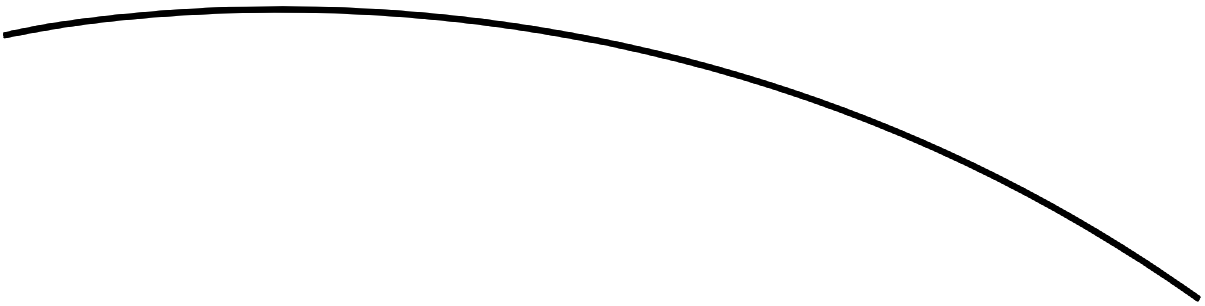
Mainstreaming of Climate Risks and Opportunities in the Financial Sector

Climate Change Risk Reporting in the Annual Reports 2006 of the European Automobile Industry

Axel Hesse

on behalf of Germanwatch



CLIMATE MAINSTREAMING

Mainstreaming of Climate Risks and Opportunities in the Financial Sector

Climate Change Risk Reporting in the Annual Reports 2006 of the European Automobile Industry

Axel Hesse

on behalf of Germanwatch

Summary

This survey analyses and evaluates the annual reports 2006 – audited by accountants – of major European automobile companies concerning appropriate reporting of climate change related risks and uncertainties. The reports were analysed with respect to whether they meet the requirements of the Directive 78/660/EEC and whether financial and non-financial key performance indicators relevant to particular businesses were included.

The information provided by the annual reports was evaluated by the author with ratings from [1] (very useful for investors) to [6] (not useful at all for investors).

The evaluation has shown that the information provided in the annual reports is not sufficient for analysts and investors to fully evaluate the financial and non-financial risks and opportunities caused by climate change impacts on the automobile industry sector. The results of the study indicate that German companies report worst regarding the performance indicator “fuel consumption”, while PSA Peugeot Citroën and Renault received the best ratings in comparison.

Imprint

Author:

Dr. rer. oec. Axel Hesse, SD-M Sustainable Development Management
Internet: http://www.SD-M.de
E-mail: Hesse@SD-M.de

Editors:

Christoph Bals, Miriam Brenck, Kristin Gerber

Publisher:

Germanwatch e.V.
Office Bonn
Dr. Werner-Schuster-Haus
Kaiserstr. 201
D-53113 Bonn
Phone +49 (0)228/60492-0, Fax -19
Internet: http://www.germanwatch.org
E-mail: info@germanwatch.org

Office Berlin
Voßstr. 1
D-10117 Berlin
Phone +49 (0)30/288 8356-, Fax -1

October 2007

Purchase order number: 07-4-05

ISBN 978-3-939846-26-0

This publication can be downloaded at:
http://www.germanwatch.org/corp/auto07.htm

With financial support from the Federal Ministry of Education and Research, grant no. 01LS05027. Responsibility for the contents of this publication rests with the publisher.

Contents

1 Introduction

The intention of this survey is to analyse and evaluate the annual reports 2006 – audited by accountants – of the European automobile industry concerning appropriate reporting of climate change related risks and uncertainties.

Analysed documents in Germany:

- BMW - Annual Report 2006,
- DaimlerChrysler - Annual Report 2006,
- Porsche - Annual Report 2005/06,
- Volkswagen - Annual Report 2006.

Analysed documents in France:

- PSA Peugeot Citroën - Registration Document 06,
- Renault - 2006 Registration Document.

Analysed documents in Italy:

- Fiat - Annual Report 2006.

