Estimation of methane emissions from a wastewater treatment plant in Valence

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Methane is the second most important anthropogenic greenhouse gas emitted; its 20 year global-warming potential is about 56 to 72 depending on authors. One of its sources is the treatment of wastewaters and more particularly anaerobic digestion processes and sludge treatment. To reduce methane emissions from wastewater treatment plants, it is necessary to precisely quantify the amount emitted globally by the plant but also for each step of the process. Fixing the potential leaks and collecting the methane emitted by the different processes allows to reduce methane emissions and costs as methane can be sold or used on-site as an energy source. Moreover improve methods to estimate flow from atmospheric measurements of methane will reduce uncertainties in the inversion models. Several measurement campaigns have been realized in the wastewater treatment plant of Valence, France. This plant treats up to 2800 m3/h of polluted water through a biological treatment. To quantify methane emissions from this wastewater treatment plant, a dual tracer method had been used. It consists in releasing acetylene collocated with the methane source and in measuring both concentrations in the emitted plumes. In parallel, an atmospheric local scale model was used to compare with the experimental results.

The higher concentration of methane's emissions was observed around the wastewater arrival. Plant's emissions are in the same range as estimations from the CITEPA French inventory. Measurements during the campaign are well correlated with the model results.