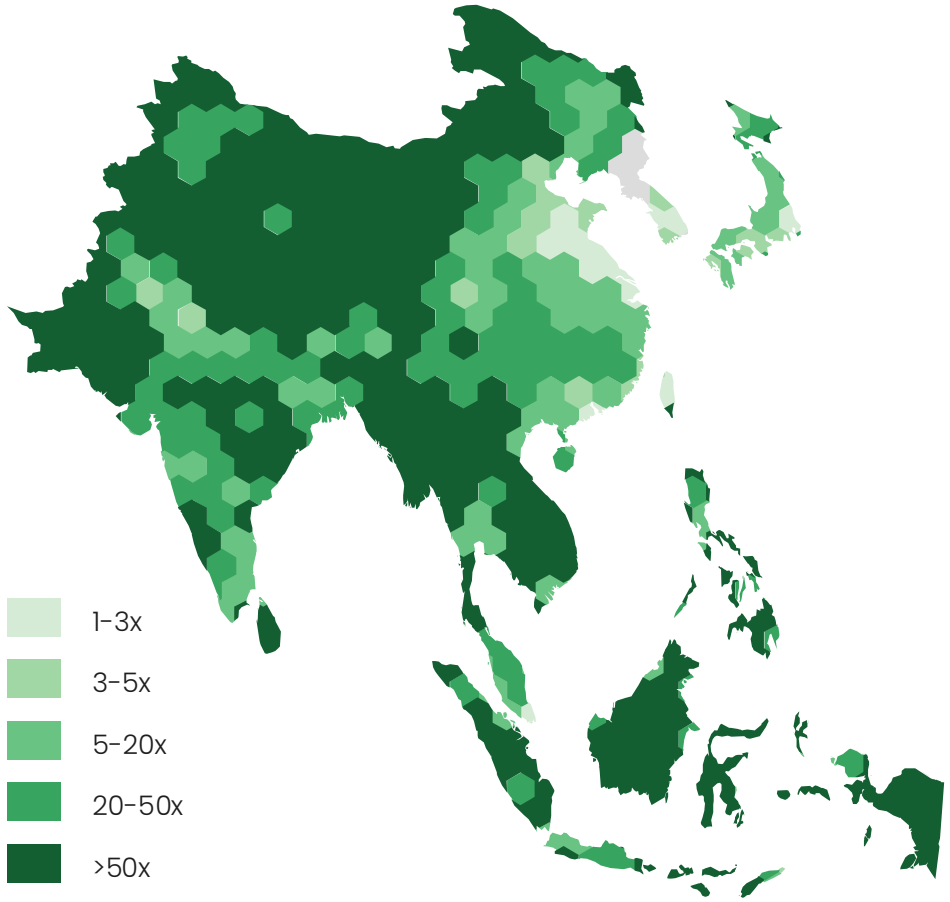
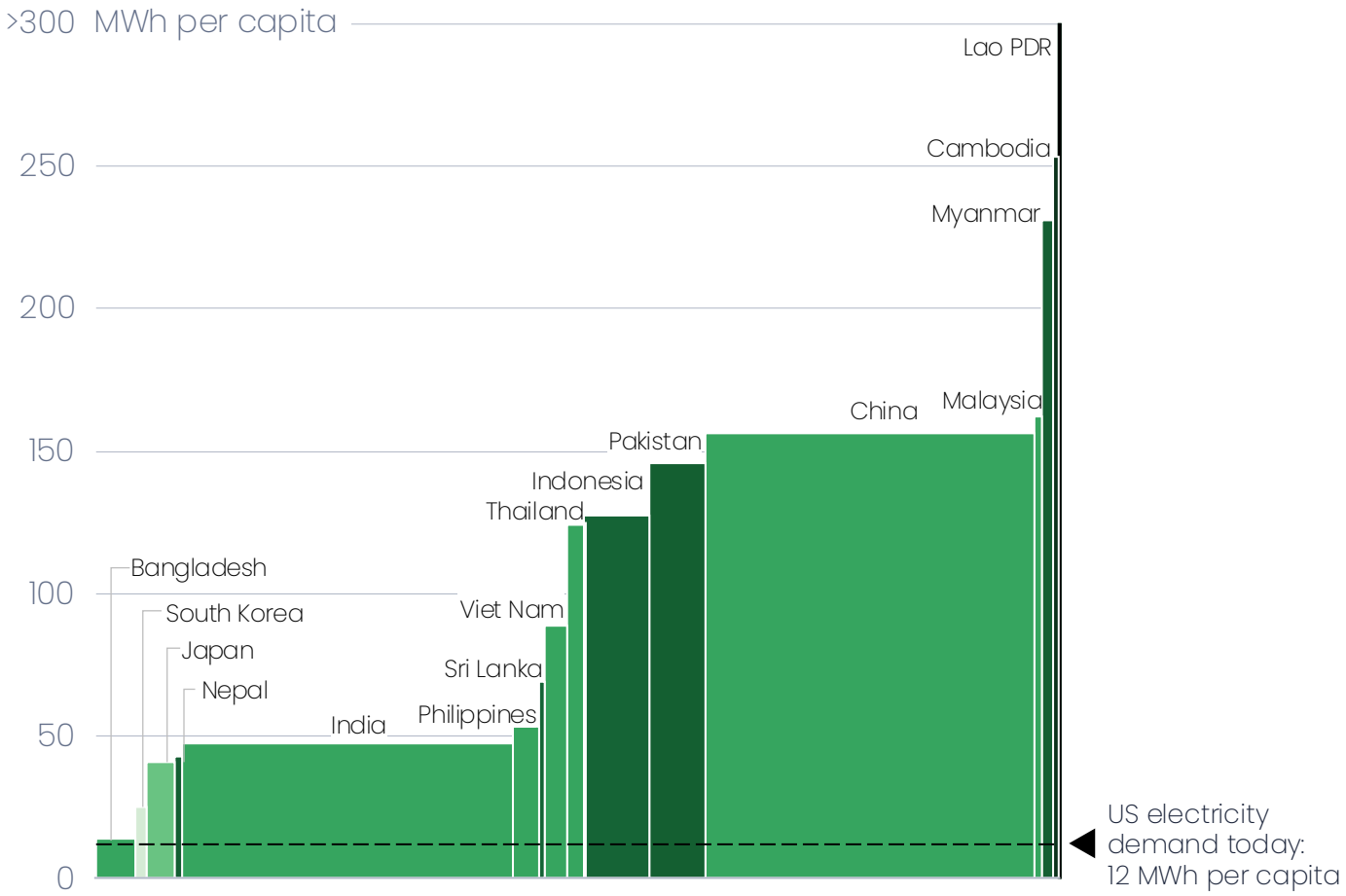
Asia has massive renewable resources

Solar and wind resources are able to supply at least 14 times Asian annual energy demand

Renewable potential as multiple of energy demand



Renewable electricity potential per capita



Sources: IEA, Ember, NREL, Solargis, NASA POWER, NASA SEDAC; Ember analysis. Note: energy demand measured in useful terms to correct for thermal losses of current fossil and biomass demand. Conservative estimate based on the usage of level 2 land only.

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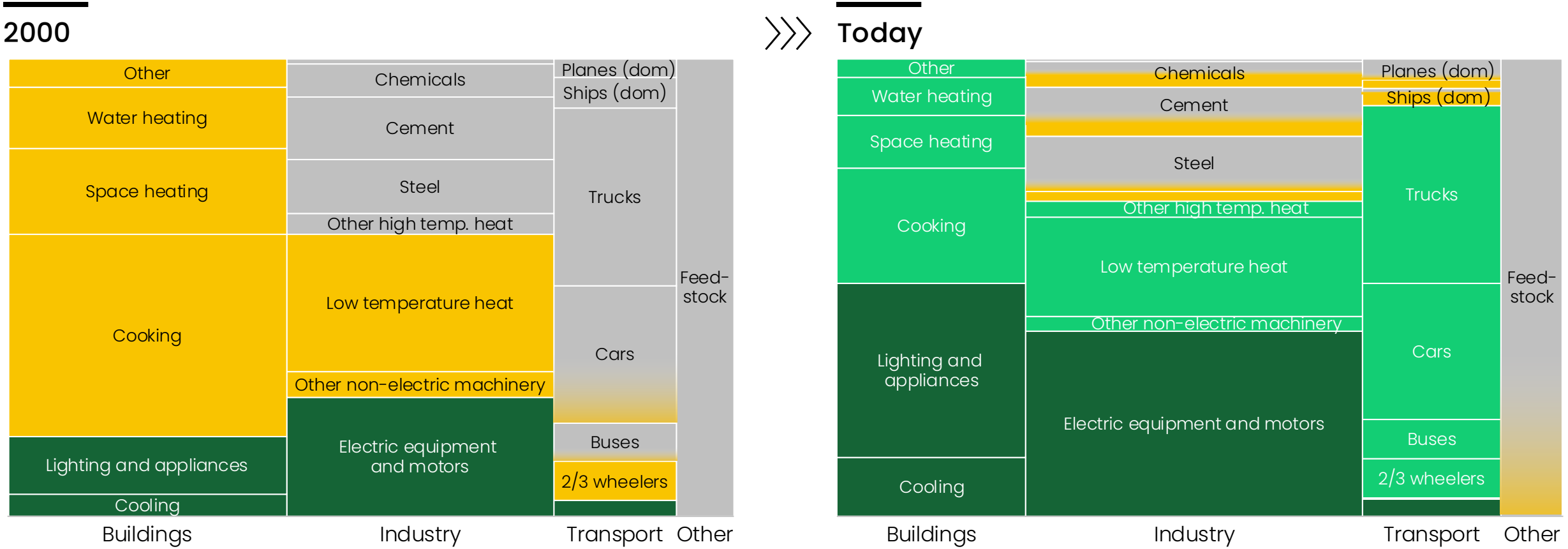
Which can power an electrified economy

Over 70% of Asia's energy can be electrified economically

Already (largely) electrified
Can be electrified technically
Can be electrified economically
Still under development

Share of Asian final energy demand by subsector and electrification potential (%)



Sources: IIASA, IEA, BNEF; Ember analysis. Note: dom = domestic.

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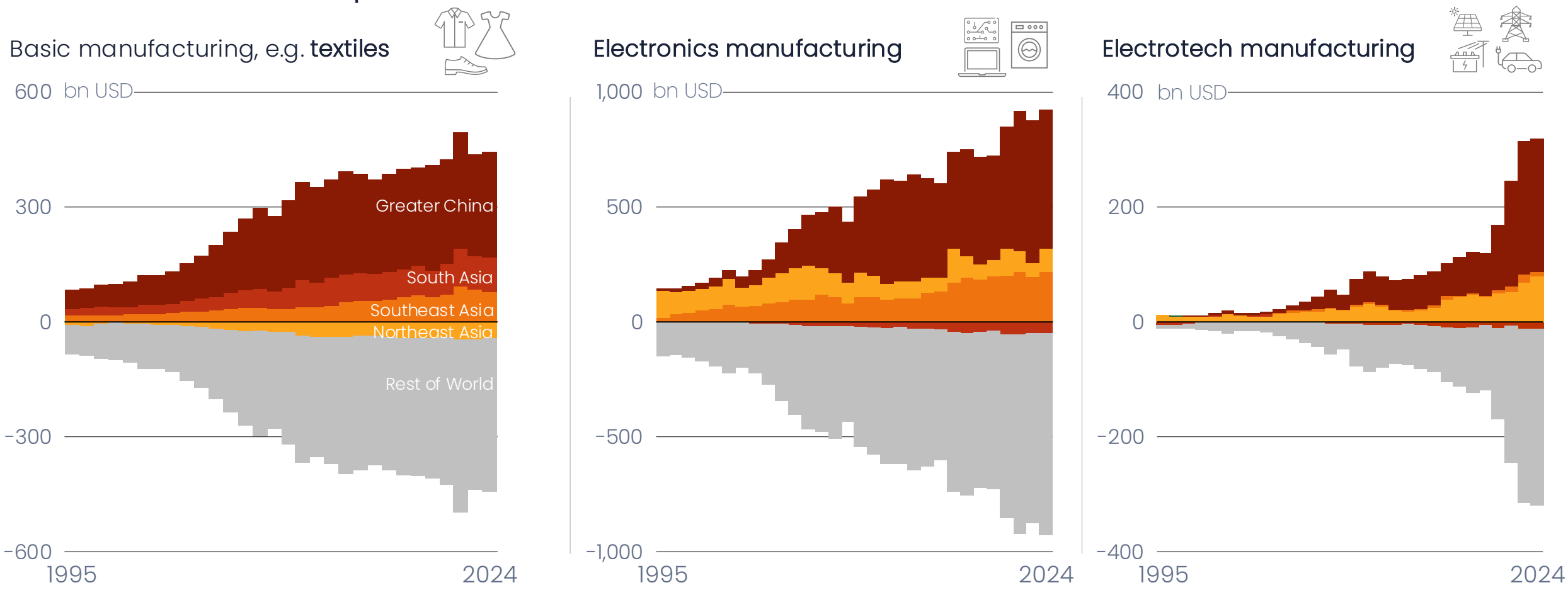
Asia is the workshop of the world

The region moved from dominating basic manufacturing to electronics, and now electrotech

Asia and Rest of World net exports



Source: Observatory of Economic Complexity (OEC); Ember analysis

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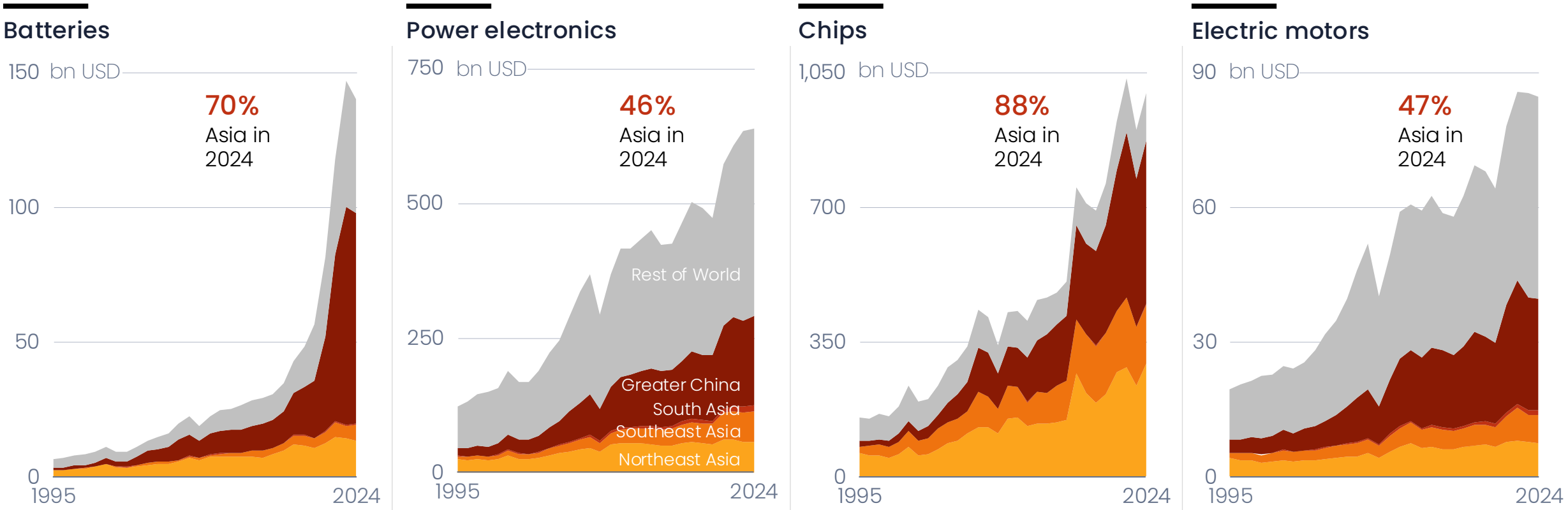
Asia has mastered the electric tech stack

