ASIA PACIFIC
FOUNDATION
OF CANADA

INSIDE INDIA

A series on India's new macroeconomic reforms

Introduction

As Prime Minister Trudeau has said, "Canada and India share a special bond." Our relationship is underpinned not only by sharing a common language and a commitment to democracy, but also by the fact that there are more than one million Canadians of Indian origin. This new essay series, which originally appeared on our website as a series of blogs, updates Canadians on some of the key developments underway in this large and complex country and to highlight why they matter to Canada. To that end, over the next five weeks, we will be releasing a series of blogs focused on India's macroeconomic reforms, from the "Make in India" initiative and smart cities to demonetization and India's new goods and services tax.

We are grateful for the assistance and input from our Indian partner, J Sagar and Associates, who provided key insights and guided our analysis.

— Eva Busza, Vice-President
Research and Programs

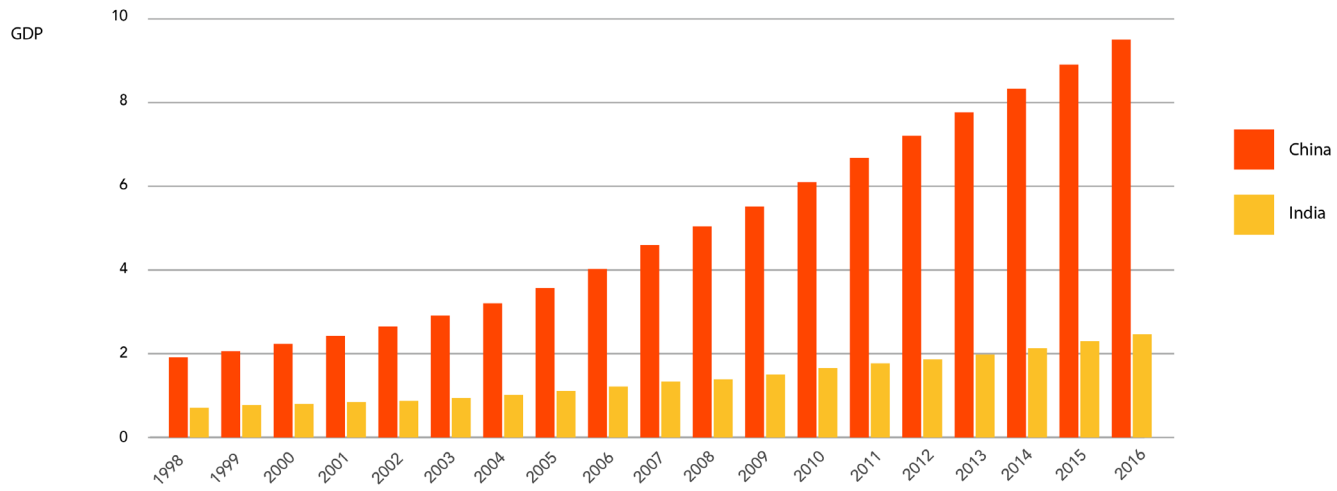
Table of Contents

1 — The Path to Becoming an Economic Juggernaut

By Jonathan Wilkinson

India's economy is at a crossroads. As economic momentum in China declines, The Economist Intelligence Unit predicts that India will be Asia's fastest-growing economy between 2018 and 2022, carving out more influence in and importance to the global economy. World Bank data support that prediction, with gross domestic product (GDP) growth rising from 5.5 per cent in 2012 to 7.1 per cent in 2016. But while its economy may be experiencing robust growth, India still faces many challenges to ensuring that rate of growth can be maintained: demographic demands; energy and environmental concerns; insufficient infrastructure; concern over being left behind in the digital age; and a frenetic economy with high barriers to entry. Once poised to rival China, India's GDP relative to that of its northern neighbour has slid continuously for the past 20 years.

China and India GDP comparison
(constant prices (2010) in US$ trillions)

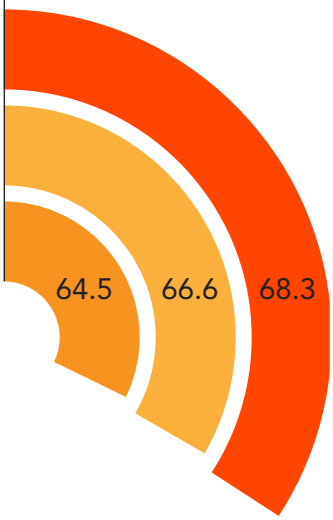


Demographics: Dividend or Curse?

Like other developing economies, India's population has undergone profound change in recent years. World Bank data shows that life expectancy has risen and child mortality and fertility rates have fallen dramatically, and poverty has been halved, from 38.2 per cent in 2004 to 21.2 per cent in 2011. 550 million Indians will be defined as middle class by 2030, according to HSBC.

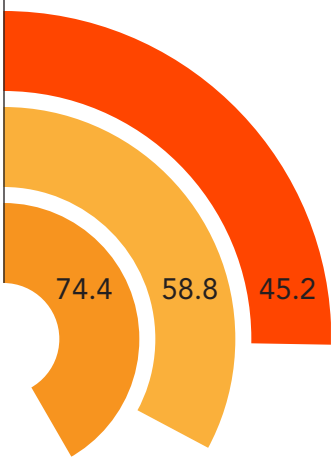
Life expectancy at birth, total

(years)



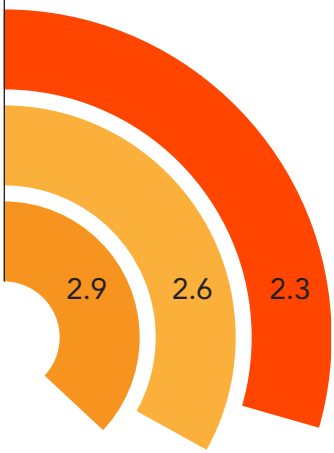
Mortality rate, under-5

(per 1,0000 live births)



