

# *The controller's role in environmental management control*

*Le contrôle de gestion environnemental : quels rôles pour le contrôleur de gestion ?*

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## **Abstract**

*This paper explores the role of the management controller in environmental management control (EMC) by means of a longitudinal case study of a French company with a pioneering approach to EMC. The results show that the management controller has four key roles (carbon auditor, business partner, euro-carbon translator, and agent of change) and illustrate the characteristics of the controller in this new domain (image, power of influence, and territory). Several theoretical, managerial, and methodological lessons may be learned from this case study.*

## **KEYWORDS:**

MANAGEMENT CONTROLLER - ENVIRONMENTAL MANAGEMENT CONTROL (EMC) - ENVIRONMENTAL MANAGEMENT CONTROLLER - CARBON FOOTPRINT - CARBON BUDGET

## **Résumé**

Cet article s'interroge sur les rôles du contrôleur de gestion dans le domaine environnemental. Pour ce faire, une étude de cas longitudinale est menée sur une entreprise française avant-gardiste en matière de contrôle de gestion environnemental (CGE). Les résultats révèlent 4 rôles du contrôleur de gestion (vérificateur de CO<sub>2</sub>, *business partner*, traducteur euro-carbone, acteur du changement) et ses caractéristiques dans ce nouveau domaine (image, pouvoir d'influence et territoire). Plusieurs enseignements d'ordre théorique, managérial et méthodologique sont tirés du cas.

## **MOTS CLÉS :**

CONTRÔLEUR DE GESTION - CONTRÔLE DE GESTION ENVIRONNEMENTAL (CGE) - CONTRÔLEUR DE GESTION ENVIRONNEMENTAL - BILAN CARBONE - BUDGET CARBONE

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## **Introduction**

Companies have seen their environmental responsibilities expand as a result of institutional and social pressures, meaning that reconciling the “natural environment” and “management control” has become a necessity. Although this is a relatively recent issue in France, it took shape in the early 1970s in the United States and Switzerland with the idea of incorporating the environmental externalities generated by companies’ economic activity into the realm of accounting (Christophe 1995, Richard 2009). This in turn led to the emergence of environmental, or green, accounting. Following the pioneering work of Gray (1992), Christophe (1995), and Schaltegger et al. (1996), the study of this new subject was first developed in the accounting and reporting literature (Gray and Bebbington 2001, Quairel 2004, Cormier and Magnan 2007, Milne and Gray 2007, Rivière-Giordano 2007, Déjean and Martinez 2009, Depoers 2010 etc.), before being taken up by the management control field, where publications relating to environmental management control have grown rapidly over the last ten years (Marquet-Pondeville 2003; Janicot 2007; Caron et al. 2007; Moquet 2008; Henri and Journeault 2010; Schaltegger 2011; Renaud 2013a,b; Antheaume 2013 etc.).

Environmental management control (EMC) can be understood as an extension of traditional management control (Anthony 1988, Simons 1995) towards environmental management (Boiral 2007, Renaud 2009). In this paper, we consider it to mean the process by which managers influence other members of the organization in order to put into practice or develop the organization’s green strategies. Green, or environmental, strategies refer to the fact that the organization takes into account the natural environment in its competitive, political, and industrial strategies (Martinet and Reynaud 2004). The role of EMC is therefore to implement these strategies and to help ensure their continuation.

EMC is now becoming increasingly widespread within companies, giving rise to a great deal of interest from both researchers (such as the CSEAR and EMAN conferences) and the accounting profession (for example the IFAC 2005 International Guidance Document: Environmental Management Accounting).<sup>1</sup> The literature in this field, however, remains limited, with previous studies focusing primarily on EMC tools (green budgets, green scorecards, calculation of environmental costs, life cycle analyses, sustainable development, and environmental reporting etc.), and consequently neglecting the role of management controllers in the environmental domain. Similarly, the majority of studies describing the profession of management controller do not address the topic. This relative scarcity highlights

the “thematic divergence” between the current concerns of businesses and those of researchers (Bollecker 2007).

A few authors, nevertheless, suggest that controllers play a limited, or practically nonexistent, role in the field of corporate social responsibility (CSR). Capron and Quairel (1998), for example, argue that developing and implementing social and environmental management tools are tasks that lie beyond the role of the controller, with this latter focusing exclusively on a financial representation of performance. Thus, given the controller’s lack of interest (Wilmshurst and Frost 2001, Quairel 2006, Caron and Fortin 2010), other actors take ownership of the CSR domain. In the EMC realm, environmental specialists have appeared as new competitors (Moquet 2008, Renaud 2013a). Now that environmental responsibility has become a requirement in Europe, with France, for example, passing its New Economic Regulations (*Nouvelles Régulations Economiques*, or NRE) in 2001, and the Grenelle II Act in 2010 (relating to extra-financial reporting), the role of controller necessarily extends to protecting the natural environment (Danziger 2009). Our research is positioned within this context.

Our objective is to examine the controller’s new responsibilities in relation to EMC. In other words, we address the following research question: What are the management controller’s roles in the environmental domain? To answer this question, we undertook a longitudinal case study on one of the first, and very few, French companies to have created a management controller position focused specifically on the natural environment, with the title of “*head of environmental accounting*.” To perform this study we carried out semi-directive interviews and analyzed written, audio, and video documentation collected from the internet. The results of our research show the diversity of the environmental management controller’s functions (carbon auditor, business partner, euro-carbon translator, and agent of change), and the characteristics of this position (in terms of image, power of influence, and territoriality).

This article is set out in four sections. The first section presents the literature review and proposes a theoretical framework for understanding the controller’s roles in the environmental domain. The second details our research methodology and presents the case examined. The third and fourth sections set out the results of our research, while the key contributions, limitations, and future research possibilities are addressed in the conclusion.

## **1. The management controller’s roles in the environmental domain: literature review and theoretical framework**

The literature is relatively silent on the management controller’s roles in environmental management control (EMC). The management controller can, however, become a major player in this process (1.1). By employing role theory and existing studies on the traditional roles of the controller, we propose an analysis framework with which to examine the various roles of the “environmental management controller” (1.2).

### ***1.1.A subject rarely examined in the literature***

Since the 1990s, an increasing number of studies have focused on management controllers (Bollecker 2007) without, however, examining these actors’ roles in the environmental domain. This subject is also neglected in the environmental management control literature which focuses primarily on EMC tools (Marquet-Pondeville 2003, Janicot 2007, Caron et al. 2007, Henri and Journeault 2010, Schaltegger 2011, Antheaume 2013 etc.). This literature in fact presents EMC as a process that appears to take place without the controller, “Environmental management control is often outside the scope of the management control function, taking place instead at the environmental department level” (Marquet-Pondeville 2003, p. 21).

If the controllers are not part of this process, it is because they remain confined to the accounting and finance domain (Capron and Quairel 1998, Wilmshurst and Frost 2001, Quairel 2006, Rivière-Giordano 2007, Berland 2007, Caron and Fortin 2010). “They have been sidestepped by other support staff pursuing, closer to the operating teams, the same goals” (Bouquin 2010, p. 143). Environmental specialists and support staff have thus taken over the advisory and verification projects normally entrusted to the controller (Moquet 2008). The controller’s new competitors monitor the implementation of the green strategy throughout the organization and help the directors to pursue strategic environmental opportunities (Renaud 2013a).

