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India's nationally determined contribution  
and future energy plans in global climate  
policy

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# **Is India pulling its weight? India's Nationally Determined Contribution and future energy plans in global climate policy**

## Introduction

India's role in the last two decades of global climate governance has often been described as 'obstructionist' and 'difficult' (Mathur & Varughese, 2009; Vihma, 2011). Yet, in recent years, and particularly in the lead up to the 2015 Paris Agreement, India was seen by some commentators to have made an active effort to play a more constructive role in global climate policy (Michaelowa & Michaelowa, 2012; Mohan, 2017). For instance, at the Paris Climate Summit, India accepted the more ambitious 1.5 degrees target despite the risk of this "shifting the mitigation burden towards countries such as India" (Dubash, 2016). India also quickly ratified the Paris Agreement despite lack of full clarity from developed countries on pre-2020 actions and then affirmed continued commitment to the Agreement after the announcement of a withdrawal from the United States (Mohan, 2017). Last but not least, India spearheaded the launch of an international solar energy alliance at Paris, demonstrating its leadership towards clean energy solutions that can be deployed not just at scale in India but also several other developing countries.

These developments have mirrored a larger shift in the Indian foreign policy agenda since the election of the Narendra Modi government in 2014, which has sought to position India as a leader in global governance and a nation intent on staking its claim among other major powers in global politics (Narlikar, 2017; Saran, 2015). India's climate diplomacy ahead of and at Paris accordingly indicated a shift in India's engagement with the United Nations Framework Convention on Climate Change (UNFCCC) and global climate politics. It has

transitioned from challenging the rules of global climate governance to helping set the norms and processes that shape international climate action (Mohan, 2017). This, combined with the fact that India is the world's third largest carbon emitter, means that India's actions will be critical towards global efforts to hold temperature rise to well below 2<sup>0</sup>C, and pursue efforts to limit it to 1.5<sup>0</sup>C, above pre-industrial levels.

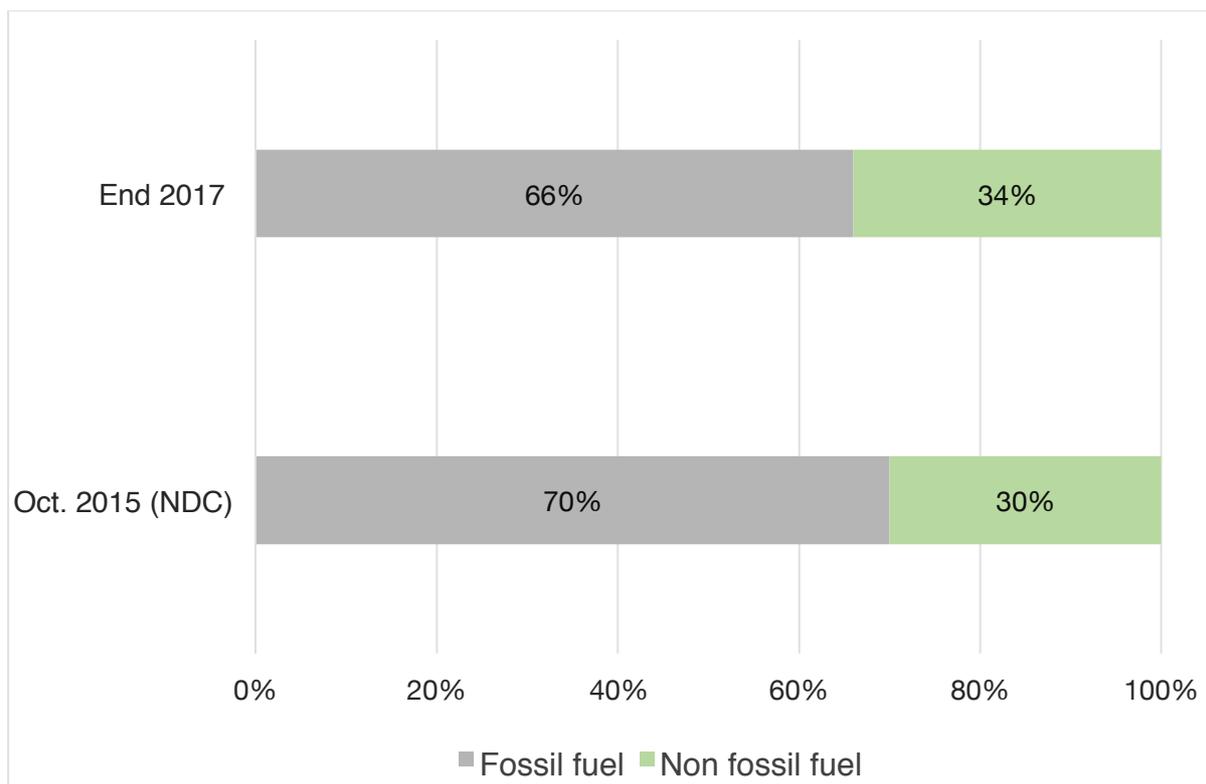
The nationally determined contributions (NDCs) made by countries under the Paris Agreement will not be sufficient to limit temperature rise to well below 2 degrees (Rogelj et al., 2016); the emissions gap to scenarios that achieve the Paris Agreement goal of limiting temperature rise to either 2<sup>0</sup>C or 1.5<sup>0</sup>C is currently 'alarmingly high' (UNEP, 2017). Furthermore, the latest global carbon budget data estimate that 2017 saw a rise in global emissions after three years of stagnation (Le Quéré et al., 2018). Increasing the ambition of the NDCs is therefore critical and urgent (Höhne et al., 2017). Following the start of the 2018 UNFCCC Talanoa dialogue and ahead of Conference of Parties (COP) 24 - where countries will continue to take stock of: 'Where we are? Where do we want to go? How do we get there' (UNFCCC, 2017) - this paper assesses India's progress on its NDC targets and role in global climate governance. Limited analysis has been done on the context of these targets and what they mean in terms of domestic energy policy in India. We contextualise the NDC commitments in India's domestic climate and energy scenario, comment on the inconsistencies between India's domestic realities and international commitments on climate change, and consider the likely effectiveness of these commitments in light of future energy plans post 2030. Finally, some suggestions are provided on how India can match its 'soft' actions towards assuming leadership in climate governance with 'hard' measures to reduce emissions at home.

