

# SCORING CORPORATE ENVIRONMENTAL AND SUSTAINABILITY REPORTS USING GRI 2000, ISO 14031 AND OTHER CRITERIA



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The purpose of this paper is to evaluate the extent to which current voluntary corporate environmental reports meet the requirements of two new sets of guidelines: (i) the Global Reporting Initiative GRI 2000 sustainability reporting guidelines and (ii) the ISO 14031 environmental performance evaluation standard. We converted them to comprehensiveness scoring systems then used them along with three existing comprehensiveness scoring systems to evaluate the 1999 reports of 40 of the largest global industrial companies. Many of the reports scored highly with the existing systems, but the GRI and ISO guidelines are much more detailed and comprehensive, and resulted in much lower scores. In particular, the economic and social topics that make up 42% of the potential GRI score and the environmental condition indicators that make up 22% of the ISO 14031 score were minimally

addressed in all of the companies' environmental reports. Current reporting practices of the companies whose reports we examined here are well below the standards reflected in the GRI and ISO 14031 guidelines, even when the reports scored well with existing report scoring systems. Copyright © 2002 John Wiley & Sons, Ltd and ERP Environment.

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## INTRODUCTION

Recently there has been a substantial increase in corporate awareness of environmental and social performance, and a concomitant desire to report such performance publicly. This has occurred for a variety of reasons, including to comply with regulations and to reduce the cost of future compliance (Dechant *et al.*, 1994; Ghobadian *et al.*, 1995; Porter and van der Linde, 1995; Shrivastava, 1995; Hart and Ahuja, 1996; Ghobadian *et al.*, 1998; Dias-Sardinha and Reijnders, 2001; Rivera-Camino, 2001), to comply with industry environmental codes (Howard *et al.*,

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1999), particularly when sanctions for non-compliance are invoked (King and Lenox, 2000), to decrease operating costs (Shrivastava, 1995; Russo and Fouts, 1997; Esty and Porter, 1998; Reinhardt, 1999) and to improve stakeholder relations (Stafford, 1996; Berman *et al.*, 1999; Cormier and Magnan, 1999; Henriques and Sadosky, 1999; Reinhardt, 1999; Waddock and Graves, 2000; Rivera-Camino, 2001). Other incentives include the perceived environmental visibility of the firm (Bowen, 2000), a sense that such improvements will result in competitive advantage (Hart, 1995; Shrivastava, 1995; Reinhardt, 1999; Bansal and Roth, 2000), a sense that without active environmental management the firm's legitimacy is in question (Bansal and Roth, 2000; Sharma, 2000) and a sense of social responsibility and desire to adhere to societal norms (Hussain, 1999; Bansal and Roth, 2000; Cordano and Frieze, 2000; Flannery and May, 2000).

The degree to which such measures are taken is related to the individual environmental initiative of managers (Andersson and Bateman, 2000), directors and owners (Rivera-Camino, 2001), the perception of environmental issues as opportunities (Sharma, 2000) and management attitudes about pollution prevention (Cordano and Frieze, 2000). It is also related to the general strategic proactivity of the firm (Aragón-Correa, 1998), the costs of obtaining the information to report (Cormier and Magnan, 1999), the size of the firm (Tilley, 1999a, 1999b) and its general performance (Russo and Fouts, 1997; Waddock and Graves, 1997a, 1997b; Ransom and Lober, 1999; Reinhardt, 1999; Sharma, 2000; Stanwick and Stanwick, 2000). The adoption of an environmental policy is associated with firm size (Roy *et al.*, 2001), high stock price (Thomas, 2001) and good financial performance (Stanwick and Stanwick, 2000), as is the adoption of formal environmental commitments (Stanwick and Stanwick, 2000).

The business effects of undertaking environmental and social improvements (and reporting on them) is not as clear as it might be,

largely because it is difficult to test causality: are environmental and social improvements the cause or the result of good or bad performance in other managerial and financial areas? Analysis of the correlation between environmental or social performance and financial performance or reputation can only shed light on this question if one of the two clearly preceded the other, which is seldom the case. Hart and Ahuja (1996) looked at return on sales, return on assets and return on equity of 127 large firms in the four years following initiation of required toxic release inventory (TRI) reporting in the US, when many companies were actively seeking to decrease their toxic effluents. They found that in 1991 and 1992 all three financial variables were significantly correlated with emissions reductions in 1989, and tentatively inferred causality while noting its uncertainty. Waddock and Graves (1997a) used the same three accounting variables and found a positive correlation between them and one-year prior and one-year subsequent social performance, suggesting that prior good financial performance provided the flexibility to improve social performance. Halme and Niskanen (2001) looked at average cumulative abnormal returns in the ten trading days before and after newspaper publications of Finnish forest industry firms' environmental investments and found that there was a large instantaneous negative market reaction followed by a rapid price recovery.

