



On the interplay between environmental reporting and management accounting change



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ABSTRACT

This paper investigates how environmental reporting (ER) and environment-related management accounting (EMA) practices may interact in the process of responding to disturbances of the natural environment (e.g., changes in environmental regulation, green consumerism, societal pressures for environmentally-responsible conduct). Based on data gathered in four Belgian case companies, we find that the emergence of an interplay between ER and EMA practices is related to the change pathways followed by these disturbances. Moreover, the strength of the environmental disturbances, top management commitment and the presence of an environmental champion are important contingent factors in understanding the development of a recursive relationship. Finally, the findings illustrate that an interplay between ER and EMA practices has the potential to foster or stifle organizational greening.

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1. Introduction

In a world conscious of sustainability issues and constraints, the demands for different flows of information are likely to grow (Hopwood, 2009). In particular, in response to disturbances of the natural environment (e.g., changes in environmental regulation, green consumerism, societal pressures for environmentally-responsible conduct), organizations may change their reporting (e.g., Bebbington et al., 2009; Cho and Patten, 2007; Spence and Gray, 2007) and management accounting practices (e.g., Albelda-Pérez et al., 2007; Fraser, 2012; Larrinaga-González and Bebbington, 2001). Moreover, Frost and Seamer (2002) and Tilt (2006) have proposed that there may also be an interaction between environmental reporting (ER) and environment-related management accounting (EMA); that is, procedural changes in one may elicit procedural changes in the other. The question then arises how this interplay

is bound up with the change process towards organizational greening. Accordingly, the purpose of this paper is to investigate *how ER and EMA practices may interact in the process of responding to disturbances of the natural environment*. This research question is mainly addressed through 15 semi-structured interviews with general, finance and environmental managers of four Belgian companies. The data were collected over a two-year period.

To fathom the various facets in the change process towards organizational greening, we use Laughlin's (1991) organizational change framework. As a middle range theory, the framework merely provides a language to explore change processes, in that empirical flesh is needed to make it meaningful (Laughlin, 1995). Several authors in the social and environmental accounting area (Gray et al., 1995; Larrinaga-González and Bebbington, 2001; Larrinaga-González et al., 2001) have already acknowledged the framework's capacity to sensitize the researcher to observe change that is not readily observable (Fraser, 2012).

The contribution of this paper is threefold. First, because the process of constructing environmental reports can

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be of greater value than the actual reports themselves (Adams and McNicholas, 2007), we enrich studies that mainly considered ER as an outcome (e.g., Gray et al., 1995; Larrinaga-González et al., 2001) by considering reporting as a process. In particular, we complement studies that investigated change pathways in response to disturbances of the natural environment (Fraser, 2012; Gray et al., 1995; Larrinaga-González and Bebbington, 2001; Larrinaga-González et al., 2001) by providing a detailed analysis of the emergence of an interplay between ER and EMA practices during this change process. At the same time, we empirically test Tilt's (2006) assumption that ER can be considered as a response that may result from undergoing some form of organizational change or as one of the drivers of it. Second, given that academic evidence on EMA is still sparse, we also respond to calls for more research in this area (Burnett and Hansen, 2008; Ferreira et al., 2010; Henri and Journeault, 2010; Parker, 2005; Perego and Hartmann, 2009). Furthermore, we complement research on the interface between managerial and financial reporting (Hemmer and Labro, 2008). Finally, by uncovering the mechanisms through which accounting develops in a specific setting, we contribute to the broader accounting change literature (e.g., Burns and Scapens, 2000; Hopwood, 1987; Innes and Mitchell, 1990; Vaivio, 1999).

The remainder of this paper is organized as follows. Section 2 reviews the relevant literature. Section 3 elaborates on the employed research method, while Section 4 analyzes and discusses the findings. The final section offers some concluding remarks.

2. Literature review

2.1. Organizational change in response to disturbances of the natural environment

Organizations are naturally change-resistant (Broadbent and Laughlin, 2005). Therefore, the dynamics of organizational change need to be studied in relation to 'disturbances' (or 'jolts', 'kicks' or 'noises') (Laughlin, 1991), for example of the natural environment (e.g., Gray et al., 1995). When organizations can successfully avoid disturbances, no change occurs. This non-change is described by Laughlin (1991) as *inertia*. In the context of the natural environment, inertia implies a complete ignorance of the environmental agenda (Gray et al., 1995; Larrinaga-González et al., 2001).

In other organizations, disturbances can cause changes in the balance of the organization's components; that is, in the amalgam of subsystems (tangible elements such as buildings, people, machines, etc.), design archetypes and interpretative schemes (Laughlin, 1991). Hinings and Greenwood (1988) define archetypes as 'compositions of structures and systems given coherence or orientation' (p. 4) by interpretative schemes. More specifically, design archetypes are 'the intervening variable between the higher level values and the tangible subsystems and are intended to guide the design of the latter to express the perspective of the former' (Laughlin, 1991, p. 212). As such, accounting forms an important part

of an organization's design archetype (Broadbent, 1992). Bartunek (1984) sees the interpretative schemes as a set of shared meanings, values and beliefs that provide a means by which organizational members have the possibility to achieve a shared interpretation of the same events. Drawing on Levy (1986), Laughlin (1991) subdivides the interpretative schemes into three increasingly deeper levels of abstraction: (1) beliefs, values and norms; (2) the mission or purpose of the organization; and (3) metarules.

To delineate the different pathways that disturbances may follow and the different degrees of change they may engender, Laughlin (1991) distinguishes between first-order or morphostatic and second-order or morphogenetic change (Levy, 1986). Morphostatic change can be characterized as merely giving things a different appearance, whereas morphogenetic change deeply penetrates into the organization's 'genetic code' (Smith, 1982) as a result of learning and development processes (Robb, 1990). While morphostatic changes leave the interpretative schemes unaffected (Laughlin, 1991), morphogenetic changes involve shifts in all three organizational components (subsystems, design archetypes and interpretative schemes) (Laughlin, 1991). Levy (1986) is more specific and argues that morphogenetic change is only possible when the deeper levels of the interpretative schemes alter.

Within each order of change, Laughlin (1991) further distinguishes two change pathways. First, *morphostatic* change is subdivided into rebuttal and reorientation. In the case of *rebuttal*, only the design archetypes will be slightly altered and then, once disturbances have been rebutted, the change may revert back. In the context of the natural environment, the primary feature of this pathway is that companies refuse to recognize their environmental impact ('the environment has nothing to do with us'; Gray et al., 1995) or divert responsibilities away by blaming other stakeholders (Larrinaga-González et al., 2001). *Reorientation* change transforms both the design archetypes and the subsystems, while leaving the interpretative schemes intact; for example, the adoption of environmental initiatives for conventional business concerns (Gray et al., 1995). Second, Laughlin (1991) subdivides *morphogenetic* change into colonization and evolution. *Colonization* change is forced upon the organization, whereas *evolution* change is chosen by the organization. Colonization change is initiated in the design archetypes, which then modify the subsystems and the interpretative schemes. In the case of evolution, changes in the interpretative schemes affect the design archetypes and next the subsystems.

Gray et al. (1995) and Larrinaga-González et al. (2001) found views that could be identified with colonization (fear) and evolution (choice) but could not detect adjustments within the interpretative schemes. This led them to theorize that both colonization and evolution can be either morphostatic or morphogenetic. Finally, it should be noted that Larrinaga-González and Bebbington (2001) and Fraser (2012) found that an organization's response to environmental disturbances also depends on the specifics of each situation, such as the strength of the

environmental disturbances, top management commitment, operational leadership and internal power relations. Such an ‘assemblage’ of factors then operates as a dynamic of interconnected elements that moderates the change pathway that an organization takes (Duncan and Thomson, 1998).