Asia became dominant across the stack through developing a powerful electronics industry

Global gross exports by electric tech stack group



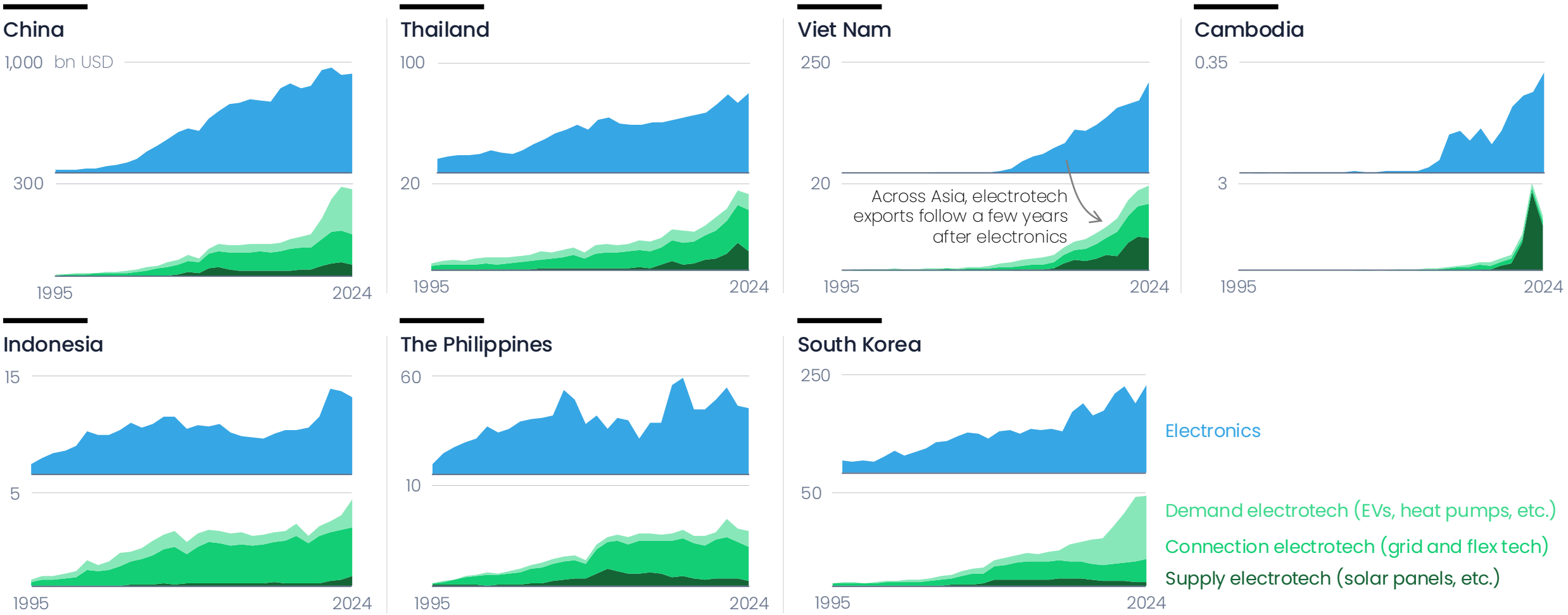
Four key electric components that underpin effectively all **electronics**, and are also the foundation of **electrotech**

Source: Observatory of Economic Complexity (OEC); Ember analysis

Electrotech follows electronics

Countries that built the skills to make electronics then moved into electrotech

Gross exports, 1995-latest – electronics vs electrotech



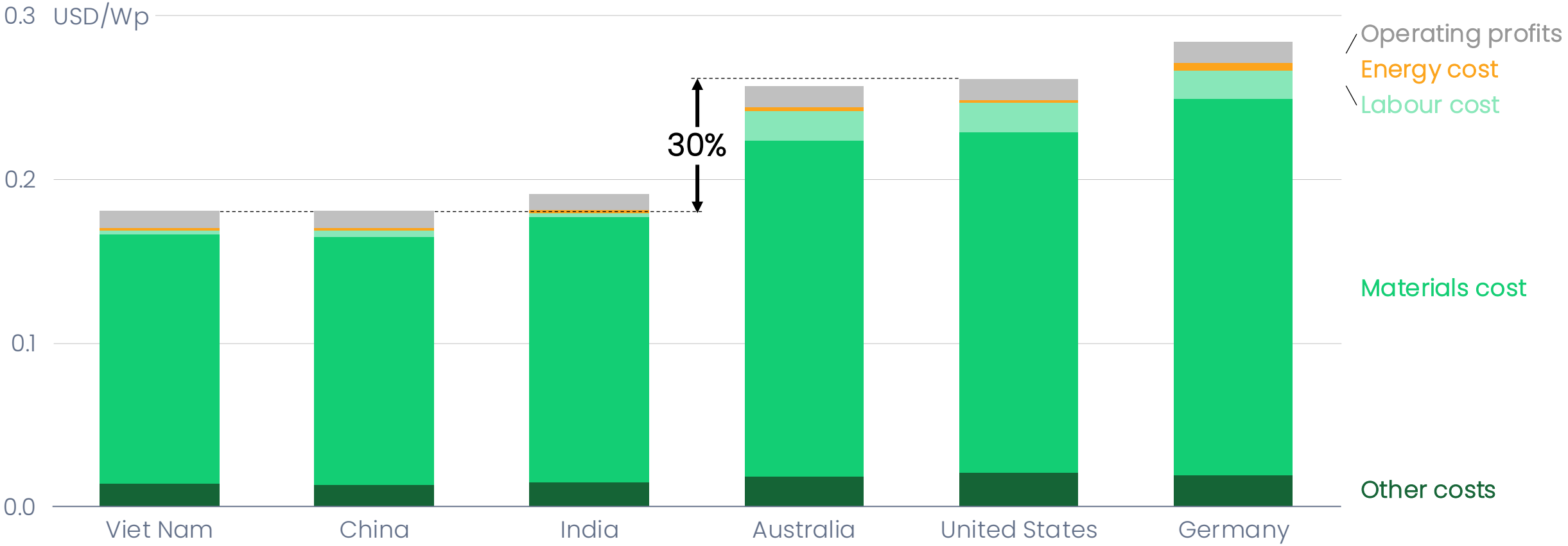
Source: UN Comtrade; Ember analysis

EMBER

Asian manufacturing is highly competitive

Asia has the cheapest manufacturing costs, and amongst the lowest electricity prices in the world

Estimated solar PV domestic manufacturing costs in 2025, IRENA



Source: IRENA Solar PV Supply Chain Cost Tool; Ember analysis

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Part 3

Why now: necessity and opportunity

01

The twin fossil shocks of the 2020s galvanise change

Asia imports 31% of its primary energy demand as fossil fuels and has been highly dependent on the previous era of geopolitical stability which is being challenged by one oil shock after another. Asia gets 45% of its oil and 30% of its LNG from the Middle East, so is uniquely vulnerable to the closure of the Strait of Hormuz. Shortages, queues and emergency measures mean that this level of dependence on fossil imports is no longer sensible.

02

Economics of electrotech have improved dramatically

The economics of electrotech have been transformed in the last five years. The cost of firm electricity from solar backed up by batteries has fallen to below that of fossil fuels for almost all of Asia. Meanwhile, electric vehicles have reached purchase price parity with petrol cars, and the capital cost per useable MWh of solar has fallen to below the capital cost of equivalent coal or gas. The cost of capital of renewables has dropped below that of fossil power, and end-use technologies have fallen in price by 35-90%, opening up new areas for electrification.

03

Electrotech is fast, modular and consumer-led

Faced with crisis, policymakers can deploy electrotech rapidly, and households can climb the energy ladder one step at a time at low incremental costs. Meanwhile, consumers are leading the change, and governments need to act to stay relevant.

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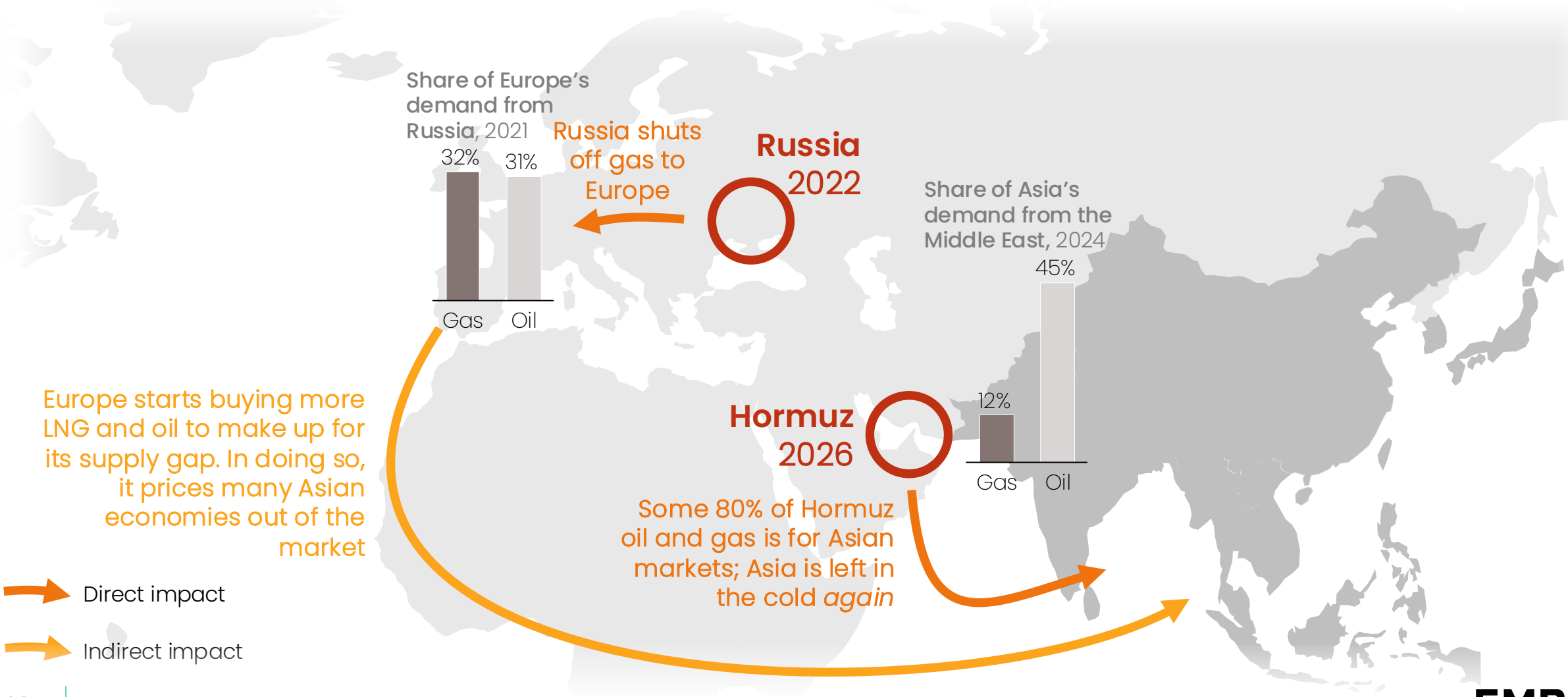
EMBER

We are in a new era of fossil shocks as geopolitical instability increases

The twin fossil shocks of the 2020s have called into question Asia's high fossil import dependence



Sources: IEA, Energy Institute, UN Comtrade; Ember analysis. Note: Europe here refers to the EU, the UK and Switzerland.

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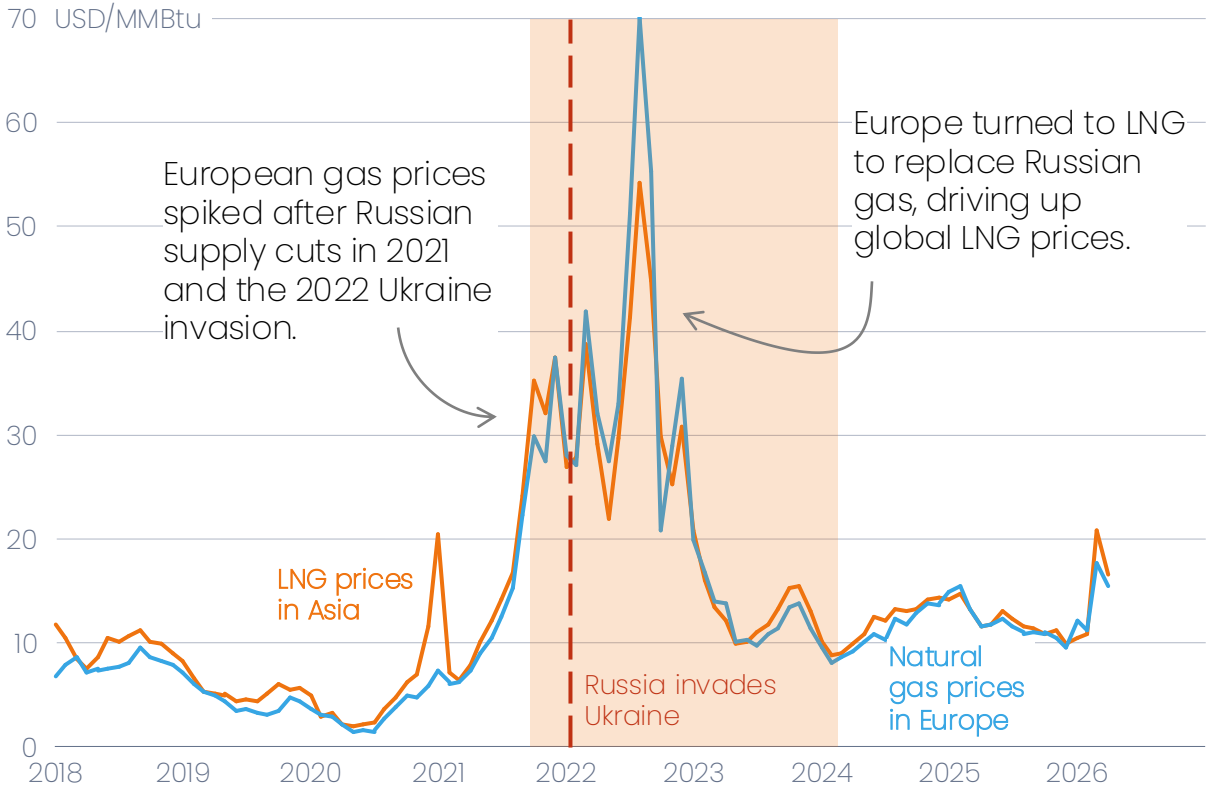
LNG has proven to be unreliable and intermittent