One correlational approach not based on time lags has been to compare the price performance of stocks or of mutual funds made up of stocks that have been environmentally or socially screened with the performance of a wider universe of stocks. Several studies have found no important differences related to social or ethical screening (Hamilton *et al.*, 1993; Diltz, 1995; Waddock and Graves, 2000). The Dow Jones Sustainability Group Index (DJSI) of stocks that are presumably from companies in some way environmentally or socially superior to the more general Dow Jones Global Index (DJGI) did outperform the



DJGI from 1993 to 2000 (Cerin and Dobers, 2001) but contained a higher percentage of technology firms, and its firms averaged two-and-a-half times the market capitalization value of the DJGI firms. Whether it is the market capitalization and technology or the social and environmental qualities that drive this performance is not known (Cerin and Dobers, 2001).

Another approach is to look for correlations between third party management quality ratings and aspects of environmental or social management. Waddock and Graves (1997b) discovered that strong performance with respect to stockholders, employee relations and product–customer relations was correlated with high evaluations in the *Fortune* magazine management surveys, but performance with respect to environmental stakeholders was not. A similar study (Turban and Greening, 1997) used 75 business students to rate the general reputations and attractiveness as employers of 160 companies, then correlated these scores with an independently derived measure of environmental and social performance. They found both reputation and attractiveness as an employer to be correlated with community relations, employee relations and product quality, but only reputation was correlated with environmental performance. Good social and environmental performance may just be a byproduct of good management: CEO compensation is positively correlated with firm environmental reputation, but also with size and financial performance (Stanwick and Stanwick, 2001); return on assets is weakly correlated with environmental rating but much more strongly correlated with firm and industry growth rates (Russo and Fouts, 1997); cost advantage of pollution prevention investments is primarily achieved by companies that are innovative relative to their major competitors and act early (Christmann, 2000).

Where reporting of environmental and social performance is not mandatory, companies appear to be doing it because of peer pressure (KPMG, 1999) and to improve employees'

and other stakeholders' perceptions of the company's environmental performance (Cormier and Magnan, 1999; Herremans *et al.*, 1999). Reporting is also correlated with financial condition and size and industrial sector of the firm as well as the regulatory environment (Cormier and Magnan, 1999). If companies have already collected data as a part of improved environmental and social management, they may feel that they might as well report it (Ball *et al.*, 2000).

Such voluntary corporate environmental reporting has been increasing over the last decade. In 1998, 35% of the largest 250 companies of the Fortune Global 500 were producing environmental reports, and an additional 32% were producing environmental brochures, or had environmental sections in their annual reports (Kolk *et al.*, 2001). Many of those not producing full environmental reports were in service sectors, which, although they may have significant environmental impacts, are more likely to have them from resource flows and waste transfers than from emissions and final disposition of waste, on which government oversight, and hence reporting, has concentrated (Graedel, 1998). The percentage of environmental reporting by the top 100 companies in 11 countries increased from 17% in 1996 to 24% in 1999, with increases in every country examined except the US (KPMG, 1999). A survey of 227 companies of various sizes in the UK from six industrial sectors found that 34% were presently disclosing at least some environmental information and 22% intended to do so in the future (Stray and Ballantine, 2000).

These reports offer a previously unavailable window into corporate environmental and social strategy and performance, and make it possible to evaluate this performance as an adjunct to more familiar financial performance metrics. Depending on what companies choose to include in environmental and social performance reports, the reader can evaluate degree of compliance with regulations, and compare performance with peer companies and across



industries. Lober *et al.* (1997) reported the percentage of 108 reports from the Fortune 500 and the S&P 500 devoted to 16 topics selected from a variety of reporting guidelines and academic papers. They also reported the percentage of reports having an additional 16 environmental characteristics, such as having an environmental policy statement, a letter from the company chairman and quantitative goals. KPMG performed a similar analysis on the top 100 companies in each of 11 countries in 1996 and 1999 (KPMG, 1999). Two hundred and sixty-seven of these companies produced an environmental report, 252 of which were analyzed for the presence or absence of environmental policy statements and the inclusion of seven environmental topics within the policy statement, the status of environmental management systems and the presence or absence of quantitative information about waste disposal, air emissions, effluent discharges, energy conservation, environmental costs and accidents and incidents. The KPMG analysis also identified the presence or absence of 12 environmental topics included in future plans and targets.

All of these studies analyzed coverage of a small number of topics relative to what could reasonably have been included in a corporate environmental report, and characterized the reports collectively by country or industrial sector, rather than by individual company, but there is a small body of literature analyzing environmental reports by company, often addressing more topics. Davis-Walling and Batterman (1997) analyzed the 25 environmental reports produced in 1996 by Fortune 50 US companies by extracting from them 29 topics that were found in at least four of them. They developed a scoring system that awarded 20 of the topics one point if addressed at all – with no additional credit for more detail – and awarded nine of the topics up to two points depending on level of detail. More than half of the potential total score is based on quantitative measures of environmental performance, which include air emissions, reduction in use of

ozone depleting chemicals (ODCs), wastewater treatment, energy conservation, reductions in packaging and waste, recycling and reuse of recycled materials. The main shortcomings of this system are that its few topics are based on what was being reported rather than what ought to have been reported, and they are not very consistent internally.

