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Emission Scenarios for Global Megacity Impact Studies

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Over half of the population of the world now lives in cities, with the global rate of urbanisation expected to continue well into the 21st century. A significant fraction of this urban population lives in so- called "Megacities", which are commonly defined as urban areas containing more than 10 million people, although there is no formally accepted definition. These shifts in the distribution of population and economic activity are expected to lead to changes in the emissions of atmospheric pollutants, which in turn could be expected to lead to changes in air quality within Megacities, in the regions surrounding Megacities, and perhaps also at the global scale. A global model of atmospheric chemistry and transport is an essential part of any integrated assessment of the effects of megacities at these scales. Global models require global emission inventories as input, along with appropriate emission scenarios. Unfortunately there are very few global emission scenarios available which are explicitly designed to explore differences in projected rates of urbanisation. In this work we examine the Representative Concentration Pathway (RCP) emissions projections which are freely available as part of CMIP5 (Coupled Model Intercomparison Project for the IPCC AR5 report). We compare the future projections of Megacity emissions from four different RCP datasets and describe strategies of adapting these RCP projections for the study of Megacity impacts on air quality. Preliminary results of global chemical transport model studies examining these projections will also be presented.