



## Accounting and the environment

Anthony G. Hopwood \*

*University of Oxford, Saïd Business School, Park End Street, Oxford OX1 1HP, United Kingdom*

### A B S T R A C T

Introducing a discussion of some of the ways in which accounting and other calculative mechanisms are involved in environmental matters, the article focuses on a number of questions that emerge from accounting for carbon emission permits and corporate environmental reporting. Both are areas where there is already a need for more research and where that need will increase in the coming years. Identifying some of the interests and pressures that already influence approaches in the area, the case is made for the need for both critical and facilitative research.

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### Introduction

Accounting has already started to be implicated in the consideration of environmental issues and the probability is that its involvement will develop further over the coming years. As greater acknowledgement is given to the role of human agency in the environmental sphere, the need for different approaches to both conceiving and acting upon human and organizational interaction with the environment has started to be recognized, albeit still far too slowly. There are, as a consequence, more signs of an emerging awareness that many aspects of human life are likely to change, even including accounting and other calculative systems. As changes occur in our concepts and focus of accountability for the environment, the demands for different flows of information, accounting and otherwise, are also likely to grow.

Of course much could already be done to alleviate some of the major environmental difficulties if there was a will to act. But that will is only very weakly developed in most countries of the world and in most spheres of life. It certainly has been largely absent at the political and the corporate levels, both arenas where rhetoric has often been a long way ahead of action and were, as a result, remarkably little has been done in the majority of cases. All too often the desire to act has only found a verbal expression, action

itself being more influenced by political infighting and corporate lobbying and influence. Even now, as the findings of environmentalists and scientists get ever more certain and disturbing, the vast majority of politicians still have difficulty in responding, continuing to put what they see as their short-term economic and political imperatives above the longer term interests of the human race.

However, although a strong will to act might result in less call on calculative devices, including accounting, to construct new patterns of incentives and visibility, I sense that the role of calculation would still not be minimal. Trade-offs would still have to be evaluated, interests would still diverge, thereby suggesting a role for incentives to engender change, intentions would still need to be checked against achievements, and there still would be areas where careful analyses of alternative approaches would need to guide action. The desirability of bio-fuels, for instance, certainly cannot be taken for granted given the complex patterns of interdependences that their production entails with that of food and the preservation of biodiversity and natural habitats and their wider environmental consequences (Scharlemann & Laurance, 2008). Current discussions over the desirability of otherwise of replacing old cars with more fuel efficient ones give rise to similar calculative complications (Monbiot, 2009; van Wee, Moll, & Dinks, 2000). In both of these and a multitude of other areas quite complex assessments and calculations need to be involved in the appraisal of alternative ways of moving forward. Moreover curiosity alone could and most

\* Tel.: +44 1865 228 472; fax: +44 1865 288 651.

E-mail address: [Anthony.Hopwood@sbs.ox.ac.uk](mailto:Anthony.Hopwood@sbs.ox.ac.uk)

likely should result in an investment in greater transparency, particularly if social and environmental values are to function alongside economic ones. So a dream of a post-calculative society is certainly a very long way away and possibly should not even be entertained at all.

A case can therefore be made that calculation, including that of new forms of accounting, is likely to be a significant feature of a world not only conscious of environmental issues and constraints but also committed to achieving a more harmonious relationship between the human and natural worlds.

