HORIZONS

Eye on the tiger:
How higher Indian economic growth could impact global energy markets

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India is rapidly reforming its economy, attracting more foreign capital and pursuing massive infrastructure and manufacturing investment. Trade, mobility and household incomes are surging, boosting the country's importance to the global economy. India's already impressive economic growth rates are poised for take-off.

With faster growth comes greater energy demand. In our base-case Energy Transition Outlook, we expect Indian energy demand to grow by around a third over the coming decade. If India's economy outperforms, however, demand growth could be significantly higher. When rampant Chinese economic growth sent energy demand and prices soaring through the 2000s, companies around the world cashed in. An Indian boom could have a similar effect.

India won't be a (hydro)carbon copy of China, however. While its energy demand today is broadly comparable to that of China in the early 2000s, its economy is far less energy-intensive. India can also capitalise on gains in energy efficiency, the rollout of low-carbon technologies and a greater focus on higher-value-added manufacturing unavailable to China in its boom years.

In this edition of Horizons, we consider the implications of higher Indian growth for global energy markets. The scenario is a boon to coal, oil, liquified natural gas (LNG) and steel producers, and pushes up investment in domestic supply chains for renewable power and grid infrastructure. However, higher growth will also test India's goal of energy independence by 2047 and risks casting the country in the unenviable role of global climate villain as emissions inevitably rise.

The case for higher Indian growth

India has an opportunity to shatter our base-case economic outlook and mirror the pace of China's 2001-11 growth over the next 10 years. In our high-growth scenario, India's economy almost triples in size from US$3.2 trillion in 2023 to just under US$9 trillion in 2033, with gross domestic product (GDP) almost 50% higher than our base case by this time.

This is not wildly unrealistic. Building on the country's 2014 "Make in India" platform, manufacturing and infrastructure investment has been prioritised, and the freshly re-elected government of Prime Minister Narendra Modi has committed to accelerating market reforms. Agriculture, labour, financial and fiscal policies to drive efficiency and foreign investment aim to establish India as a global manufacturing hub as supply chains relocate away from China.

India has an opportunity to shatter our base-case economic outlook

Progress could also be made by skilfully manoeuvring the Trump administration's tariff policies. That said, a more fractious global trade and investment environment poses risks.

Why India's rapid growth would be different to China's

While it is easy to draw parallels to China's boom early in the millennium, India's high-growth scenario shows notable differences from China's decade of rapid growth.

India's industrial sector is key, with lower energy consumption at the outset and slower growth than China for many of its most energy-intensive sectors. India's crude steel and cement output reach 340 Mt and 690 Mt, respectively, by 2033 in our high-growth scenario, only around a third of China's output in 2011.

Energy efficiency gains over the past 20 years play a part, too. We expect this trend to continue as small and medium-sized producers scale up. A higher share of renewable power and electric vehicles will further reduce India's energy intensity.

India's industrial structure will also see a larger share of high-value-added manufacturing than China did up to 2011, including renewables and advanced batteries, boosted by advances in technology and generous government subsidies.

Figure 1:
India vs China GDP comparison

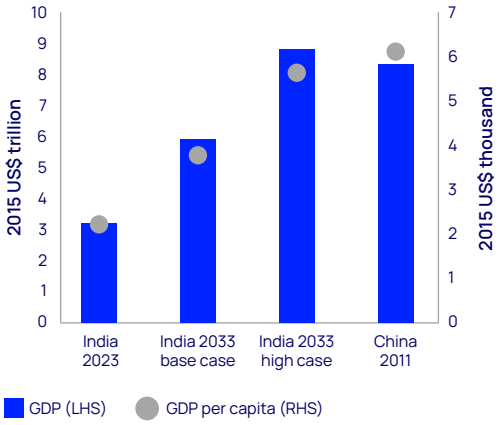
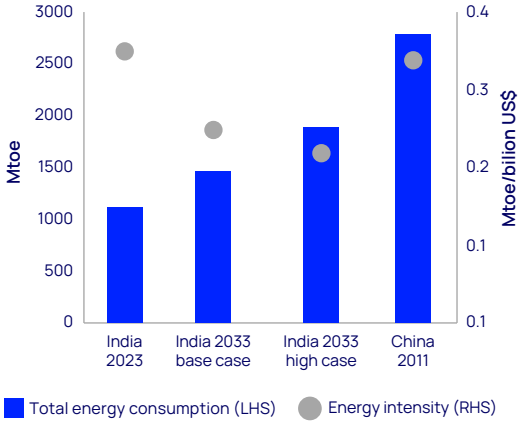


