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COP27 Analysis: Assessing India & China's Climate Targets

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Foreword

China and India are critical players in the global fight against climate change. Together they account for 2.7 billion people, nearly 20% of global GDP and nearly a third of global emissions (China 24.23% + India 6.76% [1]). At UN climate talks, what Beijing and Delhi say matters: major decisions at the COP27 UN climate summit in Sharm El Sheikh will not pass without the tacit approval of Xi Jinping and Narendra Modi.

Both countries are also deeply vulnerable to climate impacts. Leading insurer AON rates 2022 as one of the most damaging [2] on record. China has incurred extreme weather losses of +$20 billion, while flooding left India with a +$2billion bill and nearly 2000 dead. Workers in both countries suffer: in 2021, India witnessed a 5.4% drop in earnings due to extreme heat, while in China, that figure was 1% [3].

In 2021, both countries committed to long-term net-zero climate targets, China before 2060 and India in 2070. But assessing interim progress in Delhi and Beijing has been hard. Politicians in both capitals previously followed the policy of under-committing on targets internationally, in part due to energy security concerns. But a growing amount of evidence is suggesting that their investments in clean power and green technology are fast gathering momentum.

1. Climate Watch Data: China and India emissions https://www.climatewatchdata.org/countries/USA?end_year=2019&start_year=1990#ghg-emissions
2. AON rates 2022 as one of the most damaging year on record - https://www.aon.com/reinsurance/getmedia/08b0306f-790c-4f6a-8c0e-883e91ceba04/20221410-if-q3-2022-global-cat-recap.pdf
3. 5.4% drop in earnings due to extreme heat in India and 1% drop in earnings in China - https://i0.wp.com/www.climate-transparency.org/wp-content/uploads/2022/10/CT2022-SR-key-graphs7.png?ssl=1

This assessment seeks to separate the short and long-term energy trends in both countries - recognising that coal plays an important role in the power mix of both countries yet identifying the recent investments and policy shifts that suggest rapid shifts in their energy portfolios through the 2020s and into the early 2030s.

3 Key Takeaways

1. India & China are on track to overachieve their UN climate targets.

2. China is set to install a record 156 GW of wind & solar energy this year, and China's EV sales are forecasted to double, with the possibility of reaching 6 million.

3. Renewable energy installed capacity in India has expanded at a rate of 19% annually between 2016-2021. India's draft national electricity plan sees an 18 GW downward revision of installed coal capacity in 2030.

Separating Short vs Long Term

There can be no doubt that coal dominates the power mix of both India and China. Equally, looking at recent data, there is little sense that this is fast shifting. As leading clean energy analyst BloombergNEF (BNEF) explains, "global coal-fired power generation surged 750 Terawatt-hour (TWh) in 2021 from the year prior as the global economy began to recover from the effects of the Covid-19 pandemic. [4]" In China, the net change in coal-fired generation was +395TWh. Demand for coal-fired power also increased in India by +153TWh.

The International Energy Agency's 2022 World Energy Outlook [5] tells a similar story. "Coal demand rebounded strongly in 2021 to over 5 600 million tonnes of coal equivalent (Mtce) as economies recovered from the pandemic and some countries – notably India and China – turned to domestically produced fuel sources in the interests of affordability and energy security." Faced with spiking energy demand and prices, leaders turned to the fuel source they knew best.

Yet both BNEF and the IEA spy longer-term trends that will see Delhi and Beijing shift off coal. For the IEA: ***"This surge is not a long-term one in any of our scenarios… coal demand remains near its historical peak for the first half of the decade, but returns to structural decline in the second half of this decade."*** For BNEF, power costs are key to understanding where the countries are heading. "The source of bulk generation ($/megawatt-hour/MWh, levelised) in India is solar ($31) and China is onshore wind ($39)." By way of comparison, in India, in 2022, costs of coal generation/ megawatt-hour are estimated to be $127/MWh (IRENA) [6]. In China, this falls to around $53MWh, according to the country's National Energy Administration [7].

