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**HUMAN RESOURCES IN ADVANCED ENVIRONMENTAL APPROACHES –
A CASE ANALYSIS¹**

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HUMAN RESOURCES IN ADVANCED ENVIRONMENTAL APPROACHES – A CASE ANALYSIS

Abstract

A weak organizational culture in organizations creates an environment that leads to inefficiencies in human resources. Both, a weak organizational culture and inefficiencies in human resources are major barriers to the implementation of environmental action processes. However, very few studies have been published in this area. The objective of this study, therefore, is to conduct an exploratory case analysis and develop some proposals based on the conclusions arrived at. We have analyzed a total of 8 factories to ensure a sufficient number of sources of information. Some factors linked to organizational culture and the human resource management in a factory that favor environmental performance were found.

1. Introduction

Some authors have explained the differences observed between companies in terms of the type of relationship between environmental and business performance on the basis of the Resourced-Based View (Russo and Fouts, 1997). In general, the manner in which companies approach the natural environment protection can be grouped into two categories: *control* and *prevention*. From an internal company perspective, the environmental demands that obligate a company to introduce preventive approaches in their environmental management should not be perceived as negative. This is based on the argument based on the Resourced-Based View (Hart, 1995), and empirically proved in some studies (Russo and Fouts, 1997).

Environmental performance achieved by both kinds of approaches is different. In fact, Ilinitch et al. (1998) show how environmental performance is multidimensional. They identify four conceptual dimensions of corporate environmental performance: 1) organizational systems – organizational processes, including environmental audit programs, environmental mission statements, etc. –, 2) stakeholder relations – the interaction between the company and its various external constituencies –,

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3 3) regulatory compliance – the degree to which companies meet legislation – and 4) environmental
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5 impact or environmental efficiency – negative economic and environmental externalities generated in
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7 business –. In short, the main aim of some environmental practices is to improve environmental
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9 performance only as regards legislation compliance. They prevent waste and emissions (already
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11 produced) from generating negative effects on the natural environment. This is achieved thanks to
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13 specialist technologies to fight pollution (usually quite expensive and unproductive, because they do not
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15 generate value): control protection (Andersson and Wolff, 1996). These approaches are therefore a
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17 constraint for a company (Angell and Klassen, 1999), so their influence on competitiveness is negative:
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19 they reduce the company's innovative capability (Porter and van der Linde, 1995). Nevertheless, when
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21 the main aim of environmental practices in a factory is to avoid the production of this kind of waste and
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23 emissions –environmental impact decrease or improved environmental efficiency: preventive
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25 approaches–, consumers may perceive their products as of a higher quality and of better corporate
26
27 image. Simultaneously, they may lead a company to product innovation and to new market penetration
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29 (Azzone and Noci, 1998a). As a result, more environmental efficiency leads to higher quality, corporate
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31 image improvement, more innovation and new market penetration.
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39 Nevertheless, improving environmental performance by applying a preventive approach requires major
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41 changes in the organization of a company and dealing with the opposition of stakeholders (Boiral,
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43 2002). Business culture, human resources, and organizational skills required to manage initiatives in
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45 this area must reflect such changes (Russo and Fouts, 1997). Improving environmental performance by
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47 means of preventive actions also requires a different approach to environmental issues, particularly with
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49 respect to their integration into the company's business strategy (Azzone *et al.*, 1997; Azzone and Noci,
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51 1998b; Cordano and Frieze, 2000). The more advanced environmental approaches require personnel-
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53 intensive strategies (Madsen and Ulhoi, 2001). Such strategies depend on the development of tacit
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55 skills through employee participation and the use of 'green' working teams.
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3 As a result, the organizational culture and, within it, the decisions made involving human resources are,
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5 if not the central pillar, one of the critical elements upon which all the skills necessary to achieve a
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7 sustainable competitive advantage are based³, especially those related to environmental matters
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9 (Handfield *et al.*, 2001). In this vein, some authors have considered that a weak organizational culture in
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11 organizations creates an environment that leads to inefficiencies in human resource management. Both,
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13 a weak organizational culture and inefficiencies in human resource management may be major barriers
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15 to the implementation of environmental action processes (Klassen, 2000). However, very few studies
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17 have been published in this area. It is, all in all, a process of organizational change. We are interested in
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19 studying it in its natural site, so that it allows us to know about the situation of each element and from all
20
21 of the involved elements as a whole. Likewise, we are interested in knowing the how and why or, what is
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23 the same, understanding the nature and complexity of the processes inserted in such a process of
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25 change. This, together with the fact that very few works have been published on the matter to the
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27 present moment, led us to opt for the case analysis as our research methodology. The aim of this study,
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29 therefore, is to conduct an exploratory case analysis and develop some proposals based on the
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31 conclusions arrived at. These would then be verified in later empirical studies with the aim of
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33 contributing to fill in any remaining gaps.
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43 2. Review of the Literature

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45 Influence of organizational culture and human resource management on businesses' environmental
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47 performance has already been shown in the literature. We will now proceed to review some of the most
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49 significant contributions that have already been summarized in other studies (Fernández *et al.*, 2003),
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51 that includes issues regarding: a) organizational culture, senior management and leadership, b) human
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53 resource policies, c) status of environmental organizational unit and d) human resource policies
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55 specifically linking to environmental concerns.
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³ Hall (1992) observed that employee know-how and the reputation and the culture of the company were considered the most important sources of business success.