Figure 2:
India vs China energy demand comparison



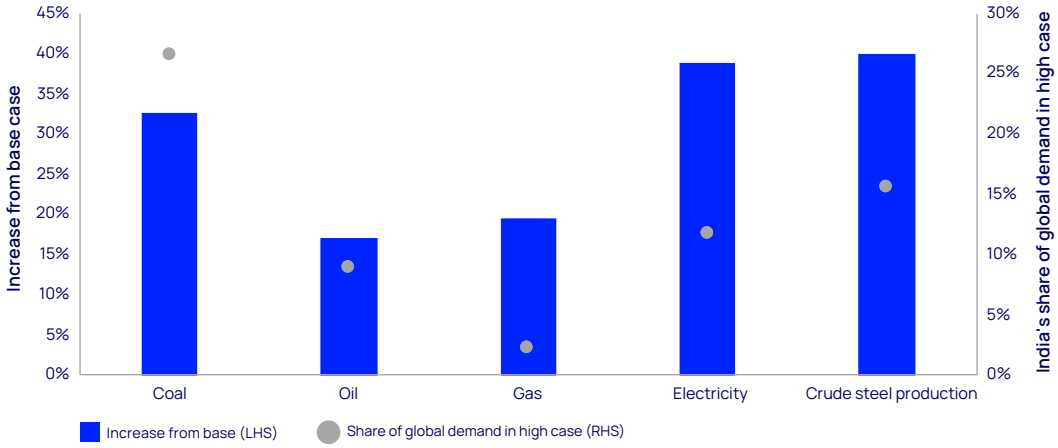
Note: energy-intensive sectors include mining, textiles, metals, oil processing
Source: Wood Mackenzie

The impact of the high-growth scenario on Indian energy demand

In the high-growth scenario, total Indian energy demand reaches 1.9 Btoe in 2033. While 45% lower than Chinese demand in 2011, this is still 1.2 Btoe higher than 2024 demand.

It is, therefore, worth considering the impact of the high-growth scenario on demand in six of India's key energy sectors.

Figure 3:
Indian commodity demand comparison in 2033: base case vs high-growth scenario



Source: Wood Mackenzie

Coal

Coal is India's ready-baked, affordable and reliable option for meeting rapidly growing power and industrial demand. The high-growth scenario turbocharges this, with coal demand almost doubling to 2.2 billion tonnes in 2033. Only the faster adoption of renewables puts the brakes on still-higher coal demand.

Oil

In the high-growth scenario, oil demand reaches 8.2 million barrels per day (mmbbl/d) in 2033, up from 5.6 mmbbl/d last year. Transport is the primary driver, as rising incomes accelerate car ownership and air travel, and stronger manufacturing boosts diesel demand for road freight. Petrochemicals demand triples with higher demand for plastics and packaging.

Power and renewables

The high-growth scenario reshapes India's power landscape as installed capacity skyrockets. Total Indian power demand reaches almost 4,000 TWh in 2033, with coal generation 38% above the base case, while wind and solar output is 45% higher.

Gas and LNG

High-growth-scenario gas demand surges to just over 100 bcm in 2033, driven mainly by an aggressive expansion of city gas distribution and industry. Despite India's 25 GW of gas-fired capacity, utilisation is currently exceptionally low, but the power sector still requires more gas to balance its expanding use of renewables.

