Updating wastewater treatment pathways for the Seventh Carbon Budget

Tender Reference Number: BL-1223

# Specification of Requirements

Invitation to Tender for analysis to update wastewater treatment pathways for the Seventh Carbon Budget.

Tender Reference Number: BL-1223

Deadline for Tender Responses: 11 January 2024.

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# Introduction and summary of requirements / Preamble

The Climate Change Committee (CCC) is an independent, statutory body established under the Climate Change Act 2008. Our purpose is to advise the UK and devolved governments on emissions targets and to report to Parliament on progress made in reducing greenhouse gas emissions and preparing for and adapting to the impacts of climate change.

Part of the CCC’s role is to advise the Government on the appropriate level for each carbon budget – a cap on the amount of greenhouse gases emitted in the UK over a five-year period. The budgets describe the cost-effective pathway to achieving the UK’s long-term climate change objectives. They take account of economic, social and technological factors.

We have recently commenced our work programme for developing our advice on an appropriate level for the Seventh Carbon Budget (the period from 2038-2042).[[1]](#footnote-2) As part of this we would like to update our pathways for wastewater treatment, including emissions, abatement options and costs.

# Background

Wastewater treatment emissions are a small proportion of total UK emissions, but this proportion increases by 2050 in our Sixth Carbon Budget scenarios, as other sectors largely decarbonise while wastewater emissions only fall by a small amount.

Assumptions on emission reductions from wastewater in our Sixth Carbon Budget scenarios were based on academic papers and discussions with academics and stakeholders in the water industry.[[2]](#footnote-3) This resulted in emission reductions of 20% by 2030 in three of our scenarios, including the Balanced Pathway. This increased to a 50% reduction by 2050 in two of our scenarios (Widespread Innovation and Tailwinds).

The main solutions assumed to deliver this abatement were:

* Across all scenarios – conversion of wastewater treatment plants to advanced anaerobic digestion systems (increasing the amount of biogas extracted and reducing methane emissions) and process optimisation improvements and leak identification using on-site emissions monitoring of CH4 and N2O.
* More ambitious scenarios – more innovative options such as membrane-aerated biofilm reactors or partial nitrification-Anammox processes.

Water companies in England and Wales submitted their draft business plans to Ofwat in October 2023.[[3]](#footnote-4) These plans are going through an ongoing verification process, so are subject to change, but include plans for wastewater treatment out to 2034, with associated emissions pathways. Aggregate wastewater emissions in draft plans are relatively steady over the period in question – differing significantly from the 20% reduction assumed in our Balanced Pathway. There is significant variation between individual water companies, with changes in emissions over the period ranging from a 60% reduction to an 50% increase by 2034, relative to 2021/22 levels.

# Aims and Objectives

This research aims to update our wastewater treatment pathways for the Seventh Carbon Budget.

There are two main workstreams in this project:

1. **Updating the baseline for wastewater emissions out to 2050**. Projecting forward wastewater treatment volumes and estimating associated emissions. This should:
   * Represent a projection of emissions in a hypothetical world without further decarbonisation in the UK, based on key drivers of change – i.e. projected changes to population, GDP, the warming climate and fuel prices (not all of these will necessarily be relevant to wastewater emissions).[[4]](#footnote-5)
   * Start with a review of baseline assumptions in the Sixth Carbon Budget, the latest Energy and Emissions Projections[[5]](#footnote-6), water company business plans and other relevant available evidence (e.g. estimates of baseline emissions using other approaches, such as applying emissions factors to the amount of sewage produced).
   * Consider whether there are other key drivers which may affect the baseline (e.g. sewage treatment standards) or lead to significant uncertainty that should be quantified (e.g. evidence suggesting that reported wastewater process emissions may be underestimates[[6]](#footnote-7)).
2. **Developing two emissions reduction pathways for wastewater treatment out to 2050**. An update to the CCC’s Sixth Carbon Budget Balanced Pathway, and a more ambitious Additional Action Pathway.[[7]](#footnote-8) This should:
   * Review wastewater treatment solutions, both those included in our Sixth Carbon Budget pathways and any relevant solutions that we either did not consider or have been developed since that advice. This should be based on a rapid review of the evidence including academic literature, water company business plans (to understand the variation in ambition between them) and wider evidence from industry.
   * Develop pathways for emission reductions consistent with the UK’s 2050 whole-economy Net Zero target, on the basis of the abatement solutions identified. This should take into account cost-effectiveness of measures, feasible roll-out rates and additional considerations such as resilience to climate change and imported emissions.[[8]](#footnote-9)
   * Consider limitations/risks associated with achieving the abatement in each pathway and ensure that these are credible given developments since the Sixth Carbon Budget, including technological progress, behaviour change, policy change and other factors (e.g. water company business plans).