In addition, as the architects and facilitators of this new process, environmental specialists design and implement EMC tools “*dissociated*” (Quairel 2006) and even at times “*opposed*” (Moquet 2008) to financial management control tools. Moquet (2008), for example, highlights internal power struggles at Lafarge between the environment manager, who follows a “green” approach, and the controller, who is rooted to a purely financial approach, detached from ecological concerns. For Quairel (2006), this separation of performance indicators enables the

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various support-function heads (management controller, environment manager, HR director etc.) to maintain, in their respective fields, their power over managers’ behavior. In other words, “This dissociation reflects the territorial approach of the various managers and their resistance to change” (Capron and Quairel 2007, p. 89). Thus, to borrow Bouquin and Fiol’s (2007, p. 12) phrase, which is also a good description of EMC, “It depicts a type of management control without a controller, a pure and simple management process that merely needs to be organized.”

Contrary to the standard literature, a very small number of authors argue (but do not show empirically) that financiers, in the general sense, may have a full role to play in exercising environmental responsibility (Quairel 2004), notably in terms of enhancing the credibility of environmental reporting and strengthening investor confidence (Rivière-Giordano 2007). For Sobczack (2011), they may even become a vital support to managers as well as to sustainable development heads by developing the management tools necessary for addressing environmental issues and communicating them to stakeholders. In line with these latter studies, we will explore the roles that management controllers can play in EMC. Firstly, however, we define the concept of “role” and use an analysis framework to examine the roles of the environmental management controller.

### *1.2.An analysis framework based on management control role theory*

Situated at the intersection between sociology and psychology, the role is the missing link between social structure and the individual (Rocheblave-Spenlé 1969). This concept was introduced into organization theory by the American social psychologists Katz and Kahn (1966), who described the organization as a system of interdependent roles in which each individual can be located. For these authors, a role designates the set of activities or behaviors expected from an individual in the exercise of a certain social position. Their work provides the theoretical foundations for HRM studies of the phenomenon of role conflict and its consequences for employees and businesses.

In the management control field, role theory is used to analyze the management controller’s role within organizations. Referring to the work of Katz and Kahn (1966), Lambert and Sponem (2009, p. 118) explain that an individual’s role cannot be directly observed without creating confusion, in the observations or in the minds of the individuals studied, between what is expected and what actually occurs. To understand this concept we therefore need to study the individual’s activities and his or her interactions within a social group.

To understand the role of management controller, we therefore analyze the controller’s functions within the organization. As noted by Bouquin (2010), it is, however, difficult to define “the” role of a management controller, as the literature assigns the controller diverse and varying functions. In fact, the review performed by Bollecker (2007) highlights four key activities to describe this ambiguous occupation: monitoring, advising, coordinating, and changing. Transmitting information to managers and/or directors is the common factor underpinning these activities. While the first two roles are somewhat opposed in North America (Caron et al. 2011), they are far from contradictory in France, where they are seen as complementary, and can be performed at the same time by the same individual (Lambert and Sponem 2009).

As verifier, or “auditor”, the controller is responsible for financial reporting and internal control (Sathe 1983). He or she is seen by managers as a “*watchdog*” “*in the pay of*” senior management. In his or her role as advisor, the controller gives “*strategic advice*” to the directors and “*operational advice*” to managers in relation to preparing budgets and monitoring performance (Fornerino and Godener 2006). In this decision-making support role, the controller also provides practical assistance relating to the use of control tools (Bollecker 2002). In addition, this role may give the controller the status of business partner or manager, in other words the controller is an internal consultant or preferred partner who intervenes as a decision-making copilot.

And yet, in reality, this partnership function appears to be illusory (Morales 2009) or at least “not as frequent as we are led to believe” (Lambert et Sponem 2009, p. 139). Certain authors warn against the risks of such a role, “Either the controller imposes his or her authority and inhibits the creativity of operational staff who then focus exclusively on their profit and loss accounts, or the controller is subsumed by the operational teams and may be encouraged to manipulate the results” (Ibid.). For Ardoin and Jordan (1979), the controller should not act as decision maker or manager for operational staff, because “A controller who takes the place of a decision maker may partly remove the latter’s responsibility and provide him or her with an alibi” (Bouquin 2010, p. 210).

Other tasks are assigned to the controller in addition the roles of monitor and advisor. The controller may, in fact, play the role of moderator/coordinator between senior management and middle management (*vertical coordination*), or between managers themselves (*horizontal coordination*), particularly during performance monitoring meetings (Bollecker 2007, p. 90).

Finally, the controller is seen as an agent of change (Bessire 1995), particularly when he or she encourages managers’ professional development through the introduction of new management tools (Vaivio 2004).

Beyond these specific tasks, the controller’s role may also be understood through the image that he or she conveys within the organization. The literature suggests that we need to study the way in which other actors, in particular managers, perceive the controller in order to better define his or her role in the organization (Deglaine et al. 2003, Lambert and Sponem 2009). According to Fornerino and Godener (2006), the controller has a dual image (monitor versus advisor), with this image naturally varying depending on the nature of the controller’s activities in the business. While the role of advisor is seen to be worthwhile (particularly by management control professionals), the role of monitor, on the other hand, gives the controller a negative, or even confrontational, image (Hopper 1980). In fact, the controller is feared and disliked when he or she aims to assist and to advise (Danziger 2000, cited by Bollecker 2007). Even with the profile of advisor, controllers consider that they are still perceived by operational managers as “*watchdogs*” (Fornerino and Godener 2006). For Caron et al. (2011), we need to move beyond this stereotype, because controllers can, to differing degrees, be both “*bean counters*” and “*business partners*.”

In addition, the power of influence may represent another criterion with which to measure the controller’s role in an organization. It appears that the different tasks assigned to the controller lead to a certain power of influence, although the controller should have only limited power because he or she occupies a support-function position within the organizational hierarchy. The controller acquires more power through his or her influence on business analyses and the choices made by decision makers (Bouquin 2010, p. 207). Although the controller’s power is indirect, it is, however, real (Bessire 1995). For Bollecker (2007, p. 98), the controller’s influence is legitimate, as the controller is only able to intervene objectively because of his or her active roles as educator, agent of change, and actor in the planning and control processes. Furthermore, according to Deglaine et al. (2003, pp. 20-21), the controller more effectively influences managers’ attitudes and behaviors via open communication techniques (testifying to his or her willingness to understand), than by force (for example, by hierarchical pressure) in order to impose his or her wishes on managers.

Finally, it appears that there is strong competition for the controller’s power, highlighting territorial issues. In fact, the question of the controller’s territory is raised because numerous

competitors have emerged within organizations (internal auditors, operational managers, financial directors, quality and environmental specialists, risk managers etc.) with legitimate claims to certain of the controller’s tasks (Danziger 2009, Bouquin 2010). Under these conditions, what territory is left for the controller? What value does the controller add if management control has become an extension of managers’ functions, for example, and if managers can prepare their own budgets and manage their own scorecards? Is there a risk that this function will disappear? (Bollecker 2007, Danziger 2009). The literature provides a limited response to these questions, which are nevertheless significant for the future of the role of controller. Consequently, in this study, we will analyze the roles assigned to the controller’s competitors in order to define the controller’s territory and to highlight the value added by the controller.

Following on from the studies cited above on the traditional profession of management controller, the question of the role of environmental management controller will be studied here from the point of view of the tasks performed by the controller, the image that the controller conveys, his or her power of influence, and his or her scope of activity (or territory) in the organization. These four dimensions therefore form the categories of our analysis framework (see Table 1).