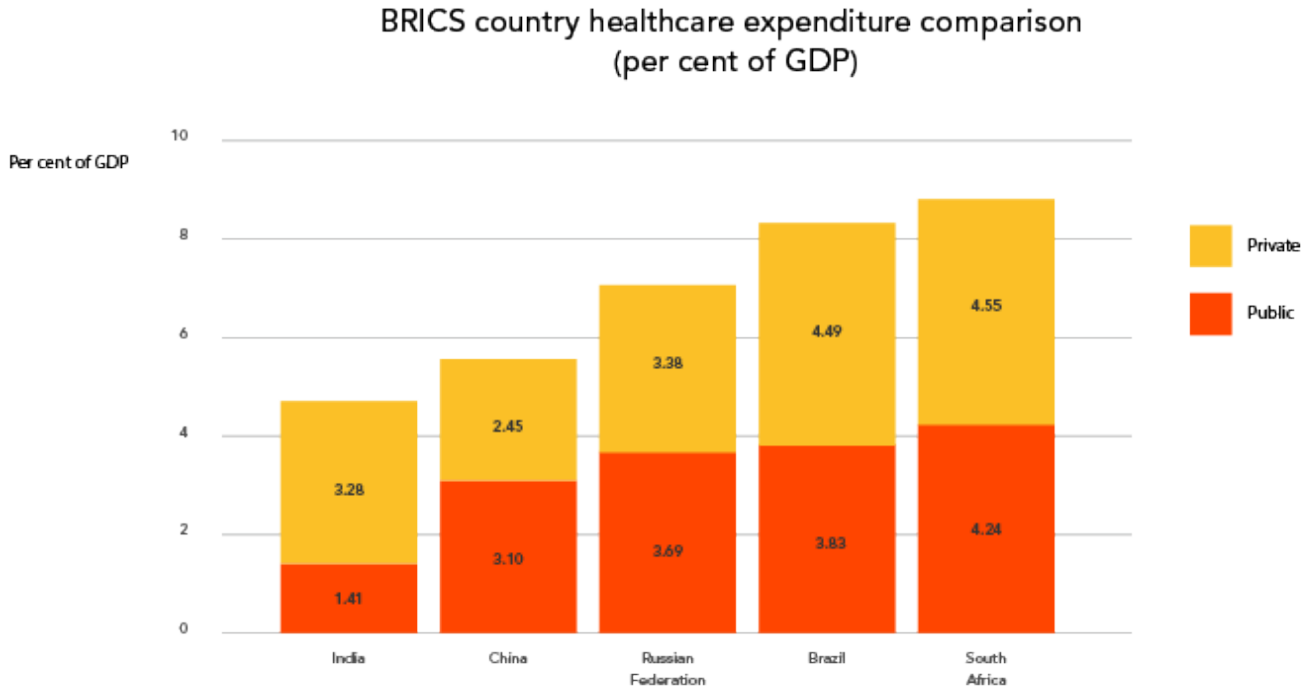
Fertility rate, total

(births per woman)

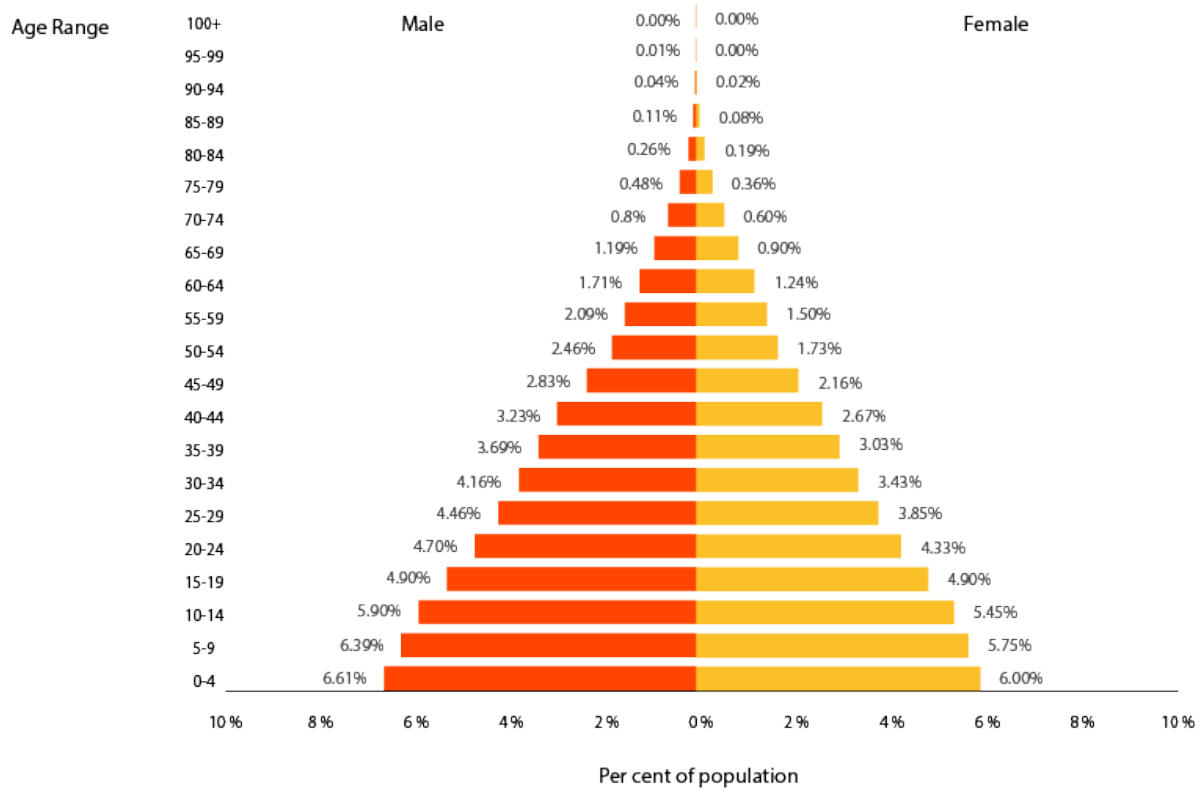


2005 2010 2015

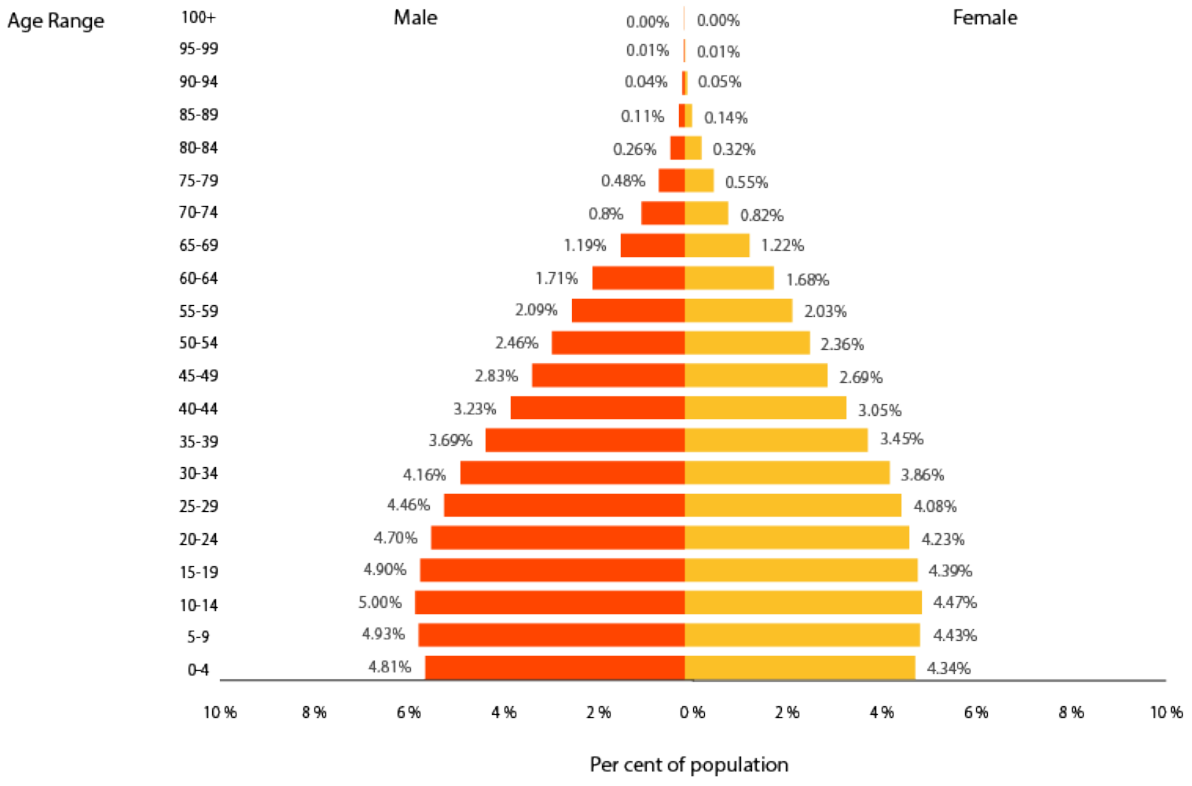
India's healthier and wealthier population is producing a youth bulge that will yield a demographic dividend in the decades to come. But demographic change also presents a challenge. According to the OECD, one million workers are entering the labour force each month, and opportunities need to be provided for them, but one-third of youth are neither employed nor in education or training. The government says that GDP growth will need to reach double digits to support the influx of workers into the economy. India's massive population is also putting pressure on the government to provide adequate social services, but in many sectors, such as health care provision, India lags behind other countries.



