Methodologies to Estimate of NOx Emission from Mobile Sources in Republic of Korea

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Northeast Asia including China, Republic of Korea (Korea) and Japan is characterized by high emissions of anthropogenic air pollutants. An emission inventory data set is essential as an input for modeling studies, and also a very important tool to evaluate the emission control strategies. To quantify and to make projection of emissions of anthropogenic air pollutants, several studies on emission inventories have been carried out. However, there are only a few Asian inventories (Streets et al., 2000; Ohara et al., 2007; Zhang et al., 2009), and mainly focused on China.

Clean Air Policy Support System (CAPSS) is an integrated air quality management system based on the emission inventory which used to evaluate the efficiency of total air pollutant control or air quality management policies of Korea developed by National Institute of Environment Research (NIER). The emission inventory includes 7 air pollutants, CO, NOx, SOx, TSP, PM10, VOC, NH_3 since 1999. This is a very fine emission inventory covers Korea divided into a 1 km × 1 km grid. Since 2000, Green House Gas (GHG)-CAPSS emission inventory including CO_2, CH_4, N_2O was estimated (Hong et al., 2008). From 2011, PM2.5 emission inventory was estimated, additionally (NIER, 2016).

CAPSS is made by bottom up approach method based on statistical data, and more than 250 kinds of statistic data is gathered from about 150 related organizations to estimate the emissions. At first, CAPSS used emission source classifications based on the EMEP/CORINAIR emission inventory guidebook (SNAP 97), and it was modified to consider the own characteristics of Korea in 2007 (NIER, 2013).

In this study, we introduce the methodology to estimate CAPSS emission inventories from on road mobile sources and report the trend of the emission amount.
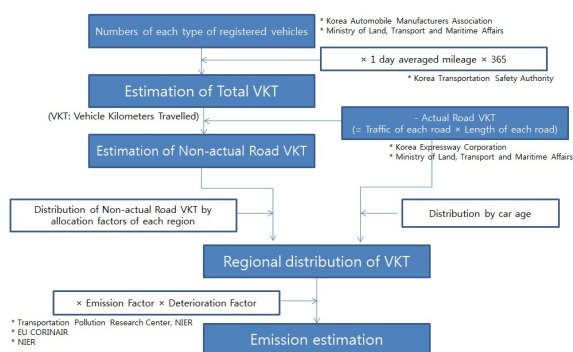

Figure 1. Schematic diagram of emission estimation method from on road mobile sources.

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