

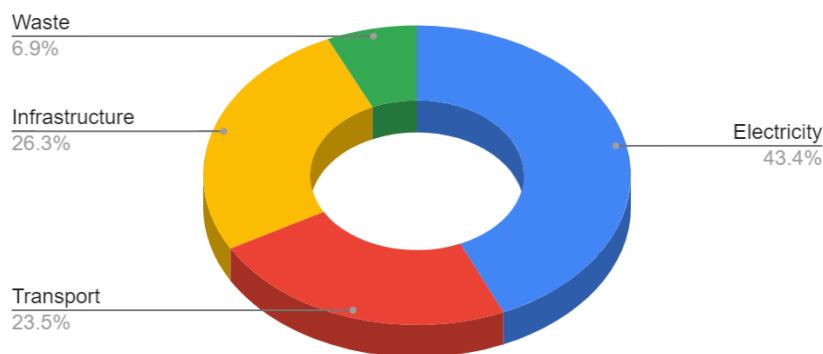
Summary of PIC report: Feasibility Assessment of Rapid Decarbonization Potential of the Pune Metropolitan Region (PMR)

Following the PIC Policy Paper on ‘*Making PMR Net-Carbon Neutral by 2030*’ released in January 2020, despite the long pause due to Covid lockdowns and restrictions, the report ‘*Feasibility Assessment of Rapid Decarbonization of PMR*’ is an effort by PIC with the support of bp India to rejuvenate the idea, with a sense of urgency in finding solutions to the impacts of Global Warming already causing serious hazards to livelihood and economy. The study concluded that it is technologically feasible for PMR to rapidly reduce its carbon emissions by 2030 to below the current levels i.e., stopping the emissions increase to bring it on a pathway to net zero emissions. All of which is possible despite the increase in population, demand for energy and resources. The study was led by the Energy Environment Climate Change (EECC) programme of Pune International Centre in collaboration with organizations such as Symbiosis University, National Chemical Laboratory, and several other private consultants along with the support of Pune Divisional Commissioner, PMC, PCMC and PMRDA officials.

To understand how to reach the goal of Net Carbon Neutrality, two scenarios were analysed: Business-as-usual and Rapid Climate Action. The team conducted an assessment of the status quo of PMR to estimate the current emissions, their compositions and future growth trends to project the business-as-usual emissions by 2030. This enabled the team to evaluate various technological solutions and governance reforms for rapid decarbonization of PMR and bridging the gap between the total emissions and total natural sequestration (absorbing) capacity. The Rapid Climate Action scenario also identifies yearly targets to reach the goal of net zero along with the key stakeholders responsible for implementing the plan.

The study analysed sectors such as Electricity, Transport, Infrastructure, Waste as they contribute the most to emissions. Additionally, based on the natural forest area (wetland and other water bodies not included) the Natural Sequestration capacity was calculated, which plays a key role in absorbing CO₂. The study also concluded that technology assisted CO₂ removal from atmosphere will be vital for reaching Net-Carbon Neutrality as required urgently to combat global warming.

Composition of total emissions in PMR (2020)



The electricity sector classified as scope 2 emissions, contributes to 44% of the carbon emissions of PMR, as long as a majority of the electricity (72%) still comes from fossil fuels such as coal and natural gas with the remaining 28% coming from Renewable Energy. The growth trends indicate that the demand for electricity in the region will nearly double by 2030 to 35 million units/ year. In the Rapid

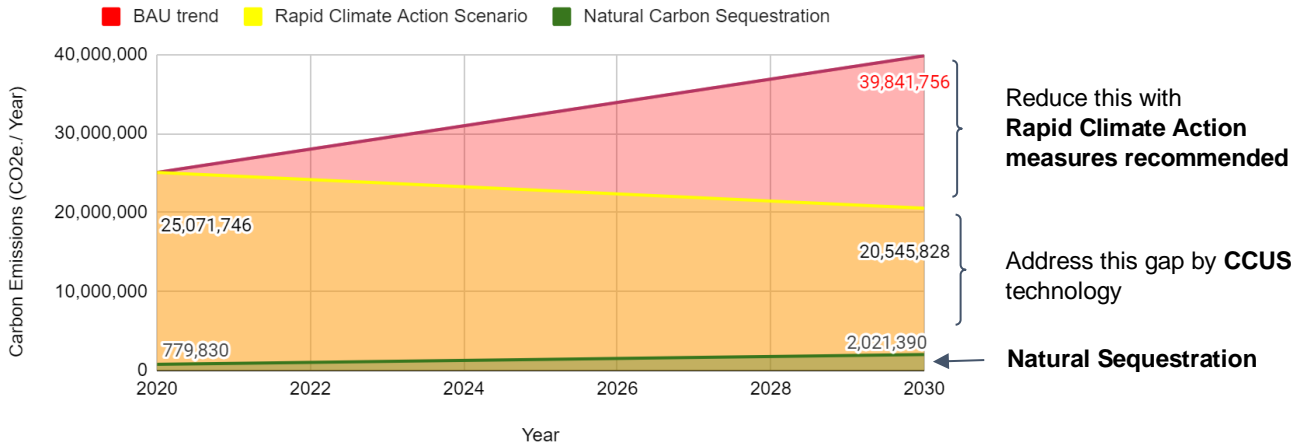
Climate Action scenario, it is estimated that the composition of Renewable Energy could reach 70% by 2030, turning the tables in the favour of a low carbon electricity grid for PMR through the formation of integrated micro-grid supplying Renewable Electricity in regional clusters.