The reports were analysed on whether they meet the requirements of the Directive 78/660/EEC, which was amended by the "Modernisation Directive" 2003/51/EC, as follows:

> "The annual report shall include at least a fair review of the development and performance of the company's business and of its position, together with a description of the principal risks and uncertainties that it faces.
>
> The review shall be a balanced and comprehensive analysis of the development and performance of the company's business and of its position, consistent with the size and complexity of the business;
>
> To the extent necessary for an understanding of the company's development, performance or position, the analysis shall include both financial and, where appropriate, non-financial key performance indicators relevant to the particular business, including information relating to environmental and employee matters; […]."

Investors and analysts want automobile companies to report especially on two non-financial key performance indicators:

- fleet consumption (see 2.2),
- energy and greenhouse gas intensity of the production[1] (see 2.3).

The conversion into German law was carried out through the "BilReG" act at the end of 2004. §§ 289, 315 HGB (German Commercial Code) were changed. This change was enforced within the annual reports of 2005, which include the management commentaries ("Lageberichte")[2].

[1] See Hesse, A., Deloitte (ed.): Sustained added value. Information demand of investors and analysts for sector-specific "Sustainable Development Key Performance Indicators" (SD-KPIs) in Management Commentaries (MCs) of Germany companies, Düsseldorf, Munich 2007, pp. 7-9.
[2] See Hesse, A., Deloitte (ed.): Added value, long term. Non-financial sustainability key performance indicators on their way into financial reports of German companies, Düsseldorf, Munich 2006, pp. 5-6.

2 Analysed and evaluated details

The following elements have been analysed and evaluated in detail (see appendix at the end of this survey).

The leading question of the analysis was to what extent the companies report concerning the following elements:

2.2 Sustainable Development - Key Performance Indicator (SD-KPI 1): fleet consumption

2.2.1. Opportunities and risks of regulative measures regarding the fleet consumption for the whole company

2.2.2. Opportunities and risks of regulative measures regarding the fuel consumption of different types of vehicles

2.2.3. Opportunities and risks of oil price changes and impacts on consumer's purchase decision

2.3 SD-KPI 2: Energy and greenhouse gas intensity of the production

2.3.1. Opportunity and risks regarding necessary changes in the production

2.4 Statements of the companies in the section risk management including legal proceedings

2.5 Reporting about lobbying activities regarding reductions in fuel consumption and/or further measures in climate change policies/regulations at EU level, in other important markets or at a global level

2.6 Projection/Outlook (more than two years)

2.7 Conventional vs. Sustainability ratings

2.8 Other information

2.9 Accountant

The author evaluated the information of the annual reports of the European automobile industry with ratings from **[1]** (very useful for investors) to **[6]** (not useful at all for investors).

To illustrate the content of the annual reports regarding the above mentioned questions, the survey cites the relevant sections of the reports.

2.1 Evaluation overview

SD-KPI 1: Fleet Consumption

	BMW	Daimler Chrysler	Fiat	PSA	Porsche	Renault	VW
sales-weighted average fleet-consumption	6	6	6	6	6	6	6
opportunities and risks of regulative measures *regarding the fleet consumption for the whole company*	5	4	4	3	6	2	4
opportunities and risks of regulative measures *regarding the fuel consumption of different types of vehicles*	5	4	3	2	6	2	6
opportunities and risks of *oil price changes and impacts on purchase decisions of consumers*	4	3	6	6	4	5	3

1 = very useful for investors, 6 = not useful at all for investors

SD-KPI 2: Energy and Greenhouse Gas Intensity of the Production

	BMW	Daimler Chrysler	Fiat	PSA	Porsche	Renault	VW
opportunities and risks regarding *necessary changes in the production*	3	6	5	3	5	3	4
risk management reporting including legal proceedings	3	3	6	4	6	5	4
reporting about *environmental complains* (legal proceedings)	6	5	6	4	6	6	6
reporting about *lobbying activities regarding reductions in fuel consumption* and/or further measures in climate change policies/ regulations at EU level, in other important markets or at a global level	4	5	5	5	6	3	5
conventional vs. sustainability ratings	4	3	6	6	6	3	6

1 = very useful for investors, 6 = not useful at all for investors

2.2 SD-KPI 1: Fleet consumption

The author conducted a survey to find out which sustainability indicators were considered of special importance to business development, position and expected development. It showed that all investors regarded fleet consumption as the most important criterion, followed by energy and greenhouse gas intensity of the production, which was named by 50% of the persons interviewed.[3]

The by far most important **Sustainable Development Key Performance Indicator (SD-KPI 1)** for the automobile industry[4], the **sales-weighted average fleet consumption** for 2006 (e.g. in g CO_2/km for the EU/worldwide, respectively miles per gallon for the USA), is not included in the seven analysed annual reports of the European automobile industries and therefore not available for **investors and analysts.**

None of the analysed companies reported on this aggregated SD-KPI 1.