## Progress on NDC targets

India's NDC outlined the shift in India's engagement with the UNFCCC and global climate politics. Traditionally, Indian climate policy has focused on balancing the twin narratives of equity and co-benefits (Dubash, 2013). While significant sections of the document continued to engage with questions of equity and fairness, the core of the commitments themselves focused on mitigation and adaptation targets. Critical among these commitments with regards to mitigation was the target to increase non fossil fuel capacity to 40% of total electricity capacity by 2030 (Government of India, 2015). Furthermore, India pledged to reduce the carbon intensity of its economy by 33-35% by 2030 compared to 2005 levels (Government of India, 2015). This commitment is an update on the Copenhagen pledge in 2009 where India promised to reduce emissions intensity by 20% by 2020 compared to 2005 levels. Although the NDC does not specify this, it is assumed that the NDC pledge excludes the agriculture sector, as that was the form of the Copenhagen commitment. It is also assumed that the commitment does not cover emissions from land use, land use change, and forestry (LULUCF), given that the NDC lists a separate target on creating additional carbon sinks (Government of India, 2015). These commitments were found to be compatible with a 2 degrees pathway by Climate Action Tracker (Climate Action Tracker, 2017) and the Indian government itself called its NDC 'fair and ambitious' (Government of India, 2015). However, India's commitments were in reality fairly modest and are inconsistent with domestic achievements and progress. For instance, as of October 2015, when India submitted its NDC, non-fossil fuel electricity capacity was already 30%<sup>1</sup> and it stood at more than 34% at the end of 2017 (CEA, 2018a) (see Figure 1). This indicates that India is already well on its way to achieving NDC targets spelled out for 2030.

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<sup>1</sup> Executive summary from CEA website of 30<sup>th</sup> September 2015.



*Figure 1: Share of installed electricity capacity October 2015 and end 2017*

Furthermore, emissions intensity has steadily declined over the past decade, reaching a reduction of 28% from 2005 levels by end 2016 (see