We expect outputs for each of the three pathways (i.e. the baseline and two abatement pathways) set out in workstreams i) and ii) to:

* Include residual emissions (by greenhouse gas), abatement (by greenhouse gas), total and additional costs (split by capex and opex), average abatement costs, energy demand by fuel type, technology/measure deployment.
* Be split into emissions from industrial and municipal wastewater treatment, be provided for the whole of the UK and split for each of the devolved administrations.
* Be provided annually for each year from now to 2050.

Our proposed methodology for the Seventh Carbon Budget is available on our [website](https://www.theccc.org.uk/publication/proposed-methodology-for-the-seventh-carbon-budget-advice/#introduction) and includes further details on our general analytical approach.

# Methodology

This research should be conducted through a combination of reviewing existing academic literature, industry sources and water company business plans as well as sourcing and analysing data relevant to addressing the questions outlined in the previous section.

We expect the successful supplier to engage with a limited set of key stakeholders to test assumptions and sense check results, which should include representatives from industry and academia. The list of stakeholders to engage with and rationale for selecting these should be proposed by the supplier – this is not required as part of this bid, though initial views on the factors to consider when determining who to engage with would be welcome.

The CCC will provide the successful suppliers with:

* Inputs on socio-economic drivers (e.g. population and GDP growth) and cost and price inputs (e.g. carbon prices, energy costs for different fuel types).
* A spreadsheet template for modelling results to be outputted into.
* Our Sixth Carbon Budget assumptions and outputs on wastewater.
* A spreadsheet containing emissions assumptions in draft water company business plans.

We understand that the long period that this study aims to investigate necessarily implies significant uncertainty. The research team will therefore likely need to make major assumptions to produce the analysis required. We see this as an important part of the project and are keen that (where feasible) these assumptions should all be transparently reported and evidence based. Where uncertainties around key assumptions could drive sizeable changes in outcome, these should be highlighted and (if possible) sensitivity testing should be performed to quantify the scale of the potential impacts. It may be particularly important to quantify the uncertainty around greenhouse gas emissions accounting of wastewater (as set out in workstream ii). The CCC team expects to be closely involved in discussions to agree assumptions and discuss plans for considering uncertainties.

# Outputs Required

The outputs required from the project include:

* + Analytical outputs:
* A set of interim quantitative outputs for each pathway for workstreams i) and ii). This is required by end of February 2024.
* A full set of quantitative outputs, in the form of a spreadsheet model (i.e. demonstrating the link between drivers and final outputs) and final outputs resulting from this model in the format of the CCC’s internal template for sectoral Seventh Carbon Budget outputs. This is required alongside the final report.
  + A short technical report summarising the research methodology, the outputs and findings, and the evidence and assumptions upon which these were based, including any stakeholder engagement undertaken.
  + Presentation of the interim and final results from the project to members of the CCC Secretariat and other interested parties.

# Ownership and Publication

The CCC will publish the report and findings. The quantified outputs from the research will also be incorporated into the CCC’s wastewater treatment pathways, which will be used within our analysis to advise Government on the level of the Seventh Carbon Budget.

# Quality Assurance

All research tasks and modelling must be quality assured and documented. Contractors should:

* Include a quality assurance (QA) plan that they will apply to the modelling and analysis.
* Specify who will take lead responsibility for ensuring quality assurance. This responsibility should rest with an individual not directly involved in the research or analysis.
* Provide a QA log to demonstrate the QA undertaken, which must identify who undertook the QA and the scope, type and level of QA that has been undertaken.

Sign-off for the quality assurance must be done by someone of sufficient seniority within the contractor organisation to be able to take responsibility for the work done. Acceptance of the work by the CCC will take this into consideration. The CCC reserves the right to refuse to sign off outputs which do not meet the required standard specified in this invitation to tender.

The successful tenderer will be responsible for any work supplied by sub-contractors and should therefore provide assurance that all work in the contact is undertaken in accordance with the quality assurance expectation agreed at the beginning of the project.

