

# Sustainable Mobility: A Look At The Automotive Industry

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## ABSTRACT

*The purpose of this study is simple. It aims to find the most sustainable car company. As a first step, it explores some common and conflicting definitions and rankings of what it means to be the most sustainable automaker. This study then turns to the sustainability reports issued by the automakers themselves to see if these reports shed light on which company performs best in terms of its economic, environmental, and social dimensions. Particular attention is given to how these reports have evolved over successive iterations. By looking at some of the more objective and quantifiable performance indicators, particularly those which reflect environmental performance, a better understanding of what it means to be a sustainable car company may be achieved.*

**Keywords:** Sustainability; Triple Bottom Line Reporting; Corporate Social Responsibility

## SUSTAINABLE MOBILITY?

It is estimated that the automotive industry is responsible for roughly 15% of global carbon emissions (PwC, 2010). Consequently, a primary issue challenging the corporate citizenship of car companies is how the cars and trucks they manufacture contribute to climate change. A phrase that is gaining increasing traction in the industry is “sustainable mobility.” While sustainable mobility may be an appropriate goal for mass transit systems, it appears to be somewhat oxymoronic when applied to individual automobiles. As many environmentalists conclude, no matter how many electric or hybrid vehicles are introduced to the marketplace, “the road to the future is not a road.” Nevertheless, the purpose of this study is simple. It seeks to find the most sustainable car company – and in the process, the most sustainable car. The two are not necessarily the same.

There is considerable confusion as to whether “sustainability” refers to the manufacturing process or to the vehicles produced, to both, or to neither. For example, researchers from Queen's University Management School in Belfast, the Euromed Management School Marseille, and the Institute for Futures Studies and Technology Assessment (IZT) in Berlin focus on the manufacturing process (Sustainable Value, 2009). After examining the use of nine economic, environmental, and social resources, they conclude that BMW and Toyota were the most sustainable car companies during the 1999-2007 period studied. Asian car manufacturers including Toyota, Hyundai, Nissan, and Honda, all out-performed their North American competitors, Ford and General Motors. Table 1 presents the Sustainable Value Margin (i.e., Sustainable Value divided by Sales, thereby eliminating difference due to size of company) for 16 automakers during the last year of the study.

The Sustainable Asset Management (SAM) Group, in connection with the Dow Jones Sustainability Index rankings, has named BMW as the most sustainable automaker for each of the last six years. In its description of why BMW has garnered this honor, SAM embraces the concept of the triple bottom-line (TBL) coined by John Elkington in his 1997 book, *Cannibals with Forks*:

*Sustainability in the automobile industry is more than just producing fuel-efficient cars, but integrating value-driving sustainability concepts in the company's business principles and strategy. Bayerische Motoren Werke AG (BMW) is very well advanced in this respect and also shows a balanced performance over all three dimensions, which has led to a confirmation of its leadership position in the automotive industry. The company has been able to surpass its peers in the economic and social dimension, and thereby in particular in Risk & Crisis Management as well as Human Capital Development and Talent Attraction & Retention. In addition to that, BMW has implemented*

*efficient environmental management systems, and undertakes regular external and internal audits for its operations as well as for its suppliers. The company has included a package of multiple emission reduction measures in large parts of the car fleet (called Efficient Dynamics) and is in the process of developing new mobility concepts in order to meet the challenges of global warming and fossil fuel reserves (SAM, 2011).*

Joining BMW in SAM's Gold Class in the automotive sector are Fiat and Volkswagen, with Daimler and Toyota being included in the Silver Class (SAM, 2011). Dow Jones includes BMW, Fiat, and Volkswagen in its World and European Sustainability Indices, Ford in its North American Sustainability Index, with Kia, Nissan, and Toyota being members of the DJSI for Asia-Pacific (DJSI, 2011).

However, if one is concerned about the sustainability of the vehicles themselves, perhaps a better measure is the Corporate Average Fuel Efficiency (CAFE). CAFE regulations were first enacted in the US in 1975 as a Congressional response to the 1973 Arab Oil Embargo. Proposed CAFE standards would require new passenger vehicles sold in the US to achieve a combined average fuel-economy standard of 35.5 mpg (39 mpg for cars; 30 mpg for light trucks and SUVs) by 2016. This not only represents a 40% improvement over the existing CAFE standards, it would reduce the time-line for achievement by some four years as compared to the legislation passed by Congress in 2007 which required a CAFE of 35 mpg by 2020 (West, 2009). Carmakers which fail to meet CAFE standards are subject to substantial fines in Europe and the US. Interestingly, given its high sustainable value margin and its status as DJSI's "most sustainable car company," BMW is a notable repeat offender (NHSTA, 2010a). Table 1 also summarizes the CAFEs for 16 automakers. While Toyota fares well in terms of both the sustainability of its manufacturing process (#2 in SV%) and the fuel efficiency of its vehicles (#1 in CAFE), BMW did not even make it into the top ten of fuel efficient cars with its CAFE of 27.5 mpg (Mays, 2010; NHSTA, 2010b).

There is also a definite distinction between sustainability reporting and sustainable performance. Many awards and rankings are based in part or in whole upon the comprehensiveness of a company's sustainability disclosures. In its study of over 100 "raters" of sustainability, SustainAbility (2010) found that around half measure some combination of performance and the transparency of reporting; one-third use only performance measures; 7% look only at reporting.

As its name would indicate, one example of a ranking system that looks solely at reporting is the Carbon Disclosure Project (CDP). Since it was established in 2000, the CDP has accumulated the largest collection of greenhouse gas (GHG) emission and energy use data in the world, serving as a conduit for the reporting by 3,000 organizations in 60 countries (CDP, 2011). The CDP releases an annual Carbon Disclosure Leadership Index (CDLI) based upon a company's responses to the CDP's questionnaire, not on the company's actual amount of emissions. The limitations of the CDLI have been somewhat mitigated by the CDP complementing it with its first Carbon Performance Leadership Index (CPLI) in 2010. Even with this additional consideration of performance, the scores are based exclusively on self-reported information provided to the CDP by the companies themselves. Despite these shortcomings, the CDP scores have gained widespread support. In April 2010, Google added the CDP scores to its "Key Stats and Ratio" section of Google Finance. Table 1 presents the CDP scores for automakers. Two French car companies, Peugeot and Renault, top the list in providing the most comprehensive carbon disclosures, with BMW coming in third (CDP, 2010). It bears repeating that CDP scores reflect self-reported responses to a questionnaire, not actual environmental performance.

Bloomberg has developed its own rating system for the reporting of environmental, social and governance (ESG) factors. Based primarily on the Global Reporting Initiative's reporting guidelines and performance indicators (discussed below), the Bloomberg ESG Disclosure Score is more comprehensive than the CDP inasmuch as it does not limit its criteria to environmental reporting. While a perfect score (100) is possible, only eight companies have achieved scores of greater than 70 (Responsible-investor, 2010). The highest Bloomberg ESG Disclosure Score has been 83; the highest score for an automaker is Peugeot's 60.33. As reflected in Table 1, there is seems to be a general lack of congruence between how Sustainable Value, CAFE, CDP, and Bloomberg measure and evaluate the reporting and performance of the various carmakers.

The Pacific Sustainability Index (PSI), developed by the Roberts Environmental Center at Claremont McKenna College, represents a blended approach. The PSI scores are based upon qualitative and quantitative

measures of a company's reporting and performance. Based on its PSI methodology, the Roberts Center concludes that Toyota, General Motors, and Daimler provide the best overall sustainability reporting and performance in the automotive industry, each receiving a "grade" of A+. Remembering that BMW has been named by DJSI as the "most sustainable car company" for six years running, it is somewhat surprising that its PSI grade is only a B+ (Roberts, 2009). Table 2 summarizes the overall grades of automakers as well as their grades in terms of environmental reporting and in terms of environmental performance.