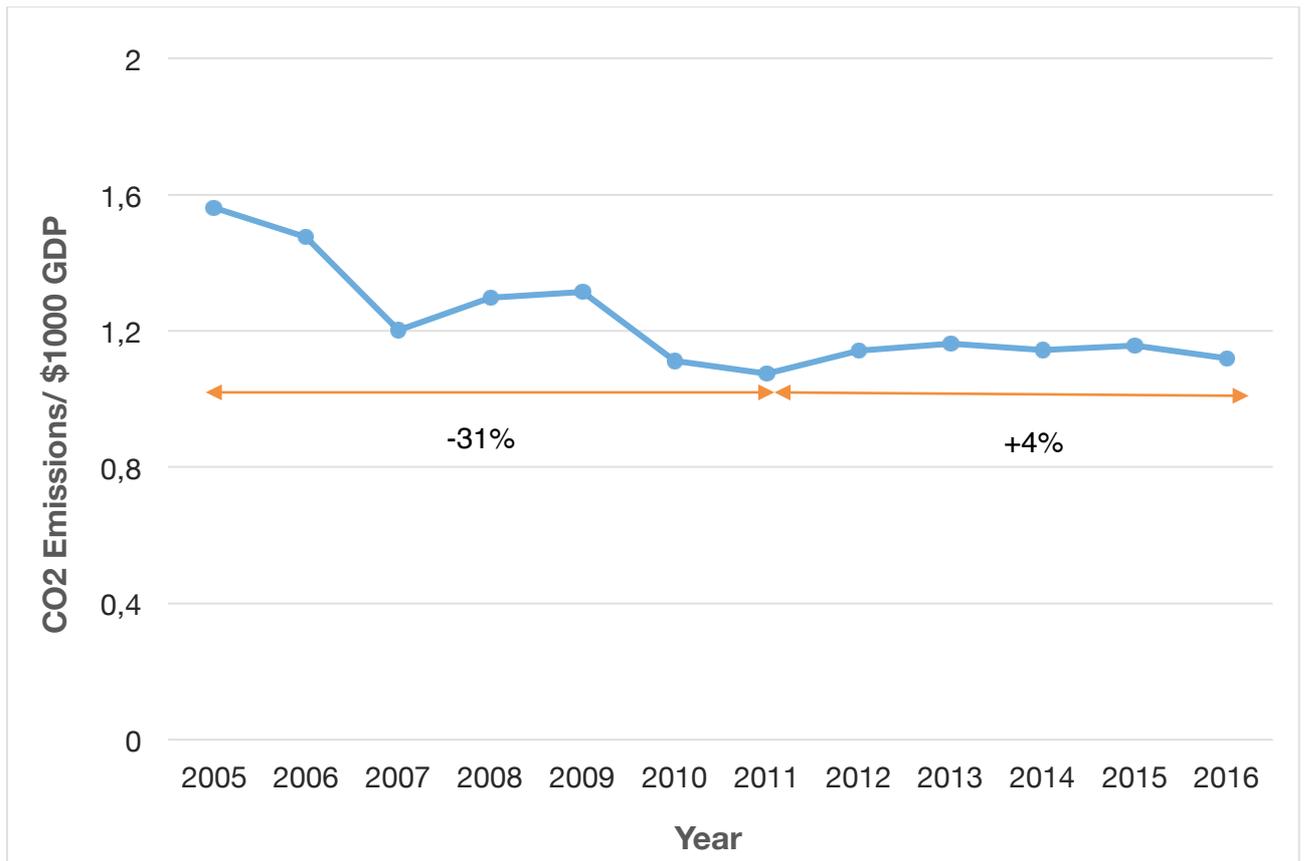


Figure 2).