2.2. The role of environmental accounting in organizational change

Because organizations’ boundaries are constantly under stress, it is important to define and manage what is ‘inside’ and what is ‘outside’ the organization (Llewellyn, 1994). In response to disturbances, for instance of the natural environment, boundary management will determine whether these will be included in or excluded from the production and reproduction of organizational discourses (Llewellyn, 1994). This ‘boundary management’ is one of the roles of accounting (see also Hines, 1988), which, as an important part of an organization’s design archetype (Broadbent, 1992), may influence the nature of the initial response to disturbances (Broadbent and Laughlin, 2005). In particular, accounting may not only function as a gateway through which jolts enter the organization (Gray et al., 1995), it may also be used to safeguard the organizational membrane. In the context of disturbances of the natural environment, Gray et al. (1995), Larrinaga-González and Bebbington (2001) and Larrinaga-González et al. (2001) found that environmental accounting and, in particular, ER was employed to negotiate and control the environmental agenda. Used in this way, environmental accounting may establish a ‘threshold’ (Llewellyn, 1994) that stifles organizational change.

Accounting may not only influence the gateways through which jolts enter the organization, but also the pathways (Laughlin, 1991) along which jolts move through the organization. In their action research study, Adams and McNicholas (2007) found that going through the sustainability reporting process resulted in some organizational change. They suggest that it was the process of preparing a report and the subsequent visibility of sustainability performance data that acted as a catalyst for change towards improved sustainability performance. As such, by making things visible (Hopwood, 1990; Hopwood et al., 2010), accounting can act as a vehicle for organizational change (e.g., Dent, 1991; Hopwood, 1987) and steer disturbances along particular change pathways (Broadbent and Laughlin, 1998, 2005). Hence, although previous research has often emphasized ER as an outward response to disturbances, the process of constructing the environmental report may also influence the inner workings of the organization (Tilt, 2006).

To fully understand the role of accounting in organizational change, it is important to also consider an organization’s internal decision making; that is, its management accounting practices (Burns and Scapens, 2000). While reporting may provide some routines which give external legitimacy, management accounting practices, as routines, may maintain organizational coherence (Scapens, 1994), such that disturbances are accommodated within

existing accounting rationales. In this respect, management accounting becomes important in ‘binding structures [which] produce and reproduce the internal unity of the organization’ (Llewellyn, 1994, p. 14). Alternatively, entirely new ‘taken-for-granted’ (Mouritsen, 1994) ways of thinking and doing in an organization may be created. In particular, the process of adding an environmental perspective to management accounting may result in more than merely the creation of new tools aimed at gaining competitive advantage and improving financial performance. Indeed, just like ER (Adams and McNicholas, 2007), EMA also has the potential to affect organizational greening. Although Larrinaga-González and Bebbington (2001) suggest that it is unlikely that environmental accounting practices will survive when they challenge the underlying rationality of the organization, Albelda-Pérez et al. (2007) found that such practices may foster environmental embeddedness and, as a result, enhance environmental performance. Hence, changes in an organization’s design archetype have the potential to lead to major shifts in the very heart of the organization (Broadbent and Laughlin, 2005). In particular, Bartunek (1984) posits that fundamental shifts in the organization’s strategy may be an indication of morphogenetic change. Importantly, however, according to Gond et al. (2012)¹, a change in strategic orientation towards sustainability requires EMA practices to be *integrated* into, as opposed to running *parallel* to, a company’s traditional management accounting systems.

2.3. The interplay between ER and EMA practices

Just as conventional accounting has been a powerful tool in communicating (financial accounting) and facilitating and influencing (management accounting; Demski and Feltham, 1976) the economic decisions of an organization, environmental accounting has the potential to be a powerful tool in communicating, facilitating and influencing the environmental decisions of an organization (Unerman et al., 2007). More specifically, environmental accounting encompasses external ER, as well as the provision of information within organizations to manage environmental performance; that is, EMA (Burrill and Schaltegger, 2010). EMA may be conceived of as the application of the ideas of management accounting to a particular area (Bennett and James, 1997, 1998). While ER is a highly visible activity, the internal environmental decision-making practices are much less obvious (Hopwood et al., 2010, p. 18). Table 1 provides an overview of some examples of EMA tools categorized into the conventional subareas of management accounting (see also Bennett and James, 1997, 1998).

Previous research has already noted that external and internal environmental accounting practices may be related. Through an analysis of a postal questionnaire surveying managing directors of 35 New South Wales public sector entities and their annual reports, Frost and Seamer (2002) examined the relationship between ER and EMA

¹ An earlier version of this paper was published as Moon et al. (2011).

Table 1
Examples of EMA tools.

EMA tool	Description
Capital investment decision making	In determining the returns from investments, environmental costs, savings and revenues may be taken into account (e.g., Parker, 2000b) or companies may also specifically invest in environmental projects (e.g., Epstein and Roy, 1997), such as wind mills or wastewater treatment stations
Budgeting	During the budgeting process, detailed targets for environmental costs (e.g., expenses for water usage and electricity consumption) and revenues (e.g., from selling material scrap or from recycling waste) may be set
Performance measurement	EPI scorecards may be ad hoc measures that managers must keep 'in control' and manage by exception (Kaplan and Norton, 1996a; Kaplan and Norton, 1996b), but organizations may also translate environmental concerns into strategy (e.g., Atkinson et al., 1997; Epstein, 1996; Johnson, 1998) and use EPIs to support decision making and motivate continuous improvement (Henri and Journeault, 2008), and to enhance environmental performance (Henri and Journeault, 2010)
Incentive systems	Incentives may be created by integrating environmental criteria into promotion considerations (Masanet-Llodra, 2006) or bonus calculations (Kolk and Perego, forthcoming)
Costing	Environmental cost classification schemes could be a first step in identifying potential environmental cost savings (Parker, 2000b), but organizations may also allocate environmental costs to specific products or services, for example through activity-based costing (e.g., Quarles and Stratton, 1998; Stone, 1995)

practices. Their study revealed a significant association between the development of EMA practices and the level of environmental disclosure in annual reports. However, the direction of the relationship is unclear (cf. Tilt, 2006). More specifically, Bartolomeo (1998) observed that some Italian companies first build up an information system to manage environmental performance indicators (EPIs) and then publish their environmental report, whereas in other companies, the environmental report drives the development of a more comprehensive environmental performance management system (see also Bennett and James, 1998). This latter pattern was confirmed by Adams and Frost (2008), who found that the desire to disclose environmental information not only resulted in increased measurement, but also led to the integration of EPIs in risk management, decision making, performance management and strategic planning.

Hence, the pathways followed by the jolts that enter the organization, and thus the resulting organizational change, may not only be influenced by ER and EMA practices separately but also by their interplay. More generally, Tyrrall and Parker (2005) argue that changes in multiple design archetype categories can mutually reinforce each other in organizational change processes.

3. Research method

3.1. Company selection

The selection of the companies was informed by the replication logic (Yin, 2003). This logic must be distinguished from the sampling logic commonly used in surveys (Yin, 2003), where it is important that the sample companies 'represent' other cases. Following the replication logic, however, our aim was to identify cases that should turn out differently as predicted by the theoretical framework. This would allow us to observe companies in different change processes (cf. Gray et al., 1995; Larrinaga-González et al., 2001; Laughlin, 1991).

Because we are particularly interested in studying change pathways, we only selected companies that disclose some environmental information² in order to avoid the no-change case; that is 'inertia' (cf. Larrinaga-González et al., 2001). Since it is very challenging to distinguish a priori between 'rebuttal', 'reorientation', 'colonization' and 'evolution' organizations in any general sense (Gray et al., 1995), we selected four Belgian companies that could be expected to experience different disturbances, and therefore could be envisioned to follow different change pathways (Fraser, 2012; Gray et al., 1995; Larrinaga-González et al., 2001). This judgment was informed by an analysis of annual reports, websites, press articles and, if available, standalone sustainability reports. More specifically, informed by Gray et al. (1995), we attempted to cover different categories of external jolts. These are listed in Table 2. However, we also acknowledge that in addition to theoretical motives, the selection of our cases was partly driven by the availability of the general managers (cf. infra).