2.1. Organizational culture, senior management and leadership

Organizational culture has been considered a form of organizational capital (Barney, 1985; Camerer and Vepsalainen, 1988). A corporate culture has a major impact on a company's ability to carry out objectives and plans, especially when a company is shifting its strategic direction (Schwartz and Davis, 1981). Likewise, the culture gives remarkable advantages, because it is extremely difficult to imitate or duplicate (Fitzgerald, 1988; Mueller, 1996), due to its inherent tacitness, complexity and specificity (Barley, 1983; Lippman and Rumelt, 1982). Several dimensions of organizational performance are dependent on the degree to which the values of the culture are widely shared, that is, on the extent to which the culture is 'strong' (Deal and Kennedy, 1982; Denison, 1990). An example is the environmental issue. Its incorporation into the culture of the firm may deliver environmental capabilities that competitors would find hard to imitate (Russo and Fouts, 1997).

The effective implementation of an advanced environmental approach also demands a culture based on ecological values that involves a high degree of awareness on the part of the employees. Thus, the organizational culture or the legitimization of the problem as an integral part of corporate identity is one of the key factors in achieving better environmental performance in companies (Klassen and McLaughlin, 1993; Russo and Fouts, 1997; Azzone and Noci, 1998a; Polonsky *et al.*, 1998; Egri and Herman, 2000; Sharma, 2000; Handfield *et al.*, 2001). The organizational culture is essential in order to create employees' attitude to environmental issues that also assume the environmental vision (Klassen and McLaughlin, 1993; Azzone and Noci, 1998a; Polonsky *et al.*, 1998; Handfield *et al.*, 2001).

Some issues influence companies' organizational culture and, as a result, companies' capability to improve environmental performance. For example, a high average age of the workforce may lead to hamper the worker participation in environmental protection because of the low trend to innovate shown by older people. This has already been observed in studies that analyzed the effects on performance indicators others than environmental ones (Hambrick *et al.*, 1993). Unionization may also be a factor

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3 that hampers a better environmental performance in a business. Resistance to change by labor unions
4 could jeopardize environmental performance (Robbins, 2004).
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8 Management capability plays a critical role in aligning employee skills, motivation and ability with
9 organizational systems, structures and processes that achieve capabilities at the organizational level
10 (Teece et al., 1997). Values held by leaders are related to their effectiveness (Thomas et al., 2001). In
11 this way, management's attitude has a crucial impact on the environmental performance in a company
12 (Ashford, 1993; Dieleman and de Hoo, 1993). Roome (1994) detected two deficits with respect to
13 management's attitude towards natural environment protection: a) the lack of managers adept at both
14 business and environmental practice and b) the absence of established competence in environmental
15 management. This is accompanied by the difficulty inherent in solving extremely complex,
16 environmental problems that are not highly compatible in the short term with improving competitiveness.
17 That is why dealing with environmental issues demands senior management to face up to the
18 leadership concern. Portugal and Yukl (1994) detected certain transformational leadership behaviors –
19 the expression of a vision that reflects environmental issues, a change in the perception of
20 environmental issues, and undertaking symbolic actions to demonstrate personnel's commitment in this
21 regard– as essential elements in environmental management. Environmental management demands,
22 indeed, transformational leaders (Gladwin, 1993). However, based on Quinn's model (1988), Egri and
23 Herman (2000) showed that the environmental manager should also have some of the characteristics of
24 the transactional leader –task coordination, financial control, information management, emphasizing
25 efficiency, and setting objectives. Egri and Herman (2000) reach the conclusion that environmental
26 management demands more master leaders (with transformational and transactional aspects) than just
27 transformational.
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54 55 56 57 **2.2. Pro-flexibility policies** 58 59 60

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3 Employee lack of motivation is one of the main constraints companies suffer when introducing
4 environmental practices in the workplace, as pointed out by Shrivastava (1995) and Getzner (1999),
5 amongst other authors. Furthermore, the creation and expansion of knowledge necessary in order to
6 market 'green' products, along with the image it offers, are intangible activities that cannot be
7 supervised or forced by the company. They only take place when the individuals cooperate voluntarily.
8 Consequently, in the same way as in the literature about classical management issues (Dyer and
9 Reeves, 1995; Meyer and Allen, 1997), Shrivastava (1995) and Getzner (1999) point out that the
10 employees' motivation is one of the main incentives companies have to achieve a competitive
11 advantage supported on environmental action. In a more general way, the argument is implicitly stated
12 by MacDuffie (1995), when he assumes that performance is more likely to be maximised when practices
13 that reinforce workers' patterns of behaviour via motivation are introduced.
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16 Companies have several mechanisms by which to strengthen employees' motivation. Some studies
17 have identified fostering employee satisfaction in their work as an element that leads to better
18 environmental performance (Florida, 1996; Sharma, 2000). Lately, the importance of job flexibility as a
19 general policy within the company has been proposed as a mechanism that improves the welfare of
20 workers in a factory, and at the same time strengthens corporate identity (Pfeffer, 1998). This may be a
21 stimulus to better environmental performance (Sharma, 2000).
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46 **2.3. Status of environmental organizational unit**

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48 The creation of the figure of a manager/department with environmental responsibilities (shared with
49 others or not) is an increasing practice in companies. However, these departments do not act in an
50 isolated manner, but provide process improvement information and innovative ideas for engineers and
51 other technical personnel (King, 1995). This is the majority option in the literature. So, although the
52 importance of setting up the right mechanisms to ensure that all personnel have some kind of
53 environmental responsibility has been demonstrated (Sadgrove, 1991; Beaumont, 1992; Ledgerwood *et*
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3 *al.*, 1992), the literature has largely stated its preference for the notion that the company that dedicates
4 a specific manager/ department to this area values environmental protection more highly, especially if it
5 is part of (or reports to) senior management (Elkington *et al.*, 1991; Sadgrove, 1991; Weldford and
6 Gouldson, 1993). Empirical evidence already exists in this vein (Sharma, 2000). The most advanced
7 companies link their environmental management unit to another function: health and safety (Epstein and
8 Roy, 2001).