## **THE GLOBAL REPORTING INITIATIVE**

With all the inconsistency in defining and measuring sustainability, it would be helpful if there were some common framework for reporting that would promote comparability between and among companies. The most widely recognized guidelines for the reporting of economic, environmental, and social performance were developed by the Global Reporting Initiative (GRI). Now in their third iteration, the so-called *G3 Guidelines* provide 79 performance indicators, fifty of which are considered "core." One of the most significant aspects of these indicators is that some are quantitative (e.g. EN16: Total direct and indirect greenhouse gas emissions by weight) while others are more qualitative or policy related (e.g. EC 2: Financial implications and other risks and opportunities for the organization's activities due to climate change; EN26: Initiatives to mitigate environmental impacts of products and services, and the extent of impact mitigation) in nature. Furthermore, the quantitative indicators are expressed in various monetary and non-monetary units of measure. [Note: The new *G3.1 Guidelines* were issued on March 23, 2011. These include expanded reporting on human rights, local community impacts, and gender (GRI, 2011b).]

In order to encourage companies to adopt the guidelines even if they are not prepared to implement all the guidelines immediately, the GRI permits different levels of reporting ranging from A through C. The level of reporting chosen can simply be self-declared, verified by an external third party, or checked by the GRI itself. In addition to content level, a G3 report can itself be externally verified. This additional assurance is noted by a "+" being added to the level of reporting, thereby giving the highest level of G3 reporting an A+. Even though approximately half of the G3- based reports are externally verified, there is a wide variation between geographical regions with European companies leading the way (46% of reports receiving some form of external assurance) and North American firms lagging behind (16%) (GRI, 2011c).

While compliance with the GRI's *Guidelines* is entirely voluntary, more than 1,800 reports were officially registered with the GRI in 2010 (Environmental Leader, 2011). Particularly significant is use of the G3 framework by more than three-quarters of the G250 and nearly 70 percent of the N100 use the GRI Guidelines for their reporting (KPMG, 2008). Further evidence of the predominance of the GRI Guidelines can be found by the fact that 64% of companies listed on Germany's DAX 30, 48% of those listed on France's CAC 40, and 22% of the UK's FTSE 100 state they use the GRI guidelines (Ceres, 2010).

## **SUSTAINABILITY REPORTING IN THE AUTOMOTIVE INDUSTRY**

One of the greatest challenges in evaluating any sustainability report is the extraordinarily wide variability in the form of the disclosures. In order to find a more common denominator, this analysis focuses on those car companies which prepare sustainability reports using the *G3 Guidelines* and to see how the sustainability reports using the *G3 Guidelines* evolve over successive iterations.

### **Level of Reporting**

As noted previously, the GRI's rationale for permitting varying levels of reporting is to give organizations an opportunity to experiment with using the *G3* indicators without having to adopt them all at once. The hope is that companies will increase their level of reporting over time. Table 3 summarizes the reporting levels and types of verifications of GRI content of sixteen major automakers. Of these sixteen, only General Motors and Honda do not use the *G3 Guidelines*. Given that it was part of the Working Group that developed the GRI's pilot Automotive Industry Supplement (GRI, 2004), General Motors' omission from the list of *G3* users is surprising. While Toyota does not issue a *G3* reports for its global operations, it does produce separate *G3* reports for Europe and for Australia, thereby increasing the number of *G3* reports issued by automakers to 15 in total. Furthermore, four

companies (Hyundai, Mazda, Nissan, Renault) do issue G3 reports but do not declare their reporting level.

Four companies were already reporting at the A or A+ level (Daimler, Ford, Toyota-Australia, VW) for their initial G3 reports, but seven companies (BMW, Fiat, Kia, Peugeot, Tata, Toyota-Europe, and Volvo) have increased their level of reporting in successive iterations. This is an encouraging indication that the GRI's rationale for permitting varying levels of reporting has resulted in increases in subsequent reporting levels. That 10 of 14 G3 reports are at the A level may also be an indication of significant peer pressure among the companies themselves. If sustainability is a key issue for automakers, it would be difficult to justify reporting at lower level than that at which by its competitors report.

### **Core Indicators Reported**

Table 4 provides a breakdown of the core indicators reported by each company in its first and successive G3 reports. As one would expect with the consistently high level of reporting, most automakers are providing information on most of the G3's core indicators, with BMW, Daimler, and Fiat leading the way by reporting on all fifty. The overall mean percentage of core indicators has increased from 72.93% reported in a company's first G3 report to 77.33% in its most recent report. Given that environmental impact is a primary challenge in the automotive industry, it is encouraging that information on the seventeen core environmental indicators has increased from a mean of 70.98% in the companies' first reports to 80.78% in the most recent reports. Eleven companies increased the number of indicators for which they reported in successive iterations of their G3 reports; only one company, Hyundai, reduced the number of indicators reported. This is true for both the total of 50 core indicators and for the 17 environmental indicators.

### **External Verification**

A growing trend in sustainability reporting is external verification of the reports. The GRI reports that 47% of the GRI reports have some form of external assurance (GRI, 2011a). However, among the car companies studied, only six had external verified first reports as indicated by a "+" suffix to their reporting level. Nine companies evidently concluded that this external assurance was not worth the additional expense.

Some caution should be exercised in relying upon the "+" designation provided in the GRI scheme of reporting levels for externally verified reports. First, there is some confusion about the GRI's role in the process of verification. This confusion stems from the possibility that the reporting level may be "checked" by the GRI. This should not be taken to mean that the GRI "audited" the report. Instead, the GRI restricts its role to checking that the content of a report is sufficient to merit a particular level of reporting. As noted previously, this checking of content can also be by a third party or even self-reported. Second, the most common external verification takes the form of a negative assurance. PwC's Independent Assurance Report on Daimler's 2011 sustainability report makes this clear:

*In a present limited assurance engagement the evidence-gathering procedures are more limited than in a reasonable assurance engagement (for example, an audit of financial statements), and therefore less assurance is obtained than in a reasonable assurance engagement. . . .*

*Based on our work described in this report, nothing has come to our attention that causes us to believe that the data and information mentioned in the subject matter and disclosed with the Daimler Sustainability Report 2011 does not give a fair picture of Daimler AG's performance in the area of Sustainability (PwC, 2011).*

According to the KPMG survey, 48% of the N100 and 51% of the G250 companies opt for this "limited" or "negative" assurance for their sustainability reports (KPMG, 2008, p. 66).

While Ford does not have its sustainability report "audited," it does have its report "reviewed" by a Stakeholder Committee convened by Ceres. Furthermore, Ford notes that some of its data have been subject to various forms of internal and third-party verification. Of particular relevance:

*More than two-thirds of Ford's global facility greenhouse gas (GHG) emissions are third-party verified. All of Ford's North American GHG emissions data since 1998 have been externally verified by FINRA, the auditors of the NASDAQ stock exchange, as part of membership in the Chicago Climate Exchange. In addition, all emissions data covered by the EU Emission Trading Scheme (EU-ETS) and voluntary UK Climate Change Agreements are third-party verified. All EU-ETS verification statements are provided to Ford by facility from BSI for UK facilities, Lloyds for Spain, and Flemish Verification Office for Belgium. North American facilities are verified against the World Resources Institute's GHG Protocol. European facilities are verified against the EU-ETS rules and guidelines (Ford, 2010a).*

This does raise the question of the relative value of the limited assurance opinion provided to and by Daimler and the stakeholder review provided for Ford. With costs for a “limited assurance” opinion estimated as being around 10% the cost of a financial audit, one wonders if these costs exceed any benefit derived, particularly when more rigorous forms of external verification of relevant data are already in place.