The CCC expects that:

* + All analysis must be delivered in a simple, transparent Excel spreadsheet, where key assumptions (agreed with the CCC) are clearly stated. All assumptions and figures should be adequately referenced, and include any supporting workings. Any such spreadsheets will be the property of the CCC.
  + Existing analysis and published research should be reviewed and considered in developing the scenarios and approaches to be analysed within this assignment.
  + Analysis should appropriately reflect uncertainty regarding model inputs. Where appropriate, a sensitivity analysis of key parameters should be conducted.

# Timetable

The proposed timetable for the project is set out in the following table:

|  |  |
| --- | --- |
| Date | **Action**/deliverable |
| w/c 6 December | Advertise tender |
| 11 January | Deadline for responses to tender |
| w/c 15-22 January | Interviews (if required) |
| w/c 22-29 January | Kick-off meeting |
| w/c 26 February | Interim quantitative outputs |
| w/c 11 March | Initial version of final report |
| w/c 25 March | Final report and quantitative outputs agreed with CCC, ready for publication |

The CCC is willing to be flexible with timelines and will consider alternative timetable proposals.

# Challenges

Tenderers should highlight any challenges or risks that they envisage in delivering all the outputs of the project, whether in terms of scope of the work, resources or timelines. Alternative suggestions will be considered if the risks are such that the project is unlikely to be able to be delivered in its current form.

# Working Arrangements

The successful contractor will be expected to identify one named point of contract through whom all enquiries can be filtered. A CCC project manager will be assigned to the project and will be the central point of contact.

# Skills and experience

CCC would like you to demonstrate that you have the experience and capabilities to undertake the project. Your tender response should include a summary of each proposed team members experience and capabilities.

Contractors should propose named members of the project team, and include the tasks and responsibilities of each team member. This should be clearly linked to the work programme, indicating the grade/ seniority of staff and number of days allocated to specific tasks.

Contractors should identify the individual(s) who will be responsible for managing the project.

# Consortium Bids

In the case of a consortium tender, only one submission covering all of the partners is required but consortia are advised to make clear the proposed role that each partner will play in performing the contract as per the requirements of the technical specification. We expect the bidder to indicate who in the consortium will be the lead contact for this project, and the organisation and governance associated with the consortia.

Contractors must provide details as to how they will manage any sub-contractors and what percentage of the tendered activity (in terms of monetary value) will be sub-contracted.

If a consortium is not proposing to form a corporate entity, full details of alternative proposed arrangements should be provided. However, please note CCC reserves the right to require a successful consortium to form a single legal entity in accordance with Regulation 28 of the Public Contracts Regulations 2006.

CCC recognises that arrangements in relation to consortia may (within limits) be subject to future change. Potential Providers should therefore respond in the light of the arrangements as currently envisaged. Potential Providers are reminded that any future proposed change in relation to consortia must be notified to CCC so that it can make a further assessment by applying the selection criteria to the new information provided.

# Budget

The budget for this project is £25,000 excluding VAT.

Contractors should provide a full and detailed breakdown of costs (including options where appropriate). This should include staff (and day rate) allocated to specific tasks.

Cost will be a criterion against which bids which will be assessed.

Payments will be linked to delivery of key milestones. The indicative milestones and phasing of payments can be adjusted and agreed with the contractor and Project Manager. Please advise in your tender response how this breakdown reflects your usual payment processes.

In submitting full tenders, contractors confirm in writing that the price offered will be held for a minimum of 60 calendar days from the date of submission. Any payment conditions applicable to the prime contractor must also be replicated with sub-contractors.

The Committee on Climate Change aims to pay all correctly submitted invoices as soon as possible with a target of 10 days from the date of receipt and within 30 days at the latest in line with standard terms and conditions of contract.

# Evaluation of Tenders

Contractors are invited to submit full tenders of no more than 25 pages, excluding declarations and CV’s. Tenders will be evaluated by at least three CCC staff.

CCC will select the bidder that scores highest against the criteria and weighting listed below, see the ITT for further information.