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17 The predominant position in the literature shows that a company with a specific environmental
18 post/department tends to give more importance to natural protection, specially if it directly depends from
19 senior management (Weldford and Gouldson, 1993). There is an empirical contrast about it in some
20 papers (Aragón *et al.*, 1998; Sharma, 2000). Likewise, we consider that, apart from criteria for technical
21 training, the legitimation that the appointment may exert on organizational culture is not an element
22 without importance (Aragón *et al.*, 1998).

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The influence of environmental activity on environmental performance has to do with the fact that the
companies' environmental activity is interdisciplinary in nature (Checkland, 1981; Vickers, 1983).
Banerjee (2001) highlighted the relevance of integrating all functional strategies in order to boost
environmental performance.

2.4. Human resource policies specifically linking to environmental concerns

Management's role in achieving a greater level of environmental performance is evidenced, among
other aspects, by giving the workers autonomy to come up with creative solutions to the problems
posed, to develop environmental awareness, and to implement their knowledge in this field (Cramer and
Roes, 1993). That is, environmental performance requires individual and group involvement (Hart,
1995). Employees' motivation and their involvement in the environmental area likewise require the
involvement mechanism design (Hart, 1995; Ramus, 1997; Chase *et al.*, 1998; Kitazawa and Sarkis,

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2
3 2000), as they lead to support problem prevention and to identify opportunities and processes for
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5 improvement (Klassen and McLaughlin, 1993).
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8 The establishment of internal communication channels to get the strategic vision across to workers has
9
10 been pointed out as a basic factor in successfully involving all personnel (Argenti, 1998), particularly in
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12 environmental activities (Gupta and Sharma, 1996; Handfield *et al.*, 2001). In more advanced
13
14 environmental approaches this communication, or information transfer, is a two-way process instead of
15
16 the traditional downward spiral of communication. Suggestion-boxes and open meetings that are held
17
18 on a regular basis have proven their usefulness in achieving this (Cascio *et al.*, 1996)⁴. Nevertheless,
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20 upward and downward communication is not incompatible with inter-functional communication.
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22 Kitazawa and Sarkis (2000) have shown that environmental preventive practices require inter-functional
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24 integration through improved communication mechanisms throughout the organization, that is, each
25
26 type of issue depends on different and even potentially 'adverse departments' (Hanna *et al.*, 2000). For
27
28 example, Chinander (2001) in a case analysis shows that the role played by internal factors, such as
29
30 communications and empowerment, has an influence on the environmental performance of a company.
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32 Likewise, Barney and Wright (1998) highlight the fact that a sustainable competitive advantage emerges
33
34 more from teams than from individuals, so that the importance of employee involvement is basically
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36 manifested through the empowerment and teamwork (Guest, 2001; Currie and Procter, 2003). Both
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38 support the generation of new ideas (Cramer and Roes, 1993; Ghobadran *et al.*, 1995; Hanna *et al.*,
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40 2000; Kitazawa and Sarkis, 2000).
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48 All of the companies must have reward systems suited to their environmental objectives. Some of them
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50 have already started action in this sense. For example, Xerox has programmes to reward employees in
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52 order to achieve high levels of innovation in waste reduction, re-using and recycling (Milliman and Clair,
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54 1995). Other companies have also used public recognition systems for the achievement of the
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⁴ Toyota, for example, has a maxim: "Don't waste your time worrying about something, say it". This allows workers to express their feelings about the company and its managers.

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3 objectives in the environmental area. Examples are meetings with employees that take part in
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5 environmental working teams, which have been successful (Handfield et al., 2001).
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10 **3. Research Methodology**

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12 In this study we have adopted a case analysis methodology with the aim of examining a novel situation
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14 (Voss *et al.*, 2002): the effect the company's organizational culture and human resource management
15
16 have on environmental performance. This methodology is the most appropriate when the key questions
17
18 are *what* (description), *how*, and *why* (application) in generating a theory (Snow and Thomas, 1994;
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20 Meredith, 1998). Case analysis is also particularly useful in the analysis of processes of organizational
21
22 change (van de Ven and Poole, 1990) and when analyzing company cultures (Bonache, 1999).
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27 A key decision related to case analysis refers to how many and which specific cases should be chosen
28
29 for analysis. A fair degree of controversy in relation to this issue exists. Eisenhardt (1989) suggests that
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31 between 4 and 10 cases is a suitable number, although Dyer and Wilkins (1991) maintain that a
32
33 maximum of two might be sufficient. With regard to this discussion, Voss *et al.* (2002) advocate that the
34
35 optimum number of cases depends on the type of results being pursued. Taking into consideration
36
37 these studies, we have analyzed a total of 8 factories to ensure a sufficient number of sources of
38
39 information. Although we are conscious that an analysis of four factories would have been enough,
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41
42 several reasons led us to analyse a larger number of cases: a) the literature is not unanimous regarding
43
44 the decision about how many houses are enough; b) this issue is very little studied and, as a result, it is
45
46 advisable to analyse the question with enough scope and c) the range of options regarding
47
48 environmental development is terribly wide and very different from a qualitative point of view, and
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50 consequently, a large number of cases would allow us to observe how to face the problem in firms with
51
52 different levels of environmental development. As a result, we analyzed eight factories.
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57 The interview was held with two different people within the company: the Environmental Manager and
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59 the Human Resource Manager. The interview was composed of open questions, which are derived from
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3 the review of the literature. It was a background to find the most influencing issues on environmental
4 performance. In that way, we removed questions about some human resource practices that would
5 have led to a very long interview. Likewise, we looked for a higher precision in the key issues for
6 environmental management. In order to carry out the interview, the researchers used an outline (**Annex**
7 **1**) with the questions. In order to classify the data from the interviews carried out by open questions, we
8 firstly support our decisions on the conclusions from the review of the literature. The primary categories
9 for each question would be deduced, as a result, in this way. However, we also consider any aspect
10 present in the interviews which would not have been dealt with previously in the literature. However, the
11 interaction with the interviewee and the direct observation during the visits to the factories helped the
12 researchers to complement their information achieved by the initial outline in an isolated way. Likewise,
13 we use businesses' documents as annual reports in order to complete our analysis. Table 1 shows the
14 distribution by sector and size (taking the number of employees as a reference) in the factories
15 analyzed. The names of the companies have been changed at the request of the some of the
16 respondents.

