



Economic sectoral transfer could not help to global CO₂ mitigation

Hansunbai Li and Yu Ye

Beijing Normal University, Faculty of Geographical Science, China (lihansunbai@mail.bnu.edu.cn)

CO₂ was the largest part of anthropogenic greenhouse gas (GHGs) caused remarkable changes in climate and earth system. In response to this situation, global mitigation efforts, especially sectoral and cross-sectoral, have been taken while meeting the needs of global development. Understanding the sectoral structures and emissions in different countries and regions in the period of emission quick growth and industrial transferred among the world after 1970 could suggest effective efforts to avoid misleading mitigation pathway and could support decision-makers to select efficient strategies for different countries and sectors.

Using CO₂ emission data form GHG emission inventory EDGAR (The Emissions Database for Global Atmospheric Research), we identified the major emission pattern of different regions by counted the largest sectoral emission on each grid, which suggests the spatial distribution of sectoral emission. We also identified the high emission regions in the world by selecting grids where emission higher than the global mean plus 2 times stand deviation after logarithm transform, which those regions contributed more than 80% of global emission in every year since 1970. Then, we counted the largest sectoral emission on each grid in the high emission regions to indicate the main contribute sectors. We analyzed those two types of sectoral emissions changes in space and time that representing the spatial distribution pattern and the highest emission sources at different times.

Our study shown emission by transport sector contribute a major part in space after the compliment of transport infrastructure construction, which emission transfer from manufacturing to transport sector. It has three different types of countries of completed time, for countries like the USA, transport sector dominant the distribution in space since the 1970s, for countries like the UK and France, the major sectoral emission in space was building sector before 1990, then was replaced by transport sector, for other countries have not finished yet. Our study also revealed high emission regions that occurred in megacities and at the place where power industries locate and its area has increased. However, sectoral emissions shown different both in time and space. For the USA and Europe, the main emission sectors in high emission regions transferred from power industry and manufacturing sector to building sector before 1990, especially sector in megacities transferred from manufacturing to building sector with the area of high emission regions increased. For the region in the east of China, the main emission sectors in high emission regions were power industry and manufacturing sector, which experienced quick growth between 1980 to 1990 and cities in there became the world manufacture center. In conclusion, during sharply increased emission since 1970, the role of industrial transfers was transfer emissions from

some sectors to another region in another country, and emissions from other sectors replaced those transferred emissions.