Company A is a family-owned B2C food company, employing approximately 1200 employees in ten different countries. Company B is a family-owned printing company that employs approximately 2900 employees and operates in six countries. Company C is a B2B food company that used to employ about 1700 employees in three countries, but due to a recent acquisition the workforce has doubled. Company D is a telecommunication company that employs about 2000 people in Belgium.

3.2. Method of data collection

According to Laughlin (1991), the interpretative schemes (e.g., language and discourse) provide coherence in organizations. Deeper organizational change can only occur when this particular element transforms (Gray et al., 1995; Larrinaga-González et al., 2001; Laughlin, 1991). Since it is only through communication that we can pick up the corporate discourses (Larrinaga-González et al., 2001), semi-structured interviews constituted the core of the data collection. Semi-structured interviews do not only provide information and facts, but also shed light on personal insights and subjective views (Czarniawska, 2004).

² This study concentrated on Belgian (listed) companies. In Belgium, disclosing environmental information is not imposed by law and is thus voluntary.

Table 2
Categories of external jolts.

Jolt	Company A	Company B	Company C	Company D
Institutional framework	Manufacturing company: increasingly demanding environmental legislation	Seveso-company: closely monitored and highly regulated	Manufacturing company: increasingly demanding environmental legislation	Service company: less demanding environmental legislation
Consumer behaviour			Increased pressure from B2B customers	
External social pressures	Susceptible to public opinion: company name = brand Mainly family-owned	Less susceptible to public opinion: company name ≠ brand Mainly family-owned	Less susceptible to public opinion: white label Family's share is decreasing	Susceptible to public opinion: company name = brand No family ownership

By providing insights into managers' perceptions of the environmental disturbances, their personal concerns and motivations, semi-structured interviews are likely to reveal more information about the potential for transition (Gray et al., 1995; Larrinaga-González et al., 2001; Laughlin, 1991).

Data collection was based on interviews with 15 managers, as well as on a search for and analysis of relevant documentation in each case (i.e. annual reports, standalone sustainability reports, websites and internal documents). The primary purpose of the interviews was to gather descriptive data on both ER and EMA practices, as well as more detailed information on the connections between these two different components of environmental accounting and their role in the process of organizational greening. More specifically, interviews were conducted with the general managers, finance managers and environmental managers of the four case companies.³

The interviews took place in two stages, which covered two years. Such an extended timeframe is highly recommendable in the context of organizational change (Larrinaga-González and Bebbington, 2001; Larrinaga-González et al., 2001) because it allows change that is not readily visible or rapid to be observed (Fraser, 2012). During the first stage (July 2010–October 2011), in each of the four companies, both the general manager and the finance manager (or equivalent⁴) were interviewed because they might have different viewpoints on the environmental agenda given the varying demands inherent in their positions (Wilmshurst and Frost, 2001). General managers were interviewed because they do not only have a broad perspective on the company's operations, but can also be expected to detect environmental disturbances and initiate the response to such kicks (Gray et al., 1995; Lewellyn, 1994). Finance managers were interviewed because of their significant input into the incorporation of items in the annual report, thereby enabling them to address questions about environmental disclosures.

The general and finance managers were contacted and interviewed separately. This approach had several advantages. First, contacting two high-level managers simultaneously and asking both of them for a considerable amount of their time would probably have stimulated a negative response. Second, such an approach prevents managers from conferring before the interview. Finally, interviewing them together might induce them to answer in a less unprompted fashion. The general manager's contact email described that the aim of the research project was to study effective decision-making and control systems. The contact email seeking an interview with the finance manager outlined that the project was concerned with decisions regarding whether to include different voluntary information items (such as environmental issues) in the annual report. The double-interview approach enabled us to cross-check the obtained information.

In line with previous research (e.g., Gray et al., 1995; Parker, 2000a; Perego and Hartmann, 2009; Wilmshurst and Frost, 2001) and practitioner (e.g., Collins et al., 2011; Epstein, 1996; Epstein and Roy, 1997) evidence, the interviews from the first stage revealed that environment-related accounting issues are not primarily addressed by the management accounting department. A short contact with the management accountant of each of the four companies confirmed this observation. Consequently, during the second stage (June–August 2012), environmental managers were interviewed to obtain more detailed information and frame the answers received so far. Although the titles of their functions varied, they were always the ones directly responsible for designing, implementing and monitoring environmental measures. The email seeking an interview with the environmental manager clearly stated that both the general and the finance manager had already been interviewed. The detailed list of the actual environmental actions that was provided by the environmental managers helped us to reflect in a more informed way on the change pathway the company was following. Furthermore, during the interview, the environmental managers were invited to share their view on any potentially contradictory insights of the general and finance managers. This enabled us to contextualize the different narratives and thus to gain more comprehensive insights.

Access to companies was granted on the understanding that the results would be published anonymously. Therefore, detailed information on corporate operations

³ In each of the four companies, we interviewed at least a general (CEO or COO), finance and environmental manager. The total number of interviewees is 15 rather than 12 because at Companies B and C we interviewed two environmental managers and at Company D we interviewed both the CEO and the COO (see also Table 3).

⁴ We always interviewed the manager who had the final responsibility for the annual report. In one case, this was the legal officer (see also Table 3).

Table 3
Overview of the interviewees.

Company	Function of the interviewee	Abbreviation
Company A	CEO	GM.A
	Legal officer	FM.A
	Environment, health and safety engineer	EM.A
Company B	COO	GM.B
	CFO	FM.B
	Environment and safety advisor	EM1.B
Company C	Project manager	EM2.B
	CEO	GM.C
	CFO	FM.C
	Quality manager	EM1.C
Company D	Environment and safety advisor	EM2.C
	CEO	GM1.D
	COO	GM2.D
	CFO	FM.D
	Vice president sustainability	EM.D

cannot be given. It is noteworthy that finance managers and environmental managers were much more accessible than general managers, whose gatekeepers repeatedly precluded us from getting access. An overview of the interviewees is provided in Table 3.

3.3. Conducting the interviews

Before commencing each interview, the nature of the research was again outlined for each interviewee. The interviews were semi-structured, which implies that the questions were open-ended in order to invite interviewees to participate in a guided conversation (e.g., O'Dwyer, 2004; Patton, 2002). The interview protocols were all informed by the literature (e.g., Patton, 2002; Yin, 2003). The average duration of each interview was approximately 55 min. Tape-recording and subsequent transcription for further analysis was done for all conversations with the interviewees, except for the environmental manager of Company D. Detailed notes were taken throughout and immediately after interviewing this manager to ensure that all issues raised were immediately recorded.

3.4. Data analysis

Informed by O'Dwyer (2004) and Spence and Gray (2007), a systematic approach to data analysis was undertaken. Three main phases can be distinguished: data reduction, data display and data interpretation. During the *data reduction* phase, each transcript was coded. The codes were initially derived from the interview protocol and prior literature review (Yin, 2003). In total, the transcripts were read on four separate occasions. The first and second in-depth readings were undertaken with the tape of the interview running as 'emphasis, mood, intonation and so on crucially elaborate meaning' (Jones, 1985, p. 58). In order to overcome bias, the first and second in-depth readings were carried out independently by both researchers. Afterwards, the results were discussed and compared. The comparison revealed that the researchers used a similar coding structure as well as similar coding rules. Following a

short discussion, the final coding structure and rules were defined and applied to the transcripts using NVivo.⁵ After the third reading, a detailed summary of each interview was prepared. Summaries of the individual interviews were then collated by theme in order to check for completion of the data and to identify possible areas where further information might be needed (Adams, 2002; Patton, 2002). In such cases, the additional information was collected through short telephone conversations.