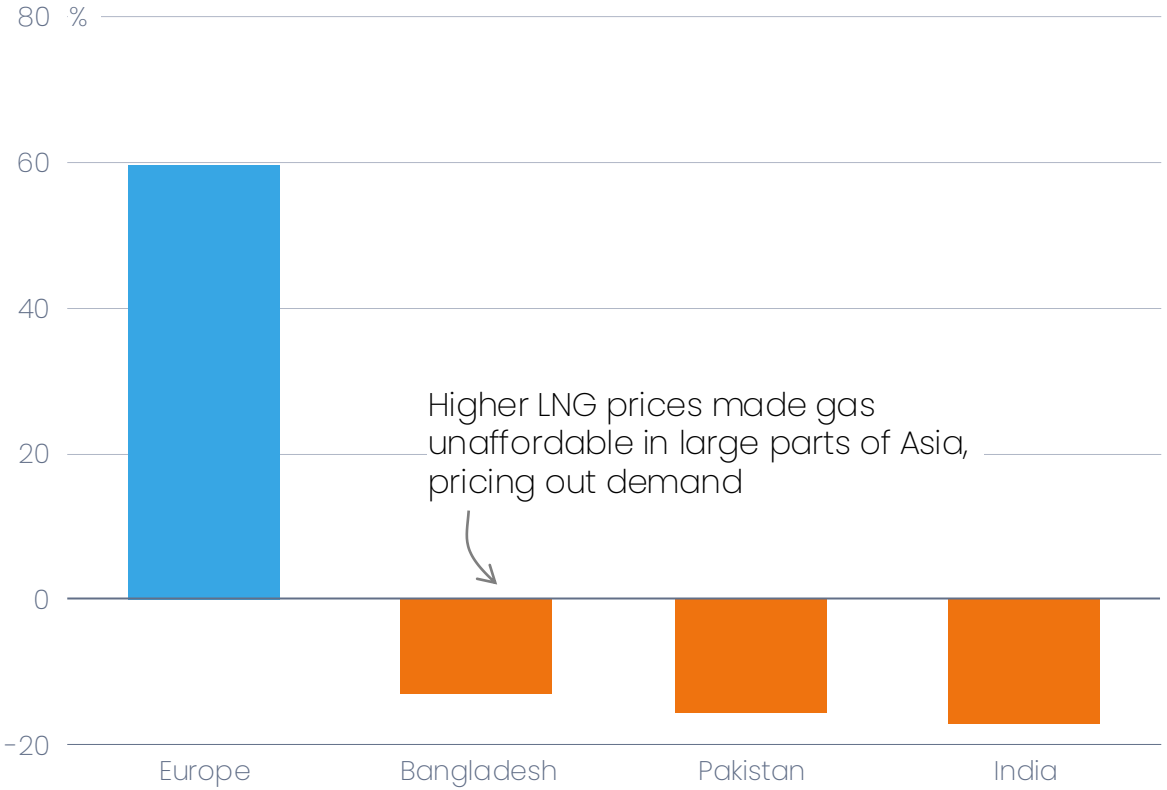
When the going gets tough, rich countries price emerging Asian economies out of their energy

Example: LNG in 2022

Global gas prices spiked in 2022



Change in LNG net imports between 2021 and 2022



Sources: IMF, GIIGNL 2023 Annual Report; Ember analysis. Note: Change % based on Mt volume.

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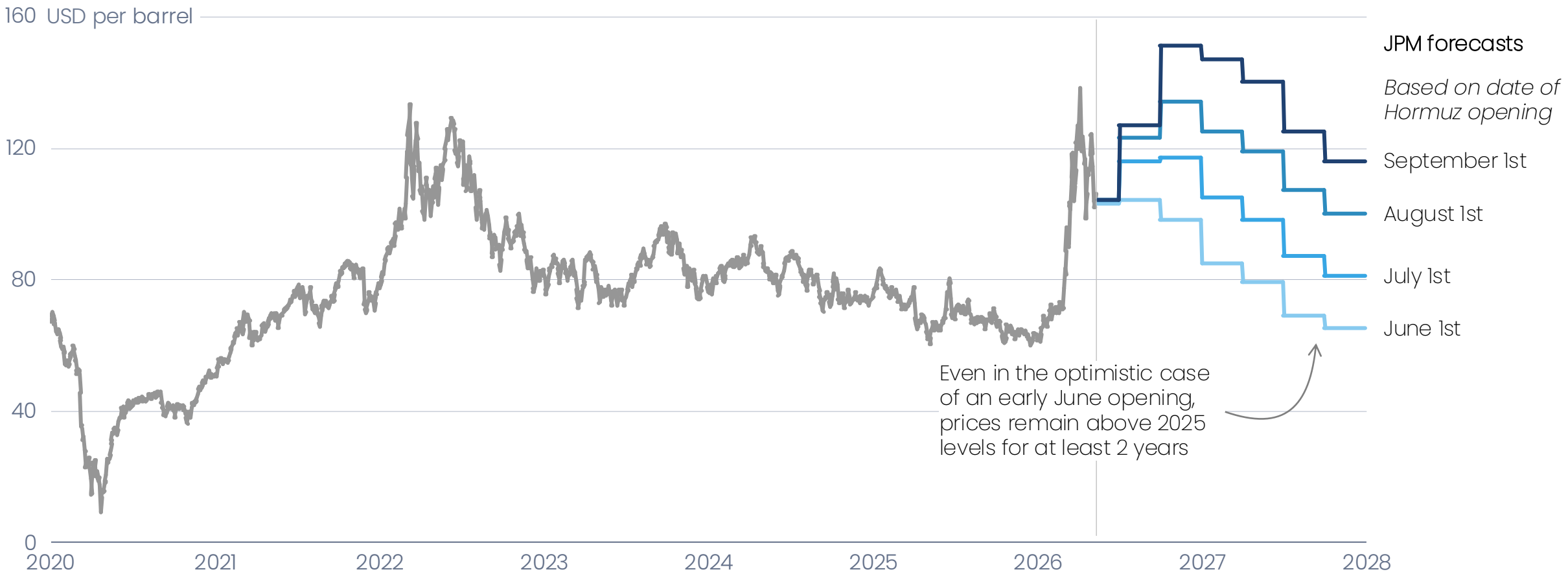
Fossil prices are likely to stay elevated for a long time

Finding a cheaper, more reliable alternative to drive growth is essential for Asia

Oil price, Brent



Sources: EIA, Thomson Reuters, J.P. Morgan Global Commodities (May 2026)

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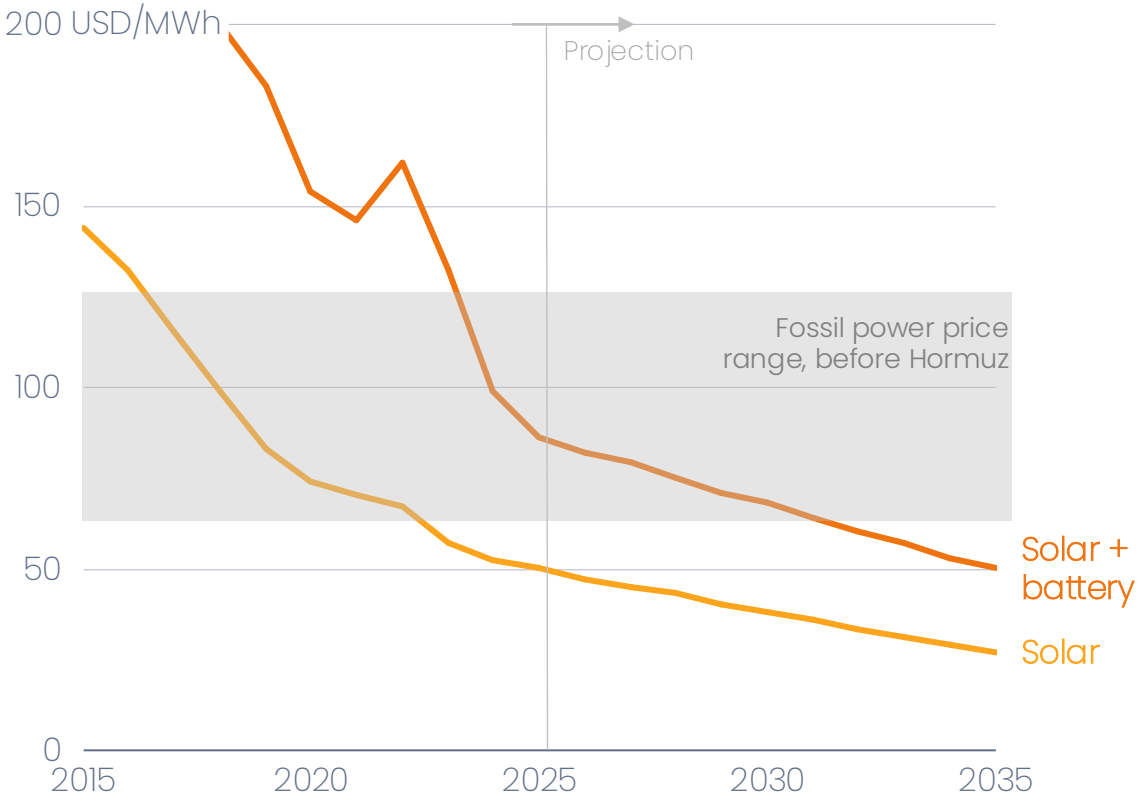
Even before the Hormuz shock, electrotech was beating fossil fuels on price

What was competitive before is irresistible now

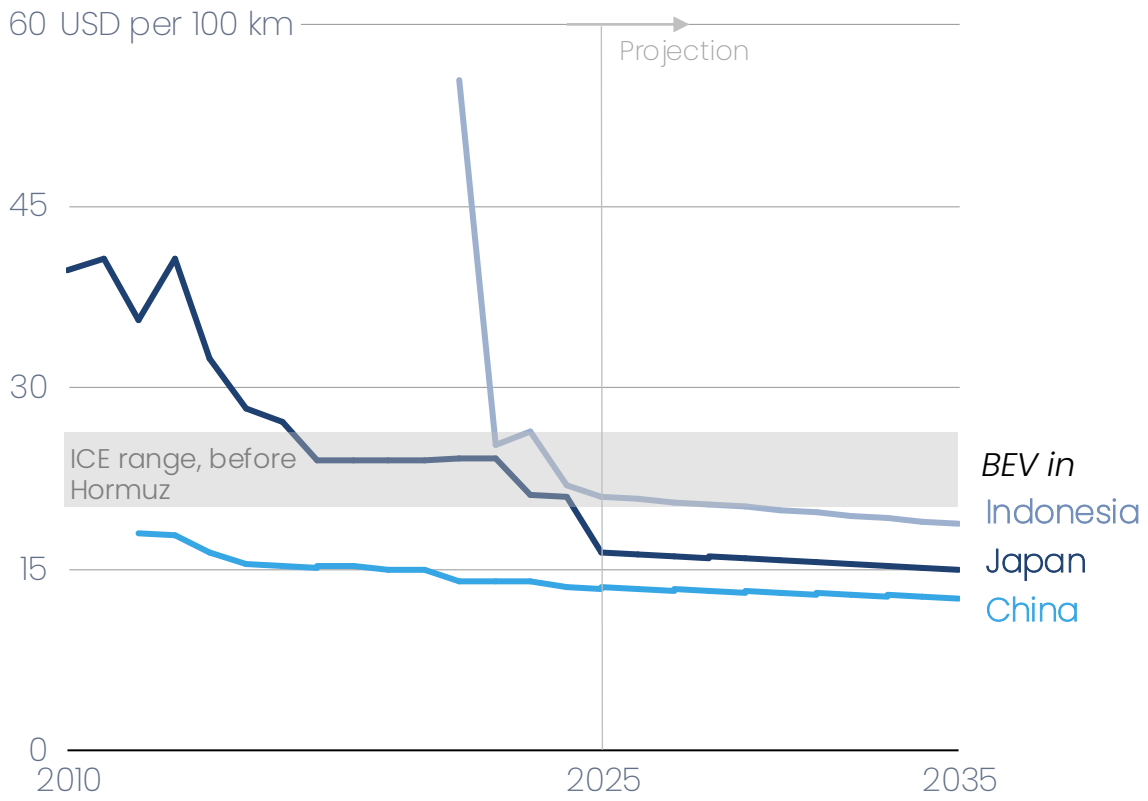
Levelised cost of supply tech

Example: solar versus fossil LCOE, Asia average



Levelised cost of demand tech

Example: total cost of ownership of cars (average)



Sources: IRENA, IEA; Ember analysis. Notes: solar-plus-storage shown with 4-hour battery pack. Solar and battery costs projected by Ember using learning curves. BEV = Battery Electric Vehicle; ICE = Internal Combustion Engine.