The Infrastructure and Transport sectors, each contribute to approx. 25% of emissions. The infrastructure emissions classified as scope 3, were calculated based on the embodied emissions i.e., the carbon footprint of the materials used during the construction phase. The results indicate that emissions can be reduced by 45% by the end of this decade if we follow all the green building guidelines that have been already created but need to be mandated at the state level. (ECBC, IGBC, ENS).

The transport emissions classified as Scope 1 are direct emissions to air from the consumption of fuel by vehicles within PMR. We found that with over 52 lakh vehicles on road (64% registered in Pune and 36% in Pimpri-Chinchwad), the region consumes about 1.2 million tons of diesel, 0.56 million tons of petrol, and 47 thousand tons of CNG, leading to 5.8 million tons of direct carbon emissions in PMR each year! Looking at the possible solutions already taking shape, the current status of the EV transition indicates that the new EVs coming into the market are being charged majorly by fossil energy and the number of EVs on road isn't enough to reduce emissions. The BAU scenario indicates that we will only have a 2% cumulative EV transition by 2030. Nevertheless, the potential to reduce emissions in the transport sector will come from the use of Electric technology and bio-CNG for which, the study has analysed multiple scenarios based on how the transition would take place. The scenarios include a 10%, 20% and 40% cumulative EV transition by the year 2030 along with a comparison of EV charging with and without Renewable Energy. Our analysis showed that emissions will reduce by 7% to 30% depending on percentage of transition but only when we transition to 40% EVs on road powered by Renewable Energy will begin to reduce emissions in the transport sector.

With 94% of the emissions coming from electricity, infrastructure, and transport put together, the waste sector contributes the least with 6% of the emissions. The PMR generates 5,085 tons of waste per day, that amounts to 1.4 million tons per year leading to 1.5 million Tons of emissions/year as of today. The projected waste by 2030 would increase to 3.4 million Tons per year, which is 134% higher than the quantity of waste. By using Renewable Energy, decentralized waste processing along with systemic changes for different types of wastes like Bio-medical, C&D, E-waste and Sewage, the PMR's emissions could be cut down by up to 2.4 million tons CO₂/ year by 2030 which would otherwise prevail if the BAU scenario continues till 2030. Municipal Wet Waste on the other hand has the potential to be converted into Bio-CNG or Biogas and reduce the emissions by up to 90% by 2030.

BAU trend, Rapid Climate Action Scenario and Natural Carbon Sequestration



Cumulatively the PMR accounts for 25 million tons of emissions/ year from these major sectors. The report also highlights the cost of these technologies and the stakeholders needed to make PMR carbon neutral. The key players: PMRDA, PMC and PCMC with the GoM and Divisional Commissioner Pune will play a key role in governance. Private industries, corporates and citizens of PMR will also play an important role in changing mindsets and reducing emissions. To enable this process, PIC aims to bring all the stakeholders on board to kick-start pilot projects in PMR. A Carbon Neutral Cell is also being proposed to be formed with PIC guidance at the DC Office, Pune. This will help guide the process of making PMR carbon neutral and provide a framework for carbon accounting, which India currently lacks.

The study was conducted in the Geographic Pune Metropolitan Region which includes areas of PMC, PCMC, and mainly PMRDA where most of the development is yet to happen. Hence, making a strong case for low-carbon development at this stage. It is absolutely crucial and feasible for PMR to take a futuristic and leading role in Net Carbon Neutrality, for the rest of the urban centres in India to follow the example.