4. BNEF - coal power generation surged 750TWh in 2021 - https://assets.bbhub.io/professional/sites/24/BloombergNEF-CEM-2022-Factbook.pdf
5. IEA WEO 2022 https://www.iea.org/reports/world-energy-outlook-2022
6. IRENA - cost of coal power generation in India $127/MWh https://www.bqprime.com/business/coal-power-is-four-times-costlier-than-renewable-energy-from-new-units-in-india
7. China's National Energy Administration estimates cost of coal power generation in the country to be $53/MWh https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/coal/110619-chinas-electricity-price-from-gas-drops-but-still-over-30-higher-than-coal-nea

These low costs are reflected in the investments pouring into the clean energy sectors in both countries, which we explore in greater detail below. As this World Economic Forum analysis details, "in 2021, clean energy investment in China spiked 69% year-on-year to $297 billion. In India, starting from a lower base, a total of $14.5 billion was invested in renewable energy [2021-2022], up by 125% compared with the financial year 2020-21 and 72% higher than in the pre-pandemic period of the 2019-20 financial year. [8]"

These investment shifts were noted in the latest IEA WEO, which says projected emissions in 2050 in this year's APS (Announced Pledges Scenario) are 8 Gt CO2 lower than last year's assessment, "mainly due to the net zero emissions pledges made by India and in Southeast Asia." Indeed, the IEA now predicts that "the massive build-out of clean energy" in China will see coal and oil consumption both peak before 2030.

The IEA uses three headline scenarios for its analysis:

1. The 1.5C-aligned "net-zero emissions by 2050" (NZE) scenario offers a "narrow but achievable" pathway to 1.5C.
2. The "stated policies scenario" (STEPS) represents current policy settings requiring detail on how they are to be achieved.
3. The "announced pledges scenario" (APS) is based on all government pledges which are assumed to be met in full and on time.

8. RE investments in India and China according to IEA's WEO - https://www.weforum.org/agenda/2022/07/india-investment-renewables-green-energy/

A Track Record of Lowballing NDCs

Setting conservative targets that are then overachieved is no bad thing. Far better to aim low and deliver high than spend big on PR advisors and nothing on energy advisors. But in the context of a global transition where investors, countries and the public are frantically looking for signs of progress, India and China's lowballing has the potential to mislead - even if that is not the intention of the respective governments.

The team at Climate Action Tracker - an independent consultancy - captures India's stance well in its latest assessment [9]:

"In August 2022, India officially submitted its updated Paris Agreement targets, having first announced new targets at COP26 in November 2021. It strengthened both the value of its 2030 emissions intensity target and the share of electricity generation capacity that will come from non-fossil fuel-based sources compared to its first NDC. At COP26, Prime Minister Modi also announced a 500 GW non-fossil capacity target. This target has not been included in the NDC update. At most, it could drive minor reductions in real-world emissions, given that the 500 GW does not go beyond current government plans. In essence, India has replaced its first NDC targets (that would have been overachieved) with targets close to its current level of climate action. India should feel confident to propose further cuts in 2030 emissions, conditional to international finance, to put India on a 1.5°C pathway."

9. Climate Action Tracker on India https://climateactiontracker.org/countries/india/

Climate Action Tracker's China assessment [10] offers a similar take, noting Beijing will "comfortably overachieve its targets" without much effort.

"Ahead of COP26 in November 2021, China officially submitted to the UNFCCC its carbon neutrality "before 2060" target and updated NDC targets, strengthening its previous non-fossil share and carbon intensity targets while adding a new renewable energy capacity target. However, while China's updated NDC was an improvement on previous targets, it leaves room for further target-raising ambition. We project that China is likely to comfortably overachieve its targets without substantially increasing its current mitigation efforts, despite increasing emissions in the short-term."

10. Climate Action Tracker on China https://climateactiontracker.org/countries/china/

China's Climate & Energy Overview

FACT BOX

Key Takeaways

1. On track to peak carbon emissions by 2030
2. Record clean energy investments in 2022
3. EV sales are now at a historic high

China's energy mix is dirty, using 88% fossil fuels across all sectors. Of this, coal accounts for 60% - significantly higher than the G20 average. According to the 2022 Climate Transparency report [11], China's emissions (excluding land use) have spiked 269% since 1990. It is the world's largest emitter of greenhouse gases by some margin and is still building out coal capacity at scale.