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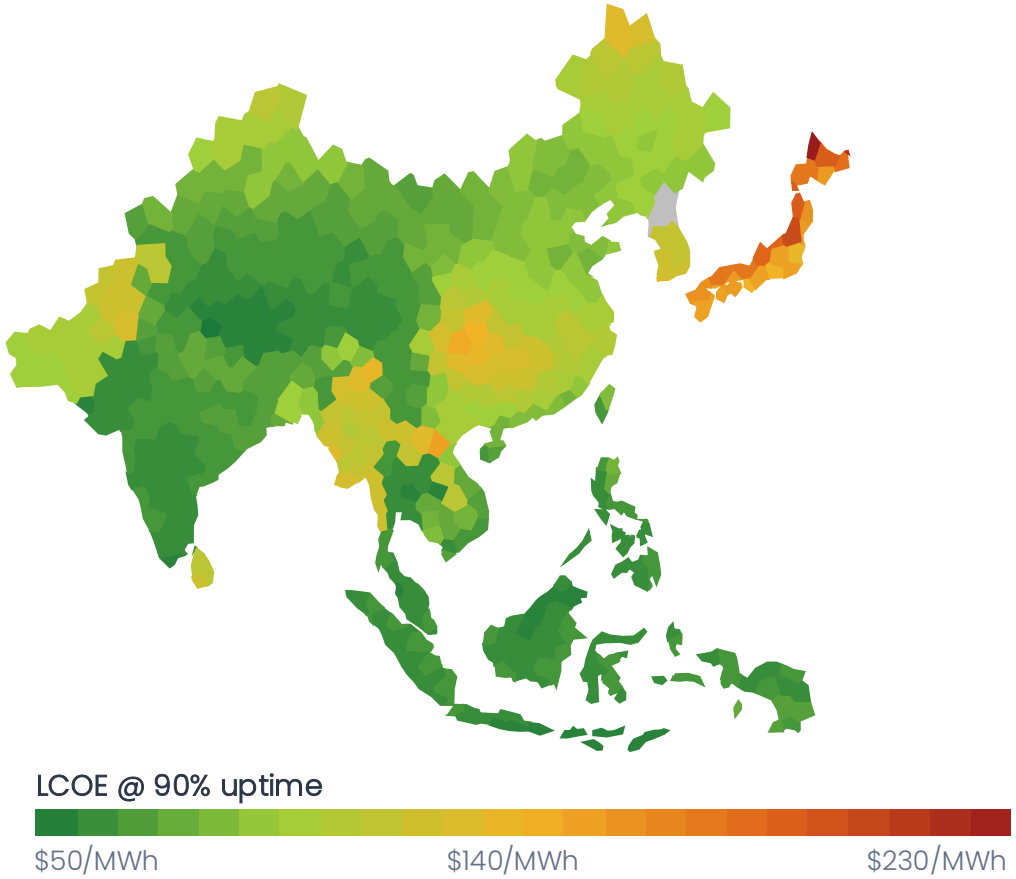
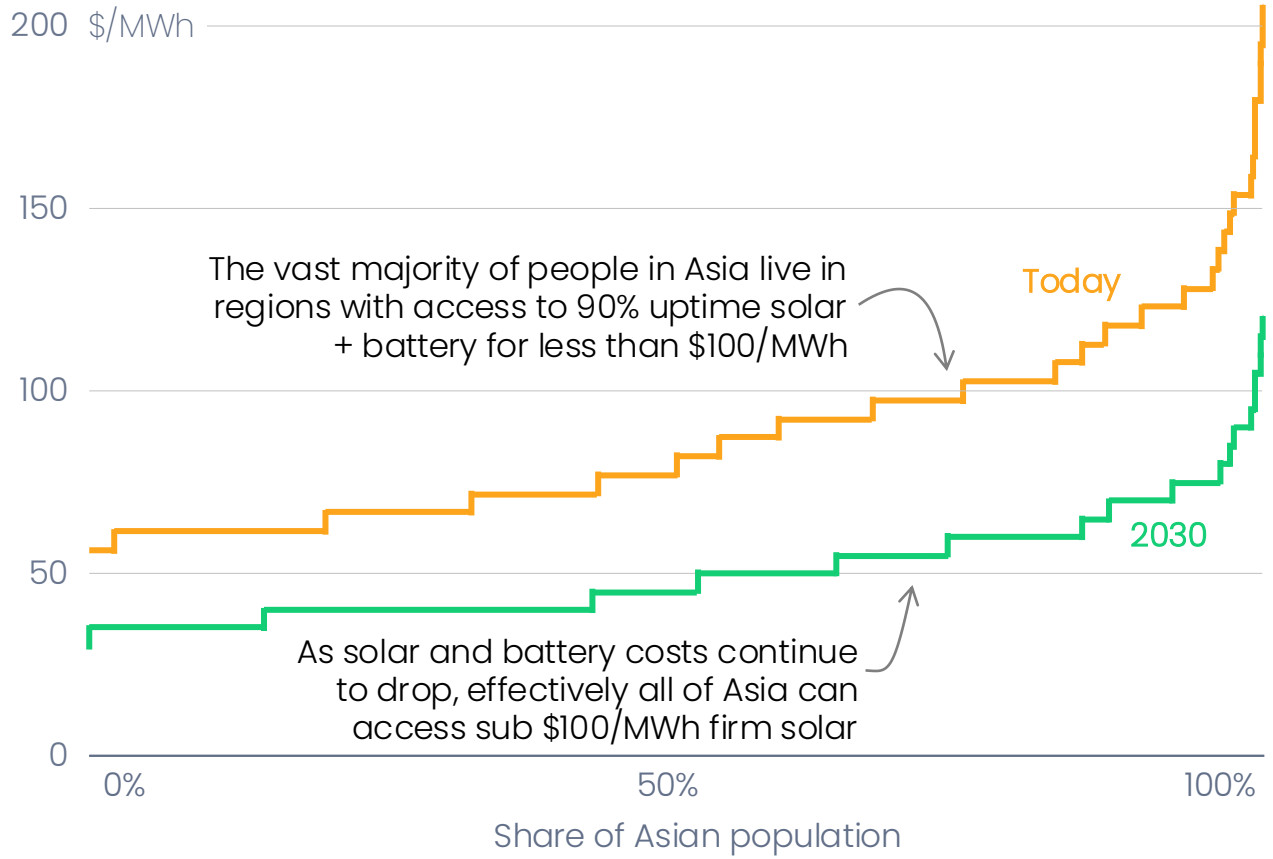
Solar plus storage is Asia's golden opportunity

Asian solar is cheap exactly where most people live

Solar plus battery LCOE across Asia, 2026



Share of population by solar LCOE



Sources: NASA POWER, NASA SEDAC, IEA, IRENA, BNEF, World Bank; Ember analysis

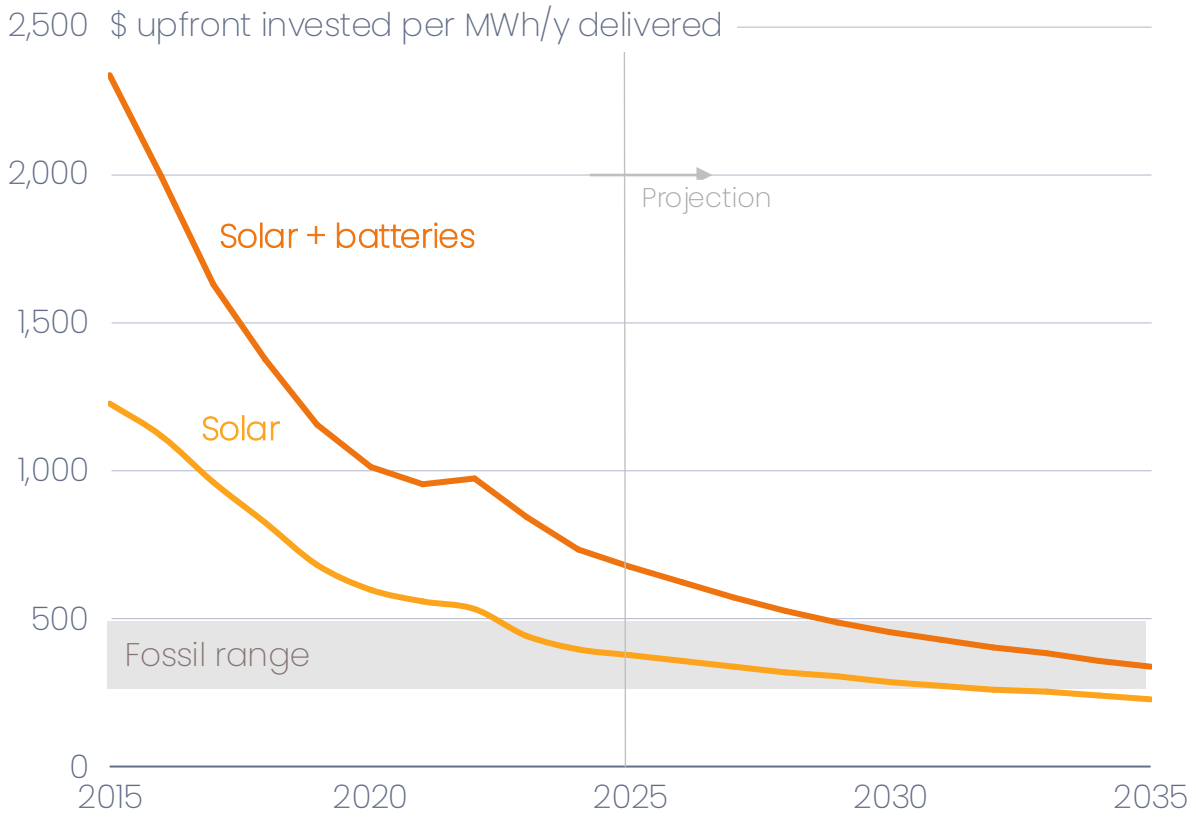
EMBER

Asia has reached capex parity

The up-front cost of electrotech now beats fossil tech – even before any fuel costs are considered

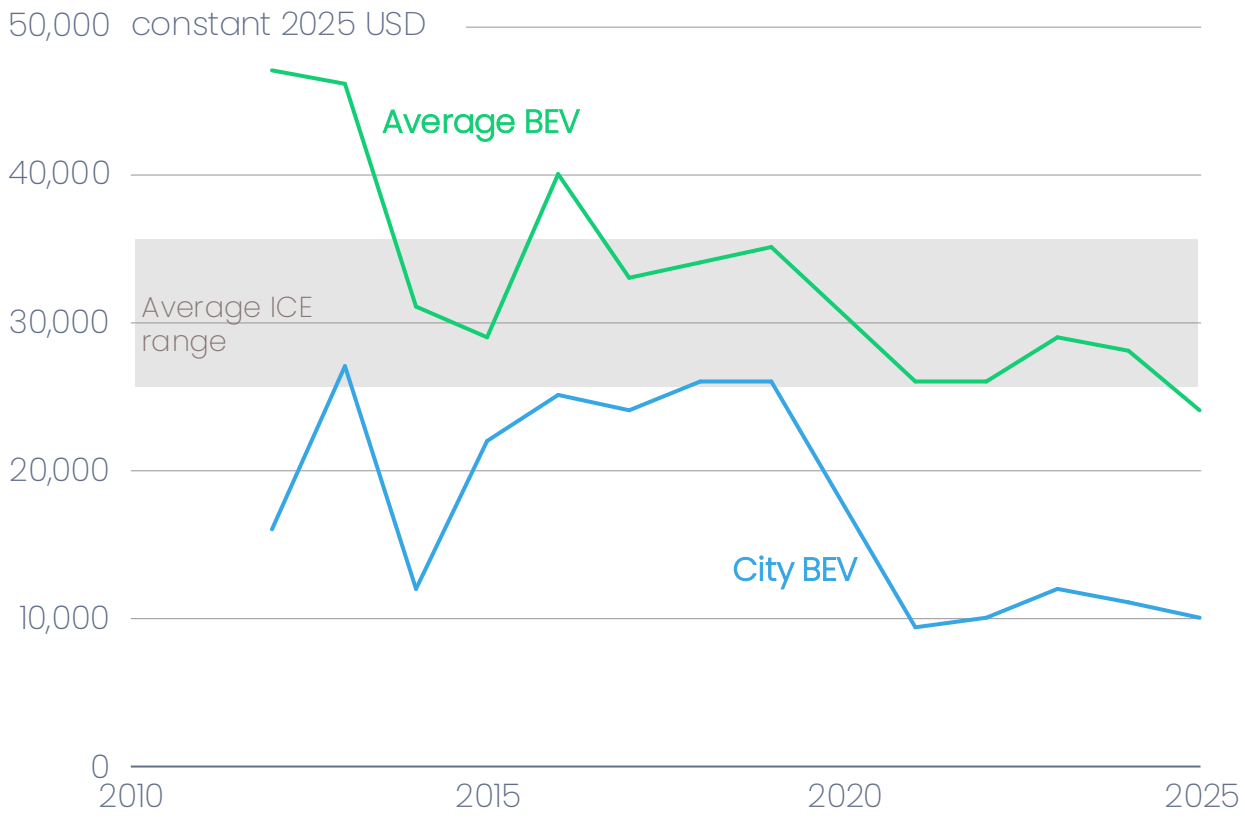
Up-front cost of supply tech

Example: solar versus fossil up-front cost, Asia average



Up-front cost of demand tech

Example: average car sale prices in China



Sources: IRENA, BNEF, IEA; Ember analysis. Notes: capital intensity measures up-front capital cost adjusted for utilisation. Excludes fuel, O&M and financing. Solar-plus-storage shown with 4-hour battery pack. Solar and battery costs projected by Ember using learning curves.
BEV = Battery Electric Vehicle; ICE = Internal Combustion Engine.

