climateXchange

Scotland's centre of expertise connecting climate change research and policy

Project Specification: evidence assessment for the applicability of the carbon calculator tool for windfarm development on Scottish peatlands and other carbon rich soils.

1. The need for this research

ClimateXChange wishes to commission an evidence review of the current operation and application of the carbon calculator for wind farms on Scottish peatlands with a view to determining whether an update to the carbon calculator is required. This is in line with our commitment to ensure that the Scottish Government has adequate tools to help assess the net carbon impacts of wind farm development proposals on peatlands and other carbon-rich soils in Scotland.

National Planning Framework 4 (NFP4)[1] requires that where development on peatland, carbon-rich soils or priority peatland habitat is proposed, a detailed site specific assessment will be required, including identifying the likely net effects of the development on climate emissions and loss of carbon. This research will fully review the current operation and application of the calculator, provide a recommendation on whether it is fit for purpose going forward and, if necessary, recommend whether changes are needed to improve its accuracy.

This specification has been revised in the light of an earlier invitation to tender, and has been tightened to focus on the first phase of work only – the need for an assessment of emerging evidence to determine the need for an update to the tool itself. This will ensure a clear and comprehensive foundation of evidence which can be utilised to update the tool should that be the recommendation.

2. Project Context

The carbon calculator for windfarms on Scottish peatlands was designed to support decision making on wind farm development within Scotland, by assessing the site-specific carbon impact of individual windfarm proposals. This is done by comparing the carbon costs of wind farm development with the carbon savings attributable to the subsequent production of renewable energy.

The carbon calculator was originally published by a research team led by Aberdeen University in 2008; it was then updated by the research team with Version 2 launched in June 2011. The calculator was subsequently revised to include multiple regions for forestry and construction. The last update of the calculator was carried out in 2014. The Scottish Environment Protection Agency (SEPA) later developed the calculator into a web tool, which

[1] https://www.transformingplanning.scot/national-planning-framework/draft-npf4/?id=3904#?id=3904

was published in June 2016. Emission Factors were updated in 2022 to reflect the current electricity mix in the grid.

The calculator is currently owned by the Scottish Government, and is hosted and maintained by SEPA on its behalf. The tool is utilised by the Energy Consents Unit within the Onshore Electricity, Strategy and Consents Division of Scottish Government and supports the process of determining wind farm applications. In light of evolving practice and understanding, and to ensure the tool's outputs can be fully utilised and applied by decision makers in line with NPF4 policy, there is a need to consider whether it is still fit for purpose.

NPF4 was adopted by Scottish Ministers on 13 February 2023. It forms part of the statutory development plan, setting the framework for development across Scotland. NPF4 includes national planning policies which set out to protect carbon-rich soils, restore peatlands and minimise disturbance to soils from development. Provisions to be applied to development proposals on peatlands and carbon rich soils are contained in policy 5, which sets out the need for a site specific assessment to identify the likely net effects of the development on climate emissions and loss of carbon.

3. Project Scope and Aim

The project has three key objectives:

1. Carry out a scientific evidence assessment (based on the most recent and up to date information) on the application and operation of the current carbon calculator as a tool for decision-making for windfarm development on peatland and carbon rich soils. This will include:
    a. a scientific analysis to determine the accuracy of the current carbon calculator, and to identify the factors that may limit its accuracy; this analysis should include evaluation of proposed versus realised parameters from existing wind farms, and should address accuracy in calculations of
        1. loss of sequestration potential,
        2. emissions associated with peat loss, disturbance and handling during construction,
        3. emission abatement through restoration, and
        4. emissions associated with the windfarm itself, e.g. turbine life cycle, and the electricity mix in the grid, and consideration as to how to handle this in the future;
    b. a scientific evaluation that will ascertain if there are potential benefits from using high resolution (~10 m) spatial data on topography, peatland distribution and hydrology to
        1. improve the calculator's accuracy, and
        2. minimise emissions, for example by supporting optimal deployment of infrastructure in the landscape, and/or guiding more effective peatland reinstatement and restoration;
    c. a scientific evaluation that will ascertain if there are potential benefits from integrating peatland condition categories (as described in the Peatland Carbon Code and UKGHG Inventory) into the calculator to
        1. improve the calculator's accuracy, and
        2. minimise emissions.
    d. an assessment of the current quality control mechanisms and its ability to support quality assurance by decision makers.

2. Based on the underpinning science, explore potential for the tool to be used, or adapted to apply to, grid infrastructure and other renewable development proposals on peatland and carbon rich soils. Including a consideration on whether there is a limit to the size of the development (i.e. is the calculator still accurate for those developments of a smaller scale).