A joint effort of the UK consultancy SustainAbility and the United Nations Environment Programme (UNEP) developed a scoring system based on 50 topics and applied it to the reports of 40 companies in 1996 (SustainAbility–UNEP, 1996), 100 companies in 1997 (SustainAbility–UNEP, 1997) and, with slightly revised scoring criteria, 50 companies in 2000 (SustainAbility–UNEP, 2000). The SustainAbility–UNEP system uses 48 topics worth up to four points each depending on comprehensiveness of coverage, and two topics (awards received and charitable contributions made) worth one point each. Its assignment of up to four possible points is quite subjective, the only guidance given in 1997 being that ‘...“0” means that the area covered by the criterion is not discussed at all and “4” means that the reporting is comprehensive’ (SustainAbility–UNEP, 1997). In the 2000 report the scoring was modified slightly so that to achieve a score of 4 the topic must be ‘...fully discussed in a comprehensive, integrated and *particularly innovative* manner’ [emphasis ours].

The Deloitte Touche Tohmatsu (1999) scoring system is derived from the SustainAbility–UNEP system and is largely a subset of it. As an independent scoring system, this one is preferable to the Davis-Walling–Batterman and SustainAbility–UNEP systems both because it treats its topics more generically and comprehensively, and is therefore applicable to more kinds of company, and because its scoring scheme is less subjective. The decrease in subjectivity over the SustainAbility–UNEP system is achieved by much more explicit rules for scoring each topic. The Deloitte Touche Tohmatsu generic treatment has the shortcoming that to score a report effectively the



scorer must know what kinds of environmental aspect the company is likely to have. If a company reports on consumption of water in detail it might seem appropriate to award it four points under the consumption topic even if the main consumption issue that the company should have been addressing was energy consumption.

The SustainAbility–UNEP system was used by Morhardt (2001), along with the Deloitte Touche Tohmatsu (1999) and the Davis-Walling–Batterman (1997) scoring systems to score the 1996 and 1998 reports of 28 US firms scored in 1996 by either Davis-Walling and Batterman or SustainAbility–UNEP or both. Morhardt showed that the scores for the 1998 reports from all three systems were highly significantly correlated with each other but with a much stronger correlation between the SustainAbility–UNEP system and the Deloitte Touche Tohmatsu system than between either of them and the Davis-Walling–Batterman system. The average normalized scores in both 1996 and 1998 were higher in the Davis-Walling–Batterman system than in the SustainAbility–UNEP system with no difference between years in either system, indicating no improvement in average scores between the two years. The lack of a change in average scores between the two years did not, however, reflect a lack of change of scores in the reports of individual companies. Some scores went up, some went down, and there was no significant correlation between the scores in 1996 and 1998.

In this paper we use these three scoring systems to analyze environmental reports, but there are other scoring systems extant as well. One (Krut and Munis, 1998) was used to evaluate the environmental reports of eight firms in the electronics sector, scoring each of them for 19 issues using typographical symbols in the same way that others have used numbers – to represent (i) no discussion of the issue, (ii) that the issue was identified/raised for consideration, (iii) that there was partial commitment to the issue, (iv) that there was

full commitment to the issue and (v) that the commitment exceeded their benchmark criterion. This approach differs from the others discussed above in three ways: first, it does not evaluate what a firm is actually doing, but only what it is committed to do in policy; second, the issues, rather than being simply topics discussed in the report, are instead prescribed activities intended to be benchmarks characteristic of a 'sustainable firm'; third, the typographical symbols are intended to prevent readers from creating averages and rankings which the authors reject as inappropriate because the '...19 categories may not have equivalent value...' and because '...it would be unfair...' since different companies have different activities associated with different environmental impacts.

In addition to these scoring systems, which are designed to evaluate environmental reports after the fact, there is also a series of guidelines intended to influence the content of environmental reports before the fact. The earliest of these, published in 1989, were from the Coalition for Environmentally Responsible Economies (CERES), a group of America's largest socially responsible institutional investors – state pension funds and religious groups – and 15 major US environmental groups. These guidelines continue to be revised (CERES, 1999a, 1999b, 2000a, 2000b) but were being used by just 50 companies at the end of 2000 (CERES, 2000c). The next major effort was the Public Environmental Reporting Initiative (PERI) Guidelines (PERI, 1993), which were formulated in 1992 and 1993 by ten large manufacturing companies. Other frequently cited guidelines are those from the Fédération des Experts Comptables Européens (FEE, 1998) and Fondazione Eni Enrico Mattei (FEEM, 2000). In addition to these there is a large number of less well known initiatives suggesting environmental, social and sustainability performance metrics that could be used in reporting (see the appendix of Ranganathan, 1999).



The most prominent current reporting guidelines are the Global Reporting Initiative (GRI) *Sustainability Reporting Guidelines on Economic, Environmental and Social Performance* (GRI, 2000), promulgated in June 2000. They are actively promoted by GRI itself and by CERES and the United Nations Environment Programme (UNEP), which jointly convened the GRI in 1998 (GRI, 2000). The GRI guidelines go well beyond any previous ones in their inclusion of financial and social criteria. It is the addition of these criteria that distinguish 'sustainability' reporting from straight environmental reporting.