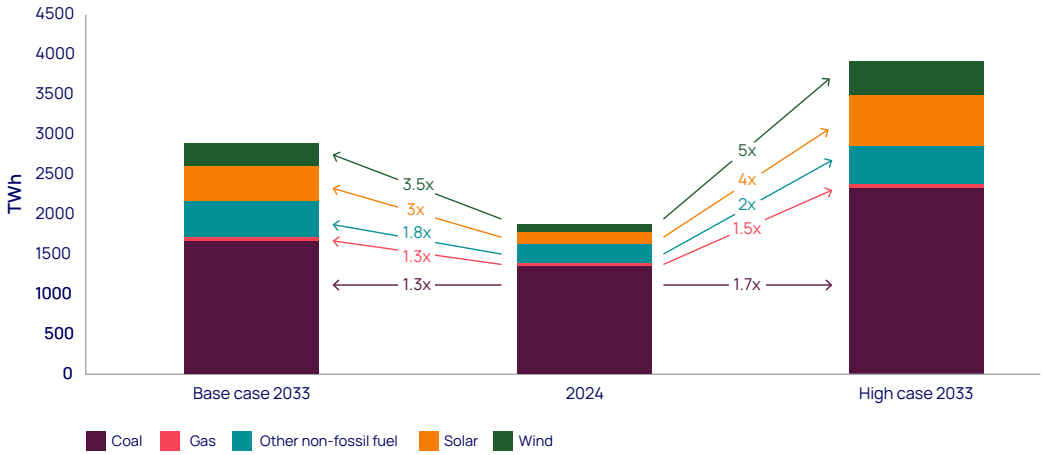
Steel

With lower steel intensity than China in the 2000s, Indian steel demand surges in the high-growth scenario, but does not match China's breakneck pace or export-oriented scale. We forecast steel demand to rise by 9% a year and reach 317 Mt in 2033, some 40% higher than the base case.

Low-carbon hydrogen

India has big ambitions for low-carbon hydrogen and ammonia, underpinned by government support, abundant renewable resources and the second-lowest electrolytic levelised cost of hydrogen (LCOH) in Asia after China. Hybrid wind and solar could reduce India's LCOH to US$4.3/kg H_2 by 2030, the lowest in the region. However, the high-growth scenario does not see a rapid surge in demand by 2033 due to more competitive fossil-fuel based technologies and insufficient transportation and storage infrastructure.

Figure 4:
Electricity generation by fuel type, TWh



Source: Wood Mackenzie

Consequences of the high-growth scenario

The high-growth scenario sets a high bar for expanding domestic energy production and infrastructure to help achieve India's ambition of energy independence – or at least 'net' independence – by 2047. And while imports are higher in this scenario, their scale and their impact on prices come nowhere close to matching those of China in the 2000s.

Domestic production accelerates, but still falls short

We estimate Indian power-sector investment at US$600 billion over the next decade. This presents a massive test for the country's ability to secure capital for generation capacity, grids and supply chains. While it has made strides in solar and wind manufacturing and installations, growth remains hindered by domestic supply chains, land acquisition and regulatory delays.

India is desperate to grow domestic oil and gas production. The Open Acreage Licensing Policy (OALP)-IX licensing round, launched in 2022, opened up many of India's deepwater areas previously closed to explorers, but uptake remains slow. Even with near-term exploration and appraisal success, any ramp-up in oil and gas production would only bear fruit from the early 2030s.

To drive greater investment, the government needs to ensure regulatory and fiscal stability and support exploration and production companies seeking to minimise time from discovery to first production. With some Majors partnering with Indian companies in full gas value-chain opportunities, India must also address its natural gas pricing model to better compete against returns available elsewhere.

India faces significant hurdles to expanding domestic refinery capacity

India faces significant hurdles to expanding domestic refinery capacity. In our base case, India adds 1.2 mmbbl/d of refining capacity over the next decade. However, avoiding a growing dependence on imported oil products in the high-growth scenario requires refining capacity additions to triple by 2033.

India's thermal coal production could ramp up quickly as the most affordable fossil fuel to boost energy security. With accelerated government efforts to hit its own 1,500 Mt target by 2030, production could rise to 1,800 Mt by 2033. Scaling up metallurgical coal production will be more challenging due to its high ash content, the country's limited mine resources and the need for more washeries.

India's crude steel output must more than double from around 150 Mt in 2024 to more than 340 Mt in 2033. While India has ample iron-ore reserves, domestic high-grade ore producers will struggle to keep pace with the surge in steel production.

Import dependence rises

The challenge of meeting higher demand from domestic supply points to a rapid increase in imports. However, this doesn't completely derail India's goal of energy independence, largely thanks to its relative self-sufficiency in thermal coal and a drop in the overall share of crude oil and LNG in the country's energy mix in the high-growth scenario. Consequently, overall levels of import dependency remain largely unchanged.

India's crude imports will rise from 6.4 mmbbl/d in 2033 in our base case to 7.8 mmbbl/d in the high-growth scenario. LNG imports hit 54 Mtpa, over 10 Mtpa above the base case. Combined, this pushes India's oil and gas import bill to US$260 billion a year by 2033.