India's Population, 1997
(per cent of population)



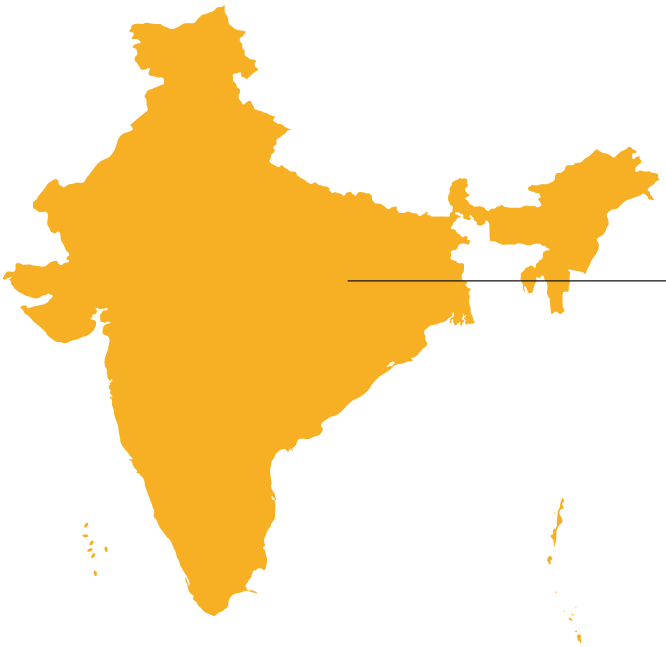
India's Population,2017
(per cent of population)



Satiating Energy Demand in the Face of Environmental Challenges

India will need to meet its rising energy demands if it is to reach its economic growth targets and satisfy the needs of its population. Consumption has more than doubled since 2000, and though incidents such as the blackout that afflicted 600 million people in July 2012 are now rare incidents, 240 million people remain without access to electricity. India is expected to account for a quarter of the rise in global energy demand to 2040 – more than any other country.[1]

Coal has long been the backbone of India's electricity-generating infrastructure, and currently accounts for 70 per cent of generation capacity. The damaging impact of India's dependency on coal is demonstrable – 11 of the 20 most polluted cities in the world are in India. To meet demand while combating health and climate change concerns, India has embarked on a bold plan to expand capacity with renewable energy. India wants to install 175 gigawatts of renewable energy by 2022, up from 37 gigawatts in 2015. But electricity distribution companies are in a precarious financial situation and India's energy regulatory structure is arcane.



India

expected to account for a quarter of the rise in global energy demand to 2040 – more than any other country.

[1] *India Energy Outlook*. International Energy Agency, 2015.

Bridging the Infrastructure Gap

India's infrastructure has long been considered rickety, inefficient, and unreliable. The rail network handles about eight billion passengers a year, but has barely expanded since India gained independence in 1947.[2] India also has one of the largest road networks in the world, but highways account for less than two per cent of the network.[3] One study by the Indian Institute of Technology Madras estimated that congestion cost the economy of New Delhi alone US$8.6B 2015.

Much of India's infrastructure deficit can be attributed to the country's litigious land-acquisition process. Property rights are strong in India, so land for infrastructure development cannot simply be expropriated. States also have a relatively high level of authority, so national projects requiring inter-state co-ordination have a hard time getting off the ground. Farmers are also an influential voting bloc, so long-term projects over multiple election cycles that impact their land and livelihood are difficult to implement. India's finance minister Arun Jaitley has stated that India will need US$1.5T in infrastructure investment over the next decade to sustain its current rate of economic growth.

[2] "India's Once-Shoddy Transport Infrastructure Is Getting Much Better." The Economist, 27 July 2017.

[3] Kaul, Vivek. "India's $100bn Road Building Gamble to Boost Economy." BBC News, 28 Oct. 2017.

Going Digital

Around 900 million Indians now have mobile phones, and their ubiquity has been beneficial. For example, the Unique Identification Authority welfare delivery system, known informally as Aadhaar, is a system that links mobile phone numbers and bank accounts with a biometric identification system, allowing welfare payments to be delivered directly to beneficiaries. The expansion of the system has made 1.1 billion enrollees "visible" to the state.

Internet use is low, but booming. The internet penetration rate was only 33 per cent in 2017, but is expected to reach 50 per cent by 2020 as smartphone ownership proliferates; 500 million Indians are expected to have smartphones by 2020.[4] However, India risks not exploiting the opportunities that greater internet use presents. India is expecting e-commerce to become a major economic pillar. Two local firms, Flipkart and Paytm, have raised hundreds of millions of dollars in venture capital, and Amazon is investing billions of dollars in India. However, according to *The Economist*, only 5 to 10 per cent of the population actively shops online, and growth has been below expectations.

[4] "Internet Penetration in Rural India Abysmal: Report." The Economic Times, 29 Sept. 2017.

Looking Forward

A few years ago, India risked squandering its monumental social and economic progress; however, when Prime Minister Narendra Modi was elected in 2014 on a platform of addressing India's macroeconomic challenges, Indians voted for economic reform. In the four years since the election, Modi has made some progress, such as tax reform and opening sectors of the economy to foreign investment, but much still needs to be done to meet the population's burgeoning desires.

Indians voted for economic reform but much still needs to be done to meet desires.