Still, underlying factors are worth noting - and are frequently ignored, given the lack of free media in the country. The most important policy development towards decarbonisation in China is the release of the 1+N framework [12] that provides an overall guidance to policy measures and actions in various economic sectors.

Since 2020 the central government has developed and published a clear policy framework on carbon peaking with clear modelling that suggests that China will achieve its goal for carbon peaking by 2030. Sectors that cover over 97% of China's GHG emissions now have specific emission-peaking plans.

It is widely acknowledged that policy coherence in driving various changes integral to decarbonisation is critical for its success.

11. 2022 Climate Transparency Report - https://www.climate-transparency.org/countries/asia/china
12. China 1+N framework https://chinadialogue.net/en/climate/year-in-review-chinas-climate-goals-hold-up-despite-intense-pressures/

In July 2022, China released its carbon-peaking plan for urban and rural development [13] . The plan applies to the urban and rural construction sector plans to “fundamentally reverse the trend of large-scale construction, big energy consumption, and high emissions.”

In August 2022, an industry carbon-peaking plan was released 14. It reaffirmed the top-line target to peak the sector’s emissions before 2030, set controls on the expansion of energy-intensive projects and set specific 2030 targets on electric arc furnaces and renewable energy in the electrolytic aluminium industry.

13. China emissions peaking plan, July 2022 https://chinadialogue.net/en/digest/carbon-peaking-plan-for-urbanisation-released/
14. China’s industrial emissions peaking plan, August 2022 https://www.scmp.com/business/china-business/article/3187317/china-releases-plan-guide-carbon-intensive-industries-reach

The speed of China's renewable energy rollout is - by any comparison - extraordinary.

1 - "China is set to install a record 156 gigawatts [15] of wind turbines and solar panels this year, said Yi Yuechun, vice dean of the China Renewable Energy Engineering Institute, a think tank that supports the National Energy Administration. That would be a 25% jump from last year's previous record set.

2 - CREA's analysis [16] of targets and projects announced by the central and provincial governments shows wind and solar capacity would reach more than 1,100GW by 2025. The wind and solar plans emerging from recent policymaking are far ahead of the pace implied by China's headline climate commitments (1200GW by 2030).

3 - China's EV sales are also forecasted to almost double this year, possibly reaching 6 million [17]. BYD, a major Chinese car maker, announced it to stop the production of ICE-only cars in April [18]. In the first six months of 2022, BYD was the world's biggest EV producer by sales [19], taking over the crown from Tesla.

4 - Regulations on green bonds have been improved [20]. China's Green Bond Standards Committee released the Green Bond Principles in July, which require that 100% of funds raised by the four major types of green bonds issued in China be used for green projects. In the past, the issuer could channel up to 50% of such funds for use in general operations. This has long been regarded as a "greenwashing" loophole discouraging international investors.

15. China set to install a record 156GW of wind and solar capacity this year https://www.bloomberg.com/news/articles/2022-06-24/china-s-clean-energy-growth-outlook-for-2022-keeps-getting-bigger#xj4y7vzkg?sref=etBYO4Ua
16. CREA Analysis: China's wind and solar installation will reach 1100GW by 2025 https://www.carbonbrief.org/analysis-what-do-chinas-gigantic-wind-and-solar-bases-mean-for-its-climate-goals/
17. China's EV sales set to reach 6 million this year - https://www.bloomberg.com/news/articles/2022-08-09/china-s-july-car-sales-rise-20-on-demand-for-electric-vehicles#xj4y7vzkg
18. BYD, a major Chinese vehicle manufacturer, stopped producing ICE-only vehicles in April this year https://www.carscoops.com/2022/04/byd-stops-production-of-ice-only-vehicle-focuses-on-phevs-and-bevs/
19. BYD is the world's biggest EV producer by sales https://www.scmp.com/business/china-business/article/3184241/chinas-byd-takes-teslas-crown-worlds-biggest-electric
20. China improved its regulations on Green bonds https://chinadialogue.net/en/digest/chinese-green-bonds-100-percent-funds-for-green-purposes/

The IEA reckons that growth in energy demand in China will likely stall in the 2020s, with a combination of nuclear and renewables gradually replacing coal in the coming decades.