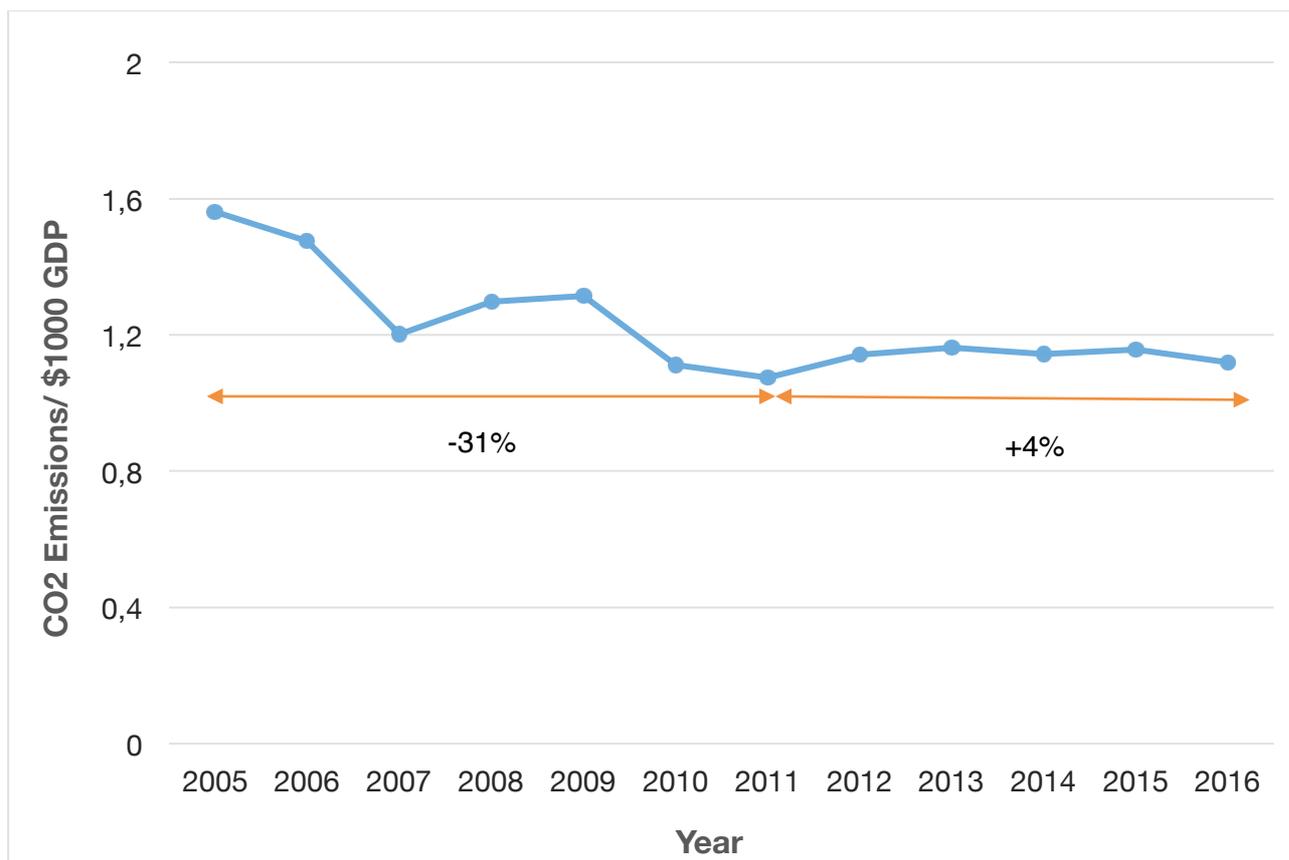


Figure 2: Emissions intensity of the Indian economy 2005-2016<sup>2</sup>

While these achievements can be celebrated as a result of strong domestic policy intervention by the Indian government, the real picture is slightly more nuanced. It is certainly true that India's central government set an ambitious domestic target for renewable energy (RE) growth in 2014 when capacity stood at just over 30 GW, targeting 175 GW of RE by 2022<sup>3</sup>. This target has strong policy support at the central government level through provision of subsidies, allocation of land, waiver of inter-state electricity transmission charges, and other measures. However, it is interesting to note that India's target of 175 GW of RE by 2022 is not an international commitment; even though it finds mention in passing in India's NDC, it

<sup>2</sup> Authors' calculations from historical total CO<sub>2</sub> emissions data from Janssens-Maenhout et al. (2017) and World Bank (2017) historical data on GDP at current US\$ prices based on market exchange rates. India's NDC does not specify which method of GDP estimation will be used for reporting emissions intensity.

<sup>3</sup> RE in Indian government statistics does not include large hydro and so in this paper RE refers to wind, solar, biomass and small hydro power.

is not part of the declared commitments (Government of India, 2015, p. 29). On the one hand, this can be construed as good news – all the better for climate policy if countries do more than they say they will. On the other hand, it poses a couple of challenges. Firstly, the lack of internationally declared commitments on RE reduces the pressure to achieve this target. Indeed, India’s progress towards the 175 GW goal has been steady with current capacity at over 60 GW (see Figure 3) but while the government has indicated its desire to both meet and possibly even exceed this goal, the current rate of growth is likely to fall short, with installed solar capacity in particular at just 17 GW at the end of 2017 compared to the 2022 target of 100 GW for this RE technology. The renewable energy sector in India is also grappling with a series of challenges such as threat of duties on imports of solar panels, difficulties in land acquisition, delays in project commissioning due to state governments renegeing on signed power purchase agreements (PPAs), as well as the weak finances of state electricity distribution companies, all of which, according to industry leaders and civil society experts, will jeopardise achievement of the 175 GW goal (Mohan & Topp, 2018; PTI, 2018). Secondly, it could suggest that the currently declared NDC targets are hardly driven by global climate considerations, but instead formulated with keeping business-as-usual in mind. Furthermore, the clean energy target in India’s NDC is also conditional on help in terms of transfer of technology and low cost international finance from the Green Climate Fund (GCF) (Government of India, 2015), which further reduces the obligation for India to achieve this goal.

These challenges hold true even in the case of emissions intensity targets. For instance, while India is well on track to achieve its 2030 emissions intensity target (see