Of course accounting has already become involved with these issues, both consciously and otherwise. Not only this, but there are also signs that at least some degree of learning has taken place and is slowly, albeit perhaps too slowly, giving rise to the creation of new agendas in the accounting area. So whilst early initiatives in the area of corporate environmental reporting might have achieved very little, even on occasions creating a degree of corporate legitimacy that shielded what was really going on, there are now some signs of pressures for more extensive and transparent approaches. Although in many areas conventional approaches to accounting stand in stark contrast to emerging environmental considerations, the potential conflicts have also started to be recognized, again albeit slowly. Prevailing approaches to costing certainly ignore many of the indirect consequences of corporate actions on the environment, but this is something that is increasingly being acknowledged (for an early discussion see Gray, Bebbington, and Walters, 1993). Existing means of project appraisal also tend to favour short-term results and thereby often used to argue against more environmentally sustainable approaches, not least in the areas of energy and transportation. But here too, the dilemmas so created are slowly starting to be discussed, if not changed (Broome, 1992; Portney & Weyant, 1999; Weitzman, 1998 and Weitzman, 2001). At least there is now some recognition of the role of conventional discounting technologies in minimising the significance of future consequences and impacts, not least in the context of the influential Stern Report (2007) whose very findings and recommendations were dependent upon the application of an alternative approach to calculating the future, namely the application of a declining discount rate across time. In numerous other areas of current environmental and sustainability concern there are now some signs of an emerging interest in more careful analysis and calculation, often including economic and financial calculation. Rather than assuming the automatic superiority of certain approaches and solutions, at least some people are now trying to delve deeper into the assumptions involved and into the wider issues that might be at stake. Relative costs and the demands made on financial resources are becoming a more prevalent part of such exercises, in the process raising questions about the adequacy of prevailing understandings about costs and their association with very particular assumptions about the nature of organizations and their boundaries.

As the papers that follow illustrate, the creation of a market in carbon emissions is one arena in which accounting and the environment have become intertwined – for better or for worse. The result of an apparently simple

abstract logic, the resulting implementation and operation of a market in emission rights has inevitably resulted in a series of issues that never entered into its original justification, suggesting that this is an area where there already are and will continue to be significant issues calling for serious research and inquiry.

### Accounting and the creation of carbon markets

Emerging from economic understandings of the roles that pricing and the establishment of markets can play in influencing resource utilisation, the Kyoto Protocol Clean Development Mechanism and the subsequent establishment of the European Emissions Trading Scheme resulted in a huge new financial arena prior to the current economic crisis. In 2007 *The Economist* (2007, p. 10) reported that \$30.4 billion of allowances had been traded in the previous year, with Europe making up 80% of the total value, and the carbon market analysis and consulting group, Carbon Point, estimated that this figure was reached in only the first 6 months of 2008 (Milner, 2008). The speed with which financial institutions moved into the area and applied both the simple and the more complex products of finance research to yet another area of human endeavour was truly remarkable and itself something worthy of a great deal of detailed and finely tuned research in the coming years (see Knox-Hayes, 2008). Equally remarkable, however, has been the speed of retreat during the current recession. With many corporations having surplus carbon permits in hand, their price has collapsed during 2009 (Glover, 2009), at least for the time being effectively eliminating their role in changing corporate practices and technologies, and possibly resulting in a questioning of the longer term effectiveness of such approaches.

For this and other reasons it is most likely still far too early to fully appreciate the consequences of the entwinement of the values which resulted in the environmental concerns that gave rise to a new market in carbon emissions with those very different ones of the financial institutions that merely trade in the resultant products (Gibson, 1996). We already know that this is an arena in which the likelihood of fraud, manipulation and a whole range of unanticipated consequences is very real. Not only is the off shoring of emissions an ever present possibility but it is also increasingly known that many of the carbon saving projects subsidised by the receipts from the sale of emission rights would have been undertaken in any case (Forelle, 2008; Wara & Victor, 2008), possibly with between one and two thirds of all clean development mechanism offsets now being seen as not representing actual emission reductions. Questions are also being asked of the likely speed with which such an approach can fundamentally change emission patterns even in times of economic prosperity and growth, with some thinking that worthy though the intentions might be, the market led adjustments will be too slow and thereby too late (Prins & Rayner, 2007).

As such questions imply, the consequences of such a stark separation of trading from the underlying concerns that gave rise to it are largely unknown at the present time.

Can, one wonders, the ethical considerations of the environmentalists be transferred to the economic market place? Or will the values of the market place overwhelm those of the environmental sphere, introducing a totally new set of unanticipated consequences and actions which are likely to be to the longer term detriment of the original concerns? For while the underlying abstract logic of the cap and trade scheme appeared rational and clear, operating in the complex world of institutional influences introduces a multitude of factors that did not enter into the original justification. Even a temporary collapse of the carbon market in the current recession only adds to such worries.

All this suggests that this is an area where many research questions remain, some of paramount importance for evaluating the likely outcomes of such cap and trade schemes, and for designing and evaluating alternative approaches to carbon reduction (also see [Bebbington & Larrinaga-González, 2008](#)). The articles that follow are suggestive of a number of the rich lines of investigation, together opening the door on an area of inquiry where accounting has been involved but accounting research has so far seemingly lagged behind that in the environmental and social sciences.