[Evaluation: 6]

2.2.1 Opportunities and risks of regulative measures regarding the fleet consumption for the whole company

"The EU is the only large economic region in which no mandatory fuel efficiency values have been codified so far, as opposed to the USA, Japan and even China. For 2007 the EU commission has announced a legislation to secure – if necessary – the achievement of the 120 g CO_2/km target for 2012.

Assuming that all automobile manufacturers will have to meet the same average CO_2 emission value, WestLB has calculated additional costs per automobile of 85 Euros for Volkswagen, 329 Euros for BMW, 335 Euros for DaimlerChrysler and 2,132 Euros for Porsche. Investors and analysts will thus expect a disclosure of the most important SD-KPI "sales-weighted fleet consumption" in g CO_2/km for the EU resp. "miles per gallon" for the USA. Furthermore the effects on business' development, position and expected development should be estimated as well as exemplified and the underlying assumptions should be disclosed."[5]

Standard & Poor's study from March 2007[6] analysed **additional costs of about 600 to 3,000 Euros per vehicle** the automobile companies might face to meet the upcoming EU emission standards, which are currently discussed. The study advises that the **companies' position regarding this legislation process** and its **potential impacts on the business**

[3] See Hesse, A., Deloitte (ed.): Sustained added value. Information demand of investors and analysts for sector-specific "Sustainable Development Key Performance Indicators" (SD-KPIs) in Management Commentaries (MCs) of Germany companies, Düsseldorf, Munich 2007.
[4] See Hesse, A., Deloitte (ed.): Sustained added value. Information demand of investors and analysts for sector-specific "Sustainable Development Key Performance Indicators" (SD-KPIs) in Management Commentaries (MCs) of Germany companies, Düsseldorf, Munich 2007, pp. 7-9.
[5] Hesse, A., Deloitte (ed.): Sustained added value. Information demand of investors and analysts for sector-specific "Sustainable Development Key Performance Indicators" (SD-KPIs) in Management Commentaries (MCs) of Germany companies, Düsseldorf, Munich 2007, p. 9
[6] Standard & Poor's: Proposed EU Clampdown On CO_2 Emissions Threatens Profitability Of Europe's Automakers, March 2007.

development should be reflected in **scenarios** within the annual reporting. In fact, this has hardly been the case yet.

BMW reported that they achieved a relative reduction of their fleet consumption by almost 30% from 1990 to 2005, yet not mentioning the absolute consumption levels.

BMW aims at **offering the most efficient vehicle** (with no defined time horizon); however, BMW so far is **only** operating in the "relevant" **premium segments** with high absolute fuel consumptions. No information is given on possible consequences for the case that the premium segment gets under pressure due to its high fuel consumption. No economic impacts were described **[Evaluation: 5]**.

DaimlerChrysler reported losses at the US market. One reason, which DaimlerChrysler named, is a shift in consumer demand towards smaller, more fuel-efficient vehicles due to higher fuel prices. DaimlerChrysler spent a total of € 1.7 billion on environmental protection in 2006 (2005: €1.5 billion). Like BMW, DaimlerChrysler **reported only the relative reduction** in fleet consumption of passenger cars by 30% since 1990 **[4]**.

Fiat is **developing products with the "lowest impact on the environment" by reducing energy consumption**; downsizing is mentioned as one example. However, economic impacts - risks and opportunities - are not reported **[4]**.

PSA Peugeot Citroën, "Europe's leading manufacturer of fuel-efficient vehicles", named its **support of sustainable mobility** a strategic strength**.** This leads to a strong brand from this point of view. To significantly reduce overall emissions of CO_2, one has to **deploy the most efficient technologies to mass-produced models**. The Group sold more than 460,000 vehicles emitting less than 120 grams of CO_2 per kilometre in Europe in 2006 and has sold more than 1,500,000 since 2001. This means that in 2006, the Group accounted for 38% of all European sales of vehicles emitting less than 120 grams of CO_2 per kilometre and more than 62% of those cars emitting less than 110 grams of CO_2 per kilometre **[3]**.