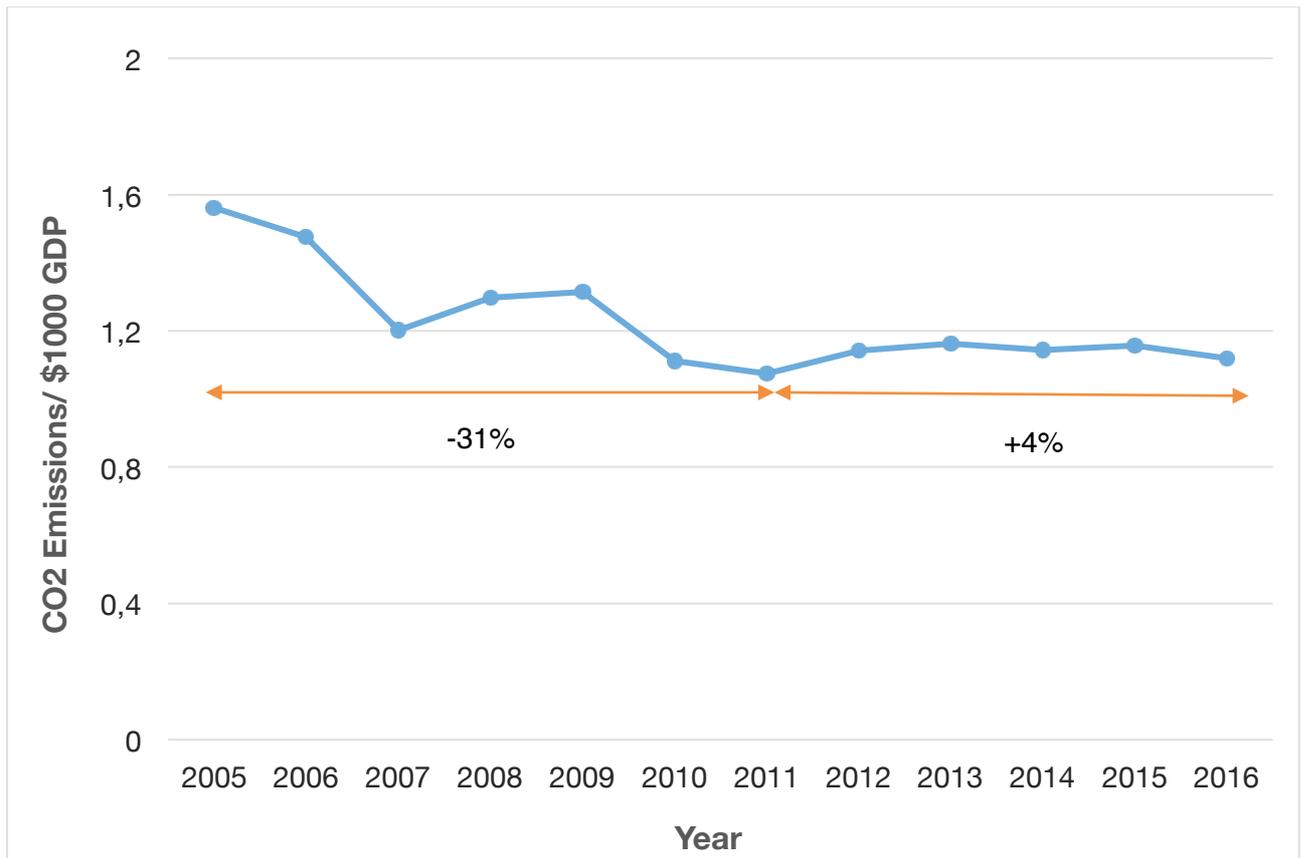


Figure 2), the strong reduction in emissions intensity took place almost entirely between 2005 to 2011 when emissions intensity declined 31%. Between 2011 to 2016, that is, in the lead up to India's NDC formulation and ratification of the Paris Agreement, emissions intensity of the economy remained essentially constant with a very slight increase (see