2 — What Has 'Make in India' Made for India?

By Stephanie Fraser

Amid great fanfare, Indian Prime Minister Narendra Modi invited international businesses to "Come, make in India, invest in India – for India, and for the world" at the eighth annual Global Entrepreneurship Summit in November of 2017. This sentiment echoes his government's ambitious efforts to transform India's economy from primarily revolving around IT call centres and other service industries to becoming a major player in manufacturing the world's goods.

This initiative was initially seen by the world as a step forward in India's commitment to highlight its manufacturing capabilities in order to attract foreign direct investment (FDI) and address gaps in employment. However, three years after the program was announced, observers are now asking: "What has *Make in India* actually made for India?"

Indian workers set up the venue for the 'Make in India' week held in Mumbai February 13-18, 2016. Over 190 companies, including national conglomerates and multinational corporations, 5,000 delegates from 60 countries, and leading industrialists participated in the maiden 'Make in India' showcase. | Photo: Indranil Mukherjee/AFP/Getty Images

India in the Spotlight: A Need for Reform

In the past decade, India has faced many challenges in terms of its future growth. These include rising unemployment, declining foreign investment, a growing youth population desperately seeking equal work opportunities (over half of India's 1.2 billion citizens are under the age of 26), and an infamously lopsided trade balance.

The election results demonstrated that Indians agreed with Modi's assertion that these factors were not permanent fixtures limiting India's ability to compete on the world stage, but instead opportunities to fix the country's well-chronicled problems. And so *Make in India* was launched on September 25, 2014, as a program to diversify India's economic portfolio through manufacturing.

---

half of

1.2 billion Indian citizens

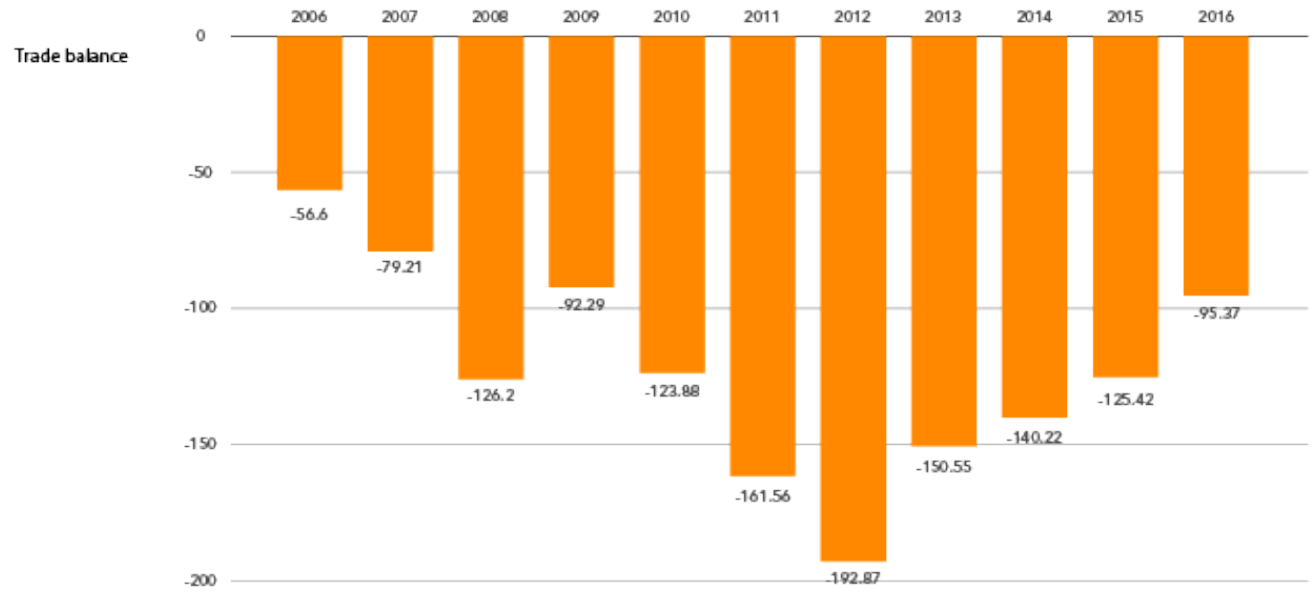
age 26

With Indian manufacturing at a distressing standstill, the goals of the campaign were simple. A renewed focus on invigorating a lackluster and abandoned manufacturing sector will drive FDI into the economy. Investment will foster innovation, providing employment for the looming demographic bulge that encompasses what will soon be the world's youngest population.

Modi has championed the initiative as a practical and streamlined method to attract companies to India for the purpose of making their products, rather than merely marketing them there. In its drive to make the abrupt shift from a society predominantly focused on services, *Make in India* turns the spotlight on goods from 25 industries, from clothing to railways, paper to renewable energy, and pharmaceuticals to submarines.

This revival of Indian manufacturing tries to cast the nation as a formidable powerhouse in exporting against established competitors, such as China and Southeast Asia. The government's hope is that the initiative will act as a catalyst for long-run growth in other areas where India has historically been intensely overshadowed, such as improving infrastructure, increasing skills training, and relieving pressure on its trade deficit. On the other hand, outsiders saw the potential for the labyrinth of archaic bureaucratic hassles and red tape that clouded the country's foreign policies to be amended or even eliminated, while simultaneously opening India up to investment, public-private partnerships, and expertise.

India's trade balance, 2006 to 2016 (US$ billions)



Transformation Through Manufacturing: How has 'Make in India' Fared?

After the campaign's well-marketed launch, Modi's flagship *Make in India* policy has given rise to some positive outcomes. In the three years since the introduction of the policy, India's rank in the World Bank's Ease of Doing Business has climbed four places, from 142 in 2014 to 100 in 2017. In addition, in 2015, India surpassed China to become the top destination for FDI in the Asia-Pacific, seeing approximately US$63 billion worth of investment flow into the country.

While the recent policy changes are making solid headway, the sobering fact is that manufacturers still face significant hurdles in the country. A closer look reveals that, despite the fact that some major companies, like Samsung, have found synergy and opened manufacturing hubs in India, the majority of FDI since the campaign's inauguration is still in the services sector, which attracted 60 per cent of India's total FDI inflows from 2016 to 2017.

