Look Forward

India's Moment

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S&P Global

Our world is in the midst of an unprecedented period of transition and uncertainty, but one fact that unites all observers is that India faces a defining opportunity to capitalize on this moment.

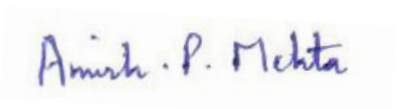
Economically and politically, there are few global issues that can be solved without the cooperation of India, a fact that is highlighted by the country's agenda for its presidency of the G20 in 2023.

As in our previous *Look Forward* reports, our analysts have leveraged their deep sector and geographic knowledge as well as our data and insights to take a deep dive into a specific subject. This time, we look at the opportunities, risks and potential for India to strengthen its claim to be a true global superpower in the next 10 years.

We hope this research will help our customers around the world understand one of the most dynamic and fast-changing countries on Earth. From energy transition to the global economy, agriculture to transportation, supply chains to technological innovation, India is at the center of it all. However, the road ahead is far from straight, and navigating it will require decision-making that considers a vast array of potential scenarios, both at home and globally.

This report has been organized by the S&P Global Research Council, which is focused on the key global themes of energy security, climate and sustainability, technology and digital disruptions, supply chains, capital markets and geopolitical shocks. The foundation of the report is the work we do every day to deliver essential intelligence to our customers and the market — on India and on other topics that matter.

CRISIL is driven by its mission of making markets function better as India's foremost provider of ratings, data, research, analytics and solutions. This report also shows the value of being part of S&P Global as it marries local expertise with global perspectives and leverages capabilities across the organization.



Amish Mehta
Managing Director & CEO, CRISIL

India's Moment

As the world finds itself in the midst of disruption, everyone is watching India.

The country is chairing the G20 under the slogan "One Earth, One Family, One Future," reflecting how the years ahead will be defined by shared global challenges including economic growth, climate risk, the energy transition, trade relationships, disruptive technologies and pandemics.

Countries across the development and political spectrum are adopting pragmatism to navigate the heightened risks and expanded opportunities of the next decade. Following this trend, India will cooperate across spheres of mutual interest and compete where national interests collide. To rise to this moment, India has set ambitious targets for itself — both in the domestic arena and on the global stage.

At home, India's realized and unrealized potential will continue to reflect the successes and prospects of its diverse states and their relationship with the constitutionally strong central government. The macro challenge in the decade ahead will be to achieve sustained high, stable and inclusive growth, which has thus far been elusive.

On the global stage, India hopes to be a guiding force for emerging economies on the journey toward net-zero emissions. Developing countries will be watching as India tries to balance the goals of achieving high growth and reducing the carbon intensity of its economy.

India will need to adeptly utilize both multilateral and bilateral relationships. It will rely upon established and diverse multilateral affiliations, such as the Quadrilateral Framework, BRICS, the G20 and the UN Framework Convention on Climate Change, to transition from being a "balancing power" to becoming a "leading power." The country will also leverage emergent bilateral trading relationships, including with the US and Australia as well as countries in the Middle East and Africa.

A paramount test will be whether India can become the next big global manufacturing hub, an immense opportunity. Developing a strong logistics framework will be key in transforming India from a services-dominated economy into a manufacturing-dominant one. Unlocking labor market potential will largely depend upon upskilling workers and increasing female participation in the workforce. Success in these two areas will shape India's ability to realize its demographic dividend, particularly with the population projected to grow over the next decade. A booming domestic digital market could also fuel expansion in India's high-growth startup ecosystem in the decade ahead, especially in financial technology and consumer technology. In the automotive sector, India is poised for growth, building on infrastructure, investment, innovation and inclusiveness.

This edition of S&P Global's *Look Forward Journal* shines the spotlight on India and its potential over the coming decade as the country contends with multiple overlapping transitions. With the world eagerly watching India navigate multidimensional changes in economics, energy, logistics, technology and demographics, the future rests on the shoulders of its people.

Dr. Lindsay Newman
Executive Director, Head of Geopolitical Thought Leadership,
S&P Global Market Intelligence
lindsay.newman@spglobal.com

Deepa Kumar
Head of Asia-Pacific Country Risk,
S&P Global Market Intelligence
deepa.kumar@spglobal.com

Dr. Atul Arya
Chief Energy Strategist,
S&P Global Commodity Insights
Co-chair, S&P Global Research Council
atul.arya@spglobal.com

Paul Gruenwald
Global Chief Economist,
S&P Global Ratings
paul.gruenwald@spglobal.com

Contents

The S&P Global Research Council has identified trends and themes that offer opportunities and challenges for our company and customers. Each of the articles below corresponds to one of our 2023 Key Themes. Click here to learn more.

India's Future: The Quest for High and Stable Growth

Achieving high and sustainable growth has been elusive for India; success will require reaping the demographic dividend, boosting private investment and increasing competitiveness.

Paul Gruenwald
Global Chief Economist, S&P Global Ratings
paul.gruenwald@spglobal.com

Dharmakirti Joshi
Chief Economist, CRISIL
dharmakirti.joshi@crisil.com

Rajiv Biswas
Asia-Pacific Chief Economist, S&P Global Market Intelligence
rajiv.biswas@spglobal.com

Highlights

The macro challenge for India in the upcoming decade is to turn traditionally uneven growth into a high and stable trend. Given structural differences with East Asian economies, India will need to follow its own unique path.

Capital accumulation will drive India's economy toward this desirable path, with the government and, increasingly, the private sector investing in infrastructure and manufacturing. Digital infrastructure is another potential driver of high growth.

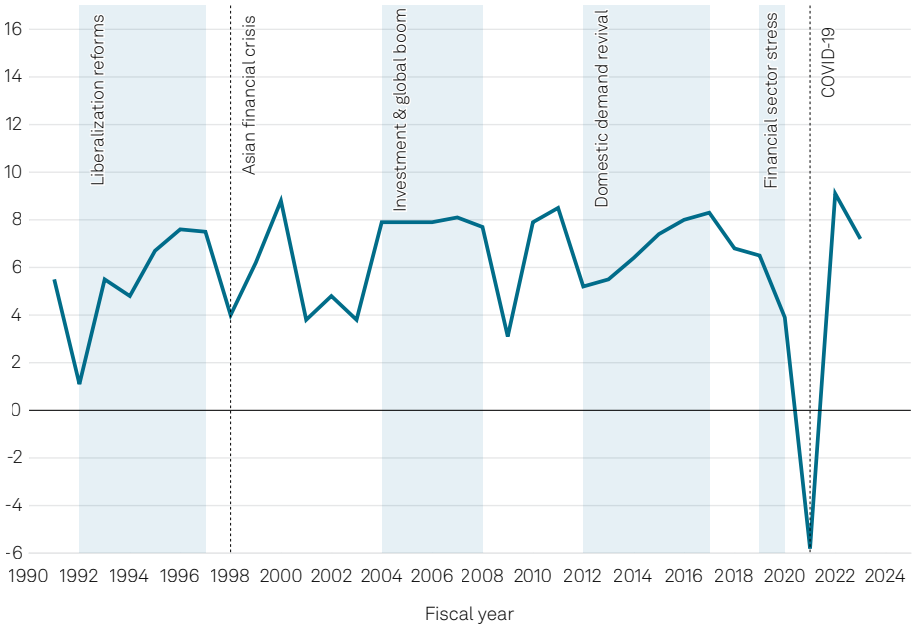
Success will ultimately depend on India's ability to reap its demographic dividend; increase labor force participation, including upskilling; boost private investment, with structural reforms in land, logistics and labor; and increase competitiveness, driven by foreign direct investment. Geopolitics could provide considerable tailwinds.

India has come out of the pandemic reasonably well, with GDP growth of 7.2% in fiscal year 2023 (ended March 2023). Expansion may cool to 6% in fiscal 2024 due to a global slowdown and the lagged effect of policy rate hikes by the Reserve Bank of India, according to S&P Global. Even at this rate, India will be the fastest-growing economy in the G20.

The trillion-dollar question is whether India can sustain high growth. That is, can it replicate the performance of the East Asian tigers over recent decades and improve the prospects and opportunities for its large and growing workforce? Importantly, India's economy is more domestically driven and services-orientated than the East Asian tigers, so its path to success will have to be different.

Ups and Downs of Growth Since Liberalization

GDP growth YOY (%)



Data compiled May 31, 2023.
Sources: National Statistical Office, Government of India; CRISIL.

Decade-Ahead Forecast

Our answer to the sustained growth question is a conditional "yes." We expect India to grow 6.7% per year from fiscal 2024 to fiscal 2031, catapulting GDP to $6.7 trillion from $3.4 trillion in fiscal 2023. Per capita GDP will rise to about $4,500.

Capital accumulation will be the dominant driver of Indian growth. Investment as a proportion of GDP reached a 10-year high of 34% in fiscal 2023. The government has played a key role in boosting investment by offering substantial support for infrastructure projects and by incentivizing manufacturing. We expect the Indian private sector to gradually increase investments given healthy corporate balance sheets.

The importance of capital is made clear using growth accounting. We expect capital to contribute 53% of India's 6.7% average GDP growth through the end of the decade. That dwarfs a 17% contribution from labor, the other main factor of production. Increases in productivity will generate 30% of GDP growth.

The growth contribution from productivity will be higher than in previous periods due to the creation of physical and digital infrastructure in conjunction with efficiency-enhancing reforms. India will likely see further efficiency gains from reforms such as the introduction of the Goods and Services Tax. Further progress in implementing the Insolvency and Bankruptcy Code would also help to drive a healthy credit culture.

Physical and digital infrastructure enhancements will support growth. Physical infrastructure is improving connectivity and lowering logistics costs for industries. Digital infrastructure will continue to speed innovation, improve payment systems and reduce leakages from government subsidy transfers. Moreover, India has used its G20 presidency to highlight its digital public infrastructure success and to encourage action on enhancing financial inclusion in other countries.

Balance of Manufacturing and Services in GDP and Exports

Even with India recalibrating toward manufacturing, services will maintain a strong role in the economy. The country needs to keep a sharp focus on both sectors as each has opportunities in domestic and export markets. In manufacturing, new growth avenues may emerge from an accelerating global trend toward supply chain diversification, the government's Production-Linked Incentive (PLI) schemes and improving physical infrastructure. Service sector growth will be driven by domestic demand as well as global outsourcing.

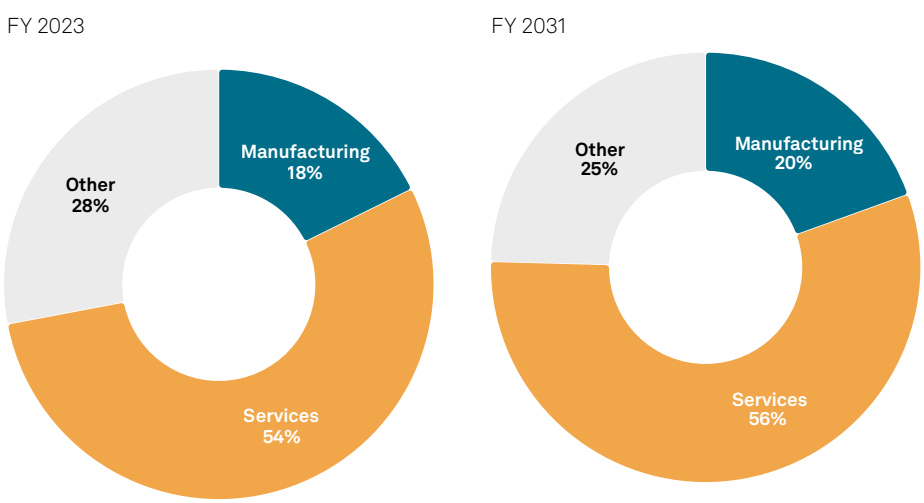
The Indian consumer market will more than double by 2031, surging to $5.2 trillion from $2.3 trillion in 2022, according to S&P Global Market Intelligence's Global Consumer Markets Service. This rapid expansion reflects a growing population and increasing household incomes. Consumer spending on food will rise to $1.4 trillion by 2031 from $615 billion in 2022. Spending on financial services will climb to $670 billion from $280 billion. Higher per capita incomes will also likely boost discretionary spending in areas such as entertainment, communications, restaurants and hotels.

Services' share of GDP will continue to rise, along with manufacturing. Gains for services will be fueled by exports in information technology and IT-enabled services, along with domestic sectors such as retail, food services, trading, finance and healthcare. The question is whether India can generate employment and productivity growth from services at levels similar to those once achieved by manufacturing countries in East Asia.

Services will remain India's export growth engine. The sector's share of total exports has already risen to 42% in fiscal 2023 from about 30% in fiscal 2012. We expect this trend to continue, reflecting the government's latest trade policy (2023) setting a target to boost overall exports to $2 trillion by 2030. Rising comfort with remote work worldwide and the growth of global capability centers in India will stoke services exports.

Services To Remain India's Key Growth Engine

% share of GDP



Data compiled May 24, 2023.
Sources: Central Statistics Office, Government of India; CRISIL forecasts.

The question is whether India can generate employment and productivity growth from services at levels similar to those once achieved by manufacturing countries in East Asia.

Ingredients for Decade of Macro Success

India has seen a good, if uneven, record of growth over the past three decades. Expansion has come in fits and starts, and it has generally been lower and less sustained than in the East Asian tiger economies. The challenge over the next decade — and beyond — will be to create the conditions for sustained growth. Achieving this will likely require structural reforms in three key areas.

1) Raise labor participation, especially among women, and boost skills.

India is failing to take full advantage of its large and growing working-age population. Upskilling workers and increasing the number of people holding jobs will boost growth. Labor force participation was just 55.2% in 2022, and only about 32.8% among women, according to the government's Periodic Labour Force Survey. Some of the attempts being made to deregulate labor markets at the state level could also improve participation and efficiency.

2) Lift private investment in manufacturing.

India's domestic market is the third largest worldwide in purchasing power parity terms, which provides opportunities for growth in private manufacturing. Expanding manufacturing has been a long-standing aspiration for the country. Still, manufacturing's share of GDP has only risen to about 18% from 15% over the past two decades. By contrast, services' share has leapt to 55% from 45%.

Manufacturing has been held back by stringent labor laws, subpar logistics and poor infrastructure. The authorities are fast-forwarding infrastructure and logistics developments in a bid to ease bottlenecks. Labor laws and the land-acquisition process are also being gradually eased.

India, like a growing number of economies, is using an interventionist industrial policy to attract manufacturing investment. Its PLI schemes cover 15 sectors, such as electronics, automobiles, steel, renewables and pharmaceuticals.

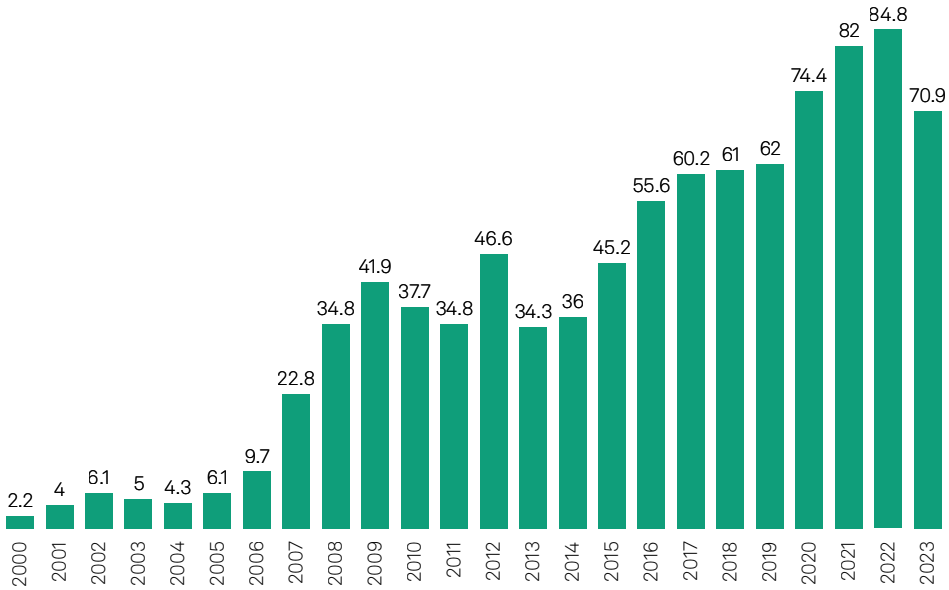
3) Bolster external competitiveness through FDI.

India has become an increasingly attractive location for multinationals across a range of industries. Gross foreign direct investment (FDI) inflows reached a record $84.8 billion in fiscal 2022, according to the Ministry of Commerce and Industry. FDI inflows into manufacturing surged 76% that year to more than $21 billion. Gross FDI inflows were just $4.3 billion in fiscal 2004. Technology-related FDI has become an important source of investment. The computer software and hardware sector was the largest recipient of FDI inflows in fiscal 2022.

A massive domestic market, along with gradually improving global competitiveness, is helping India draw foreign investment. The country has one of the largest domestic markets worldwide, and growth is poised to surpass most other emerging nations.

Growth in FDI inflows over the past decade has boosted India's foreign-exchange reserves and helped to lower its external account vulnerability.

India Foreign Direct Investments Have Surged Since 2000 (US$B)



Data compiled May 24, 2023.
Source: Reserve Bank of India.

A massive domestic market, along with gradually improving global competitiveness, is helping India draw foreign investment.

Looking Forward: Geopolitics

Geopolitics can potentially provide considerable tailwinds for India's growth efforts. The country is in a good geopolitical position, which will help it benefit from supply chain diversification and reshoring. This will likely bolster other growth-enhancing strengths, particularly competitiveness.

Still, geopolitical volatility can be a challenge. India is pursuing a pragmatic approach, cooperating and competing to serve its national interest. This means it is navigating changing partnerships and an evolving landscape. Deglobalization and protectionist measures will also create some headwinds for exports. Trade partnerships could help to mitigate some of these effects. ■

Learn more

Rider in the storm

Safe zone vibes

Credit Ratio edges up, some headwinds ahead

Q&A

Dr. V. Anantha Nageswaran

Chief Economic Advisor to the Government of India

What is India's growth target, and how do you plan to achieve it?

The Indian economy, in real terms, needs to grow annually at 7% to 7.5% until 2030. On the supply side, the share of manufacturing in total gross value added has to increase from 16% at present to at least 25% of GDP at the expense of agriculture and low-value-added services. On the demand side, gross fixed capital formation, or investment, needs to increase from about 28% of GDP to at least 35%. To fund the increasing investment, the domestic savings rate will need to be about 36% of GDP. Development of the manufacturing sector and the nature of demand will generate significant employment opportunities, facilitate business opportunities and improve overall growth potential. This, in turn, will reduce poverty and increase the equitability of income distribution.

Which areas have high growth opportunities for India?

The manufacturing sector is a key growth area that India needs to exploit, given its comparative advantage in terms of skilled labor, improved physical infrastructure, well-established industrial ecosystem and large domestic market. Key industries should be identified to reap demographic dividends and to take advantage of foreign companies' desire to diversify their supply chains.

The composition of services should change in favor of high-value-added services, as this will improve earnings by attracting foreign demand. Hospitality is one area where high-value-added services need to be developed. Another is healthcare and elderly care, including traditional and modern medicines. The elderly care sector has shown strong growth in advanced economies with an adverse dependency ratio. India can reap the benefits of this because of its favorable demographics.

Higher education is a further target for growing high-value-added services. Least Developed Countries represent the largest share of incoming international students in India because of our price competitiveness. However, India needs to expand its higher education institutions by encouraging competition and improving quality.

Achieving rapid growth in high-end manufacturing and high-value-added services requires an overarching and supportive ecosystem. This means there is a sustained pace of expansion in digital infrastructure, along with significant upscaling of research and development in both the public and the private sector. It also requires a skilled and tech-savvy workforce.

How can India boost investments?

The investment rate (gross fixed capital formation/GDP) needs to increase from about 29% to at least 35%. The private sector, including foreign direct investment, must drive up the investment rate as the government has limited fiscal space. Key steps in achieving this include the development of the domestic corporate bond market, as well as deploying well-targeted fiscal incentives to attract investment. Government investments should focus on infrastructure and public goods that will further facilitate and stimulate private-sector investment.

Net exports also need to improve from about negative 3.7% of GDP to a more balanced figure. This can be done by creating export markets for high-end manufacturing and high-value-added services.

What will it take to increase the savings rate in India?

A higher investment rate and smaller current account deficit (owing to improved net exports) should create a higher savings rate. The increase also depends on inflation remaining under control, as this will minimize the pressure on household budgets. The government needs to show fiscal prudence. There also needs to be efforts to improve financial inclusion and financial literacy to facilitate the understanding and application of financial instruments in savings and investment decisions. ■

India's Demographic Dividend: The Key to Unlocking Its Global Ambitions

Abundant labor supply will fuel India's near-term growth, but upskilling and the inclusion of women will be crucial in reaching the nation's economic potential.

Highlights

India's short-term economic growth will stand on the shoulders of its 678.6 million strong labor force, as estimated by S&P Global Market Intelligence, but labor market reforms could help to unlock sustainable long-term growth.