In contrast, **Porsche** reported that a rise in fuel prices and increasing demands to reduce fleet consumption and exhaust emissions are leading to ever increasing standards for engine and product development. The **equity investment in Volkswagen AG** was mentioned, but not regarding the possible partial goal of a reduction of the fleet consumption **[6]**.

Renault reported its commitment to be "one of the top three carmakers" in terms of reducing CO_2 emissions until 2009. **By 2008, they want to sell one million vehicles per year emitting less than 140 g/km of CO_2**; of which one third is even supposed to emit less than 120 g/km of CO_2. This goal was set as an SD-KPI. By 2009, vehicles should be highly compatible for the usage of agrofuels. Regarding CO_2 emissions, Renault is already one of the three top-performing manufacturers in Europe. Renault **defined and calculated an indicator "cost per ton of CO_2 avoided" [2]**.

In general, there are two more things investors need to know for an appropriate evaluation of Renault's annual report: What is the detailed carbon strategy for the rest of Renault's fleet and what might be economic consequences of the carbon strategy for the whole company. Therefore, the provision of various scenarios would be helpful in this context.

Volkswagen stated: "The responsible use of environmental resources is a priority in all parts of the Group. The efficiency of the company's value drivers can be measured by means of financial and non-financial performance indicators." Furthermore, they said that their responsible approach to environmental matters contributes to the sustainable increase in their enterprise value. However, Volkswagen's comprehensive reporting on measures regarding the fleet consumption for the whole company (see table) does not provide a great value of information from an investor's point of view **[4]**.

2.2.2 Opportunities and risks of regulative measures regarding the fuel consumption of different types of vehicles

The information given here describes regulative risks and opportunities for different types of vehicles regarding their fuel consumption.

BMW reported positively about **diesel cars**, "Hydrogen 7", relative reductions and different "Efficient Dynamic" measures. Again, **no economic risks** – especially regarding vehicles with high CO_2 emissions - are mentioned **[Evaluation: 5]**.

DaimlerChrysler describes the **fuel cells** strategy, BLUETEC **diesel**, **Hybrid** and the **smart models** adding, however, some useful investment figures **[4]** with a lot of details about low emission cars (e.g. only 90g CO_2/km of the cdi-version of the "smart fortwo").

Fiat raises expectations for investors that further sales possibly increase with these types of low emission vehicles **[3]**.

PSA Peugeot Citroën also reported on emission-reducing types of engines and fuels with particular time ranges. Extra costs are mentioned, but not in detail. In comprehensive **tables**, all **different types of vehicles** were selected on the basis of their sales and environmental performances **[2]**.

Porsche's reporting again is inadequate **[6]**.

Renault reports similar to PSA. Economic consequences regarding the realization of the company's carbon strategy for the different types of vehicles would have been of greater interest for investors **[2]**.

Volkswagen fuels some confusion for investors in this section. On several double-pages of the formal management commentary ("Lagebericht"), different types of vehicles with non-sustainable emission values of up to 1,001 PS or 574 g CO_2/km are advertised. As a consequence, the earlier given statements on low-carbon cars and the sustainable enterprise strategy seem not trustworthy anymore **[6]**.

2.2.3 Opportunities and risks of oil price changes and impacts on purchase decisions of consumers

One important result of KPMG's Global Auto Executive Survey 2007 is that fuel efficiency is now the most important factor for the consumer's purchase decision. Yet, very little was reported to the investors in the annual reports referring to this hard fact. Surprisingly, the laggards of the latter sections achieved the better evaluations here: **BMW [4], DaimlerChrysler [3]**, **Fiat [6]**, **PSA [6]**, **Porsche [4]**, **Renault [5]** and **VW [3]**.

2.3 SD-KPI 2: Energy and greenhouse gas intensity of the production

2.3.1 Opportunities and risks regarding necessary changes in the production

While investors and analysts can not find sufficient information in relation to the sales-weighted average fleet consumption in the annual reports (see 2.1), **most of the analysed companies reported at least to some extent on SD-KPI 2 "Energy and greenhouse gas intensity of the production"**[7].