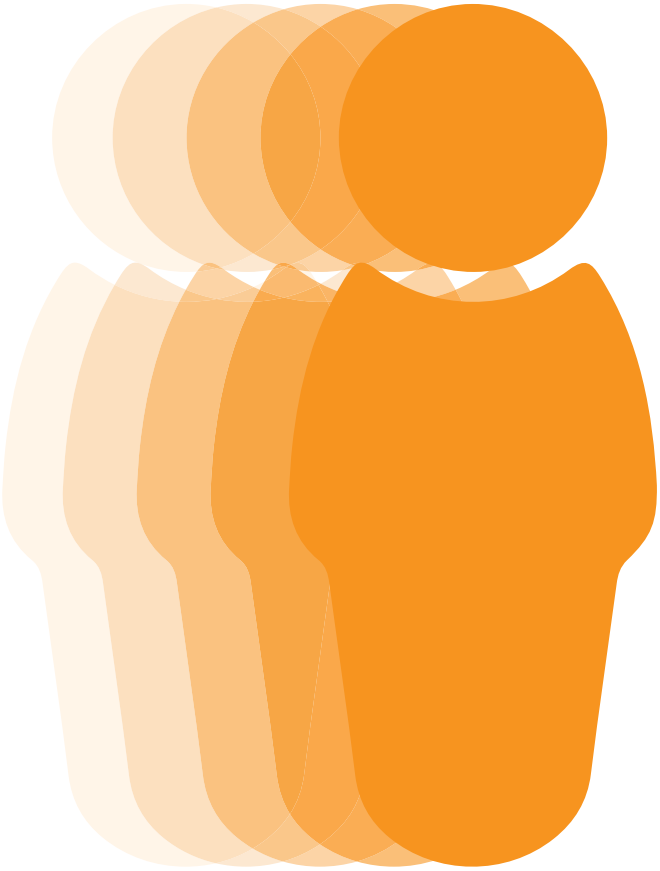
The government's ambitious goal to increase the gross domestic product share of manufacturing from a current 16.5 per cent to 25 per cent by 2020 is not yet on track. Global companies have been unsparing in their criticism over the country's poor industrial safety records and failure to enforce environmental manufacturing policies. Vague regulations that have yet to be streamlined, a shallow supply chain ecosystem, and inefficient bureaucracies are additional challenges that remains steeped in the old India. Weak infrastructure has also hindered the *Make in India* program. While Modi's list of national-building projects showcases growth in infrastructure through the futuristic *Smart Cities Mission*, the provisions set out for this initiative have not yet come to fruition in a way to stimulate growth in the industrial sector that *Make in India* needs to succeed.

The campaign also unfortunately appears to be out of sync with the employment realities of India. The unique feature of *Make in India*'s implementation was a structural approach towards creating 100 million new jobs by 2022, giving the manufacturing sector an important role in domestic job creation. But a quickly growing population doesn't equal skilled labour, which the sector requires. The harsh reality may be that the highly skilled resource requirements for the manufacturing sector are out of kilter with the skill profile of India's young up-and-coming labour force. As a result, education and skills may become extremely competitive in order to meet the demands of future employment in the sector.

Looking Forward

Whereas a lot has been done in three short years, it is still too early to call *Make in India* a success or failure. Regardless, it needs to be recognized for all that it is: An innovative method of thrusting India onto the world stage by building a strong manufacturing base. While the Indian government has begun to address certain issues surrounding the policy, for instance by pledging to provide manufacturing skills training to 500 million people by 2022, the solution to the conundrum of achieving long-term sustainable growth and development still remains out of reach.

The future trajectory of Indian economic development therefore rests in the government's ability to showcase the country as one with a wealth of untapped resources that deserve to be taken advantage of. There is, however, a lot of work that still needs to be done before investors shift their attention away from decades of goods being 'Made in China' to PM Modi's vision for the world to 'Make in India.'



500

million people provided with manufacturing skills training by 2022.

3 — Navigating India's Transportation Maze

By Denea Bascombe

How can you effectively transport more than one billion people? It is a question that India's policy-makers grapple with every day. The integration of public and private transportation systems across a country comprising the world's seventh-largest land mass and second-largest population is not easily accomplished. From planes, trains, and automobiles to buses and rickshaws, regional and national travel in India has many options with many limitations. The magnitude of domestic transportation leaves the Indian government without the funding to match the cause.

India's 2017-18 budget for all transportation infrastructure is the equivalent of C$46.8B. With the end of India's final Five-Year Plan in 2017, the budget outlines the country's ongoing priorities. It includes the implementation of a Metro Rail Policy to manage mass rapid urban transit systems, an increase in budget allocation in highways, the identification for new roads for construction and development, and operations and maintenance support for select airports.

Across these policies and programs, one primary constant is the suggested opportunity of foreign private investment in transportation endeavours across the country. However, is private capital from abroad the silver bullet to solve the breadth of issues facing transportation in India?

C$

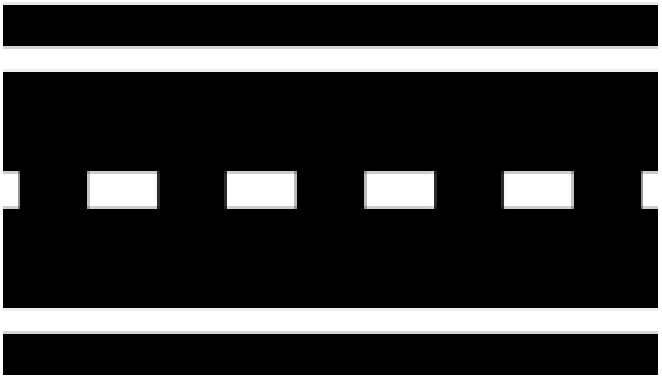
46.8

is India's 2017-2018 budget for all transportation infrastructure.

Road, Rail, and Air: A Transportation Labyrinth

Private vehicles – from auto rickshaws to cars and everything in between – pack Indian roads and highways at a rate of nearly one vehicle per household. Citizens in India are highly dependent on private modes of transportation, which even include walking and cycling. As such, road conditions and accessibility are of utmost importance to domestic transportation. Unfortunately, the number of vehicles in India – mostly motorcycles – is growing much faster than the population, and in effect faster than the government's ability to increase capacity for road infrastructure.

In rural India, most citizens are dependent on bicycles and motorcycles, and are more likely to travel by motorcycle than by bus. This poses a transportation problem not only for traffic congestion and pollution, but for infrastructure capacity. Many highways require extensive road and highway upgrades and connectivity improvements, despite the National Highway Development Project's ongoing efforts. Though the 2017-18 budget aims to improve this issue by increasing funding for highways from 57,976 to 64,900 crore rupees, or C$11.2B to C$12.6B, it is unlikely that this amount will suffice for the proposed 2,000 new kilometres of coastal connectivity roads identified for construction, as well as the much-needed upgrades required throughout the country.



Number of vehicles is growing faster than the population and the road infrastructure capacity.

The Shared Vehicle: A Failing Necessity

Contrary to rural trends, buses are the most popular and convenient mode of transportation in urban cities. Unfortunately, bus users see the need for both road and highway upgrades and bus vehicle and system improvements. Though more than 1.6 million buses are registered in India, bus transportation has not been able to meet the growing travel demand. Unfortunately, it is unlikely to do so any time soon, given that the 2017-18 budget does not include funding for bus vehicle and system improvement.

1.6 million

the most popular and convenient mode of registered transportation in urban cities of India.