4. Discussion of Case Analysis Outcomes

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The case analysis is based on the review of experiences of eight factories of different size that operate
in different industries, although with a common characteristics: they are all ISO 14001 certified (**Annex**
2). The analysis was carried out in factories with very different dimensions of environmental
performance. As a result, the companies can be classified as having a lower to higher degree of
environmental performance, as follows: 1) B ("Our objective is legislation compliance, so we design
approaches that are basically for control, without value recovery processes, or protection of innovations,
or environmental actions conveyed to the stakeholders") – 2) E ("Our objectives are: to comply with
legislation and international standards, for which we implement control technologies and some
preventive technologies. We collect packages and reach agreements with a regional consortium to

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3 transport waste. We do not protect our environmental innovations nor do we inform the stakeholders of
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5 our situation”) – 3) F (“Our aim is to integrate the environmental issues at a strategic level and with
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7 quality (although we have not fully achieved it), to then be successful in preventive approaches and to
8
9 achieve continuous improvement. We also apply technologies to minimize environmental impacts. We
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11 reuse inert waste, and the rest is transported to a regional consortium. We do not carry out
12
13 environmental innovations or provide information to stakeholders periodically”) – 4) H (“Our objective is
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15 to examine our mistakes in order to analyze their causes and prevent them, and also to improve our
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17 image, so we implement a combination of control and preventive technologies. The waste is transported
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19 to a regional consortium. We patent our environmental innovations of an environmental nature. We do
20
21 not inform stakeholders as to our environmental situation”) – 5) A (“Our present objective is to comply
22
23 with legislation and improve our image, although we have already implemented a large number of
24
25 actions to make our environmental activities more systematic and reduce our consumption of raw
26
27 materials and energy. We have implemented control technologies and also preventive technologies,
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29 mainly to reduce the level of consumption. We do not recover value because it is not pertinent. We
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31 protect our environmental innovations through continuous improvement. We do not inform stakeholders
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33 of our environmental situation on a regular basis”) – 6) C (“Our present objective is to be an
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35 environmental leader in the industry and practice corporate public-mindedness. To do this we have set
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37 a number of actions into motion: a policy of sustainability and corporate social responsibility, the
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39 inclusion of the social dimension in the environmental management system, and the incorporation of
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41 customers and suppliers in this process, while driving the implementation of environmental preventive
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43 technologies and management systems. We have value recovery mechanisms: treatment systems for
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45 waste and packaging, battery collection and recycled and biological paper. We base our environmental
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47 innovation protection on our technological leadership and on continuous improvement. We put out an
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49 environmental report and we are quoted on the Dow Jones Sustainability Index”) – 7) D (“Our objectives
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51 are to make progress in corporate public-mindedness and be a leader in our industry, so we drive
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3 environmental R&D and implement technologies (particularly preventive ones), as well as substantial
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5 modifications to product and process design. We have 17 centers worldwide for product recovery and
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7 recycling at the end of life, which include total and partial re-use. We protect our environmental
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9 innovations by means of our technological leadership, continuous improvement, and patents. We issue
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11 an annual corporate report on the natural environment”) – 8) G (“Our present objective is to be
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13 environmental leaders (a basic mechanism to protect our innovations in this field), so we promote
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15 changes to processes and products and value recovery processes. This is communicated to
16
17 stakeholders quarterly and annually”).
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22 Using specific data based on the case study, we will now show how the human resource management
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24 approach is closely linked to the ability of companies to improve their environmental performance.
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28 29 **4.1. Organizational culture, senior management and leadership**