BMW reported comprehensively about several measures in plants, environmental management audits as well as recycling and logistics activities. More informative for investors are the following aggregated figures: **Over the last ten years, energy consumption has been reduced by more than 26% and CO_2 emissions by approximately 24%. Energy consumed per unit produced in MWh 2002-2006: 3.21-2.90; CO_2 emissions per unit produced in tons 2002-2006: 0.98-0.94. However, the reader misses absolute figures and an economic interpretation [Evaluation: 3].**

DaimlerChrysler did not provide information in the audited sections at all (see 2.11) **[6]**.

Fiat provided only a link to its comprehensive sustainability report **[5]**.

PSA Peugeot Citroën stated that since 1996, despite a sharp increase in the number of vehicles produced in concerning plants, the group has succeeded not only in containing total CO_2 emissions but even in reducing them for installations rated over 20 MW. Absolute greenhouse gas emissions (in tons) CO_2 N_2O CH_4; total CO_2 equivalent: 2004 (714,372), 2005 (687,496), 2006 (631,716) **[3]**.

Porsche without further explanation reported on capital expenditures on property, plant and equipment and intangible assets of 361.7 million Euro including measures related to environmental protection **[5]**.

Renault disclosed a graph which showed the energy consumption from 1998 to 2006 (MWh/vehicle): 1998: 2.42; 2006: 2.42. Since 2003, total direct emissions of greenhouse gases have decreased from 755 GteqCO_2 to 688 GteqCO_2 in 2006. An even more important **"Key Environmental Objective" was set for manufacturing processes: Cutting the energy consumption per vehicle manufactured by 2.5% annually** (manufacturing cut CO_2 emissions by 45% compared with 1998). Nevertheless, questions remain regarding the quantity of indirect emissions and again the economic impacts **[3]**.

Volkswagen reported the expenditures on environmental protection from 2002 to 2006 in a graph, which showed investments of 19 million Euros and reduced operating costs of 170 million Euro in 2006 (share of air pollution control: 19,9%; climate protection: 4,9%) **[4]**.

---

[7] See Hesse, A., Deloitte (ed.): Sustained added value. Information demand of investors and analysts for sector-specific "Sustainable Development Key Performance Indicators" (SD-KPIs) in Management Commentaries (MCs) of Germany companies, Düsseldorf, Munich 2007, pp. 7-9.

2.4 Risk management reporting including legal proceedings

BMW explained under the topic "**specific industry risks**" that **changes in fuel prices** (either market-induced or due to governmental tax policies) **and the increasingly stringent requirements to reduce fleet fuel consumption** as well as CO_2 and NOX emissions **continue to place high demands on the BMW Group's engine and product development.** The **statutory regulations for CO_2 emissions targeted by the European Commission** could have an adverse materially effect on the business development of the automobile segment and consequently on the group's profitability. However, no information was provided about the possible range of these adverse materially effects. **[Evaluation: 3]**

DaimlerChrysler reported in a similar way on consumer's preference for smaller, more fuel-efficient vehicles. This tendency could necessitate additional measures to **enhance the attractiveness of less fuel-efficient vehicles**, especially at the Chrysler Group, which would have adverse effects on DaimlerChrysler's profitability. A further **shift in the model mix towards smaller vehicles with lower margins** would also place an additional burden on the Group's financial position, cash flows and profitability. **Legal and political frameworks** also have a considerable impact on DaimlerChrysler's future business success (see 2.8). A range of these potential burdens and consequences for the whole premium segments of the group were not disclosed **[3]**.

Fiat did not provide corresponding information in this section **[6]**.

PSA Peugeot Citroën spoke about "**manufacturing risks**": Special attention is paid to the **environmental impact of manufacturing facilities**. However, the main environmental risks – or PSA's risk-decreasing opportunities – regarding the products (not the production) were not mentioned **[4]**.

Porsche did not provide corresponding information in this section **[6]**.

Renault's reporting is rather general **[5]**.

Volkswagen Research and Development and the procurement sector are investigating the use of alternative and recycled material. VW sees a **general risk of increased environmental protection regulations** with regard to global carbon dioxide emission caps. It is expected that the EU sets stricter requirements in its legislation primarily affecting diesel technology **[4]**.

The companies hardly reported on **environmental complaints (legal proceedings)** in this section **[6]**. Only **DaimlerChrysler [5]** and **PSA Peugeot Citroën [4]** briefly mentioned aspects corresponding to the environment. No company reported about the legal disputes with **the State of California** regarding emission reductions for the automobile industry which were pending at the time of publishing the annual reports.