### **Selected Core Indicators: A Closer Look at What is being Reported**

The increased number of key performance indicators reported by automakers is encouraging. However, just ticking off whether information on an indicator is being disclosed is not particularly meaningful. In order to further investigate the comparability of the G3 reports, this study takes a closer look at the actual data reported by companies. A first level of comparability between and among these companies is represented by the common disclosures contained in the most recent G3 reports of fifteen automakers.

Table 5 provides an overview of the reporting of eight core indicators - two economic, four environmental, and two in product responsibility. For instance, all fifteen companies provided complete or partial information on core indicators EC2 (Financial implications and other risks and opportunities for the organization's activities due to climate change) and PR1 (Life cycle stages in which health and safety impacts of products and services are assessed for improvement, and percentage of significant products and service categories subject to such procedures). Similarly high disclosure of data relating to EN16 (Total direct and indirect greenhouse gas emissions by weight – 93%) and EN19 (Emissions of ozone-depleting substances by weight – 87%) is found among the automakers. Reporting on the other four core indicators is much more varied. Remembering that these indicators are considered “core” because the GRI believes them to be of interest to most stakeholders and, consequently, are “assumed to be material unless deemed otherwise on the basis of the GRI Reporting Principles” (GRI, 2006), this non-reporting is somewhat surprising.

A second level of comparability is represented by the actual data being disclosed by the companies for one of the most objective performance indicators – EN 16. It would be difficult to imagine how disclosure of “the total direct and indirect greenhouse gas emissions by weight” could be subject to interpretation. Nevertheless, only Renault provides a total for all GHG emissions. The other carmakers provide different and somewhat incomparable breakdowns of greenhouse gas (GHG) emissions. The one common disclosure is that of CO<sub>2</sub> emissions. Even this is expressed in different unit of measure for the total (tons, thousands of tons, millions of tons) and for per vehicle amounts (tons per vehicle vs. kg per vehicle). Some of these differences simply need to be converted into a common unit of measure. Table 6 summarizes the data disclosed by the automakers on CO<sub>2</sub> emissions, converted from the measures originally reported. Note: Even though Honda does not prepare a G3 Report, because its sustainability report does provide data on CO<sub>2</sub> emissions, it is included in this summary.

Given that there is no adjustment for the size of the company, it is expected that two largest automakers in the study, Ford and Volkswagen, have the highest CO<sub>2</sub> emissions. If Toyota (Global) and General Motors reported this data, one would expect they would also be among the highest CO<sub>2</sub> emitters. These data need to be standardized in order to make meaningful comparisons. Unfortunately, not all companies disclose their emissions per vehicle and even those that do are unclear in just what is being measured. Some report direct CO<sub>2</sub> emissions per vehicle (i.e., those that can be traced to the manufacturing process) while other provide total emissions per vehicle. With those caveats, Fiat, Honda, and BMW appear to be the most sustainable as measured by emissions per vehicle manufactured.

## CONCLUSION

Sustainability encompasses more than just environmental performance. It has economic and social dimensions as well. Appropriately, companies in different industries are confronted with different challenges to their corporate sustainability. Pharmaceutical companies worry about product safety; sporting goods companies look to responsibly manage their supply chains. Paramount for car companies is how the vehicles they manufacture contribute to climate change.

*The worldwide production of motor vehicles has been running at record levels. Progressive globalisation and economic growth have led to increasing mobility and motorisation. Mobility is a basic human desire and an essential facilitator of economic development and quality of life. Access to mobility, especially in the developing world, means access to employment, education, and health care. Not surprisingly, the emerging markets show the highest growth rates of newly registered vehicles... [C]arbon dioxide (CO<sub>2</sub>) emissions, which are directly correlated to the consumption of fossil fuels, contribute to the greenhouse gas effect and thus have a global impact. Vehicle manufacturers will need to satisfy global customer demands while minimising environmental and social impact to the greatest extent possible (GRI, 2004).*

The purpose of this study is simple. It aims to find the most sustainable car company. Consequently, it focuses on the environmental dimension of sustainability. Even with this limited scope, it did not find an answer. Not only is there no consistency in whether sustainability refers to the manufacturing process, to the vehicles manufactured, or to both, there is no consistency in the ways to measure the sustainability either. Table 1 summarizes the sustainable values, CAFE miles per gallon, CDP and Bloomberg ESG scores for the major automakers. Companies which do well in one ranking, lag behind in another. Perhaps this is to be expected when some are based on performance (SV% and mpg) while other rank according to the information disclosed (CDP and Bloomberg).

With all the inconsistency of defining and measuring sustainability, it would be helpful if there were some common framework for reporting that would promote comparability between and among companies. This is where the Global Reporting Initiative (GRI) comes in. That almost all the major automakers follow the GRI framework and the majority conforms at the highest level of G3 reporting, a consideration of these companies' sustainability reports would seem promising. However, given that the reporting concentrates on the company's operations (i.e., manufacturing) and not on the operation of the vehicles produced, limited conclusions can be reached. After all, it is the product (cars), not the process that has the more deleterious environmental impact. To make matters worse, even with the most objective performance indicators (e.g. total direct and indirect greenhouse gas emissions by weight), comparisons between and among the car companies are difficult. These difficulties are compounded when looking at other performance indicators that are more qualitative and policy related in nature. As one survey of sustainability reports concludes:

*At the same time, the problem may arise from the lack of an established means of assessing sustainability information in reports. It might then be said that the reports provide "too much information, too little meaning" (KPMG & SustainAbility, 2008, p. 29).*

More generally accepted methodologies and measures of sustainability need to be developed. One example would be the use of a commonly understood concept – the carbon footprint. Despite obvious difficulties in getting agreement on a particular methodology for calculation, requiring companies to disclose the carbon footprint for their company and for their products would lead to a common denominator for expression. If the carbon footprint of every company and its products were calculated according to a common methodology, more consistent communication and evaluation of this dimension would lead to more informed decisions. Perhaps then one could find the most sustainable car company and, in the process, the most sustainable car.

Table 1: Comparison of Rankings

Sustainable Value Margin			CAFE	MPG	CDP Score		Bloomberg ESG Score	
1	BMW	5.03%	1 Toyota	38.1	1 Peugeot	86	1 Peugeot	60.33
2	Toyota	4.91%	2 Honda	36.5	2 Renault	80	2 Mazda	55.37
3	Daimler	3.94%	3 Nissan	34.0	3 BMW	79	3 Fiat	49.17
4	Honda	3.08%	4 Kia	33.7	4 Toyota	77	4 Daimler	47.93
5	Isuzu	1.86%	5 Hyundai	33.2	5 Fiat	70	5 Ford	47.52
6	VW	1.30%	6 GM	33.0	6 VW	69	6 Mitsubishi	45.45
7	Hyundai	1.08%	7 Suzuki	32.7	6 Nissan	69	7 BMW	43.80
8	Mitsubishi	0.75%	8 Mazda	32.2	8 Daimler	65	8 Renault	42.98
9	Tata	0.32%	9 Ford	31.1	9 Honda	56	9 Honda	40.50
10	Nissan	-0.03%	10 VW	30.2	10 Ford	51	10 Hyundai	39.67
11	Suzuki	-0.12%	11 Mitsubishi	29.5			10 Toyota	39.67
12	PSA - Peugeot	-1.08%	12 Subaru	29.0			12 Kia	35.95
13	Renault	-1.75%	13 Chrysler	28.3			13 VW	34.30
14	Ford	-2.59%	14 BMW	27.5			14 Nissan	33.06
15	Fiat	-2.81%	14 Daimler	27.5				
16	GM	-7.47%						

