Development of Greenhouse Gas Emission Factor in Wastewater Treatment Section in Korea

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Abstract

The IPCC recommend to use country-specific emission factor to improve the reliability of the national greenhouse gas inventory. So, we have been developing country-specific emission factor by field measurement since 2009. The categories are classified by type of treatment in domestic wastewater treatment. Methane (CH_4) and Nitrous oxide (N_2O) are the GHG (Green House Gases) generated from domestic wastewater treatment facilities, according to IPCC Guidelines waste sector.

Since 2000, advanced treatment ratio in domestic wastewater treatment has increased rapidly reaching to 96.5% for 2017 in Korea. The 'A^2O' type is the most used method type based on the capacity of facility among the types of advanced treatment method currently.

In this contents, we reflected the measurement result of one facility (call 'A') as an example of development procedures of emission factor made by field measurement. 'A' facility uses 'A^2O' type for domestic waste water treatment method.

We use U.S. EPA's 'Dynamic Chamber Method' for measuring system of GHG. Floating type chamber (which captures sample gases) and NDIR (Non-Dispersive Infrared Red) analyzer (which measures concentration, temperature and pressure) are used for measuring.

As a result of measurement, the emission factor of 'A' facility became 0.01158 kg CH_4 / kg BOD, 0.0130 kg N_2O / kg T-N.

As for the method of measuring GHG, further studies in various aspects (such as seasonal difference, treatment type difference, etc.) are need to be done.