



## **Potential mitigation of Indian Construction Industry through shift in energy efficient technology**

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India is one of the developing countries committed to doing its part towards Paris agreement by reducing GDP emission intensity up to 35% by 2030. However, due to growing economy, the GDP of the country is increasing rapidly through growth in various sectors; construction is one of the major industries which have been growing at 26 percent compound annual growth rate in India since 1990. Cement, steel, and bricks form a major portion of the raw materials in construction activity along with which they contribute 8 percent, 6 percent and nearly 0 percent of the total emissions in India respectively. The industry collectively contributes 14 percent to the total emissions in India, which is going to increase in future. Moreover, the estimate varies amongst literature and shows promising reductions by adopting efficiency improvements and technology shifts. The industry has been studied under the Life Cycle Assessment framework for a single dwelling or from the input-output economic perspective. However, it has not been studied from climate change perspective at the country level which could result in promising mitigation opportunities. Therefore, the present study attempts to determine the contribution from the construction industry in present (2015) and in future (2050) using scenarios. The total emissions are derived using energy intensity, emission factors and amount of production technology-wise for each raw material separately. The calculations show that the construction industry contributed 400 MT CO<sub>2</sub> per year in 2015; where the share of cement, steel, and brick was 48 percent, 28 percent and 26 percent respectively. Extending the existing trend, business as usual (BAU) scenario suggests that the emissions would increase up to 3396 MT CO<sub>2</sub> per year in 2050 with highest contributions coming from cement manufacturing (60 percent). The alternate mitigation scenario assumes moderate changes in energy efficiency under cement manufacturing, and shifts towards less energy intensive technologies for cement, steel and brick production. Such efforts lead to an emission reduction of 600.14 MT CO<sub>2</sub> which is 18 percent reduction compared to BAU in 2050. Mitigation at such scale opens up new opportunities for India to commit towards climate actions. Moreover, it is evident that more stringent technology standards and persistent efforts towards efficiency improvements could result in more optimistic reductions from the industry to curb the emissions below 1.5 degrees.