Institution: University of Edinburgh

Unit of Assessment: 17 Business and Management Studies

Title of case study: Calling time on 'green-washing': Fixing international greenhouse gas accounting practices to promote genuine climate change mitigation.

Period when the underpinning research was undertaken: 2013-2017.

Details of staff conducting the underpinning research from the submitting unit:

Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Matthew Brander	Senior Lecturer	2013-present
Francisco Ascui	Senior Lecturer	2009-present

Period when the claimed impact occurred: 2014 to 2020.

Is this case study continued from a case study submitted in 2014? N

1. Summary of the impact

More than 500 companies globally spend approximately USD150 million/yr on renewable energy certificates in order to claim to have reduced emissions. However, research from the University of Edinburgh Business School shows that greenhouse gas (GHG) accounts based on certificates misinform managers, consumers and investors, as buying certificates does not increase renewable energy generation or reduce actual GHG emissions. These findings have influenced business practice and limited the use of renewable energy certificates through: informing the development of new international GHG accounting standards (International Organisation for Standardisation (ISO) 14064-1, and UK government guidance); and direct and indirect engagement with companies.

2. Underpinning research

The research focuses on how companies and other organisations account for the GHG emissions associated with their consumption of electricity (3.1; 3.5). This is a matter of global significance, as electricity generation accounts for approximately 25% of global GHG emissions (or about 12.4 billion tonnes of CO_2 equivalent per year), and more than two-thirds of this electricity is consumed by commercial and industrial users (3.1). It is therefore essential that these emissions are measured accurately and for decision-relevant information to be provided to managers, consumers, regulators and investors, so that funds and efforts aimed at reducing emissions actually achieve this objective. The research (3.1, 3.2, 3.3, 3.4), which was in part carried out with the support of funding from the ESRC, involved documentary, quantitative and conceptual analysis, as well as the synthesis of findings from existing studies in the US and Europe.

An emergent GHG accounting practice called the 'market-based method' allows reporting entities to purchase certificates, or enter into other contractual arrangements, for renewable electricity attributes and then claim that their electricity consumption is from a renewable source and the associated GHG emissions are zero. The market-based method is becoming widespread practice (at least 400 terawatt hours (TWh) of contractual emission factors were purchased globally in 2017 – equivalent to total annual electricity consumption in France).

The insights and findings from the research (3.1) show that there are two fundamental problems with the 'market-based method':
a. the market for contractual emission factors/renewable attributes **does not increase the amount of renewable generation, and therefore does not reduce GHG emissions**; and
b. it results in **GHG accounts that do not accurately reflect the emissions caused by organisations' activities**. This is a key novel insight provided by the research, as the accuracy and relevance of corporate/organisational GHG accounts had not been the focus

of previous research. The research shows that allocating emissions between reporting entities, without double-counting, is not sufficient for meaningful GHG accounts, and that there must be a causal link between the reporting entity and the emissions reported.

Providing clarity on this issue is highly important because reporting companies and some international standard-setting organisations largely ignore these fundamental problems for a range of reasons, e.g. the market-based method is highly attractive as it allows companies to appear to reduce emissions at low cost, and there is conceptual confusion over what constitutes a meaningful GHG account.

The research suggests a **practical solution: to use the 'locational grid average' method for reporting emissions from grid-connected energy** consumption; and if there are contractual arrangements that genuinely cause additional renewable generation, then the emission reductions should be quantified and reported separately.

3. References to the research

3.1 Brander, M., Gillenwater, M. & Ascui, F., 2018. Creative accounting: A critical perspective on the market-based method for reporting purchased electricity (scope 2) emissions. *Energy Policy*, 112. https://doi.org/10.1016/j.enpol.2017.09.051

3.2 Brander, M. & Ascui, F., 2015. The attributional-consequential distinction and its applicability to corporate carbon accounting. In S. Schaltegger et al., eds. Corporate Carbon and Climate Accounting. Dordrecht: Springer, pp. 99–120. https://link.springer.com/chapter/10.1007%2F978-3-319-27718-9_5

3.3 Brander, M., 2015. Extending the attributional-consequential distinction to provide a categorical framework for greenhouse gas accounting methods. PhD thesis. https://era.ed.ac.uk/handle/1842/25448

3.4 Ascui, F., 2014. Making carbon count: The role of carbon accounting in carbon management and markets. PhD thesis. (can be supplied by HEI on request). https://tinyurl.com/y7fwlkr6

3.5 Brander, M., 2013. The impact of contractual emission factors on the accuracy and relevance of corporate greenhouse gas accounts. Working Paper. https://tinyurl.com/yab3qz7l

4. Details of the impact

Research from the University of Edinburgh Business School's Centre for Business, Climate Change and Sustainability (B-CCaS) has directly influenced the text of national and international GHG accounting standards which promote the allocation of corporate funds towards genuine reductions in GHG emissions. Through these standards, and as well as through direct engagement with businesses, the research has influenced organisations' decisions not to use renewable energy certificates.

