

India's energy transition to tackle climate change - State of Play and Interesting Lead Indicators

AN AVALON PERSPECTIVE



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Energy Transition has transformed from mere buzz word a decade ago to a ray of hope for our future. A nation's energy transition journey encapsulates a wide gamut of subjects – policies, schemes, finances, economic growth, technology. In a series of articles to be published, we will explore these subjects pertaining to India. But from where do we start? Well, 190 countries recently gathered in Egypt for #COP27. India's performance analysis as per COP pledges seems like a good starting point.

COP (Conference of the Parties) is a global platform where all nations huddle to decide on policy measures to limit global warming and make positive impact with respect to climate change. The first United Nations Framework Convention on Climate Change meet led to the Kyoto Protocol, the first legally binding international treaty on climate change. However, it was reduced to a mere formality as many nations didn't ratify it, including USA, world's largest carbon emitter at the time. The Paris Agreement, from the 21st COP is the most significant one. 194 nations are party to this Agreement which works on a 5-year cycle with updates to Nationally Determined Contribution (NDCs). India updated its NDC in August'22, to achieve the following targets by 2030:

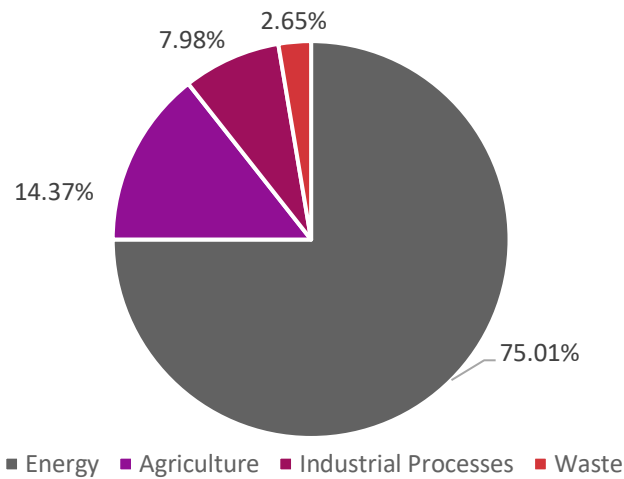
	Initial NDC (2016)	Updated NDC (in Aug '22)
<i>Reduction in emissions intensity of GDP compared to 2005 levels</i>	33%-35%	45%
<i>Contribution of energy from renewable sources</i>	40%	50%
<i>Creation of additional carbon sink (in billion tons of CO₂e)</i>	2.5-3	2.5-3



Is India really on track to achieve these targets? Or the updated NDCs are for hogging highlights? Let's try to find the answer.

Reduction in emissions intensity of GDP

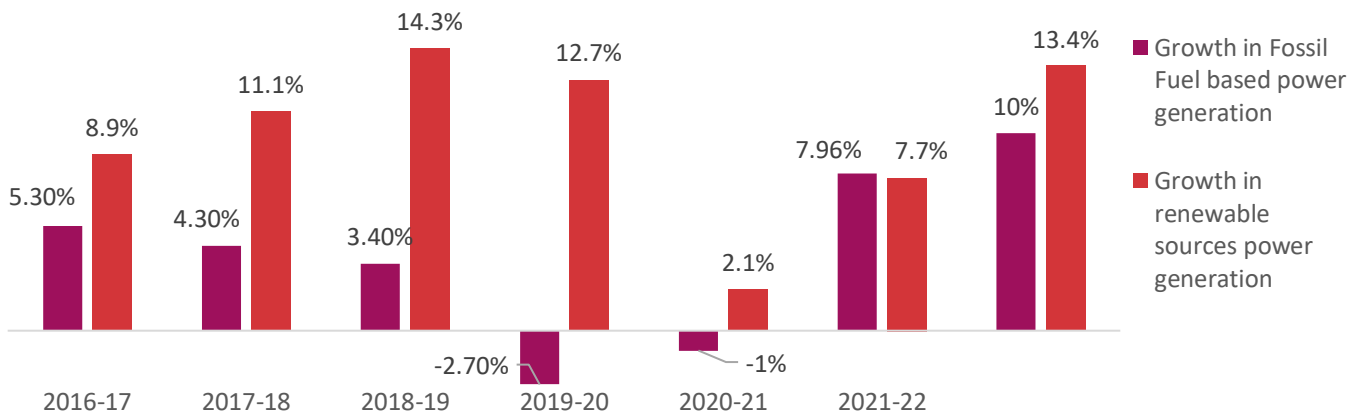
Sectoral Contribution to India's Emissions, 2016



Emissions intensity is the total amount of GHG emissions emitted per unit of GDP. Emission intensity was 27.8g of CO₂e/INR of GDP in 2005 which decreased to 20.7g of CO₂e/INR in 2016, a 25.5% decrease in 10 years. This shows that India's GDP has increased at a much faster rate compared to the emissions rate of growth.

India has undertaken major initiatives to decouple the GDP growth from GHG emissions. This has been made achievable by lowering energy intensity (0.27 MJ/INR in 2011-12 to 0.23 MJ/INR in 2018-19) which contributes 75% to India, the sector with the highest emissions (75%). Faster growth of the services sector as compared to industries and manufacturing, deployment of energy efficient technologies, growth of renewable energy and productivity improvements have made this possible.