While all of these guidelines explicitly address contents of environmental reports, there are many additional sources of guidance that focus on the selection of environmental metrics rather than on report writing. These include the ISO 14031 environmental performance evaluation guidelines (ISO, 1999), a book from the US National Academy of Engineering (National Academy of Engineering, 1999), a report from the World Business Council on Sustainable Development (Vervailie and Bidwell, 2000) and many technical papers (Wells *et al.*, 1992; Wolfe and Howes, 1993; Azzone and Manzini, 1994; Azzone *et al.*, 1996; White and Zinkl, 1997; Bennett and James, 1998; Reijnders, 1998; White and Zinkl, 1998; Wright *et al.*, 1998; Cleveland and Ruth, 1999; Dobers and Wolff, 1999; Miakisz, 1999; Murayama, 1999; Rauberger and Wagner, 1999; Rikhardsson, 1999; van der Werf, 1999; White and Zinkl, 1999; Dias-Sardinha and Reijnders, 2001; Johnston and Smith, 2001).

The ISO 14031 standard, part of the ISO 14000 family of voluntary international environmental standards, is entirely informational and makes no recommendations about reporting or about which metrics a company should utilize for management, but it does include, in Annex A, a list of 197 topics from which companies could select metrics for environmental management and that can be viewed as a fairly comprehensive collection of metrics on which a company could base an environmental or

sustainability report. This list goes far beyond any existing reporting guidelines in its inclusion of measurements of existing environmental conditions. Whereas most reporting guidelines are concerned with reporting company-specific natural resource usage, waste generation and emissions—things directly under the control of individual companies—the ISO guidelines extend to the ecological commons and to environmental conditions that may have been the result of multiple influences not under the reporting company's control.

Reporting guidelines are incipient scoring systems and we took advantage of this to produce two new comprehensiveness scoring systems. The first is based on the GRI 2000 guidelines (GRI, 2000). The second is based on the ISO 14031 guidelines (ISO, 1999). Most of the topics in these guidelines are capable of being treated at various levels of comprehensiveness, ranging from being mentioned briefly to being fully documented quantitatively. Thus, when incorporated into a scoring system, they can be assigned a range of points indicating how thoroughly the topics were discussed.

Our contribution to the environmental communication literature is twofold. First, we measure how well current corporate environmental reports from large companies in four industrial sectors do under the existing scoring systems and under two scoring systems based on more complex new guidelines, and we identify a major gap between what the newer guidelines propose and what companies are currently reporting. Second, we demonstrate significant differences in environmental report comprehensiveness between consumer product sectors (electronics, motor vehicles and parts) and commodity sectors (petroleum refining, gas and electric utilities).

## METHODS

In the GRI 2000 reporting guidelines, the topics can be arranged into eight categories, the first



five of which deal with various management and policy considerations, and the last three with performance (Table 1). To construct a scoring system from these guidelines, we systematically identified every item called for in Part C of the GRI documentation (the report content section) – 139 by our count – for a possible 429 points (Table 1). Our general strategy for assigning points to each topic was as follows: 0, not mentioned; 1, anecdotal or briefly mentioned; 2, more detail, but characterizing only selected facilities or using only self-comparison metrics; 3, company-wide absolute or relative metrics that could be compared with other companies. The nature of the GRI topic list made it seem reasonable to assign more points to some topics than to others, so in several cases we allowed a topic to be worth four points, and in a few others (such as mentioning the date of the most recent report) only one point.

The ISO 14031 topics are grouped into four categories, which include general information and three classes of performance indicators: management performance, operational performance and environmental conditions (Table 1). In creating a scoring system, we approached Annex A of the ISO 14031 standard as we had approached the GRI guidelines. We identified each separate topic – 197 in all – and assigned a maximum of three points to each using the same criteria we used for the GRI scoring. The result was a possible total of 591 points (Table 1).

To identify environmental reports to score, we selected four industrial sectors that we knew from previous work had relatively high levels of environmental reporting (KPMG, 1999) and that we felt were sufficiently different in their activities that differences in their environmental reports would be detected by the scoring systems. These included the motor vehicles and parts sector, the electronics sector, the petroleum-refining sector and the gas and electric utilities sector. We used the Fortune Global 500 list (as of 30 January 2000) to identify the largest companies in each of

these sectors, and we searched their English language websites for environmental reports. In each sector, we selected the ten largest companies that had an environmental report posted on their websites. These 40 reports are the basis of our analysis.

We scored them using the scoring systems we created from the GRI 2000 and ISO 14031 guidelines and using the Davis-Walling-Batterman (1997), Deloitte Touche Tohmatsu (1999) and SustainAbility-UNEP (1997) systems. The latter three systems had been published well before the 1999 environmental reports and could have influenced their writers. The GRI 2000 and ISO 14031 guidelines had not been published prior to the time the environmental reports were written. One of us (JEM) used both the GRI 2000 and ISO 14031 guidelines to score all 40 reports. Using the Davis-Walling-Batterman, Deloitte Touche Tohmatsu and SustainAbility-UNEP systems another of us (SB) scored the 20 electronics and motor vehicles reports and the third (KF) scored the 20 petroleum and utilities reports. Each report was scored only once.