In 2014 and 2015 Brander and Ascui provided consultation responses [5.1] and peer-review [5.2] [5.3], and organised an international workshop, to inform the Department for Environment, Food, and Rural Affairs' (Defra's) decision not to recommend the market-based method within guidance for corporate GHG reporting. Defra's guidance is applicable to all UK listed companies, which from October 2013 have been required to report on their GHG emissions as part of their annual Directors' Report. The guidance is also recommended for all other voluntarily reporting by UK organisations, and is followed by many organisations internationally. Defra removed the text "Organisations on a 'green energy' tariff should first report their electricity usage using the emission factor specified by their particular energy tariff [which is an instance of the market-based method]" from the draft guidance [5.2] following the advice provided [5.1] [5.2] [5.4]. Recommending the use of the market-based method could have potentially (depending on the proportion of UK companies using the Defra guidance) affected the reporting of, and the allocation of funds to

reduce, over 100 million tonnes of CO_2 emissions/year in the UK alone (approximately 25% of the UK's total CO_2 emissions).

In 2018 Brander provided amendments [5.5] to the draft Environmental Reporting Guidelines from the Department for Business, Energy and Industrial Strategy (BEIS), recommending that reporting companies should disclose whether their renewable energy purchasing creates additional renewable supply. The proposed text has been incorporated into the published guidelines [5.5]. The BEIS Policy Officer with responsibility for the guidelines acknowledged the influence of this engagement: "Matthew's response to the consultation was crucial in coming up with an alternative wording that was included in the final version of guidance, and his research helped us adopt a practical approach in coming up with a solution that strikes the right balance between the relevant policies, SECR legislation and promoting best practice in the guidance" [5.6].

The research (especially 3.1 and 3.5) has also informed the development of the International Organization for Standardization's (ISO) revised standard for organisation-level GHG inventories (ISO 14064-1). Published in December 2018, the new standard includes the recommendation (3.1) that a more accurate alternative accounting method must be used. The new standard permits the use of the market-based method, but only if reported separately, and the method cannot be used to claim that a GHG reduction target has been met. This provides a clear signal that the market-based method is not recognised as best practice. The ISO Working Group Chair acknowledged the influence of the research in reaching this outcome: "I believe that this final outcome was significantly influenced by the underpinning research provided by Dr Brander" [5.7].

The underpinning research has also been disseminated through: an online Open Letter on the GHG Protocol's guidance; media articles (*Ethical Corporation, Environmental Finance, Politiken* (Denmark), and *Stuff* (New Zealand)); and a presentation at an industry conference (EMEX, 2019). In addition, following the publication of the ISO standard, Brander contacted by email approximately 350 global companies to inform them of the ISO publication, and to share the research available on this issue via a dedicated University of Edinburgh web page. The page has had 1,202 unique views up to 1st January 2021 [5.8].

These activities have led to further discussion and engagement, including: discussions with companies (e.g. Scottish & Southern Energy, Marks & Spencer, Royal Bank of Scotland, Salesforce, Aberdeen Standard, Scottish Water) on how to achieve genuine emission reductions via electricity purchasing; support for new information products to enhance electricity reporting; input to an EU policy briefing from the Centre for European Policy Studies, a top-ten non-US think tank, with direct acknowledgement of the research; and a letter from Caroline Lucas MP to BEIS [5.9], which cites 3.1. A number of individuals from organisations such as the US Environmental Protection Agency, United Technologies Corporation (US corporate with USD60 billion revenue) and Salesforce (US corporate with USD15 billion revenue) have stated that they will use the research in making the case against the use of the market-based approach within their organisations [5.10] [5.11]. Scottish Water, Scotland's water utility with emissions from grid electricity use of 175,000 tCO_2/yr, has stated that their decision not to use the market-based method is based on the research [5.12].

5. Sources to corroborate the impact

5.1. Response to Defra consultation - GHG Reporting Guidelines – 2014 Update (24 March 2014).
5.2. Proposed update to Defra's 2015 'UK Government conversion factors for company reporting', with Brander's peer-review comments tracked in. (Compare with 5.3, demonstrating that the final version removed the text allowing the market-based method – see the 'UK electricity' tab).
5.3. Final published version of Defra's 2015 'UK Government conversion factors for company reporting'.
5.4. Feedback on Draft Environmental Reporting Guidelines (July 2014).
5.5. Response to BEIS's draft Environmental Reporting Guidance (Compare 5.5 with final published guidance to see adoption of suggested text that only the location-based method should be mandatory (p55) and inclusion of information on additionality (p57) of published guidance https://tinyurl.com/wyvf55l and https://tinyurl.com/yy7ypzhj).
5.6. Testimonial from Policy Officer, BEIS, UK Government. Stating that the research [3.1] was used developing the Government's Streamlined Energy and Carbon Reporting guidance.
5.7. Testimonial from Chair of ISO Working Group for ISO 14064-1. Stating that the final text of the standard was directly and indirectly influenced by the research.
5.8. Data confirming website views Dec 2018-Jan 2021
5.9. Letter from Caroline Lucas MP to BEIS.
5.10. Email from Associate Director, United Technologies Corporation (2017). Stating that he will use the research [3.1] to support UTC's position not to use the market-based method.
5.11. Email from Head of Clean Energy and Carbon Programs, Salesforce (2019). Stating that the research [3.1] has helped shape Saleforce's action on this issue.
5.12. Testimonial from Strategic Environmental Regulation Advisor, Scottish Water (2020). Stating that Scottish Water's decision not to use the market-based method is largely based on the research [3.1].