3. On the basis of the evidence gathered under objective 1,
    a. provide a clear recommendation on whether the current tool is fit for purpose with regard to windfarm development on peatland and carbon rich soils, and
    b. if the recommendation is that the tool is not fit for purpose in its current form, identify key updates or improvements that would bring the tool in line with current scientific understanding, and would improve the accuracy to better inform decision making

4. Audience

The work is commissioned on behalf of the Scottish Government, and is of particular interest to the Rural and Environmental Science and Analytical Services Division, ENFOR's Nature Division, the Onshore Renewables Team, the Energy Consents Unit, as well as the Planning, Architecture and Regeneration Division. The results will also be of particular interest to SEPA.

The results must be presented in a format and language that can be easily understood by readers without technical or academic background. Written outputs must be well presented and written in Plain English.

5. Methodology

Tenderers are invited to put forward proposals on how to best meet the research aims within the budget available. A full explanation of your chosen approach, including any limitations, should be provided.

- We expect the research to build on previous reports and recommendations, comprising a full analysis of the parameters and methodology of the current tool and a comprehensive review of the latest relevant literature.
- We expect the successful bidder to draw on research and evidence across a wide range of sources, including both peer-review literature and industry-led research.
- The research team will therefore be expected to carry out an element of stakeholder engagement to ensure all relevant material and expertise is identified and considered when developing recommendations, and will be expected to engage with the Scottish Peatland Expert Advisory Group.

Access to sample data for determined applications will be provided to the successful bidder.

The research team will work closely with relevant teams within Scottish Government through regular meetings with a steering group. Report findings will be presented to the Scottish Government Peatland Expert Advisory Group (PEAG).

6. Outputs

We expect the research outputs to be presented in a report. The report must be written in plain English, follow the CXC house style, and should comprise:

1) an executive summary of no more than two pages, detailing the key findings and recommendations; and
2) a full report of the project to include:
   a) a narrative analysis of the current state of research on how carbon and greenhouse gas impacts of development can be assessed, including identification of potential gaps and areas of active debate, to build on but not replicate previous work by CXC;
   b) a thorough analysis of the accuracy of the tool in its current format, and where applicable, identification of key factors that may limit its accuracy; this should draw on empirical analysis of proposed versus realised input parameters;
   c) analysis of the benefits (and any possible drawbacks) that high resolution spatial data could have in improving the tool's accuracy and minimising carbon loss;
   d) analysis of the benefits (and any possible drawbacks) of integrating peatland condition categories within the calculator to improve accuracy and minimise carbon loss;
   e) an assessment of the current quality control mechanisms and its ability to support quality assurance by decision makers.
   f) an analysis of the potential for the tool to be used, or adapted to apply to, grid infrastructure and other renewable development proposals on peatland and carbon rich soils
   g) a clear recommendation, supported by evidence, on whether the current tool is fit for purpose in its current state with regard to wind-farm development on peatland and carbon rich soils,
      i) if the recommendation is that the tool is not fit for purpose in its current form, identify the key updates or improvements that would bring the tool in line with current scientific understanding, and would improve the accuracy to better inform decision making. Including a SWOT analysis to illustrate strengths and weaknesses; (To note, this does not include <u>making</u> any recommended updates to the tool).

3) Annexes detailing:
   a) the methodologies used and underlying assumptions;
   b) technical details of the assessment of the current tool;
   c) a glossary and list of abbreviations.
4) References.
5) Excel spreadsheets capturing primary data collected during the research.

Findings from the research will also be presented to the Scottish Peatland Expert Advisory Group, which comprises relevant stakeholders across Scottish Government, SEPA, industry and academia.

The ownership of the research material including the final report and any data produced as a result of the research lies with ClimateXChange on behalf of Scottish Ministers. The research may be published on the ClimateXChange website, the date and format of which will be determined by the Scottish Government and ClimateXChange. One or more drafts are likely to be required before a final version is agreed.

ClimateXChange supports the Scottish Government Open Research Guidance for RESAS, summarised as "open as possible, closed as necessary." This means that all products will be

placed in the public domain, unless there is a strong argument otherwise (for example to comply with data protection regulations). Descriptions of all projects and related products will be uploaded to the ResearchFish system.

7. Project Governance

A steering group will be established to support delivery of the project. This will include key members from teams across both the Environment and Forestry and Energy and Climate Change Directorates within the Scottish Government, and SEPA. The steering group's role is to guide the direction of the research and review progress at key milestones.

