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First emission estimates from the UK DECC network

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The UK DECC (**D**eriving **E**missions linked to **C**limate **C**hange) network monitors the atmospheric concentrations of greenhouse gases to assess the impact of international policies related to climate change. The effects of control measures on greenhouse gases introduced under the Kyoto Protocol are now being observed. Continued monitoring is required to assess the overall success of the Protocol. For over 25 years the UK Government has funded high-frequency measurements of greenhouse gases at Mace Head, a global background measurement station on the west coast of Ireland. These in-situ, high-frequency, high-precision measurements are used to estimate emissions of greenhouse gases across the UK using the inversion methodology InTEM (Inversion Technique for Emission Modelling). InTEM links the Met Office's atmospheric dispersion model, NAME (Numerical Atmospheric dispersion Modelling Environment), with the Mace Head observations and provides independent verification of bottom up (inventory) emission estimates. In 2011 the UK government (Department of Energy and Climate Change) funded the establishment and integration of three new tall tower measurements stations in the UK, to allow enhanced resolution emission estimates with decreased uncertainty to be produced using InTEM. The new network became operational in 2012. All three additional stations provide ultra high-frequency (1 sec) data of CO_2 and CH_4 using the Picarro© Cavity Ring Down Spectrometer and high frequency (10 min) measurements of N_2O and SF_6 from custom built sample modules with GC-ECD.

We will present the new UK measurement network in detail along with the new inversion results highlighting the enhanced resolution in regional emission maps for the UK. These results are presented to the UK government annually and provide independent verification of the emission estimates of radiatively active trace gases. The results are compared to the bottom up inventory emission estimates as submitted to the UNFCCC.