Morgan Stanley
INVESTMENT MANAGEMENT

Weaving India's Future: A Tapestry of Green and Grey Energy

TALES FROM THE EMERGING WORLD | EMERGING MARKETS EQUITY TEAM | April 2024

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On a recent visit to Mumbai, we were struck by the contrast of sleek electric motorbikes gliding alongside old diesel rickshaws, dirt roads intersecting with modern bridges and towering skyscrapers, while piles of plastics and waste gathered underneath billboards heralding a cleaner, greener India. The country is home to 83 of the 100 most polluted cities in the world,[1] where every autumn, a thick and acrid smog blankets the capital, New Delhi, forcing school closures and restrictions on vehicle use. Despite its reputation as an environmental laggard, we believe India is undergoing a significant transformation, while striking a balance between economic growth and sustainability.

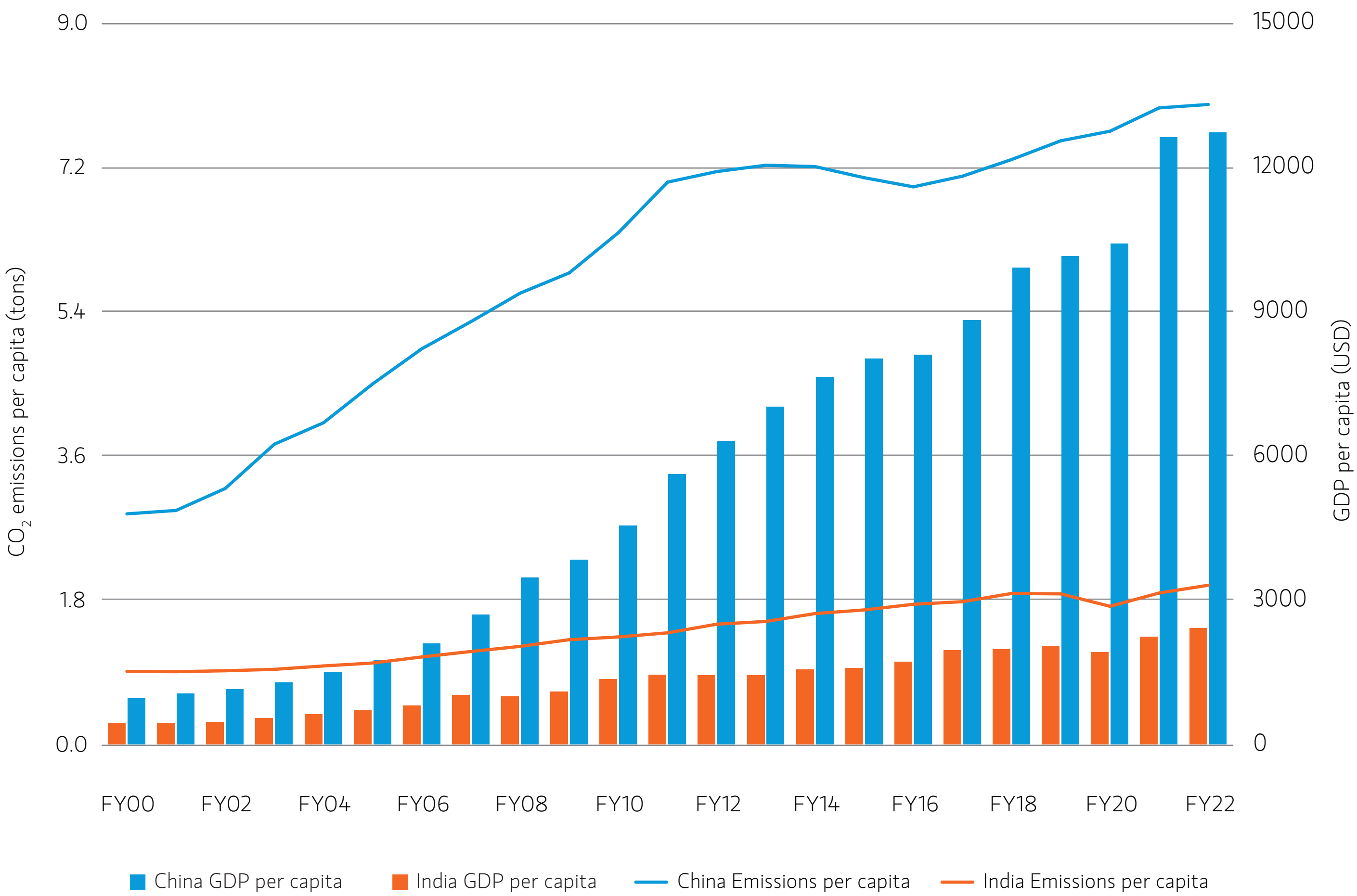
Over the last decade, India's GDP grew at a 7% CAGR (compound annual growth rate) to $3.6 trillion, propelling it to become the world's fifth largest economy. By 2030, it's projected to become the third largest. Economic growth has come at an environmental cost: India is already the third-largest emitter of CO_2 despite low per capita emissions of 2 tons annually, compared to the U.S. which is eight times as much or China at four times the amount. India's absolute emissions will continue to grow, as power demand exceeds GDP growth driven by an increase in manufacturing activities and overall economic development.