The nation's ambitions to become a global manufacturing hub are closely linked to its ability to upskill workers. Progress is already underway, as nearly 10 million youth benefit from the Skill India program annually.

Getting more women to enter the workforce will be pivotal for future growth, as only 24% were participating in 2022, according to International Labour Organization estimates.

Sophie Malin
Senior Economist, Pricing and Purchasing,
S&P Global Market Intelligence
sophie.malin@spglobal.com

Ashima Tyagi
Economics Associate Director, Pricing and Purchasing,
S&P Global Market Intelligence
ashima.tyagi@spglobal.com

India, home to 1.4 billion people, has surpassed mainland China to become the world's most populous country, according to UN estimates. This gives India potential advantages, especially at a time when countries around the world are facing declining birth rates and tight labor markets. S&P Global Market Intelligence forecasts that India's population will continue growing over the coming decade. The UN estimates that India's population will not begin to decline for another four decades.

India's abundant labor force makes it well placed to achieve domestic growth goals and to capitalize on global efforts to diversify supply chains. Both of these potential outcomes will serve the nation's geopolitical ambitions well. However, there is a clear need to accelerate labor upskilling and to strengthen women's participation in the workforce if India is to achieve its economic potential.

Labor Market Slack Will Help Fuel India's Manufacturing Ambitions

The sheer size of India's workforce is a major competitive advantage as the country tries to become a global design and manufacturing hub. The government's emphasis on "Make in India, Make for the World" complements this labor advantage by incentivizing marque global companies to invest in Indian manufacturing.

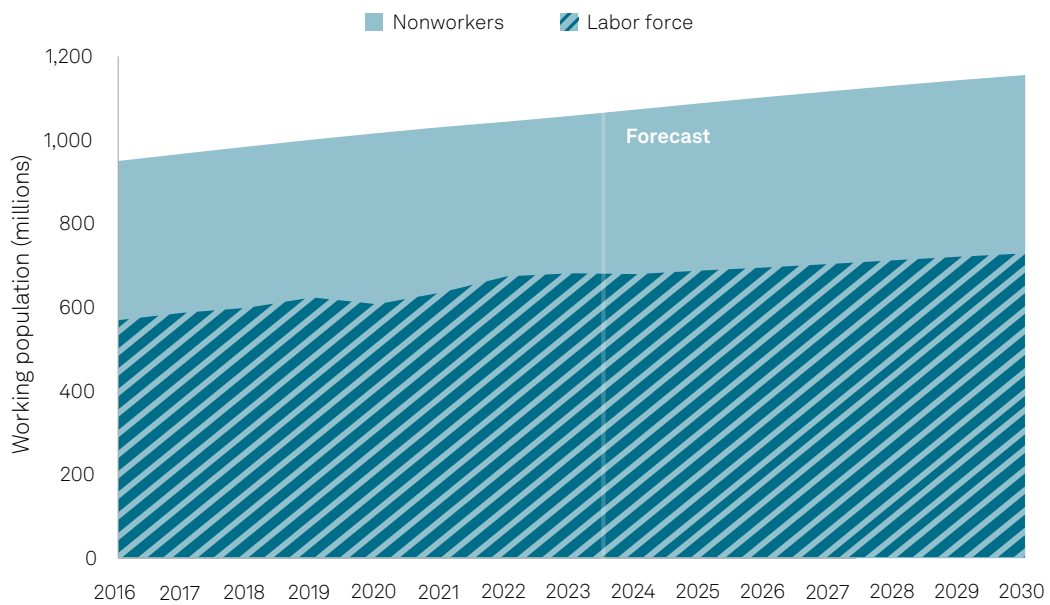
India is currently a services-orientated economy, with 30.7% of the labor force employed in the services sector, according to International Labour Organization (ILO) estimates. Increasing manufacturing's contribution to national GDP is a challenge. Still, the global drive to strengthen supply chain resilience in the post-pandemic world provides India with an opportunity.

Beyond the size of India's population, relatively high unemployment and muted labor force participation suggest ample room for increased hiring before labor shortages become a concern.

The nation had an unemployment rate of 9.3% in 2022, surpassing the global average of 6.8%, according to the World Bank. This labor market slack will remain over the coming decade, with unemployment set to average 11.0%, as per S&P Global Market Intelligence forecasts. Labor force participation was also relatively low at 61.4% in 2021, versus a global average of 63.3%, according to the World Bank.

India's pool of untapped labor presents a long-term advantage as there are marginal workers that could be attracted into the jobs market, easing any potential recruitment pressures. This slack contrasts with concerns about labor shortages in other countries, so it could offer manufacturers some risk mitigation against escalating employment costs.

India's Slack Labor Market Can Meet Demand for More Workers



Data compiled June 2, 2023.
Source: S&P Global Market Intelligence.

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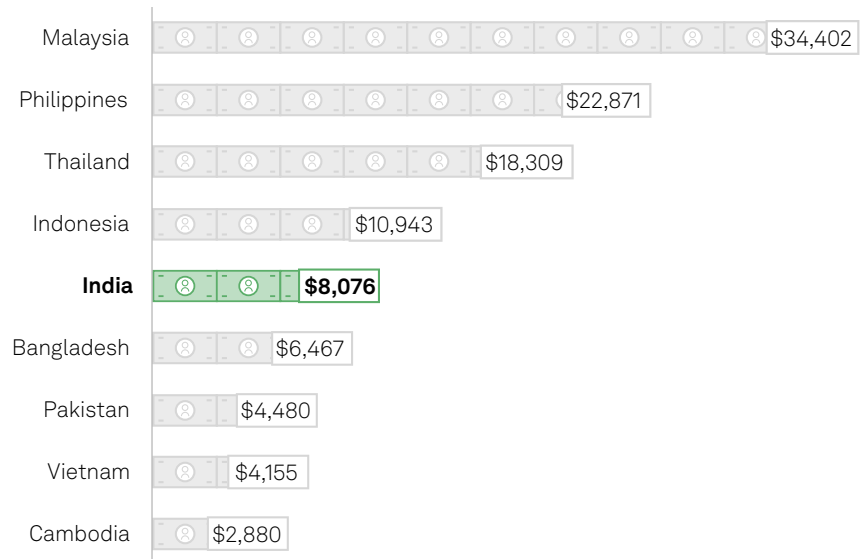
Skill Development Will Help Shift India's Economic Focus to Manufacturing

Indian manufacturing is dominated by low-skilled labor, in contrast to the upskilled workforce found in services. This difference reflects the central government's focus on services-driven economic growth in recent decades, which has naturally driven higher skill development in this sector. Increasing skill levels in manufacturing would aid India's efforts to become a global manufacturing hub.

The lower skill level in Indian manufacturing means that each employee added just $8,076 of value on average in 2021, according to S&P Global Market Intelligence. That's far behind the $18,308 achieved in Thailand and the $34,402 seen in Malaysia. This skills shortage is a key risk for manufacturers wanting to move up the value chain, jeopardizing India's bid to be a manufacturing hub. Securing talent has been difficult for 79.0% of industrials and materials employers, according to the ManpowerGroup Employment Outlook Survey for the second quarter of 2023.

Low Skill Levels Hinder India's Manufacturing Ambitions

Real manufacturing value added per employed person (US$)



Data compiled June 2, 2023.
Source: S&P Global Market Intelligence.

The government's decision to establish the Ministry of Skill Development and Entrepreneurship (MSDE) in 2014 demonstrated its intent to address the skills gap. The MSDE's mandate includes coordination of skills development efforts nationwide and the establishment of a vocational and technical training framework. Prime Minister Narendra Modi also launched the Skill India Mission in 2015, with an ambitious initial target of training 400 million Indians in various skills by 2022. This goal was divided across a number of different programs. One of them, the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) program, has helped 13.7 million individuals receive training since April 2016. The National Skill Development Corporation has acted as a catalyst for PMKVY, working with 538 training partners to set up about 10,000 training centers across 36 sectors.

Government efforts to improve education will also likely provide more skilled workers for manufacturing and other industries. The National Education Policy, announced in 2020, created a comprehensive framework to transform the education system by 2030. A major focus of the initiative is foundational literacy and numeracy. Another key goal is improving the fragmented higher education sector. This could help India attract more high-value and globalized jobs in manufacturing, as well as in other sectors such as research, technology and financial services.

Boosting Female Employment Will Be Key in Harnessing India's Demographic Dividend

India's future economic growth will rest heavily on whether governments can boost low labor participation among the nation's 691.7 million females, based on UN estimates. Just 24.0% of women were working in 2022, according to the ILO, a decline from the already low 27.8% seen in 1990. The drop, even amid greater female education, partly reflects the reduced need for women to work, as higher wages for men have boosted household incomes. A wide range of employment and gender discrimination issues have also deterred women in India from working, as highlighted in a 2015 report by the Ministry of Women and Child Development.

India's future economic growth will rest heavily on whether governments can boost low labor participation among the nation's 691.7 million females.

Policies seeking to mitigate gender discrimination and address lingering structural imbalances will enable women to outsource care responsibilities, participate more in higher education and leverage the increasing

formalization of work. For instance, the central government's Mission Shakti program offers safe havens for women at risk of abuse, creche support services, accommodation for working women and gap funding for female entrepreneurs. Vocational training specifically targeted at women of different ages and from different socioeconomic groups is also being offered at 19 National Skill Training Institutes for Women.

Looking Forward

Labor dynamics will be pivotal in achieving India's domestic growth targets and its global ambitions.

A key impediment to overcome will be public perception that upskilling is a last resort for those who have opted out of the formal academic system. This was acknowledged by the government in MSDE's Annual Report 2021-22. Consolidating and streamlining upskilling schemes may also improve their effectiveness. MSDE has a challenging task in coordinating skill-development programs spread across multiple ministries and associated departments within the central and state governments.

Boosting female labor participation will partly depend upon an evolution in the perception of the role of women in Indian society. This will reduce barriers for women entering the workforce and diminish gender discrimination more broadly.

India's demographic dividend will help drive the country's domestic and global ambitions, but appropriate and timely policy interventions will be key in achieving the desired goals. ■

Learn more

India's economy continues to expand as inflation moderates

Inflation trends diverge as service sector growth spurt drives global growth to 16-month high

Global Trade at a Crossroads: As Tensions Escalate, U.S. Companies Try to Diversify Supply Chains Away from China

S&P Global India Manufacturing PMI®

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Q&A

Dharmendra Pradhan

India's Minister of Education, Skill Development and Entrepreneurship

What does the government see as the public sector's role in reaping India's favorable demographic dividend?

India is home to more than 600 million people aged between 18 and 35, with 65% under the age of 35. India's demographic dividend is expected to persist at least until 2055–56 and will peak around 2041, when the share of the working-age population — 20–59 years — is expected to hit 59%. It is an opportunity which can be harnessed if the right conditions are there or created. Under the leadership of Prime Minister Narendra Modi, we have launched a futuristic National Education Policy (NEP). Experts have found that over 80% of a child's brain development occurs prior to the age of six years. Based on this, for the first time in India's history, early childhood care and education have been brought under the formal schooling system. Our government is ensuring that multilingualism is part of NEP. Prime Minister Modi has envisioned India to be the skill capital of the world. We have made tremendous progress at speed and scale in skilling, reskilling and upskilling our youth. We have skilled more than 63.5 million people under various initiatives and have created a network of skill institutes and are encouraging more and more women to take up vocational training.

What does the government envision as the role of entrepreneurship in creating high employment and economic growth? And what is the strategy in education to inspire entrepreneurship?

Our prime minister has called entrepreneurs India's "growth ambassadors" and has pledged to make India an entrepreneurship hub. With the launch of NEP 2020, the focus has been to shift the mindset of the youth from being jobseekers to job creators. Prime Minister Modi has said that wealth creation is a great national service and there is a need to recognize and encourage wealth creators. India is also setting up laboratories in schools across the country to foster curiosity, creativity and imagination in young minds, as well as to inculcate skills, such as a design mindset, computational thinking, adaptive learning and physical computing. We are also fast setting up and growing a network of incubation centers to promote innovation and entrepreneurship. I say it proudly that today we have the third-largest startup ecosystem in the world and eagerly await to be at the No. 1 spot with our policies and strategies. To give you some statistics, there were more than 90,000 startups in 2022 in India versus less than 1,000 in 2016. We now have over 100 unicorns. Over the years, these unicorns have raised over $94 billion in funding and have a combined valuation of $344 billion. NEP 2020 is driving a wave of change and promoting skill-based education that not only minimizes the social stigma attached to taking up a vocation as a career, but also exposes the youth to multiple career paths, including entrepreneurship.

How will automation and technological developments impact and influence government policies?

Automation and groundbreaking advancements in technology are fundamentally changing the nature of work in more ways than one can think. Trends such as demographic transitions and technological changes such as Industry 4.0, Web 3.0, extended reality technology and AI are bringing immense possibilities that will forever change lives. We need to accept and adapt to these changes and do it fast. It is inevitable that the future of work will be characterized by the collaboration of boundaryless teams that will collapse all barriers to imagination, productivity and creativity. Our ambition is also to make India a global powerhouse for AI. As technology becomes more integrated into governance and public services, ensuring cybersecurity and protecting citizens have also become paramount. Therefore, we are developing robust policies and regulations to safeguard critical infrastructure, protect against cyberthreats and establish frameworks for data privacy and consent. The rapidly evolving future of work will lead to some skills rising in importance whereas some other skills will witness a decline. NEP 2020 provides the opportunity for that alignment. ■

Interviewed by Sambit Mohanty, Editorial Lead, Petroleum News at S&P Global Commodity Insights. Sambit is based in Singapore.

Cooperation and Competition: India's Evolving Center-State Dynamics

Relations between states and the central government will determine whether India's national strength equals the sum of its parts.

Highlights

India's realized — and unrealized — potential over the next decade will be a story about the successes and opportunities of its diverse states.

Center-state relations will increasingly be characterized by "competitive federalism," with central and state governments jostling for investment and employment opportunities.

A key question for India will be how the center and states devolve more power and responsibilities to increasingly important city governments, which need to create timely and effective solutions to multigenerational challenges.

Deepa Kumar
Head of Asia-Pacific Country Risk,
S&P Global Market Intelligence
deepa.kumar@spglobal.com

An oft-cited truism is that India is characterized more than anything by its diversity. This is clearly illustrated by its 28 states and eight union territories. Such a range of subnational entities presents benefits and challenges as India aims for greater social and economic dynamism domestically, and for elevated influence internationally.

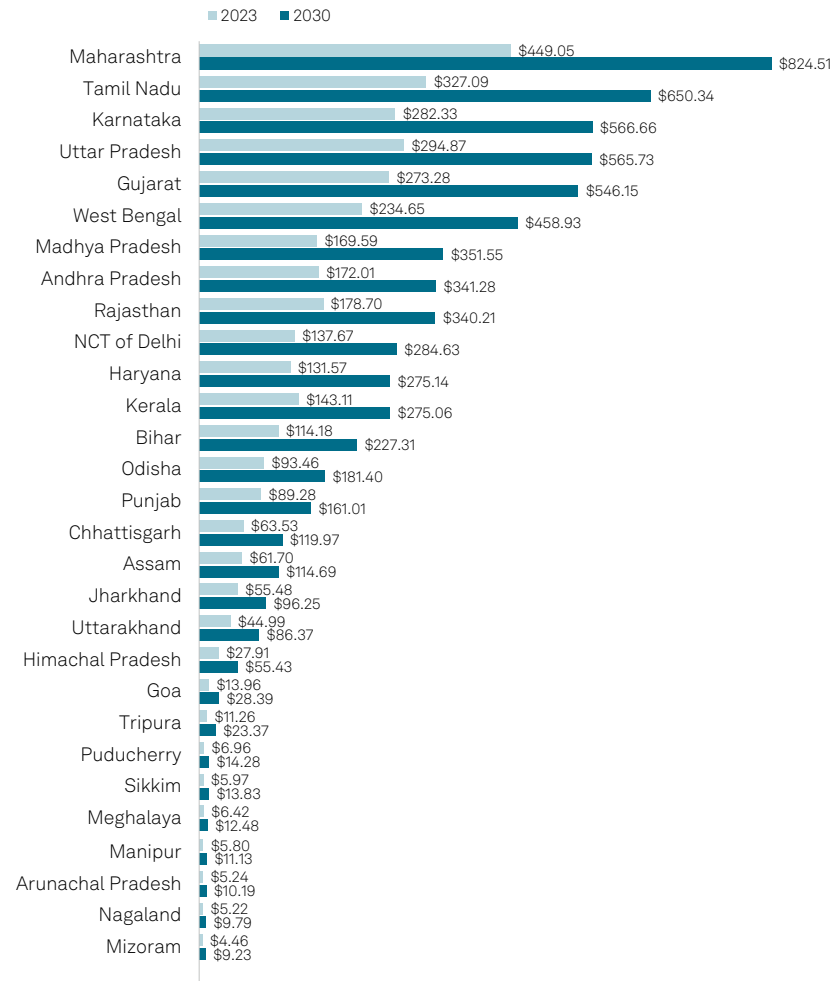
India's potential growth over the next decade will be shaped by its diverse states and their alignment with the constitutionally mandated strong central government.

Competitive Federalism Will Be the Driving Dynamic of Center-State Relations

India's political and economic integrity has historically been based on "cooperative federalism," an approach that espouses mutually beneficial coordination between the center and state governments in solving problems and unlocking capabilities. Center-state relations in the coming years are more likely to be characterized by "competitive federalism," where central and state governments jostle for investment opportunities and the chance to create jobs. These tensions are heightened when some states benefit from close ties with the central government or from inherent advantages such as size, geography or population.

Diverse Growth Trajectories of Indian States Will Encourage 'Competitive Federalism'

Nominal GDP by state (US$B)



Data compiled May 18, 2023.
Sources: S&P Global Market Intelligence; Regional Explorer.

International governments and businesses engaging with India will need political astuteness to navigate different layers of bureaucracy and stakeholder interests.

More competitive elections in India are also driving competitive federalism, particularly because voters increasingly distinguish between state and parliamentary polls. This trend encourages national and subnational governments to pursue policies that go beyond their traditional mandates. The constitution broadly gives strategic authority to the central government and functional authority to the states.

While competitive federalism will dominate, prospects for cooperative federalism still exist and will be pursued intermittently. International governments and businesses engaging with India will need political astuteness to navigate different layers of bureaucracy and stakeholder interests.

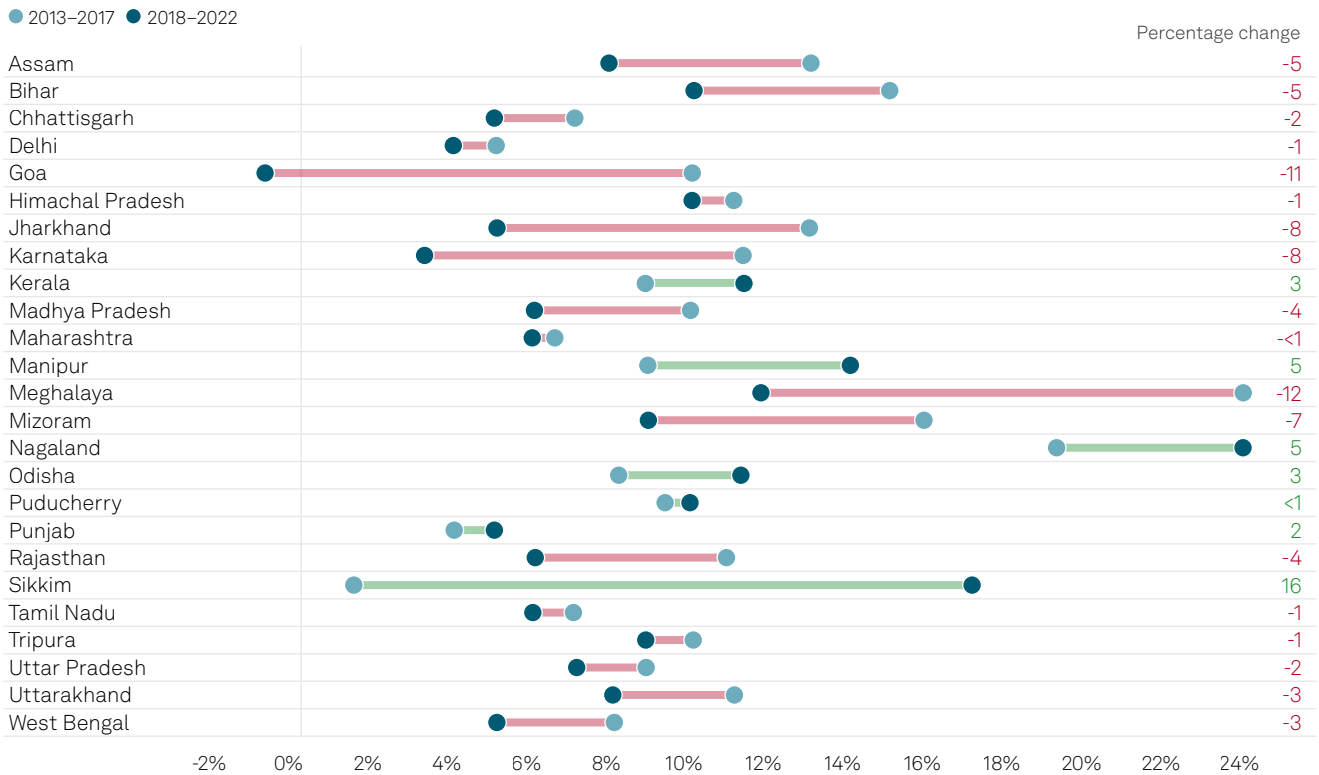
Cooperative Federalism in Focus: India's Adoption of the Goods and Services Tax

An example of cooperative federalism in India is the 2017 adoption of the Goods and Services Tax (GST), which marked a massive center-state alignment. GST was introduced with the goal of boosting integration in the Indian economy and of potentially spurring foreign investment. States transferred significant tax collection powers to the center under GST in return for economic efficiencies.