**Table 1: Analysis framework for the roles of the environmental management controller**

Concept	Dimensions	Items sourced from the literature
Roles	• Tasks	<ul style="list-style-type: none"> <li>• Monitoring</li> <li>• Strategic advice</li> <li>• Operational advice</li> <li>• Methodological assistance</li> <li>• Moderating/coordinating</li> <li>• Assisting in change</li> </ul>
	• Image	<ul style="list-style-type: none"> <li>• Negative image (bean counter, watchdog)</li> <li>• Positive image (business partner, copilot)</li> </ul>
	• Power	<ul style="list-style-type: none"> <li>• Level of power of influence varies as a function of the controller’s position in the organizational hierarchy and his/her assigned tasks</li> </ul>
	• Territory	<ul style="list-style-type: none"> <li>• Responsibilities of the controller’s competitors</li> <li>• Internal power struggles</li> </ul>

## **2. Research strategy based on a longitudinal case study**

We employ a longitudinal case study to examine a real life situation. After having explained the rationale for this choice (2.1), we set out the procedures used to collect (2.2) and analyze the data (2.3). We then follow the evolution of the position of environmental management controller in the company examined (2.4).

### ***2.1.Rationale for choosing a longitudinal case study***

We have chosen to perform a longitudinal case study (Yin 2003) because, in accordance with the literature, this research strategy “allows us to analyze, on both a spatial and temporal level” the controller’s functions within an organization. By contextualizing the data, this strategy encourages the in-depth analysis of the controller’s professional situation (Bollecker 2007, p. 101). In order to perform our longitudinal study, we employed qualitative methods (interviews, non-participative observations etc.) because quantitative methods, in particular questionnaire-based surveys, are not suited to understanding the role of the controller. “In fact, it is hard to collect information on individuals’ roles within organizations, especially when these roles are considered to be low-status, [because] the respondents tend, especially in questionnaire-based surveys, to embellish, simplify, or to be more ambitious than realistic regarding their future” (Lambert and Sponem 2009, p. 121). Conversely, qualitative methods, in particular interviews, can facilitate information gathering for confidential or sensitive issues (Gavard-Perret et al. 2008).

In addition, our longitudinal study is based on a “*textbook example*” highlighting an unusual and innovative situation (David 2004). We have, in fact, examined the “*groundbreaking*” case of BIO, one of the first, and very few, French companies to have created a specific EMC role. We have chosen a single case, as this encourages in-depth analysis and a better understanding of the research topic (Hlady-Rispal 2002). Moreover, as stated by Yin (2003), a longitudinal study based on a single case is particularly relevant when following the development of a phenomenon over time. In the present study, we follow the evolution of the position of environmental management controller over a six-year period, from its creation in 2007 until the present day.

## ***2.2.Data-collection procedure***

Our research is based on a rich and varied body of information, constructed by combining various methods of data collection throughout the course of the case study (see Table 2).

We began by using the life story technique, which involves performing biographical interviews during which the interviewee is invited to communicate all or part of their past experience (Bertaux 2005). Over the period of our study, we carried out six semi-directive interviews, lasting an average of an hour and a half each, with the various actors involved in the research question: the chief executive officer, store managers, the head of sustainable development, and the head of environmental accounting (i.e. the management controller responsible for environmental accounting). Various topics were addressed in these interviews: the interviewee’s career path, professional experience, and current functions; general information regarding the company studied (business activities, governance, organization chart, key financial figures etc.); the history and development of the environmental management controller’s role; EMC tools used in the company; and relations with stakeholders. Additional exchanges took place by e-mail in order to obtain more precise details or to confirm the statements collected.

In order to extend the research beyond the actors’ accounts, we also visited three of the company’s ISO-14001-certified stores located across various regions in France. This passive, or non-participative, observation gave us access to actual practices and enabled us to confirm interviewees’ statements. To complete our primary data, we collected various written documents: sustainable development reports, web pages, press articles published online etc. We also collected six video and audio documents prepared by external media or by the company itself. We transcribed and analyzed all of these documents, which varied in length from between five and 30 minutes.

Triangulating the methods, types, and sources of data in our study enabled us to limit data collection bias and to thus strengthen the internal validity of our research (Miles and Huberman 2003, Ayerbe and Missonnier 2007).

**Table 2: Empirical data used in the BIO case study**

Data-collection methods	Primary data (unpublished data prepared by the researcher or by the company)	Secondary data (published by the company or by a third party)
Semi-directive interviews	→ Six interviews performed with five actors: <ul style="list-style-type: none"> <li>• Chief executive officer</li> <li>• Two store managers</li> <li>• Head of sustainable development (two meetings)</li> <li>• Head of environmental accounting</li> </ul>	→ Four video and audio interviews prepared by news media (television, radio): <ul style="list-style-type: none"> <li>• Founding president</li> <li>• Vice president, suppliers, and independent external auditors</li> <li>• Head of environmental accounting</li> <li>• Business seminar</li> </ul>
Email correspondence	→ Emails from the actors interviewed	
Passive (non-participative) observation	→ Field notes from the three store visits	
Collection of written, audio, and video documents	→ The company’s EMC tools: carbon footprint, carbon budget, green scorecards, carbon expenses, wood eco-calculator etc.	→ Documents prepared by the company: <ul style="list-style-type: none"> <li>• Seven 350-page sustainable development reports for the period from 2006 to 2012</li> <li>• Web pages setting out the company’s sustainable development policies</li> <li>• Two video documentaries on its activities, customers, and environmental commitments</li> </ul> → Documents prepared by the external press: <ul style="list-style-type: none"> <li>• Six written articles based on interviews with the marketing director, the human resources director, and the head of environmental accounting etc.</li> <li>• Readers’ online comments from a newspaper e-discussion forum</li> </ul> → Documents available on social networks: interviewees’ CVs
Note: We use the following abbreviations when citing the sources in the text below: President (Founding President), CEO (Chief Executive Officer), SM (Store Manager), MD (Marketing Director), HRD (Human Resources Director), SD Head (Head of Sustainable Development), EA Head (Head of Environmental Accounting), SD Report (Sustainable Development Report).		

### ***2.3. Analysis and interpretation of data***

After collecting the data, it was broken down and examined using thematic content analysis (Bardin 2007). This technique involves identifying themes when analyzing the data (interviews, documents, field notes etc.) and grouping all elements of the text treating the same theme into a given code. The text was firstly broken down using the themes from the analysis framework shown above, with the themes identified in the literature enabling us to perform an initial coding. Other themes then came to light in the course of our analysis, allowing us to complete our coding grid. This additional coding led to a more detailed analysis of the data; for example,

the “methodological assistance” theme was split into sub-themes: “helping to prepare carbon budgets”, “helping to draw up action plans”, “creating green scorecards, and “creating carbon expenses”. In the end, we obtained 54 codes classified into four main categories: tasks, image, power, and territory.

Given the size of the body of data, the data processing was automated in order to manipulate the significant quantity of heterogeneous information quickly and easily. Using NVivo 10 software, we were able to work on text, audio, and video documents. We used the *NCapture* functionality to import web pages, social network information, and emails. The *nodes* function was used to construct the analysis coding grid and to classify the selected extracts into the coding (called nodes in the software). The *matrix query* function allowed us to compare the coded extracts by linking to the sources or nodes. We used the *memo* function to record our ideas during the data-interpretation phase. By using the various functionalities of the software (nodes, requests, memos etc.), we were therefore able to code, classify, compress, compare, and interpret the data collected.<sup>2</sup>

Finally, we performed a detailed comparison of the empirical and theoretical factors in order to identify the similarities or differences in relation to the literature and to obtain our research results: the four roles of the environmental management controller. This comparison (*pattern matching* per Yin 2003) was essential in order to improve the external validity of our research (Musca 2006).

#### ***2.4.BIO case study: presentation of the company and evolution of the position of environmental management controller***

Founded in 1990, BIO is a French company specializing in the sale of natural products. It employs more than 1,000 staff and owns 80 stores across France and abroad. Its annual turnover is around 150 million euros. This family-run, limited liability company is managed by a Supervisory Board and a Management Board, which are respectively headed up by the father (founding president) and by one of his children (vice president). The company is not listed on a French regulated market.