Table 2: Roberts Environmental Center Scores (2009)

Company	Overall Grade	Environmental Reporting	Environmental Performance
Toyota	A+	N/A	A+
General Motors	A+	A-	N/A
Daimler	A+	A	N/A
Volkswagen	A	A	A
Peugeot	A	A-	A
Mazda	A	N/A	A
Ford	A	N/A	N/A
Hyundai	A-	A	A
Fiat	A-	N/A	N/A
BMW	B+	A	N/A
Honda	B+	A-	A+
Renault	B	N/A	N/A
Volvo	B	N/A	N/A
Nissan	B-	N/A	N/A

N/A = Not in the top 10

Table 3: Selected Automotive Companies

Company	Previous Reporting Level	Most Recent Reporting Level	GRI Content Verification	Country
BMW	B+	A	GRI-checked	Germany
Daimler	A+	A+	GRI-checked	Germany
Fiat	B+	A+	Third-party-checked	Italy
Ford	A	A	GRI-checked	USA
General Motors	N/A	N/A	N/A	USA
Honda	N/A	N/A	N/A	Japan
Hyundai	Undeclared	Undeclared	N/A	Korea
Kia	B+	A+	Third-party-checked	Korea
Mazda	Undeclared	Undeclared	N/A	Japan
Nissan	Undeclared	Undeclared	N/A	Japan
Peugeot-Citroen	B+	A+	GRI-checked	France
Renault	Undeclared	Undeclared	N/A	France
Tata	A	A	Self declared	India
Toyota				
Australia	A+	A+	Third-party-checked	Australia
Europe	Undeclared	A	Third-party-checked	Belgium
Volkswagen	A+	A+	GRI-checked	Germany
Volvo	Undeclared	B	Self declared	Sweden

**Table 4: G3 Core Performance Indicators Disclosed**

	<b>BMW 2007-08</b>	<b>BMW 2008</b>	<b>Daimler 2008</b>	<b>Daimler 2009</b>	<b>Daimler 2010</b>	<b>Daimler 2011</b>	<b>Fiat 2007</b>	<b>Fiat 2008</b>	<b>Fiat 2009</b>	<b>Ford 2008/9</b>	<b>Ford 2009/10</b>
<b>Reporting Level</b>	B+	A	A+	A+	A+	A+	B+	B+	A+	A	A
<b>Economic</b>	6	7	7	7	7	7	7	7	7	6	6
% Reported	85.71%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	85.71%	85.71%
<b>Environmental</b>	17	17	12	15	15	17	14	16	17	16	16
% Reported	100.00%	100.00%	70.59%	88.24%	88.24%	100.00%	82.35%	94.12%	100.00%	94.12%	94.12%
<b>Social: Labor Practices and Decent Work</b>	10	10	9	10	10	10	10	10	10	8	8
% Reported	100.00%	100.00%	90.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	80.00%	80.00%
<b>Social: Human Rights</b>	6	6	6	6	6	6	6	6	6	6	6
% Reported	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
<b>Social: Society</b>	6	6	6	5	6	6	5	5	6	6	6
% Reported	100.00%	100.00%	100.00%	83.33%	100.00%	100.00%	83.33%	83.33%	100.00%	100.00%	100.00%
<b>Social: Product Responsibility</b>	4	4	4	4	4	4	3	3	4	3	4
% Reported	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	75.00%	75.00%	100.00%	75.00%	100.00%
<b>Total Indicators</b>	49	50	44	47	48	50	45	47	50	45	46
% Reported	98.00%	100.00%	88.00%	94.00%	96.00%	100.00%	90.00%	94.00%	100.00%	90.00%	92.00%

**Table 4: G3 Core Performance Indicators Disclosed (Continued)**

	<b>Hyundai 2007</b>	<b>Hyundai 2008</b>	<b>Hyundai 2009</b>	<b>Hyundai 2010</b>	<b>Kia 2007</b>	<b>Kia 2008</b>	<b>Kia 2009</b>	<b>Kia 2010</b>	<b>Mazda 2008</b>	<b>Mazda 2009</b>	<b>Mazda 2010</b>
<b>Reporting Level</b>	A+	Undeclared	Undeclared	Undeclared	B+	B+	A+	A+	Undeclared	Undeclared	Undeclared
<b>Economic</b> % Reported	7 100.00%	5 71.43%	4 57.14%	6 85.71%	6 85.71%	6 85.71%	6 85.71%	6 85.71%	2 28.57%	3 42.86%	3 42.86%
<b>Environmental</b> % Reported	15 88.24%	11 64.71%	13 76.47%	13 76.47%	13 76.47%	15 88.24%	16 94.12%	16 94.12%	11 64.71%	11 64.71%	12 70.59%
<b>Social: Labor Practices and Decent Work</b> % Reported	8 80.00%	6 60.00%	6 60.00%	7 70.00%	10 100.00%	10 100.00%	10 100.00%	9 90.00%	3 30.00%	4 40.00%	5 50.00%
<b>Social: Human Rights</b> % Reported	5 83.33%	4 66.67%	4 66.67%	3 50.00%	5 83.33%	5 83.33%	4 66.67%	4 66.67%	2 33.33%	2 33.33%	2 33.33%
<b>Social: Society</b> % Reported	6 100.00%	5 83.33%	4 66.67%	2 33.33%	3 50.00%	5 83.33%	3 50.00%	5 83.33%	0 0.00%	1 16.67%	2 33.33%
<b>Social: Product Responsibility</b> % Reported	4 100.00%	3 75.00%	3 75.00%	1 25.00%	4 100.00%	3 75.00%	4 100.00%	4 100.00%	0 0.00%	1 25.00%	2 50.00%
<b>Total Indicators</b> % Reported	45 90.00%	34 68.00%	34 68.00%	32 64.00%	41 82.00%	44 88.00%	43 86.00%	44 88.00%	18 36.00%	22 44.00%	26 52.00%

**Table 4: G3 Core Performance Indicators Disclosed (Continued)**

	<b>Nissan 2008</b>	<b>Nissan 2009</b>	<b>Nissan 2010</b>	<b>Peugeot 2007</b>	<b>Peugeot 2008</b>	<b>Peugeot 2009</b>	<b>Renault 2008</b>	<b>Renault 2009</b>	<b>Tata Motors 2006-07</b>	<b>Tata Motors 2007-08</b>	<b>Tata Motors 2008-09</b>	<b>Tata Motors 2009-10</b>
<b>Reporting Level</b>	Undeclared	Undeclared	Undeclared	B+	B+	A+	Undeclared	Undeclared	C	A	A	A
<b>Economic</b> % Reported	2 28.57%	2 28.57%	2 28.57%	6 85.71%	6 85.71%	6 85.71%	3 42.86%	3 42.86%	3 42.86%	4 57.14%	4 57.14%	7 100.00%
<b>Environmental</b> % Reported	12 70.59%	12 70.59%	13 76.47%	17 100.00%	17 100.00%	17 100.00%	10 58.82%	10 58.82%	7 41.18%	17 100.00%	4 23.53%	15 88.24%
<b>Social: Labor Practices and Decent Work</b> % Reported	4 40.00%	3 30.00%	3 30.00%	10 100.00%	10 100.00%	10 100.00%	7 70.00%	7 70.00%	5 50.00%	10 100.00%	4 40.00%	10 100.00%
<b>Social: Human Rights</b> % Reported	0 0.00%	0 0.00%	0 0.00%	6 100.00%	6 100.00%	6 100.00%	5 83.33%	5 83.33%	5 83.33%	5 83.33%	3 50.00%	6 100.00%
<b>Social: Society</b> % Reported	1 16.67%	1 16.67%	1 16.67%	6 100.00%	6 100.00%	6 100.00%	1 16.67%	1 16.67%	4 66.67%	3 50.00%	4 66.67%	6 100.00%
<b>Social: Product Responsibility</b> % Reported	1 25.00%	1 25.00%	1 25.00%	4 100.00%	4 100.00%	4 100.00%	3 75.00%	3 75.00%	1 25.00%	3 75.00%	1 25.00%	4 100.00%
<b>Total Indicators</b> % Reported	20 40.00%	19 38.00%	20 40.00%	49 98.00%	49 98.00%	49 98.00%	29 58.00%	29 58.00%	25 50.00%	42 84.00%	20 40.00%	48 96.00%