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31 The literature suggests that a culture based on ecological values in a factory favors environmental
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33 performance (Alberti *et al.*, 2000). In this sense, we will refer to some of the elements that characterize
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35 these ‘organizational cultures’ and observe their role in the environmental performance of the factories
36
37 under study.
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41 Based on the observation of the factories analyzed, we have identified characteristics that define the
42
43 least developed companies in environmental terms. On one hand, three of the least advanced
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45 companies (B-E-H) have high levels of labor union membership. One of the least developed companies
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47 (E), despite having mechanisms for worker participation in environmental protection, finds difficulties as
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49 a result of the high average age of the workforce. On one hand, perhaps high levels of union
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51 membership occur more in mature sectors in which, as a result, it is more difficult to introduce the
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53 modifications required by more advanced environmental approaches. Another explanation could be that
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55 resistance to change by labor unions could jeopardize environmental performance. Thus, we would
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57 make the following proposition on the basis of the above observations:
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3 **Proposition 1.** *Highly unionized factories and those whose workers have a high average age show*
4 *lower levels of environmental performance.*
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8 Next, we will refer to the support of senior management for the environmental performance of a
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10 company. From lesser to greater importance, we find the following order of the factories analyzed: B-H-
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12 E-F-A-C-D-G. The management of B merely conducts a “precautionary analysis of environmental
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14 proposals, and taking a step forward requires a detailed and time-consuming prior analysis”. H simply
15
16 states: “management gives little support”. E says that “senior management carries out monthly and
17
18 annual monitoring of quality and natural environment, mainly with respect to quality, although it does
19
20 emphasize the environmental training program”. In F, “the role of management is limited to being the
21
22 highest level of authority for the application of the environmental management system”. In A,
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24 “management indicates its availability to, support for, and communication with the environmental
25
26 manager, but actions are negatively affected by other competitive priorities”. The situation is very
27
28 different in companies with a greater level of environmental performance. In C, “management drives the
29
30 environmental criteria for business management”. In D, management “gets involved, supports, and
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32 takes the environment into account, provides funds and presents the environment department
33
34 performance”. Finally, management at G stands out as a result of “its direct support and considerable
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36 contribution of funds”. Consequently, we find a very similar situation as the one that emerged when
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38 organizing the companies on the basis of their environmental performance. This approach is similar to
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40 the literature in the sense that the attitude of senior management is an essential element in eliminating
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42 organizational barriers that keep a factory from achieving effective environmental performance (Ramus,
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44 2001). As a result, we would propose the following:
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52 **Proposition 2.** *Factories in which management is more aware and involved and that offer greater*
53 *support to environmental activities achieve higher levels of environmental protection.*
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58 As to the role of senior management, the literature does not give conclusive results on what type of
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60 leadership is best for the environmental performance of a company. Whereas some authors (Portugal

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2
3 and Yukl, 1994) are in favor of the transformational model, Egri and Herman (2000) opt for a 'master
4 leadership' with transactional and transformational aspects. In our case, if we put the factories analyzed
5 in order (again from lesser to greater) in terms of transformational leadership, we find the following
6 sequence: B-E-F-H-A-C-D-G. In the first five, relationships are basically top-down. In F, the workers only
7 "contribute ideas". In E this communication channel is not "effective", while in H, although there are
8 relations in the other direction, there is no "emphasis" placed on them. In A, communication channels
9 exist, but only for contingencies: "e-mail, notice boards, and regular meetings". Conversely, the other
10 companies give leadership to enable participation through other channels: "interactive" (C), "encouraged
11 by the organizational structure" (D), or with "personalized environmental agendas" (G) As we can see,
12 this sequence is identical to that of the environmental performance of a factory. However, we do not find
13 differences between companies in terms of the characteristics that have to do with transactional
14 leadership. As a result of this case analysis, in contrast with the stance of Egri and Herman (2000) and
15 in agreement with that of Portugal and Yukl (1994), the characteristics of transformational leadership
16 serve as instruments of environmental performance in a factory. The following proposition is therefore
17 put forth:
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38 **Proposition 3.** *The features of transformational leadership drive environmental performance in*
39 *factories.*
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45 **4.2. Pro-flexibility policies**

46 One of the factors that leads to better environmental performance is to foster employee satisfaction in
47 their work (Florida, 1996; Sharma, 2000). Lately, the importance of job flexibility as a general policy
48 within the company has been proposed as a mechanism that improves the welfare of workers in a
49 factory (Pfeffer, 1998). This strengthens corporate identity and it is likewise a stimulus to better
50 environmental performance (Sharma, 2000). We have observed the following in the factories we have
51 analyzed: a) the top factory with regard to environmental concerns (G) states that "we have flexibility
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3 policies and consult the workers about them” and b) in another of the leading factories, the third (C), “we
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5 have this type of mechanism and work is sometimes carried out on a project basis”. These top
6
7 companies are those that have the best image in the market and cultivate it more through advertising
8
9 and sponsorship. As a result, we arrive at the following proposition:

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12 **Proposition 4.** *Pro-flexibility in human resource policies in the workplace as a general policy within the*
13
14 *company leads to better environmental performance.*
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17 18 19 20 **4.3. Status of the environmental organizational unit**

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22 Regarding the organization of environmental activities, the literature has mainly considered one
23
24 question: the availability of an organizational unit dedicated to the natural environment (King, 1995),
25
26 although the existence of an organizational unit covering the natural environment, health and safety is
27
28 also recognized as an indicator of development (Epstein and Roy, 2001). Our observations of factories
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30 lead us to support this notion. Four of the five less advanced companies in terms of environmental
31
32 performance have environmental activities integrated into their quality system, which may help to
33
34 weaken the environmental protection image in the factory as whole. Nevertheless, in addition to the
35
36 approaches in the literature we would add that there are two other factors that explain environmental
37
38 performance related to the organizational unit responsible for environmental issues: a) the hierarchical
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40 situation of the environment departments in relation to the senior management and other departments,
41
42 and b) the relations between the natural environment department and other functions in the company.
43
44 We therefore find that, for example, in the factory with the least environmental performance (B) “the
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46 Quality and Environment Department does not have links with the Human Resource Department”, which
47
48 could mean a barrier to sharing goals and visions in the field of environmental activities (Kitazawa and
49
50 Sarkis, 2000; Chinander, 2001). We also find very good inter-functional relations and a favorable
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52 situation regarding the senior management on the part of the environment department in the factories
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54 with the greatest level of environmental performance (C-D-G). C thus has a “Sustainability and
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3 Environment Network that is represented in all the business units”, in D “the department for the
4 environmental product and process design has representatives from all departments”. In G the
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8 “Environmental and Health and Safety Department has a good relationship with the General Manager,
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10 and its level is identical to that of other functional areas. Sometimes, Environmental Department’s
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12 opinion even prevails”. We would make the following proposition on the basis of these observations:

