

## India's renewed story

### “Does India Want to Solve Its Pollution Problem?”

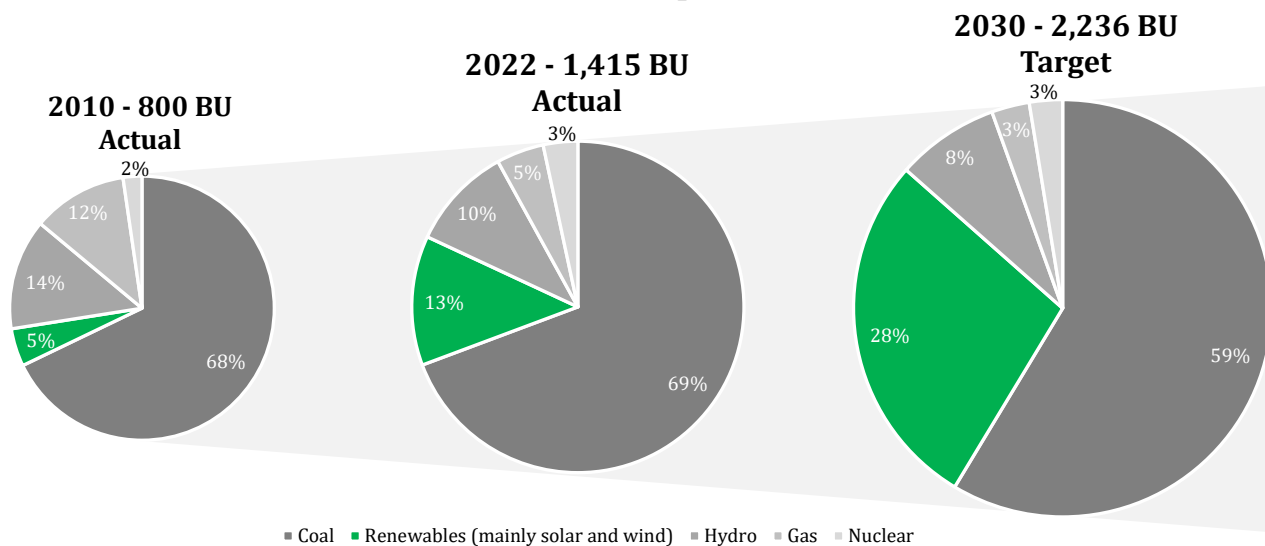
- a report in the December 2021 issue of Foreign Policy, an American news magazine.

Slumdog Millionaire, like many stereotypical Hollywood movies, fades in to a dark smoke-belching industrial chimney near a polluted river and the Taj Mahal in the distance. The serene sitar music soon gets replaced by the hustle of an overcrowded street with thick smog. One can easily understand why India, ranked the fifth-most polluted country globally, might have brought this image upon itself.

Ground realities, however, may not be as grave as portrayed as changes are afoot. India is indeed a major carbon emitter, with 2.4 billion tons expelled annually. While this is clearly unsustainable, India is a distant third with less than half of the US' and a fifth of China's emissions. In terms of emissions per square kilometer and per capita, India ranks 26<sup>th</sup> (far behind the UK, Singapore, Germany, and Denmark) and 115<sup>th</sup>, respectively; hence, India is not a major carbon offender when considering land mass or population base.

## Dropping fossils from fuels

### What fuels India's power?



Source: Kotak Institutional research

In 2022, India will generate 13% of its 1,415 billion units<sup>1</sup> (BU) of annual consumption from renewable sources. This increasing shift in our generation mix has been propelled by a combination of policy changes, technological advancements, aggressive targets, and large-scale investments by the private sector. India now targets to increase the share of consumption from renewable sources to 28% by 2030. As domestic power consumption is expected to increase by 50%, renewable generation will triple during this period.

India is the world's second-largest consumer, producer, and importer of coal. Historically, incremental capacity generation was addressed through new coal-based power plants, thereby making Coal India (a government company) one of India's most valuable businesses. Today, though, 90% of proposed coal-based projects have been canceled in favor of solar farms, thereby causing coal's share to fall to 59% by 2030. Coal India has pivoted by announcing plans to set up a solar wafer manufacturing fab at a cost of \$8 billion.