Since its inception, the company has endeavored to be a forerunner in environmental management. This ambition first took root in the values of the founding president, “I created BIO for my children, to protect the environment, and to encourage people living in towns to discover nature. We needed a business activity, but we decided to operate in such a way as to have the smallest possible impact on the environment” (President, video).<sup>3</sup> This commitment

was translated into action in the 1990s when the company created a sustainable development division that introduced, and obtained the certification for, an environmental management system (EMS). BIO therefore became the first French company in its sector to be ISO 14001 certified. During this period, the company also adopted an eco-design policy for its buildings, in accordance with the French “high environmental quality” approach (the *haute qualité environnementale* or “HQE”). It also published a yearly sustainable development report, “In 1993, we became the first company in France to prepare a sustainable development report, a practice that our president brought back from the United States” (CEO, interview).

In 2007, the company created an environmental management control position referred to as the “*head of environmental accounting.*” According to media reports, this was a first for France. The role of this new controller was to implement the company’s strategy for reducing its greenhouse gas (GHG) emissions. Prior to the Grenelle II Act (2010), this strategy was pursued voluntarily, because the company is not required to comply with either the French New Economic Regulations (NRE, 2001) or with the regulation of GHG emissions allowances.<sup>4</sup> Beyond ecological considerations, this strategy brought a triple advantage: a competitive advantage over its competitors (by selling “green” products, it positioned itself in a promising niche market as consumers are increasingly responsive to ecological ideas), credibility in the eyes of its stakeholders (it obtained the support of the general public by committing to preserve the environment), and an economic advantage (by reducing its costs through its environmental actions).

The controller (33 years old, with a Finance PhD) began his career as an information systems consultant for multinational companies. He then took up the post of management controller at a BIO subsidiary before being hired by the parent company. “They were looking to create an environmental accounting position. So I met the president, then the CEO, who told me, ‘I don’t have any sustainable development indicators, and I don’t understand anything about it. ... We need to show that we can reduce CO<sub>2</sub> at the same time as increasing turnover’” (EA Head, interview). For the head of sustainable development, the objective of this new post was to “embody the idea that we can reconcile business and the environment, management control and our carbon footprint” (SD Head, press article).

The evolution of the role of environmental management controller at BIO can be broken down into three key phases: the period before the controller was hired, the period when he carried out the role, and the period after his departure. Although the post officially commenced

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in 2007, it can be traced back to 2005 when the founding president decided to measure his company’s carbon emissions. This role was first assigned to the head of sustainable development, “I worked on it 12 hours a day, including weekends, and after three weeks I managed to produce BIO’s first carbon footprint report. ... But the president wanted to see more details, to get the whole firm involved in the issue, to perform a quarterly review. ... In a nutshell, it was a full-time position, and I already had my own job to do. That’s when the controller came into play” (SD Head, interview).

Recruited in 2007, the controller put carbon accounting and environmental reporting in place to monitor the company’s results. He took on the role of monitor, “I prepared an extremely detailed quarterly income statement. I calculated the carbon results per store. It took me one year to put carbon accounting in place” (EA Head, interview). From 2008, the controller attempted to measure the return on investment by showing the savings made as a result of the carbon footprint reporting. He prepared management tools for the managers and his advisory activities developed at all levels within the organization. During this period, the company stepped up its responsible purchasing policy, and the controller also became an agent of change by encouraging suppliers to improve the environmental quality of their products, “We worked on analyzing the life cycle of the products that we sell, and we tried to see how we could ask our suppliers to improve their processes” (CEO, interview).

The head of sustainable development has occupied the post on an interim basis since 2012, after the controller left the company.<sup>5</sup> An environmental engineer-lawyer by training, the sustainable development head acknowledges the difficulties of this post, “I don’t deny that it was difficult to begin with, because the controller had done a fantastic job on our ERP and databases. ... It took me one month to prepare my first quarterly carbon footprint report! The role of environmental accountant didn’t just disappear; it carried on after the departure of the controller” (SD Head, interview).

In the next section of this article, we analyze the tasks performed by the controller when he was BIO’s “*head of environmental accounting*.”

### **3. The environmental management controller’s roles**

The results of the case study highlight the different environmental roles performed by the management controller: carbon auditor (3.1), business partner (3.2), euro-carbon translator (3.3), and agent of change (3.4). Each role is presented by describing the activities performed and the image conveyed by the controller within the organization. In the interests of clarity, questions relating to the controller’s power of influence and territory will be detailed in a separate section (see Section 4).

### ***3.1. Carbon auditor reporting to senior management***

The first task assigned to the controller was to monitor activity. In order to verify the company’s GHG emissions, the controller put in place a carbon footprint report by drawing on the ADEME method (*Agence de l'Environnement et de la Maîtrise de l'Energie*, the French Environment and Energy Management Agency).<sup>6</sup> This tool enabled him to measure GHG emissions by business activity (transport of goods, employee business travel, packaging, publications, energy, waste management etc.) in tons of carbon dioxide equivalent (CO<sub>2e</sub>). He then prepared a carbon budget to limit GHG emissions, “I created the BIO carbon footprint report when I arrived in 2007. ... I then persuaded the CEO to prepare a carbon budget, a real budget just like our budget in euros, and then we said, ‘The executives are at such and such an amount, so we are going to do 3% less’” (EA Head, interview). For example, “The marketing director can’t exceed his budget: when choosing his suppliers, packaging etc. he has to take into account their GHG emissions” (EA Head, press).

The controller prepared an environmental report every quarter to monitor GHG emissions and to ensure that the carbon objectives set for the company’s various managers had been achieved. This approach was explained by a store manager, “We prepare our carbon statement. ... Someone in head office is responsible for it [i.e. the EA Head]. We send him the CO<sub>2</sub> consumption for our business travel: seminars, training courses, site visits etc. and it’s compiled quarterly” (SM, interview). Additionally, this reporting enables senior management to assess managers’ performance and to reward or penalize them in function of the results obtained. “This year, the HRD’s objective is to reduce CO<sub>2</sub> emissions by 10% compared to last year’s emissions, while maintaining the number and quality of training courses. ... If the directors don’t achieve their objectives, they won’t receive a bonus” (SD Head, interview).

By limiting its environmental impact, the company has also reduced costs relating to goods transport, waste disposal, raw materials, and energy consumption etc. The CEO gave us an example of an ecological action that had allowed the company to reduce its transport costs, “At

the beginning, we delivered goods to our stores by road, but we realized that it was more interesting from a CO<sub>2</sub> point of view to deliver by rail, and that rail-road transport was cheaper than road transport” (CEO, interview). The CEO employed the same reasoning for investments; for example, constructing a new store should be profitable as well as being less harmful for the environment. Economic motivations therefore also hid behind the ecological rhetoric, “The idea was to determine the return on investment in euros and in carbon. In fact, my boss wanted to see whether his operating decisions were consistent both in terms of financial profitability and in terms of sustainable development” (EA Head, interview).

The controller’s role as carbon auditor gave him a negative image within the organization, “I was a bit like a cop”, “the department pain in the neck”. The terms “carbon chaser”, or “Inspector ‘Sustainable Development’” (EA Head, interview) attributed to the controller sum up the mindset fairly accurately. He was perceived as the “strong arm” of senior management, “For example, the head of marketing took a return flight from Paris to Nice in business class. The rating came in at 894kg of CO<sub>2</sub>. We just had to rap him on the knuckles. If he had taken the train, it would have only cost the planet and the company 19kg of CO<sub>2</sub>” (Press report). Finally, the bean counter image has proved hard to shake off, except that in the environmental field, the controller has become a “carbon counter”!