**Evaluation criteria**

|  |  |  |
| --- | --- | --- |
| Criterion | Description | Weighting |
| 1 | RELEVANT EXPERIENCE / DEMONSTRATION OF CABABILITY | 15% |
| 2 | MANAGING YOUR RELATIONSHIP WITH THE CCC | 5% |
| 3 | QUALITY ASSURING THE SERVICES YOU PROVIDE | 10% |
| 4 | MANAGEMENT STRUCTURE | 5% |
| 5 | PROJECT TEAM – SKILLS AND KNOWLEDGE | 15% |
| 6 | METHOD, ABILITY AND TECHNICAL CAPACITY | 25% |
| 7 | UNDERSTANDING OF REQUIREMENTS | 15% |
| 8 | RISK AND CHALLENGES | 10% |

**Scoring method**

Tenders will be scored against each of the criteria above, according to the extent to which they meet the requirements of the tender. The meaning of each score is outlined in the table below.

The total score will be calculated by applying the weighting set against each criterion, outlined above; the maximum number of marks possible will be 100. Should any contractor score 1 in any of the criteria, they will be excluded from the tender competition.

|  |  |
| --- | --- |
| Score | Description |
| 1 | Not Satisfactory: Proposal contains significant shortcomings and does not meet the required standard |
| 2 | Partially Satisfactory: Proposal partially meets the required standard, with one or more moderate weaknesses or gaps |
| 3 | Satisfactory: Proposal mostly meets the required standard, with one or more minor weaknesses or gaps. |
| 4 | Good: Proposal meets the required standard, with moderate levels of assurance |
| 5 | Excellent: Proposal fully meets the required standard with high levels of assurance |

**Scoring for Pricing Evaluation**

Price will be marked using proportionate pricing, as set out in the example below.

There will be a maximum of e.g. 20 marks. The lowest priced bid will receive the full 20 marks, all other bids will then be marked following the method illustrated in the table below.

Proportionate Pricing scoring example:

If 20% = 20 marks

|  |  |  |
| --- | --- | --- |
| Supplier | Price | Marks |
| 1 (lowest bid) | £50,000 | 20 |
| 2 | £60,000 | 50/60 \* 20 = 16.7 |
| 3 | £70,000 | 50/70 \* 20 = 14.3 |

**Structure of Tenders**

Contractors are strongly advised to structure their tender submissions to cover each of the criteria above and supply a price schedule specifying the daily rates (ex-VAT) you will charge for each level of your staff.

**Evaluation for Interviews, if held**

CCC reserves the right to award the contract based on applicants’ written evaluation only if one candidate emerges from the evaluation stage as significantly stronger than the others.

Should interviews go ahead, CCC will shortlist the top three suppliers with the highest marks from the written proposals. Interviews are provisionally expected to be held in the week commencing 15th January 2024. If this date changes, CCC will notify applicants.

The areas to be covered in the interview, and markings allocated to each topic area will be sent to the shortlisted supplier prior to interview.

Further details of interviews will be sent to successful applicants on selection.

**Feedback**

Feedback will be given in the unsuccessful letters or emails.

1. Our proposed methodology for the Seventh Carbon Budget is available on our website: <https://www.theccc.org.uk/publication/proposed-methodology-for-the-seventh-carbon-budget-advice/> [↑](#footnote-ref-2)
2. See wastewater sections in our Sixth Carbon Budget waste sector summary report: <https://www.theccc.org.uk/wp-content/uploads/2020/12/Sector-summary-Waste.pdf> [↑](#footnote-ref-3)
3. <https://www.ofwat.gov.uk/regulated-companies/price-review/2024-price-review/business-plans/> [↑](#footnote-ref-4)
4. See section 2.4 of our Seventh Carbon Budget methodology note for further details on our proposed approach to modelling baselines: <https://www.theccc.org.uk/publication/proposed-methodology-for-the-seventh-carbon-budget-advice/> [↑](#footnote-ref-5)
5. <https://www.gov.uk/government/publications/energy-and-emissions-projections-2022-to-2040> [↑](#footnote-ref-6)
6. <https://ukwir.org/quantifying-and-reducing-direct-greenhouse-gas-emissions-from-wastewater-treatment-processes-phase-2-0> [↑](#footnote-ref-7)
7. See section 2.2 of our Seventh Carbon Budget methodology note for further details on our proposed approach to developing pathways. [↑](#footnote-ref-8)
8. See section 2.2.4 of our Seventh Carbon Budget methodology note for further details on our proposed approach determining decarbonisation options. [↑](#footnote-ref-9)