An illustration of the need for more research into the interface between accounting and environmental considerations came to my attention through a recent incident in the United Kingdom. In these relatively early days of the European Emissions Trading Scheme companies are given a specified number of emission rights for free, thereafter having to buy any additional permits which they require on the market, or pay a penalty. The idea behind such an approach was to reduce corporate resistance to the scheme and to provide a learning period during which the new market could develop. In practice, however, at least two difficulties have emerged. First, many companies in the majority of polluting sectors were given more emission permits than they required, thereby having the opportunity to either sell the spare permits, earning immediate cash incomes, or bank them for use in the later phase of the scheme when it is intended that all permits should be bought. Either way, rather than polluters having to pay, in many cases polluters have been paid! The distribution of permits was made by the relevant European governments, officially on the basis of past experiences and future plans but also, it would appear, on the basis of intense corporate lobbying and governmental characterisations of their short-term national interest. So electricity generators were systematically provided with appreciably less permits than they needed, at least in the United Kingdom, the argument being that because firms in this sector are not subject to international competition, they are in a position to pass on to their customers the additional costs of acquiring further permits. It certainly would appear that corporate interests and fairly conventional short-term nationalistic economics were given priority over environmental considerations, despite the underlying rationale for the scheme. And the second difficulty stemmed from this. While the cost of any additional permits purchased on the market would enter into the normal costing structure of a firm, that indeed being the original intention of

a scheme designed to provide economic incentives to reduce carbon emissions, how were the free permits to be accounted for?

In a paper that follows [Allan Cook \(2009\)](#) outlines the discussions and debates about accounting for emission rights that occurred in the International Accounting Standards Board. Those discussions are still ongoing, pointing to both the politics and lobbying that surround the issue as well as the conceptual and technical issues involved.

Not unrelated issues surrounded the attention given to emission rights accounting in the United Kingdom where sections of the press were interested in the fact that although electricity generating firms had received some of their emission permits for free, they nevertheless were costing the free receipts at the prevailing market price and using this enhanced cost base to justify price increases to customers. The environmental policy thereby had not insignificant, although clearly unanticipated, distributional consequences, with customers loosing and the financial interests of capital and no doubt senior management gaining. Moreover the regulatory authority, Ofgem, the Office of the Gas and Electricity Markets, not only sanctioned this practice but also agreed with the conceptual basis articulated for it, that of opportunity costing. The seeming logic of economics was accepted without question. The press seemed to have a different approach, however, taking what might be seen as a more ethical stance in emphasising the resultant windfall profits. “Fuel firms set for £11bn windfall in CO2 trading”, exclaimed one headline (*The Guardian*, 10 August 2008; “Polluters stand to make hundreds of millions from European carbon permit scheme”, declared another (*The Guardian*, September 13, 2008). Observing the operation of the European scheme from afar, others also seemed to recognize the gap between the rationale built into the scheme and the profit making corporate response (see [Williams-Derry & de Place, 2008](#)), with the Market Advisory Committee of the [California Air Resources Board \(2007\)](#) rather gently noting that “The free allocation of emission allowances generates rents – that is, profits beyond the normal expected return to capital – to recipients of the free allowances.”

For anyone who is not used to such corporate interest in relatively obscure academic concepts, the speed with which the concept of opportunity cost was utilised is not without interest. Despite its articulation in many cost and management accounting textbooks, the concept has never appeared to be in frequent use in practice. Economists may propagate it but conventional costing almost invariably overrules it. But in this instance, conventional costing would have attributed a zero cost to a gift, with firms thereby not recognizing it as a cost in the determination of prices. Prices might thereby be lower, particularly in a regulatory environment where justifications for price increases might be required, and, as a result, the potential for profit enhancement is sacrificed. But corporate actions in the United Kingdom and elsewhere ([Sijm, Neuhoof, & Chen, 2006](#)) suggested that profit enhancement was a dominant concern, this seemingly providing a utility to even an obscure concept. Indeed the subsequent literature on the operation of the European Emission Trading Scheme is impregnated with the language of opportunity cost.