2.5 Reporting about lobbying activities regarding reductions in fuel consumption and/or further measures in climate change policies/regulations at EU level, in other important markets or at a global level

As mentioned before, **Standard & Poor's** study from March 2007[8] analysed additional costs of about 600 to 3.000 Euros per vehicle the automobile companies might face to meet the upcoming EU emission standards, which are currently discussed. The study advises that the **companies' positions regarding this legislation process** and its **potential impacts on the business development** should be reflected in **scenarios** within the annual reporting. In fact, this was hardly the case:

BMW supports the Kyoto targets and the agreement made by the German Automobile Industry (VDA) to reduce fleet consumption by 25% in the period from 1990 to 2005. BMW contributed with a relative reduction of 30% for their own models. The BMW Group is also **making an active contribution towards fulfilling the voluntary commitment given by the European Automobile Manufacturers (ACEA) to the EU Commission.** This voluntary commitment envisages a 25% reduction in CO_2 emissions over the period from 1995 to 2008. This means that the European fleet average for passenger cars should be reduced to 140 gram per kilometre driven by the year 2008. However, **neither was mentioned** that the **ACEA target will not be achieved** according to current projections, **nor** that the **EU** has already discussed **mandatory targets for the European automobile markets**, which will be very important for the business development of the automobile industry. BMW **did not inform its investors about their corresponding lobbying position [4]**.

Daimler Chrysler only mentioned that **legal and political frameworks have a considerable impact** on DaimlerChrysler's future business success in general and that regulations concerning exhaust emissions and fuel consumption as well as the development of energy prices play a particularly important role. This general information is **not usable for investors [5]**.

Fiat reported far too brief and diffused about the European CAFE (Corporate Average Fuel Economy) plan **[5]**.

PSA Peugeot Citroën strongly encouraged the promotion of **agrofuels** by taking part in discussions on technical, business-relevant and political issues. No further disclosure of lobbying activities has been integrated **[5]**.

Porsche did not provide corresponding information in this section **[6]**.

Renault reported about 1998's voluntary commitment to the European Commission and the current **negotiations to reach a new target of 130 g CO_2/km by 2012** (CAFE) in Europe. Renault's CAFE indicator remained stable in 2005, placing Renault once again among the top three European carmakers. However, Renault did not clarify its lobbying position to the investors **[3]**.

[8] Standard & Poor's: Proposed EU Clampdown on CO2 Emissions Threatens Profitability of Europe's Automakers, March 2007.

Volkswagen only mentioned that they joined the **Clean Energy Partnership (CEP)**, a global demonstration project for emission-free mobility, **which tests the suitability of hydrogen** as a fuel for everyday use. The CEP is part of the German federal government's national sustainability strategy and will be in operation until December 2007 **[5]**.

2.6 Projection/Outlook (more than two years)

This section has not been evaluated in depths.

The main target here was to analyse the time horizon of formal projection in the annual reports. The outlooks provided differed between the year 2007 and 2007 to 2009. However, in other parts of the annual reports, long-term sustainability projections were given, reaching until the year 2020 (e.g. PSA Peugeot Citroën).

Taking the long-term model cycles of the automobile industry and the increasing importance of climate change impacts into consideration, one could advise the management to give long-term outlooks regarding climate relevance of fleet development to meet the information needs of the investors more adequately.

2.7 Conventional vs. Sustainability ratings

Sustainability aspects are becoming increasingly important as an element of capital market work.

BMW [4] and **Renault [3]** reported good results within **sustainability ratings and indices**. BMW did not name negative commentaries; Renault provided more comprehensive information. **DaimlerChrysler** reported even more impressive on how the conventional rating firm **Standard & Poor's** revised the outlook, taking into consideration, among other things, the **so-far unprofitable smart brand**. DaimlerChrysler reported that **Moody's** downgraded the company due to, among others, further financial pressure, resulting from **effects of shifting consumer trends** away from more profitable large SUVs and light trucks, with which the Chrysler Group generates most of its revenues, **to more fuel-efficient, less profitable smaller vehicles [3]**.

The **other companies** did not report on climate change issues in the rating section **[6]**.

2.8 Other information

This section has not been evaluated.

