

Analysis of CO2 emissions embodied in the urban water use in China

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Author: Qian ZHANG

Co-Authors: Jun NAKATANI, Yuichi MORIGUCHI

Drinking water supply and wastewater treatment require significant energy input, and now reduction of GHG emissions from the water sector becomes one of important climate mitigation strategies for the municipalities. The aim of this paper is to examine both direct and indirect CO2 emissions embodied in the urban water use (including water supply and wastewater treatment services) for China. We compiled a 135-sector embodied CO2 inventory in terms of (I-(I-M)A)-1, which impacts from import were excluded. Data sources are mainly from 2007 Chinese Input-Output Tables, Chinese national energy statistics, and IPCC guidelines for GHG accounting. One progress is our careful disaggregation process to allocate energy consumption into each IO sector. The accounting boundary of indirect GHG emissions from process-based approach (like WRI Scope 3 standard) is usually different from the IO-based estimation. Therefore, another highlight lies in our proposed attribution way of embodied CO2 emissions to make it comparable with these process-based LCA estimations. The results show that CO2 emissions from urban water use can be double if upstream induced emissions are taken into account, which are mainly from indirect requirement for electricity, metal products, water conservation service, basic and special chemicals, plastic and so on. This implies that efficient energy uses as well as good maintenances of urban water systems are main potentials for CO2 emission reduction in the water sector.