

## ***Interactive comment on “Timely estimates of India’s annual and monthly fossil CO<sub>2</sub> emissions” by Robbie M. Andrew***

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Overall comments Overall, this is a useful and important paper, and of high scientific quality and policy importance.

It would be good to include a table with sources and hyperlinks if consistent with the journal policy.

From a policy-making point of view, I believe it would be useful for the paper to make a few observations on the ways in which India’s data presentation could be best improved. Frustration with the disparate sources and poor presentation are widespread among the policy community and providing guidance on improvement would be valuable.

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Page 1, Lines 24-27: It is worth mentioning here that India’s carbon intensity of energy supply has also increased over the last 10-15 years, as the share of hydro electricity has declined, the share of coal increased, biomass transition in the residential sector has progressed, and emissions intensive fuels in industrial final energy consumption has increased. Page 1, Line 28: Better not to say "small renewables" as India has some of the largest utility scale solar parks in the world. Page 1, Line 40: this list of references should include the India GHG Platform initiative: <http://www.ghgplatform-india.org/> Page 3, Line 25-27: it may be possible to get naphtha consumption for production of durable commodities in the Annual Survey of Industries macro-data, and apply this ratio to monthly naphtha consumption data. Page 3, Line 37-40: It is know that the calorific value of Indian coal varies greatly between different coal grades, and is generally understood to be declining over time as the quality of domestic mined coal declines. Some discussion of improved estimates of the calorific value of Indian coal should be made. Page 4, Lines 23-26, and Page 5, Line 1: it is worth noting that the observed monsoonal seasonality for coal, cement and oil is due in part to the same reason: economic activity in industry and construction declines during monsoon, implying reduced power demand and transport requirement. In additional residential electricity consumption declines as the temperature drops. Page 7: Lines 11-18: It would be good to discuss in a little detail, which errors may have cancelled. In addition, it would be good to explore the BUR to look at what emissions factors have been used for Indian coal, and how these compare with those used in this paper. Page 8: Lines 6 -16: This paragraph confused headwinds and tailwinds to coal supply with headwinds and tailwinds to coal demand. "difficulty in acquiring land and environmental permits, local protests, difficulty obtaining finance" relates to coal supply, while "large economic shocks such as 2016’s demonetisation, 2017’s GST introduction and 2020’s COVID-19 pandemic" relate to coal demand through channel of general macroeconomic growth. I believe the latter is much more important to understanding the deviation from forecast demand. In this regard, the paper could cite briefly some of the macroeconomic literature explaining India’s growth

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slowdown (for example: <https://www.hks.harvard.edu/centers/cid/publications/faculty-working-papers/india-great-slowdown>) Page 10, Lines 23-26: As discussed above, calorific value and emissions factor estimates for Indian coal may lead to significant uncertainties and are worth reviewing here.

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