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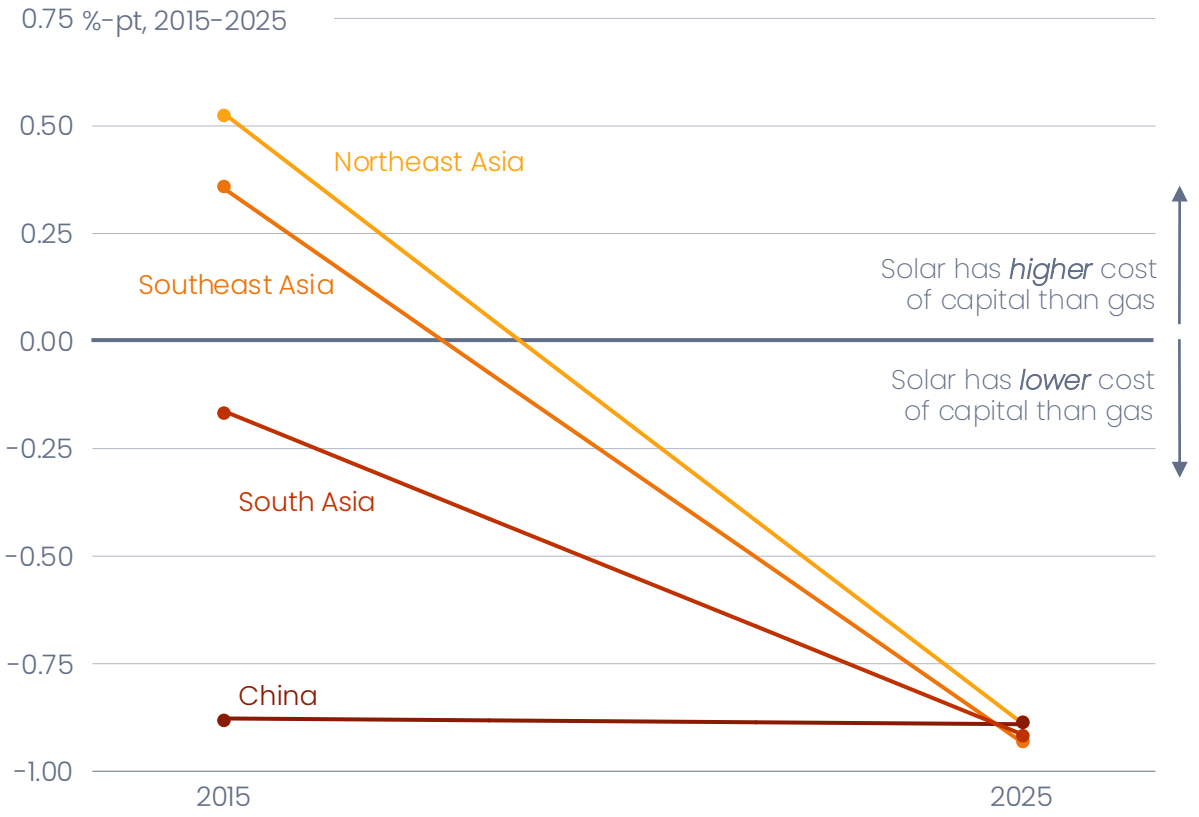
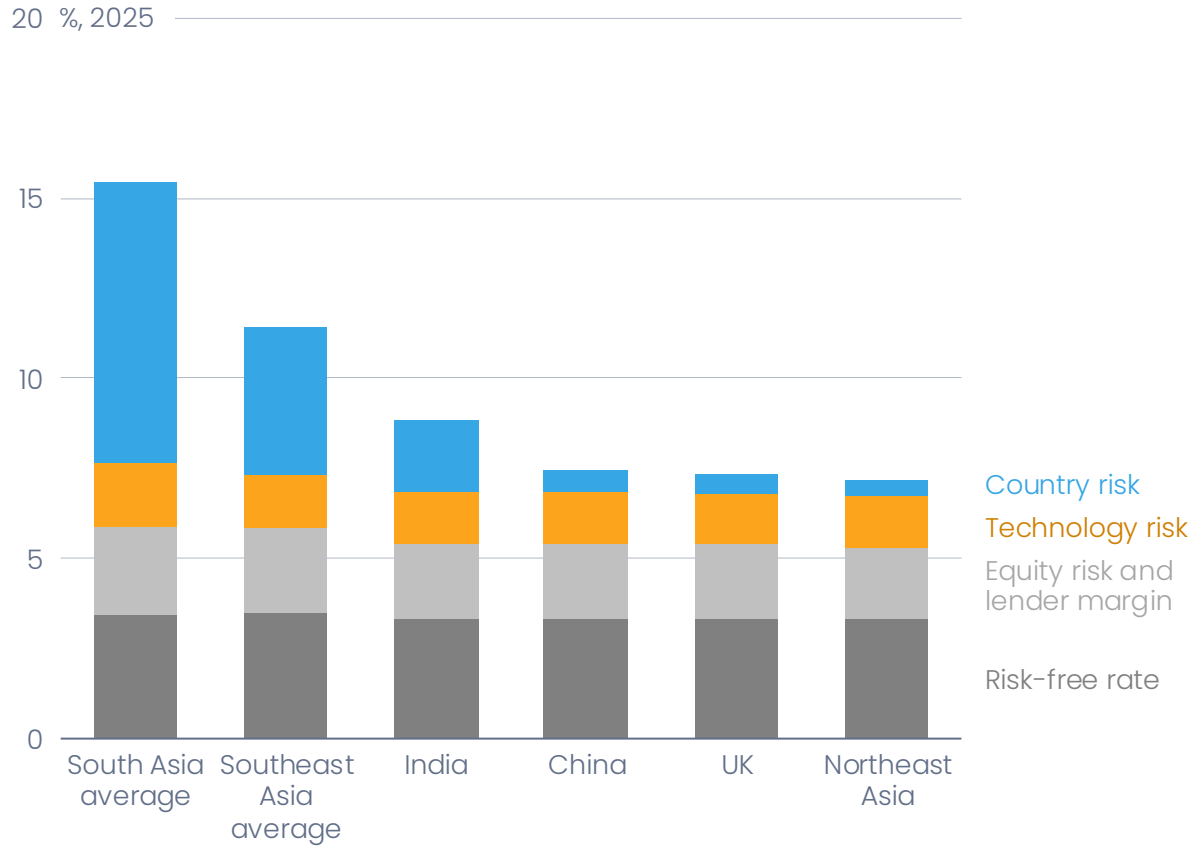
Electrotech also enjoys a lower cost of capital now

Solar's cost of capital is lower than gas in most Asian economies, but often still elevated versus the West

Change in cost of capital, solar versus gas



Cost of capital of solar in selected Asian regions versus UK



Source: Hatton et al. (2025); Ember analysis

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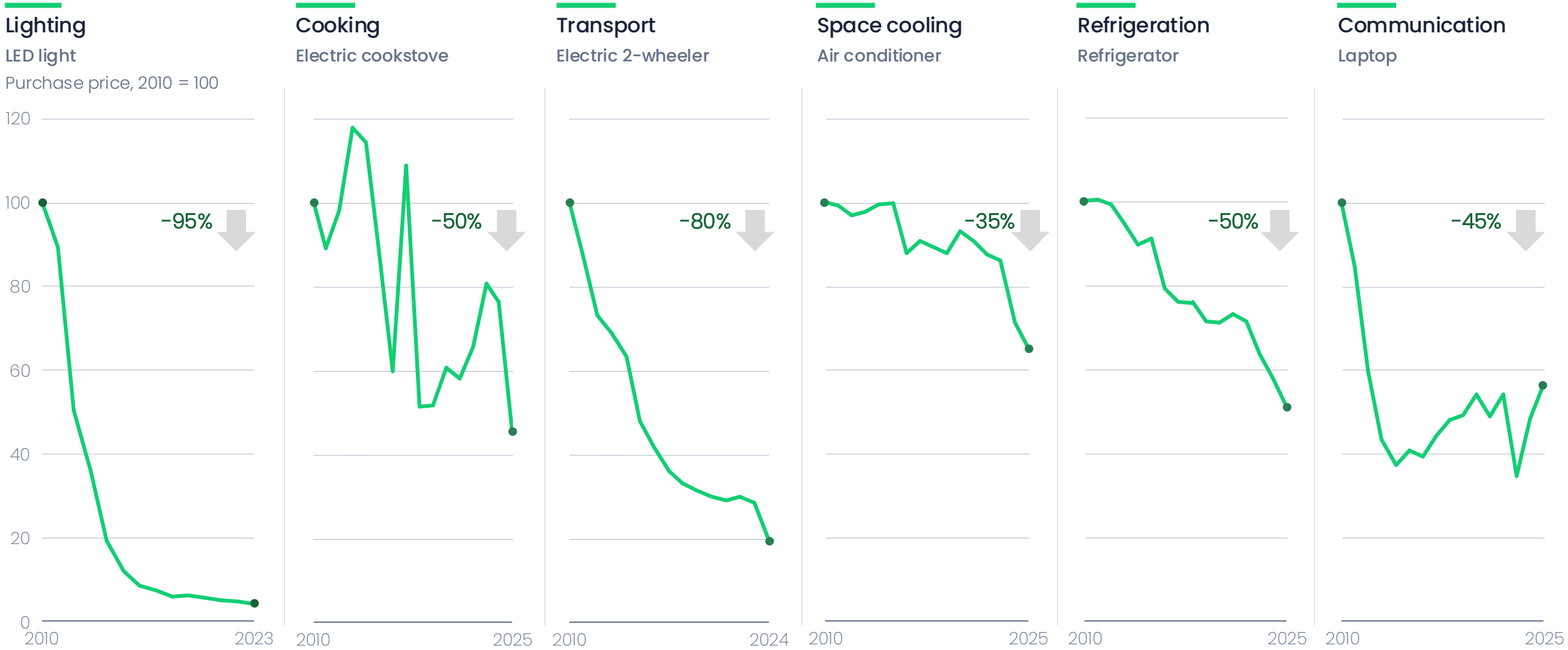
Low-cost renewables can power increasingly cheap electric end-use tech

Cheaper electric end-use technologies open the door to faster electrification



Source: UN Comtrade; Ember analysis. Notes: prices based on import cost; LED light ($/bulb), Cooking ($/stove-kg), Transport ($/vehicle), Space cooling ($/aircon-kg), Refrigeration ($/fridge-kg), Electronics ($/laptop).

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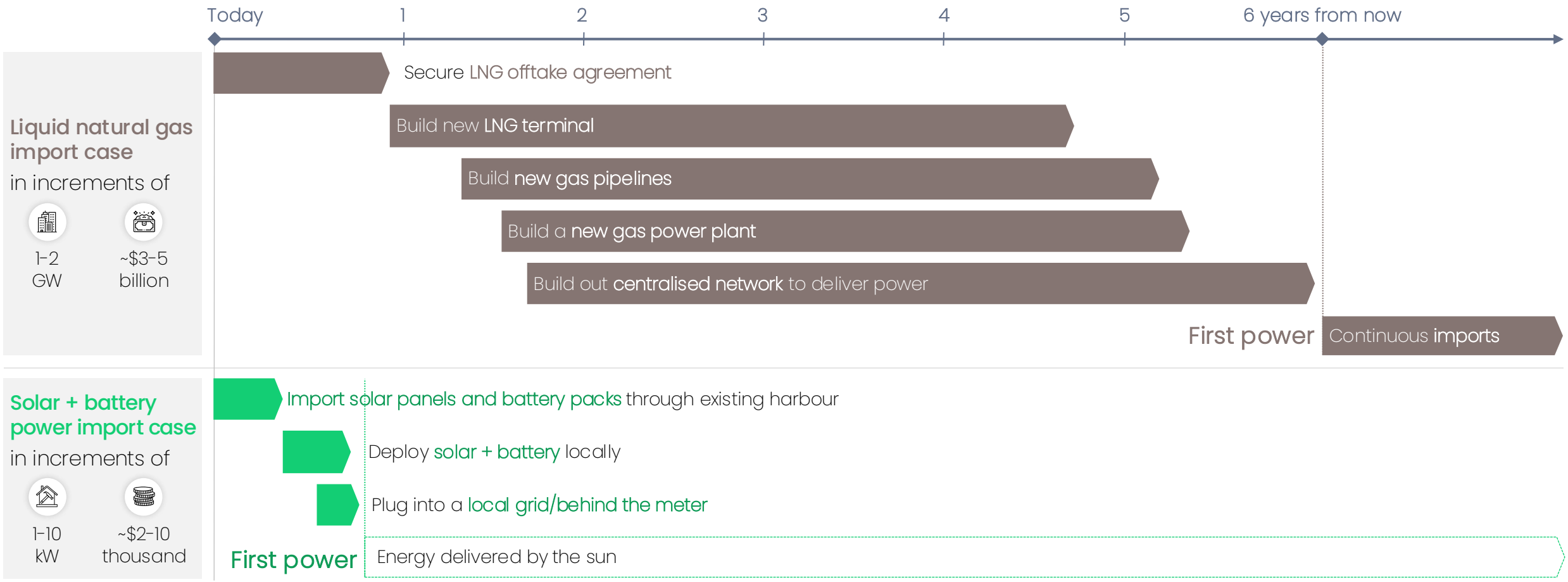
Electrotech beats old energy on speed

And so allows for faster development and economic growth

Steps to deploy new energy



Source: Rystad; Ember analysis. Note: timelines are averages and indicative.

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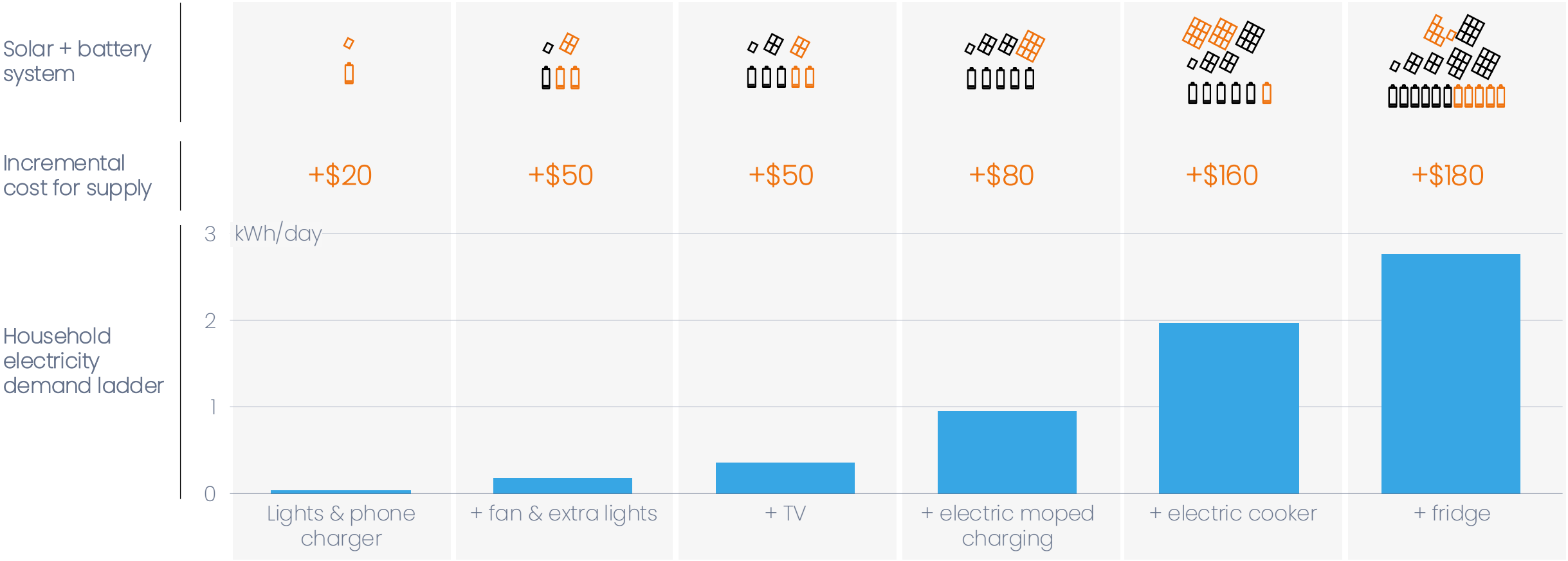
And lets households climb the energy ladder one step at a time

Most steps cost $50-100, within reach through savings or pay-as-you-go

INDICATIVE

Electricity demand and solar + battery requirements at each stage



Sources: Ember, various desktop sources. Notes: 3x3 panel icon ≈ 150 W; each battery icon ≈ 200 Wh storage. Indicative system sizes reflect households at the lower end of emerging markets income distribution. This does not include the cost of the appliances.