In summary, as carbon auditor, the controller performed the classic tasks of budget forecasting, reporting, and variance analysis. He also performed a financial monitoring role for senior management, although his image as monitor was seen as somewhat negative by managers.

### ***3.2.A business partner for directors and managers***

After carbon accounting had been implemented, the role of the management controller evolved towards that of business partner. In addition to his auditing role, the controller carried out a decision-making advisory role for two types of internal client: senior management and managers (store managers, support-function managers etc.). An environmental information system needed to be created and operated for this role.

#### *3.2.1. Advising decision makers*

The controller assisted the CEO in his analyses and helped him to make strategic decisions to reduce GHG emissions. He appeared to occupy the role of special advisor as the CEO often specifically drew on the controller’s expertise, “I organize a meeting every two weeks with the head of sustainable development and the person who looks after green accounting. I therefore firstly discuss matters with them. Then, after we have analyzed the various figures, they are discussed in a second stage during our executive committee meetings” (CEO, interview). The controller used the tools in place to inform and steer senior management decisions, “Our carbon footprint report and carbon budget give us our business priorities. For example, we know that our transport activities have a significant carbon impact, while our carbon impact from waste activities is tiny.<sup>7</sup> ... We therefore decided to tackle the most significant issues, which have the greatest impact, in order to obtain the best solutions as fast as possible” (CEO, interview).

From an operational point of view, the controller helped the managers to prepare their carbon budgets and action plans, “If you are preparing a purchasing budget, and want to reduce air freight, for example, you go to see the purchasing division. ... As they have the expertise, they are the ones who decide, ‘We will do this much by air freight, this much by sea etc.’ ... And then after that, I went to see each person with a financial budget and I added a carbon budget” (EA Head, interview). “Over the year, he helped us to put in place corrective actions to reduce our energy consumption and carbon emissions. It was the same for waste recycling and product quality. These are the three most significant issues affecting our in-store activity” (SM, interview).

The controller encouraged managers to take into account the environmental impacts when making their operational decisions. Far from hampering them, this intervention encouraged them to be creative, and the managers put into place various innovative action plans for reducing GHG emissions. For example, for employee business travel, they “reorganized internal training to limit journeys, and developed online training” (press). In terms of transporting goods, “We work with a green shipping company and optimize our use of container space. Once received at our warehouse, the goods leave by natural gas truck for nearby stores, by piggyback transport for stores more than 600km away, and in trucks whose drivers have been trained in eco-driving for all other stores” (SD Report). In terms of energy consumption, “All the stores, the head quarters, and the warehouses are fully powered by electricity from renewable sources” (SD Report). Finally, the packaging division replaced suppliers’ packaging with biodegradable or recyclable packaging. “We often reconfigure the packaging for our products, which we package

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in boxes. ... Every year, our packaging division redesigns between 800 and 1,000 packs out of the 2,500 different product lines that we offer in store” (SD Head, interview).

### *3.2.2. Creating and operating the environmental information system*

The controller also provided practical assistance in designing and using the environmental information system. “I monitor all our energy and raw materials consumption ... with our carbon manager using a kind of scorecard” (CEO, interview). “He has created carbon expense forms. This tool enables us to detail the GHG emissions generated by each employee during his or her business travel. Employees fill in a simple Excel table that calculates the quantity of CO<sub>2</sub> for each mode of transport” (press).

Parallel to his role as architect of the information system, he also performed the role of facilitator in terms of bringing the control tools to life. “The carbon footprint report is updated every quarter. It shouldn’t just gather dust in a drawer; the goal is for it to become a management tool as important as euro reporting” (EA Head, interview). He held performance monitoring meetings and commented on the environmental indicators, sharing his expertise with managers. He therefore exercised a certain degree of influence over managerial decisions. “I presented the results using PowerPoint and orally. I presented my figures after the finance director at business committee meetings. ... All the directors (purchasing, marketing etc.), everyone in a management position, participated in these business committees. ... They were informed of the results of the tool, and this was meant to help us to make our decisions” (EA Head, interview).

To summarize, the management controller’s image in the role of advisor-facilitator was more gratifying than in the role of monitor. His expertise was recognized within the company, because he brought real added value to both senior management and to the managers in terms of strategic and operational advice. He was perceived as a business partner because he participated in decision making and co-prepared environmental budgets, action plans, and management tools.

### *3.3. The company’s euro-carbon translator*

The management controller played the role of translator in a context where carbon had become a new language, “When everyone else was still speaking in euros, we decided to speak in carbon” (website). There are three essential stages in the translation process: calculating “CO<sub>2</sub> equivalents” for GHG-emitting accounts, determining emission-reduction goals and

action plans, and measuring the effectiveness of the actions put in place by calculating the reductions achieved in euros.

### 3.3.1. *Preparing an inventory of GHG-emitting accounts and calculating CO<sub>2</sub> equivalents*

In order to determine the CO<sub>2</sub> equivalents, the controller firstly prepared an inventory of the various GHG-generating activities, known as “*GHG-emitting accounts*.” “To prepare the carbon income statement, I first tackled everything contributing to our business activity: goods transport, packaging, catalogues, energy for our warehouses and buildings, employee business travel etc.” (EA Head, interview). He collated the physical consumption during the period for each GHG-emitting account from either the accounting information system or directly from the company’s various departments. For example, for goods transport, “I log on to the company’s information system, which provides me with statistics on goods transport for the last quarter. ... I call the warehouses and they give me all the details relating to the number of store deliveries, and the routes” (EA Head, SD Report). In terms of employee business travel, the controller used the carbon expense forms to determine the mode of transport and the distance travelled. For the packaging account, he obtained data from the packaging engineer on the composition of the packaging used for the company’s products. Similarly, he contacted the communications division to collect data on publications (quantity, weight, paper). Regarding energy costs, he used electricity bills or energy meter readings.

After collecting this data, the CO<sub>2</sub> equivalents for the GHG-emitting accounts were calculated using ADEME “*carbon footprint spreadsheets*.” These spreadsheets convert business activity data (freight-km travelled, and liters of fuel, KWh of energy, and kg of raw materials consumed etc.) into GHG emissions, expressed in carbon equivalent (CE) or CO<sub>2</sub> equivalent (CO<sub>2e</sub>).<sup>8</sup> The coefficients used for the conversion are known as “*emission factors*.”<sup>9</sup> The controller explained his approach to us, “The carbon footprint is a set of multiplications. To calculate the GHG emissions, you take A [business activity data] times B [emission factor]. ... I took ADEME’s carbon footprint training, but I didn’t use their software because it was really complicated. I created my own spreadsheets based on the ADEME spreadsheets. ... I struggled a bit, but you don’t need to be a rocket scientist to manage it, you just need to think logically and have the analytical skills of a management controller” (EA Head, interview). Once the business activity data have been converted into CO<sub>2</sub> equivalents, the company’s carbon

footprint can be obtained by summing the CO<sub>2</sub> equivalents for all of the GHG-emitting accounts.

### 3.3.2. *Defining the reduction targets and the actions required*

The controller performed simulations using these spreadsheets to define the objectives for reducing GHG emissions (e.g. cutting emissions related to air transport by 50%, reducing the headquarters’ energy consumption by 4%). To do this, he first worked with the different managers within the company to study the actions likely to reduce GHG emissions for their activities (e.g. reducing air freight by switching to shipping, replacing office lamps with low-energy lamps), and the financial impacts. He then used the spreadsheets to calculate the resulting GHG economies, with the objectives being approved by senior management before being communicated to managers.