## RESULTS

Table 2 lists the scores for all 40 companies individually by industrial sector. The principal result is that the GRI and ISO scores are much lower than the scores from the other three systems. The motor vehicles and parts and electronics sectors had higher average scores than the petroleum refining and utilities sectors in all but one instance.

Because of the scatter in the scores, most of the average sector scores within scoring systems were not statistically significantly different from one another based on *t*-tests of the means. The exceptions were electronics being higher ( $p < 0.05$ ) than the other sectors in the Davis-Walling-Batterman system, motor vehicles being higher ( $p < 0.01$ ) in the GRI system, and both motor vehicles and electronics being higher than petroleum ( $p < 0.01$ ) and



Table 1. Topics and possible points for the five scoring systems

Scoring system	Category	Topics	Possible points	% of possible points
Davis-Walling & Batterman	Corporate policies and investments	8	11	31
	Regulatory	7	10	28
	Pollution prevention	6	7	19
	Employee involvement	2	2	6
	Community involvement	3	3	8
	Miscellaneous (awards, response card, ecology)	3	3	8
		30	36	100
Deloitte Touche Tohmatsu	Corporate profile	4	10	10
	Report design	5	15	15
	Environmental impact/data	9	20	20
	Environmental management	8	20	20
	Finance/ecoefficiency	6	10	10
	Stakeholder relations	5	10	10
	Communications	2	10	10
	Third party statement	1	5	5
	Total	40	100	100
UNEP-SustainAbility	Management policies and systems	12	45	23
	Inputs and outputs	18	72	
	<i>Inputs</i>	3	12	
	<i>Process management</i>	6	24	
	<i>Outputs</i>	5	20	
	<i>Products</i>	4	16	
	Finance	5	17	9
	Stakeholder relations and partnerships	9	36	19
	Sustainable development	5	20	10
	Report design and accessibility	1	4	2
		Total	50	194
GRI 2000	General organizational features	43	134	31
	<i>CEO statement</i>	5	20	
	<i>Organizational profile</i>	15	45	
	<i>Key indicators</i>	5	15	
	<i>Vision and strategy</i>	4	12	
	<i>Policies, organization and management systems</i>	14	42	
	Environmental performance metrics	36	115	27
	Economic performance metrics	23	69	16
	Social performance metrics	37	111	26
		Total	139	429



Table 1. (Continued)

Scoring system	Category	Topics	Possible points	% of possible points
ISO 14031	General	46	138	23
	<i>Potentially interested parties</i>	12	36	
	<i>Financial issues</i>	6	18	
	<i>Environmental interests and public policy development</i>	15	45	
	<i>Methods for identifying views of interested parties</i>	13	39	
	Management performance indicators	44	132	22
	<i>Implementation of policies and programs</i>	18	54	
	<i>Environmental conformance</i>	11	33	
	<i>Financial performance</i>	6	18	
	<i>Community relations</i>	9	27	
	Operational performance indicators	63	189	32
	<i>Materials</i>	8	24	
	<i>Energy</i>	5	15	
	<i>Services supporting the organization's operations</i>	4	12	
	<i>Physical facilities and equipment</i>	8	24	
	<i>Supply and delivery</i>	5	15	
	<i>Products</i>	8	24	
	<i>Services provided by the organization</i>	5	15	
	<i>Wastes</i>	7	21	
	<i>Emissions</i>	13	39	
	Environmental condition indicators	44	132	22
	<i>General overview</i>	8	24	
	<i>Air</i>	4	12	
	<i>Water</i>	6	18	
	<i>Land</i>	7	21	
	<i>Flora</i>	7	21	
	<i>Fauna</i>	4	12	
<i>Humans</i>	5	15		
<i>Aesthetics, heritage and culture</i>	3	9		
	Total	197	591	100

utilities ( $p < 0.01$  for motor vehicles,  $p < 0.05$  for electronics) in the ISO system. For the combined average scores of all scoring systems, the petroleum sector was significantly lower than vehicles ( $p < 0.01$ ) and electronics ( $p < 0.05$ ).

For the Davis-Walling-Batterman system, much of the higher score by the electronics

sector was made up of more emphasis on environmental performance. The petroleum sector was lowest in the SustainAbility-UNEP system largely because of less attention to environmental performance and stakeholders, but was lower in the Deloitte Touche Tohmatsu system because of generally lower scores in all



Table 2. Environmental report scores, normalized to a maximum score of 100 points