Linking Cities Rail by Rail

In 1853, India's first passenger train, a 14-car steam locomotive, bridged the distance between Bori Bunder station in Bombay and Thane, 39 kilometres away. It was the first step toward what is now the world's fourth-largest railway network, operating both long-distance and suburban trains. Much of the debate around infrastructure capacity revolves around India's railway systems, which are often paralyzed by capacity issues

Currently, state-owned Indian Railways is responsible for all rail transportation in India, and the newest budget includes a total capital and development expenditure of railways at approximately C$25.4B. The budget's notable goals include 3,500 kilometres of railway lines to be commissioned, 25 stations to see redevelopment, and 7,000 stations to be fed with solar power. This will be followed in 2019 by the installation of composting toilets, also known as bio toilets, on all coaches of Indian Railways. In order to reach these goals, the budget introduced Metro Rail Policy 2017 to facilitate the installation of mass rapid transit systems, and the Metro Rail Act to update existing laws to encourage more foreign private funding in the form of public-private partnerships to develop the system.

In 2016,

100 million

The Struggle to Take Flight

In 2016, 100 million domestic air transport passengers flew through India's skies. With such magnitude, it is not surprising to see that India's government has a deep vested interest in the industry. The Airports Authority of India under the Ministry of Civil Aviation is responsible for creating, upgrading, maintaining, and managing civil aviation infrastructure in India; however, there is evidence that challenges lie ahead. Flight concentration and aviation capacity are the major issues facing Indian air transport. While there are 450 airports in the country, only 75 are operational, and the top 6 airports account for two-thirds of domestic air traffic. It is in response to such trends that the government plans to build more airports in smaller cities, and has identified 160 unserved or underserved airports and air strips with state governments that could benefit from revival plans.

domestic air transport passengers flew through Indian's skies.

Is Private Capital the Silver Bullet to India's Transport Needs?

Meeting India's transport needs is going to be expensive. Prime Minister Modi committed the equivalent of C$74.2B in early 2017 to upgrade the country's railways, airports, and roads.

This followed a 2016 statement by Finance Minister Arun Jaitley, who commented that while the starting point for massive development should come from public finance, it is only when public finances are committed that India can start attracting investment from private funds.

Minister Jaitley also highlighted that, over the next decade, India will require nearly C$1.9T to fill its infrastructure gap. At the current rate of over C$74B per year – an already unsustainable amount of government funding for infrastructure – it would take the government over 20 years to reach the funding required for 10 years.

In order to bridge the infrastructure financing gap, the government will have to rely on private capital from abroad. The Indian government plans to sell shares in its state-owned rail companies, allow the former state-owned Airports Authority of India to monetize land holdings, and allow foreign companies to invest in domestic metro systems. And, although there is a need for private expertise and capital to ensure the viability of Indian transportation infrastructure, it remains unclear as of yet whether the current amount of private investment will be enough.

C$

1.9 thousand

is required by India to fill its infrastructure gap.

Looking Forward

Although India's transportation infrastructure financing gap is wide, what appears promising is India's ability to court international investment, particularly in metro system development.

With international multinationals such as Bombardier Inc. and General Electric Co. already setting up factories in the country, a past joint venture between Russian and Indian companies executed, and state meetings being conducted with CEOs in China and South Korea regarding Indian metro rail projects, the future of transportation in India may pose a promising international business opportunity.

Whether it is domestic or foreign capital, investment in India's transport system will have to consider the needs of both rural and urban populations. We see that rural areas would likely better support spending on road and highway upgrades, while urban populations would prefer an upgrade of the bus system. In the past, severe road congestion, road accidents, and air pollution have eroded Indians' confidence in their public transportation systems. And if the focus will be on improving transportation systems for urban populations, rural populations may be left in the dust, without the adequate road, bus, or rail upgrades needed to take them where they need to go.

4 — Realizing Renewable Energy in India

By Peter O'Boyle

When Mahatma Gandhi challenged Indians with the statement, "If we could change ourselves, the tendencies in the world would also change," it was a rallying call for the country to inspire change across the globe by looking first introspectively at aspects they could change within themselves. Gandhi's message then still resonates today, as India commits itself to be a positive force in climate change. India made this commitment clear with its participation in the Paris climate agreement.

The agreement, negotiated in a 2015 summit, constituted a landmark in international efforts to mitigate and adapt to a warming world, and marked a milestone in India's own environmental and energy policy. Building on the country's *National Action Plan on Climate Change* and National Solar Mission, the government has prescribed a renewed focus on advancing renewable energy in India. However, this begs the question: with an unprecedented growing demand for electricity, can a greater investment in renewables save India from its future energy-supply woes?

"If we could change ourselves, the tendencies in the world would also change."

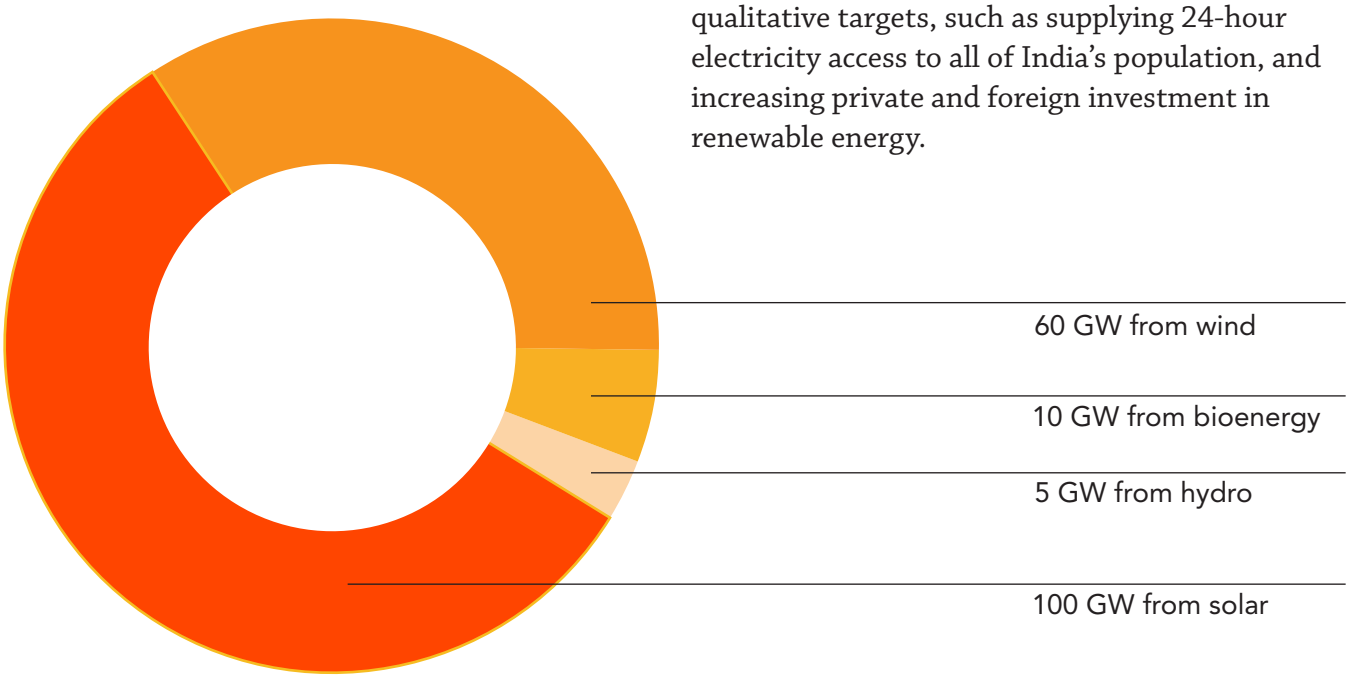
Renewable Energy's Role in Meeting Energy Needs