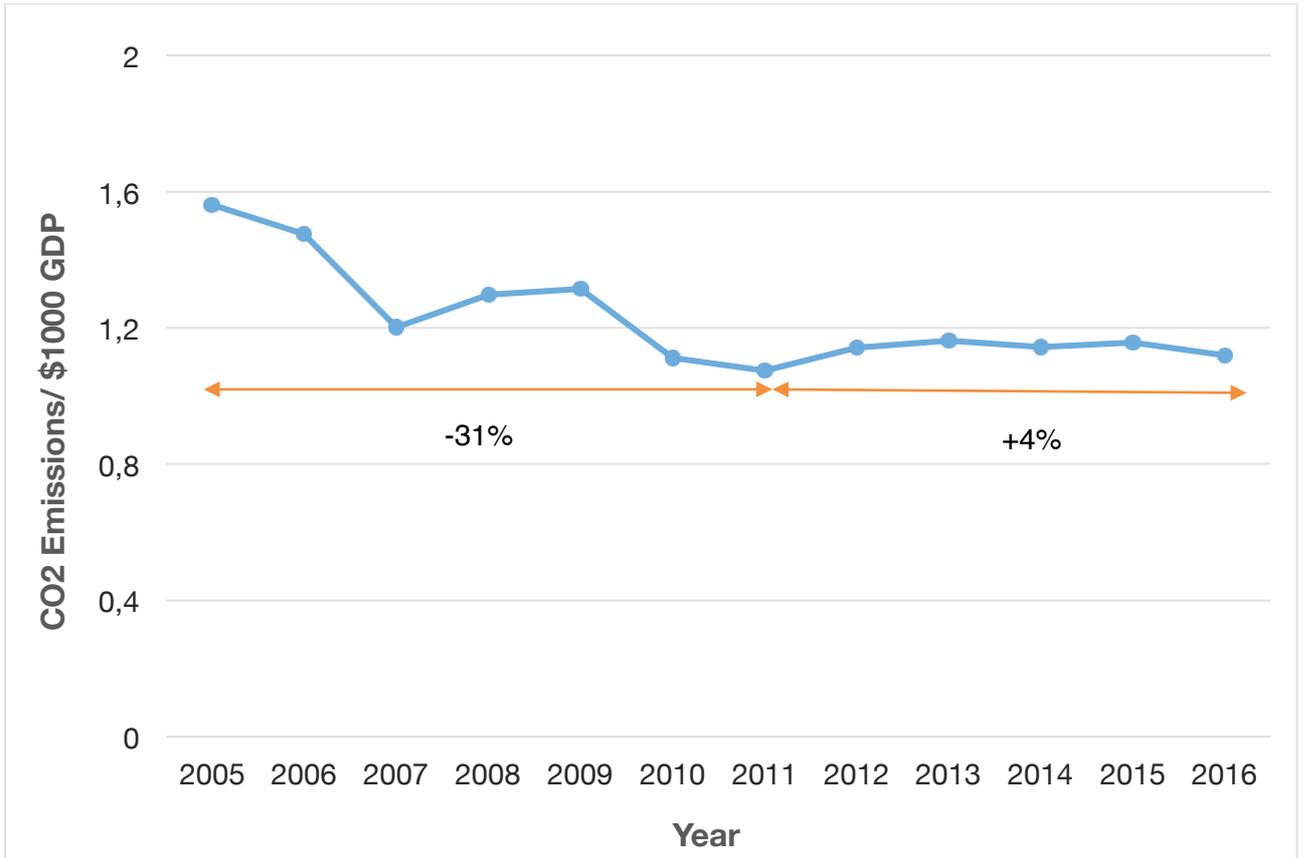


Figure 2).

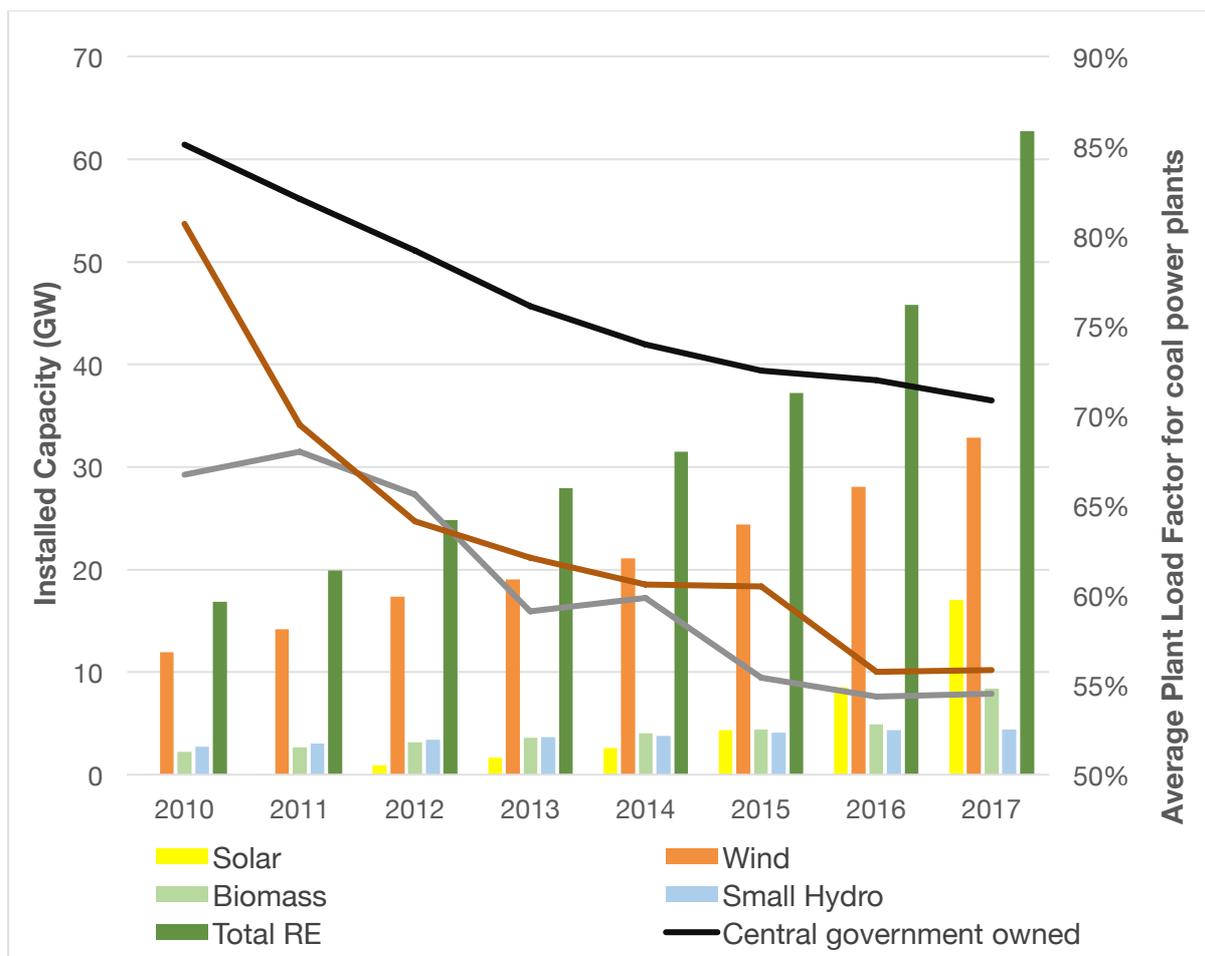


Figure 3: Year on year renewable energy capacity and plant load factors (PLFs) of coal power plants<sup>4</sup>