An important issue for senior management is that the GHG reduction objectives are compatible with the company’s economic objectives. In other words, the company should be able to increase its turnover while having the smallest possible effect on the environment. The head of sustainable development explained this “*eco-friendly*” concept: “Being eco-friendly is about improving human, societal, or economic added value, while reducing, in absolute terms, the main impacts on the environment. It’s the hardest thing to do, because if you triple your sales volume, CO<sub>2</sub> emissions tend to follow mechanically by a similar factor” (SD Head, interview). But in reality, when the objectives are incompatible, the company will sometimes favor its economic objectives to the detriment of its ecological aspirations, as implied by the human resources director, “Reconciling the irreconcilable is not always a comfortable position to maintain. The X newspaper, for example, recently mentioned us in its ‘eco-hypocrite of the month’ section. The best defense against these critics is to show that we can be profitable, while making really significant changes” (HR Director, press).

### 3.3.3. *Assessing the GHG savings achieved in euros*

In the last stage of the translation process, the spreadsheets are used to estimate the monetary value of environmental performance. “I analyze the financial costs/gains achieved following the reduction in CO<sub>2</sub> emissions” (EA Head, interview). For example, following the improvements made to a warehouse, the company achieved a 19% gain in energy efficiency, representing a saving of 688,000kWh of gas, 143 tons of CO<sub>2</sub> equivalent, and €12,700 on the gas bill.

In his role as translator, the controller was perceived as a technician who could translate and explain the carbon results in financial terms. “With the CO<sub>2</sub> expense forms, I could provide an extremely fine level of detail on people’s travel, which enabled me to perform a meticulous micro-economic analysis and to make comments during the business committees that I attended” (EA Head, interview). This competency provided a tangible added value that legitimized the controller’s work in the eyes of the managers. “It is extremely gratifying to be able to present an environmental performance report at the end of the year that shows key indicators as well as the actual costs and savings achieved” (SD Head, interview).

#### *3.3.4. The limitations of translation*

We emphasize that the carbon footprint does not provide a precise estimate of GHG emissions. The CO<sub>2</sub> equivalents are in fact determined by order of magnitude, given the significant number of parameters used to calculate them. There is also uncertainty regarding the emission factors (which are often calculated as average values) and business activity data. To limit bias in the calculation, default uncertainties are applied to each emission factor included in the ADEME spreadsheets. To ensure the reliability of internal data, the controller checked the data back to invoices or performed physical verifications (e.g. taking energy meter readings). In addition, the carbon footprint is externally verified as part of the environmental audits performed by ECOPASS, a certification body approved by COFRAC (*comité français d’accréditation*, the French Accreditation Committee). Although the results of the carbon footprint should be interpreted with care, this does not, however, mean that practical conclusions cannot be drawn from the report.

To summarize, the role of euro-carbon translator is specific to the environmental domain because, as we have seen, “carbon language” is complex and can only be interpreted with specific skills. This translation function called on the controller’s teaching skills to help managers and operational staff to understand and use this new language to achieve the objectives set by senior management. This role therefore sent out a positive “technician-teacher” image of the controller to managers. Lastly, these new environmental skills were crucial in allowing the controller to perform his functions of carbon auditor and advisor.

#### *3.4. An agent of change for stakeholders*

The management controller filled the role of agent of change for both internal and external stakeholders.<sup>10</sup> Although this role was initially of secondary importance in the company, it

became dominant in relation to the three previous roles in terms of the company’s interaction with its suppliers.

#### *3.4.1. Changing mindsets and encouraging internal innovation*

The controller was perceived within the company as a person who could “stimulate environmental awareness.” By developing new management tools, and tools to assist in environmental decision making, the controller enabled actors to understand the environmental impacts of their actions and to progressively change their approach. This is illustrated by the following statement made by the marketing director, “At the beginning I thought that the carbon expense forms were a real pain, but now it’s just part of the routine” (MD, press). These tools, as well as the simple presence of the controller in the company, changed actors’ behavior, “When we saw each other in the corridor, people thought about their expense form and they tried to take it into account in their work. This created carbon management, and an awareness of the issue” (EA Head, interview).

Even if they bought into the environmental change dialogue, certain actors were nevertheless reluctant to become tangibly involved in the approach. This was particularly evident with the accountants, who were ill at ease with “carbon language,” preferring to retreat to their financial logic, and to restrict themselves to an information providing role. “It wasn’t the accountants’ strong point. ... They have trouble with carbon, they don’t understand it; there’s too much uncertainty for them. ... They were proud that I belonged to their team, but they didn’t help me at all. For me, they were suppliers of economic and financial data” (EA Head, interview). “They aren’t really involved in developing environmental management tools. They are more focused on the financial dimension” (SD Head, interview).

In addition, the implementation of environmental accounting enabled the controller to be a driving force in the company. He inspired innovation by encouraging managers to look for new solutions that better respected the environment while also improving the company’s financial profitability. “The carbon footprint enabled us to inspire change within the company through innovation, because we need to do more (or at least the same) with less. ... Take packaging for example, the financial management controller always had X thousand euros of boxes and he didn’t ask himself whether this should be reduced. But if you look at the carbon plan, you see that it’s a high emitting account, so you say, ‘Why are we sending a CD in a box ten times heavier than the CD?’ ... So, by looking at physical flows we see economic drivers that we don’t see with euros” (EA Head, interview).

### 3.4.2. *Encouraging suppliers to change*

Outside the company, the controller met suppliers to encourage them to integrate environmental impacts into their production processes and to improve the environmental quality of their products. To do this, he helped them prepare their carbon footprints, “I tackled our suppliers, starting with our three or four largest ones, to make them prepare their carbon footprint. ... The idea was to integrate environmental quality into the products” (EA Head, interview). “With the support of BIO, we have now initiated a carbon footprint approach in parallel to implementing ISO 14001. The EA Head also started by adapting the carbon expense form to our needs and, after testing on a trial user, we are going to launch it internally during our sustainable development week” (cosmetics supplier, SD Report).

This role of external agent for change expanded when the company reached a certain stage in improving its internal performance, “At the beginning, I didn’t tackle our products because there were 2,500 product lines ... but in the end that was the only thing left to be done” (EA Head, interview). “For example, progress in terms of packaging didn’t depend solely on us, but also on our suppliers. ... By helping them to improve, they improved our carbon footprint” (CEO, interview). In addition, the company paid attention to its suppliers because of the “cradle to grave” principle, where it felt responsible for the entire manufacturing-sales-consumption chain of its products, “The product is made because we order it, because it sells. There is therefore joint responsibility in the production chain” (SD Head, interview).

Suppliers are therefore invited to complete a self-assessment using a diagnostic tool created by the company based on the life cycle analysis method (LCA). This tool, completed by the respondent, aims to raise the respondent’s awareness rather than seriously assessing him or her, and is presented as a discussion tool. “It is an internet site, a dialog box between us and our suppliers, where we ask them a series of LCA-inspired questions to see how we can help them to improve their products” (EA Head, radio). In addition, the company has its main suppliers audited by an independent, external audit firm in order to guarantee the environmental quality of the products.

However, not all suppliers are responsive to this ecological dialogue. Faced with business pressures, certain suppliers have strategies to discourage it. For example, “On packs with recycled fibers, [certain suppliers] in China sent us quotes at 300% of the standard price; they didn’t want to do it and so they massively pushed up prices to try to dissuade us” (SD Head, interview). At other suppliers, the company is faced with the problem of *greenwashing*, where

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there is a discrepancy between the suppliers’ environmental dialogue and their actual practices. The suppliers construct an image that conforms to their client’s demands, “For the book division, [certain suppliers] in France say that they have an environmental traceability policy. But to get the details, we need to chase them repeatedly, and it’s only after the 25<sup>th</sup> attempt that they tell us, ‘You know, it’s complicated, it’s all a bit of a mixture’” (SD Head, interview).