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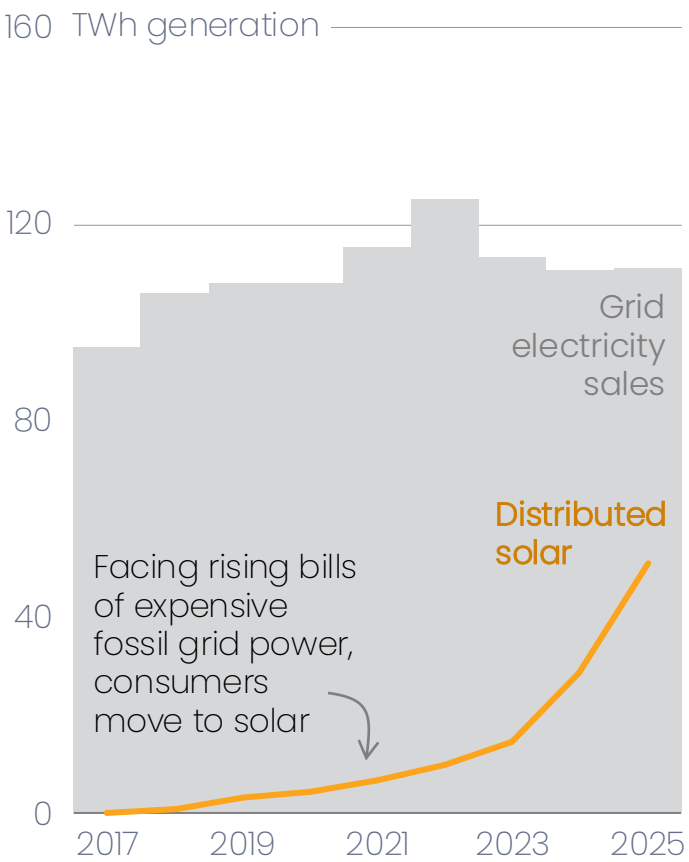
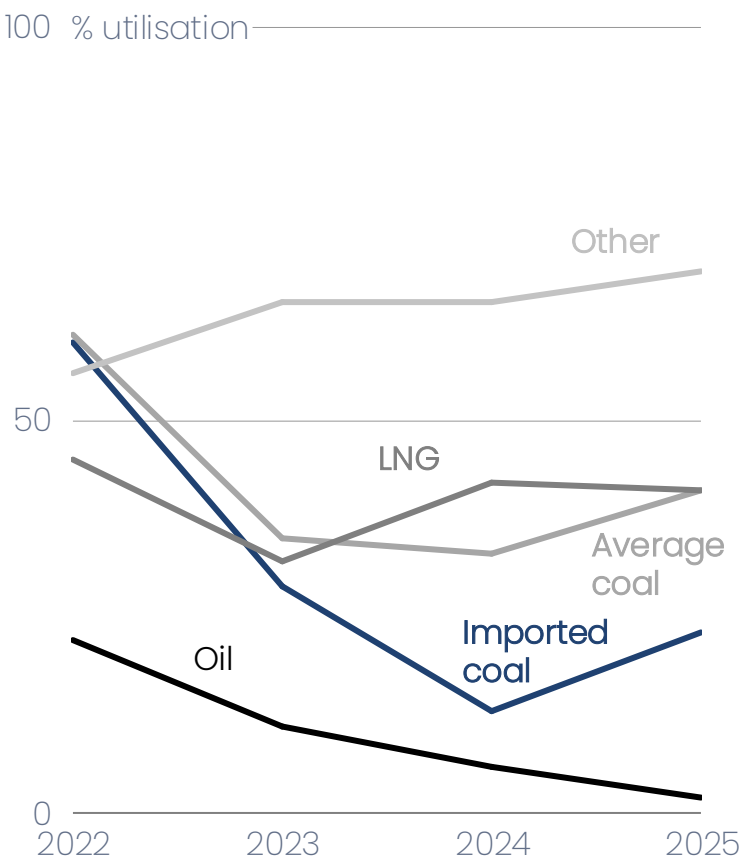
This is a people-led revolution – governments need to keep up

Witness what happened in Pakistan; this revolution is happening with or without centralised control

Distributed solar boomed in Pakistan…



…leading to falling utilisation of centralised generators on the grid…



…sparking fears of a broader utility debt crisis

Sources: Renewables First, press search; Ember analysis

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Part 4

The electrostate imperative

01

Fossil dependence or electric independence

Asian demand for oil and gas per person is one-eighth that of the US (24 GJ vs 191 GJ per person per year). Asia does not have the oil and gas resources to grow with domestic molecules. The only way to grow without deepening energy dependence is through electrotech. Countries across the region have the opportunity to take the electrotech fast track.

02

Road transport is the great opportunity

Asia can electrify its road transport fleets and save over $300 billion in oil imports every year. And because vehicle penetration is low and demand is growing, Asia can electrify its fleet rapidly, push oil out of road transport, and halve total oil imports.

03

Focus on cheap local solar, not expensive LNG imports

Firm solar plus batteries can beat LNG on price in three quarters of those areas in Asia currently planning new gas capacity. As solar and battery prices keep falling, they will outcompete LNG in all of Asia by the end of the decade.

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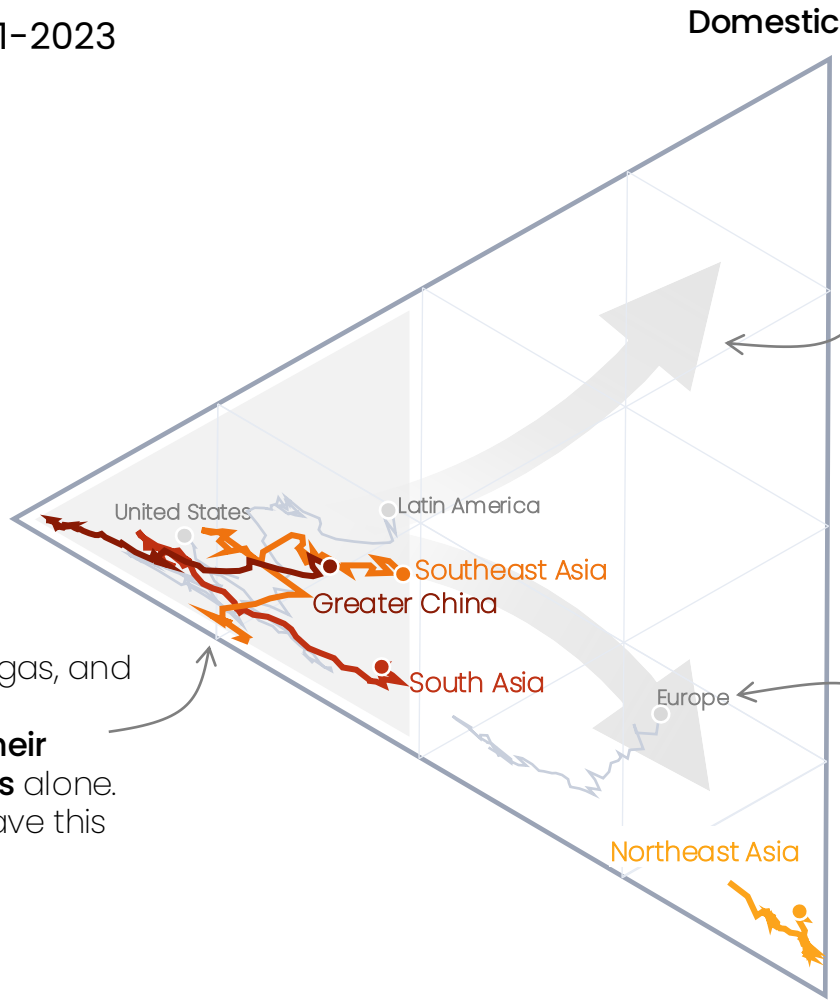
The Electrostate Imperative

Electrotech is the only way to keep growing without deepening import dependency

Share of useful energy, 1971-2023



1 Emerging Asia lacks oil and gas, and so, unlike the US, **cannot economically develop on their domestic molecule reserves** alone. Growth means having to leave this corner

2 If emerging Asia keeps growing on oil and gas, it will need to create **deep import dependency**; Europe and Northeast Asia are a warning: their development came at the cost of huge fossil import dependency

3 The only way to keep growing without deepening dependence is to **develop on domestic electrons**: electrotech such as solar and wind that power electric transport, industry and buildings

Sources: IEA, Ember; Ember analysis

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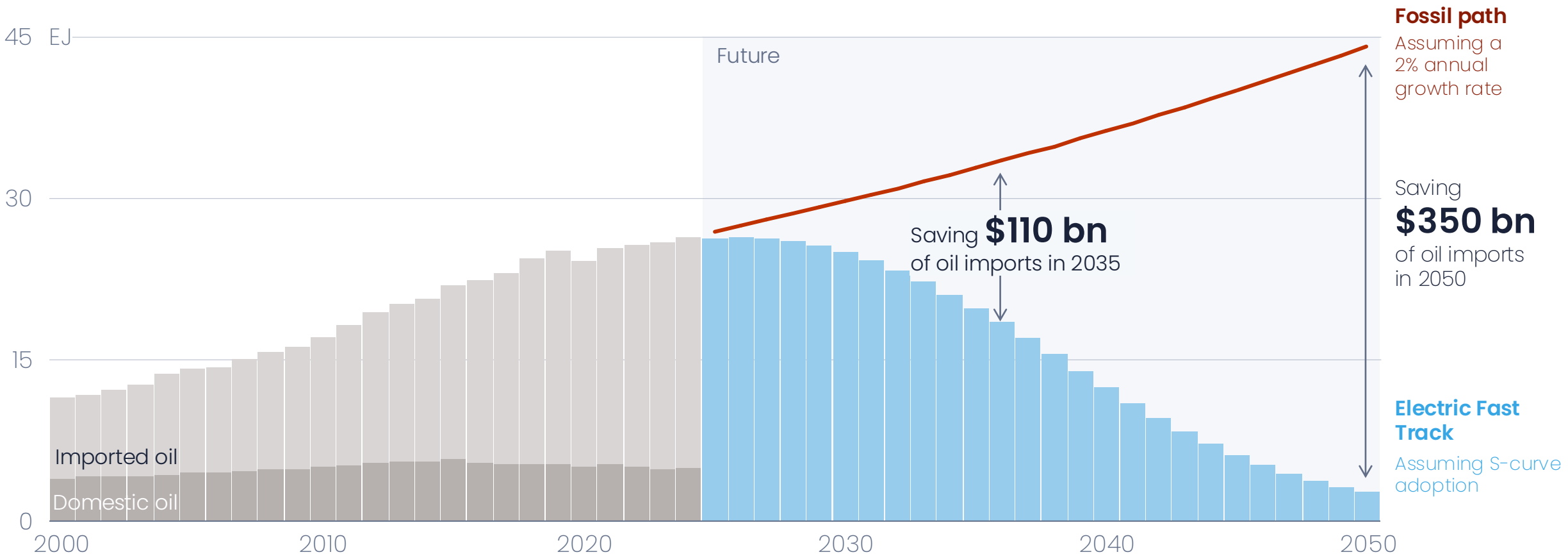
Today’s demand superlever: EVs instead of ICE vehicles

Asia's rising car ownership can run on electrons, not imported oil

Road oil demand in Asia



Source: IEA; Ember analysis. Note: forward savings assume an oil price of $60/bbl; see the methodology for detail.

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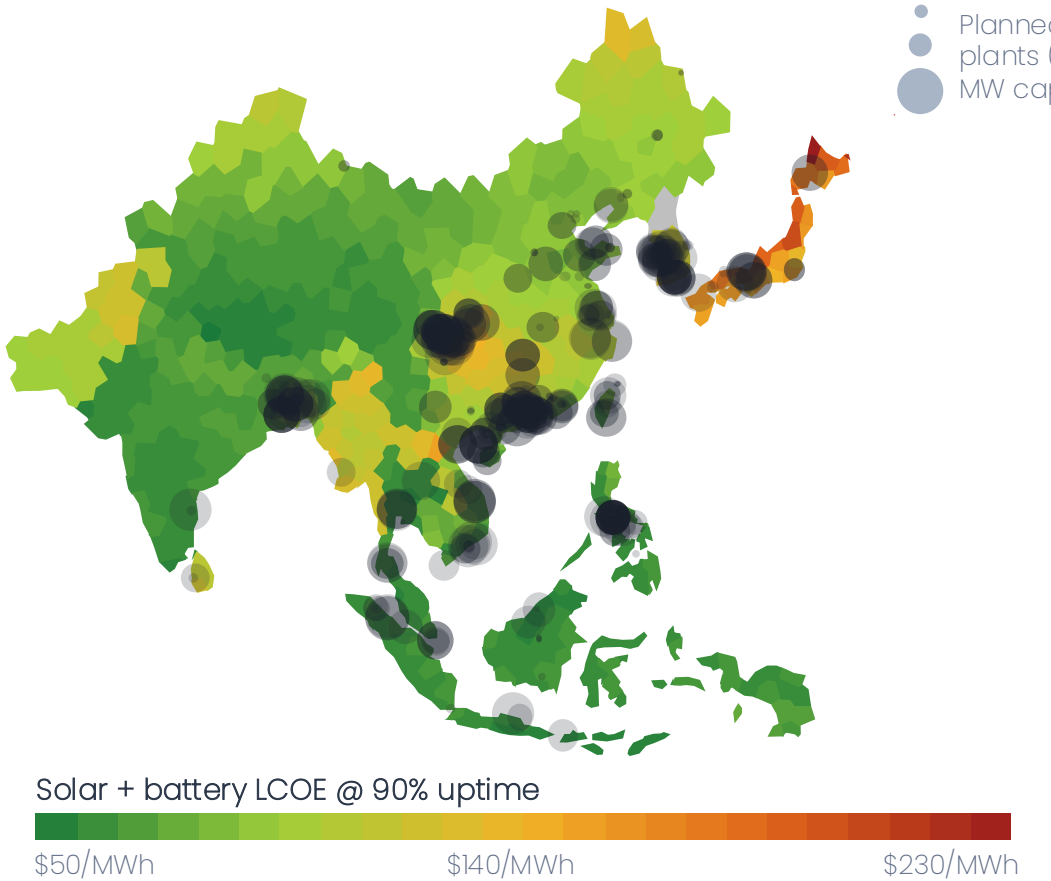
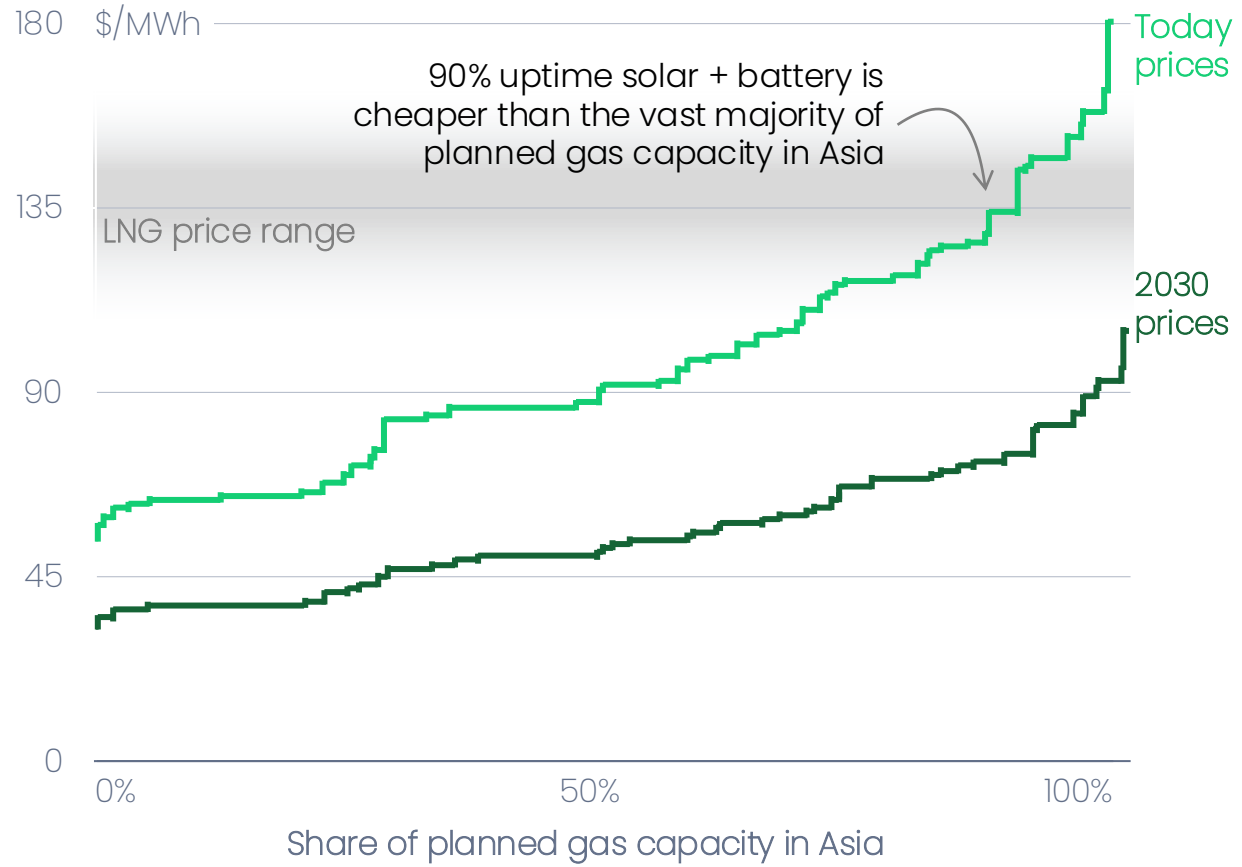
Today's supply superlever: Renewables instead of LNG