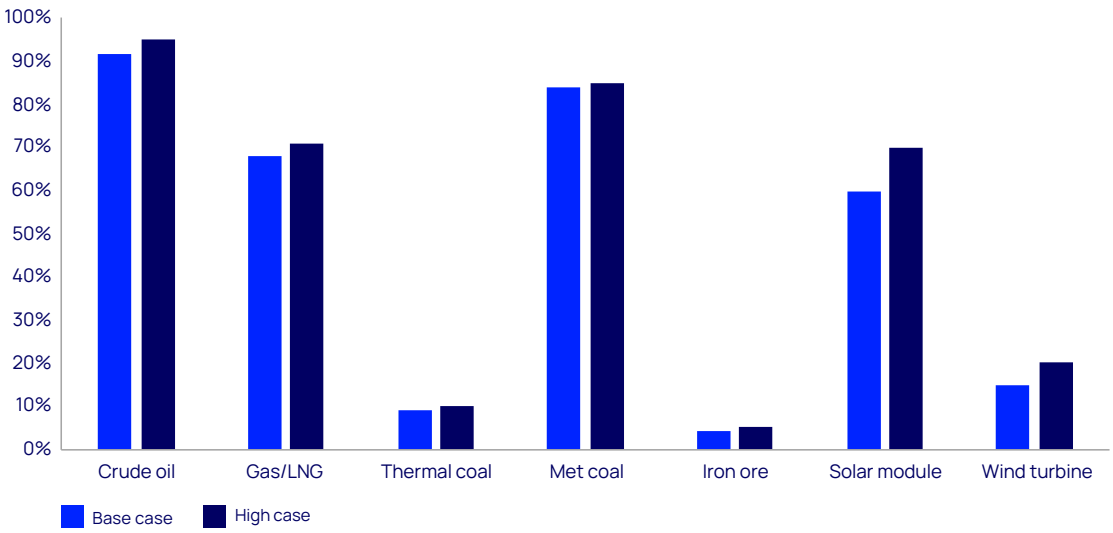
We estimate India's thermal and metallurgical coal imports to increase to 200 Mt and 160 Mt in 2033, equal to 28% and 47% of the global seaborne markets, respectively. There will be pressure on Indonesian thermal coal and Australian metallurgical miners to keep up with the demand when investment in coal is scarce.

Scaling up solar and wind will put pressure on domestic supply chains

Scaling up solar and wind will put pressure on domestic supply chains. India currently imports about 70% of its solar modules, mostly from China, and despite government incentives for domestic manufacturers, reducing its dependence on imported polysilicon, wafers and advanced cell technologies will be difficult. In the high-growth scenario, import dependency increases to around 80%.

The pace of domestic manufacturing growth will impact future costs. Up to 2030, accelerated domestic investment could increase costs slightly due to higher capital expenditure, import duties and supply-chain inefficiencies. After this, costs should gradually decrease, and we expect India to become increasingly self-sufficient beyond 2035.

Figure 5:
India's energy import dependency in 2033: base case vs high-growth scenario



Source: Wood Mackenzie

Bioenergy: India's secret weapon in reducing imports

India has a tantalising opportunity to utilise its massive biomass residue sector to reduce imports and push for greater energy independence. In the high-growth scenario, bioenergy demand rises by more than 12% by 2033 compared with our base case. Increased biomass demand from cement production, biomass co-firing and waste-to-energy plants will help reduce coal consumption and displace oil demand in the road transport sector through blending with diesel.

Modest impact on global energy prices

China sent global coal, iron ore and oil prices through the roof in the 2000s. But while the high-growth scenario similarly increases competition for resources, India doesn't match the scale of China's imports or its impact on commodity costs and prices.

Stronger Indian oil demand, while the primary driver of global oil demand growth, still has a relatively modest impact on prices, however. OPEC+ spare capacity is broadly sufficient to meet this, meaning Indian oil demand in the high-growth scenario pushes up Brent prices by a relatively moderate US$1-3/bbl.

An increase in development activity to meet higher Indian LNG demand, coupled with rising competition with Asian buyers, might be expected to put additional pressure on LNG prices. However, the additional 10 Mtpa of Indian LNG demand will come at a time when global gas prices are expected to soften. With the market set to absorb more than 200 Mtpa of LNG supply growth, equal to around 50% of current supply, LNG price upside will be limited.

India doesn't match the scale of China's imports or its impact on commodity costs and prices

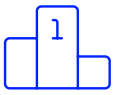
Domestic thermal coal consumers increasingly rely on imported high-calorific-value coal, and the high-growth scenario expects an additional 70 Mt of coal annually compared with the base case. There are cost implications to greater dependence on spot markets, but they are low. The current seaborne cost of around US$107/tonne could rise to US$110/tonne by 2033 in the high-growth scenario.