To conclude, this study shows that the management controller can perform distinct but complementary environmental functions: carbon auditor, business partner, euro-carbon translator, and agent of change. While the two first roles are similar to the traditional role of controller, the euro-carbon translator task requires specific new environmental skills. Similarly, the role of agent of change takes the controller outside the company to work with its external stakeholders. In fact, in the environmental field, one of the controller’s objectives (or challenges) is to encourage change in the company’s suppliers. This study therefore highlights the duality of the controller’s image. He is perceived as both a “carbon counter” in his role as monitor, and as an “advisor-facilitator”, “technician-teacher”, and as someone who “stimulates environmental awareness”, and “creates value”, respectively, in his roles as business partner, translator and agent of change. He appears to be a changeable character whose attitude varies depending on his role. The versatility of the controller’s assignments, however, enables the negative and positive perceptions of his role within the company to be balanced.

We will return to these various roles later in the discussion section of this article. We begin, however, by examining the questions of the controller’s power and territory.

#### **4. The environmental management controller’s power of influence and territory**

To understand the management controller’s environmental roles, we also need to examine his position and influence within the organization (4.1) and to demarcate his territory, taking into account the activities of the competitors with whom he needs to collaborate to ensure that the company’s operations run smoothly (4.2).

##### ***4.1. The controller’s position in the organization chart and his power of influence***

At BIO, the controller reported to senior management while also being close to the operational and support function managers. As he occupied a support function, the controller should have had no formal power within the company; however, his hierarchical proximity to

senior management increased his influence over environmental decision making. In fact, as advisor to the CEO, the controller acquired significant power as his function enabled him to intervene in strategic decisions. “The carbon manager prepares a kind of mini-report each time we open a store or warehouse. For example, before building a warehouse, we ask ‘How much it will cost?’, as well as ‘What is the CO<sub>2</sub> impact?’” (CEO, interview). “It seemed completely natural to me to put carbon everywhere, even in our investments, and to look at euros and carbon. ... I performed investment analyses and return on investment, or rather, return on carbon” (EA Head, interview).

Even though he lacked hierarchical authority within the company, the controller influenced environmental objective setting, managers’ performance appraisals, and their bonuses. “The directors are given environmental objectives every year, set by senior management and the environmental head. This forms a scorecard that we use to roll out all of these actions across the divisions. ... Directors’ individual bonuses are based on this scorecard. As they are heavily “incentivized” it really hurts, and so in general they meet their objectives” (SD Head, interview). On a local level, we also note the controller’s influence over managers’ operational choices, for example in terms of transport, energy, or packaging etc. In fact, as we saw above (Section 3), it was through his roles as translator, business partner, and agent of change that the controller steered managerial decisions to reduce GHG emissions.

In addition, the controller’s reporting line to senior management offered him greater autonomy than other functions within the organization (financial and sustainable development, in particular). In fact, the lack of a hierarchical relationship with the finance director guaranteed the controller independence and autonomy when undertaking his role, helping to ensure reliable environmental reporting. “I participated on the same basis as the finance director during business committee meetings. He presented the euros and I presented the carbon” (EA Head, interview). In addition, his relationship with the administration and finance division (AFD) facilitated his access to the internal physical and accounting data necessary to perform his various tasks. “I was part of the accounts department, so the accountants gave me the data because they have all the figures” (EA Head, interview). The controller also maintained a working relationship with the sustainable development division, “I had strong links to the head of sustainable development. For a certain time, I had a desk in their office, as I had asked to be closer to them” (EA Head, interview). This operational proximity made it easier for him to

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access external environmental data, as the sustainable development division is responsible for legal and technological monitoring at BIO.

To summarize, the controller enjoyed a power of influence over decision making because of his strategic position within the organization. He worked in partnership with decision makers and was independent from the finance and sustainable development teams, with whom he maintained operational links.

#### ***4.2. The controller’s competitors and his territory***

The controller had various contacts within the company. As we have seen above, the CEO and the managers were his “privileged” internal clients, in other words, those whose needs he addressed first; although, he also maintained operational relations with the AFD and the sustainable development division, whose activities sometimes overlapped with his own, generating territorial issues. In this context, in order to clearly define the scope of the controller’s activities, we need to identify his competitors’ roles and their collaboration with the controller.

Although the scope of the finance director’s role may appear to be clearly defined, the controller sometimes took over certain of his responsibilities, “My scorecard mainly contained carbon, because I wasn’t there to replace the finance director, but I put some financial data into it anyway” (EA Head, interview). Furthermore, the controller tried to separate himself from the finance team and to legitimize his role in the organization by means of his specific competencies. For example, he believed that he added value compared to the finance team, “This type of position adds value, it allows you check that you aren’t off course on the environmental plan, and also to make savings, given that carbon = euros. ... The carbon footprint shows certain economic drivers, such as an energy dependence, which we don’t see in the financial reporting” (EA Head, interview).

In addition, the scope of the controller’s activities is narrower than that of the head of sustainable development. Firstly, his role as advisor is limited to environmental issues, while the head of sustainable development’s advisory role extends to other aspects of CSR (healthcare, security, societal etc.). The head of sustainable development gave us an example of his proposals for improving working conditions for warehouse staff, “I thought about the pallets; they had to be just as strong, but much lighter, and most importantly without splinters, because if a worker gets a splinter in his finger, he makes a sudden movement, and that can

cause lumbago or sciatica. So we started using plastic pallets that are lighter, stackable one inside another, and sourced from a local recycling plant (the supplier is around 170km away from our warehouses). And, hey presto, they were cheaper than the wooden pallets and we made a saving of 50,000 euros” (SD Head, interview).

The controller’s role of local facilitator was small, “I organized breakfast meetings in our stores to present the carbon results, but I didn’t run the network” (EA Head, interview). The head of sustainable development steered and ran the company’s green network, i.e. the function regrouping the environmental contacts spread across the various divisions, stores, and warehouses. “This year, I spent 50 to 70% of my time on internal communication, supporting and managing projects with the teams” (SD Head, interview). To do this, he used the carbon-related data provided by the controller, “He was pleased that I gave him the figures because it enabled him to manage his network. ... He didn’t do the calculations, although he was an engineer. But he couldn’t do everything, he was running the network and he mainly focused on putting in place the EMS ISO 14001” (EA Head, interview). In addition, the EMS audits performed as part of the ISO 14001 certification were the preserve of the head of sustainable development and the external auditors. These audits were not limited to GHG emissions but extended to all of the company’s environmental impacts.

Finally, in contrast to the controller, the role of sustainable development communicator is very significant in terms of the external stakeholders, with this latter being responsible for promoting CSR activities to strengthen the company’s social legitimacy. “He spread the message of BIO’s sustainable development policy to external parties. ... There was a lot of publicity about environmental accounting and huge positive effects in terms of image” (EA Head, interview). Apart from suppliers, the controller had very little contact with other external stakeholders. Nevertheless, he contributed to the sustainable development report by supplying data relating to environmental accounting, “The carbon footprint was also used for preparing the sustainable development report and for putting lots of CO<sub>2</sub> data in it. It was useful both for the report and for showing the outside world that we were doing innovative stuff” (EA Head, interview). As we have just seen, the boundaries between the activities of these two actors were sometimes blurred, but analyzing the role of the head of sustainable development indicates that this latter appears more focused on internal facilitation and external communication. This analysis enables us to better understand the controller’s “environmental territory” and to highlight the head of sustainable development’s power of influence within the company.