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15 **Proposition 5.** *The availability an independent organizational unit (or one linked to the health and*
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17 *safety in the workplace) dedicated to environmental protection, the privileged position of this*
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19 *organizational unit vis-à-vis the senior management and fluid inter-functional relations favor the*
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21 *environmental performance of a factory.*
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27 **4.4. Human resource policies specifically linking to environmental concerns**

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29 The importance of the involvement of all employees in environmental activities has been considered in
30
31 the literature as a key factor (Handfield *et al.*, 2001). From the observation of the factories analyzed we
32
33 can conclude that several mechanisms facilitate the achievement of better environmental performance.
34
35 On one hand, the joint responsibility of all workers in environmental activities is a common feature of
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37 factories with a higher level of environmental performance (basically C-D-G). These are, on the other
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39 hand, the companies that have the largest number of communication mechanisms. These are also more
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41 complex for environmental matters: “Internet, interactive software and environmental statements” in C,
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43 “corporate Intranet, e-mail, posters, leaflets and CDs” in D and “information on screens, magazines,
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45 notice boards, personal digital agendas, videos, World Environment Day, etc.” in G. The two least
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47 advanced factories in environmental protection either do not have a defined system to analyze
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49 employees' suggestions (B) and/ or do not consult them on a regular basis (E).
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54 Another employee involvement mechanism that leads to better environmental performance is the work-
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56 team creation to solve environmental problems. These exist in the companies that are better placed in
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58 the field of environmental protection (C-D-G). They also serve to solve different types of problems,
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3 although not just those related to the protection of the environment, in intermediate companies in terms
4 of environmental performance (H-E-A): “generic” in A “without specific composition” in H and for “health
5 and safety, quality and environmental protection” in F. They do not exist in express terms in two of the
6 worst situated companies in terms of their ability to protect the natural environment (B-F). The
7 companies with environmental teams (C-D-G) are also different regarding the integration of this team
8 (inter-functional in the most environmentally developed factories) and the functions assigned to project
9 leaders and the incentives established for them. Factory G stands out in this respect: “they are assigned
10 environmental functions and annual objectives up to supervisor level and are given incentives to include
11 environmental issues into their projects”. As a result, we would make the following proposition:

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24 **Proposition 6.** *The level of worker involvement in environmental activities, the existence of more and*
25 *better mechanisms for communication and the teamwork creation (especially those made up of people*
26 *from different departments and whose leaders have great decision-making powers and those that are*
27 *given incentives) are factors that have a positive influence on the environmental performance of a*
28 *factory.*

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The effective involvement of individuals and groups of workers in the environmental activities of a
company requires awareness (Keogh and Polonsky, 1998) and instruction (Kitazawa and Sarkis, 2000).
Companies can provide these internally and/or consider environmental aspects in the personnel
selection process. In this regard, we cannot establish differences in our case because all the factories
analyzed have this kind of training program. Perhaps the reason is that they are ISO 14001 certified
factories, and this inevitably leads to environmental training in a factory.

However, major differences are perceived in forms of reward on the basis of environmental criteria. The
least environmentally developed factories have not established prizes or reward for environmental
reasons (B-E-F-H). Only in one case there are some annual prizes (E), “Christmas Competition for the
Best Ideas and ‘I Protest’”. In the next most developed company (A) these payments are only made to
people with direct responsibility for environmental management systems. Finally, the companies with

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3 the best performance in environmental protection are those that offer individual and group reward (both
4 financial and public recognition) for sporadic ideas and behaviors and for annual goals (C-D-G). In C
5
6 financial and public recognition) for sporadic ideas and behaviors and for annual goals (C-D-G). In C
7
8 “there is also individual and group reward and the individual or group that has been recognized for the
9
10 ideas is notified to everyone”. In D there are “monetary reward, publication of the best ideas, etc., and
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12 prizes for groups, individuals or wider areas”. G rewards the “use of paper recycling and remunerates
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14 ideas according to the annual objectives and goals in the environmental area”. Our conclusions
15
16 therefore coincide with other approaches in the literature in the sense that the establishment of different
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18 forms of reward for environmental reasons leads to better environmental protection performance in
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20 factories (Handfield *et al.*, 2001). As a result, we would make the following proposition:
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24 **Proposition 7.** *Factories that have established reward formulas (individual or group, intrinsic or*
25 *extrinsic, for ideas or behaviors, sporadic or for annual objectives) of an environmental nature show*
26 *better environmental performance.*
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34 5. Conclusions

35
36 This study has identified the key factors related to organizational culture and the management of human
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38 resources that drive environmental performance. In this work we have found some key factors that may
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40 contribute to improve the environmental performance in companies, specially organizational culture,
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42 pro-flexibility policies in the whole company, the status of the environmental organizational unit and
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44 human resource policies specifically linking to environmental concerns (communication, teamwork and
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46 environmental rewards). Other factors may act as a barrier. For example, a high average age of
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48 employees or their unionization may hamper organizational culture.
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53 However, the mechanisms that give rise to the relationship between organizational culture, human
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55 resource management and environmental performance are still unknown to us. We will deal with them in
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57 future research projects by several kinds of qualitative methodologies, such as case analysis, inductive
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59 methodology, amongst others. Furthermore, the absence of external validity that is a feature of case
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analysis means that further studies need to be made based on larger samples, in order to give the conclusions general validity.