The demand for energy in India is on the rise. The International Energy Association (IEA) estimates that the country's total energy demand could rise from 775 million tonnes of oil equivalent (Mtoe) in 2013 to 1,908 Mtoe in 2040. For India to meet the nation's increasing energy needs, its power system will have to quadruple in size, increasing at a rate of almost five per cent per year. While coal currently accounts for over 70 per cent of India's power generation, the government is looking at using renewable energy to fill in the gap and meet Indians' growing energy demand.

India's renewable energy policies focus on long-term goals, including reducing its emissions intensity from 2005 levels by 33 to 35 per cent of gross domestic product by 2030, and having 40 per cent of cumulative electric power installed capacity come from non-fossil-fuel-based energy sources by 2030. To help get Indians to a place where renewable energy is a part of their daily lives, the government has set an ambitious target of increasing renewable power capacity to 175 gigawatts (GW) by 2022, focusing mainly on solar and wind power. Of the 175 GW of planned renewable power capacity, 100 GW will be generated from solar, 60 GW from wind, 10 GW from bioenergy, and 5 GW from hydro power.

These specific measures complement other, qualitative targets, such as supplying 24-hour electricity access to all of India's population, and increasing private and foreign investment in renewable energy.

India's government target of power capacity by 2020

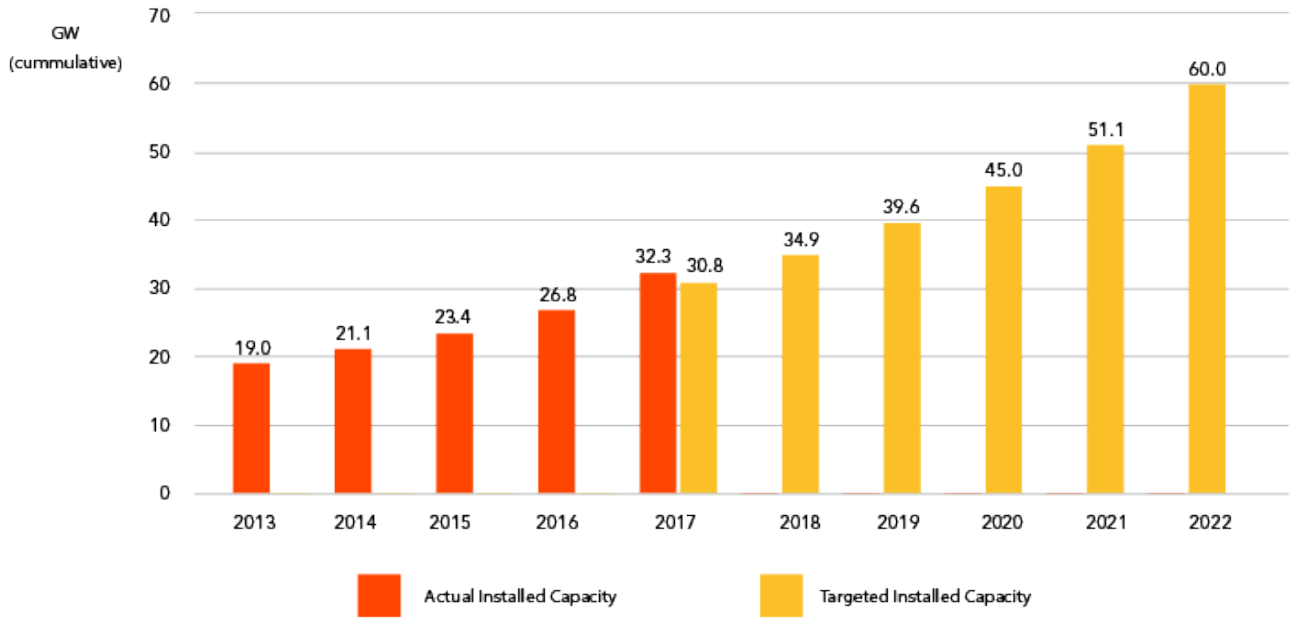


Progress Despite Falling Short of Ambitious Targets

Since announcing the policies, the country has made significant steps toward realizing its renewable capacity targets. This can be seen in its progress in building its wind and solar power industries.

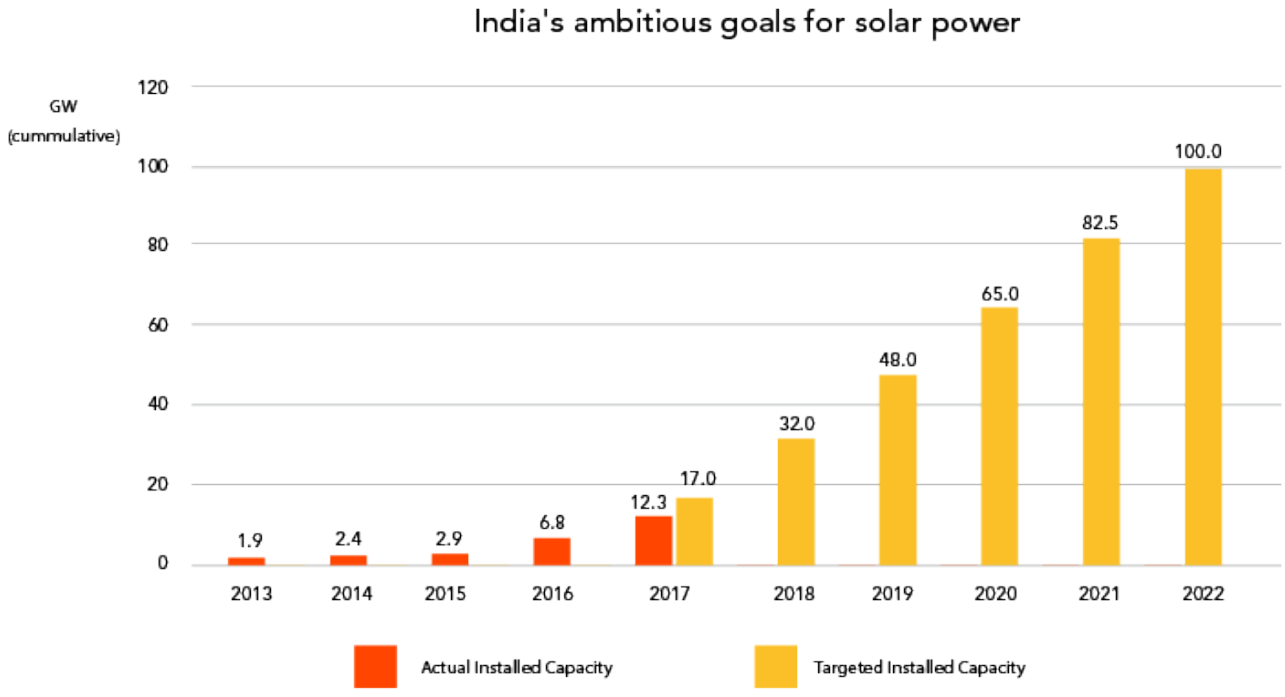
For wind power, data from India's Ministry of New and Renewable Energy shows that India exceeded its 4 GW annual cumulative target in 2017, adding 5.5 GW since 2016.

