Potential GHG and air-pollutant emission pathway

in the Korean residential sector under RCP-SSP scenarios

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Abstract

This study analyzes potential GHG emission pathways and air-pollutant emission pathways in the Korean residential sector by using the bottom-up optimization model, AIM/Enduse. This study focuses on: 1) estimating potential emissions considering future changes in society and climate, 2) assessing the mitigation potential of GHG with a carbon tax scenario and analyzing co-benefits of reducing air pollutants such as NOx, SO2, and PM in the context of mitigation measures in the Korean residential sector. The carbon tax scenario at from 20 US$/tCO2-eq to 1000 US$/tCO2-eq in 2050 can reduce GHG emissions, but a higher carbon price around more than 200 US$/tCO2-eq in 2050 is required in order to achieve substantial reductions with a short-term investment plan. A low discount rate, 5%, equivalent to the current interest in Korea, shows a drastic decrease of GHG emission compared to a high discount rate. However, there is also a co-benefit of large reduction potential of air pollutants, in the range of 5-40% reductions in 2050 in the government power generation plan with mitigation measures.

Key words: Socio-economic scenario, RCP scenario, discount rate, co-benefit, Bottom-up approach.

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