	Davis-Walling & Batterman	SustainAbility/ UNEP	Deloitte Touche Tohmatsu	GRI 2000	ISO 14031	Average
<i>Motor vehicles and parts</i>						
BMW	74	69	62	41	32	56
VW	71	77	76	33	20	56
General Motors	79	46	44	31	28	46
Volvo	61	57	57	28	24	45
Toyota	55	60	57	27	21	44
Ford	61	54	53	25	23	43
Fiat	55	62	55	28	16	43
Renault	58	58	53	20	17	41
Daimler Chrysler	61	41	48	28	16	39
Honda	53	48	44	11	12	34
Average	62.6 ± 6.3	57.2 ± 7.7	55.5 ± 6.8	27.2 ± 5.6	20.9 ± 4.3	44.7 ± 4.9
<i>Petroleum refining</i>						
Chevron	68	75	68	17	10	48
Atlantic Richfield	74	60	57	10	8	42
USX (Marathon Oil)	74	59	57	5	8	41
Texaco	68	54	55	5	2	37
BP-Amoco	63	32	44	17	13	34
Elf-Aquitaine	50	44	46	18	8	33
Shell	47	42	46	20	5	32
Phillips Petroleum	50	35	35	24	13	31
Exxon Mobil	53	29	26	11	6	25
Tosco	42	16	31	3	0	18
Average	58.9 ± 8.4	44.6 ± 12.6	46.9 ± 9.5	13.0 ± 5.2	7.3 ± 3.0	34.2 ± 6.2
<i>Utilities, gas and electric</i>						
Tokyo Electric Power	71	70	68	27	18	51
ENEL	58	59	55	29	22	45
Kansai	71	68	57	10	9	43
PGE	71	69	62	7	3	43
EDF	66	63	53	9	7	40
Reliant	61	60	51	4	4	36
Texas Utilities	63	55	45	6	8	36
Duke	45	49	43	1	10	30
RWE	42	48	44	10	6	30
Entergy	45	36	36	6	2	25
Average	59.2 ± 8.2	57.7 ± 7.8	52.0 ± 7.0	10.9 ± 6.7	8.9 ± 54.6	37.7 ± 5.7
<i>Electronics</i>						
Sony	87	76	71	20	19	55
Motorola	76	76	69	19	17	52
Matsushita	76	61	60	24	25	49
Toshiba	79	69	76	10	5	48
Mitsubishi	68	58	56	21	31	47
Intel	74	59	49	22	18	44
ABB	68	57	57	22	13	44
Siemens	58	46	46	18	20	38
Lucent	61	41	41	7	6	31
General Electric	71	32	31	9	9	30
Average	71.8 ± 6.2	57.5 ± 10.4	56.1 ± 10.2	17.2 ± 4.4	16.3 ± 5.9	43.8 ± 6.0
<i>Overall average</i>	63.2 ± 3.6	54.3 ± 4.6	52.6 ± 3.8	17.1 ± 3.1	13.4 ± 2.7	40.1 ± 2.8



categories except discussion of environmental aspects. Motor vehicles fared best in the GRI system because of more attention to environmental performance and company profile, and in the ISO system both the electronics and motor vehicles sectors paid much more attention to environmental performance than did the petroleum and utilities sectors.

Almost all the points awarded using the GRI system were for general organization topics and environmental performance (Table 3). These two categories, comprising the realm of traditional environmental reporting, represent 58% of the total possible points in the GRI scoring system, but they accounted for 93% of the actual points with little difference among sectors. There was, however, considerable variation among companies on the distribution of points between these two categories. For example, the Volkswagen report had nearly twice as many points in the general organizational features category as in the environmental performance indicators category, while General Motors, which ranked just below Volkswagen in the GRI system, had 40% more points in the environmental performance indicators category than in general organizational features. Not only were the features that distinguish sustainability reports from environmental reports – economic and social performance indicators – underrepresented, half of the reports did not include them at all (Table 3).

Within the ISO 14031 scoring system general issues received an average of 38% of the total points awarded and had the most points of all four sectors (Table 4), although they represented only 23% of the possible points. The management performance indicators also received more than their share of points (28% of the awarded points versus 22% of the possible points), while the operational performance indicators had 30% of the awarded points versus 32% of the possible points. Environmental condition indicators, generally not under the direct control of the company, were strongly underrepresented, receiving only 4% of the

awarded points but having 22% of the possible points. The petroleum-refining sector stood out by having, by far, the lowest number of total points (fewer than 40% of the points accumulated by the motor vehicle sector), and by having those that it did obtain heavily represented in the general issues category.

## DISCUSSION

The most striking result is the fact that the current environmental reports of 40 of the world's largest companies achieve fewer than 20% of the total possible points in the GRI 2000 scoring system. There is a tremendous gap between what large companies think is appropriate to report and what is hoped for by the Global Reporting Initiative. Much of the gap, however, is occasioned by the fact that most companies are content to leave their financial reporting to their annual financial reports, and much of the remainder to the fact that social reporting is either not perceived to be appropriate for an environmental report, or is simply not being reported at all. The idea of generally accepted sustainability accounting principles envisioned by GRI appears to be barely on the radar of most companies. The even lower scores resulting from application of the ISO 14031 Annex A guidelines are surprising because the guidelines primarily address environmental performance – the thing most companies are already reporting on. They are fairly comprehensive and not internally redundant, and most of the topics are applicable to any company, but, as revealed in Table 4, most companies have not embraced the idea of reporting on environmental condition indicators. What the low scores reveal for the other topics is the incomprehensiveness of most current environmental reporting when compared with the ISO 14031 Annex A list of topics.