Placing the central government at the heart of GST incentivizes it to focus on the advantages of the system rather than its drawbacks. The potential gains include simpler taxes for small businesses, easier interstate trade and improved government revenue collection. The biggest impediment for the central government is working out how to divide tax revenue between the various states.

Calls from both more and less developed states to change how GST funds are redistributed — along with the central government's response — will test the system's spirit of cooperative federalism. States' increasing responsibility for policy execution, including politically sensitive social welfare schemes, will further intensify this argument.

GST Implementation Has Resulted in Unequal Revenue Growth for Indian States (%)



Data compiled May 17, 2023.
Sources: PRS Legislative Research compilation of state government data; S&P Global Market Intelligence.

The GST Council, which includes representation from all states and the center, will help in maximizing GST's benefits and in addressing states' concerns. It can also serve as a template for center-state coordination in other areas.

Competitive Federalism on the Horizon: Indian States' Approach to Reform

Indian states' unique pathways to growth will influence their future reforms and development. Competition among states will also only increase as the country's huge and expanding population of workers and consumers fuels investor interest in the country.

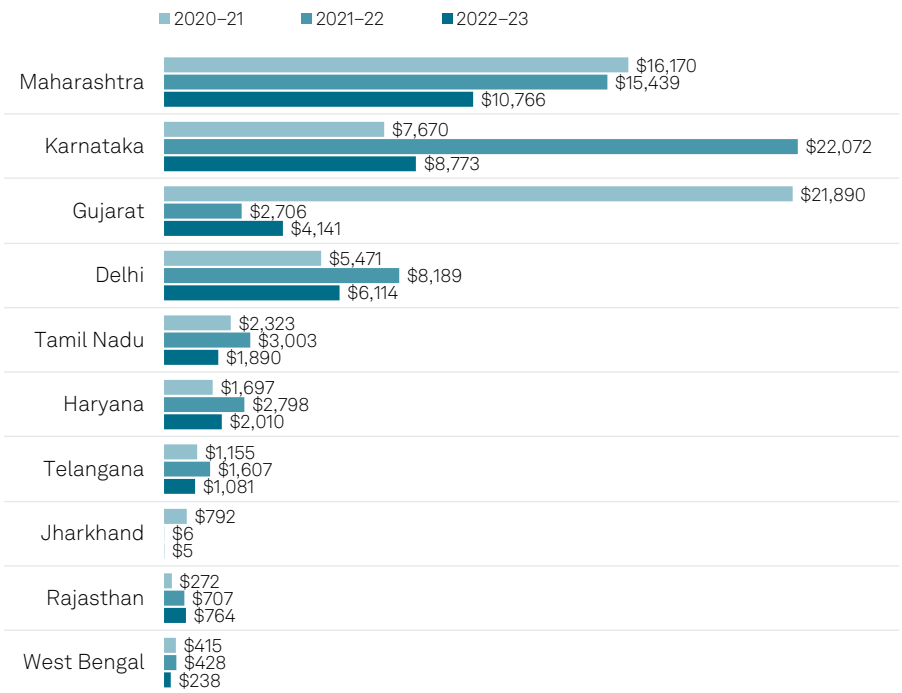
Indian states will likely adopt differing policies for land acquisitions, tax incentives and especially labor reform, reflecting local conditions. They will also want to deliver reforms in ways that give them an advantage over other states in the competition for foreign direct investment.

Tensions between states and the central government are also inherent in the system because of states' reliance on the central government for revenue. An argument is often presented that relations can ease when the same party runs the state and the central government, but these spells are intermittent owing to subnational election cycles.

The center and states will continue to diverge at times on policy, but the overarching ambition to maximize India's growth potential and geopolitical influence remains the same. Businesses operating in India must recognize that each state is distinct and that each needs its own curated solution. Still, the country's reform gradualism lessens policy uncertainty that stems from political upheavals.

Some States Have Been More Successful at Attracting FDI Inflows, Incentivizing Further Competition

US$M, minus reinvested earnings



Data compiled May 17, 2023.
Sources: Department of Promotion of Industry and Internal Trade, Government of India; S&P Global Market Intelligence.

Mutual support and coordination across cities, states and the central government will be necessary if India is to fulfill its ambition of becoming a global manufacturing hub as well as realizing its goals in energy transition and agriculture.

Looking Forward: The Future of Center-State Relations

Successive central governments will need to find ways of equitably sharing revenue with states. This means adequately compensating states that deliver higher growth while addressing the needs of states that lag. The implementation of GST shows that this can be a point of contention. India's Finance Commission will be pivotal in tackling this challenge and in setting a precedent.

Another key question is how the center and states will devolve more power and responsibilities to India's increasingly important city governments. New Delhi, Mumbai, Bengaluru, Chennai and other major cities will be on the front line of multigenerational challenges like climate change and harnessing India's demographic dividend. Adequately empowering substate governments to be more involved in the last-mile delivery of resources will be crucial for timely and effective responses.

India's path to becoming a more influential global actor will be determined by how effectively it can manage its federalism balancing act and mobilize the participation of grassroots interests. Mutual support and coordination across cities, states and the central government will be necessary if India is to fulfill its ambition of becoming a global manufacturing hub as well as realizing its goals in energy transition and agriculture. Navigating this dynamic with deliberation and purpose will help India capitalize on the moment it is in now. ■

Learn more

Outlook for India's economic growth and policy platforms

Modi-Biden summit: Key drivers of cooperation

This article was authored by a cross-section of representatives from S&P Global and in certain circumstances external guest authors. The views expressed are those of the authors and do not necessarily reflect the views or positions of any entities they represent and are not necessarily reflected in the products and services those entities offer. This research is a publication of S&P Global and does not comment on current or future credit ratings or credit rating methodologies.

India's Energy Transition: More Energy, Fewer Emissions

India is critical in the global push toward net-zero because of its large and growing energy demand. Its efforts to reduce emissions will also be a model for other emerging economies.

Dr. Atul Arya
Chief Energy Strategist,
S&P Global Commodity Insights
atul.arya@spglobal.com

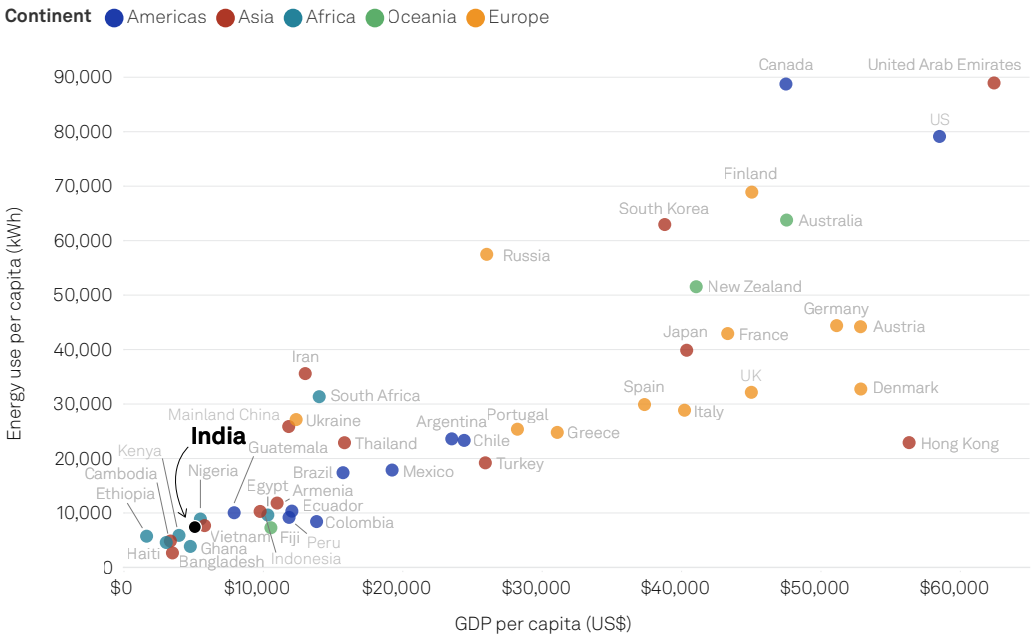
Gauri Jauhar
Executive Director, Energy Transitions and Clean Tech Consulting,
S&P Global Commodity Insights
gauri.jauhar@spglobal.com

Highlights

Any path to global net-zero emissions will have to travel through India due to the country's energy use, its projected demand growth and the commensurate increase in greenhouse gas emissions. India's development trajectory will also influence countries in the Global South that are trying to provide secure, reliable and affordable energy to their citizens while reducing emissions. India's policymakers and companies can use many technology, policy and finance levers to deliver the energy required to meet the nation's economic aspirations while mitigating the impacts of climate change.

India's energy transition reflects its robust economic growth, with a fast-expanding middle class and rapid urbanization. The nation is the third-largest consumer of energy globally, according to data from S&P Global Commodity Insights. Total primary energy demand more than doubled from 2000 to 2020, surging to 937 million tons of oil equivalent (Mtoe) from 417 Mtoe. Still, India's energy consumption per capita is less than 1/10th of the US's. How India meets its growing energy demand and changes its primary energy mix over the coming decade will substantially influence global energy markets and help determine if, and when, global emissions targets are reached.

India's Energy Use Trails Advanced Economies



Data compiled Jan. 1, 2023.
Source: Our World in Data.

India's slogan for its G20 presidency — "One Earth, One Family, One Future" — is fitting at a time when the world is grappling with many crises simultaneously. Over the last 18 months, the focus globally has shifted to balancing energy transition with improving energy access, ensuring energy security and providing affordable energy supplies. The impact of climate change is also being felt globally and, together with high energy prices, it is accelerating the widening of the socioeconomic divide between the Global North and South. The ability of emerging economies such as India to absorb these economic shocks and to cope with extreme weather and other climate-related emergencies will have reverberations worldwide.

Securing Reliable, Affordable and Sustainable Energy Supplies

India's economy will average 6.7% per annum GDP growth from fiscal 2024 to fiscal 2031, and its increasing energy demand will have a sustained global impact. The nation's oil consumption will jump to 305 Mtoe in 2030 from 210 Mtoe in 2020, according to S&P Global Commodity Insights. Gas consumption will rise to 70 Mtoe from 53 Mtoe. Limited domestic supplies mean that India's oil imports will exceed

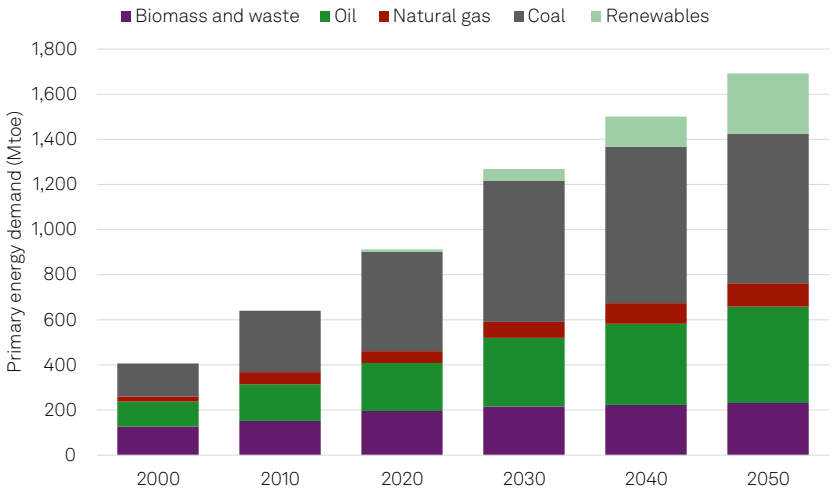
The ability of emerging economies such as India to absorb these economic shocks and to cope with extreme weather and other climate-related emergencies will have reverberations worldwide.

90% of demand by 2030 at 280 Mtoe. Gas imports will surpass 60% of supplies, at 44 Mtoe. Coal will buck the trend, with imports remaining at about 25%, due to India's own substantial resources. India already spends more than $160 billion of foreign exchange every year on energy imports, according to government statistics. The import bill is likely to double in the next 15 years without steps to reduce this import dependence. Higher imports will put a further burden on government finances.

Ensuring secure and affordable supplies of oil and gas is the highest energy priority for the government.

There are several opportunities to reduce import dependence.

India's Energy Demand to Double by 2050

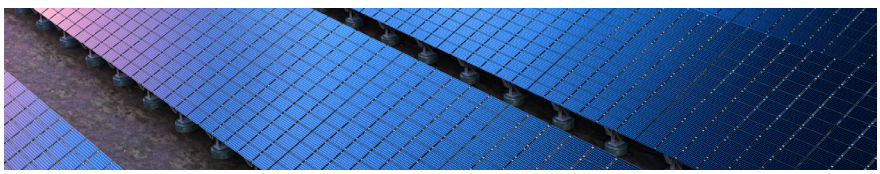


Data compiled Jan. 1, 2023.
Source: S&P Global Commodity Insights.

- **Upstream oil and gas:** Domestic exploration has yielded mixed results over the last decade with no new major discoveries. Renewed interest in India from international oil and gas companies is likely to have limited impact because these companies are reducing oil/gas investments while transitioning to a broader fuel mix. Still, there is potential to boost output at Indian oil/gas fields using secondary and tertiary recovery technologies. Average recovery factors in India are 20%-30% compared with global averages of 35%-40%. The application of new technologies, including digital technologies, machine learning and data analytics, provides a further impetus to focus on improving recovery factors. High oil prices are another incentive for increasing domestic oil and gas production.

- **International assets:** Many oil and gas companies around the world are divesting oil/gas assets and focusing on energy transition to meet net-zero targets. Indian public sector oil/gas companies can pool resources and jointly bid for these assets. They can also partner with strategic international investors that want to access India's growing domestic energy market. Greater ownership of foreign oil/gas supplies will ensure energy security for India and help in managing price volatility.

- **Deployment of renewables:** Solar photovoltaic installations have grown 12-fold in India since 2015, based on S&P Global Commodity Insights data, while wind power capacity has doubled. Further accelerating deployment of renewables will be critical in achieving the government's target of increasing installed renewables capacity to 500 GW by 2030. This will help meet growing electricity demand while keeping prices affordable and cutting emissions. It will also reduce the impact of gas price volatility on power generation and support the retirement of old and inefficient coal power plants.



Further accelerating deployment of renewables will be critical in achieving the government's target of increasing installed renewables capacity to 500 GW by 2030.

- **Hydrogen:** The government launched the National Green Hydrogen Mission earlier this year with the goal of producing 5 million metric tons of the fuel annually by 2030. This will help reduce fossil-fuel imports and turn India into a leading producer and exporter of green hydrogen. The government plans to export 70% of output overseas. Domestically, hydrogen can be utilized for long-duration storage of renewable energy, as well as replacing fossil fuels in industry and heavy-duty transportation. It can also help to decarbonize India's steel sector and make a significant impact in reducing emissions.

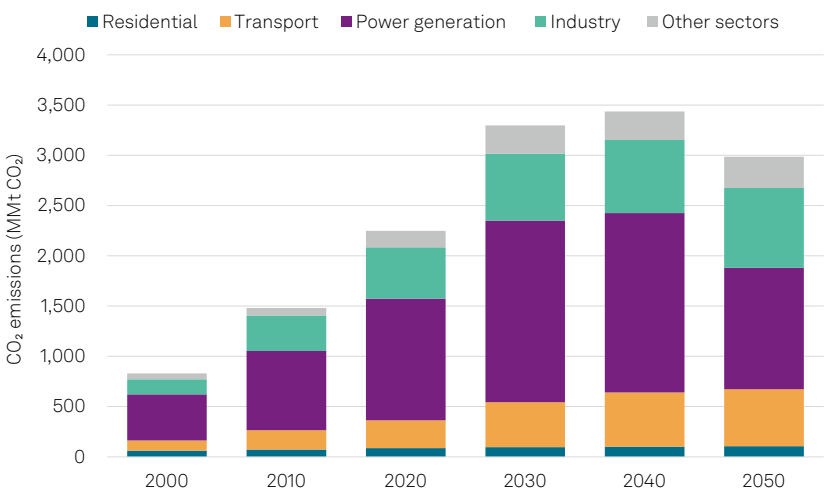
Reducing Emissions

Any road to net-zero globally will have to travel through India. India's economic growth coupled with rising demand for energy will result in a continuing increase in greenhouse gas emissions for the foreseeable future. The historical disparity of cumulative GHG emissions between the Global North and Global South is well acknowledged; however, effects are being felt around the world. India is seeing unprecedented temperatures, floods and droughts, as well as deteriorating air quality. Net-zero emissions targets are also likely to be superseded over the next decade by a focus on energy security and affordability.

Over the last decade, the focus has been on improving energy access via rural electrification and on ensuring affordability through targeted subsidies. Looking forward, India will have to strike a balance to increase energy access and reliability while delivering affordable energy supplies and diversifying its fuel mix to reduce the overall carbon intensity of its energy system. There are several pathways to reducing emissions.

- **Power sector:** Power generation is India's largest source of GHG emissions because coal provides over 70% of the country's electricity. It is unrealistic to rapidly reduce coal's share in the fuel mix, even with richer countries providing support through initiatives such as the Just Energy Transition Partnership. Nevertheless, aging and inefficient coal plants can be phased out, while newer plants can be cleaned up to meet more stringent emissions standards. The deployment of renewables can also be stepped up significantly by establishing a domestic clean-energy supply chain.
- **Transport sector:** Decarbonizing the transport sector will likely be more challenging than decarbonizing power. The sector can start by electrifying two- and three-wheelers, which account for about two-thirds of India's petrol demand. Deploying the infrastructure for these vehicles will be easier than setting up nationwide charging systems for light-duty vehicles. Mass transportation can also be fully electrified. Rapidly scaling up production of biofuels from agricultural waste would increase liquid fuel supply and reduce local air pollution.
- **Energy efficiency:** A nationwide initiative to accelerate energy efficiency could pay significant dividends. Other expanding economies have shown that it is possible to slow growth in energy demand with efficiency measures, which then eases emissions. Energy savings would come from industry, buildings and transportation.

Energy Sector CO_2 Emissions To Peak Around 2040



Data compiled Jan. 1, 2023.
Source: S&P Global Commodity Insights.

India will have to strike a balance to increase energy access and reliability while delivering affordable energy supplies and diversifying its fuel mix to reduce the overall carbon intensity of its energy system.

Looking Forward

India and the rest of the world are joined at the hip in the journey to reach net-zero emissions. It will be a hollow victory if the Global North reaches net-zero and the Global South remains far behind. Developing countries will be watching closely as India continues its growth trajectory while trying to reduce the carbon intensity of its economy and ultimately bend its total GHG emissions curve. The way ahead will not be straightforward; however, there are actions that will enable the provision of secure, affordable and sustainable heat, light and mobility to the citizens of India.

- **Increase energy financing:** The Indian government estimates that more than $10 trillion of new investments will be required to reach its goal of net-zero by 2070. Additional work will be required for capacity building, improving systemic efficiency and increasing investor confidence. The Reserve Bank of India has highlighted an urgent need for a supportive Indian green taxonomy and carbon pricing. More broadly, the International Energy Agency's "World Energy Investment 2023" report again highlighted the huge imbalance between clean energy investments in developing and developed economies. There are immediate and timely opportunities to accelerate investments in the Global South via the G20 and COP28.

- **Improve policy alignment and coordination:** The pace of technological and geopolitical developments affecting the global energy landscape continues to accelerate. India's energy needs require a nimble policy and political response with coordination and alignment among multiple stakeholders, including the government, private sector and the public. IEA members such as the US and Japan could serve as a model for creating a single energy-focused entity that is responsible for coordinating national energy strategy, aligning diverse interests and accelerating decision-making.

- **Strengthen national champions:** State-owned companies and national champions will be instrumental in delivering India's energy and climate future. These companies will need global partnerships to access international finance and accelerate the implementation of new and emerging technologies. While progress has been made in increasing commercial focus and reducing bureaucracy, national champions need to be more agile in order to cultivate overseas partnerships, attract capital and access state-of-the-art technology. State champions can also pool resources and coordinate strategies when bidding for assets overseas.

- **Accelerate market orientation:** Ongoing reforms have improved market-based pricing for energy, as well as enabling more efficient and transparent targeting of subsidies. More work is needed to accelerate deployment of new technologies at scale and to fully implement electricity sector reforms. A robust, market-led system will require additional structural changes if India's state champions and private companies are to meet the needs of energy-hungry consumers.