"Renewables account for nearly 45% of electricity generation in 2030 and account for the majority of the electricity demand growth, helping unabated coal use to peak before 2030 in alignment with government targets. Oil demand also peaks in the second half of this decade, reaching a similar level of demand as the United States in 2030 at just under 17 mb/d (with a population four times larger) before declining. This peak and decline reflect rising EV sales, and China remains the world's largest EV market."

FACT BOX

SLOWDOWN IMPACT

China's economy faces severe headwinds and allied to Covid lock-downs, this will have a major impact on the country's emissions trajectory. The Chinese government aimed for 5.5% GDP growth in 2022, but most recent forecasts suggested the actual growth rate would be around 3.2% [21], mostly due to China's long-lasting zero COVID policy. China's economic outlook in the following years is not optimistic [22], as China's real estate sector - one of the most important sectors of China's economy and carbon emissions - is undergoing a crisis. The slower-than-expected GDP growth rate can mean earli-er-than-planned peaking of carbon emissions.

21. China's actual growth rate to be around 3.2% https://www.theguardian.com/business/2022/sep/27/china-growth-lags-asia-pacific-for-first-time-in-decades-as-world-bank-cuts-outlook

22. China's economic outlook for the next several years is not optimistic https://carnegieendowment.org/chinafinancialmarkets/87007

India's Climate & Energy Overview

FACT BOX

Key Takeaways

1. India's domestic power targets aim to achieve 68% of non-fossil installed capacity by 2030, whereas India's updated NDC aims for 50% by 2030.
2. Renewable energy installed capacity in India has expanded at a rate of 19% annually between 2016-2021.
3. India's draft national electricity plan sees an 18GW of downward revision of installed coal capacity in 2030

To understand India's energy mix, look at its air quality. To cite the 2022 Climate Transparency report [23], "around two million people die in India every year as a result of outdoor air pollution due to stroke, heart disease, lung cancer and chronic range respiratory diseases. Compared to the total population, this remains one of the highest levels in the G20."

India is a fast-developing country, which means a parallel growth in total emissions. From 1990-2018 emissions (excl. land use) increased by 172%. As with China, fossil fuels dominate the energy mix: coal (44%) and oil (22%) are out in front, with just 12% rated low carbon [24]. The 2022 IEA WEO predicts Energy demand in India will rise at over 3% per year through 2030, with coal meeting a third of this demand.

Still, the IEA and others are seeing signs of a significant shift. Long seen as a major employer, the coal sector is directly and indirectly

23. 2022 Climate Transparency report - Outdoor air pollution causes 2mn deaths per year https://www.climate-transparency.org/wp-content/uploads/2021/10/CT2021India.pdf
24. Low carbon makes about 12% of India's energy mix https://www.climate-transparency.org/wp-content/uploads/2021/10/CT2021India.pdf

linked to 13m jobs [25], but falling employment levels speak to an otherwise hidden transition [26]. The WEO sees renewables meet 30% of electricity demand growth to 2030, notably through a rapid increase in solar PV deployment. By 2030, renewables will account for 35% of generation, and solar alone will account for 15%.

Driving these shifts are a number of policies and trends. Government programmes, such as the Gati Shakti National Master Plan (to coordinate the quick ramp-up of energy infrastructure) and the Self-Reliant India scheme, are predicted to increase renewables.

It's notable that thermal power giants such as NTPC, Tata Power and JSW Energy have lately pivoted towards green energy with ambitious capacity addition commitments. In addition, a new set of independent power producers (IPPs), such as Adani Green Energy, ReNew Power and Azure Power, have entered the market, tapping into both domestic and increasingly global capital markets.

Growing momentum for clean power growth in India has also translated into a record 13 GW of renewable energy capacity in just the first three quarters of 2022 [27]. This is 26% more than what was installed in the same period in 2021. More specifically, recent renewable energy capacity growth in states like Rajasthan, Gujarat and Karnataka shows what is possible.

Key government policy shifts include a production-linked incentive (PLI) program of Rs420 billion (US$5.3 billion) to manufacture solar

25. India's coal industry employs 13mn people - https://www.business-standard.com/article/current-affairs/coal-transition-can-impact-over-13-mn-people-s-livelihood-in-india-study-121112201472_1.html
26. Falling employment levels in the coal industry points to a transition already under way https://scroll.in/article/1016936/in-indias-coal-belts-jobs-are-now-hard-to-get-and-harder-to-keep
27. India installed a record 13GW of renewable energy in the first three quarters of 2022 https://ember-climate.org/data/data-tools/india-re-newables-tracker/

modules [28] and batteries [29] for electric vehicles and energy storage; the Energy Conservation Bill 2022 that sets out consumption thresholds for various non-fossil sources and the green open access (OA) policy in June 2022.

