



UKWIR Project CL01B

CARBON ACCOUNTING IN THE WATER INDUSTRY; NON-CO₂ EMISSIONS

Need for Project

UKWIR, collaboratively with Water UK and the Carbon Trust, recently commissioned WRc to further develop its spreadsheet tool (the 'Carbon Accounting Workbook'), by which water companies can estimate retrospectively the annual greenhouse gas (GHG) emissions from their operational activities. Companies require this data for several purposes, including their Ofwat reporting obligations.

Developing the Workbook involved selecting GHG estimation methodologies and Emission Factors (EFs), and it was noted that estimates of nitrous oxide (N₂O) and methane (CH₄) emissions from certain wastewater and sludge management operations remain subject to high levels of uncertainty.

The magnitudes of some of these emissions (when expressed as carbon dioxide equivalents, CO_{2eq}) are significant in relation to the companies' total operational GHG emissions. Consequently, there is a need to:

- understand better the sources of uncertainties in current methods of estimating these emissions;
- further improve, using more recent work methodologies and EFs, the accuracy of estimates obtained from the Workbook;
- identify (in outline design and budgetary terms) experimental programmes which could be used to devise better estimation methodologies and/or EFs, to reduce significant remaining uncertainties.

Objectives

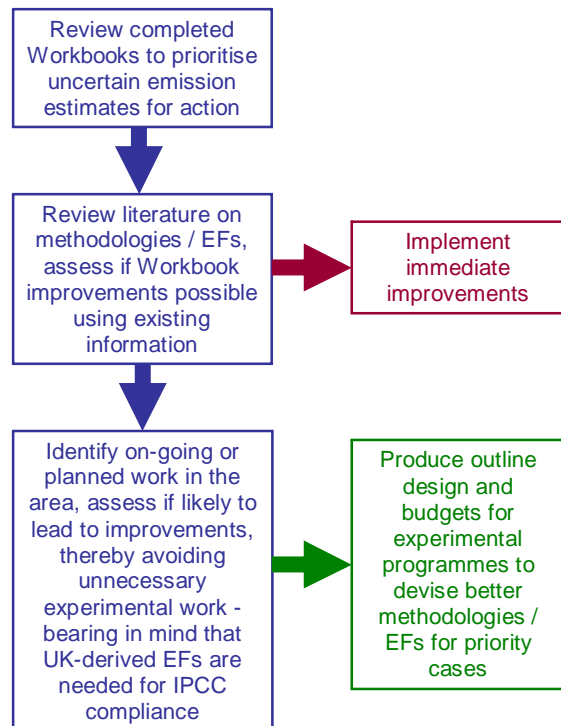
The project therefore has the following key objectives:

1. Assess which of the emission sources contribute the greatest uncertainty to overall GHG emission estimates and, on a prioritised basis, critically review the relevant methodologies and EFs.

2. Recommend, on the basis of the review, any revisions which should be made to the current Workbook, and implement them.
3. Identify, for the most important remaining sources of uncertainty, the nature and likely cost of experimental work to produce better estimation methodologies/ EFs.

If appropriate, UKWIR and other stakeholders would then consider undertaking a further stage of the project to undertake that experimental work and incorporate its results in a future revision of the Workbook.

Project Outline



Work Programme

The work involves the following key tasks:

1. Prioritise, by reviewing a number of companies' completed Workbooks, those emission sources whose





estimation methodologies and EFs contribute the greatest uncertainty to overall operational GHG emission estimates.

2. Review the UK and wider literature on relevant methodologies/EFs, assess if improvements can be made to the Workbook (without experimental studies, using existing information and data), and implement any such improvements.
3. In concert with the review, determine what work is on-going or planned in the area, and assess whether or not these studies are likely to lead to reductions in the uncertainty levels associated with non-CO₂ emissions. This should help avoid *needless* duplication of work being undertaken elsewhere - though it must be borne in mind that estimation approaches need UK-derived EFs, to be compliant with the Intergovernmental Panel on Climate Change (IPCC) Good Practice Guide.
4. For priority emissions sources, produce outline designs and budget estimates for experimental programmes to develop better methodologies/EFs. This will involve identification of sound, statistically-based experimental designs, selection of suitable GHG and other measurement methods, and approaches for data handling. Key considerations could include: identifying factors affecting emissions; the statistical nature of experimental designs (e.g. random or systematic sampling); the nature and number of sites; sampling duration and frequency; identifying sampling and analytical requirements and methods; identifying data handling procedures.

Timetable

The project started in August 2008 and is due to report in January 2009. A workshop will follow to disseminate results to a wider group.

Benefits

The benefits that will arise from this project include:

- Improved understanding of uncertainties in estimates of N₂O and CH₄ emissions, particularly those contributing to high uncertainties in overall company estimates of GHG emissions.
- Awareness of recent, planned and on-going work, both in the UK and overseas, on the estimation of relevant emissions.
- Immediate improvement, where feasible using existing data and information, of the accuracy of estimates obtained using the Carbon Accounting Workbook. Results could feed into related work.
- A sound basis to decide on any future experimental programmes to develop improved estimation methodologies and/or UK specific EFs for priority emission sources (compliant with IPCC guidance, and potentially applicable to UK national emissions inventory reporting).
- Improvements, in both the short and (potentially) medium term, to the accuracy of GHG emissions estimates from water company operations, for reporting to regulatory bodies, such as Ofwat and Defra.
- A better basis for determining soundly-based programmes to reduce GHG emissions from water industry activities, and a more secure basis on which to discuss such activities with regulators and other stakeholders.

Project team

The project was awarded to WRc and ADAS, who have expertise and experience in all areas pertinent to the project, including: water, wastewater and sludge treatment; sludge disposal; carbon accounting; and experimental design and emissions measurement (including GHGs from water industry activities and agricultural land).