India also depends heavily on fuel oil, 85% of which is imported, burning a gaping hole of \$62.3 billion (~16% of total imports) in its annual exchequer. The government has mandated for 10% of the fuel to be blended with ethanol, reducing emissions by ~3 million tons and saving ~\$5 billion in foreign exchange annually. Encouraged by the success of the “E10” program, India has mandated a 20% ethanol blend by 2026.

Notwithstanding India's carbon reduction agenda, EVs are a negligible part of the mix today, partly because the government's priority has been changing the electricity generation mix. In the past two years, the government has begun promoting EVs with purchase incentives and reduced taxes, and a mandate to shift all two-wheelers and public transport vehicles to EVs by 2030. This should reduce the annual oil bill by ~22%.

<sup>1</sup> One unit of electricity is one kilowatt-hour, a million units is a gigawatt-hour, and a billion units is a terawatt-hour.

## Empowering the future – solar, wind, and green hydrogen

India's renewable energy consumption has increased five-fold to 179 BU since 2010 (13% of consumption). With a target of 624 BU of renewable energy consumption and a plan to increase installed capacity by at least ~5x to 500 gigawatts (GW) by 2030, India has the world's largest renewable energy expansion plan.

India's long coastline is conducive to large-scale wind power generation: current wind consumption is 69 BU (fifth largest in the world). By 2030, installed capacity is expected to grow ~4x to 140 GW. India is also setting up the world's largest renewable energy (solar-wind hybrid) park with a 30 GW capacity covering an area roughly the size of Singapore! Half of this is expected to be operational by 2024.

Hydrogen, nature's lightest and most abundant element, can also be used as an energy source and could be a game changer in achieving carbon neutrality. 'Green hydrogen' is derived by extracting hydrogen using renewable energy. This technology has been around for decades, but the economics were challenged with output (30-35 units of electricity) being less than the energy used (40-45 units) to produce the gas. However, a revolution appears to be around the corner, with the government and private sector announcing large scale investments in this area.

## Not just a social cause

Renewable energy sources emit merely 5% of the carbon emitted by coal and 1% of that of natural gas. While these statistics highlight the importance of switching to renewables in building a sustainable future, there are also significant strategic benefits that warrant the shift towards renewables:

- **Cheaper access to power:** At ~Rs 2/kWh, power from renewable sources is 60% cheaper than coal-based. Even if half of India's power becomes renewable, an average household can save \$45 annually (~\$13 billion country-wide). Cheap power will also fuel India's ambitions to replace China as the world's manufacturer.
- **Increased foreign reserves:** India's trade deficit rises by ~\$15 billion for every \$10 rise in crude prices. India can save over \$90 billion in imports between now and 2030, even if half of the current coal-based power is replaced by renewables, in addition to saving \$14 billion annually in its oil import bill.
- **Self-sufficiency:** Through various policies, import duty reductions, and a \$3 billion production-linked incentive scheme, the government aims to support the manufacturing of high-efficiency solar glass and modules in India, reducing reliance on imports and, in fact, become a manufacturer for the world.
- **Ripple effect:** The renewables push propels the growth of ancillary industries that aid the development of the ecosystem. This includes manufacturers of solar panels, turbines, and batteries, as well as service providers.

## A \$200 billion investment opportunity

Investors are happy to get on board with the Government to ride the renewables wave. Since the current government took charge, India's renewables industry has attracted foreign investments of over \$85 billion, with ~\$19 billion invested in 2021 (125% higher than 2020). The sector will need ~\$40 billion annually to meet its 2030 targets. There are 492 investible renewable energy projects in India, offering a ~\$200 billion opportunity.

India's largest conglomerate, Reliance Industries, plans to invest ~\$80 billion in renewables over the next decade. The Adani group, the metaphorical David to Reliance's Goliath, plans to invest \$70 billion to become the world's largest hydrogen producer. French energy giant Total Energies SE has invested \$2.5 billion in Adani. More such announcements, including from ADIA, GIC, and CDPQ, aggregate over \$11 billion in India's renewable industry.

## A new opening scene

In addition to shifting to renewable energy, the government is also trying other ways to reduce carbon emissions. India is home to factories that make over 243,000 metric tons of disposable plastic each year. To fix India's "polluted country" image and to reduce India's oil/petrochemical bill, the government has banned single-use plastics such as bags, balloon sticks, and straws from July 1<sup>st</sup> 2022.

With solar, wind, green hydrogen, and other initiatives, India is looking to leapfrog into a new age of sustainable energy consumption. We hope future Hollywood movies will portray a cleaner and greener India without smoke covering the incredible Taj Mahal!