The lead contact for ClimateXChange will be the CXC project manager for climate and land use, Sarah Govan (Sarah.Govan@ed.ac.uk) who will liaise with the contractor. Regular update calls will be scheduled fortnightly between the principal investigator and Sarah Govan to discuss progress and address any issues, escalating to steering group for consideration where necessary.

8. Project Timetable

Task	**Completed by**
Project kick-off meeting, to confirm • Scope of evidence review • Terms of technical assessment • Boundaries • Timeframe • Terms of any stakeholder engagement	Thursday 21 December
Online/ in-person meeting with the Scottish Government expert advisory group to discuss context and raise key issues	Friday 19th January
Share search terms for evidence review with steering group	Friday 26th January
Report on progress (Principal investigator and CXC Project Manager)	Fortnightly
Steering group meeting to discuss progress	Friday 8th March
Submission of revised draft report for circulation to the steering group	Friday 3rd May
Steering group meeting (including presentation to client), and comments on draft	Friday 17th May
Submission of final report	Friday 7th June
Presentation to expert group	Friday 21st June

9. Award Criteria

Price 20%

Quality 80%

Quality Criteria	Descriptor	Weight
Understanding the research specification and the policy environment	The proposal should include an introduction which demonstrates a clear understanding of the research requirements, including: The policy environment and the supporting role of research The cross-sectoral nature of the project The need for this research The research aim, and how the proposal will address this need	30%
Research methodology	The proposal should demonstrate a high quality and workable research methodology that will deliver the outputs in the required timescale, including: How the evidence will be identified, reviewed and assessed How the research objectives will be addressed The suitability, robustness and limitations of the methodology	20%
Project management and staff resource	The proposal should: Include a clear project plan, that captures: The key steps required to deliver the desired output within scope and to time Reference – where relevant – to mechanisms for compliance with regulations (e.g. GDPR) Provide details of individual staff members who will work on this project (with CVs) and demonstrate how they will meet the project requirements, specifically their experience and expertise: In research generally In tasks specific to this research In inter-disciplinary team-working Provide a commitment that named staff members will be available to work on the contract if the bid is successful Set out the management arrangements for the project Include a timetable for delivery of tasks and project milestones covering the duration of the contract Clearly show allocation of staff and staff time against each task	15%

Quality Criteria	Descriptor	Weight
Communication and report writing	The proposal should describe the approach to writing the report, which will be published on the ClimateXChange website. This should include how different contributions from the team will be brought together. The proposal should outline any planned visualisations and/or added value presentations of the material. It should detail who will take lead responsibility for report-writing and overall report quality. It should provide accessible links to outputs and/or publications they have been involved in, detailing their role in the work. It should detail specific data management tasks (and their related costs) required to comply with the open data guidelines	5%
Quality assurance and risk mitigation	The proposal should provide details of quality assurance procedures to demonstrate how the contract will be continuously delivered to a high standard. It should specifically address issues of quality control at different stages of the project, including evidence gathering, analysis and report writing. The proposal should provide a risk assessment matrix detailing any risks identified in relation to the delivery of this contract, and proposed mitigation measures to minimise their probability and impact.	10%

10. Submitting a proposal

Please send a brief work plan (no more than six pages excluding CVs) responding to the award criteria above and including deadlines, applicable day rates, relevant research experience, examples of previous work and the number of person days' work proposed. CVs for the proposed delivery team can be outwith the 6 page limit. Your submission should be a single document in PDF format with the file name in the following format name of submitting organisation – evidence assessment - carbon calculator – IQ26-2023. File size should not exceed 5MB.

You should highlight any potential conflicts of interest in your proposal.

Proposals need to be submitted to lee.callaghan@ed.ac.uk and cc'd to sarah.govan@ed.ac.uk for evaluation by noon on Friday 24th November. Any documents or amendments submitted after the deadline will not be accepted. Any clarifications questions regarding the specification should be submitted by email at least 5 working days before the bid submission deadline above. We expect to contact the successful bidder by Friday 17th November.

The costs of proposals for this project are expected to be no more than £50,000 (excluding VAT). However, ClimateXChange would welcome proposals for less than this amount. We welcome consortium bids.

Depending on the quality of proposals received, CXC may chose not to appoint any contractor.

11. Terms and conditions

The University of Edinburgh Terms and Conditions of contract for services can be found at: Microsoft Word - Standard Terms and Conditions Goods and Services.

It is expected that these will be the terms and conditions which govern any resulting contract.

CXC Secretariat

October 2023