Growth in fossil vs renewable power generation, 2016-17 till 2022-23



61.3 Mt CO₂ was saved from 2016-17 to 2018-19 under the PAT (Perform, Achieve, Trade) scheme through which companies could save and trade excess energy and GHG. The Standards and Labelling Scheme for energy rating of electrical appliances saved 56 bn units of electricity or 46 Mt CO₂ in 2018-19 alone. 5-star rated pumps in agriculture have saved 52 bn units in 2018-19. LED bulbs, tube lights and energy efficient fans distributed by EESL have saved 180 Mt CO₂ from 2014-15 to 2020. With government's tremendous focus on energy efficiency and clean energy, the emissions intensity from this sector will be further decreased. The net zero target set by Indian Railways by 2030 will save 60 million tons of CO₂ annually while the LED bulb campaign will save 40 million tons annually. The Green Hydrogen Mission, FAME scheme for EVs and cutting down of HCFs will further bring down emissions in the coming years. Considering a growth rate of 6% in GDP and 4% in emissions, India is likely to achieve 47% reduction in emissions intensity from 2005 levels which surpasses the target set in the updated NDC.



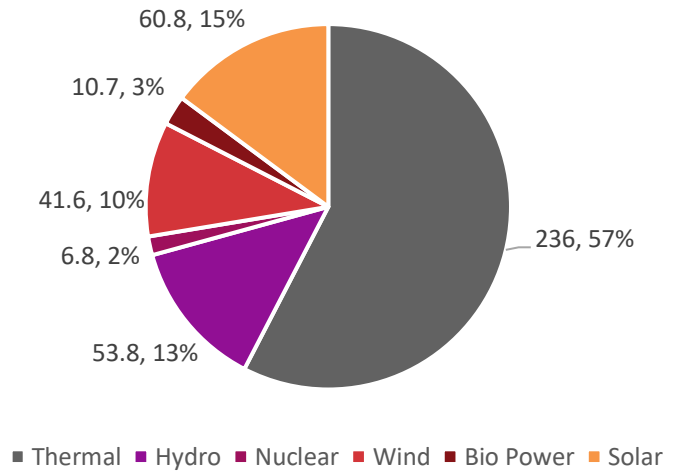
Contribution of renewable sources to total energy

For achieving 40% energy from renewable sources, India had initially taken a target of 450 GW installation by 2030, which is now revised to 500 GW. The installed capacity of renewable energy (165 GW) has already reached 40% of the total installed capacity (408 GW). Although the actual power generated from renewable sources is just 22% of total, it has steadily increased from just 16% five years ago.

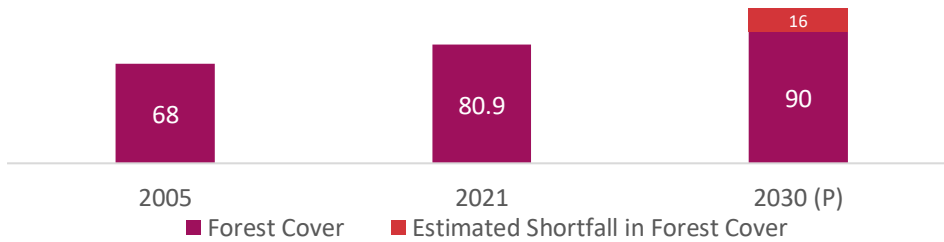
Multi-pronged approach by the government to discourage new coal fired power plants while incentivising solar power ecosystem has born the right fruits. Based on the encouraging results in the renewables energy field, India has raised the bar and committed to 50% energy from renewable sources by the year 2030, which seems very achievable considering the ambitious project pipeline along with PLI schemes and innovative funding methods like sovereign green bonds.

Creating additional carbon sink

Installed Capacity (in GW), Oct '22



India's forest cover (in mn hectares), 2005-30



India had total forest cover of 80.9 million hectares in 2021, covering 25% of the country's geographical area, up from 68 million hectares in 2005. To create additional carbon sink of 2.5-3 billion tons, India needs afforestation over 25-30 million hectares of land, at a budget of INR 60,000 crore annually. Programs for afforestation along railway lines and highways are good but highly insufficient. Green India Mission's achievement from 2015-16 to 2020-21 is also a meagre 70%, with afforestation on 1,17,503 hectares of land against target of 1,67,151 hectares. India seems to have over committed with regards to this aspect of the NDC. Assuming the 1.1% annual growth rate in forest cover from 2005-21, India will only add 9 million hectares of forest till 2030, which is way short of the requirement. However, for quicker results, India has committed to restoration and conservation of natural ecosystems and protection of mangroves, which are proven to absorb 4-5 times more carbon than tropical forests

It's certain that India has made satisfactory progress on its initial NDC and is therefore confident enough to revise two of its targets. India is one of the fastest growing economies in the G20 and also the only nation on path to achieve the goals of Paris Agreement. Therefore, India cannot ignore environmental aspects in its quest for rapid economic growth. That's a tight rope balancing act that the various institutions involved need to play to help India achieve its economic goals while also achieving the best for the environment.

Our Values – The Avalon EDGE

E

ENTREPRENEURSHIP

Enterprising ownership to transform ideas into pragmatic and profitable solutions

D

DEDICATION TO EXCELLENCE

Commitment to premier quality and highest standards in everything we do

G

GREAT VALUE CREATION

Focus on delivering maximum client impact through innovation and collaboration

E

ETHICAL APPROACH

Respect, fairness and transparency in all our interactions

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