Once the coding was completed, after the fourth reading, the *data display* phase was initiated by the drawing of a mind map for each company. Detailed matrices summarizing the themes/codes identified in each transcript (Miles and Huberman, 1994) were developed in order to visually display the emerging themes. These displays aided in identifying patterns in the interview evidence as a whole, with the predominant themes/codes becoming partially evident by mapping the relative incidence of different codes (cf. Patton, 2002).

Finally, during the *data interpretation* phase, companies were compared two-by-two and the similarities and differences between each pair were listed, as suggested by Eisenhardt (1989). Subsequently, a more general mind map of the interplay between ER and EMA practices was drawn (see Fig. 1).

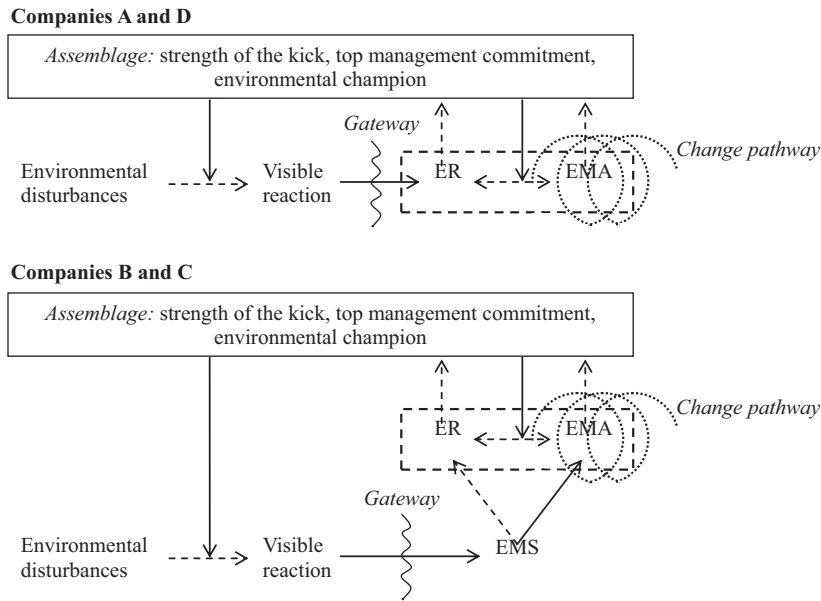
To make sense of the data collected, we drew on Laughlin's (1991) organizational change framework and those who have more recently applied it within the social and environmental accounting literature: Gray et al. (1995), Larrinaga-González and Bebbington (2001), Larrinaga-González et al. (2001) and Fraser (2012). Like these authors, we followed Laughlin's (1991) framework as a 'skeletal' theory (Laughlin, 1995) to categorize the change processes at the four case companies. In particular, Laughlin's (1991) pathways formed a language for exploring empirical situations (Broadbent and Laughlin, 2005). As such, the empirics put the 'flesh' onto this 'middle-range' framework (Laughlin, 1995) and resulted in a dynamic empirical context that fostered the visibility of the change processes (Larrinaga-González and Bebbington, 2001).

4. Analysis and discussion

For each company, we will first reflect on the change pathway (Laughlin, 1991) that the environmental disturbances have taken and then discuss how ER and EMA processes and their interplay are bound up in the organizational change process (cf. Tilt, 2006). The section concludes with a summarizing discussion.

Table 4 lists the different EMA tools employed by the four case companies. The different cell entries will be illustrated throughout the following paragraphs.

⁵ As suggested by O'Dwyer (2004), NVivo was merely used as 'a tool designed to assist analysis' (p. 395), in that it cannot replace theoretical thinking and analysis.



Note: As far as the link between environmental reporting (ER) and environment-related management accounting (EMA) practices is considered, two groups can be distinguished in our case companies. In the first group (Companies A and D), the annual report is considered as a trigger to undertake action. In the second group (Companies B and C), reporting mainly originates from the subscription to the 'charter for sustainable entrepreneurship', an environmental management system (EMS).

Fig. 1. Mind map of the interplay between ER and EMA practices.

Table 4
EMA tools used by the four case companies.

Tool	Company A	Company B	Company C	Company D
Capital investment decision making	x	x	x	x
Budgeting			x	
Performance measurement				
Ad hoc EPIs		x		x
Parallel, strategic EPIs				x
Integrated EPIs			x	
Incentive systems				x
Costing				

Note: Our insights are not only based on interviews, but also on detailed analyses of internal documents.

4.1. Company A

4.1.1. Description of the disturbances and change pathways

Although Company A is operating in an industry with increasing environmental legislation (see Table 2), we found some evidence of a preference to reject its environmental impact: 'In fact, we are a company with relatively low environmental impact' (FM.A). Such rejection is the primary feature of the rebuttal change pathway (Gray et al., 1995; Larrinaga-González et al., 2001). However, the managers of Company A realized that they could no longer deny the environmental facets of doing business:

[...] society is putting more and more attention on [the environment] and starts to take it into account in their buying decisions, consumer behaviour and perception of the firm. (FM.A)

Operating in a highly environmentally-regulated industry, Company A merely pursues conformity 'because that's

what you need' (EM.A) to avoid image damage at all times. The detection of environmental jolts does, however, not imply a commitment of top managers to the environmental agenda:

[The top managers] are occupied with sales, with financial results and whatever. So, you have to gain a foothold somewhere. If they then see that it yields, that it can actually be a positive story, then they take it on board. [...] (EM.A)

Indeed, the newly-recruited environmental manager of Company A indicates that in order to obtain financial support, he attempts to translate environmental initiatives into the top managers' traditional business language (i.e. savings and image). He repeatedly underlines that only those initiatives (e.g., energy savings, water savings, waste reduction) that yield a financial return would be accepted by management: 'But it has to be something that ... delivers. Financially, of course' (EM.A). Consequently, Company A adopts those environmental initiatives that fit in with its

conventional business concerns; that is, the current interpretative schemes.

The above evidence suggests that Company A inclines towards reorientation for direct business reasons (Gray et al., 1995), in that image protection (i.e. avoiding image damage due to non-compliance with law) and savings form the basis of its environmental focus.

4.1.2. *How environmental accounting processes are bound up in organizational change*

While traditionally, the sustainability information at Company A was fragmented throughout the annual report, this information has been merged into one corporate social responsibility (CSR) chapter since the 2010 annual report. This decision was taken because *'there is obviously a trend of reporting about the broad domain of CSR'* (FM.A). Furthermore, this decision was *'an example of a suggestion from the board of directors who proposed [to start reporting], bearing in mind what other companies do, bearing in mind what "lives and moves" in society'* (FM.A). In addition, *'It is also something that has been suggested by the executive committee'* (FM.A). The finance manager of Company A also considers sustainability as a trend and, therefore, wishes to disclose some information *'as a part of image building'* (FM.A). Since ER was initiated before environmental initiatives were undertaken, the phrasing of each environmental disclosure had to be discussed:

[The people involved] determined for each element, what we would say about it at the moment, and what we would not say about it and . . . Should we establish a specific goal, so that in x time, we can come back to it and demonstrate that the objective has been achieved? (FM.A)