Solar + battery is much better suited to supply cheap bulk electricity than LNG, and will only get cheaper

Solar + battery LCOE versus planned gas capacity, 2026



Cost of 90% uptime solar + battery at site of planned gas capacity



Sources: Global Energy Monitor, NASA POWER, NASA SEDAC, IEA, IRENA, BNEF; Ember analysis

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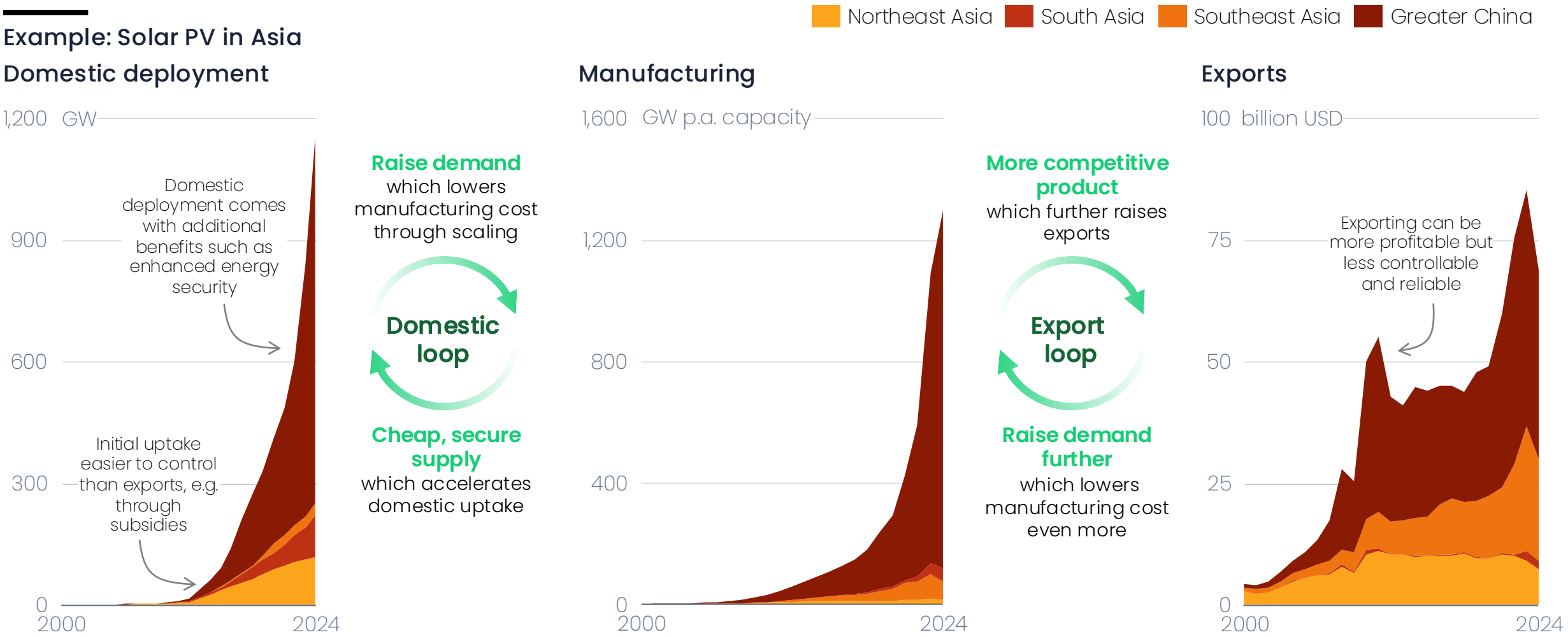
Invest in the electrotech manufacturing flywheel

Domestic deployment can kickstart manufacturing, which can then trigger an export feedback loop

Example: Solar PV in Asia



Sources: IEA, Ember, OEC, UN Comtrade; Ember analysis

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Conclusion

The electric advantages for Asia

01

Reduce energy dependence

Asia can cut its fossil import dependency by two-thirds by electrifying road transport, building more renewables and electrifying low temperature heat. That would reduce imports by over $700bn a year, materially reduce trade deficits and foreign currency requirements, and free up money to be spent on domestic infrastructure. Each country can build an electro-shield with domestic supply chains, market power, energy security and defence readiness.

02

Save millions of lives

Asia already suffers from the hottest cities and the worst pollution in the world, killing nearly three million people a year. Electrotech can clean the air and curb pollution.

03

Accelerate growth

Electrotech has emerged as a key driver of growth across the region, making up a quarter of Chinese growth and around 10% in emerging Asia. And Asia already has 60% of global electrotech jobs, employing 20 million people. Countries that embrace the opportunity are likely to lead the industries of the future. Two hundred years after fossil fuels drove the divergence between the West and Asia, electrotech can accelerate the convergence.

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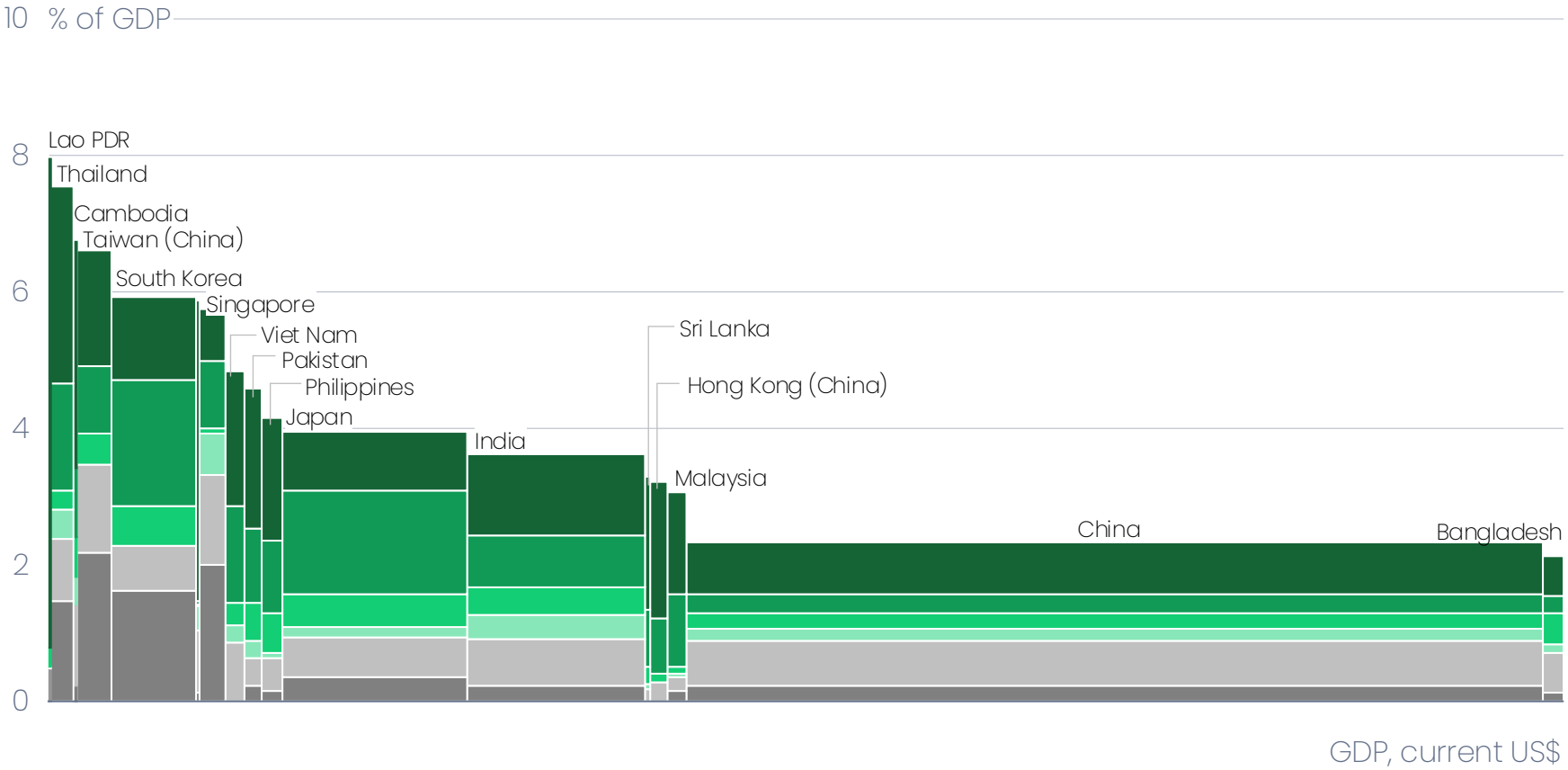
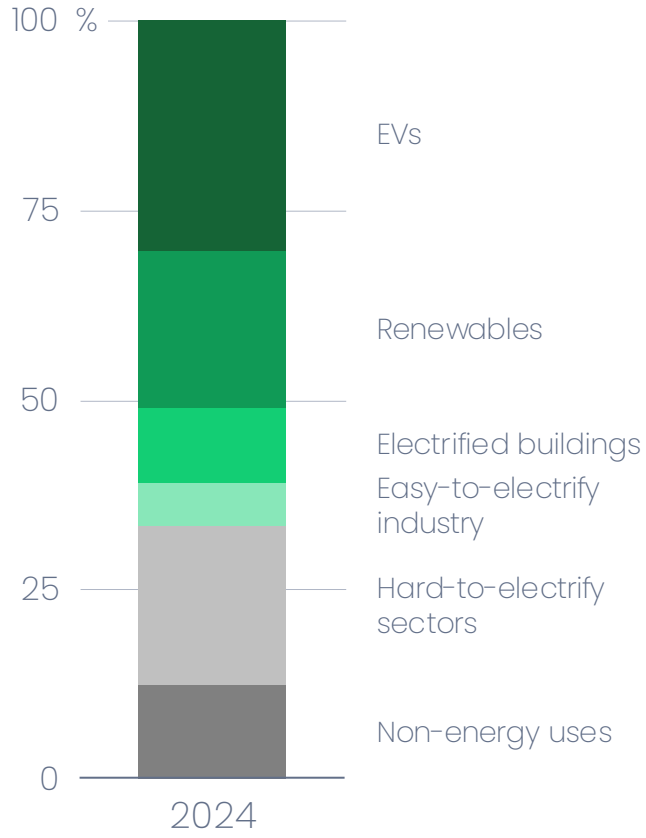
Electrotech can slash Asia's import bill

Cutting the $1.1 trillion bill by two-thirds, while strengthening sovereignty and growth

Fossil fuel net import cost by end-use sector, as share of GDP – Asian net importers, 2024



Net importers' fossil import bill, $1.1 trillion



Sources: UN Comtrade, IEA, World Bank; Ember analysis. Note: see methodology for detail.

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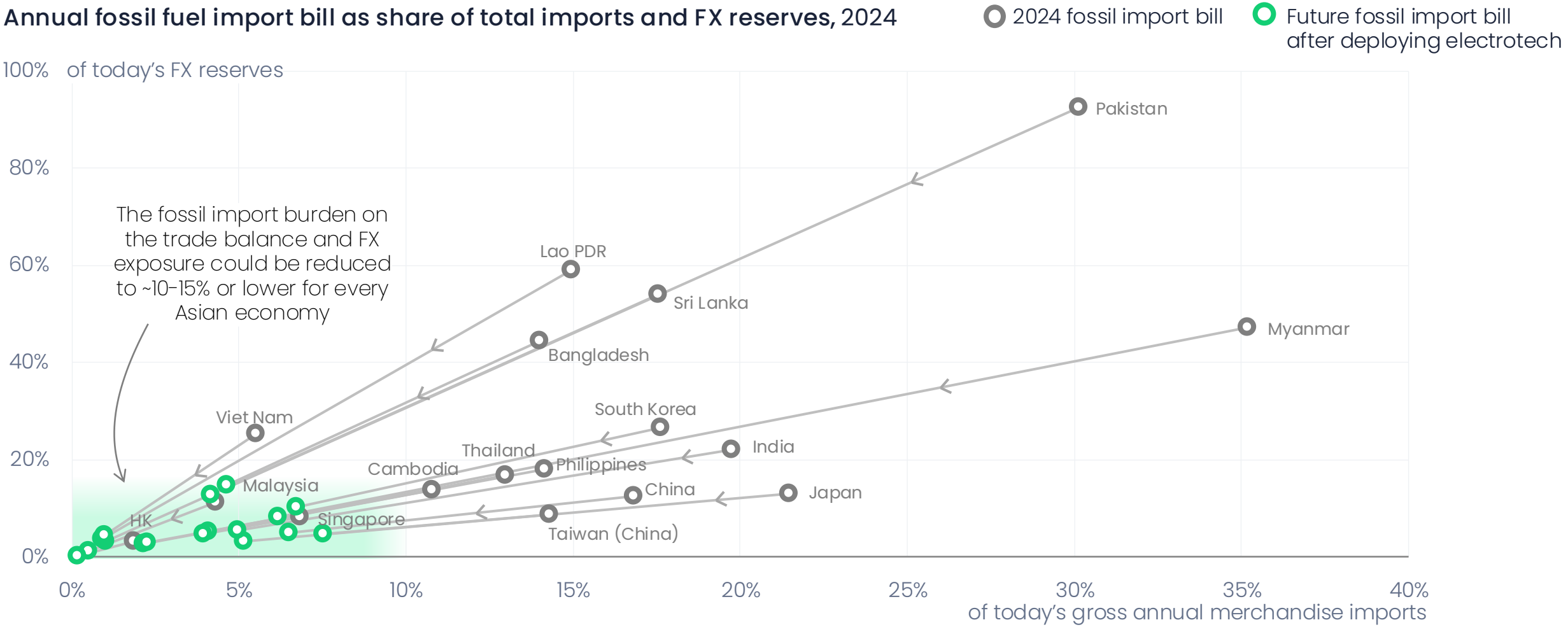
Which improves trade and FX positions across Asia

Avoiding fossil imports means a better trade balance and a stronger currency

Annual fossil fuel import bill as share of total imports and FX reserves, 2024



Sources: UN Comtrade, IEA, World Bank; Ember analysis. Notes: FX includes gold; future import bill equals today minus the electrotech levers on the previous page. HK = Hong Kong (China).