- **Better center and state policy coordination:** Improving alignment and coordination between the center and state governments would accelerate decision-making. This would build on progress made in the implementation of policies, such as rural employment guarantees, diesel deregulation and targeted LPG subsidies. ■

Learn more

Key trends for India's power and renewables markets in 2023

India's energy options and the roadmap ahead

Countries face challenge in matching US 'firepower' over green industrial policy

US, EU climate policies may pose unforeseen risks for emerging Asian economies

This article was authored by a cross-section of representatives from S&P Global and in certain circumstances external guest authors. The views expressed are those of the authors and do not necessarily reflect the views or positions of any entities they represent and are not necessarily reflected in the products and services those entities offer. This research is a publication of S&P Global and does not comment on current or future credit ratings or credit rating methodologies.

Q&A

Hardeep Singh Puri

India's Minister of Housing and Urban Affairs & Petroleum and Natural Gas

Global oil and gas markets have seen a lot of turbulence since you took over as petroleum minister. How do you think India has managed to navigate through this upheaval?

I took charge of the petroleum ministry in 2021 when the pandemic was in full swing. All strategic decisions we have taken have been done with the prime ambition of making fuels affordable to a population of 1.4 billion. There's been no shortage of fuels, and our retail prices are amongst the lowest in the world. Today, we are in the situation where India can take reasonable satisfaction in having dealt with the trilemma, which is availability, affordability and sustainability.

India's decision to boost oil purchases from Russia since the Ukraine war started has drawn a lot of questions. What's your view?

The decision to buy Russian oil — as well as from other new suppliers — was driven to make fuel affordable to our consumers. Also, global oil prices would have been much higher if India was also competing to buy from Middle Eastern and other suppliers the volumes that it is now buying from Russia. Even as the global transition takes place to green energy, the fact of the matter is that global oil consumption is about 100 million b/d. If two well-known producers are sanctioned — Venezuela and Iran — and if energy coming out of a third producer, Russia, is also taken off, consumption cannot come down overnight. That's because you're not going to stop traveling or heating your homes.

In addition to buying oil from Russia, what has been India's overall crude diversification and supply strategy?

India has not only diversified by buying oil from Russia, it has also been increasing its energy purchases from other major suppliers, such as the US. Today, we buy $20 billion worth of energy products from the US annually. We used to buy oil from about 27 countries a few years ago. Now, we have got to 39, with new sources like Guyana coming up. Except for one or two OPEC producers, the ability of other oil producers to quickly raise output to fill the vacuum is limited. In late 2021, I was told that leading Middle Eastern producers would gradually increase production, which would eventually help prices to cool by February 2022. But then the Russia-Ukraine conflict started. Even now, therefore, whatever cutbacks in production have taken place, the market will have to adjust.

What are the steps India is taking to meet its future energy needs?

Our upstream reforms are all anchored in a sense of pragmatism, farsightedness and an understanding that we require more domestic production. Some of the initiatives include policies to incentivize production in the northeastern region, as well as the decision to open up more sedimentary areas to exploration and production. We are also in the market to acquire more upstream assets and take more equity outside. Because, as I see it, even if we make a major transition to green energy, we will still need oil and gas, at least for another 20 to 30 years. In addition, India is planning to raise its annual refining capacity from the current 250 million metric tons to 400 MMt as refiners increase their capacity to produce more downstream products, such as petrochemicals. Gas is a bridge fuel. We are also slowly but surely moving in a direction where India will be a major producer and consumer of green hydrogen. Our biofuels, ethanol push and biogas plants will be big stories. ■

Interviewed by Sambit Mohanty, Editorial Lead, Petroleum News at S&P Global Commodity Insights. Sambit is based in Singapore.

Bigger and Greener: The Changing Landscape of Indian Mobility

India's mobility sector is on the cusp of a major transformation. Aspirational car buyers are trading up to SUVs and electric vehicles, while other drivers are shifting to shared services amid environmental and infrastructure challenges.

Puneet Gupta
Director (India & ASEAN Automotive Sales Forecast),
S&P Global Mobility
puneet.gupta@spglobal.com

Highlights

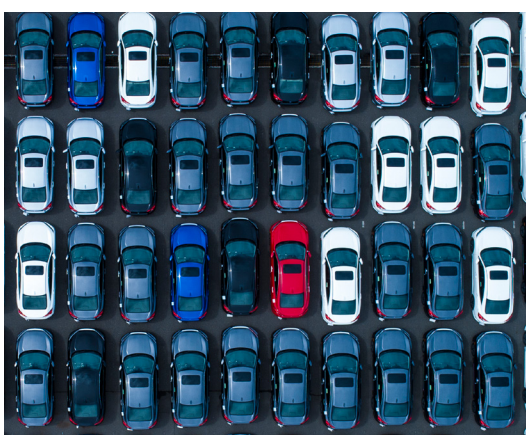
India's light-vehicle market has grown from "small is beautiful" to favoring larger models. SUVs already account for more than 40% of sales, and their share will top 50% by 2030.

Total sales will grow to 6.1 million units in 2030, from 4.4 million in 2022, helped by India's economic growth and investment in the national highway network.

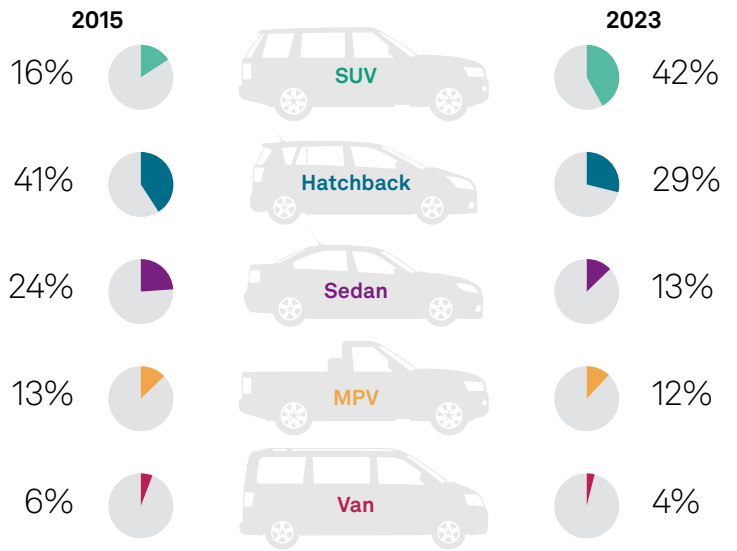
Urban infrastructure is still a challenge, leading to congestion and pollution in large cities. This may spur demand for shared vehicle services as well as public transport.

Two decades ago, a popular slogan in India's vehicle market was "small is beautiful." The outside world's view was encapsulated by decidedly developing-world mini cars. This relegated India to the status of an economy-car market.

Today, more than 40% of Indian light-vehicle sales are SUVs, reflecting consumer preferences for larger and more spacious rides. An increase in national highway construction has accelerated this trend.



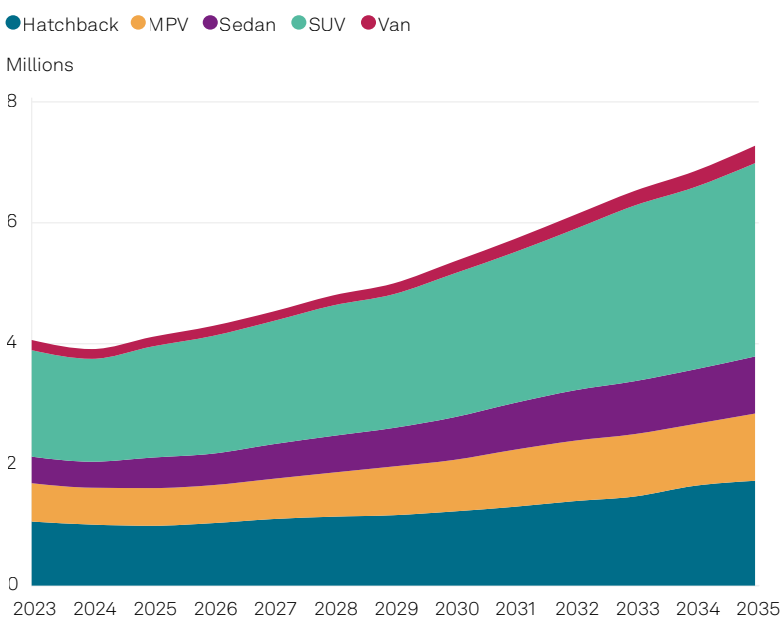
India Body Type Development From 2015 to 2023



Data compiled June 19, 2023.
Data includes cars and light commercial vehicles <6 metric tons.
Source: S&P Global Mobility.

Indian light-vehicle sales, comprising cars and light commercial vehicles, will grow to 6.1 million units in 2030 from 4.4 million units in 2022, according to an S&P Global Mobility forecast. SUVs will surpass 50% of demand. The nation has already passed Japan to become the third-largest vehicle market globally. It is also the largest two- and three-wheeled automobile producer and the second-largest bus maker.

SUVs To Reach Half of Indian Auto Sales



Data compiled June 19, 2023.
Data includes cars and light commercial vehicles <6 metric tons.
Source: S&P Global Mobility.

Continued industry growth will be challenged by infrastructure hurdles, particularly within cities. This will make personal mobility far more important than individual car ownership.

Urban Infrastructure Challenges

Existing congestion in big Indian cities shows how urban infrastructure may limit the auto industry's growth. Today, there are more than 100 registered vehicles per kilometer of road in many big Indian cities. This often leads to gridlock and protracted journey times even for shorter trips.

Traffic jams also cause pollution, which is another deterrent against further private vehicle ownership. Forty of the world's 100 most-polluted cities are in India, with Delhi ranked as the worst, according to air-quality monitoring company IQAir. A scrappage scheme may help to eliminate old fuel-guzzling, high-emission vehicles.

Pollution and congestion could spur demand for public transportation in India. The nation has about 2 million buses on the road. Still, this is only about 1.2 per 1,000 people, which is notably less than in developed markets. This does provide massive headroom for growth. Presently, many states have started switching to e-buses and adopting a public-private partnership model, where the government pays bus operators per kilometer of service. E-buses will rise to 9% of the total bus fleet by 2026 and to 30% by 2030, according to S&P Global Mobility.

Sales of commercial vehicles will also likely increase as economic growth stokes goods shipments and infrastructure development. India's GDP will expand 6.7% per year from fiscal 2024 to fiscal 2031, reaching $6.7 trillion, according to an S&P Global forecast.

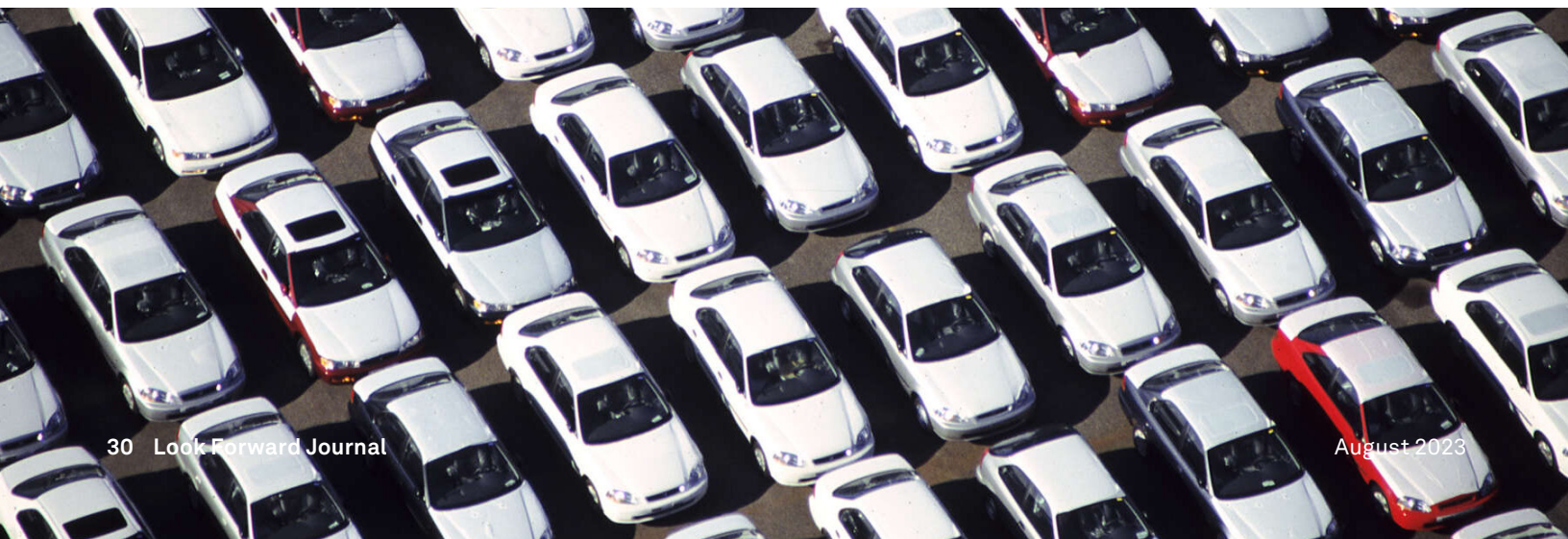
The pandemic and subsequent lockdowns also spurred the use of vehicles for hyperlocal deliveries, with goods being brought to consumers instead of the other way around. The associated rise of e-commerce and startups will likely fuel sales growth for two-wheelers and light commercial vehicles in coming decades.

Continued industry growth will be challenged by infrastructure hurdles, particularly within cities. This will make personal mobility far more important than individual car ownership.

Where Cars Play a Role

The automotive industry is a key contributor to the Indian growth story as it generates almost 7% of GDP and provides a livelihood to more than 40 million households spread evenly across the nation. The industry is also adapting to growing urbanization, rising aspirations, higher incomes and stricter regulations.

The average price of a car has more than doubled in India over the past decade to 1,150,000 Indian rupees (about $14,000) from 450,000 Indian rupees. This is an opportunity for global carmakers, as it reflects Indian drivers' willingness to pay up for feature-loaded and robust vehicles that offer safety and security. Still, cars will continue to be overshadowed by two-wheelers in terms of units. The two-wheeler market will reach 27 million units in 2030, more than four times the size of the light-vehicle market, according to S&P Global Mobility. Half of these two-wheelers are likely to be battery-electric.



The industry is adapting to growing urbanization, rising aspirations, higher incomes and stricter regulations.

We predict that shared mobility, such as ride-hailing services and car-sharing platforms, will gain further traction in India. Car subscription services — where consumers pay a monthly fee for access to a vehicle — are also gaining popularity. These developments reflect a focus on cost-effective and convenient transportation, along with changing consumer preferences. Indian millennials and Gen Z consumers are less interested than Gen X and baby boomers in owning a car. The shift toward shared mobility will help to increase vehicle utilization, which is extremely low. On average, cars are in use less than 5% of the time in India.

India's Power Mix

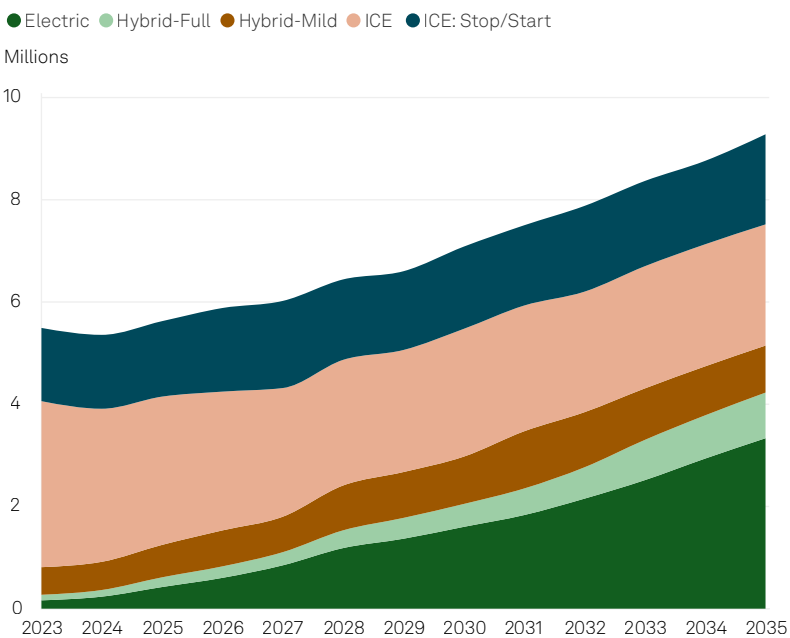
In the medium term, India will likely adopt a range of power technologies for vehicles due to each state having its own unique set of challenges. Different states will need different solutions, possibly including smart cities, reskilling, digitization and tweaking the models offered by carmakers in various parts of the country. A wide variety of technologies will also likely serve the diverse needs of customers all over India, such as internal combustion engines (ICEs), compressed natural gas, electricity, hydrogen, flex fuels and biofuels.

The auto industry is already taking advantage of greater electrification in India. Original equipment manufacturers, parts suppliers, fuel-filling companies, the government, testing agencies and others are working toward a common goal of supplying greener transportation. Stakeholders across the sector are stretching themselves and adopting innovative technologies at an ever-quicker pace. The government is proactively working to reduce pollution and cut energy imports by promoting greener mobility and technologies.

Decarbonization Ambitions

Over the longer term, green hydrogen may emerge as India's main alternative fuel for mobility. A few Indian players are already engaging in the government's $2.1 billion Production-Linked Incentive scheme for hydrogen. This may eventually help the technology scale and deliver on India's decarbonization objectives. The country has pledged to reach net-zero emissions by 2070. Some conglomerates aim to achieve that goal in India by 2037.

India's Changing Vehicle Mix



Data compiled June 19, 2023.
ICE = internal combustion engine.
Data includes cars and light commercial vehicles <6 metric tons.
Source: S&P Global Mobility.

Looking Forward: The Four I's of Mobility

India's mobility sector is poised for growth, building on four I's: infrastructure, innovation, investment and inclusiveness.

Infrastructure: There is massive development in road infrastructure, which is changing the landscape of the country. Digital infrastructure is also spurring growth, especially in rural areas.

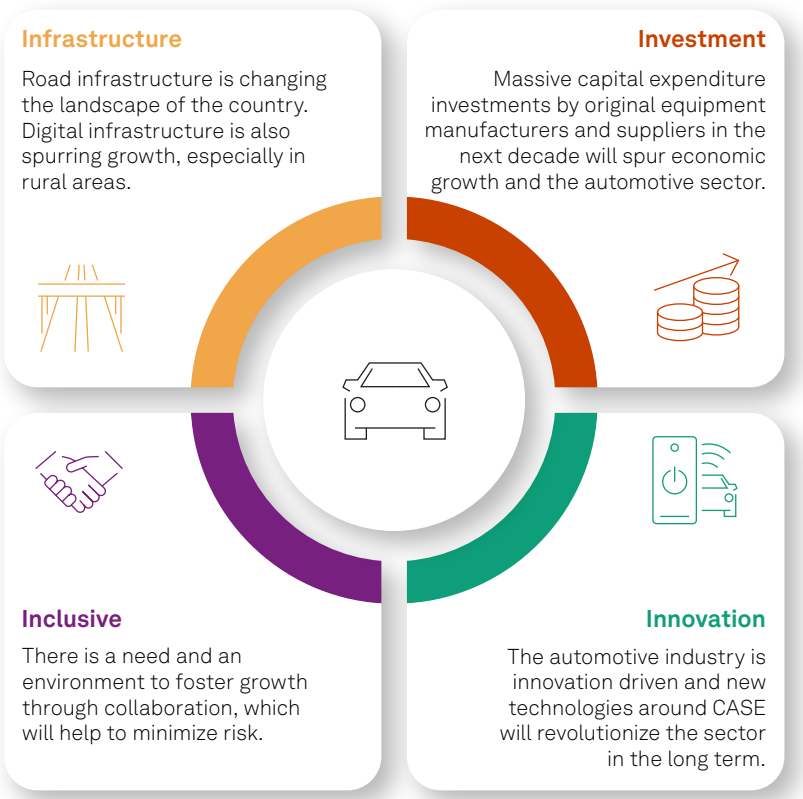
Innovation and technology: Globally, the auto industry is seeing a "race for CASE," meaning connected, autonomous, shared and electric. In India, connected, shared and electric are likely to predominate. Autonomous vehicles may be limited to nonpublic areas, such as college campuses or large corporate facilities.

A key innovation goal for Indian carmakers is developing battery-electric vehicle technologies that are affordable for the local market. Core and peripheral EV infrastructure will also have to be built. Still, once the technology becomes cost effective, Indian drivers will see EVs as a viable alternative to conventional ICE technology.

Investment: Car manufacturers and suppliers are set to spend more than $15 billion on capital expenditure in India through 2030. This is to meet consumer demand and develop new technologies.

Inclusive growth: Mobility depends on an ecosystem. Carmakers, parts suppliers, fuel-filling companies, energy providers and the government must all collaborate on common platforms to provide affordable and efficient mobility solutions.