The justification for the inclusion of the opportunity cost of the free emission permits was on the basis that the generators would only produce electricity if the price of the electricity is high enough to compensate them for using, rather than selling, their emission permits. As one would expect, there is a presumption that the firms would compare the profits from the production of electricity using the freely granted emission permits or selling the permits directly at the prevailing market price, doing whichever would give the highest profit. But only one option is available, so if the permits are used to gain the higher profit, they cannot be sold, thereby suggesting that alternative uses disappear after the decision to proceed with one course of action rather than another. Such a logic might suggest the basis for a rather different, albeit not profit enhancing, approach to thinking of the opportunity costs.

Indeed such an approach is not inconsistent with the more critical analysis of opportunity costing offered by the economist John Gould (1962, p. 218):

“To assert that the true nature of costs is contained in the opportunity cost theory, and that the definition of cost is the value of the sacrificed alternative, can be dangerously misleading – because it might be taken to advocate the rigid application of a rule rather than to promote the better understanding of the nature of the problems of decision-making.”

He went on to add:

“... the opportunity cost doctrine is best viewed as a method of approach to a class of problem, rather than simply as an injunction to use a particular definition.”

And to further illustrate the difficulties of using the concept Gould (1962, pp. 228–229) went on to say:

“Consider an accountant faced with the problem of ranking six plans in order of profitability. To work out the profit of each plan, he deducts from the revenue the costs. If – as he may think he ought to do after hearing economists speak of opportunity costs – he simply substitutes for his own notion of cost the definition of opportunity cost, he finds himself at an impasse. To rank the plans, he must know the opportunity cost; to know the opportunity cost, he must know the value of the next best alternative plan; thus to find the opportunity cost, he must rank the plans.”

All too clearly Gould was not convinced by either the utility or the conceptual clarity of the concept. To his mind the role of the economist was not to advocate “a particular definition of cost” but rather to create “an awareness that decision problems involve choices between alternatives” (Gould, 1962, p. 229), albeit informed ones.

That more than economics is at stake in the interest in the concept of opportunity costs was suggested by an incident in my own institution. During a discussion one finance faculty member suggested the recalibration of the calculation of overhead costs in the area of executive education. Although finance faculty already received the highest salaries (despite the much greater supply of trained

doctorates in the area than in most other management subjects) and some had also negotiated double the prevailing rate for executive education teaching, refusing to teach otherwise, the finance faculty were now interested in the possibility of taking a share of the surplus generated on executive education programmes on which they taught. Faculty from other subjects had seen such surplus's as accruing to the institution as a whole and even when the possibility of sharing was raised, they recognized the need for the institution to be able to cover all the costs involved, including so-called overhead costs, before calculating the surplus. Not so for at least some of the finance faculty. Not only were overhead costs seen as an institutional problem rather than an issues for an individual discipline but also they had more of a notion of a contribution margin in mind rather than a conventional calculation of surplus after overheads. Yes, some indirect costs might be relevant but calculated, they suggested, on the basis of their opportunity cost rather than any conventional overhead charge. So spatial charges would only be attributed if there was a competing use of the space involved and even then only at the rate that would be gained from such an alternative use. And similarly for other charges. All too clearly this was a highly particular appeal to the use of opportunity costs and one not unrelated to the example discussed above. This was opportunity cost being appealed to in the service of the maximisation of gains by a specific set of interests.

Such examples suggest the possibility of a relationship between particular calculative technologies and the value culture of an organization, set of organizations or even, as in the above example, a segment of an organization. In the case of the discussions over the possible sharing of surplus, the majority's acceptance of the legitimacy of costing technologies that distributed all the costs of an organization or activity before attributing a surplus to either the whole or a part of it was suggestive of a more communitarian ethos. The concern with using opportunity costs to increase a highly specific and segmental surplus was far from communitarian in approach, being suggestive of the individualism that is enshrined in so much economic thought. The possibility of such an inter-relationship between calculative approaches and value cultures is certainly an intriguing area for further research.