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The electro-shield opportunity for Asia

Electrotech allows Asian countries to gain sovereignty in four different ways

Supply chain criticality

Control the industrial base behind the electric economy

Stay sovereign across the stack while becoming dominant in one or more indispensable parts: batteries, grids, power electronics, critical minerals processing, heat pumps, EVs, cables, sensors.

Energy security

Run the economy on domestically generated electricity, not imported fuels

Electrification reduces exposure to fossil fuel price shocks, supply coercion, and foreign interference in the energy system.

Market access

Use demand, standards, and scale to shape global markets

Asia's large markets that deploy electrotech at scale can set standards, attract investment, discipline suppliers, and make international players compete for access.

Defence readiness

Build dual-use capabilities needed for modern security

The same technologies that power electrotech also underpin drones, sensors, mobile power, resilient bases, cyber-secure grids, logistics and advanced manufacturing.

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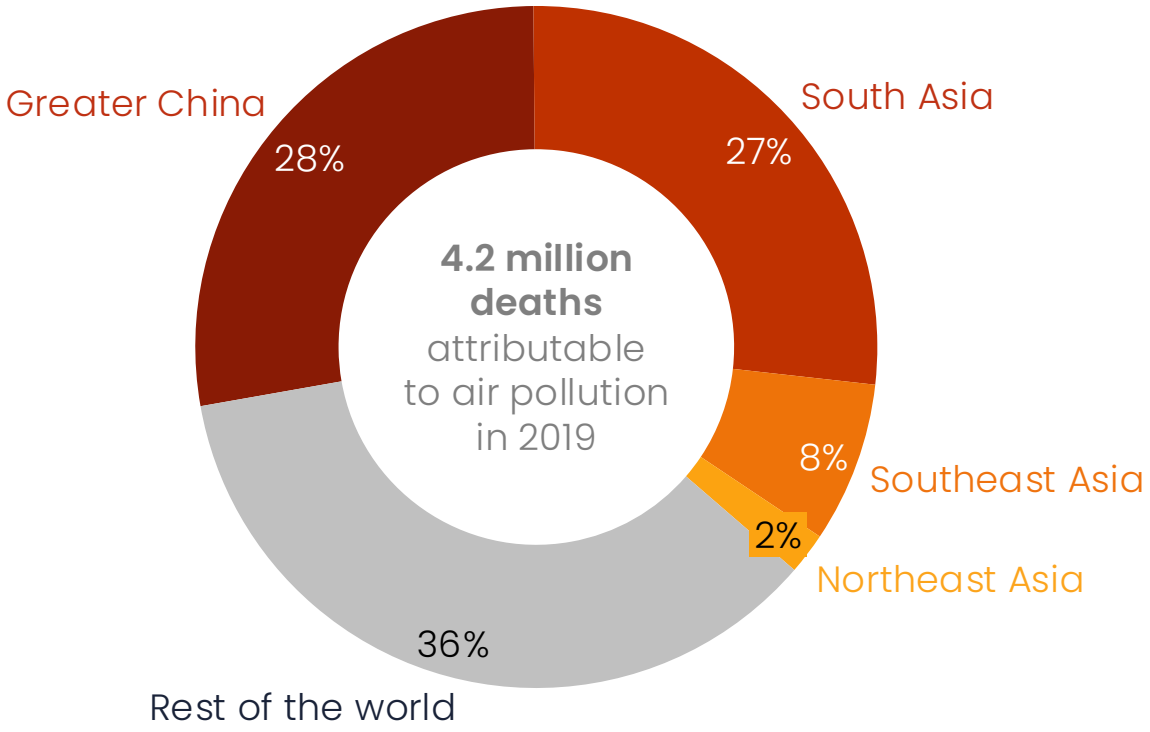
Reduce deaths from pollution

Further increasing fossil demand for growth would make life unbearable for many

Ambient (outdoor) air pollution attributable deaths

All causes, 2019



2.7 million deaths
were attributable to ambient air pollution in Asia in 2019

92% of Asia's population
are exposed to levels of air pollution that pose a significant risk to their health

9 out of 10
of the world's cities with the worst air pollution are in South Asia

3.3% of global GDP
the economic cost of fossil fuel air pollution

Sources: World Health Organization, World Bank, CREA, UNEP

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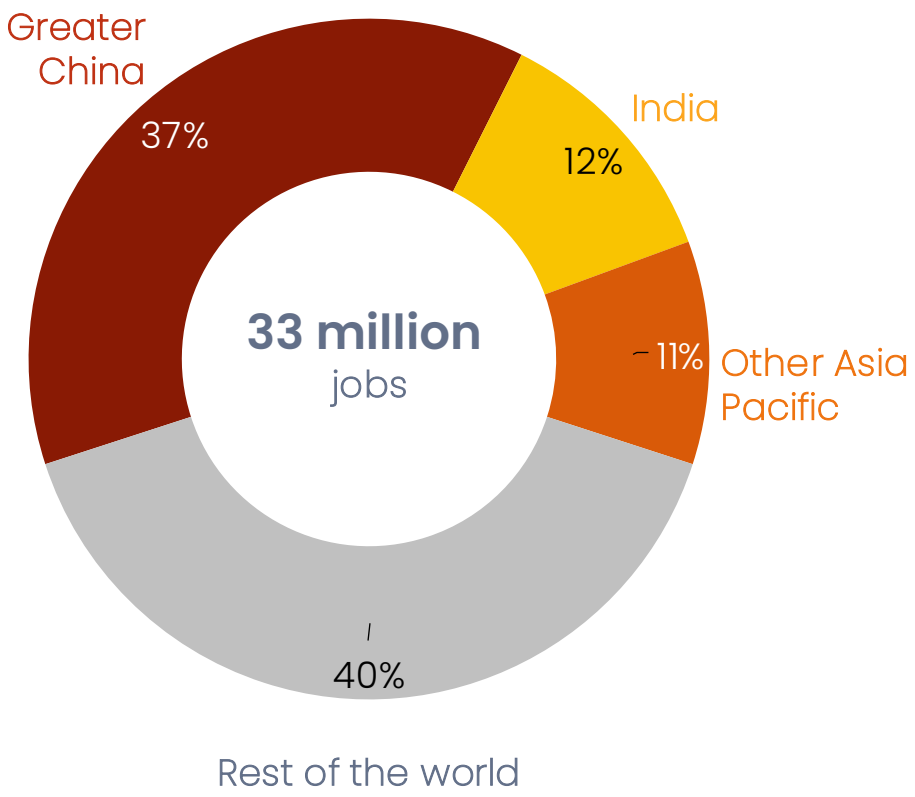
A new engine of growth

Electrotech already generates millions of jobs across Asia and is an increasing contributor to growth

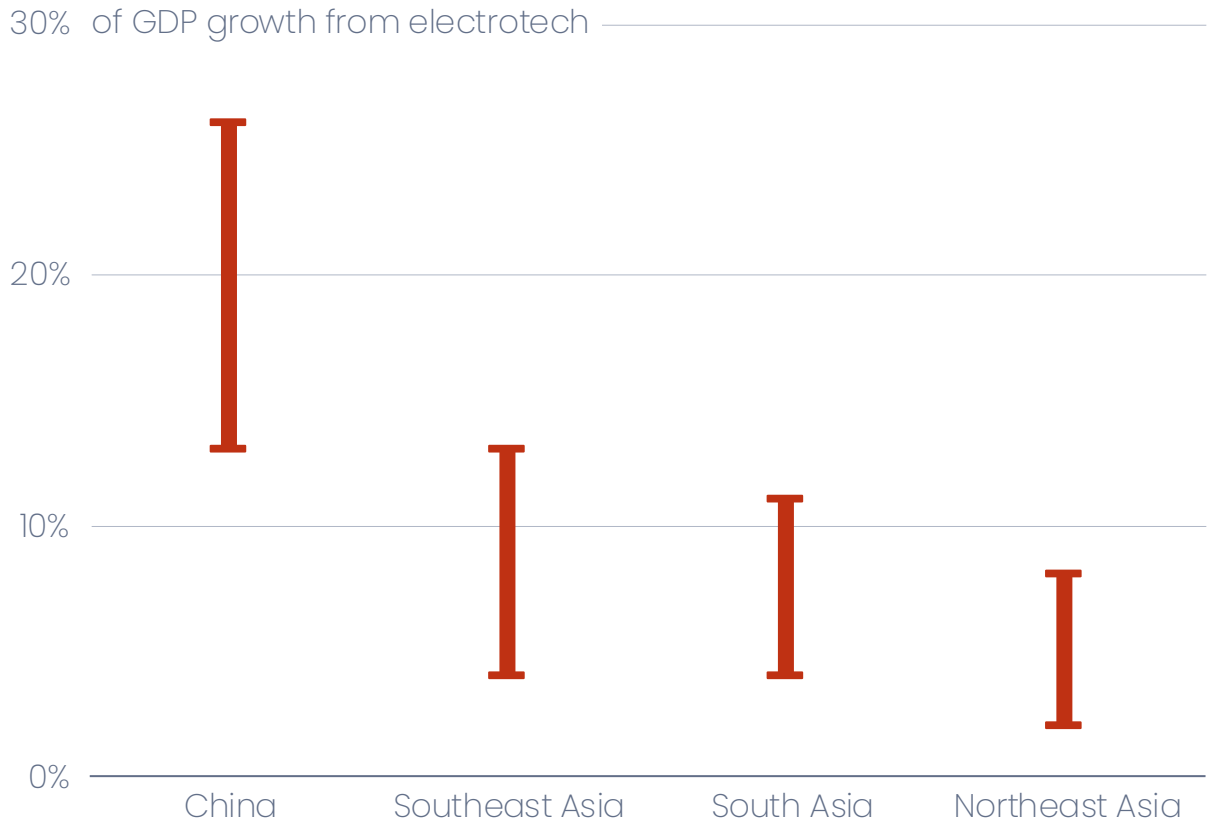
Electrotech jobs

2024



Electrotech contribution to GDP growth

2022-2025, estimated



Sources: IEA World Energy Employment 2025, IEA, BNEF, IRENA; Ember analysis

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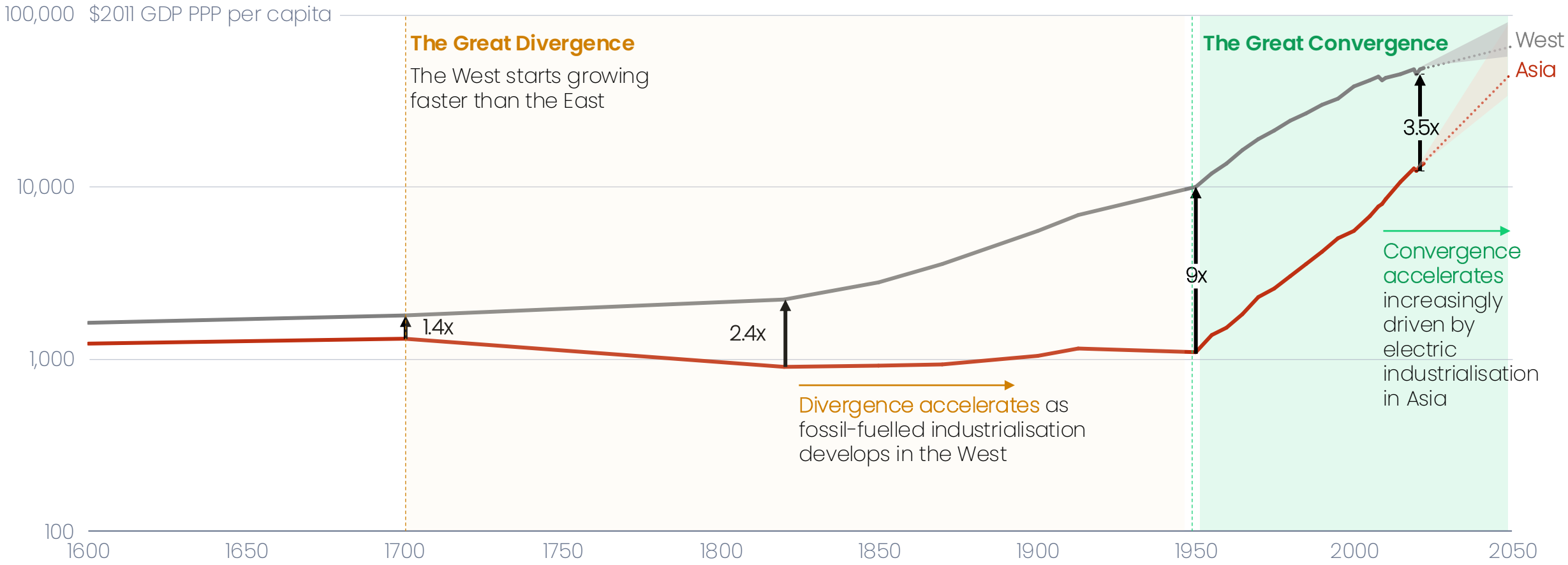
Electrotech accelerates the Great Convergence

Fossil fuels drove the West's divergence; electrotech can drive Asia's convergence

GDP per capita, the West versus Asia, 1600-2050



Sources: Maddison Project Database, UN, World Bank; Ember analysis

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About Ember

Ember is an independent energy think tank that aims to accelerate the clean energy transition with data and policy. Its vision is a world with a safe climate, powered by a clean, electrified energy system for all.

About Ember Futures

Ember Futures is a new research initiative established to help leaders navigate the rise of electrotech and what it means for energy, financial markets, and geopolitics.

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