India's ambitious goals for wind power



Source: Ministry of New and Renewable Energy (India); adapted from World Resources Institute
Note: Years are fiscal year

And while India has failed to meet its annual cumulative target of 17 GW in 2017 for solar power, it added 5.5 GW in 2017 to reach 12.3 GW, nearly doubling the previous year's cumulative total installed solar capacity of 6.8 GW.

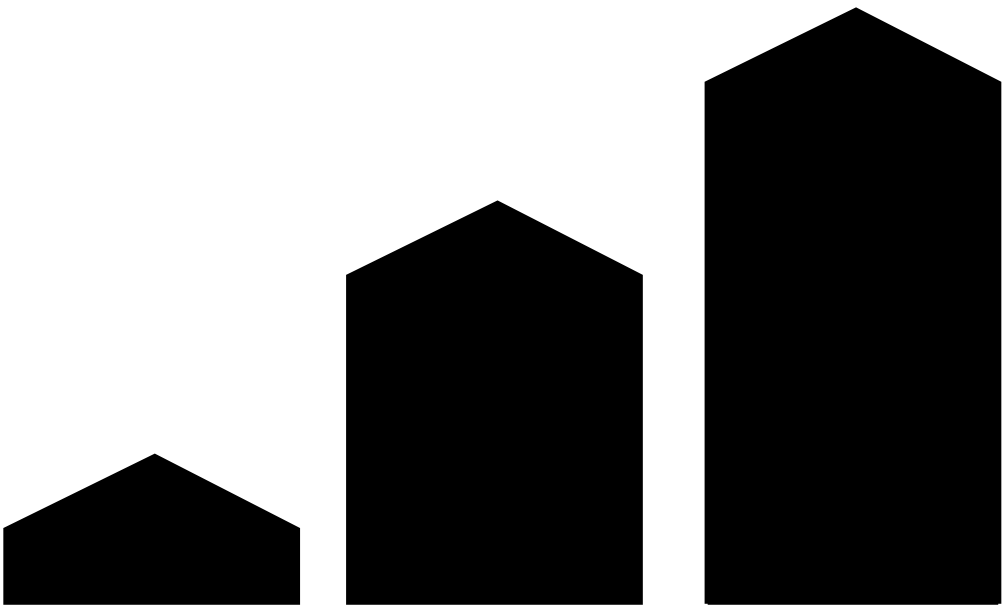


Source: Ministry of New and Renewable Energy (India); adapted from World Resources Institute
Note: Years are fiscal year

Looking forward, estimates for the potential energy drawn from wind power are hugely variable. According to the IEA, installed capacity will grow less than 50 per cent of solar, with the lack of greater wind capacity in part due to the fact that different renewable energy types are competing for similar funding and other resources.

The IEA's estimates for India's future performance in developing solar capacity indicate that it will most likely not meet its target of 100 GW by 2022, with installed capacity only rising to 29 GW by 2020. However, projections show that by 2040 there will be total 188 GW of installed capacity, representing a 16 per cent increase in the total share of solar power in India's energy mix from 2015.

Given these statistics, it would be fair to say that much progress is being made in reaching India's renewable capacity targets; nevertheless, challenges are arising that could throw the overall success of India's renewable energy ambitions in doubt.



IEA's estimate for India's development of solar capacity

29 GW

actual installed capacity by 2020

100 GW

target of installed capacity by 2022

188 GW

projection of installed capacity by 2040

Challenges Abound for Renewables

One of the main hurdles in building a system integrated with renewable energy sources is the limitations that the variability in supply places on the availability of dependable energy. This especially applies to building solar and wind capacity, where the unpredictability of weather conditions prevents consistent power generation.

These problems are exacerbated in India by the weakness of transmission networks and the timing of peak energy demand. For example, during the monsoon season, while high-speed winds can generate a considerable amount of power, they also cause significant damage to power lines, which in turn leads to major disruptions in transmitting newly-generated energy. Another example is in the evening, when power demand is at its highest, but when solar panels are unable to generate power. In addition, mechanisms to limit these problems, including strengthening the grid and improving demand-side management, have notable regulatory and cost hurdles. This means that making the necessary adjustments to address variability is not easy.

For solar deployment, specifically, there are a few hurdles in terms of site selection, land acquisition, and the supporting policy framework. For example, there are large inconsistencies among subnational governments being able to fulfil national targets for renewable purchase obligations because of poor enforcement by the national government. Another example is the high cost required to acquire the land for solar farms, as the national government must make deals with individual land overs to gain access to enough space to support the infrastructure for these massive farms.

A possible way to mitigate these issues is to install more rooftop solar panels. The outlook here is positive, with the IEA stating that is has the potential for very rapid growth as solar generation costs decline and access to financing options – to combat a high initial cost – becomes easier.

In terms of increasing wind-power capacity, similar challenges exist in terms of site selection, land acquisition, power transmission, and the supporting policy framework. For example, finding the right site that can produce the most amount of energy is very tricky, as ideal sites are often in remote mountainous areas. This problem is further exacerbated by the fact that these remote areas are nowhere near major power grids, making it expensive to link wind power facilities with main transmission lines.

A possible solution to these problems is for national and subnational governments to facilitate more interconnection agreements to make sure the wind power generated can reach those who need it most.

Overall, the challenges are significant. They also have an impact on India's wider energy mix, where the future increase in energy demand cannot be met with renewable energy alone. Coal will still play a large role in India's energy portfolio, with investment in new coal-fired power plants unlikely to cease in the immediate future.

Looking Forward

India has set meaningful targets regarding renewable energy and has gone a long way toward achieving them. However, it still faces significant challenges in terms of integrating renewable energy in its energy mix due to an overwhelming increase in electricity demand to meet the needs of India's burgeoning economy.

The success or failure of India's renewable energy policies remains to be seen. But the positive outlook in the sector suggests a bright future, as investors and industry experts are paying attention to the wealth of opportunities on offer. If India can realize its renewable energy ambitions, it will be the world that needs to change to catch up.

"Canada and India share a special bond."