Indeed I had wondered whether such differences might be evident in different national tendencies in accounting for the free allocation of emission rights under the European Scheme. Were there, one wondered, differences in regimes of what might be seen as financial and social capital. But a study involving Germany and The Netherlands (Sijm et al., 2006) found pricing patterns consistent with the incorporation of the opportunity cost of the free permits being fed into prices. Moreover, although another study (IETA (International Emissions Trading Association), 2007) found variations in the accounting for emission permits in the external reports of European firms, further inquiries found that those differences were sectoral rather than national, with all those accounting for the permits at the market price being traders in the financial sector rather than users – none of whom at the time of the study were externally accounting for the free allocations. So

interestingly, although opportunity costs entered into the calculation of price and the justification of any resultant increases to the regulatory authorities, they did not enter into the mainstream financial accounts, something that seems only to reinforce the fact that this is likely to be an area of genuine research interest.

Perhaps it should be noted that at the national level only Greece has forbidden the passing on the opportunity cost of freely given permits in the price charged to the customer, possibly suggesting a more communitarian rather than a neo-liberal and business influenced approach (Knight, 2008). Such a ruling should increase the incentives to invest in less polluting technologies, particularly in areas like electricity generation where off-shoring is more difficult. But in those industrial sectors where moving production off-shore is possible, the incentive might be to do just this, at the best resulting in no reduction in carbon emissions and in the worst case scenario, production in less environmental efficient circumstances. If nothing else, such responses suggest the importance of investigating and understanding the environmental profile of whole supply chains rather than just pockets of national production.

### Corporate environmental reporting

It is such consequences that reinforce the need for corporate reporting of their environmental as well as financial performance. Such reporting has some potential to give a greater degree of visibility to corporate environmental activities and consequences, casting light on what is often invisible. But having said that, it is also important to recognize that visibility is not the only possible consequence of corporate reporting in this area (Milne & Gray, 2007). Indeed it is possible that such reporting can even reduce what is known about a company and its environmental activities. Companies are also interested in the possibilities for environmental reporting to increase their legitimacy in the wider world. Not only that, they can also have an interest in using reporting to facilitate the construction of a new and different image of the company. To the extent that such strategies work, it is possible that fewer questions might be asked of the legitimated organization and thereby less might be known of it. It is as if the report serves as a corporate veil, simultaneously providing a new face to the outside world while protecting the inner workings of the organization from external view. Done with skill and a fair amount of planning and thought, it is possible for some modes of reporting to thicken that veil such that even less is known of the corporation despite the apparent openness of its reporting. Once again this suggests an area in urgent need of more research.

Admittedly such legitimating rationales rarely enter into corporate let alone public policy discussions of the roles and potential of enhanced environmental disclosures (although there is a developing research literature on the theme, for an overview of which see Deegan (2007)). However their relevance for understanding the approaches within the corporate sector was once again brought to my attention at a recent Association of Chartered Certified Accountants' ceremony for the 2008 United Kingdom Awards for Sustainability Reporting.

The top award was given to BT Group plc, not least for displaying "a strong integration of sustainability concerns into the core business strategy" (ACCA, 2008, p. 8). Whether the report was inclined towards legitimacy or a more genuine interest in enhancing transparency was not clear, although at the very least one would like to know much more about whether those changes in strategy also changed action. Often strategies have a complex and diffuse relationship with the world of action. Despite this, corporate and consultancy firms' discussions of environmental reporting still place far too much attention on changing strategy and far too little on changing action!

More understandably the joint awards for the small and medium sized enterprise sector went to Traidcraft, one of the main British movers in the area of fair-trade, and Reap, a local sustainable development organization in Scotland. Interestingly for both of these organizations the judges primarily made comments on what they were actually doing and the reporting and assessment of it whereas for the more corporate BT more emphasis was placed on "strategy", "target(s)", "the future" and its developmental programme. Compared with the action orientation for Traidcraft and Reap, interestingly BT appeared to be residing more in the realms of reporting intentions.

Of the other short listed reports, the joint runners up were The Co-operative Group and Unilever, the rest being Anglo American plc, British American Tobacco plc, BHP Billiton, BP plc, Camelot Group plc, GlaxoSmithKline, Royal Dutch Shell plc, Vodafone Group plc and Xstrata plc. Some of these do indeed suggest that this is an area where further investigation into rationales for environmental and sustainability reporting might well be illuminating.