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To conclude, it appears that the hierarchical position of the environmental management controller and the autonomy that he possessed in his work gave him a power of influence over decision makers. In addition, this study highlights territorial problems between the controller and his internal competitors. Although the finance director can also be seen as a supplier of information, the head of sustainable development may be considered a more significant competitor given that he had the authority to interfere in the controller’s investigative scope. He made use of the controller’s carbon data to run the green network, prepare the sustainable development report, and communicate with external parties. Even if territories exist to guarantee the power and legitimacy of each actor, this study nevertheless underlines the willingness of the controller to collaborate with his competitors (with the AFD being his main information supplier, and the head of sustainable development a new internal client, in addition to senior management and managers).

## **Discussion and conclusion**

By exploring the management controller’s roles in relation to the environment, this study departs from the literature (Capron and Quairel 1998, 2007; Wilmshurst and Frost 2001; Marquet-Pondeville 2003; Quairel 2006; Moquet 2008; Caron and Fortin 2010; Renaud 2013a; Antheaume 2013 etc.), which describes the controller as an intruder in the realm of environmental responsibility, readily limiting his proficiency to the economic and financial domain. In fact, based on a longitudinal case study, this research shows that the controller can be a key environmental management control (EMC) actor. The controller is tasked with various assignments in this process: carbon auditor, business partner, euro-carbon translator, and agent of change. The results also highlight the image, power of influence, and territory attributed to the controller in this new domain. It is, to our knowledge, the first French empirical study establishing an overview of the role of controller in the environmental domain. We set out below the theoretical and managerial implications as well as the limitations and future research perspectives of our study.

From a theoretical point of view, this study contributes to the management control field by highlighting the characteristics of the environmental management controller. In fact, this study allows us to classify the controller’s assigned roles into two categories: classic roles adapted to ecological concerns (carbon auditor and business partner), and specific roles arising out of the environmental context (euro-carbon translator and external agent of change). As carbon auditor,

the controller performs the traditional role of monitor, reporting to senior management. Similarly, in his business partner role, he assists directors and managers in their strategic and operational decision making. To do this, he jointly produces environmental budgets, action plans, and management tools, and then runs performance management meetings. Beyond these ecological questions, we also find the roles traditionally assigned to the management controller as identified in the literature (Sathe 1983, Fornerino and Godener 2006, Bollecker 2007, Lambert and Sponem 2009 etc.).

On the other hand, the management controller is also characterized by two new roles in the environmental domain. Firstly, as euro-carbon translator, the controller employs new skills specific to the environmental domain (in terms of climate change, GHG emission calculations, life cycle analyses etc.). He specifically needs to master “carbon language” and translate it into a financial and/or operational language that can be understood by decision makers and operational staff. The technical-pedagogical value added provides the controller with a new legitimacy in the eyes of managers. In fact, in contrast to the financial domain where managers can take over certain of the controller’s skills, such as preparing their own budgets and managing their own scorecards (Danziger 2009), in the environmental domain, these latter are faced with a higher level of technical sophistication and a new language that they do not yet understand. Because of this, they cannot forgo the controller’s expertise. In addition, although the controller is described as an internal agent of change (Bessire 1995, Vaivio 2004, Bollecker 2007), this study shows that he is now capable of stimulating change in external stakeholders, namely suppliers. He can be a driving force and a source of innovation for suppliers in order to improve the environmental performance of their products. This role of external agent of change, highlighted in our study, represents a new contribution to the literature.

From a managerial point of view, this research considers the emergence of the new profession of “environmental management controller”, similar to the older role of “social management controller”. This new horizontal role can develop at the boundary between environmental management and traditional management control. In fact, this study shows that the environmental management controller has the technical skills of an environmental engineer to be able to prepare a carbon footprint, and the expertise of a traditional management controller in terms of budget management, performance reporting and management, cost calculation and optimization etc. The requisite personal skills are the same as those of a controller: the ability to analyze, summarize, and communicate; good interpersonal and teaching skills; the ability to

be a driving force and to convince others etc. This study therefore enables directors, human resources actors, and students to learn from the different profiles of this new position in terms of tasks, technical and personal skills, reporting lines, operational relations, and training.

Although this case study is set within a specific context, the results of our research can be generalized to other similar companies (size, industry sector, position in the organizational structure, similar type of actors). We have not, however, examined all of the roles of an environmental management controller because of the characteristics of BIO. As the company is not subject to the French National Allocation Plan (NAP) for allocating emissions quotas, questions relating to compensation and to the accounting and tax treatments of GHG emissions quotas have not been examined in this study. Similarly, given the company’s industry sector, our study has focused on carbon accounting,<sup>11</sup> whereas controllers in chemical or nuclear industry sectors, for example, may be required to manage other environmental impacts: emissions of volatile organic compounds (VOCs), eutrophication in aquatic environments, human toxicity, the generation of hazardous waste etc. Thus, from a future research perspective, it would be useful to repeat this study in new contexts (companies in different industry sectors, and of different sizes) in order to generate additional profiles of the role of “environmental management controller.”

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## Notes

<sup>1</sup>CSEAR: Centre for Social and Environmental Accounting Research; EMAN: Environmental and Sustainability Management Accounting Network; IFAC: International Federation of Accountants

<sup>2</sup>For more information on NVivo10 software, refer to <http://www.qsrinternational.com>

<sup>3</sup>To preserve contributors' anonymity, we have removed from the transcripts elements likely to reveal their identity without altering the meaning of the statements collected.

<sup>4</sup>In compliance with EU Directive 2003/87/CE, the French government has established a National Allocation Plan (NAP) to allocate emissions quotas to companies in certain GHG-intensive industries (energy production, cement, glass, ferrous metals, mineral industries, pulp and paper) to encourage them to reduce their GHG emissions. Each year, these companies are required to surrender the quotas that they have been authorized to emit. A compensation mechanism exists through which they can purchase the quotas that they need or sell their unused quotas.

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<sup>5</sup>After receiving a job offer from a consulting firm, the management controller left BIO and is currently a carbon footprint consultant-expert.

<sup>6</sup>In 2004, ADEME developed its *Bilan Carbone*<sup>®</sup> software to account for, by order of magnitude, the direct and indirect GHG emissions generated by an organization’s activities. In France, however, Jean Marc Jancovici is recognized as the originator of the method. Since the introduction of the Grenelle II Act (Article 75), companies with more than 500 employees are required to prepare a GHG emissions report. The GHGs reported are those defined in the Kyoto protocol: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and fluorinated gases (HFC, PFC, and SF<sub>6</sub>).

<sup>7</sup>In this case, the transport of goods and staff represents 60% of CO<sub>2</sub> emissions, compared to only 0.5% for waste disposal.

<sup>8</sup>The carbon equivalent (CE) represents the weight of carbon alone in the compound CO<sub>2</sub>. We can move from the carbon equivalent, CE, to the CO<sub>2</sub> equivalent by multiplying by a factor of 44/12, which is the ratio of the molar mass of CO<sub>2</sub> to that of carbon.

<sup>9</sup>Examples of emission factors are: 0.063kg CE per kWh for liquefied petroleum gas; 0.023kg CE per kWh for electricity (EDF); 6.1g CE per passenger km for French high-speed TGV trains (SNCF). For more information on emission factors, see <http://www.basecarbone.fr>

<sup>10</sup>Like Carroll and Näsi (1997), we distinguish between internal stakeholders (owners, directors, managers, non-managers) and external stakeholders (customers, suppliers, competitors, public authorities, environmental associations, residents, the financial community, the media etc.).

<sup>11</sup>The company has recently begun “*wood accounting*,” which involves accounting for the wood used to manufacture products, packaging, and publications etc. in terms of “*equivalent trees to plant*.” We have not studied this new type of accounting in the present article because it was introduced by the head of sustainable development after the management controller’s departure. The roles highlighted in our research may, however, be adapted to this new type of accounting, by referring to a “fiber auditor” and “euros to trees-to-plant translator.” The company uses a spreadsheet (known as an eco-calculator) to perform the conversion.