Company A's annual reports (i.e. for both years in the time frame of our study) briefly discuss the company's energy and water usage, packaging, and waste recycling. Although no specific data are provided on the company's environmental impact, the company's 'primary concern' to reduce its CO₂ footprint does include the reduction of its annual energy consumption by a predetermined percentage. The setting of this objective was, however, *'not based on a large scientific study'* (GM.A), the general manager said laughing. The environmental manager admits that things have been written *'of which I know they are certainly not going to happen'* (EM.A), so that he does not feel comfortable with the annual report: *'I stopped reading. I thought to myself: I'm gonna go insane.'* (EM.A). At the same time, however, the finance manager recognizes that these disclosures *'are a means to develop a few projects more quickly, to set objectives, and to achieve them as well'* (FM.A). Hence, the ER process acts as a 'gateway' (Gray et al., 1995), in that it 'creates' the environment and 'authors' the organizational discourse around it (Francis, 1990). Indeed, the environmental manager confirms that the company is currently cooperating with an external party to calculate its CO₂ emissions because according to the annual report *'the company would like to determine its overall CO₂ emissions and also reduce them in the long run'* (EM.A). It should be noted, however, that the recently started environmental

initiatives are not supposed to be progressing all too quickly:

We will let it evolve very softly [. . .]. We will certainly not do anything precipitously. [. . .] Step by step, no brutalizing, but a steady progress. (EM.A)

This illustrates that the company's interpretative schemes cannot be expected to change soon. Accordingly, the company's occasional green investments also have short payback times (e.g., solar panels and insulation). Apart from these capital investment decisions, Company A does not employ any other EMA tools.

Hence, it may be argued that the process of trying to disclose environmental information triggered the need for data and actions (cf. Adams and Frost, 2008). Accordingly, the ER process fed the EMA practices by creating a need to measure environment-related performance. The process of ER thus appeared to be of greater importance than the actual report itself (Adams and McNicholas, 2007). However, at the moment, the environmental policy of Company A is still mainly focused on compliance with current legal requirements and quick financial gains.

4.2. *Company B*

4.2.1. *Description of the disturbances and change pathways*

Similar to Company A, Company B is also a highly environmentally-regulated (see Table 2) company that would prefer to rebut its environmental impact (cf. Gray et al., 1995; Larrinaga-González et al., 2001):

By accident, we are a firm that does not have much to do with [the environment], except for one thing: we print. (FM.B)

Although Company B's environmental agenda is dominated by legal concerns in order not to *'appear negatively in the news'* (EM1.B), its managers are also aware of the commercial repercussions of a 'sustainability' image:

So when a French customer asks about the "bilan carbone", or a Dutch or an English customer asks about footprint [. . .]. In the end, you have to play the game along, and communicate. (EM1.B)

Accordingly, Company B voluntarily subscribed to the 'charter for sustainable entrepreneurship'⁶ and the 'audit

⁶ The 'charter for sustainable entrepreneurship' is a tool to continuously improve environmental, social and economic performance. It centres on open and honest communication and dialogue with all relevant stakeholders. Subscription to the charter is voluntary but engenders a commitment to report a realized plan of action around ten themes to the company's provincial government: (1) corporate governance, (2) societal engagement, (3) communication and dialogue, (4) people-oriented entrepreneurship, (5) risk management, (6) sustainable investment, purchasing and product & service development, (7) supply chain management, (8) climate change and energy, (9) quality of the direct environment, and (10) sustainable logistics and mobility. The ten themes have to be translated into company-specific measures and targets. A team of independent experts audits the subscribers every year and suggests areas for

convenant⁷ – two environmental management systems (EMSs) – for visibility reasons; that is, to obtain a certain label. However, this awareness does not imply a commitment of top managers to the environmental agenda:

Except for [the production manager], nobody knows the detail of what we are doing here. (EM1.B)

And did [the COO] know something about [the environment], [seriously]? (EM1.B)

The tasks of the environmental managers are mainly concentrated on fleshing out legal requirements and maintaining the company's labels. To enable these tasks, the production manager *'creates the [budgetary] space'* (EM2.B).

The dominance of direct business reasons is also reflected by a focus on financial implications:

We will always look for things that [raise revenue]. We will never do something without return. It will always be something financially motivated. (EM1.B)

At Company B, image protection and savings mainly drive the introduction of environmental initiatives while leaving the current interpretative schemes untouched. Hence, similar to Company A, Company B also tends towards reorientation (cf. Gray et al., 1995).

4.2.2. How environmental accounting processes are bound up in organizational change

Company B's annual reports mention that the company subscribed to the 'charter for sustainable entrepreneurship' and the 'audit covenant'. These subscriptions are not without engagement in that they both involve a commitment to continuous improvement, which is regularly subject to audits and creates a need for data collection. Furthermore, the 'charter for sustainable entrepreneurship' also entails a reporting requirement to the government and an obligation to communicate to the public. This is considered as a challenge by the environmental managers, who are located at a rather low operational level in the organization:

We're probably not specialists in communication. I mean, if you put a commercial – what's it called? – marketing guy on it – is that a "marketeer"? – [...], if you wanted to build a commercial story around it to partly exploit it, it would perhaps also yield something. (EM1.B)

Accordingly, the disclosed information mainly summarizes the environmental initiatives required by the 'charter for sustainable entrepreneurship':

We are doers and try, afterwards, to communicate everything we do. (EM1.B)

improvement. In the case of a positive evaluation, a certificate is granted. The charter originates from the Flemish provincial governments and is accessible to all Flemish companies, independent of size or industry.

⁷ The 'audit covenant' is mainly aimed at energy-intensive companies. Subscription is voluntary but engenders an obligation to reduce carbon emissions. Subscribers have to elaborate an energy plan that lists their current energy consumption, as well as detailed actions to reduce it. The energy plan is scrutinized through a yearly audit. The 'audit covenant' originates from the Flemish government.

[Communicating] is not our strongest point. (EM2.B)

The company's commitment to continuous improvement requires the monitoring of energy, water and raw materials usage. In particular, to fulfil the stringent requirements of the 'audit covenant', EPIs have been developed for energy usage (electricity and gas). At the same time, in line with the company's financial focus, these EPIs will also be used to control costs. For example, the company will determine the optimal drying temperature not only to meet the requirements of the 'audit covenant', but also to ensure that the printing installations operate cost efficiently. It should be noted, however, that the EPIs are managed by exception and that there are no specific targets for these ad hoc EPIs:

No, no, we just try to improve. (EM2.B)

We have to make sure it is translated into a graph that goes down. (EM1.B)

There are also EPIs that have been developed apart from the 'audit covenant'. These EPIs are only used to control costs; for instance, the ratio of the number of sellable printed copies to the amount of waste.

To fulfil the requirements of the 'charter for sustainable entrepreneurship' and the 'audit covenant', Company B also invests in specific environmental projects with a reasonable payback time; that is, investments that yield sufficient energy savings and, consequently, financial benefits. In addition, when building a new factory, the company paid special attention to energy consumption and insulation because *'if you don't do it, you are screwed for 15, 20 or 30 years'* (EM1.B). This is in line with their basic assumption of *'100 per cent conformity'* (EM1.B). Finally, company B not only ensures compliance with current legal requirements, it also tries to *'anticipate'* (EM1.B) and get ahead of the regulatory curve (cf. Shrivastava, 1995).

The monitoring of energy, water and raw materials and the technical investments needed to obtain decreasing trends in these figures are discussed in the annual reports, as well as the financial savings (e.g., 'free' water) these will engender. This direct business focus is also clearly reflected in the standalone sustainability report that the company publishes every two years. Indeed, the very first line of this report already states that eco-efficiency is very important for the company.

Although the standalone report *'should become a working document'* (EM2.B), the current reporting process does not trigger any actions. Hence, the reporting process does not influence the management accounting process, even though the reporting of Company B is informed by EPIs.