The conclusion to be drawn from India's emissions intensity and renewable capacity progress is that India has very much 'played it safe' with regards to international climate commitments. India's renewable capacity has actually grown nearly 300% since 2010 but its official NDC target for share of RE in 2030 remains modest, while emissions intensity dropped nearly as much between 2005 to 2011 as India has committed to reducing between 2005 - 2030.

<sup>4</sup> Coal PLF data from <https://powermin.nic.in/en/content/power-sector-glance-all-india#>, renewables installed capacity data from <http://cea.nic.in/reports.html>

## Future energy plans

More worryingly, India's draft National Energy Policy released by the Government think tank NITI Aayog in November 2016 outlines ambitious plans to both expand coal mining and coal fired power capacity in the country. According to the business as usual scenario (BAU), NITI Aayog envisages 440 GW of coal capacity by 2040, which would be a more than a two-fold jump on current levels (NITI Aayog, 2017). This figure is in line with the estimates of Shearer et al (2017) based on the coal projects proposed, in planning, under construction or operational as per the CoalSwarm database. Interestingly, most of this build out is projected to happen between 2027-2040 as the draft national energy policy states that no new coal plants will be built between 2017-2027 apart from the 50 GW already under construction (NITI Aayog, 2017), something which is confirmed by the recently released National Electricity Plan (CEA, 2018b). This indicates that India will be starting a second wave of installing more than 200 GW worth of coal power projects just at the time of the second global stocktake<sup>5</sup> and the final phase of the current NDCs. Even under the 'ambitious action' pathway, it estimates 80 GW of new coal capacity to be needed between 2027 to 2040 (NITI Aayog, 2017).

Despite this significant growth in coal, NITI Aayog estimates that India will comfortably meet its NDC commitments in 2030 with more than half of installed capacity potentially from non-fossil fuel sources, while emissions intensity is estimated to decrease by 45-53% by 2030 compared to 2005 levels (NITI Aayog, 2017). While India is safely on track to meet and overachieve on its first NDC under the Paris Agreement (Kuramochi et al., 2017),

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<sup>5</sup> Under the Paris Agreement countries are required to 'take stock' of progress on climate commitments every five years beginning in 2023.

significant new coal expansion has been planned for the 2030s, putting the strength of its second NDC in doubt.

## India's relevance to global climate targets

According to analysis by Shearer et al (2017) India's future planned coal construction of 243 GW of new capacity to 2040 will result in 83Gt of CO<sub>2</sub> emitted by India's currently operating and future coal plants between 2015-2065. These emissions alone would be 24% of the remaining carbon budget for the rest of the world outside of EU, US and China for a 2°C pathway, if allocations of emissions between regions follow the current distribution pattern (Peters, Andrew, Solomon, & Friedlingstein, 2015). To make sense of those numbers, India's total emissions are currently 14% of the rest of the world emissions, meaning other developing countries, many of which are poorer than India, would have to decarbonise significantly in coming years for India to expand its coal emissions as planned. Another analysis indicates that India can emit 48 Gt of CO<sub>2</sub> for a 50% chance of limiting warming to 2 degrees (Raupach et al., 2014), which would once again mean India's coal plans are incompatible with a 2 degrees pathway. On the other hand, if future distribution of emissions between regions would be through a 'fair' budget allocation, India's annual CO<sub>2</sub> emissions would need to decline by 2030 and can peak at about 3 Gt by 2025 (Peters, 2016; Peters et al., 2015). However, current future energy plans would see annual emissions of 2.3 Gt of CO<sub>2</sub> from just India's coal plants alone in 2040<sup>6</sup>. Overall, in most of the scenarios that limit warming to below 2°C, coal fired power generation with no carbon capture and storage is to be completely phased out by 2050 (Audoly, Vogt-Schilb, & Guivarch, 2014; Kriegler et al., 2014; UNEP, 2017; Williams et al., 2012).