[1] Regan, H The world's 100 Worst Polluted Cities are in Asia - and 83 of them are in just one country. CNN. March 19, 2024.

DISPLAY 1

India Will Be Cleaner Faster Than China

On a GDP per capita basis, India today lags China by 15 years, but emissions per capita are far lower.



Source: Haver, Global Carbon Budget. As of December 31, 2022.

Although coal currently accounts for about 70% of electricity generation, India is turning to renewables to meet the majority of incremental power demand, using coal only when necessary. That means, the country is becoming cleaner earlier in its economic development curve than all of the other major economies, including China *(Display 1)*.

At COP26, the 2021 United Nations Climate Change Conference in Glasgow, India surprised everyone by unveiling a plan to reach net zero by 2070, two decades later than many other economies. Despite skepticism around India's target, the country has made a conscious effort to decarbonize its economy. India's government has undertaken significant policy reform and initiatives to stimulate renewables growth. In the last eight years, India's installed renewables capacity has jumped fourfold to 190 Gigawatts (GW).[2] India is on track to reach 500GW total renewables capacity by 2030, accounting for more than 40% of its incremental electricity generation. This figure could grow as the economics of battery storage improve, driving large-scale adoption of battery and pump storage which will increase load factor and reduce the risk of future power deficits.[3] Today, around 4GW of pumped storage projects are under construction and an additional 35GW are awaiting approval.

[2] Manohar, A. (2024, February). Invest India. Renewable Energy.

[3] In 2013, peak electricity demand was about 130GW whereas today it is almost double and by 2030, this figure will reach 370GW.

India's electricity demand and generation growth is a significant investment theme for the coming decade with a tapestry of opportunities across the value chain. In 2023, India spent $30 billion on green capital expenditure *(Display 2)*.[4] We expect green capex to grow to more than $400 billion cumulatively in the decade 2022-32.[5]

We have identified three major areas of opportunity:

1. POWER TRANSMISSION AND DISTRIBUTION (T&D)

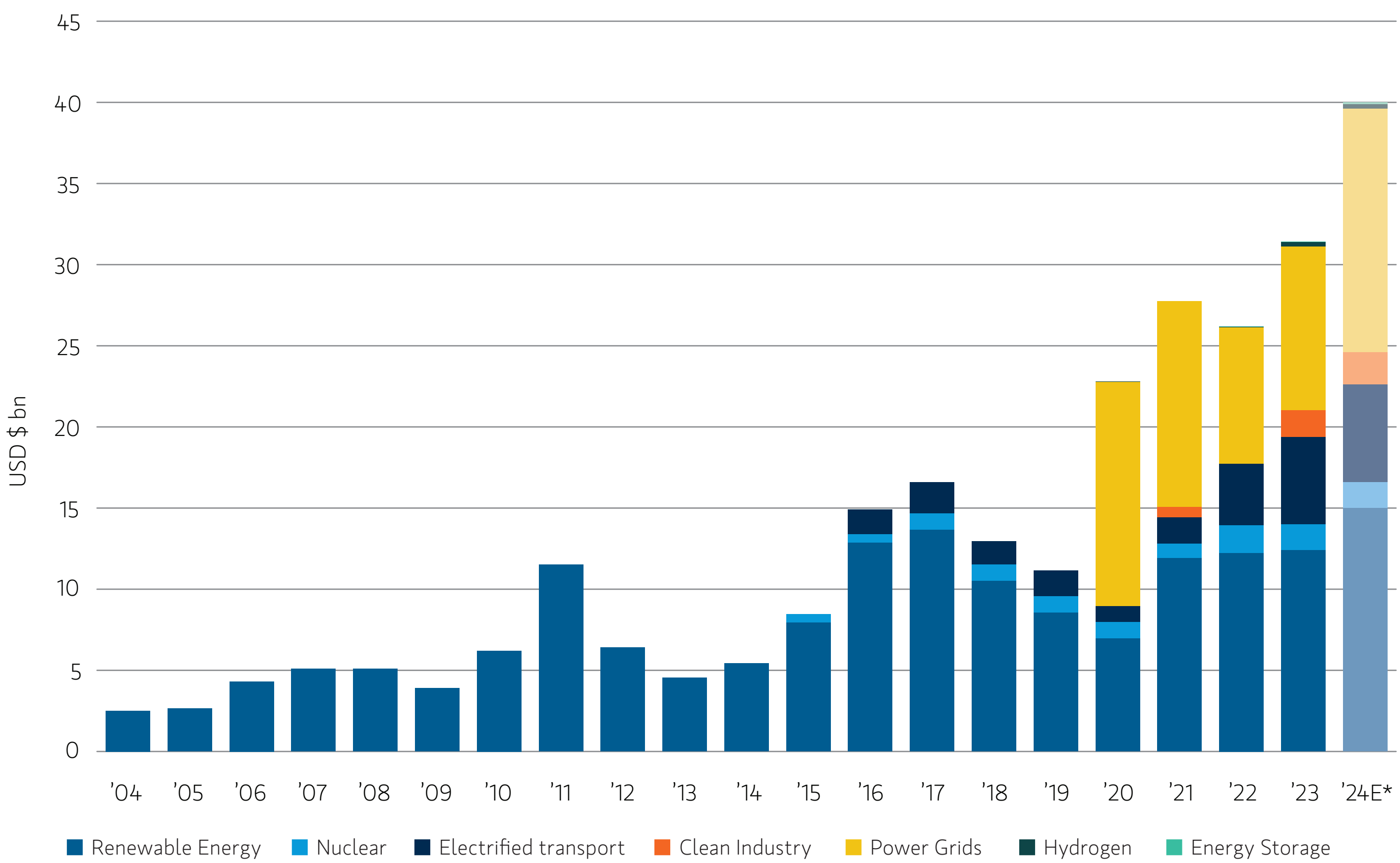
Grid connection backlogs, a big issue globally, are delaying at least 3,000GW of renewable energy projects and posing a major bottleneck to reaching net zero.[6] However, India has made significant strides to overcome this hurdle in its own electricity market. In the past decade alone, India has expanded its grid by 60%, increasing transmission lines by 180,000 km. By 2030, the government plans to invest $30 billion into T&D, as well as renewable grid integration, prioritizing rapid deployment to ensure a reliable power supply.[7]

One of our portfolio companies, a leader in high voltage technology, is a critical supplier to a number of national T&D projects. As India gears up to more than double its current installed capacity from about 416GW to 933GW in the next

DISPLAY 2

India's Green Capex

USD $ bn



Source: Bloomberg New Energy Finance, MSIM Estimates. As of March 31, 2024. *Estimates are based on current market conditions, subject to change, and may not necessarily come to pass.

[4] Bloomberg New Energy Finance (BNEF). 45% to renewable energy, 32% to power grids, 16% to electrified transport, and the rest in hydrogen, energy storage, and other.

[5] India Central Electricity Authority and MSIM estimates. Estimates are based on current market conditions, subject to change, and may not necessarily come to pass.

[6] IEA. Electricity Grids and secure energy transitions. October 17, 2023.

[7] Company data and Baruah, R. Power outages grip states amid scorching heat. June 2023.

decade,[8] we believe this company appears well-positioned to thrive. We expect this company to significantly benefit from the growth in power T&D investments.