Various government corporations have also committed to achieving net-zero carbon emissions, like Indian Railways (which carries 24 million people daily) by 2030, Indian Oil Corporation by 2046, GAIL by 2040 and Chhattisgarh Health Department by 2050. In addition, the Ministry of New and Renewable Energy recently revived India's off-shore wind power plans with an announcement of a mega 4GW tender for offshore wind power off Tamil Nadu and Gujarat coasts in the next few months.

These projected shifts have seen India's government hike its clean energy projections - even if this is not reflected in its UN target. In its new draft National Electricity Plan, India is considering even more aggressive national power sector targets, including setting solar capacity at 333GW by 2032, up from 300GW in 2030 set in the OGCM report (Optimal Generation Capacity Mix Report).

The government's draft National Electricity Plan [30], sees coal use falling, 249GW by 2032 vs 267 GW by 2030 in the OGCM report. This first step is in line with its coal phasedown commitment at COP26. It also pegs the share of non-fossil power generation by 2032 at 49% - Coal generation to fall from 74% in FY 2022 to 50% in FY 2032 (Higher/conservative demand growth assumption made in the draft means coal's share can drop much lower than this in reality)

28. India's PLI for solar panel manufacturing https://www.financialexpress.com/industry/pli-scheme-for-solar-to-help-reliance-tata-adani-16-others-to-take-india-closer-to-2030-renewable-goal/2425262/
29. India's schemes for increasing battery manufacturing infrastructure - https://pib.gov.in/PressReleasePage.aspx?PRID=1809037
30. India's draft National Electricity Plan sees a downward revision in installed coal capacity by 18GW https://energy.economictimes.indiatimes.com/news/renewable/indias-energy-transition-spike-in-solar-decline-in-coal/94225531

China and India at COP27

Neither Modi nor Xi will travel to Egypt for COP27, evidence that little should be expected by way of major announcements at Sharm El Sheikh from the two.

China is unlikely to present a more ambitious climate plan at COP27, as the government is constrained by economic pressure. However, the continued rapid expansion of China's EV and renewable energy industries provides reassurance in the country's low-carbon transition. The Chinese government is increasingly embracing the notion of "high-quality development", which implies slower GDP growth but more prioritisation of environmental and social benefits. The clean industries' strong resilience against economic turbulence presents a feasible pathway to achieve this new vision.

India too, is likely to stick to what it has committed in its plans, given the economic constraints and geopolitical uncertainty in 2022. Growth and development remain part of India's priorities as it steers towards decarbonisation. Even though coal is the mainstay and will remain part of the energy mix with no clear indications of peaking, recent policy measures and the current progress indicate that India is well poised to accelerate past its 2030 targets.

Conclusion

There can be no doubt that China and India's greenhouse gas emissions have soared in the past decade, built on their vast expansion of coal power generation. Driven by the need to maintain high levels of employment and growth, these powerhouse economies have invested huge sums in fossil fuel infrastructure, China taking the top spot as the world's top polluter and India edging into the fourth spot behind the US and EU.

What's also clear is that Beijing and Delhi are pivoting fast towards cleaner economies, a shift obscured by the smog that hangs low over their largest cities and an unwillingness to explain their long-term energy strategies at length.

The fact is - as the 2022 IEA WEO explains - "New policies in major energy markets help propel annual clean energy investment to more than USD 2 trillion by 2030 in the STEPS, a rise of more than 50% from today." Those new policies are, in no small part, driven in Asia, recognising the huge opportunities for growth and jobs in the cleantech sector and its place as a major arena for international economic competition.

China and India play a critical role in global climate diplomacy and in driving the energy transition. Leadership is required from both countries both domestically and internationally. Higher targets and clearer policies drive confidence among investors and shift markets. As such both should be more specific about their short-term targets and action plans, and should further raise their climate ambitions to match their development trajectories.

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