Tackling India's rising carbon emissions

India is already making significant efforts to decarbonise while continuing to prioritise economic growth. Domestic low-carbon supply chains will accelerate the adoption of clean energy technologies, but a more rapid expansion of coal use will increase CO_2 emissions. By 2033, CO_2 emissions are expected to rise by 1.2 billion tonnes ($BtCO_2$), reaching 5.3 $BtCO_2$, compared with the base-case level of 4.1 $BtCO_2$ - a whopping 30% increase that will increasingly focus global attention on India.

However, mounting global pressure to reduce emissions and technological progress have opened the door to a different outcome for India. The high-growth scenario sets the stage for the rapid development of low-carbon supply chains by the mid-2030s, positioning India to achieve its net-zero emissions goal by 2070 - or potentially sooner - an outcome not achieved in the base case.

Again, China provides a useful comparison: its post-2010 strategy saw rapid investment in low-carbon supply chains for solar, wind, electric vehicles and critical minerals. If India can repeat this, its higher emissions by the early 2030s will be temporary, with stronger growth laying the foundations for faster and more durable decarbonisation to follow.



Winners and losers

Energy and natural resources producers

Energy and natural resources suppliers are the obvious winners in the Indian high-growth scenario. The high case sees Russian and Middle Eastern oil producers capitalising on existing buyer relationships to increase volumes into India. Similarly, Middle Eastern LNG suppliers benefit from their geographical proximity. Indian LNG buyers would push for favourable terms in long-term contracts, including lower oil indexation and greater flexibility, but rising competition with other Asian buyers could mitigate against this.

Australia will supply more metallurgical coal and iron ore in the high-growth scenario, especially as green steel only scales up slowly in India due to lofty hydrogen costs. However, constraints on Australian thermal coal output mean Indonesia and South Africa export more to India.

The high-growth scenario assumes some low-carbon supply chains gradually relocate away from China as trade barriers rise. However, there are clear opportunities for Chinese suppliers to collaborate with India on low-carbon technology and investments if bilateral relationships between the two countries improve.

Governments

While offering huge potential to increase prosperity, the high-growth scenario undoubtedly intensifies the challenges of the Indian government's energy trilemma, namely, ensuring energy security, reducing emissions and promoting economic growth through affordable energy.

Higher commodity imports will hit India's balance of payments, public debt and foreign reserves. Meanwhile, India will need to dig deeper to finance subsidies for key sectors and support greater investment.

Energy and natural resources suppliers are the obvious winners in the Indian high-growth scenario

With global interest rates expected to remain high, India's borrowing costs will also be affected. And if China proves successful in reducing its emissions over the coming decade, greater attention will turn to India's carbon emissions.

The high-growth scenario also impacts other governments. Many Southeast Asian economies could struggle to compete with India for investment as higher energy prices buoy inflation.

The India-US relationship will be essential, but complicated. Both will compete for investment, but with escalating US protectionism putting pressure on supply chains in China and Southeast Asia, domestic companies could benefit if the US looks to compete against low-cost Chinese manufacturing by outsourcing to India.

Investors

To fully exploit the opportunities in the high-growth scenario, investors will need to ensure first-mover advantage before domestic companies scale up. Given project lead times, supply is expected to lag demand in the early stages of the scenario, allowing first movers to capture substantial returns. Later projects could add to excess capacity issues.

India's track record of protecting domestic industries through subsidies or trade barriers risks preferential treatment for local production, incentivising foreign investment compared to exporting to the country.

Conclusion: a different animal

The transformation of global trade, technology and action on emissions over the past 20 years means India's decade of growth will not mirror that of China in the 2000s. But many of the fundamentals remain the same. Meeting breakneck growth in energy demand is hugely challenging, particularly with energy security at the top of the political agenda. Like China, India cannot do this alone, and rising imports and higher prices add to the burden.

These challenges also offer tantalising prospects. In addition to rising imports, higher growth cannot be achieved without massive investment in domestic energy production, oil refining, steel making and low-carbon supply chains. The growing need to rein in emissions will also spur huge demand for decarbonisation technologies, including carbon capture and storage. Like China in the 2000s, opportunities abound.

India's decade of growth will not mirror that of China in the 2000s

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