**Table 4: G3 Core Performance Indicators Disclosed (Continued)**

	<b>Toyota Australia 2009</b>	<b>Toyota Australia 2010</b>	<b>Toyota Europe 2008</b>	<b>Toyota Europe 2009</b>	<b>Toyota Europe 2010</b>	<b>VW 2007-08</b>	<b>VW 2009-10</b>	<b>VW 2010</b>	<b>Volvo 2007</b>	<b>Volvo 2008-2009</b>	<b>Volvo 2010</b>
<b>Reporting Level</b>	A+	A+	Undeclared	Undeclared	A	A+	A+	A+	Undeclared	B	B
<b>Economic</b>	7	7	4	4	7	5	6	7	1	1	2
% Reported	100.00%	100.00%	57.14%	57.14%	100.00%	71.43%	85.71%	100.00%	14.29%	14.29%	28.57%
<b>Environmental</b>	15	15	4	12	14	12	15	15	9	12	15
% Reported	88.24%	88.24%	23.53%	70.59%	82.35%	70.59%	88.24%	88.24%	52.94%	70.59%	88.24%
<b>Social: Labor Practices and Decent Work</b>	10	10	7	7	10	8	9	9	5	7	7
% Reported	100.00%	100.00%	70.00%	70.00%	100.00%	80.00%	90.00%	90.00%	50.00%	70.00%	70.00%
<b>Social: Human Rights</b>	6	6	3	3	6	6	6	5	1	2	2
% Reported	100.00%	100.00%	50.00%	50.00%	100.00%	100.00%	100.00%	83.33%	16.67%	50.00%	50.00%
<b>Social: Society</b>	6	6	4	4	6	5	6	5	1	2	4
% Reported	100.00%	100.00%	66.67%	66.67%	100.00%	83.33%	100.00%	83.33%	16.67%	33.33%	66.67%
<b>Social: Product Responsibility</b>	4	4	3	3	4	3	3	3	1	2	2
% Reported	100.00%	100.00%	75.00%	75.00%	100.00%	75.00%	75.00%	75.00%	25.00%	50.00%	50.00%
<b>Total Indicators</b>	48	48	25	33	47	39	45	44	18	26	32
% Reported	96.00%	96.00%	50.00%	66.00%	94.00%	78.00%	90.00%	88.00%	36.00%	52.00%	64.00%

**Table 5: GRI Core Performance Indicators – A Sample**

- Economic**
- EC1: Direct economic value-generated and distributed, including revenues, operating costs, employee compensation, donations and other community investments, retained earnings and payments to capital providers and customers
  - EC2: Financial implications and other risks and opportunities for the organization’s activities due to climate change
- Environmental**
- EN16: Total direct and indirect greenhouse gas emissions by weight
  - EN17: Other relevant indirect greenhouse gas emissions by weight
  - EN19: Emissions of ozone-depleting substances by weight
  - EN28: Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations
- Product Responsibility**
- PR1: Life cycle stages in which health and safety impacts of products and services are assessed for improvement, and percentage of significant products and service categories subject to such procedures
  - PR9: Monetary value of significant fines for noncompliance with laws and regulations concerning the provision and use of products and services

	<b>Fully Reported</b>	<b>Partially Reported</b>	<b>Not Reported</b>	<b>% Reported</b>	<b>% Not Reported</b>
<b>Economic</b>					
EC1	12	3	0	100%	0%
EC2	10	1	4	73%	27%
<b>Environmental</b>					
EN16	14	0	1	93%	7%
EN17	7	2	6	60%	40%
EN19	11	2	2	87%	13%
EN28	9	1	5	67%	33%
<b>Social: Product Responsibility</b>					
PR1	14	1	0	100%	0%
PR9	8	0	7	53%	47%

Table 6: EN16: Total direct and indirect greenhouse gas emissions by weight

	CO2 Emissions	Per Vehicle		CO2 Emissions	Per Vehicle
<b>BMW</b>			<b>PSA - Peugeot</b>		
2008	1,184	0.82	2008	869	NA
2009	1,139	0.91	2009	878	NA
<b>Daimler</b>			<b>Renault</b>		
2008	3,879	1.49	2008	615	NA
2009	3,135	1.64	2009	1,191	NA
2010	3,699	1.48	<i>Note: Total GHG Emissions Reported</i>		
<b>Fiat</b>			<b>Tata</b>		
2008	NA	0.52	2008	195	1.01
2009	2,572	0.46	2009	586	0.90
<b>Ford</b>			<b>Toyota-Australia</b>		
2008	5,400	1.09	2008	166	1.27
2009	4,900	1.05	2009	141	1.33
<b>Honda</b>			<b>Toyota - Europe</b>		
2008	1,060	0.76	2008	261	NA
2009	990	0.82	2009	268	NA
<b>Hyundai</b>			<b>Volkswagen</b>		
2008	2,017	NA	2008	6,630	1.15
2009	1,986	NA	2009	6,450	1.17
<b>Mazda</b>			2010	7,700	1.15
2008	575	NA	<b>Volvo</b>		
2009	609	NA	2008	68	NA
<b>Nissan</b>			2009	59	NA
2008	609	NA	2010	68	NA
2009	2,113	NA			

Total CO2 Emissions in 1,000 tons

Per Vehicle CO2 Emissions in ton per vehicle

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## REFERENCES

1. BMW (2007). GRI content index 2007, accessed May 22, 2011, available at [http://www.bmwgroup.com/bmwgroup\\_prod/e/0\\_0\\_www\\_bmwgroup\\_com/verantwortung/publikationen/sustainable\\_value\\_report\\_2007/pdf/SVR2007BMW\\_GRI\\_e.pdf](http://www.bmwgroup.com/bmwgroup_prod/e/0_0_www_bmwgroup_com/verantwortung/publikationen/sustainable_value_report_2007/pdf/SVR2007BMW_GRI_e.pdf).
2. BMW (2008). Sustainable by design, accessed May 22, 2011, available at [http://www.bmwgroup.com/publikationen/e/2009/pdf/BMW\\_Sustainability\\_Broschuere\\_2009\\_en.pdf](http://www.bmwgroup.com/publikationen/e/2009/pdf/BMW_Sustainability_Broschuere_2009_en.pdf).
3. BMW (2008). Sustainable value report 2008, accessed May 22, 2011, available at [http://www.bmwgroup.com/e/0\\_0\\_www\\_bmwgroup\\_com/verantwortung/publikationen/sustainable\\_value\\_report\\_2008/pdf/SVR\\_2008\\_engl\\_Gesamtversion.pdf](http://www.bmwgroup.com/e/0_0_www_bmwgroup_com/verantwortung/publikationen/sustainable_value_report_2008/pdf/SVR_2008_engl_Gesamtversion.pdf).
4. Carbon Disclosure Project (CDP, 2010). Global 500 report, accessed May 22, 2011, available at <https://www.cdproject.net/CDPResults/CDP-2010-G500.pdf>.
5. Carbon Disclosure Project (CDP, 2011). What we do, accessed May 22, 2011, available at <https://www.cdproject.net/en-US/WhatWeDo/Pages/overview.aspx>.

