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HFC-134a Emissions in China: An Inventory for 1995-2030

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HFC-134a is the most important substitute of CFC-12 used in the mobile air-conditioner in China since 1995. The bottom-up method was used to estimate HFC-134a emissions in China, from 1995 to 2030, basing on updated automobile industry data and latest emission characters. From 1995, total HFC-134a emission has kept a high growth rate of nearly 60% per year, and reached 16,414.3 Mg (11,959.4–20,834.5 Mg) in 2010, which was equivalent to 23.5 Mt CO_2-eq emissions. Furthermore, the emissions in China accounted for nearly half of total emissions of Non-Annex_I countries in 2008. As for provincial emissions in 2010, provinces with emission greater than 1,000 Mg are Guangdong, Shandong, Jiangsu and Beijing. Quantitative relationship between provincial HFC-134a emissions and GRP of the Tertiary Industry was used to estimate HFC-134a emissions at county level, and Hangzhou municipal district held the maximum emission intensity (4,605 Mg/10,000 km^2). For HFC-134a, emissions calculated from the observations within 46 cities through Euler box model are in good agreement with the corresponding emissions estimated from the bottom-up method, verifying that the emission inventory at county level adequately describes the emission spatial pattern. For the future emissions of HFC-134a, projected emissions will reach 89,370.4 Mg (65,959.7- 114,068.2 Mg) in 2030 under the Business-as-usual (BAU) Scenario, but under the Alternative Scenario, a emission reduction potential of 88.6% of the projected BAU emissions would be obtained.