4.3. Company C

4.3.1. Description of the disturbances and change pathways

Although Company C is also part of an environmentally-regulated industry, B2B pressures seem to override the regulatory pressures. Indeed, the finance manager of Company C indicates that, to a great extent, the company

was 'forced' (FM.C) by its B2B customers to undertake some environmental initiatives. In fact, Company C's initial voluntary subscription to the 'charter for sustainable entrepreneurship' and the 'audit covenant' may be considered as an attempt to signal its environmental efforts to its customers. It should be noted, however, that these customers 'play an ambiguous role [...]. No single customer would pay an additional euro cent' (FM.C). To reconcile the rather contradictory demands of the B2B customers, environmental initiatives preferably have an economic underpinning; for example, the reduction of energy consumption, which is 'obviously good for your wallet' (GM.C). This reconciliation entails that only initiatives in line with the company's current efficiency discourse, and thus the current interpretative schemes, are launched.

Besides external disturbances, Company C's change pathway was also influenced by internal disturbances due to a recent series of mergers and acquisitions. Whereas before, Company C's 'mentality' (GM.C) was to consider environmental efforts as expenses, it is now 'open to it because we are 100 per cent convinced that it is a good thing' (GM.C). In fact, this shift might be explained by a change in top management:

What is different now, is that sustainability is embedded at the top of the company and that it has to descend to all levels. (GM.C)

The appointment of a new CEO for the entire group of companies (i.e. after the acquisition) may be considered as an influential internal disturbance (cf. Fraser, 2012):

[The group's CEO] really asks about it, so he wants it to become a company that plays an exemplary role in that area. (GM.C)

Although the operational responsibility for sustainability has recently been added to GM.C's agenda, this is mainly 'because we assume that it shall become a very important element of differentiation in sales, because that's why you have to do it in the end' (GM.C). Hence, the change in management did not have a great impact on the core of the organization. Rather, the realization that responding to B2B pressures might counter the fear of losing markets seemed to be intensified by a change in management. We tend to believe that this evidence bespeaks of morphostatic colonization (cf. Gray et al., 1995).

It is noteworthy that the environmental manager of a site of one of Company C's acquired companies has always been strongly empowered: 'He simply made an issue of it and [the acquired company's former management] let him' (GM.C). This particular site was then used to show off when customers asked questions even though 'the top executives were not entirely convinced that it was necessary for the entire company' (GM.C). In fact, this environmental manager might be considered as an environmental champion, as nicely illustrated by the following quote from the finance manager:

During an executive meeting there was a topic about sustainability and then [EM1.C] said: "We will do that." (FM.C)

Moreover, the environmental managers, as 'energy ambassadors', are still catalysts for the creation of environmental awareness on the floor:

It is my responsibility to make sure the foremen and the workers are aware of it. (EM2.C)

4.3.2. How environmental accounting processes are bound up in organizational change

The annual reports of Company C clearly state that the company's strategy consists of three areas: efficiency, quality and sustainability. The techniques used to limit water and energy usage, as well as a supply chain initiative to reduce CO₂ are also described. Moreover, it is mentioned that the monitoring of energy and waste flows is just as important economically as it is ecologically. Similar to Company B, Company C makes environment-related capital investment decisions in order to get ahead of the regulatory curve (cf. Shrivastava, 1995). Although Company C acknowledges that economic returns can emanate from such decisions, it also recognizes that its continuous efforts to reduce environmental impacts may come to a halt 'when a limit is reached where less water is used, but at a higher cost. Then [the board of directors] say: "Stop, stop right there."' (GM.C).

The annual reports further explain the company's participation in the 'charter for sustainable entrepreneurship' and that this is a binding commitment used to design an overall plan of actions. The website mentions that this participation not only creates awareness but also motivates personnel. Although these qualitative disclosures are rather similar to those of Company B, Company C does not report any quantitative indicators yet. However, in contrast to Companies A and B, Company C uses detailed energy and material accounting (cf. Bennett and James, 1997, 1998) per site and per processing line. As an integrated part of the budgeting process, starting from efficiency KPIs (key performance indicators) related to production (e.g., the ratio of the number of tons produced to the number of machine hours needed), detailed targets for energy (e.g., kWh per ton) and gas usage are set. Deviations are monitored through weekly variance analyses and meetings with foremen. The yearly audits resulting from Company C's subscription to the 'audit covenant' also stimulate increasingly challenging targets. To foster continuous improvement, for some EPIs, there are also league tables between teams, production lines, sites and countries. As such, information is disseminated (cf. Adams and McNicholas, 2007) and eco-efficiency is further embedded (Albelda-Pérez et al., 2007).

Similar to Company B, the reporting and communication requirement entailed by the 'charter for sustainable entrepreneurship' is considered as a challenge by the (lower-level) environmental managers:

It's sometimes easier to do everything and more difficult to report everything, I have the impression, you know. (EM1.C)

It should be noted, however, that environmental reporting at Company C has recently become the responsibility of the general manager who believes that, ultimately,

companies should not have standalone sustainability reports but integrated annual reports. He believes that ‘*the path towards that evolves via the participation in [EMSS]*’ (GM.C). In fact, the process of reporting makes the managers realize that their environmental programme lacks structure, as illustrated by the following quote from an environmental manager:

We would probably have made much more progress if all the points had been listed. That is actually the most important remaining challenge: to put our heads together and see what we already do now. (EM1.C)

The EMSS have given Company C the opportunity to develop internal activities and the company now is determined to undertake a ‘*catch-up manoeuvre*’ (GM.C) in the commercial exploitation of its report. Given the number of questions Company C receives from its customers, this should not be surprising. The company will increasingly use its environmental report for commercial purposes, which makes it important to ‘*demonstrate that you really do it*’ (GM.C). This, however, requires that ‘*you enter it all more and more into a database in the future, so that you can prove more and more that you approach it consciously*’ (GM.C). At Company C, it was the desire to make its environmental progress more visible that created a need for supporting data. This is in line with Bartolomeo (1998) who observed that some Italian companies first build up an information system to manage EPIs and then publish their environmental report.

Hence, both EMSS involve a commitment to continuous improvement, which creates a need for data collection; that is, EMA information. Moreover, the reporting and communication requirement of the ‘charter for sustainable entrepreneurship’ has brought along improvements in reporting, which, in turn, revealed the need to structure EMA information and practices. Ultimately, the disclosed environmental information should benefit from this enhanced structure. The general manager summarizes as follows:

One day, we will say as much as we do. I hope that we will never say more than we do. (GM.C)

4.4. Company D

4.4.1. Description of the disturbances and change pathways

While the initiation of environmental initiatives is mainly driven by fear in Company C, at Company D, the executive committee (cf. Fraser, 2012) decided to develop a separate sustainability strategy because several managers were ‘*worried about the environment*’ (GM2.D) and considered wider implications of the environmental agenda (cf. Gray et al., 1995):

I am quite interested in the environment because I am a pessimist when it comes to the survival chances of humanity on this planet. (GM2.D)

You want to make sure that you do not only run a business today, but that you can actually still run that business in 20 years and, at least, that you do your very

best to neutralize everything you create in terms of pollution. (FM.D)

That personal concerns of the management play a role, is also expressed by the following answer provided by the CEO to the question whether his personal vision influenced the company’s sustainability policy. Moreover, the quote reveals how the CEO perceives the link between the sustainability agenda and the conventional business discourse:

I always struggle a lot with it, because I think, what you call CSR, corporate social responsibility, (hesitates) is that well-organized egoism, (hesitates again) you see? Or does it include something else too? I believe it is a bit of everything. I believe that a company wants to safeguard its interests by operating a good CSR policy. But that’s like any political party, you have an interest in it. Ok, you are allowed to, right? I mean, everyone can defend his own interests. [...] And is that related to your societal expectations? Absolutely. But there are so many things that you do as a manager - just like a politician - that are driven by personal beliefs. (GM1.D)