6. Ceres (2010). 21st century corporation: The Ceres roadmap for sustainability, accessed May 22, 2011, available at <http://www.ceres.org/ceresroadmap>.
7. Daimler (2008). 360 degrees: Facts on sustainability 2008, accessed May 22, 2011, available at [http://sustainability2008.daimler.com/daimler/annual/2008/nb/English/pdf/080612\\_F\\_GRI-Index\\_ENG\\_sa.pdf](http://sustainability2008.daimler.com/daimler/annual/2008/nb/English/pdf/080612_F_GRI-Index_ENG_sa.pdf).
8. Daimler (2008). GRI index for 2008 report, accessed May 22, 2011, available at [http://sustainability2008.daimler.com/cgi-bin/show.ssp?companyName=daimler&language=English&report\\_id=nb-2008&id=9060](http://sustainability2008.daimler.com/cgi-bin/show.ssp?companyName=daimler&language=English&report_id=nb-2008&id=9060).
9. Daimler (2009). 360 degrees: Facts on sustainability 2009, accessed May 22, 2011, available at <http://sustainability2009.daimler.com/reports/daimler/annual/2009/nb/English/0/sustainability-report-2009.html>.
10. Daimler (2009). GRI index for 2009 report, accessed May 22, 2011, available at [http://sustainability2009.daimler.com/daimler/annual/2009/nb/English/pdf/090403\\_GRI-Index\\_E.pdf](http://sustainability2009.daimler.com/daimler/annual/2009/nb/English/pdf/090403_GRI-Index_E.pdf).
11. Daimler (2010). 360 degrees: Facts on sustainability 2010, accessed May 22, 2011, available at [http://sustainability.daimler.com/daimler/annual/2010/nb/English/pdf/DAI\\_2010\\_sustainability\\_en.pdf](http://sustainability.daimler.com/daimler/annual/2010/nb/English/pdf/DAI_2010_sustainability_en.pdf).
12. Daimler (2011). 360 degrees: Facts on sustainability 2011: Interactive sustainability report 2011, accessed May 22, 2011, available at <http://sustainability.daimler.com/reports/daimler/annual/2011/nb/English/0/home.html>.
13. DJSI (2011). Sector overview: automotive, accessed May 22, 2011, available [http://www.sustainability-index.com/djsi\\_protected/Review2010/SectorOverviews\\_10/DJSI\\_AUT\\_11\\_1.pdf](http://www.sustainability-index.com/djsi_protected/Review2010/SectorOverviews_10/DJSI_AUT_11_1.pdf).
14. Elkington, J. (1997). Cannibals with forks: The triple bottom line of the 21st century business. Capstone: Oxford.
15. Environmental Leader (2011). US lags in environmental report assurance, accessed May 22, 2011, available at <http://www.environmentalleader.com/2011/05/11/us-lags-in-environmental-reporting-assurance/>.
16. Fiat (2007). 2007 sustainability report, accessed May 22, 2011, available at <http://www.fiatspa.com/en-US/sustainability/FiatDocuments/rapporto2007.pdf>.
17. Fiat (2008). 2008 sustainability report, accessed May 22, 2011, available at <http://www.fiatspa.com/en-US/sustainability/FiatDocuments/rapporto2008.pdf>.
18. Fiat (2009). 2009 sustainability report, accessed May 22, 2011, available at [http://www.fiatspa.com/en-US/sustainability/FiatDocuments/Bilancio\\_2009\\_UK.pdf](http://www.fiatspa.com/en-US/sustainability/FiatDocuments/Bilancio_2009_UK.pdf).
19. Ford (2008). Blueprint for sustainability 2007/8, accessed May 22, 2011, available at <http://corporate.ford.com/doc/sr07-ford-sustainability.pdf>.
20. Ford (2009a). Blueprint for sustainability: Our future works (2008-09), accessed May 22, 2011, available at <http://corporate.ford.com/microsites/sustainability-report-2008-09/default>.
21. Ford (2009b). GRI content index for 2008-09 report, accessed May 22, 2011, available at <http://corporate.ford.com/microsites/sustainability-report-2008-09/gri>.
22. Ford (2010a). Assurance statement for 2009-10 report, accessed May 22, 2011, available at <http://corporate.ford.com/microsites/sustainability-report-2009-10/overview-assurance>.
23. Ford (2010b). Blueprint for sustainability: The future at work (2009-10), accessed May 22, 2011, available at <http://corporate.ford.com/microsites/sustainability-report-2009-10/default>.
24. Ford (2010c). GRI content index for 2009/10 report, accessed May 22, 2011, available at <http://corporate.ford.com/microsites/sustainability-report-2009-10/gri>.
25. Global Reporting Initiative (GRI, 2004). GRI automotive sector supplement - Pilot version 1.0, accessed May 22, 2011, available at <http://www.globalreporting.org/NR/rdonlyres/70611BE2-F097-4550-AEC7-D93B1A858D49/0/AutomotiveSectorSupplementPilot.pdf>.
26. Global Reporting Initiative (GRI, 2006). Sustainability reporting G3 guidelines, accessed May 22, 2011, available at <http://www.globalreporting.org/ReportingFramework/G3Online/>.
27. Global Reporting Initiative (GRI, 2011a). Sustainability data more reliable, accessed May 22, 2011, available at <http://www.globalreporting.org/NewsEventsPress/PressResources/2011/SustainabilityDataMoreReliableSaysNewFigures.htm>.