The three existing scoring systems used in this paper have been characterized by Kolk (1999) and their numerical comparability has



Table 3. Un-normalized environmental report scores by category for the GRI 2000 system. Total possible score is 429 points

	Organization features	General performance indicators	Environmental performance indicators	Economic performance indicators
<i>Motor vehicles and parts</i>				
BMW	72	50	4	20
VW	71	36	6	0
General Motors	35	49	0	4
Daimler Chrysler	48	45	2	0
Fiat	49	41	0	9
Volvo	46	40	7	9
Toyota	41	46	5	0
Ford	35	49	0	4
Renault	43	25	0	0
Honda	19	21	0	0
Average	45.9	40.2	4.6	2.4
<i>Petroleum refining</i>				
Phillips Petroleum	48	27	6	0
Shell	49	14	1	1
Elf-Aquitaine	29	30	3	4
Chevron	28	16	14	6
BP-Amoco	35	19	6	0
Exxon Mobil	17	14	7	0
Atlantic Richfield	22	13	0	0
USX (Marathon Oil)	13	4	0	0
Texaco	5	12	0	0
Tosco	6	3	0	0
Average	25.2	15.2	1.1	3.7
<i>Utilities, gas and electric</i>				
ENEL	46	48	8	0
Tokyo Electric Power	46	41	2	7
RWE	24	9	0	0
Kansai	15	21	0	0
EDF	13	16	2	0
PGE	10	11	2	3
Texas Utilities	6	13	0	4
Entergy	11	10	0	0
Reliant	6	9	0	0
Duke	16	19	5	0
Average	19.3	19.7	1.4	1.9
<i>Electronics</i>				
Matsushita	37	43	0	4
Intel	28	40	5	7
ABB	42	33	0	0
Mitsubishi	33	40	0	0
Sony	27	42	0	0
Motorola	25	37	5	0
Siemens	17	46	0	0
Toshiba	14	20	0	0
General Electric	14	11	5	3
Lucent	16	4	3	3
Average	25.3	31.6	1.7	1.8
Overall average	28.9	26.7	2.2	2.5
Average % of points awarded	47.9	44.3	3.6	4.1



Table 4. Un-normalized environmental report scores by category for the ISO 14031 system. Total possible score is 591 points

	General issues	Management performance indicators	Operational performance indicators	Environmental condition indicators
<i>Motor vehicles and parts</i>				
BMW	38	37	43	2
General Motors	28	34	37	9
Volvo	38	35	22	1
Ford	36	31	17	8
Toyota	25	27	28	0
VW	36	26	19	1
Renault	23	12	28	2
Fiat	20	11	26	1
Daimler Chrysler	29	13	25	2
Honda	12	13	20	0
Average	28.5	23.9	26.5	2.6
<i>Petroleum refining</i>				
BP-Amoco	25	14	11	5
Phillips Petroleum	30	10	7	5
Chevron	24	13	3	5
USX (Marathon Oil)	30	3	1	2
Atlantic Richfield	15	6	8	2
Elf-Aquitaine	16	6	9	2
Exxon Mobil	14	4	4	0
Shell	12	4	6	0
Texaco	7	0	2	0
Tosco	1	0	1	0
Average	17.4	6.0	5.2	2.1
<i>Utilities, gas and electric</i>				
ENEL	30	20	30	5
Tokyo Electric Power	28	18	19	5
Duke	17	7	13	3
Kansai	15	11	8	2
Texas Utilities	9	8	8	5
EDF	14	5	5	2
RWE	9	8	5	0
Reliant	5	4	6	0
PGE	2	8	4	0
Entergy	4	4	2	0
Average	13.3	9.3	10.0	2.2
<i>Electronics</i>				
Mitsubishi	39	37	40	2
Matsushita	28	31	32	3
Siemens	28	22	26	0
Sony	26	19	26	0
Intel	19	19	25	7
Motorola	25	18	22	1
ABB	17	9	21	2
General Electric	17	13	6	2
Lucent	7	14	6	0
Toshiba	9	5	6	2
Average	21.5	18.7	21.0	1.9
Overall average	20.2	14.5	15.7	2.2
Average % of points awarded	38.4	27.6	29.8	4.0



been analyzed by Morhardt (2001). The systems have been criticized on the grounds of unfairness because different kinds of company have different types and intensities of environmental impact (Krut and Munis, 1998) and because the variables on which companies are scored are categorical rather than continuous and hence are inherently inappropriate for arithmetic addition and parametric statistical analysis (Jones and Alabaster, 1999). Nevertheless, the systems and their scores continue to be used, often highlighting the top and bottom scorers (Elkington *et al.*, 1998; Jones and Alabaster, 1999; SustainAbility-UNEP, 2000; Morhardt, 2001), with some companies quick to publicize their high scores (Jones and Alabaster, 1999).