It gives the reader further information sources or newly applied financial reporting rules like IFRIC 5 (Rights to Interests arising from Decommissioning, Restoration and Environmental Rehabilitation Funds). See appendix below.

2.9 Accountant

According to law, all companies provided the information on which accountant was responsible for the annual report. This information was not evaluated.

3 Conclusion

Reporting on financial and non-financial impacts of climate change in annual reports has been a new topic for about three years now. However, recent surveys, e.g. from Deloitte, KPMG, Standard & Poor's and WestLB, have made clear that the topic is already **important for analysts and investors** and will become even more important soon.

The **evaluation of the annual reports** of the named European automobile companies shows, among other things, that:

- legislation in **France** leads to **more comprehensive annual reports** integrating sustainability issues,
- **no company totally fulfils the requirements of the Directive 78/660/EEC**, respectively §§ 289, 315 HGB (German law),
- the most important "Sustainable Development Key Performance Indicator" (SD-KPI) for investors and analysts, the **sales-weighted average fleet consumption for 2006** (e.g. in g CO_2/km for the EU/worldwide, respectively miles per gallon for the USA), **was not reported** by any of the enterprises on this aggregated level,
- the **reporting quality** of the evaluated sections ranged broadly from [2] to [6], on a scale from [1] (very useful for investors) to [6] (not useful at all for investors),
- **German companies were reporting worst** in the most important sections regarding fuel consumption (2.1), while PSA Peugeot Citroën and Renault received the best ratings,
- however, in other sectors the evaluation results were mixed (for details see 2.2 to 2.6).
- **Porsche reported worst** regarding climate and oil price related risks and opportunities of all analysed companies.

With the given information in the annual reports, analysts and investors are not able to fully evaluate the financial and non-financial risks and/or opportunities caused by climate change impacts on the automobile industry sector (fuel price, shifts in consumer behaviour, regulatory environment).

Therefore, the **horizon** for the formal **business outlook** regarding this important topic **should be expanded from 2 years to 5 to 15 years**.

So far, there is a **lack of monetarily quantified information regarding climate change impacts**.

Policy and market **scenarios** with transparent premises and methods would be the best mean **to improve the information value of annual reports/management commentaries** for investors.

4 Appendix - Analysed and evaluated details

The author evaluated the information of the annual reports of the European automobile industry with ratings from [1] (very useful for investors) to [6] (not useful at all for investors).

4.1 BMW

A.1 SD-KPI 1: Fleet consumption (2.2)

No reporting on this Sustainable Development Key-Performance Indicator.

[Evaluation: 6]

A.2 Opportunities and risks of regulative measures regarding the fleet consumption for the whole company (2.2.1.)

The BMW Group supports the Kyoto targets and has been working intensively for years to reduce its fleet's fuel consumption. Their **Energy strategy** is sub-divided into three steps:

According to the **short and medium term strategy** the fuel consumption of vehicles will be reduced by new, highly efficient engine generations, active aerodynamics, and the use of innovative lightweight materials and intelligent energy management of the vehicle. All of these activities fall under the concept of BMW "EfficientDynamics".

In the **medium term** BMW is working on achieving additional consumption benefits through various measures such as increasing the electrification of the drivetrain and hybridisation.

From the BMW Group's perspective, the most sustainable technology in the **long term** is the use of hydrogen in the combustion engine, since hydrogen can be produced from various regenerative energy sources with hardly any CO_2 emission (p. 30).

In recent years good progress has been achieved in reducing the fuel consumption level of the fleet. 1990-2005: reducing its fleet consumption by almost 30%; "**active contribution towards fulfilling the voluntary commitment** given by the European Automobile Manufacturers (**ACEA**)" (p. 30). Through its EfficientDynamics concept, the BMW Group is continually generating fuel consumption reductions with the **aim of offering the most efficient vehicle in each relevant premium segment** (p. 30). The BMW Group endeavours to make any new fuel consumption reducing technologies available to as many customers as possible, as soon as possible. This is seen as the only way to achieve ecological progress for the fleet as a whole (p. 32). The Brake Energy Regeneration system will also increase efficiency. Beginning in spring 2007, this technology will be included in all BMW 1 Series and 5 Series vehicles and will then be successively integrated into an increasing number of other models (p. 32).