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ANNEX 1

1. Company's description

Name:

Sector:

Size:

Number of factories:

Interviewee's post:

2. Company's history:

3. Which are the strategic implications derived from environmental issues in your company?

4. How are the environmental issues strategically integrated in your company?

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5. Which are the key challenges of your company regarding natural environment and which is the hierarchy between them?
- a) To comply with regulation
 - b) To give a positive image of the company
 - c) Corporate citizenship
 - d) To avoid the environmental stakeholders pressures
 - e) To be an environmental leader in the industry
 - f) OTHERS
6. What kind of technologies has your company implemented?:
- a) control (sewage treatment plants, filters, etc., that is, those that eliminate waste after they have been produced avoiding in this way its emission to the company' environment)
 - b) preventive (changes in the process that reduces the quantity of waste, the used energy, etc.)
 - c) environmental management systems: total quality management (TQM), total quality environmental management (TQEM), life-cycle analysis (LCA), design for the environment (DfE), ISO 14001, EMAS, etc.
7. Does your company carry out any activity to recover the product value after they have been used (repair, recycling, remanufacturing, etc.)? Which ones?
8. What happens afterwards with the products achieved by those activities?
9. What barriers does your company have to surpass regarding its environmental development?
10. Is it easier for your competitors? Why?
11. Does your company carry out any public report about its environmental state? If your answer is yes, which is its content? (in an affirmative case, if it is possible, achieving the last of them).
12. Who are the head of the environmental issues in your company:
- a) An independent environmental manager
 - b) A manager belonging to another department
 - c) A group within a functional department different from the environmental department
 - d) R&D department
 - e) Environmental department
 - f) Health and safety department?
13. What kind of relationships do environmental heads maintain with the other functional areas?
14. Could you give us a flow chart of your company?
15. How does your company protect its environmental innovations?
- a) patents
 - b) commercial secret
 - c) complementary assets
 - d) technological leader
 - e) licences
 - f) continuous improvement
16. What is the senior management's role regarding the development of environmental activities: involvement, support, consideration, fund investment, etc.?
17. What is the importance in the company of the project leaders for environmental activities?
18. Which is the status of the project leaders in your company?
19. Which are their responsibilities within their teams?
20. What kind of leadership do the team heads carry out?
- a) Rather transformational (it grants employees' responsibility, cooperative values, two-way communication, orientation to change, charisma, trust and individual consideration)
 - b) Rather transactional (instrumentalized, contingent and one-way communication)
21. Which is the multifunctional composition of the environmental teams?
22. Which are the criteria in order to choose the members of the teams regarding:
- a) age
 - b) training
 - c) wide versus narrow competences
 - d) compromise and dedication in a short and long term
 - e) continuity within the team?
23. Do the team members belong to several departments?
24. Do employees have an environmental responsibility shared with the management?
25. Does the company encourage employees to give information about environmental issues?
26. Does the company consider employees' suggestions a source of ideas?
27. Does the company reward employees because of giving ideas?
28. Does the company avoid discussions or foster the open contrast about the problems?

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29. Does the company channel the ideas of employees by teams for the continuous improvement of suggestion-boxes?
30. Which are the communication mechanisms for the information: bulletin, video, etc.?
31. What kind of environmental training do managers and employees respectively receive? Who conveys it?
32. Are the ecological values (knowledge, experience, etc.) important in your company's personnel selection? In the case that it was not important for all of the employees, in order to hire what kind of employees?
33. If you were (or if you are) a head for environmental public policies, what kind of training would you include within the public programs to environmental protection in companies?
34. Does your company have some human resource policies focused on the achievement of job flexibility in order to improve the wealth of its employees?
35. Does your company value managers and employees according to environmental criteria? Is it individual, in groups or mixed? Are they rewarded according to this valuation?
36. Independently of the pecuniary reward, does your company give any other kind of reconnaissance because of environmental performance?

COMPANY	SECTOR	SIZE OF THE FACTORY (NO. OF WORKERS)
A	Construction machinery and industrial installations	Large (1,114)
B	Rack design, development, and manufacturing	Large (540)
C	Supplier of mobile systems	Large (1,700)
D	Hardware and software products	Large (2,000)
E	Manufacturing of capital goods	Large (2,000)
F	Construction	Medium-sized (200-400)
G	Pharmacy	Medium-sized (230)
H	Foodstuffs	Large (1,348)

TABLE 1: ACTIVITY SECTOR AND SIZE OF FACTORIES

For Peer Review Only

Name of the company	A	B	C	D	E	F	G	H
Natural environment	Objectives: comply with legislation, improve image Actions: a) systematization, b) lower consumption of raw materials and energy	Objectives: comply with legislation and b) improve practices	Gradual objectives: a) legislation, b) environmental management systems c) want to be leaders and public-minded Currently pushed into the background due to day-to-day problems Actions: a) policy of sustainability and corporate social responsibility b) include the social dimension in environment management systems and c) involve customers and suppliers in environmental matters	Objectives: strategic integration for corporate public-mindedness and leadership environmental, efficiency and positive image (the sector is not conflictive) Environmental R&D	Objective: comply with legislation and international acceptance	Objective: continuous improvement and pollution prevention Integration at strategic level and with quality, but not fully achieved yet	Objective: become environmental leaders	Objectives: strategic integration and leadership environmental However their current goal is to correct errors to then analyze causes and prevent They also aim to create a positive image
Environmental technologies	Filters, preventive measures to reduce consumption and ISO 14001	Control (hazardous-inert), periodic audits Reduction in water consumption ISO 14001	ISO 14001 (many factories, EMAS) Control Stands out in preventive measurements and management systems. For example, a component composition database	Control and preventive measures for the maintenance of buildings In design, control, but above all preventive measures and design ISO 14001	Prevention, but basically control ISO 14001	Technologies to minimize impacts Modifications to processes ISO 14001	Control Changes to processes Product design ISO 14001	Control Prevention ISO 14001
Value recovery	Not applicable	No	Treatment of waste and packaging Battery waste Recycled and biological paper	17 centers worldwide for the recovery and recycling of products at the end of their working life, including the total and partial re-use of equipment	Waste to a regional consortium Agreements with customers for the collection of used packaging Recycling of welding and office material consumables	Re-use of inert waste, such as rubble The rest, regional consortium	Active recycling policy	It is easier for international companies. Cultural difficulties (resistance from management and workers) and economic problems (cost)
Situation regarding competitors	Difficult because the sector is changing so fast Equally difficult competition	Lack of knowledge Difficulty of making investments	Current problems as a result of the externalization of activities	Technological leadership Difficulties due to differences between Autonomous Communities and the low environmental awareness of suppliers	Heterogeneous Waste handled by a regional consortium	Advantages of those that do not comply But environment in its sector is considered as public contract	Better situation than competitors: are leaders	Waste to a regional consortium
Public report	No	No. In future, perhaps in Internet	Company Report, and quoted on Dow Jones Sustainability Index	Annual corporate environmental report	No	No	Quarterly and annual corporate report	No
Protection of environmental innovations	Based on a commitment to continuous improvement	No	Technological leadership and continuous improvement	Technological leader Continuous improvement Patents	No	Do not carry out environmental innovations subject to protection	Become an environmental leader	Patents prevention innovations