The I's Defining India's Mobility Future



India's mobility sector is on the cusp of a major transformation. Consumer aspirations are spurring a shift in vehicle sales toward SUVs, while environmental concerns are helping to fuel demand for alternative propulsion systems.

Elsewhere, shared mobility will play an important role for effective utilization of vehicles, and better public transportation may ease congestion and pollution.

Still, the mobility of 1.4 billion people needs to be transformed around the four I's to realize a greener future. This change must be made gradually, and it will require infrastructure developments and technological advancements to make future mobility accessible to all. ■

Learn more

Electrification technology in reshaped supply chains for ubiquitous EVs

A revolutionary road

Autos and Sustainability: From Compliance to Leadership

Q&A

Sunita Narain

Director General, Centre for Science and Environment

What is your vision for sustainable mobility in India?

We know mobility is key for economic growth and livelihood security, particularly in our urban areas, where work and home are distant. My vision is a mobility system that is affordable and accessible for all, yet modern, convenient and clean. Let me explain why I say this. Currently, as per official data, the bulk of people in our cities do not drive personal vehicles; less than 15%-20% on average commute by personal car. Yet personal cars take up the bulk of our road space, and, like other cities in the world, we are struggling to build more highways and fight the battle of the bulge. A city like Delhi has over 25% of its land area under road infrastructure, 90% of which caters to the 15%-20% of the commuting population that travels in personal vehicles. The bulk of people in cities still walk, cycle or take the bus, or now the metro — this is where the huge opportunity is. We need to envision and reengineer our cities so that people can use public transport that is massively augmented and available to all. Most importantly, for public transport to work, we need last-mile connectivity. People cannot take a bus or metro if they cannot walk or cross the road — our cities need to be redesigned not for the ease of moving vehicles but moving people.

What is the link between mobility and sustainability in India?

We face a challenge of toxic air pollution, which is endangering our health. The key contributors to pollution are vehicles in our cities and the use of unclean fuel for energy. This is in spite of the huge efforts made by the government to introduce clean fuel and vehicle emission standards. The fact is we have a large fleet of older vehicles, and as we introduce newer, cleaner variants of fuels, the sheer number of older vehicles on the road negates the impact of cleaner fuels. Congestion on roads adds to pollution as well.

We also know that transport-related emissions are a key contributor to greenhouse gas emissions. So, as India moves to transforming its mobility systems, it will improve air quality in our cities as well as decarbonize our transport sector. It is a clear opportunity for co-benefit. This is particularly important as we can see that with only 15%-20% of people driving, the airshed is polluted. We literally do not have the space for the remaining 80% of people to drive personal vehicles, which will then contribute to emissions. Like the issue of climate justice in our world, this needs policies deliberately designed to cater to the growing needs of people, and, in this case, it means building mobility systems of the future that are suitable for all.

Does electric mobility play a role in this transformation in India?

Indeed it does, but not in the way the rest of the world is approaching electric mobility. The focus on e-mobility for private transport is not a game changer in a fast-warming world. This is particularly because there are constraints on minerals and the management of batteries and other issues when it comes to e-vehicles. The Indian government has recognized this, and its programs have incentivized e-buses and paratransit vehicles like three-wheelers. This means that we are investing in e-vehicles for the transport for the majority — over 15,000 e-buses will soon be on roads in key cities in the country. The Ministry of Housing and Urban Affairs is providing guidance to cities to invest in public transport. This now needs to be augmented and interconnected to intra- and intercity mass transport systems, including fast-track railways and metro-rail systems. This electrification of transport systems will help to clean local air. This is a huge opportunity for our cities. ■

‘Make In India’ Manufacturing Push Hinges on Logistics Investments

A strong logistics framework will be key to transforming India from a services-dominated economy into a manufacturing-dominant one.

Highlights

India has an immense opportunity to increase its share of global manufacturing exports, and the government is seeking to raise manufacturing to 25% of GDP from 17.7% by 2025.

Developing a strong logistics framework will be key to transforming India from a services-dominated economy into a manufacturing-dominant one, particularly enhancements in intermodal connectivity and heavy investments in ports and shipping capacity.

Accelerated investments should aid India’s ambition; a boom in Indian mobile phone production provides a template for future policies in other sectors.

Rahul Kapoor
Vice President, Global Head of Shipping Analytics & Research, S&P Global Commodity Insights
rahul.kapoor@spglobal.com

Chris Rogers
Head of Supply Chain Research, S&P Global Market Intelligence
chris.rogers@spglobal.com

India stands on the cusp of a massive opportunity to increase its share of global manufacturing exports. Corporate manufacturing giants are looking for alternative production and sourcing destinations to accelerate supply chain diversification. India should benefit from these positive tailwinds, aided by significant milestones already achieved in its domestic and export logistics framework as well as by projects now underway. The telecom sector provides a case study for the delivery of the Modi administration’s “Make in India, Make for the World” policies. Global smartphone manufacturers are setting up shop in India after years of patient government intervention via targeted trade policies focused on phones and components.

Successive Indian governments have emphasized policies promoting domestic manufacturing to reduce India’s import dependence and to increase its share of global exports. The current administration’s focus on “Make in India, Make for the World” encourages investments in manufacturing, especially through Production-Linked Incentive (PLI) schemes. First introduced in 2020 for electronics makers, PLIs provide incentives to domestic and foreign companies that invest in Indian manufacturing and meet predetermined output targets.

India’s policy landscape is often disparate, spanning multiple states with independent reform agendas. Approaching reform at a national level through platforms like PLIs can allow the central government to circumvent state-level differences.

Effective uptake of these schemes will be crucial as India seeks to increase manufacturing to 25% of GDP by the year ending March 2025. It was 17.7% last fiscal year, according to S&P Global Market Intelligence.

Policies in complementary sectors — especially logistics — will be key to meeting the government's goal of transforming India from a services-dominated economy into a manufacturing-dominant one. Sophisticated logistics could give India a competitive advantage over other countries vying for inbound investment.

Accelerated Investments Should Aid India's Global Manufacturing Ambitions

India's ability to compete internationally against other manufacturing exporters will be enhanced by its two-pronged approach to logistics. This is focused on improving intermodal connectivity and on heavy investment in ports and shipping capacity.

Capital-intensive infrastructure projects would also be supported by the government's strong digitalization efforts. Existing frameworks such as the National Logistics Policy (NLP) could help to build a technology-enabled, integrated, cost-effective and dependable logistics ecosystem.

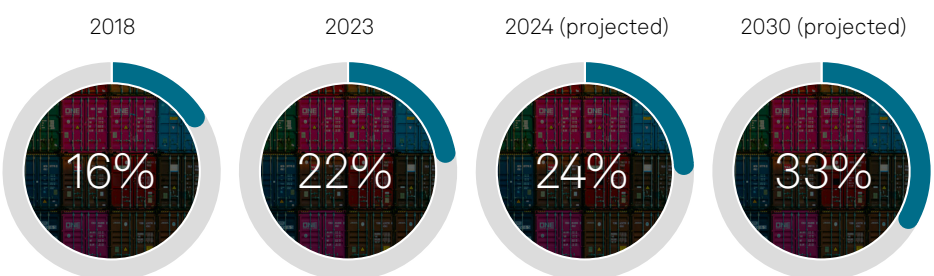
Digital and infrastructure initiatives have already helped India to rise six spots since 2018 in the World Bank's Logistics Performance Index (LPI), to rank 38th out of 139 countries in 2023. The country has significantly improved its score in four of the six LPI indicators (infrastructure, international shipments, logistics quality and competence, and timeliness), which bodes well for the future.

A key variable affecting India's manufacturing potential is cost competitiveness in logistics. Costs are about 14% to 18% of GDP, according to the country's full-year 2022–23 Economic Survey. The government aims to lower these costs to below 10% to be more in line with major Asian exporters.

Improving road and rail connectivity will help to cut logistics costs. There is already a noticeable acceleration in national highway building, with the government expecting construction to reach 33 km/day in fiscal year 2024, almost double the 17 km/day achieved in fiscal year 2016. The share of containers being shipped by rail is also rising: It is forecast to hit 23.5% in fiscal year 2024 and 33% in fiscal year 2030, according to the government.

Moving a Third of Containers on Rail Should Lessen the Burden on India's Road Infrastructure and Significantly Increase Logistics Efficiency

Containers, EXIM, rails (%)



Data compiled March 30, 2023.
EXIM = export-import.
Sources: Ministry of Railways; Ministry of Shipping; CRISIL.

Ports Need Investment to Boost India's Cargo Capacity and Throughput

Increasing India's manufacturing exports in a cost-competitive and efficient manner will require improvements in logistics. The country has geographical advantages including a long coastline of more than 7,500 km and proximity to shipping traffic transiting the Indian Ocean.

Looking Forward

India lags Japan, South Korea and mainland China in export infrastructure and efficiency, particularly in terms of port capacity. To narrow this infrastructure gap and to become the global manufacturing destination of choice, India will need massive upgrades covering areas such as rail, ports and freight corridors.

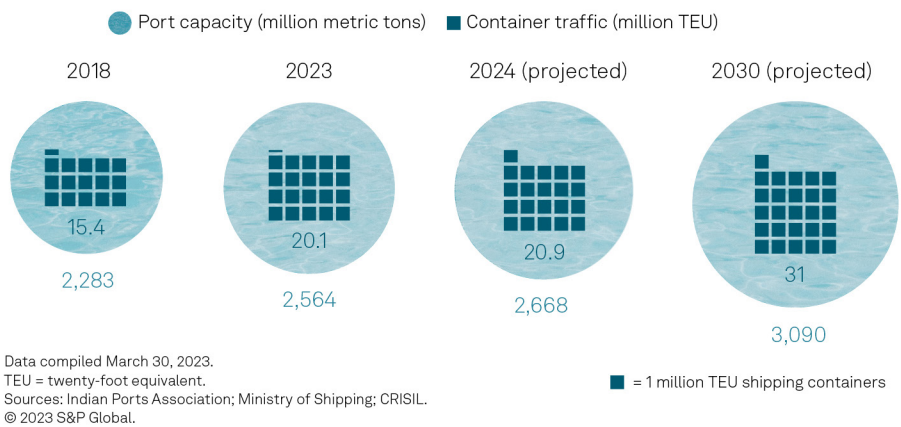
India needs to reduce its reliance on transshipments via hubs such as Singapore and Hong Kong to help manufacturers avoid potentially lengthy transit times. This means adding efficient high-capacity ports that can handle the largest container ships or incentivizing operators to introduce direct services to major markets. It will also entail strengthening links with global container carriers and freight forwarders.

India has an opportunity to increase its share of global container shipments and bulk commodities, even if North Asia will likely continue to be the driver of global container volumes, according to S&P Global's Global Trade Analytics suite. Accelerating port infrastructure development will be key to achieving this goal.

Port capacity and container throughput have experienced robust growth in India over the last five years. Looking forward, capacity will have a compound annual growth rate of 2.7% in 2023–30, with container traffic achieving 6.5%, based on estimates from CRISIL, an S&P Global company. This is growth from a low base, and a key question is how India facilitates significantly more port investments and higher growth rates in support of its bid to become an export powerhouse.

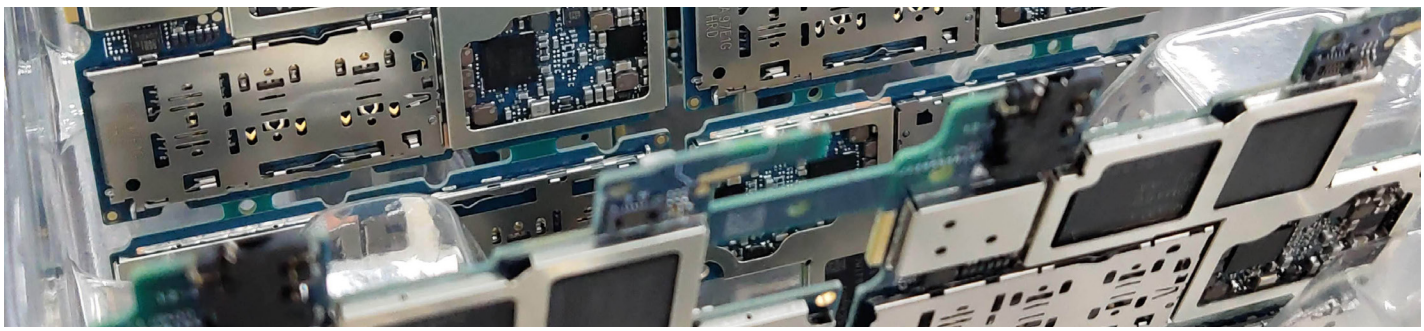
Successfully emerging as a global manufacturing hub is central to achieving India's domestic growth target and geopolitical ambitions. The path to achieving this goes via the government's ability to design and build a world-class logistics system, encompassing domestic road and rail networks, as well as international shipping services.

Indian Port Expansion Offers Chance To Build Capacity for Biggest Container Ships



Data compiled March 30, 2023.
TEU = twenty-foot equivalent.
Sources: Indian Ports Association; Ministry of Shipping; CRISIL.

Smartphones Show Potential for Electronics Manufacturing



Getting the logistics framework right should facilitate growth in sectors earmarked for exports, especially high-strategic areas like electronics that require tightly integrated supply chains. Electronics makers also generally rely on airfreight, which means the sector is less affected by India's existing seaport constraints.

India's policy interventions in the smartphone sector illustrate its ambitions for manufacturing as a conduit to service the domestic market as well as its geopolitical aims. Smartphones are among the most sophisticated manufactured products, and their ubiquity makes them a logical target for any country looking to extend its economic development. The arrival of Apple contractors as major players in Indian mobile phone production shines a light on the nation's success so far and on its opportunities for future growth.

Evolution in India's Domestic Market

Reshoring of telecom manufacturing is a competitive field, with India facing significant competition as multinationals look to expand their operations. However, India's large domestic market gives it an advantage, especially over Southeast Asian countries.

A revolution in India's telecom services has helped to make the country one of the world's most digitalized economies. India's next target is to ensure the availability of low-cost mobile phones.

Sales of telecom products in India are projected to reach $18.3 billion — or 1.3% of the global total — in 2027, according to forecasts by S&P Global Market Intelligence. The market is expected to grow 7.3% annually through 2027, outpacing the global average of 6.2%. India's large mobile phone sales make it worthwhile setting up local supply chains serving both domestic and export markets. Major manufacturers that already operate in India include Samsung Electronics and Xiaomi, as well as contract producers for Apple including Wistron and Pegatron.

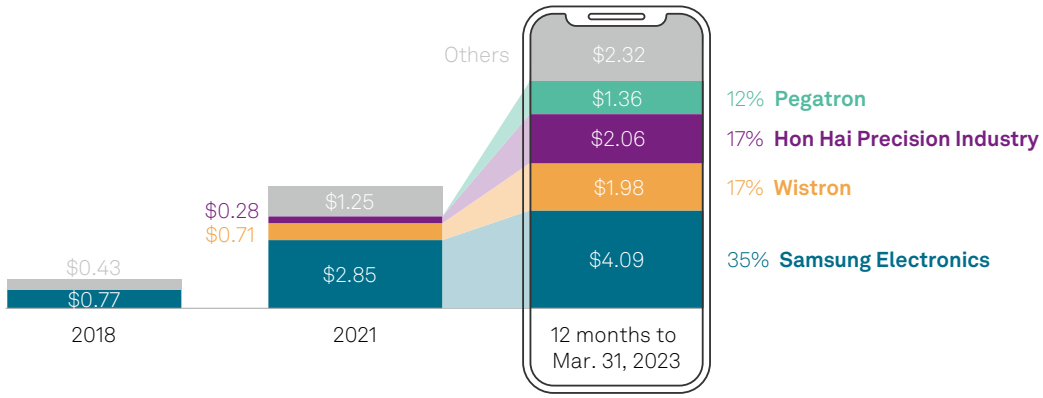
The "Make in India" strategy includes a variety of import restrictions on phones and parts, which offers support to local manufacturers. Domestically produced, low-cost phones may also help bring informal, unregistered businesses into the mainstream economy.

India's Viability as Export Hub

India's export industry for telecom equipment, including smartphones, is rapidly expanding. Exports reached $11.8 billion in the 12 months to March 31, 2023, data from S&P Global Market Intelligence and Panjiva shows. Samsung Electronics led with 35% of exports, followed by contract manufacturers Wistron and Foxconn (Hon Hai Precision Industry) with 17% each.

Four Makers Account for Over 80% of India's Expanding Telecom Exports

Indian exports of smartphones (US$B)



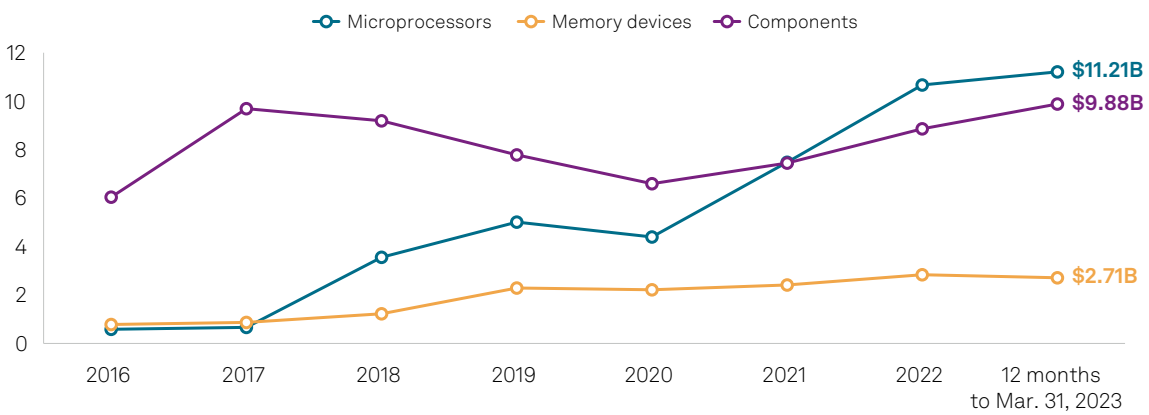
Data compiled May 5, 2023.
Sources: S&P Global Market Intelligence; Panjiva.

To ensure sustainable growth in telecom, public and private sector coordination will be needed to transition beyond only assembling smartphones. This work can always be relocated to lower-cost locations, whereas fully integrated operations are stickier. Such operations would also make India pivotal to the global telecom equipment supply chain.

Replicating the full supply chain back to semiconductors is not necessary. For instance, mainland China and Vietnam both import processors and other chips. India's imports of semiconductors and other parts for telecom and computing devices have tracked steadily upward. Panjiva data shows imports of telecom equipment and computer chips reached $27.4 billion in the 12 months to March 31, 2023, after 12% of compound annual growth since 2017.

Indian Imports of Telecom Components Are Rapidly Expanding

Indian imports of telecom equipment components, electronic integrated circuits (US$B)



Data compiled May 5, 2023.
Sources: S&P Global Market Intelligence; Panjiva.

India has significant opportunities for manufacturing expansion across a range of sectors. Success so far in smartphone supply chains provides a template for future development potential — in terms of both scale and the complex hurdles to be overcome. ■

Learn more

Right place, right time: Supply chain outlook for third quarter 2023

Before the battery and magnet: IRA and mineral supply chains

This article was authored by a cross-section of representatives from S&P Global and in certain circumstances external guest authors. The views expressed are those of the authors and do not necessarily reflect the views or positions of any entities they represent and are not necessarily reflected in the products and services those entities offer. This research is a publication of S&P Global and does not comment on current or future credit ratings or credit rating methodologies.

Future Farming: Agriculture's Role in a More Sustainable India

Agricultural innovation can help India cut emissions, improve energy security and boost farmers' incomes.

Sana Khan
Senior Consultant, Agribusiness Consulting,
S&P Global Commodity Insights
sana.khan@spglobal.com

Swati Mathur
Associate Director, Agribusiness Consulting,
S&P Global Commodity Insights
swati.mathur@spglobal.com

Highlights

India's agriculture sector plays a critical role in the country's bioethanol sector, as well as supporting moves toward food security, energy security and decarbonization goals.

The country has come a long way with bioethanol policies, and it is likely to achieve a 10% ethanol blending target in 2023–24. There will be pressure on agriculture to meet future targets, so innovation will be important.

Participating in biofuel will provide farmers with an opportunity to improve economic efficiency. It will also create competition between food and fuel producers for valuable crops.

Indian agriculture can help the nation tackle three of its biggest challenges — feeding a huge and expanding population, ensuring sufficient energy supplies and curbing emissions. Still, meeting these goals will require a coordinated effort with alignment across policy, investment and agricultural research. Surpassing mainland China as the world's most populous country, according to the UN, has only heightened these challenges, especially as S&P Global Market Intelligence expects India's population to grow further over the coming decade.

The Indian agricultural sector has been a great success story over the past 60 years. After years of import dependency punctuated by severe droughts in the mid-1960s, a series of policy initiatives and technology shifts boosted agriculture production and made India self-sufficient in areas such as wheat, rice, sugar and animal proteins. This "green revolution" demonstrated that Indian farms can achieve dramatic productivity increases with the right policies, technology and investment. Indian agriculture again needs an astute mix of policy, technology and investment to meet the interlinked goals of food security, energy security and decarbonization in the 21st century.