2. RENEWABLES AND BATTERY STORAGE

Blessed with 300 days of sunshine annually, India is on track to meet a significant share of incremental energy demand through renewables, particularly solar. The country, which already has 67GW of installed solar capacity, is projected to increase solar capacity by 22%, or 13GW, this year alone.[9] The push towards renewable energy is driven by cost competitiveness and has the benefit of improving India's overall energy security. India could also reduce its net energy import bill, currently around 3% of GDP. To bolster domestic solar energy manufacturing capacity, the government has introduced subsidies for local producers and imposed tariffs that will cut Chinese imports to zero. While this is a positive for domestic manufacturing, it could lead to supply-side constraints.

Wind power is also playing an important role. India has the world's fourth-highest installed wind capacity with a total of around 45GW.[10] Cumulative wind capacity is expected to grow 60% to 71GW by 2030, adding 4-5 GW annually.[11]

One of our portfolio companies, a Brazilian manufacturer of energy generation and T&D equipment, has a global business and local presence in India. The company plans to increase production capacity in India, including building 4MW onshore wind turbine platforms, which, if completed, will provide it with a competitive offering in a growing market.

3. ELECTRIC TRANSPORTATION

During our visit to Mumbai, we rode in a number of EV (electric vehicle) taxis and heard positive feedback from drivers who raved about the EVs needing less maintenance, lowering their total costs. Despite a global slowdown in EV sales, we remain constructive on India's EV story. Unlike other markets, India's EV journey has started with two-wheelers (2W). This has led to the share of electric vehicles in the overall two-wheeler market to grow from 1.2% in 2021 to 5.2% today in new car sales. We expect penetration to grow as total cost of ownership improves, charging infrastructure expands and the clear benefits of a zero-emissions vehicle and lower maintenance costs in India's urban environment are realized by consumers.

The government has set an aggressive EV sales penetration target of 80% for 2W and 3W, as well as 30% for PVs, by 2030. That could prove challenging in the near term, especially after the phasing out of the government's Faster Adoption and Manufacturing of Electric Vehicles (FAME) subsidy scheme. However, we think the trend in electric two-wheeler growth remains positive.

In our view, India's own manufacturers will lead much of the EV growth, especially given that India is already the world's largest two-wheeler market. One of our portfolio companies, a leader in two- and three-wheeler vehicles, has a strong domestic market share and a growing product line of electric vehicles. As electric two-wheelers continue to grow, we believe this company will be a key beneficiary.

Conclusion

Vallabhbhai Patel, a leader in India's independence movement and political integration once remarked, "The negligence of a few could easily send a ship to the bottom, but if it has the wholehearted cooperation of all on board it can be safely brought to port." This sentiment encapsulates the essence of India's progress towards a cleaner and energy secure future—where the collective commitment of the government, private sector and people could help steer the country to a more sustainable path. Despite its reputation as an environmental laggard, India is laying the groundwork now in order to secure a cleaner and more renewable future. We think this presents multiple opportunities to invest and we believe these opportunities will only continue to grow.

[8] International Energy Agency, 2021 Outlook

[9] BNEF. As of December 31, 2024.

[10] India Ministry of New and Renewable Energy. As of December 31, 2024.

[11] BNEF. As of December 31, 2024.

Risk Considerations

There is no assurance that a portfolio will achieve its investment objective. Portfolios are subject to market risk, which is the possibility that the market values of securities owned by the portfolio will decline and that the value of portfolio shares may therefore be less than what you paid for them. Market values can change daily due to economic and other events (e.g. natural disasters, health crises, terrorism, conflicts and social unrest) that affect markets, countries, companies or governments. It is difficult to predict the timing, duration, and potential adverse effects (e.g. portfolio liquidity) of events. In general, **equities securities'** values also fluctuate in response to activities specific to a company. Investments in **foreign markets** entail special risks such as currency, political, economic, market and liquidity risks. The risks of investing in **emerging market countries** are greater than the risks generally associated with investments in foreign developed countries. The risks associated with ownership of **real estate and the real estate industry** in general include fluctuations in the value of underlying property, defaults by borrowers or tenants, market saturation, decreases in market rents, interest rates, property taxes, increases in operating expenses and political or regulatory occurrences adversely affecting real estate.

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CRC 6553085 Exp. 04/30/2025 10604922 Lit-Link: EMEWRLDBRO LTR