

Project Specification

Lifecycle Analysis on Use of Distillery By-Products in Renewable Energy

Introduction

[ClimateXChange](#)¹ wishes to commission a lifecycle analysis of the emissions implications of using by-products from distilleries in Scotland for renewable energy production; and to understand the potential impact on the livestock industry in Scotland.

Background

By-products from the distillation process in whisky can provide a high protein feed source for ruminant diets. This can come in three formats: (1) **draff**, which is the soaked grains from the first stage of production; (2) **pot ale syrup**, which is the evaporated co-product from the first distillation stage, or; (3) **dark grains**, a combination of (1) and (2) following an intensive drying process.

Scottish Government has been advised of an expansion in the use of distillery by-products as a form of feedstock for renewable energy, and an impact on the cost and availability of by-products for livestock feed. There is a concern that this has resulted in a higher systemic carbon footprint and cost.

Project Aim

The overall aim of this project is to understand the practical impact of evolving market for distillery by-products in Scotland and their use in the whisky, energy and livestock production sectors, through the application of cost-benefit analysis of greenhouse gas emissions reductions and overall cost.

Project Scope

This analysis will take into account

1. the full lifecycle of the whisky production process and its use of by-products within this system, including the impact of renewable energy incentives.
2. potential changes in coming years, including any planned increase in demand for distiller by-products for renewable energy
3. the lifecycle of the livestock production, taking into consideration the use of distillery by-products as part of a feed ration as well as the lifecycle using alternative high protein feeds such as soya and rapemeal and including an assessment of the use of by-products of bio-ethanol production.

¹ For more information on ClimateXChange, the Scottish Government-funded Centre of Expertise on Climate Change, see www.climatexchange.org.uk

It should address:

1. The whisky production process (results should be expressed as grams of CO₂e per Litre of product) this should include all costs and associated emissions of such things as;
 - The production of the barley.
 - The malting process.
 - Other production processes involved in the manufacturing of whisky including transport and storage.

2. The use of by-products (results should be expressed as grams of CO₂e per Mega joule or kilowatt hour of energy produced) within the whisky industry including all costs and associated emissions of such things as;
 - Current uses of both draff and pot ale serve within the whisky industry.
 - What benefits are gained through their use.
 - What costs and emissions are generated (including transport, storage and waste/by-product disposal).
 - What emissions and energy use are offset by their use.

3. The emissions from the livestock production lifecycle (results should be expressed in grams of CO₂e per Kilo of product) taking into account and providing a comparisons of the following.
 - The use of each distillery by-product as part of a feed ration and all costs and associated emissions including the process of creating dark grains.
 - The use of alternative high protein feeds such as soya and rapemeal with all costs and associated emissions.
 - The availability of by-product from bio-ethanol production and its potential use as a feed within the livestock industry and all costs and associated emissions.

4. The role of renewable energy incentives, and projected changes in the near to medium term based on an understanding of the market place and policy drivers (in place and emerging) set by UK and Scottish Governments.

Outputs

This project is commissioned on behalf of Scottish Government, and intended for a policy and practitioner audience, including stakeholders such as the Scottish Tenant Farmers Association. Presentation of the results should therefore be suitable for use by stakeholders who are not expert in this scientific field.

The outputs will comprise:

A project report, written in plain English and following the [CXC style guide](#)², not exceeding 20 pages. It should comprise:

- a) an executive summary of no more than two pages, explaining the key findings of the research and what it means to a policy and practitioner audience
- b) a full report of the project, to include:
 - i) Technical life cycle analysis of distillery by-products being used within the whisky/renewables sector as well as for animal feed and the alternative feed sources.
 - ii) Conclusions
 - iii) Appendices [to include methodology, technical analysis, results, and any references, if appropriate]

Project Timetable

Milestone	Completed by (date)
Project kick-off meeting, to cover <ul style="list-style-type: none">• By-products to be addressed• Life-cycle scope (and any pertinent assumptions/ exclusions)	12 May 2017
Report on progress – with secretariat	fortnightly
Submission of draft report	16 June 2017
Steering group meeting (presentation and discussion of draft)	6 July 2017
Submission of final report	28 July 2017

Project steering group

A small group, likely to include leading researchers, ClimateXChange representatives and other stakeholder representatives, will meet with the successful bidder for project kick-off and provide feedback on draft paper.

The successful contractor will be expected to participate in at least 1 stakeholder meeting.

Day-to-day communication will be between the review team (the contractor) and CXC's project manager Sarah Govan, and is likely to involve short catch-up phone calls either fortnightly or as agreed.

² http://www.climatexchange.org.uk/files/6214/6539/3614/CXC_report_writing_guide_2016_v2.docx.pdf

Award criteria

1.	Technical Criteria	Weight	Descriptor
2.	Understanding the research specification and the policy environment	20%	<p>The proposal should include an introduction which demonstrates a clear understanding of the research requirements. This should include an understanding of the policy environment, Scottish farming practice and the supporting role of research; the need for this research; the research aim; and how the proposal will address this need.</p>
3.	Research methodology	30%	<p>The proposal should demonstrate a high quality and workable research methodology, including how the evidence will be identified, reviewed and assessed, which will address the research objectives and produce the deliverables in the timescales required.</p> <p>It should explain the suitability, robustness and limitations of the proposed methodology.</p>
4.	Staff resource	15%	<p>The proposal should provide details of individual staff members who will work on this project and demonstrate how they will meet the project requirements, specifically:</p> <ul style="list-style-type: none"> a. general research experience and expertise; b. a practical understanding of Scottish farming practice c. experience in developing and undertaking life cycle analyses; d. specific experience and expertise in the evidence review topic; <p>The proposal must also provide a commitment that named staff members will be available to work on the contract if the bid is successful.</p> <p>The proposal should set out the management arrangements for the project.</p>
5.	Communication and report writing	20%	<p>It should detail who will take lead responsibility for report-writing and overall report quality. It should demonstrate an understanding of communicating science to an informed – but non specialist – audience.</p> <p>It should provide examples of previously published literature or evidence reviews in which they have been involved.</p>
6.	Quality control and assurance	15%	<p>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. It should include a timetable for delivery of tasks, project milestones and allocation of staff and staff time against each task, covering the duration of the contract.</p> <p>The proposal should also include 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.</p>

Submitting a proposal

Please send a brief work plan responding to the award criteria above and with deadlines, CVs for the proposed delivery team, applicable day rates, relevant research experience and the number of person-days' work proposed. 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 Monday 1st May 2017**. Please contact Sarah Govan (sarah.govan@ed.ac.uk /0131 651 4322) if you would like clarification of any of the above.

The costs of proposals for this project are expected to be in the range of £15,000 (including VAT). However, ClimateXChange would welcome proposals for less than this amount.

You should highlight any potential conflicts of interest in your proposal. For queries about what may constitute a potential conflict of interest, please contact sarah.govan@ed.ac.uk.

CXC Secretariat

13 April 2017