Agriculture again needs an astute mix of policy, technology and investment to meet the interlinked goals of food security, energy security and decarbonization in the 21st century.

Biofuel Targets Can Be a 'Win-Win-Win' for India

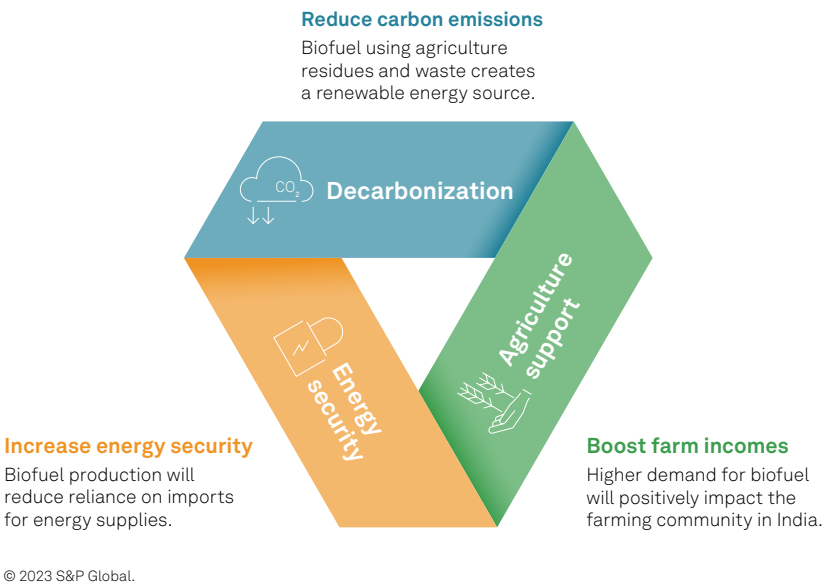
India is the third-largest energy consumer in the world, and its long-standing overreliance on imports poses a long-term challenge to economic growth. The nation gets 85% of its crude oil from overseas, based on a 10-year average of S&P Global data. At the same time, India is home to a large farming population, which the World Bank says generates about 18% of GDP. The biofuel industry is an opportunity to tackle the country's energy challenges and create an extra income stream for farmers. Additionally, India's pledge at the 2021 UN Climate Change Conference (COP26) to cut 1 billion metric tons of carbon emissions by 2030 requires the concerted use of renewable energy sources.

More than 90% of the biofuel produced in India is ethanol, predominately from sugar. India has come a long way with its bioethanol policy, and the nation is likely to achieve a goal of 10% ethanol blending in conventional fuel in 2023–24. Still, further supplies will be needed to meet an ambitious target of hitting 20% ethanol blending (E20) by 2025–26.

India has also moved forward with bioethanol as a sustainable aviation fuel. Many milestones have already been achieved, and the fuel is undergoing commercial trials.

Still, India's wider bioethanol push is being held back by a lack of ethanol distillation capacity and a shortage of feedstock supply. Expanding distillation requires investment, and the government is actively tackling the issue. The feedstock deficit depends on the agriculture sector. Reducing food waste would also help.

India's Interlinked Biofuel Goals

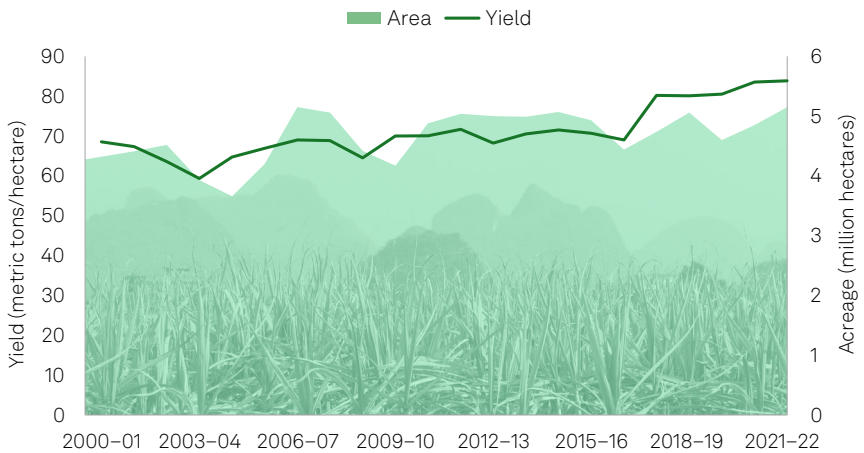


Sugarcane, Rice and Maize: The Trifecta To Meet Ethanol Demand

India's sugar yields have surpassed Brazil's in the last five years, climbing to 80 metric tons/hectare versus the South American nation's 75 metric tons/hectare. New sugarcane varieties and the ongoing adoption of drip irrigation instead of rain-fed irrigation have fueled this improvement. Still, supply isn't sufficient to reach the target of E20 by 2025–26. Increasing the acreage used for water-intensive sugarcane is also problematic, especially after recent droughts.

India has come a long way with its bioethanol policy, and the nation is likely to achieve a goal of 10% ethanol blending in conventional fuel in 2023–24.

India's Sugarcane



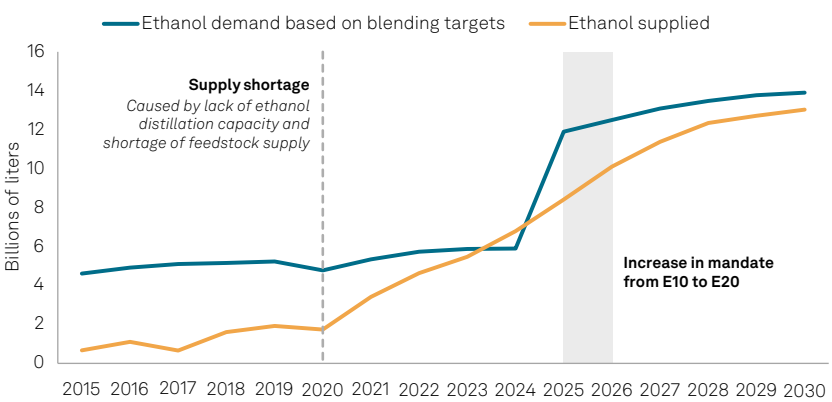
Data compiled July 10, 2023.
Source: Ministry of Agriculture.

The government aims to boost ethanol feedstock with rice and maize, which would utilize the nation's increasing grain-based distillery capacity. Guidelines will be needed for both crops to avoid the "food versus fuel" debate. Maize yields will also have to catch up with those of rice.

Decarbonizing the Economy With Help From Agriculture

Ethanol could generate emission savings in India totaling 68 million metric tons of carbon dioxide equivalent ($MMtCO_2e$) from 2022 to 2030 if the country meets its targets, according to S&P Global calculations. That's equivalent to about 29 billion liters of gasoline, or the emissions generated by 15 million gasoline-powered vehicles per year. Achieving bioethanol targets will enable India to move further toward fulfilling its COP26 pledge to cut 1 billion metric tons of projected carbon emissions by 2030 and reduce the carbon intensity of its economy by 45% versus 2005 levels. Furthermore, turning crop residues into biofuels, instead of just burning them, would prevent as much as 3 billion tons of carbon emissions, according to the UN's Food and Agriculture Organization, while also improving air quality.

Ethanol Demand Based on Blending Mandates vs. Ethanol Supplied



Data compiled May 10, 2023.
E10 = 10% ethanol blending; E20 = 20% ethanol blending.
Source: S&P Global Commodity Insights.

Is Ag-Tech and Waste-to-Fuel the Answer?

Agricultural waste can be turned into a valuable product and renewable energy source. This gives farmers a new income stream, as well as reducing the amount of waste that ends up in landfills and cutting energy costs for consumers. India's government recognizes the large potential of biomass-to-fuel. It amended the National Policy on Biofuels in 2022 to set up second-generation biorefineries that can convert residues into bioethanol.

Waste from just bagasse, wheat straw and corn stover could be enough to surpass India's total E20 requirements, as there is potential for 84 billion liters of ethanol, based on 2025 crop output forecasts. To take advantage of this, India will need significant investment in infrastructure to recover biomasses efficiently and in ag-tech to convert biomass to biofuel through processes such as cellulosic fermentation and gasification.

India's Liquid Fuel Potential From Next-Generation Feedstocks

Liters (billion)

Data compiled May 10, 2023.
Source: S&P Global Commodity Insights.

> Waste from just bagasse, wheat straw and corn stover could be enough to surpass India's total E20 requirements.

Looking Forward

India's ethanol shortfall is an opportunity for local farmers to participate in a booming sector and generate additional income. Sugarcane farmers are already benefiting from government action, including support for higher sugar recoveries. Technology investments and improved yields would add further gains. Grain farmers can similarly benefit as most existing ethanol plants can process sugarcane or grain. Still, any shift to fuel from food would stoke food security concerns. So, what should be expected in India's biofuel sector in the coming decade?

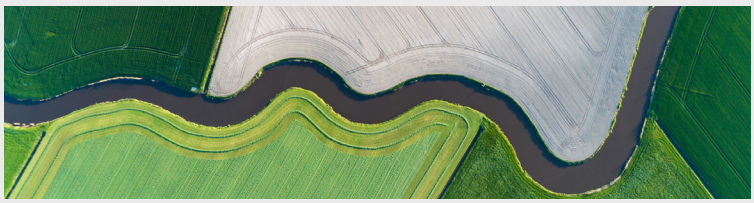
India's adoption of innovative ag-tech and new crop varieties through gene-editing will create a consistent feedstock supply to meet bioethanol targets, leading to energy security, higher farmer incomes and ultimately decarbonization.

Biomass-to-fuel capacity building will surpass domestic demand and make India an exporter of low-carbon biofuel, once the full potential is realized.

Advanced technologies such as alcohol-to-jet can position India's biomass sector as an important supplier of sustainable aviation fuel, thereby tapping into what will be a significant and growing market.

Any program that reduces food waste will free up agriculture production for biofuel and bioenergy purposes, as well as easing concerns about food security.

The right policy, investment and strategy mix will lead to technology solutions that achieve a "win-win-win" situation. ■



Learn more

India's ethanol blending target faces feedstock challenges on its path

Biofuel Feedstock Trade Flows

10 Cleantech Trends in 2023

INDIA CEO SERIES: India's crude strategy a cushion for both global, domestic prices, says Puri

India's energy options and the roadmap ahead

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Unlocking India's Capital Markets Potential

Expanded foreign participation in India's government bond market should free sizable resources to facilitate ambitious development plans.

Jose Perez-Gorozpe
Head of Credit Research, Emerging Markets,
S&P Global Ratings
jose.perez-gorozpe@spglobal.com

Brian Lawson
Senior Consultant,
S&P Global Market Intelligence
brian.lawson@spglobal.com

Angus Lam
Senior Economist,
S&P Global Market Intelligence
angus.lam@spglobal.com

Aries Poon
Head of APAC Insights & Analysis,
S&P Global Market Intelligence
aries.poon@spglobal.com

Highlights

Increased foreign investment in India's public sector will release large-scale resources and sizably increase the capital available for the country's economic growth.

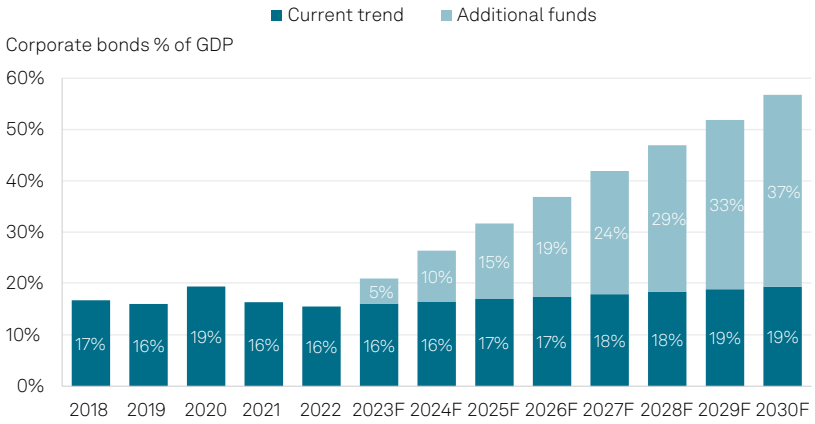
Deeper domestic financial markets will facilitate more efficient allocation of investment funds and better pricing of resources, easing implementation of national privatization, innovation and sustainability agendas.

Whether domestic capital markets can keep pace with India's plans to develop its domestic manufacturing sector, position the country as a major technology producer and improve its infrastructure is questionable. Despite India's sizable economy and its substantial domestic government bond market, the country is excluded from major global government bond debt indexes, so it fails to generate the sizable portfolio inflows associated with inclusion.

If wider index inclusion increases foreign participation in India's government bond market to 10% from the current 0.9% (source: Institute of International Finance), we forecast that funds available for corporate debt issuers in India could almost triple relative to nominal GDP by 2030.

Index Inclusion To Unleash More Funds for India's Corporates

Available funds for corporates could almost triple by 2030 if foreign ownership of Indian government bonds rises to 10%



Data compiled June 9, 2023.
F = forecast.
Sources: Securities and Exchange Board of India; S&P Global Market Intelligence; The Institute of International Finance.

Without foreign participation, India's public sector, including the central government, has funded projects primarily from domestic markets, crowding out resource provision to the private sector. The private sector has therefore capitalized on equity markets.

Index Inclusion Is Highly Likely, Unlocking Portfolio Dynamics

Foreign funds that allocate local currency investments based on major global bond index ratings lack incentive to invest in Indian government debt.

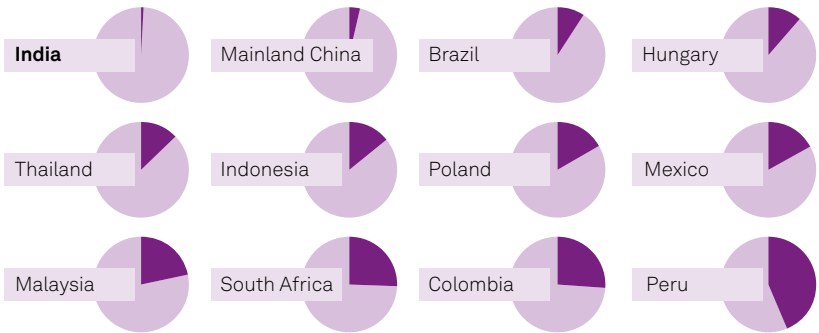
JP Morgan's reference index for global government bonds excluded India in 2022. This was attributed to factors including concerns over the potential inadequacy of domestic bond settlement systems and a perception that investor registration requirements, rules on fund repatriation and India's capital gains tax regime were not aligned with international standards.

Without foreign participation, India's public sector, including the central government, has funded projects primarily from domestic markets, crowding out resource provision to the private sector. The private sector has therefore capitalized on equity markets.

In the following analysis, we consider the impact of wider index inclusion and conclude that the availability of funds for the corporate sector could triple by 2030.

Foreign Ownership of Indian Government Bonds Is Lower Than Major Peers

Foreign investors collectively held less than 1% of outstanding Indian government bonds as of 2022-end.



Data compiled Dec. 31, 2022.
Source: The Institute of International Finance.

Index Inclusion To Lower Borrowing Cost, Free Resources for Private Sector

Higher foreign participation in India's domestic government debt market would increase demand and meaningfully lower the cost of new government debt issuance. It would also free up resources for the private sector. Successful completion of more large-scale domestic corporate offerings would deepen the domestic capital market, providing additional pricing benchmarks and improving liquidity, attracting even greater foreign involvement.

Market estimates suggest inclusion in major bond indexes could attract an initial inflow of US$20 billion-US$40 billion, increasing to US$180 billion over the next decade.

India Likely To Phase Out Capital Controls Gradually, Limiting Scope for Capital Outflows

The liberalization of capital account convertibility is "a process rather than an event," Reserve Bank of India Governor Shaktikanta Das said in November 2020. The suggestion that restrictions on local investors investing abroad will be eased in stages remains the likely trajectory.

Wider Access to Overseas Capital Markets To Broaden India's Funding Sources

Easing rules for Indian companies to raise debt and equity externally and wider sovereign use of major international markets would broaden India's funding sources.

India's Debt Capital Markets: Significant Upside

Data compiled Dec. 31, 2022.
Sources: The Institute of International Finance; Bank for International Settlements; Securities and Exchange Board of India.

Existing laws prohibit direct listing of Indian companies on a foreign stock exchange. Secondary overseas listing is allowed, but there are restrictions on overseas issue size and the amount of paid-up capital. At a sovereign level, India's external borrowing comes mostly from multilateral and bilateral sources, while state governments are not allowed to borrow abroad directly. Plans to raise up to US$10 billion from overseas public debt markets stalled in 2019. India would be well-received if it chose to borrow in US dollars, as demonstrated by past dollar issuance by Indian borrowers.

Tax Reform To Increase Appeal of Domestic Capital Market

Simpler tax structures and greater alignment with international practices would increase the appeal of domestic capital markets.

India applies capital gains tax to profits on government bonds, a major constraint driving its exclusion from global bond indexes. The international norm is to permit payment on sale without withholding.

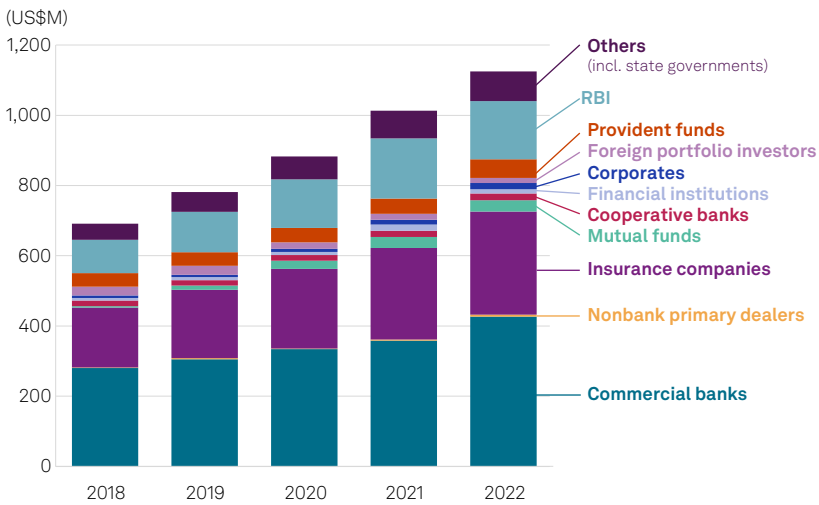
A simpler regime would also reduce tax-based arbitrage between financial products. In the private market, foreign funds and nonresident investors pay a tax on the difference between capital raised and the fair value of securities sold, the so-called angel tax, according to Union Budget 2023. Investors believe that the levy discourages investments by foreign private equity and venture capitalists in India's startups while hindering broader portfolio inflows.

Deeper Capital Market To Boost India's Overall Economic and Financing Capacity

As of 2022-end, commercial banks owned 38.0% of state and government debt securities, while insurance companies held a further 25%, Reserve Bank of India data shows. This implies combined aggregate holdings of 60 trillion Indian rupees. India's central government funding is heavily skewed toward domestic issuance, with just 11% of central government debt externally funded. Investing in government securities is a core business activity for banks, with 27% of assets estimated as held in government securities.

Ownership Pattern of India's Government Securities

Commercial banks and insurers are the biggest holders of India's government bonds



Data compiled Dec. 31, 2022.
Sources: Reserve Bank of India (RBI); S&P Global Market Intelligence.

India applies capital gains tax to profits on government bonds, a major constraint driving its exclusion from global bond indexes.

Wider participation in the equities market improves the exit options and valuations for startups, while attracting more funding from abroad.

S&P Global Market Intelligence's Banking Risk Service forecasts credit expansion growth to average 13% annually from 2023 to 2030 due to fast economic growth and banks strengthening following the recent large-scale bad loan write-off. With more nonbank financial companies likely to convert into banks over the period, greater availability of funds for domestic investment will accelerate credit provision, bringing the credit-to-GDP ratio to 60.7% in 2030, from about 50% in 2022.

Credit expansion is likely to be uneven given how the government assigns its lending. Approximately 40% of loans will go to priority sectors such as agriculture under the prime minister's "money scheme," Pradhan Mantri Jan Dhan Yojana, and to favor small and medium-sized enterprises. Nonetheless, the total stock of bank loans to Corporate India should more than double by 2030.