Just consider the oil companies, BP and Royal Dutch Shell. In the United Kingdom BP has invested in an enormous green advertising programme outlining its practices and intentions in a tiny percentage of its overall business. Moreover that campaign has been refreshed at the very time when even its modest moves into renewable and more environmentally friendly modes of energy production have been cut back. BP has pulled out of renewables projects in China, India and the United Kingdom and is only keeping US investments in the area because of the more favorable tax incentives which provide an acceptable economic return. In contrast, it remains committed to its involvement with the Canadian tar sands, an oil source that involves three times as many carbon emissions as ordinary oil production and one which is already having devastating effects on biodiversity (Jowit, 2009). The reality of its environmental and sustainability performance is therefore an interesting one and some serious questions can be and should be explored in relation to how its modes of reporting relate to these. Perhaps some clues are given by the fact that one of its senior officials in the area occupied the post of Vice President of Corporate Responsibility, Communications and External Affairs. At least such honesty can be appreciated. Not dissimilar issues relate to Royal Dutch Shell. Again investing in the Canadian tar sands (Macalister & Wearden, 2009), Shell also has a complex history of involvement in Nigeria, has withdrawn from investing in renewable energy generation in the Thames Estuary in the United Kingdom and is considering moving



towards a commitment to bio-fuels which, as has already been mentioned, is a complex and potentially problematic area from a sustainability point of view. Moreover the Carbon Disclosure Project reported that Shell has worldwide carbon emissions of 743 million tones compared with 573 million for the whole of the United Kingdom, this figure including the carbon impacts of product use and disposal (Macalister, 2008). In more recent times Shell had kept a quite low profile in the environmental arena, most likely still all too conscious of the consequences of its involvement with Brent Spar, but in the last year, despite its positioning as presented here, it has joined BP in investing in a major green PR campaign in the national media in the United Kingdom. Perhaps fortunately for the wider public, the British Advertising Standards Authority intervened in parts of this after Shell had claimed in an advertisement in the *Financial Times* that its \$10 billion investment in Canadian tar sands was a contribution to a sustainable energy future (Pearce, 2008). Shell had taken advantage of the multiple definitions of sustainability to imply a positive environmental aim when what it was really doing was trying to maintain a sustainable flow of fuel to its customers!

Even without commenting on the environmental profiling of Anglo American Tobacco, it is clear that a variety of motives may well be implicated in the production of environmental and sustainability reports. Exploring these further is likely to be a very complex task requiring the use of both analytical and historical insights. Detailed internal case studies could also be useful, as would deeper understandings of the interaction of such concerns with the relevant regulatory authorities, the media and political circles. However, the probability of such companies allowing detailed probings can hardly be high when so much is at stake for their image and reputation. But one hopes that this does not prevent active members of the research community from at least trying.

Concerns with the current state of knowledge in the area of corporate environmental reporting have already started to emerge in the research community (see for example Milne & Gray, 2007, and Gray, forthcoming) and most certainly need further encouragement. There are genuinely complex and very difficult issues to be confronted in reporting on corporate actions in relation to the environment. Indeed they are such that it is very doubtful whether any satisfactory approach will emerge. At best, environmental accounting and reporting is likely to function alongside a range of other regulatory and influencing structures, and an enhanced investment in the informational and investigative activities of non-governmental organizations and some sections of the media that have the expertise and motivation to engage in a whole series of specific ad hoc investigations and analyses (Hopwood, 1978). For that is how many existing understandings of the environmental area have reached a wider public rather than through the disclosure activities of the corporate sector, and such a balance in information sources is unlikely to change in the coming years.

So rather than seeing reporting as ever being likely to emerge as an adequate approach to corporate transparency in the environmental sphere, we should instead focus on a

multitude of ways of enhancing the informational context of corporate activities. But this will require not only new knowledge and new institutional mechanisms but also a shift in the relative balance of power. The ability to gain information, let alone any changes in the more fundamental right to know, can never be separated from the locus of power and changes in its distribution.