Hence, the CEO also recognizes the importance of business reasons. Accordingly, when directly asked whether the inclusion of the company into a sustainability index, ‘*the view of Wall Street*’ (EM.D), was important for branding purposes and thus reputation, ‘*the view of Main Street*’ (EM.D), he replied:

I believe that investors are attaching more and more importance to it and that they connect much more consequences to it. [...] I believe that the customer often conceives of it as a PR thing, but I don’t think this is a problem. . . Look, you should never try to convince everyone on the first day. You always have to try to score points in the long run. [...] (hesitates) As [Company D], we just have to do our thing, but a company should, in my mind, try to let its image shine along as far as sustainability is concerned. (GM.D)

The finance manager seems to confirm that the company’s interest in CSR originates from branding purposes:

But do all shareholders actually like to see such things happening? There are few shareholders that really make a problem of it, but private equity companies are indeed inclined to question such practices. But then I respond: “It’s an element of my vision. It’s an element of the brand [Company D] and as part of the brand [Company D], I want to do that. Full stop.” (FM.D)

Because Company D deliberately chooses to address the environmental agenda, it may be situated in the most proactive pattern of change: evolution (cf. Gray et al., 1995; Larrinaga-González et al., 2001). However, since the interpretative schemes or discourses (Larrinaga-González et al., 2001) seem to remain unaffected, Company D resides in morphostatic change (cf. Gray et al., 1995).

The environmental manager of Company D directly reports to the COO (GM2.D) who reserves the required budget and ‘*volunteered from the managerial level to “take him along”*’ (GM2.D). Moreover, ‘*my impact is to stimulate that,*

to keep our management team's attention on it' (GM2.D). In this sense, and also because of his personal concerns (cf. supra), the COO might be considered as the environmental champion. The environmental manager of Company D – who previously was the communications manager – has to elaborate a sustainability policy and does not have to combine this with any other duties.

4.4.2. How environmental accounting processes are bound up in organizational change

The annual reports of Company D mention a separate long-term sustainability strategy. It can be inferred from the annual reports that this strategy is followed to brand the company as sustainable, and to realize profit along the way. The company further brings a shade of green into its brand through investments in environmental projects (e.g., planting woods), which are *'of course communicated'* (FM.D).

A target of carbon neutrality is put forward in the company's annual reports, as well as several supporting data and initiatives. Special attention is paid to the investments undertaken to reduce the energy consumption levels of the company's products. In addition, the performance with respect to a few ad hoc EPIs is listed (e.g., paper consumption). Next to an annual report, Company D also publishes a yearly standalone sustainability report, in which the same information is discussed in a more elaborate way.

In contrast to Company C, Company D did not integrate sustainability into its core organizational strategy. Rather, environmental stewardship is part of one of the three pillars of Company D's *parallel* sustainability strategy (Gond et al., 2012). There is one overarching objective linked to environmental stewardship, namely to become carbon neutral. This global target is subdivided into two parts. For the first part, the initial target was to use 100 per cent green energy. This target has already been achieved and, therefore, the next step will be to measure power and network efficiency and set specific targets for those EPIs. The second part focuses on the mobility policy. Every year, the target is to reduce the emission per employee by a certain percentage. More specifically, the HR department calculates the emissions for each full-time equivalent and aggregates this EPI per responsibility centre. The emissions are offset, for example by planting woods. A fixed part of the bonus of each member of the executive committee depends on the emission related to his/her own mobility. Some top and middle managers also have variable sustainability objectives:

The weighting [of the environmental measures in the bonus formula] depends on the function. [...] It depends on the extent to which people can influence [the target]. (GM2.D)

All EMA practices run parallel to the company's traditional management accounting systems. In addition to its *strategic* EPIs, Company D also separately records its waste and paper usage on an ad hoc basis, as mentioned in its annual and sustainability reports. Moreover, for paper usage, a specific target is set; i.e. a certain percentage of e-billing.

In contrast to Company A, at Company D environmental disclosure and activities evolve more simultaneously. Company D is also more careful in not making promises that might be difficult to keep:

Communicate what you have to say, but do not communicate more than necessary. We do not want to turn it into a hype or an "air bubble". We do not sell hot air. [...] But if you put it in [the annual report], then you have to do it, right? It is not merely a message; it is also a commitment. (FM.D)

In fact, at Company D, environmental disclosures fulfil three roles: the sustainability report acts as a communication device, it serves as an internal management tool, and it entails a commitment. These three roles are illustrated by the following quote from the finance manager:

You want to flaunt those initiatives externally, but you mainly want to continue working with it internally. For us, it is a guideline for next year. (FM.D)

Hence, Company D translates the commitments it makes in its reports into targets and develops EPIs to monitor the performance related to these targets, which is then subsequently reported. At Company D, the relationship between ER and EMA thus seems recursive. Indeed, the environmental manager confirms the symbiotic relationship between these two environmental accounting components by indicating that integrated reporting can only be realized when *'controlling can deliver the necessary data'* (EM.D). At that moment, *'my job will be succeeded since it will no longer exist'* (EM.D); that is, when the sustainability strategy will no longer run parallel to, but be integrated into the corporate strategy. The environmental manager realizes, however, that a larger community of socially responsible investors will be required to win the controlling and finance department over.

4.5. Summarizing discussion

The case findings not only illustrated that environmental disturbances could lead to changes in ER or/and EMA, but also that the (interacting) processes of ER and EMA may act as catalysts for organizational change (Adams and McNicholas, 2007; Tilt, 2006), and even might have the potential to affect the 'heart' (Gray et al., 1995) of the organization. Our analyses also revealed that changes in ER and EMA practices as well as the subsequent organizational change depend on an assemblage of factors (Duncan and Thomson, 1998): the strength of the environmental disturbances, top management commitment and the presence of an environmental champion. We will now elaborate on these reflections in greater detail (see also Fig. 1).

All four case companies disclose environmental information to signal that they detected environmental disturbances. At Companies A and D, ER was directly initiated in response to environmental kicks. At Companies B and C, both ER and EMA practices were mainly the result of the subscription to an EMS, and thus an indirect response to environmental jolts. Whereas the limited EMA practices at Companies A and B are rather ad hoc, Companies C and

D adopted a more strategic approach. At Company D, the sustainability strategy runs parallel to the organizational strategy, whereas Company C integrates the environmental requirements of its customers into its overarching strategy (cf. [Gond et al., 2012](#)). The fact that all companies made environment-related capital investments confirms that such point decisions are the easiest to take ([Bennett and James, 1998](#)). The differences between the four companies may be explained by the environmental kick (cf. [Fraser, 2012](#)). More specifically, while at Companies A and B the kick is not that powerful and responding to it is mainly driven by conventional business reasons (i.e. image and savings), at Company C, addressing the kick is crucial for long-term survival. At Company D, the current environmental kick is not that strong but top management expects it to become more important and also expresses to be personally concerned about the environment (cf. [Gray et al., 1995](#)).

The cases also reveal that differences may exist in the impact of ER, EMA practices and their link on the organizational change process. At Company A, the process of reporting has created the awareness that the company is nowhere yet, which acted as a trigger to start measuring EPIs and undertaking actions (cf. [Adams and Frost, 2008](#)). The company intends to disclose this information in the future. At Company B, the ad hoc EPIs are mainly used to cut expenses. Neither the EPIs, nor the ER inform any environment-related decision making. Information is generated, reported and put aside. The absence of an interplay between ER and EMA practices may be explained by environmental managers working at a low hierarchical level and a lack of top management commitment. Accordingly, we noticed that the environmental managers of Company B try to enforce environmental investments through the company's subscription to an EMS. Similarly, Company A's environmental manager admits that he tries to introduce structures acceptable to top managers, in that the disturbances are absorbed in such a way that the interpretative schemes remain unaffected (cf. [Broadbent and Laughlin, 2005](#)). The combination of a lack of top management commitment and an environmental kick that is not that powerful, leads Companies A and B to reside in the reorientation pathway of [Laughlin's \(1991\)](#) organizational change framework.