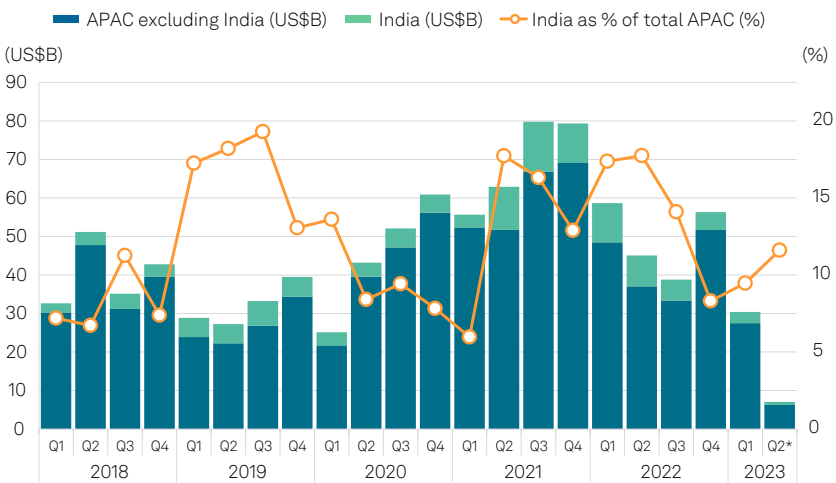
A broader issuer and investor base should also increase financial sector competition and the availability of long-term debt (notably benefiting infrastructure projects). It would also lower interest rates for corporate borrowers while increasing resource allocation to sectors that boost productivity and employment. This may bolster overall investment returns in India and support economic growth, attracting further investment in India.

Deeper Capital Market To Promote Equity-Raising Activity, Privatization of State Assets

Wider participation in the equities market improves the exit options and valuations for startups, while attracting more funding from abroad.

PE/VC-Backed Investments in India and APAC Region, 2018–2023

Private equity activity in India is recovering from a slow 2022, after a record-breaking 2021



Data compiled May 11, 2023.
PE/VC = private equity or venture capital.
* Quarter-to-date through May 11, 2023.
Analysis includes whole-company acquisitions, minority stake acquisitions, asset acquisitions and rounds of funding announced between Jan. 1, 2018, and May 11, 2023, where the transaction geography is in Asia-Pacific and the buyer/investor is or includes a private equity or venture capital firm.
Excludes terminated deals.
Source: S&P Global Market Intelligence.

Few government disposals have been made through capital markets flotations. Greater availability of investment funds — with reduced crowding out by government — would facilitate a more active privatization calendar. Such momentum could also encourage joint ventures with foreign partners providing incremental resources and technologies, implying a further boost to economic efficiency.

Looking Forward

The speed at which India's capital markets catch up with the country's ambitious development plans will in part depend on the government's balancing act between capital controls and financial stability.

These capital controls will be eased only gradually during the period to 2030, while flexibility for Indian financial sector investments abroad will increase. Existing controls on foreign investors are unlikely to be tightened.

There is also scope for regulatory change that widens India's corporate access to overseas capital markets, something that is likely to be gradual and involve ongoing supervision.

This outlook will be balanced against big ticket items on India's domestic agenda. The central and state governments have provided almost 80% of funding for the National Infrastructure Pipeline, which was introduced in 2019 with projects in energy, roads, railways and urban development worth US$1.3 trillion. India will require a further US$50 billion-US$100 billion annually to meet its net-zero target by 2070, according to an estimate by a government parliamentary panel on finance. ■

Learn more

India's global ambitions

India banks' strong performance set to continue

Startups Riding Digital Infrastructure Could Transform Indian Economy

Digital startups in India are drawing investor interest, aided by a public "tech stack" and a positive macro story.

Highlights

India's public digital infrastructure and growing economy have helped to make the country a hotbed for startups. These tailwinds allowed the startup ecosystem to weather a global tech slowdown in 2022, turning India into the fourth-most popular destination for startups worldwide.

Sampath Sharma Nariyanuri, CFA
Fintech Research Analyst,
S&P Global Market Intelligence
sampath.sharma@spglobal.com

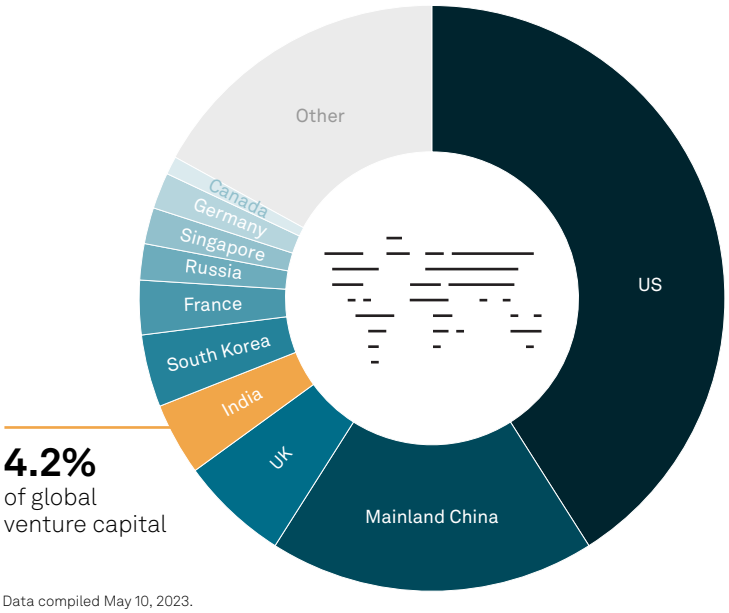
Shankar Krishnamurthy
Head of Essential Tech Center of Excellence & Innovation,
S&P Global
shankar.k@spglobal.com

Startups in India have spawned a multitude of technology-first business models and permeated vast swathes of the economy. Although the global technology market decelerated recently, India's startup ecosystem continues to enjoy tailwinds. As a result, the share of global venture capital flowing into Indian startups may roughly double by 2030.

India emerged as the fourth-most popular destination for startups in the world in 2022, attracting 4.2% of global venture capital, behind the US (41%), mainland China (18%) and the UK (6%), according to S&P Global Market Intelligence. Moreover, Indian startups raised more capital than their listed counterparts did through public issues (IPOs and follow-on equity offerings). A consensual definition of startups is that they are primarily a creation of venture capital, which makes these measures a quantitative way to identify and track the growth of the startup ecosystem.

India in Top 4 Startup Markets

Share of 2022 global startup funding



Data compiled May 10, 2023.
Source: S&P Global Market Intelligence.

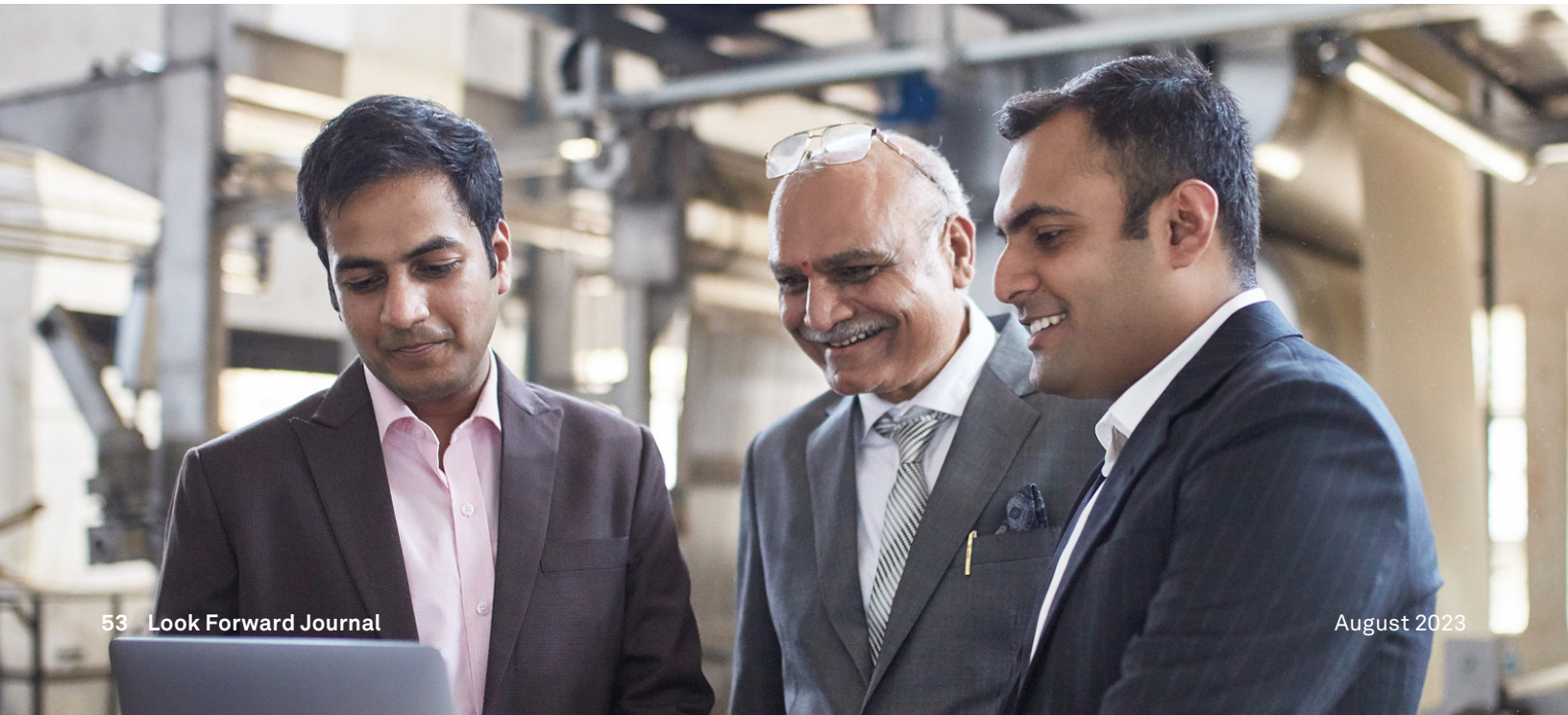
The share of global venture capital flowing into Indian startups may roughly double by 2030.

Doubts may arise about the sustainability of startups in India amid the wider global technology slump. As we look forward to 2030, three critical questions arise:

1) Will venture capital (VC) interest in Indian startups continue?

2) Which startup sectors will be resilient in India?

3) What are the emerging sectors for startups in India?



VC Interest in Indian Startups

Despite the global slowdown in VC activity for startups, we expect India to be resilient for two reasons.

India's huge economy means that it offers a significant runway for expansion, an essential filter for VCs scouting for high-growth startups. The country is home to some 1.4 billion people, and it is on course to become the world's third-largest economy by 2030, according to S&P Global Market Intelligence.

Startups in India can also leverage the growing digital market, fueled by the expansion of mobile internet and the availability of the government-backed digital stack as a public utility.

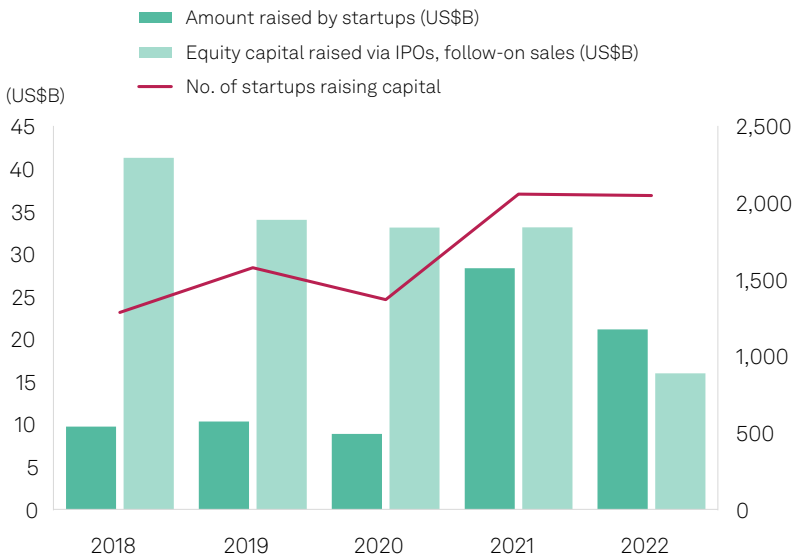
Reliance Industries Ltd.'s rollout of Jio in late 2016 significantly expanded mobile internet services across the country. Consequently, 4G rose to 63.1% of total mobile subscriptions in 2021 from just 0.7% in 2015, according to 4G penetration rate estimates by Kagan, a part of S&P Global Market Intelligence.

The digital stack links Indians to digital identities, payments and bank accounts. Alongside widespread access to mobile internet services, it has enabled digital-native businesses to target millions of consumers. Government policies around funding, incubation and protection of intellectual rights have also helped to foster a startup community.

The country saw a record 26,542 startup registrations in 2022, even amid a global funding slowdown. India had more than 92,000 startups recognized by the Department for Promotion of Industry and Internal Trade (DPIIT) as of Feb. 28, 2023. Young startups looking to get off the ground may face fewer challenges raising money amid the global VC slowdown, helped by low funding requirements and high potential. By contrast, VC investors may shy away from mature startups seeking much bigger amounts of cash.

Startup Funding Versus Public Equity Issuances

Startup funding surpassed amount raised by public companies in 2022



Data compiled May 10, 2023.
Source: S&P Global Market Intelligence.

Young startups looking to get off the ground may face fewer challenges raising money amid the global VC slowdown, helped by low funding requirements and high potential.

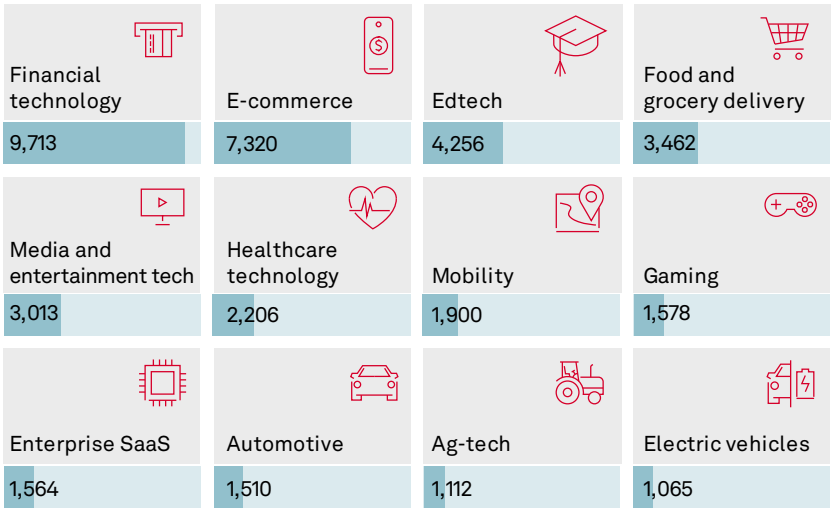
Resilient Sectors for Startups

The financial technology sector has topped the funding charts in India in recent years, attracting a cumulative $9.7 billion in 2021 and 2022, according to S&P Global Market Intelligence data.

Venture capitalists initially focused on fintechs in the consumer-payment space. This sector is now mature, so attention has turned to other areas. For instance, fintechs are increasingly becoming the de facto distribution platform for banks to sell loans, wealth management products and credit cards to consumers.

Fintech Leads India Startup Investment

Funding received in 2021 and 2022 combined (US$M)



Data compiled May 10, 2023.
SaaS = software as a service.
Source: S&P Global Market Intelligence.

Electric vehicles could benefit from the twin tailwinds of a concerted policy push and surging consumer demand.

The government is seeking to encourage the use of digital financial services by sponsoring API infrastructures that ease consent-based sharing of financial data and help underbanked individuals and small businesses access credit. The Account Aggregator (AA) network and the Open Credit Enablement Network (OCEN), which began operations in July 2020, execute lending workflows online and can be integrated with e-commerce, fintech and marketplace apps.

E-commerce and food-delivery services, the second- and fourth-largest startup segments in India, could benefit from another state-sponsored initiative called Open Network for Digital Commerce (ONDC). This system will bring interoperability across the widely fragmented digital commerce space. For instance, it will let customers of an e-commerce app participating in the network purchase goods from vendors listed on other participating apps. At present, apps are closed-loop networks, meaning that buyers and sellers on one app cannot transact with potential suppliers or customers elsewhere.

India's digital commerce and on-demand services space won more than $10 billion of VC investments over the last two years, primarily driven by a cohort of startups attracting millions of middle-class Indians to their apps.

Other e-commerce formats could now gain greater investor attention. For example, online business-to-business marketplaces in manufacturing and retail raised $2.76 billion in aggregate in the last two years. These have the potential to proliferate further as tech-led, end-to-end integrated supply chain models offer a superior alternative to traditional systems.

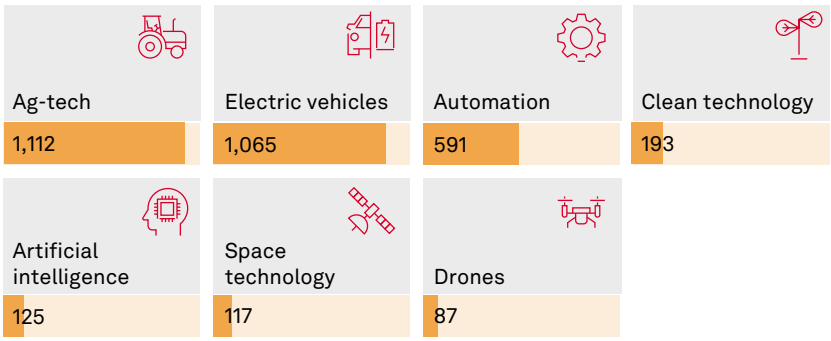
Looking Forward

Several newer verticals for startups could see considerable momentum in the next few years.

Electric vehicles could benefit from the twin tailwinds of a concerted policy push and surging consumer demand. The sector will need about $266 billion of investment this decade to meet government targets, including having EVs account for 30% of private car sales and 70% of commercial vehicles sales by 2030, according to Government of India think tank NITI Aayog and the Rocky Mountain Institute. Venture capitalists will likely account for a significant share of these expected investments. The industry drew $1.5 billion of cumulative VC in India in 2021 and 2022.

India's Emerging Startup Sectors

Funding received in 2021 and 2022 combined (US$M)



Data compiled May 10, 2023.
Source: S&P Global Market Intelligence.

Investors may also favor future-defining segments, including space technology, artificial intelligence, drones, robotics and clean technology. Companies in these sectors constitute a tiny share of India's startup universe, and most are only seeking seed and early-stage investments. Among 91 firms that successfully undertook capital raising in the last two years, only four reached a mature stage, completing a series C or later round of financing.

In the near term, the global funding crunch could compress round sizes for Indian firms in the growth or mature stage. Late-stage businesses may similarly face lower valuation multiples and a greater focus on profitability. Younger firms experimenting with newer technologies and product innovation could defy the downturn.

In the longer run, India's open APIs and public digital stack will likely act as enablers for new startups. The country's positive macro story will also drive demand. The fintech and consumer tech segments will likely get bigger and more sophisticated, while startups in emerging technologies could gain greater traction and investor interest. ■

Learn more

Global fintech funding primed for reset in 2023

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With Physical Climate Risks Increasing in India, Adaptation Strategies Take Priority

Based on analysis of S&P Global environmental, social and governance data, nearly 40% of India-headquartered companies conduct physical risk assessments, and one-third of large Indian companies rate climate strategy as one of their top three material issues.

Jennifer Laidlaw
Senior Writer,
S&P Global Sustainable1
jennifer.laidlaw@spglobal.com

Highlights

A higher percentage of Indian firms compared with firms globally consider climate strategy a material issue, according to S&P Global ESG Scores raw data based on the S&P Global Corporate Sustainability Assessment (CSA).

About one-quarter of major Indian companies have a plan to adapt to the physical impacts of climate change, higher than the global average, according to S&P Global Sustainable1 analysis of 187 companies headquartered in the country and representing 85% of local market capitalization.

Almost all of India's economy and population will be exposed to more frequent extreme heat by 2050, S&P Global Sustainable1 data shows.

In India, as in much of the world, the physical hazards of climate change are becoming more severe and more frequent. The country faces major challenges ahead from increasing heat waves and floods, which will put its economy, businesses and rapidly growing population at risk. Investment will be key to addressing these challenges, and companies will play a major role in providing the financing needed for the country's energy transition.

Companies Have Shortfall in Adaptation Planning

Assessing physical risks and implementing adaptation plans can help companies prepare for the effects of extreme weather events on their business and the broader economy. However, companies globally need to engage in climate adaptation planning to build resilience to these hazards, research from S&P Global Sustainable1 shows. This trend holds true for Indian companies as well.