Name of the company	A	B	C	D	E	F	G	H
Environmental accountability	Person responsible for the Environment in the Quality Department Direct relationship with other functional areas	Environmental and Quality Department. No links to the Human Resources Department although same hierarchical level Relations with Production and Logistics	Sustainability and Environment Network Representation of all business units	Department for the environmental product and process design Including all departments	Environmental and Health and Safety Department, integrated with Quality Guidelines in Marketing, Purchasing and Production for Environment	Environmental, Quality and Health and Safety Manager Responsibility of "Work Superintendents"	Environmental and Health and Safety Department Relationship with the General Manager Same level as departments of Production, Marketing and Finance Its opinions even prevail	Environmental Department Ongoing relationship with other functional areas
Senior management	Willingness, support and communication with Environmental Manager. However, actions diminished by other business priorities.	Preventive analysis of environmental proposals Highly detailed studies before taking any steps	Environmental criteria driven for management of the business	Involvement, support, consideration and provision of funds Presentation of environmental department performance Appraisal and remuneration according to environmental criteria	Monthly and annual monitoring in quality and environment Committee for the environmental training program	Maximum authority for application of the environmental management system	Direct support and considerable provision of funds	Limited support from senior management
Project Leaders	Other leaders in the organization	No teams	They belong to the departments of Sustainability and Environment Network	Person responsible among managers of departments involved, selected by them	No rules regarding project leaders	No	They are allocated environmental functions and annual objectives up to the supervisor level Incentives to include environmental matters into projects	Environmental Manager
Composition of teams	General improvement groups: also environmental suggestions	Do not exist. Only working meetings with Production/Logistics and Maintenance	Yes	Usually managers of departments involved, with responsibility delegated to coordinator	Improvement teams for Quality, Environment and Health and Safety Different composition for each case, consisting of people from different departments, but no one responsible person Present conclusions	No	Interdepartmental	Without specific composition, depending on the type of project. Involvement of different departments
Ways of involving workers in the environment	No shared responsibility in environmental protection People encouraged to provide information	Environment instructions in workplace No suggestions box	Analysis of environmental profile of workers. They are encouraged to improve awareness	Responsibility, above all in energy consumption and recycling of resources All initiatives receive a reply	Contributes ideas Difficulties of older people	Contributes ideas	Presents of objects made from recycled materials Shared environmental responsibility with the management	Responsibility, but without emphasis Awareness around waste

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Name of the company	A	B	C	D	E	F	G	H
Communication mechanisms	E-mail, notice boards and regular meetings	Suggestions through middle managers	Via Internet, interactive software, environmental statements	Alerted by the organizational structure Corporate Intranet, e-mail, posters, leaflets and CDs	Suggestions box not effective	Suggestion-box not very effective Informative panels	Information on screens, in magazines, notice boards, etc. Personalized digital agenda for each employee Videos World Environment Day	No suggestion-box Awareness-creating posters
Selection	Environment not considered	Only technical criteria considered	Environment not considered, but intake training is given	Only considered in posts related to the natural environment	Based on technical criteria In-company training in quality and natural environment	Adaptation to a job description	No, but training is given	The environmental profile is considered
Environmental training	In-house and external training at all levels. Awareness creation and instruction	In-house and external training to supervisor level and personnel	Internal and external	Given by the Environmental Management Coordinator Training plan	Internal and external Lately, given by people directly involved in the task Priority to prevention and environment courses	Ongoing awareness creation Internal and external at all levels	Given by the monitoring committee of the Environmental and Health and Safety Department, consisting of managers of all the departments Detailed program Guest trainers called in	Courses Responsible: Environmental Department. Also external training on awareness and learning of procedures
Compensation for environmental reasons	Only for people with direct responsibility environmental management systems	No prizes or rewards	Individual and group Internal communication of which person or group has had an idea	Yes, through financial reward, publication of the best ideas, etc. Prizes for groups, individuals and entire organizations	Christmas Competition for Best Ideas and "I protest" No compensation for environmental reasons	Fixed and for objectives (not environmental) Suggestions not rewarded, just considered for promotion	The use of recycled materials is rewarded Monetary reward as prize Remuneration according to annual objectives and goals in the area of the natural environment	Not for environmental reasons
Workforce flexibility	Yes, but not comparable to welfare	No. No priority given to workers' welfare	Yes. At times, work per project	Specific programs	No	No	Yes, and with worker consultation	No
Level of unionization	Low	High	Low	Low	High	Low	Low	High

ANNEX 2: SUMMARY OF THE MORE SIGNIFICANT FINDINGS OF CASE ANALYSIS