28. Global Reporting Initiative (GRI, 2011b). Sustainability reporting G3.1 guidelines, accessed May 22, 2011, available at <http://www.globalreporting.org/NR/rdonlyres/53984807-9E9B-4B9F-B5E8-77667F35CC83/0/G31GuidelinesinclTechnicalProtocolFinal.pdf>.
29. Global Reporting Initiative (GRI, 2011c). Sustainability reporting statistics, accessed May 22, 2011, available at <http://www.globalreporting.org/NR/rdonlyres/23A1D934-64BF-4934-ACB5-43CD4A41E48A/0/GRIReportingStats.pdf>.
30. Honda (2008). 2008 North American environmental report, accessed May 22, 2011, available at [http://corporate.honda.com/images/banners/environment/Honda\\_2008\\_North\\_American\\_Environmental\\_Report.pdf](http://corporate.honda.com/images/banners/environment/Honda_2008_North_American_Environmental_Report.pdf).
31. Honda (2009). 2009 North American environmental report, accessed May 22, 2011, available at [http://corporate.honda.com/images/banners/environment/Honda\\_2009\\_North\\_American\\_Environmental\\_Report.pdf](http://corporate.honda.com/images/banners/environment/Honda_2009_North_American_Environmental_Report.pdf).
32. Honda (2010). 2010 North American environmental report, accessed May 22, 2011, available at [http://corporate.honda.com/images/banners/environment/Honda\\_2010\\_North\\_American\\_Environmental\\_Report.pdf](http://corporate.honda.com/images/banners/environment/Honda_2010_North_American_Environmental_Report.pdf).
33. Hyundai (2007). The road to sustainability: 2007 sustainability report, accessed May 22, 2011, available at [http://csr.hyundai.com/download/Sustainability%28ENG%29\\_2007.pdf](http://csr.hyundai.com/download/Sustainability%28ENG%29_2007.pdf).
34. Hyundai (2008). The road to sustainability: 2008 Sustainability Report, accessed May 22, 2011, available at [http://csr.hyundai.com/download/Sustainability%28ENG%29\\_2008.pdf](http://csr.hyundai.com/download/Sustainability%28ENG%29_2008.pdf).
35. Hyundai (2009). The road to sustainability: 2009 sustainability report, accessed May 22, 2011, available at [http://csr.hyundai.com/download/2009\\_Sustainability%20report.pdf](http://csr.hyundai.com/download/2009_Sustainability%20report.pdf).
36. Hyundai (2010). The road to sustainability: 2010 sustainability report, accessed May 22, 2011, available at [http://worldwide.hyundai.com/Web/C\\_Sustainability\\_down/2010\\_reports.pdf](http://worldwide.hyundai.com/Web/C_Sustainability_down/2010_reports.pdf).
37. Kia (2011). Sustainable management, accessed May 22, 2011, available at <http://www.kiamotors.com/about-kia/sustainability-management/overview-activities.aspx>.
38. KPMG (2008). International survey of corporate responsibility reporting 2008, accessed May 22, 2011, available at <http://www.kpmg.com/Global/en/IssuesAndInsights/ArticlesPublications/Documents/International-corporate-responsibility-survey-2008.pdf>.
39. KPMG & Sustainability (2008). Count me in the reader's take on sustainability reporting, accessed May 22, 2011, available at <http://www.globalreporting.org/NR/rdonlyres/3F57ACC8-60D0-48F0-AF28-527F85A2A4B4/0/CountMeIn.pdf>.
40. Mays, K. (2010). Corporate average fuel economy: How automakers rank. Accessed May 22, 2011, available at <http://www.cars.com/go/advice/Story.jsp?section=fuel&story=cafe&subject=fuelList>.
41. Mazda (2007). Mazda social & environmental report 2007, accessed May 22, 2011, available at [http://www.mazda.com/csr/download/pdf/2007/e2007\\_all.pdf](http://www.mazda.com/csr/download/pdf/2007/e2007_all.pdf).
42. Mazda (2008). Mazda social & environmental report 2008, accessed May 22, 2011, available at [http://www.mazda.com/csr/download/pdf/2008/e2008\\_all.pdf](http://www.mazda.com/csr/download/pdf/2008/e2008_all.pdf).
43. Mazda (2009). Mazda sustainability report 2009: Towards a sustainable future for people and cars, accessed May 22, 2011, available at [http://www.mazda.com/csr/download/pdf/2009/2009\\_all.pdf](http://www.mazda.com/csr/download/pdf/2009/2009_all.pdf).
44. Mazda (2010). GRI index for 2010 report, accessed May 22, 2011, available at <http://www.mazda.com/csr/guideline/gri.html>.
45. Mazda (2010). Mazda sustainability report 2010, accessed May 22, 2011, available at [http://www.mazda.com/csr/download/pdf/2010/2010\\_d\\_all.pdf](http://www.mazda.com/csr/download/pdf/2010/2010_d_all.pdf).
46. National Highway Traffic Safety Administration (NHTSA, 2010a), CAFE fines collected, accessed May 22, 2011, available at [http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/Fines\\_Collected\\_112010.pdf](http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/Fines_Collected_112010.pdf).
47. National Highway Traffic Safety Administration (NHTSA, 2010b), Summary of fuel economy performance – October 28, 2010, accessed May 22, 2011, available at [http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/Oct2010\\_Summary\\_Report.pdf](http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/Oct2010_Summary_Report.pdf).
48. Nissan (2008). Sustainability report 2008, accessed May 22, 2011, available at <http://www.nissan-global.com/EN/COMPANY/CSR/LIBRARY/SR/2008/>.
49. Nissan (2009). Sustainability report 2009, accessed May 22, 2011, available at <http://www.nissan-global.com/EN/COMPANY/CSR/LIBRARY/SR/2009/>.

50. Nissan (2010). Sustainability report 2010, accessed May 22, 2011, available at <http://www.nissan-global.com/EN/COMPANY/CSR/LIBRARY/SR/2010/>.
51. Nissan (2010). GRI index, accessed May 22, 2011, available at [http://www.nissan-global.com/EN/COMPANY/CSR/GRI\\_GUIDELINE/](http://www.nissan-global.com/EN/COMPANY/CSR/GRI_GUIDELINE/).
52. PSA Peugeot Citron (2008a). 2007 sustainable development and annual report, accessed May 22, 2011, available at [http://www.psa-peugeot-citroen.com/document/publication/PSA-RA2007\\_GB1212139969.pdf](http://www.psa-peugeot-citroen.com/document/publication/PSA-RA2007_GB1212139969.pdf).
53. PSA Peugeot Citron (2008b). 2007 sustainable development performance indicators, accessed May 22, 2011, available at [http://www.psa-peugeot-citroen.com/document/publication/PSA\\_indicators\\_ENG1213262688.pdf](http://www.psa-peugeot-citroen.com/document/publication/PSA_indicators_ENG1213262688.pdf).
54. PSA Peugeot Citron (2009a). 2008 sustainable development and annual report, accessed May 22, 2011, available at [http://www.sustainability.psa-peugeot-citroen.com/upload/files/RADD\\_PSA\\_GB\\_Complet%2012%2006.pdf](http://www.sustainability.psa-peugeot-citroen.com/upload/files/RADD_PSA_GB_Complet%2012%2006.pdf).
55. PSA Peugeot Citron (2009b). Supplement to the sustainable development and annual report: 2008 sustainable development performance indicators, accessed May 22, 2011, available at [http://www.sustainability.psa-peugeot-citroen.com/upload/files/2008\\_Performance\\_Indicators\\_interactive.pdf](http://www.sustainability.psa-peugeot-citroen.com/upload/files/2008_Performance_Indicators_interactive.pdf).
56. PSA Peugeot Citron (2010). 2009 sustainable development performance indicators, accessed May 22, 2011, available at [http://www.developpement-durable.psa.fr/upload/files/IDD2009\\_ENG\\_full\\_version\\_printing.pdf](http://www.developpement-durable.psa.fr/upload/files/IDD2009_ENG_full_version_printing.pdf).
57. PriceWaterhouseCoopers (PwC, 2010). Global sustainability industries - Automotive, accessed May 17, 2011, available at <http://www.pwc.com/gx/en/automotive/issues-trends/sustainability.jhtml>.
58. Price WaterhouseCoopers (PwC, 2011). Independent Assurance Report on the Daimler Sustainability Report 2011, accessed May 22, 2011, available at [http://sustainability.daimler.com/daimler/annual/2011/nb/English/pdf/003\\_Pwc\\_ENG.pdf](http://sustainability.daimler.com/daimler/annual/2011/nb/English/pdf/003_Pwc_ENG.pdf).
59. Renault (2007). 2007 registration document, accessed May 22, 2011, available at <http://www.renault.com/en/Lists/ArchivesDocuments/Renault%20-%202007%20Interactive%20Registration%20Document.pdf>.
60. Renault (2008). 2008 registration document, accessed May 22, 2011, available at <http://www.renault.com/en/Lists/ArchivesDocuments/Renault%20-%202008%20Registration%20Document.pdf#page=292>.
61. Renault (2009). 2009 registration document, accessed May 22, 2011, available at <http://www.renault.com/en/Lists/ArchivesDocuments/Renault%20-%202009%20Registration%20Document.pdf>.
62. Responsible-investor.com (2010). ESG USA 2010: Global trends & US sustainable investing, accessed May 22, 2011, available at [http://www.responsible-investor.com/images/uploads/reports/ESG\\_USA\\_2010.pdf](http://www.responsible-investor.com/images/uploads/reports/ESG_USA_2010.pdf).
63. Roberts Environmental Center (2009). Motor vehicles and parts sector analysis - Pacific sustainability index scores: A benchmarking tool for online sustainability reporting, accessed May 22, 2011, available at <http://www.roberts.cmc.edu/PSI/PDF/MotorVehicle2009.pdf>.
64. SAM (2011). Yearbook 2011, accessed May 22, 2011, available at [http://www.sam-group.com/html/yearbook/downloads/SAM\\_Yearbook\\_2011.pdf?CFID=3170017&CFTOKEN=c1aade8d5493f7c9-17DC8281-9F8F-2534-43704784B62EC31D](http://www.sam-group.com/html/yearbook/downloads/SAM_Yearbook_2011.pdf?CFID=3170017&CFTOKEN=c1aade8d5493f7c9-17DC8281-9F8F-2534-43704784B62EC31D).
65. Sustainable Value (2009). Sustainable value in automobile manufacturing, 2nd edition, accessed May 22, 2011, available at <http://www.sustainablevalue.com/downloads/sustainablevalueinautomobilemanufacturing.pdf>.
66. SustainAbility (2010). Rate the raters - Phase two: Taking an inventory of the rating universe, accessed May 22, 2011, available at <http://www.sustainability.com/library/rate-the-raters-phase-two>.
67. Tata Motors Limited (2008). Corporate sustainability report 2007-2008, accessed May 22, 2011, available at <http://www.tatamotors.com/sustainability/pdf/GRI-report-07-08.pdf>.
68. Tata Motors Limited (2009). Global reporting initiative report 2008-2009, accessed May 22, 2011, available at [http://www.tatamotors.com/our\\_world/csr-pdf/GRI-report-08-09.pdf](http://www.tatamotors.com/our_world/csr-pdf/GRI-report-08-09.pdf).
69. Tata Motors Limited (2010). Wheeling innovation: Corporate sustainability report 2009-2010, accessed May 22, 2011, available at <http://www.tatamotors.com/sustainability/pdf/GRI-09-10.pdf>.