While certainly not addressing such fundamental issues, a nevertheless interesting approach to the more immediate task of trying to design an approach to corporate environmental reporting is emerging from The Prince of Wales Accounting for Sustainability Forum (see <http://www.accountingforsustainability.org>). Explicitly recognizing that there is unlikely to be any significant shift in the balance of power in the immediate future, the team working on the project has proposed an approach that they think has some potential to engage the corporate community whilst at the same time resulting in environmental matters being seen as a more mainstream part of business. The Connected Reporting Framework that has emerged from the project is seen as a tangible step towards not only a more holistic concept of reporting but also one that starts to recognize that carbon and other environmental constraints are likely to become significant factors in the twenty first century. It seeks to demonstrate how both economic and financial and environmental and sustainability information can and should be presented in a connected way, showing the economic costs and benefits of more environmental considerations. Rather than environmental issues being seen as “out there”, at the boundary of managerial attention, as so often is the case, the aim is to connect them to the consideration of economic and financial matters, hopefully thereby making them a more mainstream part of business. For the way that environmental matters are managed will be an increasing material factor in many sectors of the economy in the years to come.

Rather than having the static aim of merely reporting, the Connected Reporting Framework also has the explicit intent to introduce a dynamic element into organizational life, thereby striving to reposition the significance of an environmental and sustainability agenda (see also Bebbington, 2007). Admittedly cautious in approach, seeking to stretch the prevailing corporate policies and actions rather than more radically change them in the shorter term, the thought processes behind the Connected Reporting Framework are nevertheless interesting ones worthy of further consideration. The framework seeks to integrate a quite explicit consideration of organizational change processes into the design of a reporting system.

### The way forward

The articles that follow give a rich introduction to the issues at stake in the creation of a market in carbon emissions and the roles that accounting and calculative mechanisms can and cannot play in the environmental area. Together they open the door a little more on a domain that is in need of much more attention in the coming years. As such, they point to some of the problems that need further exploration, to the need for a questioning and critical approach, and to the importance of looking at actions and consequences as

well as just aims and intentions. The research traditions now established in the area of the organizational and social analysis of accounting provide a good basis for looking beyond abstract schemes for change and improvement to explore the actuality of their functioning and operations, and to use this knowledge for the more realistic design of approaches to changing both the significance which environmental and sustainability considerations play in the corporate sphere and our ways of gaining insights into the adequacy or otherwise of these. For this is an area where both facilitative and critical research are required and where there are likely to be possibilities for the one to feed into the other, albeit in most cases by different people.

Such considerations point to the very real potential of research which seeks to explore the role and functioning of accounting in the environmental and sustainability spheres. Being at such an early stage of our understanding of this area, both the opportunities and need for research are very real. It is to be hoped that the examples of the pioneering researchers who have already sought to map out some of the outlines of the area will be recognized, valued and built upon (see Unerman, Bebbington, & O'Dwyer, 2007), thereby providing a more informed and systematic knowledge base in an area of human endeavour that is likely to have profound consequences for the human race.

