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At the UN Climate Change Conference or COP26 last November, Patricia Espinosa, Executive Secretary of the United Nations Framework Convention on Climate Change, urged us to “recognize that business as usual isn’t worth the devastating price we’re paying”. Former US Vice President and 2007 Nobel Laureate Al Gore had, way back in 2005, spoken on similar lines in his Commencement Address at Johns Hopkins University. Talking about “an imminent planetary crisis”, he had said that taking a BAU approach here “can only lead to disaster in the near future.”

As we accelerate efforts to combat climate change, we must take cognizance of our overall approach towards it.

The push for clean energy transition as an effective climate action strategy is intensifying. Since fossil fuels—which include coal, lignite, and liquefied natural gas (LNG)—are major greenhouse gas producers, they will have to be replaced with cleaner sources of energy production, broadly known as renewables (solar, wind, and hydro). In addition, natural gas, which is significantly less carbon-intensive as compared to coal, is being used as a lower-emission fuel during the energy transition.

Our discussion on the possibility and feasibility of replacing thermal energy with renewables in just a few years can start by reviewing the energy-mix data at the national level, as indicated in the graph below. It is immediately evident from the graph that till as recently as 2019, coal occupied a dominant place among the sources of energy, but is seeing a downward trend thereafter. On the other hand, the share of renewables (solar) has been steadily growing, with rapid increases.

Hence, we may infer that the decreasing proportion of thermal energy and the increasing share of renewables must lead to a situation where renewables provide all the energy that is currently being provided by thermal sources (mainly coal).

However, there are at least four important factors that, when considered, indicate that the goal of achieving such complete substitution by 2025 is extremely ambitious for India.

Firstly, the trends in thermal energy and renewables and their extrapolation by a few years show that a complete substitution by 2025 is unrealistic. Secondly, we need to factor in supply-side constraints, which will apply in the case of rapid scaling-up of renewables. For example, the production of photovoltaic panels will have to rise dramatically for the 2025 deadline to be met. We also have to consider the supply of associated electronics and storage systems, and the balance of systems required to achieve the substitution.

Further, the COVID pandemic has slowed down the energy transition journey, which implies that India will be coal-dependent for a longer period than anticipated. According to the International Energy Agency (IEA), investment in the energy sector fell by an estimated 15% in 2020, in the aftermath of the pandemic, worsening the financial stress across the board, and especially on India’s electricity distribution companies.

Finally, the recent geopolitical shocks caused by the war in Ukraine have increased spot prices for natural gas. This will lead to fewer power producers using natural gas turbines to produce electricity, and resorting to coal instead. The trend is likely to continue for another two years, due to which coal will probably remain the top source of power generation.

According to an analysis in IEA’s India Energy Outlook 2021, coal accounts for about 66% of total energy production in India in 2022, and is projected to reduce to 54% by 2030. Solar energy production, on the other hand, is projected to increase from 6% to 16% in the same time frame.

If we take these projections at face value and consider them as part of the BAU approach, it is quite clear that aiming for a complete replacement of thermal power with renewables by 2025 is indeed ambitious for India. The global situation is not very different.

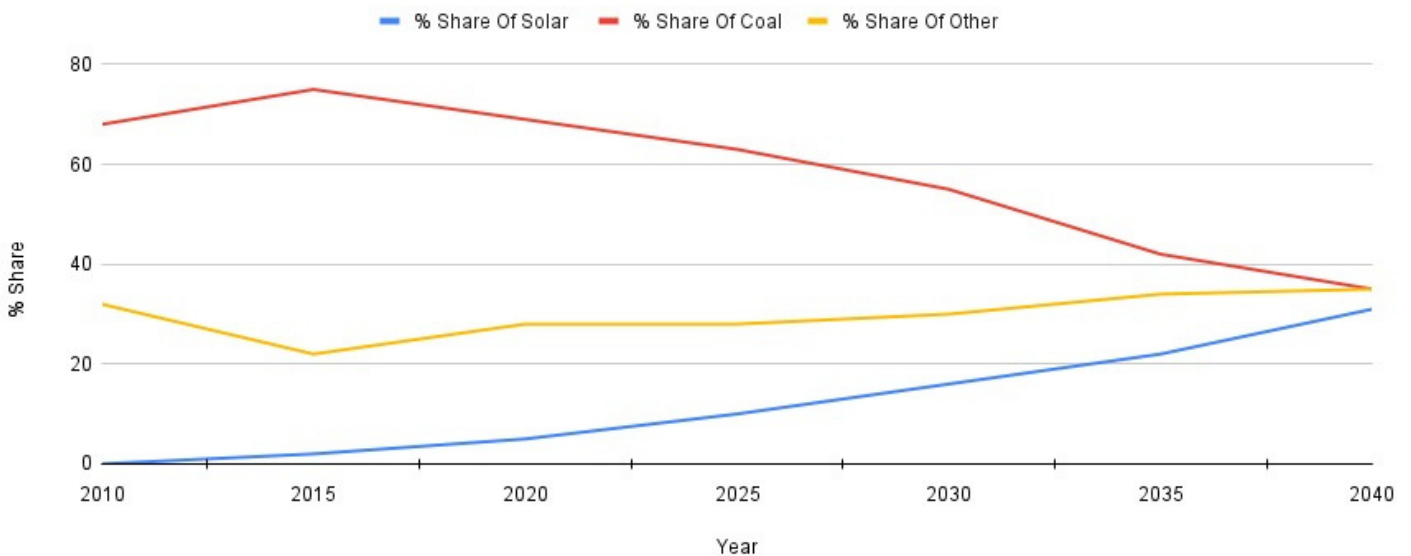


Figure 1: Relative contributions of coal and solar to power generation in India (2010-2040) in a BAU scenario.

Source: India Energy Outlook 2021