70. Toyota Australia (2009). 2009 sustainability report, accessed May 22, 2011, available at [http://www.toyota.com.au/toyota/environment/pdf/2009\\_Sustainability\\_Report.pdf](http://www.toyota.com.au/toyota/environment/pdf/2009_Sustainability_Report.pdf).
71. Toyota Australia (2010). 2010 sustainability report, accessed May 22, 2011, available at [http://www.toyota.com.au/toyota/environment/pdf/2010\\_TMCA\\_Sustainability\\_Report.pdf](http://www.toyota.com.au/toyota/environment/pdf/2010_TMCA_Sustainability_Report.pdf).
72. Toyota Europe (2008). 2008 sustainability report, accessed May 22, 2011, available at [http://www.toyota.eu/SiteCollectionDocuments/Sustainability%20report%202009/Archive/Sustainability\\_Report\\_2008.pdf](http://www.toyota.eu/SiteCollectionDocuments/Sustainability%20report%202009/Archive/Sustainability_Report_2008.pdf).
73. Toyota Europe (2009). 2009 sustainability report, accessed May 22, 2011, available at [http://www.toyota.eu/SiteCollectionDocuments/Sustainability%20report%202009/2009\\_sustainability\\_report.pdf](http://www.toyota.eu/SiteCollectionDocuments/Sustainability%20report%202009/2009_sustainability_report.pdf).
74. Toyota Europe (2010). 2010 sustainability report, accessed May 22, 2011, available at [http://www.toyota.eu/Lists/ECS%20Publications/TOYOTA001\\_RA\\_DEF29-09-10\\_01.pdf](http://www.toyota.eu/Lists/ECS%20Publications/TOYOTA001_RA_DEF29-09-10_01.pdf).
75. Toyota Europe (2010). GRI index, accessed May 22, 2011, available at <http://www.toyota.eu/sustainability/GRI/Pages/default.aspx>.
76. Volkswagen (2008). Sustainability report 2007/2008: We are moving into the future responsibly, accessed May 22, 2011, available at [http://www.volkswagenag.com/vwag/vwcorp/info\\_center/en/publications/2007/09/sustainability\\_report.-bin.acq/qual-BinaryStorageItem.Single.File/sustainability\\_report\\_07-08\\_engl.pdf](http://www.volkswagenag.com/vwag/vwcorp/info_center/en/publications/2007/09/sustainability_report.-bin.acq/qual-BinaryStorageItem.Single.File/sustainability_report_07-08_engl.pdf).
77. Volkswagen (2011). Sustainability report 2010, accessed May 22, 2011, available at [http://www.volkswagenag.com/vwag/vwcorp/info\\_center/en/publications/2011/05/Report\\_2010.-bin.acq/qual-BinaryStorageItem.Single.File/VWAG\\_Nachhaltigkeitsbericht\\_online\\_e.pdf](http://www.volkswagenag.com/vwag/vwcorp/info_center/en/publications/2011/05/Report_2010.-bin.acq/qual-BinaryStorageItem.Single.File/VWAG_Nachhaltigkeitsbericht_online_e.pdf).
78. Volvo Car Corporation (2008). 2007 sustainability report, accessed May 22, 2011, available at [http://www.volvocars.com/SiteCollectionDocuments/TopNavigation/About/Corporate/VolvoSustainability/vcc\\_sus\\_rep\\_en.pdf](http://www.volvocars.com/SiteCollectionDocuments/TopNavigation/About/Corporate/VolvoSustainability/vcc_sus_rep_en.pdf).
79. Volvo Car Corporation (2009). 2008-2009 corporate report with sustainability, accessed May 22, 2011, available at [http://www.volvocars.com/intl/top/about/corporate/volvo-sustainability/reports/Documents/VolvoCars\\_report\\_2008\\_ENG.pdf](http://www.volvocars.com/intl/top/about/corporate/volvo-sustainability/reports/Documents/VolvoCars_report_2008_ENG.pdf).
80. Volvo Car Corporation (2009). 2009 Volvo cars: GRI report, accessed May 22, 2011, available at [http://www.volvocars.com/intl/top/about/corporate/volvo-sustainability/Documents/Volvo\\_Cars\\_GRI\\_Report\\_2009.pdf](http://www.volvocars.com/intl/top/about/corporate/volvo-sustainability/Documents/Volvo_Cars_GRI_Report_2009.pdf).
81. Volvo Car Corporation (2011a). 2010 Volvo cars: GRI report, accessed May 22, 2011, available at [http://www.volvocars.com/intl/top/about/corporate/volvo-sustainability/Documents/Volvo\\_Cars\\_2010\\_GRI\\_report\\_LOCKED.pdf](http://www.volvocars.com/intl/top/about/corporate/volvo-sustainability/Documents/Volvo_Cars_2010_GRI_report_LOCKED.pdf).
82. Volvo (2011b). GRI Index 2010, accessed May 22, 2011, available at <http://www.volvocars.com/intl/top/about/corporate/volvo-sustainability/pages/gri.aspx>.
82. West, L. (2009). The Obama administration's CAFE standards, accessed May 22, 2011, available at <http://environment.about.com/od/environmentallawpolicy/a/obama-sets-new-fuel-efficiency-standards.htm>.

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