The Davis-Walling-Batterman scoring system is based on topics that were included in at least four of the 25 reports it was originally used to score (Davis-Walling and Batterman, 1997). Thus it uses the most comprehensive reports as the standard by which to judge all reports but does not go beyond established practice. The Deloitte Touche Tohmatsu and SustainAbility-UNEP scoring systems are more aggressive, including topics that may not have been as widely reported on but that their authors felt should have been. In effect, these scoring systems are judging reports by adherence to guidelines that do not exist. However, scoring systems that are independent of writing guidelines tend to become writing guidelines themselves: after the first round, companies that wish to improve their scores in these systems will adjust their reporting accordingly. The subset of companies examined by Morhardt (2001) failed to do so, but of the 19 reports compared by SustainAbility-UNEP between 1997 and 2000 (using 1997 SustainAbility-UNEP criteria) 16 showed improvement (SustainAbility-UNEP, 2000). In their 2000 report, however, SustainAbility-UNEP changed their scoring system rules, and most companies' scores declined under the new system. Thus SustainAbility-UNEP is continuing to play the role of an independent arbiter

after the fact rather than as a source of specific guidelines.

The GRI 2000 reporting guidelines take a similarly aggressive posture, redefining environmental reporting as sustainability reporting and including many topics that are barely mentioned in current environmental reports. The GRI guidelines were published later than the reports we analyzed, however, so our use of them is comparable to SustainAbility-UNEP's use of its new scoring system on current reports, written before the guidelines were published (SustainAbility-UNEP, 2000), rather than our use of its 1997 system on 1999 reports.

The ISO 14031 guidelines fall into neither of these categories. They were intended as a non-comprehensive list of environmental considerations companies might want to consider managing. Is it legitimate to convert them to a scoring system? We think so, with the caveat that, unlike the other scoring systems, there should be no expectation that any company would achieve a perfect score. A realistic use of this system might be to compare companies in the same industrial sector and normalize the scores to the highest achieved in that sector. The ISO 14031 list is the most comprehensive set we have seen of environmental issues facing companies, and well worth consideration by environmental report writers.

One of the main problems in trying to assess the scores of corporate environmental reports is that a particular score can be achieved in very different ways. In the GRI system, for example, Shell and Elf-Aquitaine have similar total scores, but Shell's general organizational score is much higher than Elf-Aquitaine's (Table 3). Even though the overall scores are nearly the same, the components that went into them are quite different, so the score, without amplification, is ambiguous. This is a general problem any time scores are applied to categorical variables – depending on how the scales are constructed it may be inappropriate to sum or average them, or to apply parametric statistical analyses to them, as we have done in this paper. Jones and Alabaster (1999) have



discussed this issue in some detail with respect to corporate environmental report scoring systems and conclude, correctly we think, that 'Further work must be conducted to create more rigorous, fully justifiable and calibrated scales...' On the other hand, even though similar scores may not mean the same thing, high scores do represent more open reporting, if not necessarily in exactly the same topics. Moreover, very high scores that are near the maximum possible scores are automatically comparable within a particular scoring system. The more difficult problem may be sorting out the differences between scoring systems and reaching conclusions about which system is most appropriate.

*Is scoring for comprehensiveness fair and adequate?*

All of the scoring systems used here evaluate corporate environmental reports based on the range of items discussed and the intensity of discussion, rather than on the quality of environmental performance. Two of the consequences are that (i) environmentally benign companies, with no substantive reason to discuss many of the topics, will have low scores if they restrict themselves to topics relevant to them and (ii) any company wishing to improve its score can do so simply by adding topics, irrespective of performance.

The first consequence means that if a single guideline or scoring system is applied to all companies in all sectors, benign companies wishing to score well will have to have reports as detailed as those with the most complex operations and the greatest potential impacts. This seems inherently wrong, and has been addressed by CERES with sector-specific guidelines (CERES, 2000a, 2000b). Companies have addressed this issue by putting details in facility-specific (Daimler Chrysler) or product-specific (ABB, Volvo) reports but have not necessarily found ways to translate their logic into good report scores.

Another approach is to simplify report scoring systems, even to the point of substituting icons for numerical scores (Krut and Munis, 1998) to frustrate attempts at comparing scores. This does not seem to us the best solution. Environmental performance is clearly amenable to scientific analysis, which, if it is to mean anything, must be reducible to numbers, which can be subjected to statistical analysis.

The second consequence means that companies have the potential to manipulate scores without increasing their environmental performance (Morhardt, 2001). By simply adding topics and discussing them, irrespective of performance or improvement, scores in each of these systems can be improved. Since there is no penalty in any of the systems for including topics that are not scored, it is feasible to achieve high – possibly perfect – scores in all of the systems. Clearly it is not the intent of any of the guidelines or scoring systems to encourage such behavior, but linking scoring to content rather than performance assures that this option is available to be explored.

The amount of detail contained in the GRI 2000 and ISO 14031 guidelines should be very helpful to writers of environmental and sustainability reports. The two guidelines cover somewhat different material but in combination provide much more guidance than could be obtained from any of the existing guidelines or scoring systems. A report that scored well under both the GRI and ISO systems would be far more informative than any of the reports we examined for this paper. Short of implementing systematic sector-wide quantitative metrics, following a combination of the GRI 2000 and ISO 14031 guidelines would go a long way toward creating the transparency that most report readers would like.

The low scores from the GRI 2000 and ISO 14031 scoring systems compared with the scores from the existing scoring systems make it clear that there is considerable room for improvement both in environmental and sustainability reporting and in scoring.



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