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<sup>6</sup> Authors' calculations based on final TWh of electricity produced from coal in 2040 according to DNEP page 97, table 12 and assuming a coal powered electricity emissions factor of 900 gCO<sub>2</sub>/kWh

Clearly, India's planned expansion of coal capacity, if it materialises, will undermine any chance to limit warming to well below 2 degrees. For a pathway consistent with limiting temperature rise to 1.5 degrees, even India's current energy mix would need rapid transformation with emissions reductions required immediately (Peters, 2016), and future coal plans having to be shelved. The benchmark for coal power in scenarios allowing a 1.5 degrees warming limit, according to Kuramochi et al (2018), is no new coal power plants built worldwide and a 30% reduction in emissions from the existing fleet globally by 2025. Furthermore, according to the 1.5 POLES scenario, India's primary energy consumption from coal in 2030 and 2050 should be 170 and 47 Mtoe respectively to be compatible with a global 1.5 degrees pathway (Luderer et al., 2016; Spencer et al., 2018). However current plans for coal expansion will lead to 517 Mtoe in 2022 and possibly 1000 Mtoe in 2040 (NITI Aayog, 2017).

## Conclusion and policy suggestions

Our analysis of India's NDC suggests a significant mismatch between India's domestic energy realities and the pledges submitted towards the Paris Agreement, mirroring the broader problem with inconsistency of talk and action in global climate policy (Geden, 2016; Höhne et al., 2017)

Recent developments in India's electricity sector also raise doubts about the future role of coal in India's energy mix. The rapid uptake of renewable energy in the country and slowdown in power demand growth (Andrew, 2018) has led to existing coal plants struggling to maintain profitability, as their utilisation rate has dropped (see Figure 3). The International Energy Agency (IEA) also estimates renewables to be responsible for 60% of the people

gaining access to electricity in India as the government implements ambitious universal electricity access targets (IEA, 2017), reducing the historical imperative for coal based electrification to support pro-poor energy policies (Jaeger & Michaelowa, 2016). Significant future expansion of coal power in India risks stranded assets in the power sector which would also create further systemic risk to India's fragile banking sector which is already dealing with a high share of non-performing loans, the second largest share of which are associated with power companies (Mukherjee & Tripathy, 2017).

With a view to the economy of coal mining regions, analysis of historic cases shows that declines in coal mining put not only coal workers under heavy economic pressure but also the whole region (Campbell & Coenen, 2017; Sartor, 2017; Spencer et al., 2018). This is even more true for regions in which coal mining constitutes a major share of the local economy. This fact is proving to be a key barrier to the phase-out of coal in Germany (Leipprand & Flachslund, 2018). A possible overestimation of future coal use and mining in India could thus also create challenges for the regional economy of mining regions. A more realistic long-term outlook on coal would therefore help to reduce social tensions and could facilitate planning towards a just transition.

A few recommended policy steps for India that can help generate much needed momentum ahead of COP 24 are:

- 1- Clarify plans for coal power post 2030

The National Electricity Plan outlined positive steps to reduce coal's share in the power sector by 2027. It is crucial that the final version of the National Energy Policy ensures

India's future coal power plans post 2027 are compatible with global climate targets and reflect current trends in the power sector.

#### 2- Raise ambitions of carbon intensity targets

India is well on track to exceed its carbon intensity targets. Setting a fresh and more ambitious target to 2030 is not only economically feasible, but would also provide further impetus to clean up the power sector, with associated co-benefits in reducing local air pollution.

#### 3- Bring NDC pledges on non-fossil fuel electricity in line with domestic policy

India's NDC pledge on the share of non-fossil fuel based electricity is set to be achieved even before the next stocktake. The National Electricity Plan envisages a share of 57% of non-fossil fuel based installed capacity by 2027 (CEA, 2018b) – that number should inform the updated target to 2030.

#### 4- Improve data reporting frequency and transparency

Up-to-date estimates of emissions are crucial to the Paris Agreement's implementation and for domestic policy. However, India's last biennial update report to the UNFCCC was in 2010 and the Ministry of Environment, Forests and Climate Change (MOEFCC) continues to use 2010 as the most recent estimate for Indian emissions. Improving the quality and frequency of emissions accounting will help both researchers and policymakers better assess India's climate metrics. Similarly, transparency in the methodology behind India's NDC targets on afforestation and emissions intensity is urgently required.

The success of renewable energy in the country, India's aspirations to be a major power in global governance, domestic pressures around air pollution, and the urgency of global climate policy present an ideal opportunity for India to demonstrate climate leadership with 'hard' actions on the domestic front. India's climate diplomacy is controlled by a tight knit group mainly led by the foreign ministry (Mohan, 2017) with limited inputs from the Ministry of Power and the MOEFCC. A more coordinated effort across ministries could help harmonise policy action across four fronts – the power sector, India's broader foreign policy aspirations, cleaning up local air pollution, and UNFCCC climate pledges. Taking a central stage in global affairs will require an expanded team of people working across departments and breaking through silos to collectively organise around common goals. This would help resolve the inconsistencies pointed out in this paper as well as strengthen India's position as a responsible partner in global climate governance.

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