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## References

- ACCA (2008). *ACCA UK awards for sustainability reporting 2008: Report of the judges*.
- Bebbington, J. (2007). Changing organizational attitudes and culture through sustainability accounting. In J. Unerman, J. Bebbington, & B. O'Dwyer (Eds.), *Sustainability accounting and accountability* (pp. 226–242). London: Routledge.
- Bebbington, J., & Larrinaga-González, C. (2008). Carbon trading: Accounting and reporting issues. *European Accounting Review*, 17(4), 697–717.
- Broome, J. (1992). *Counting the cost of global warming*. Cambridge: The White Horse Press.
- Market Advisory Committee, California Air Resources Board (2007). *Recommendations for designing a greenhouse gas cap-and-trade system for California*.
- Cook, A. (2009). Emission rights: From costless activity to market operations. *Accounting, Organizations and Society*, 34(3–4).
- Deegan, C. (2007). Organizational legitimacy as a motive for sustainability reporting. In J. Unerman, J. Bebbington, & B. O'Dwyer (Eds.), *Sustainability accounting and accountability*. London: Routledge.
- Forelle, C. (2008). Carbon credits reassessed. *Wall Street Journal*, 23(April).
- Gibson, K. (1996). The problem with reporting pollution allowances: Reporting is not the problem. *Critical Perspectives on Accounting*, 7(6), 655–665.
- Glover, J. (2009). A collapsing carbon market makes mega-pollution cheap. *The Guardian*, 23(February).
- Gould, J. R. (1962). The economist's cost concept and business problems. In W. T. Baxter & S. Davidson (Eds.), *Studies in accounting theory* (pp. 218–235). London: Sweet and Maxwell Limited.
- Gray, R. (forthcoming). Is accounting for sustainability actually accounting for sustainability... and how would we know? An exploration of narratives of organizations and the planet. *Accounting, Organizations and Society*.
- Gray, R., Bebbington, J., & Walters, D. (1993). *Accounting for the environment*. London: Paul Chapman in Association with the Chartered Association of Certified Accountants.
- Hopwood, A. G. (1978). Social accounting – the way ahead? In *Social accounting* (pp. 53–64). London: Chartered Institute of Public Finance and Accounting. Reprinted in Hopwood, A. G. (1988). *Accounting from the outside: The collected papers of Anthony G. Hopwood*. New York: Garland Publishing.
- IETA (International Emissions Trading Association) 2007. *Trouble-entry accounting – revisited: Uncertainty in accounting for the EU emissions trading scheme and certified emission reductions*. London: PriceWaterhouseCoopers.
- Jowit, J. (2009). British firms battle for oil in Canadian tar sands rush. *The Guardian*, 26(February).
- Knight, E. R. W. (2008). *The economic geography of carbon market trading: How legal regimes and environmental performance influence share performance under a carbon market*. Working paper. Oxford University Centre for the Environment.
- Knox-Hayes, J. (2008). *The developing carbon financial services industry: expertise, adaptation and complementarity in London and New York*. Working paper. Oxford University Centre for the Environment.
- Macalister, T. (2008). Nearly half of FTSE-250 companies keep their carbon footprints hidden. *The Guardian*, 8(October).
- Macalister, T., & Wearden, G. (2009). Polluters cash in on carbon trading. *The Guardian*, 28(January).
- Milne, M., & Gray, R. (2007). Future prospects for corporate sustainability reporting. In J. Unerman, J. Bebbington, & B. O'Dwyer (Eds.), *Sustainability accounting and accountability* (pp. 184–207). London: Routledge.
- Milner, M. (2008). Value of global carbon trading is already nearly double last year's figure at £30bn. *The Guardian*, 9(July).
- Monbiot, G. (2009). This scam is nothing but a handout for motor companies, resprayed green. *The Guardian*, 10(March).
- Portney, P. R., & Weyant, J. P. (Eds.). (1999). *Discounting and intergenerational equity*. Washington, D.C.: Resources for the Future.
- Pearce, F. (2008). The great green swindle. *The Guardian*, 23(October).
- Prins, G., & Rayner, S. (2007). Time to ditch Kyoto. *Nature*, 449(25 October), 973–975.
- Scharlemann, J. P. W., & Laurance, W. F. (2008). How green are biofuels? *Science*, 319(5859), 43–44 (4 January).
- Sijm, J., Neuhoff, K., Chen, Y. (2006). *CO2 cost pass through and windfall profits in the power sector*. Working paper. Electricity policy research group, University of Cambridge.
- Stern, N. (2007). *The economics of climate change: The Stern review*. Cambridge: Cambridge University Press.
- The Economist (2007). *Cleaning up: A special report on business and climate change*, 2(June).
- Unerman, J., Bebbington, J., & O'Dwyer, B. (2007). *Sustainability accounting and accountability*. London: Routledge.
- van Wee, B., Moll, H. C., & Dinks, J. (2000). Environmental impact of scrapping old cars. *Transportation Research Part D: Transport and the Environment*, 5(2), 137–143.
- Wara, M. W., Victor, D. G. (2008). *A realistic policy on international carbon offsets*. Working paper # 74. Program on energy and sustainable development, Stanford University.
- Weitzman, M. L. (1998). Why the far-distant future should be discounted at its lowest possible rate. *Journal of Environmental Economics and Management*, 36(3), 201–208.
- Weitzman, M. L. (2001). Gamma discounting. *The American Economic Review*, 96(1), 260–271.
- Williams-Derry, C., & de Place, E. (2008). *Why free allocation of carbon allowances means windfall profits for energy companies at the expense of customers*. Sightline Institute.