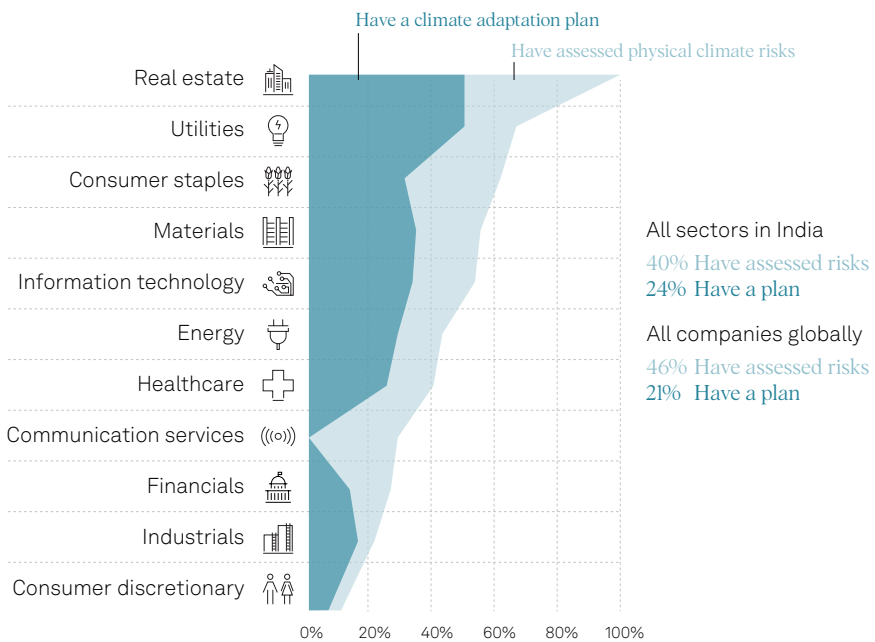
About one-quarter of Indian companies (24%) have a plan to adapt to the physical impacts of climate change, compared with the global average of 21%, according to S&P Global ESG Scores raw data, based on the 2022 S&P Global Corporate Sustainability Assessment (CSA). The universe is based on assessments of 187 companies headquartered in India, representing 85% of the nation's market capitalization. While this is not the only signal of steps taken to mitigate climate risk, an adaptation plan is a key indicator of a company's efforts.

S&P Global defines an adaptation plan as a plan to adapt to any climate risks across a company's value chain that have been identified through a climate risk assessment. These can be specific climate-related mitigation plans included in wider risk assessments or separate climate-specific reports.

Utilities and real estate lead physical risk adaptation planning among the 187 Indian companies covered in the assessment, with 50% of businesses in both sectors having plans. Utilities are heavily reliant on physical infrastructure, which will be increasingly at risk of damage and disruption from storms, flooding and other climate hazards. The built environment accounts for 40% of global emissions. The Indian real estate industry has been taking steps to undertake sustainable projects that are more resilient to climate hazards. Unplanned urbanization and unregulated construction make India more vulnerable to physical hazards such as flooding, according to the World Bank.

Trends in Adaptation Planning in India

Percentage of Indian companies that conduct physical risk assessments and that have a climate adaptation plan



Data compiled May 18, 2023.
Chart based on S&P Global ESG Scores raw data. Results based on responses from 187 companies based in India and 6,266 companies globally assessed in the 2022 S&P Global Corporate Sustainability Assessment.
Source: S&P Global Sustainable1.

Physical Risk Assessments Are the Cornerstone of Adaptation Planning

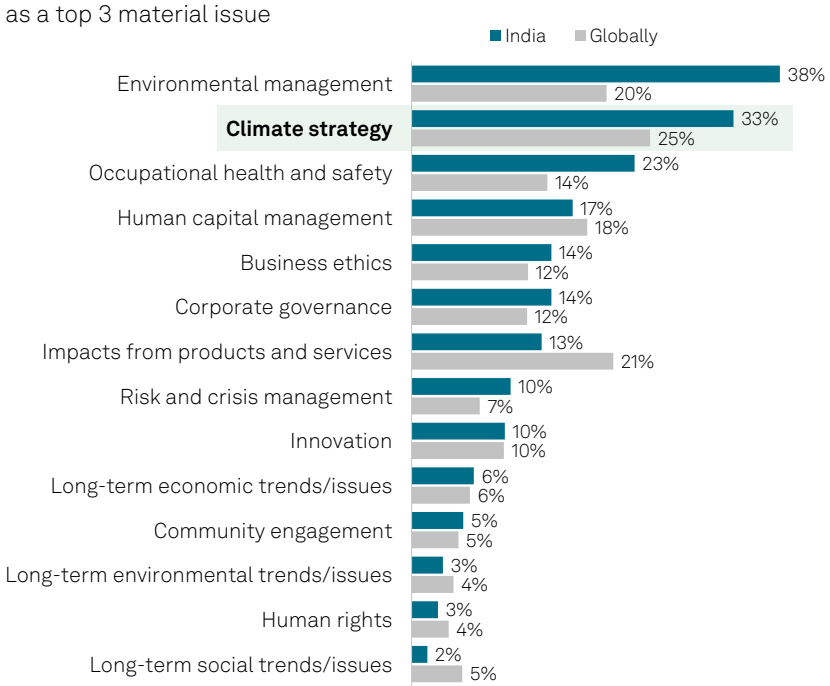
Nearly 40% of India-headquartered companies conduct physical risk assessments, based on analysis of S&P Global environmental, social and governance data. Physical risk assessments form the basis for adaptation plans as they can show how vulnerable an organization might be to hazards such as heat waves or floods. Sectors that carry out physical risk assessments are more likely to implement physical risk adaptation plans. For example, all of the real estate companies in our analysis conduct physical risk assessments, along with about two-thirds of utility companies. These are also the sectors with the highest rates of physical risk adaptation planning.

Among consumer services companies, 28.6% in our analysis carry out physical risk assessments, but at present none have adopted adaptation plans. In consumer discretionary, 13% of companies conduct physical risk assessments and 8.7% have a plan.

While adaptation planning and physical risk assessments are not yet widespread globally, about 33% of large Indian companies in the CSA rate climate strategy as one of their top three material issues. That surpasses the share among the 6,266 companies assessed worldwide and likely reflects the fact that India is already feeling the acute impact of physical risk hazards.

1/3 of Indian Companies Consider Climate Strategy as 1 of Top 3 Material Issues

Percentage of companies in India and globally that chose the following issues as a top 3 material issue



Data compiled May 18, 2023.
Chart based on S&P Global ESG Scores raw data. Results based on responses from 187 companies based in India and 6,266 companies globally assessed in the 2022 S&P Global Corporate Sustainability Assessment.
Source: S&P Global Sustainable1.

Environmental management is one of the top three material issues for 38% of Indian companies in our analysis, compared with about 20% globally. The country contains 14 of the world's 20 most-polluted cities, according to IQAir. Air pollution costs the Indian economy $95 billion per year, or 3% of GDP, consultants Dalberg Advisors, the Clean Air Fund and the Confederation of Indian Industry said in a 2021 report.

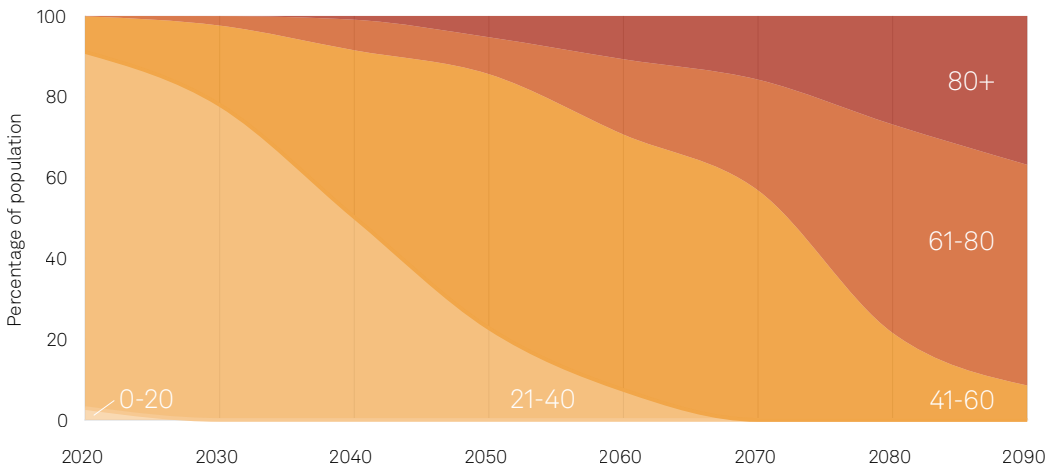
The Economic and Health Impacts of Climate Hazards

The physical hazards of climate change, such as extreme heat, can lead to power outages, increased air pollution and public health issues. This in turn results in severe health risks to the population, lower labor productivity and reduced economic growth. The country has suffered more than 24,000 heat-wave-related deaths since 1992, according to University of Cambridge researchers. The country is likely to have a greater share of its economy exposed to physical risks than peers by 2050 because of high exposure to wildfires, floods, storms and rising sea levels, S&P Global Ratings said in an April 2022 analysis.

S&P Global Sustainable1 uses the UN Intergovernmental Panel on Climate Change (IPCC) climate scenario SSP3-7.0[1] as a conservative representation of business-as-usual in which emissions continue to rise to the end of the century. Under this scenario, emissions are mitigated globally to some extent but continue to rise, resulting in a global average temperature increase of 2.8 degrees C to 4.6 degrees C by 2100. S&P Global Sustainable1 analysis shows that under this scenario 94% of India's GDP and 89% of its population will be exposed to the effects of extreme heat by the end of this century.

Extreme Heat Will Become a Frequent Risk for Much of India's Population

Number of extreme heat days affecting India's population under a business-as-usual climate change scenario



Data compiled May 25, 2023.
"Extreme heat" is modeled based on local historical highs. It is defined as a temperature at or above the 95th percentile for historical maximum temperature in a 25-square-kilometer region. While temperatures vary widely across India, the historical extreme heat threshold is 37 degrees C on average.
The business-as-usual scenario, also known as SSP3-7.0, is characterized by limited mitigation, where total greenhouse gas emissions double by 2100 and global average temperatures rise by 2.8 degrees C to 4.6 degrees C by 2100.
Population data sourced from SEDAC Gridded Population of the World. Licensed under the Creative Commons Attribution 4.0 International License.
Source: S&P Global Sustainable1.

[1] Intergovernmental Panel on Climate Change (2023). Sixth Assessment Report. Available at https://www.ipcc.ch/assessment-report/ar6/.

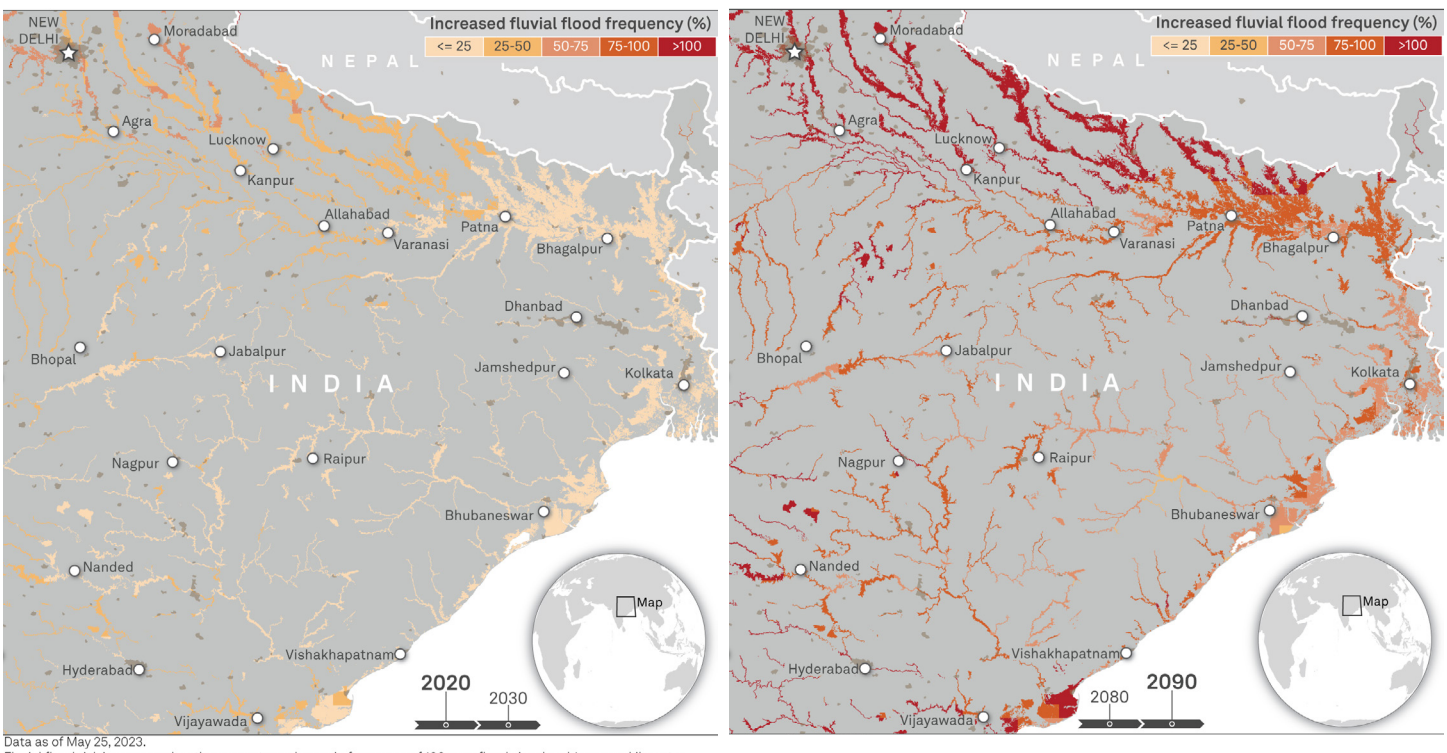
While temperatures vary widely across India, the historical extreme heat threshold is 37 degrees C on average. About 15% of the year 2050, or 54 days, will be hotter than this average, according to S&P Global Sustainable1 data. In New Delhi, the temperature will exceed 40 degrees C for 48 days a year by the 2050s.

India also faces vulnerability from other physical risk hazards such as flooding. Power plants that rely on water could be impacted, along with offices, datacenters, warehouses, agricultural equipment and transportation. S&P Global Sustainable1 data shows that the frequency of severe flooding will increase in many parts of India by the 2090s. A severe flood is typified as a 1-in-100-year event, meaning an event where flood depths reach a level that has only occurred on average once every 100 years in the past. When looking at India, the risk of a flooding event of this severity for some fluvial areas will double, making them 1-in-50-year events by the 2090s.

Intense rainfall during the 2019 monsoon season affected 12 million people, and economic losses were about $10 billion, according to the Reserve Bank of India. The country could face annual average losses of between $132 billion and $224 billion under moderate-to-worst-case climate change scenarios, according to a report by Indian think tank Observer Research Foundation and professional services firm PwC. The country will have to raise funding for adaptation, mitigation and the management of weather-related disasters, with investment between $7.2 trillion and $12.1 trillion by 2050, the Reserve Bank of India estimated.

100-Year River Floods Will Become Much More Likely in Some Heavily Populated Areas

Frequency change of 1-in-100-year fluvial flooding under a business-as-usual climate change scenario



Data as of May 25, 2023.
Fluvial flood risk is measured as the percentage change in frequency of 100-year floods in a local 1-square-kilometer area. A 100% increase would equal a 100-year flood becoming twice as likely, or becoming a 50-year flood.
The business-as-usual scenario, also known as SSP3-7.0, is characterized by limited mitigation, where total greenhouse gas emissions double by 2100 and global average temperatures rise by 2.8 degrees C to 4.6 degrees C by 2100.
Source: S&P Global Sustainable1.

Looking Forward

Globally, the sense of urgency around climate change adaptation is growing. In March 2023, the UN IPCC released a synthesis report warning that the world must act fast to reduce emissions. The IPCC in 2018 found that the world needs to achieve net-zero emissions by 2050 to limit global warming to 1.5 degrees C. India has set a goal of reaching net-zero by 2070. It plans to reduce emissions related to economic output by 45% by 2030, versus 2005 levels.

India has just surpassed mainland China as the world's most-populous nation, and it will have to balance a number of competing priorities: providing access to affordable, reliable and clean energy to its people while mitigating the impacts of climate change. At the same time, India will play a major role internationally for the world to reach net-zero emission goals. *India's Energy Transition* outlines possible strategies and actions India can take to meet these challenges. ■

Learn more

Financed emissions are missing from many firms' net zero plans

Adaptation planning is the next step for companies to prepare for climate risk

How the world's largest companies depend on nature and biodiversity

How global food producers are responding to rising water stress

About the S&P Global Research Council

The S&P Global Research Council includes senior leaders from all our divisions and Sustainable1 who work together to connect our content and expertise across the company to develop actionable insights for markets and establish S&P Global as the premier research leader on key strategic themes.

Council Members have identified the trends and themes that present opportunities and challenges for the company and our customers. The 2023 Key Themes are:

1 Sustainability & Climate
2 Trade, Resources & Supply Chains
3 Geopolitical Shocks
4 Future of Capital Markets
5 Digital Disruption
6 Balancing Energy Security & Energy Transition

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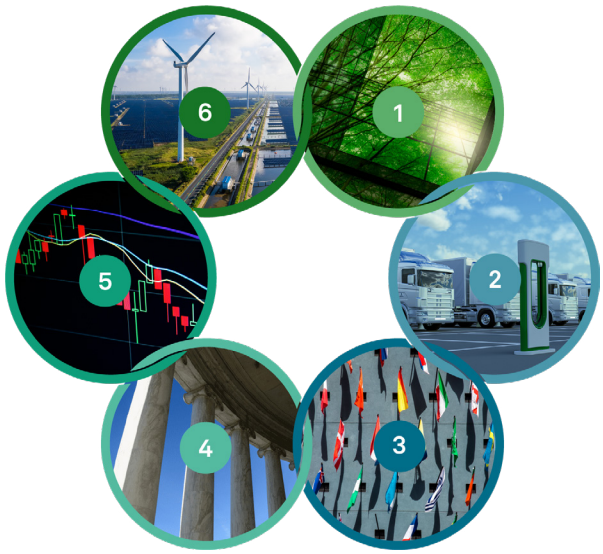
Key Research Themes



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Executive Sponsor, S&P Global Research Council

Martina Cheung
President,
S&P Global Ratings

Co-chair, S&P Global Research Council

Alexandra Dimitrijevic
Global Head of Research & Development,
S&P Global Ratings

Co-lead, Look Forward Journal India and
Co-chair, S&P Global Research Council

Dr. Atul Arya
Chief Energy Strategist,
S&P Global Commodity Insights

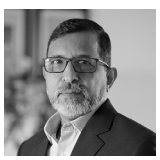
Co-lead, Look Forward Journal India

Dr. Lindsay Newman
Executive Director, Head of Geopolitical Thought Leadership,
S&P Global Market Intelligence

Hana Beckwith
ESG Specialist,
S&P Global Sustainable1

Stuart Bowles
ESG Analyst,
S&P Global Sustainable1

Puneet Gupta
Director (India & ASEAN Automotive Sales Forecast),
S&P Global Mobility



Dharmakirti Joshi
Chief Economist,
CRISIL

Sana Khan
Senior Consultant, Agribusiness Consulting,
S&P Global Commodity Insights

Deepa Kumar
Head of Asia-Pacific Country Risk,
S&P Global Market Intelligence

Angus Lam
Senior Economist,
S&P Global Market Intelligence

Rick Lord
Head of Innovation Methodology,
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Swati Mathur
Associate Director, Agribusiness Consulting,
S&P Global Commodity Insights

Sampath Sharma Nariyanuri, CFA
Fintech Research Analyst,
S&P Global Market Intelligence

Rajiv Biswas
Asia-Pacific Chief Economist,
S&P Global Market Intelligence

Paul Gruenwald
Global Chief Economist,
S&P Global Ratings

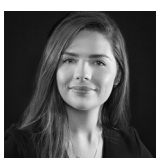
Gauri Jauhar
Executive Director, Energy Transitions and Clean Tech Consulting,
S&P Global Commodity Insights

Rahul Kapoor
Vice President, Global Head of Shipping Analytics and Research,
S&P Global Commodity Insights

Shankar Krishnamurthy
Head of Essential Tech Center of Excellence & Innovation,
S&P Global

Jennifer Laidlaw
Senior Writer,
S&P Global Sustainable1

Brian Lawson
Senior Consultant,
S&P Global Market Intelligence



Sophie Malin
Senior Economist, Pricing and Purchasing,
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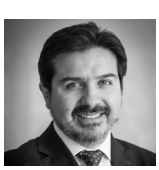

Jose Perez-Gorozpe
Head of Credit Research, Emerging Markets,
S&P Global Ratings

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S&P Global Market Intelligence

Chris Rogers
Head of Supply Chain Research,
S&P Global Market Intelligence

Juan Sacoto
Executive Director, Agribusiness Consulting,
S&P Global Commodity Insights

Tom Scott
Vice President, Agribusiness Consulting,
S&P Global Commodity Insights

Gaurav Sharma
Senior Analyst (Automotive Sales Forecast),
S&P Global Mobility

Ashima Tyagi
Economics Associate Director, Pricing
and Purchasing,
S&P Global Market Intelligence

Aries Poon
Head of APAC Insights & Analysis,
S&P Global Market Intelligence

Annie Sabater
Associate Industry Expert, Central Data,
S&P Global Market Intelligence

Tasnim Safian
Economist, Industry Insights,
S&P Global Market Intelligence

Hafiz Noor Shams
Associate Director, Industry Insights,
S&P Global Market Intelligence

Kuntal Singh
ESG Innovation and Analytics Manager,
S&P Global Sustainable1

Cornis Van der Lugt
ESG Research Senior Manager,
S&P Global Sustainable1

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For media inquiries, please contact Christopher Krantz
christopher.krantz@spglobal.com.