In contrast to Companies A and B, there does appear to be an interplay between ER and EMA practices at Companies C and D, in that procedural changes in the first evoke procedural changes in the second and vice versa. In addition, both companies indicate that in order to evolve towards integrated reporting, ER and EMA practices should develop simultaneously. What further distinguishes Companies C and D from Companies A and B, is the presence of an environmental champion and the commitment of top management, the importance of which already has been underlined in previous research, both in the area of environmental accounting (e.g., [Fraser, 2012](#); [Larrinaga-González et al., 2001](#); [Wilmshurst and Frost, 2001](#)), as well as in management accounting change studies in general (e.g., [Burns and Vaivio, 2001](#); [Cobb et al., 1995](#); [Kasurinen, 2002](#)). Whereas Companies A and B reside

in morphostatic change, the question arises whether morphogenetic change has occurred at Companies C and D; that is, whether their interpretative schemes (discourses) have been affected.

Savings are repeatedly underlined by Company C, for example in terms of less water and electricity consumption. This savings emphasis is likely to originate from the company's efforts to survive in the highly competitive, low-margin market by reconciling two conflicting demands from its customers: high sustainability requirements and low selling prices. Importantly, targets for EPIs are determined based upon 'efficiency KPIs' as an integrated part of the budgeting process. That sustainability revolves around efficiency is also communicated in the annual reports. In fact, Company C translated sustainability into eco-efficiency and thus absorbed only one part of sustainability (except for the launch of a sustainable agriculture policy but this initiative is still in its infancy). This is in line with [Gray and Bebbington \(1996\)](#) who suggest that the language of efficiency, doing more with less, has been more easily embraced by business because it matches with broader business concerns. Indeed, Company C translated sustainability into eco-efficiency because this was a language it was able to understand ([Larrinaga-González and Bebbington, 2001](#)). It should be noted that the environmental manager who acted as an environmental champion (EM1.C) played a pivotal role in this translation by showing top management how environmental disturbances could be absorbed into the company's efficiency discourse (cf. [Bartunek, 1984](#)). Relating this to [Llewellyn's \(1994\)](#) boundary management, environmental disturbances may enter the organizational discourse through the language of financial accounting (e.g., expenses), whereas management accounting becomes important in avoiding internal uncertainties and, hence, in the reproduction of the internal unity of the organization by developing efficiency-focused EPIs. These EPIs illustrate that the sustainability pillar of Company C's strategy has been absorbed by the efficiency pillar. The discourses of accounting and environment thus seem to have fused. Currently, top management focuses on eco-efficiency because this can provide an answer to the demand from their B2B customers. At Company C, the adjusted structures thus foster the continuity of the discourse. Indeed, according to [Richardson et al. \(1996\)](#), changes in the interpretative schemes of the organization's most influential strategic decision makers are an important prerequisite to the achievement of morphogenetic change. Although it becomes unlikely that morphogenetic (colonization) change will materialize (unless in the case of a new jolt), it should be noted that the interaction between ER and EMA practices clearly fostered progress in the area of eco-efficiency (perhaps most of all our case companies).

It is noteworthy that, in Company D, there is a tension between the conventional business discourse and the sustainability discourse. However, this conflict between two contradictory discourses, called 'schizoid incoherence' ([Greenwood and Hinings, 1988](#); [Hinings and Greenwood, 1988](#)), may not necessarily have a negative connotation. In contrast to Company C, at Company D, there might be

a chance that the current non-integration of the conventional business discourse and the sustainability discourse ultimately evolves towards a new interpretative scheme. In particular, the interplay between ER and EMA practices may develop learning and development processes (Robb, 1990) and embed sustainability values (Albelda-Pérez et al., 2007), which might help the organization in progressing from morphostatic evolution towards morphogenetic evolution. The alternative (and arguably more likely) scenario may be what Larrinaga-González and Bebbington (2001) observed at ASES. More specifically, at ASES, conventional accounting and environmental accounting pursued different goals, which disempowered the environmental accounting to change perceptions and actions, and this inhibited its ability to affect organizational changes. Accordingly, the environmental manager of Company D indicated that it will be challenging to win the controlling and finance department over. Indeed, Llewellyn (1998) confirms that merging two discourses at the organizational boundary is likely to come with some resistance. Overcoming this resistance may enable the environmental manager to integrate the sustainability strategy into the company's core strategy, such that environment-related decision making no longer runs parallel to the company's traditional management accounting systems (cf. Gond et al., 2012).

5. Concluding remarks

The purpose of the paper was to investigate how ER and EMA practices may interact in the process of responding to disturbances of the natural environment. Utilizing a middle-range thinking approach, we used Laughlin's (1991) skeletal organizational change framework to describe the pathways that environmental disturbances have taken in four particular organizations and to articulate the roles of ER and EMA practices in the changing context. Over a two-year period, 15 semi-structured interviews were conducted with general, finance and environmental managers of four Belgian companies and internal documents were analyzed in detail. We found that in response to disturbances of the natural environment, organizations responded in a visible way, either by initiating ER or by subscribing to an EMS (that entailed a reporting and communication requirement). In the first case (Companies A and D), ER drives EMA practices because disclosing information brings about the realization that supporting data are required (albeit perhaps not immediately). In the second case (Companies B and C), the binding commitment of an EMS triggers a need for data, which may or may not be used for decision making. In either of the two cases, an interplay might arise between ER and EMA (i.e. procedural changes in the first may evoke procedural changes in the second and vice versa) and this may influence the organizational change process. More specifically, EMA information may be used to inform ER, just like ER may trigger a need for the development of EMA practices (Frost and Seamer, 2002). This confirms that ER can be both a response to as well a driver of the organizational change process, as suggested by Tilt (2006). We found that, for an interplay to emerge, the presence of strong

environmental jolts, an environmental champion and top management commitment are important contingent conditions. This 'assemblage' of factors (Duncan and Thomson, 1998) was not present in Companies A and B, which resided in Laughlin's (1991) reorientation change pathway. According to Gray et al. (1995), companies, like Company C, that experience environmental kicks that engender fear but leave the interpretative schemes unaffected can be located in Laughlin's (1991) colonization change pathway. In a similar vein, evolution change occurs when top managers voluntarily absorb environmental disturbances in their systems and structures (Gray et al., 1995), as in Company D. Consequently, an interplay is more likely to emerge in companies that reside in one of these change pathways. Importantly, however, this interplay may be tailored in order to fit in with or even to strengthen the organization's conventional business discourse such that organizational change is stifled, as in Company C. Hence, our case findings empirically support the conjecture of Gond et al. (2012) that an integrated sustainability strategy may not be ideal from a sustainability viewpoint. In fact, given that we found no evidence for second-order change, there might be some synergy between a legitimacy explanation of firm behaviour and first-order organizational change, as suggested by Tilt (2006). However, an important nuance may be added in that companies seem to realize that, ultimately, the 'greenwashing' rhetoric should be supported by some evidence in order to maintain legitimacy.

We acknowledge that the organizational change processes at our case companies may not have reached their endpoints (Larrinaga-González and Bebbington, 2001). In particular, we have noticed that the parallel existence of a sustainability discourse at Company D may not be stable and, furthermore, the outcome of any potential evolution is unclear. Therefore, we encourage future studies to follow similar 'schizoid' (Greenwood and Hinings, 1988; Hinings and Greenwood, 1988) companies over an extended time-frame in order to complement our insights by revealing the factors that determine organizational change processes in the long run. Furthermore, given the importance of champions in change processes, it would also be worthwhile to disentangle how individuals can embed sustainability thinking at all hierarchical levels (see also Fraser, 2012).

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