[Evaluation: 5]

A.3 Opportunities and risks of regulative measures regarding the fuel consumption of different types of vehicles (2.2.2.)

The proportion of diesel-powered BMW cars is steadily increasing. Altogether **40% of BMW cars sold in 2006 were equipped with a diesel engine**. 2005: 39%; 2004: 34%. In many European markets, the number of diesel cars sold well exceeds the number of petrol cars sold; with the highest proportion in Portugal: 91%, France: 90%, Italy: 89 %. In absolute terms, the highest numbers of BMW cars with diesel engines are sold in Germany: 153,940 diesel-powered BMW cars were sold in 2006, 59% of the total sales volume.

BMW Group announced that it would also be offering diesel-powered BMW brand cars from 2008 onwards to customers in the USA, resulting in an even higher proportion of this type of car in the overall fleet; (See a graph on Deliveries of **BMWdiesel** automobiles in total and % 2002-2006 on pp. 16-17); more than 30% purchased the MINI model with the most powerful engine (the MINI Cooper S) (pp. 17). In 2006 BMW presented the **Hydrogen 7** [more details on p. 33] based on the BMW 7 Series, the first hydrogen-powered vehicle to be offered in the premium segment (p. 30).

The extent to which BMW achieved a fuel consumption reduction in recent years, is demonstrated by a **comparison of enterprise's best-selling models**. BMW 3 Series and BMW 5 Series, over four model cycles: new **BMW 525i requires 33% less fuel than** the BMW 525i from the model year **1982**. BMW 525i from the model year 2007 with 160 kW generates approx. 45% more power than the equivalent model from 1982. Substantial improvements were achieved despite much higher levels of safety and comfort requirements make the new BMW 525i 16% heavier than the equivalent model from1982. BMW 3 Series Sedan: **Compared to BMW 320i from 1983**, the **consumption level of the current BMW 320i is almost 23% lower** (p. 30). Further information has been also provided in graphs on p. 31.

The added efficiency improvement of BMW118i model 2004-2007: fuel consumption -19% (p. 31); new "High Precision Injection" petrol injection technology: world's first jet-guided direct fuel injection system suitable for large-scale serial production provides a practical solution for reducing consumption. In 2007 this technology will be introduced to the four-cylinder Otto engines of the BMW 1 Series and the six-cylinder Otto engines of the BMW 5 Series (p. 32). BMW Group will also introduce a Auto Start/Stop feature to their range of models, starting with the BMW 1 Series. This can help to save a relevant amount of fuel, especially for urban stop-and-go driving conditions (p. 32). The engine's electronics system calculates the optimum moment to change gear in terms of fuel economy (p. 32).

The potential reduction in fuel consumption offered by these EfficientDynamics measures in BMW1 Series is estimated around 14-19% (p. 32). BMW is also working on a hybrid version of the powertrain for its high-performance models in cooperation with General Motors and Daimler-Chrysler. A "Two-Mode" hybrid drive-system capable of reducing fuel consumption by up to 20%, both for urban driving and on highways (p. 32).

No reporting on economic risks regarding vehicles with high CO_2 emissions.

[Evaluation: 5]

A.4 Opportunities and risks of oil price changes and impacts on purchase decision of consumers (2.2.3.)

The raw material prices further increased over the course of 2006 due to a strong global economy growth. The growth rates had risen despite the greater impact of adverse factors. […] further hikes in the price of crude oil and other raw materials were the main reasons for higher costs for businesses and the further reduction in consumer buying power (p. 12). On page 13 a graph illustrates the prices per barrel of Brent Crude in US$ / Euro 2002-2006. After the summer peak of prices of approx. US Dollar 80 per barrel, oil prices then decreased sharply, settling towards the end of the year […] at approx. US$ 60 per barrel (pp. 13 and 39).

Specific industry risks are changes in fuel prices, which may be either market-induced or due to governmental tax policies and the increasingly stringent requirements to reduce fleet fuel consumption as well as CO_2 and NO_X emissions. All those risks continue to place high demands on the BMW Group's engine and product development (p. 59). The oil market will remain strained and consequently subject to volatility (p. 62).

[Evaluation: 4]

A.5 SD-KPI 2: Opportunities and risks with regard to the energy and greenhouse gas intensity of the production and the impacts of necessary changes in the production (2.3 + 2.3.1.)

The assembly of V-engines at the BMW Munich plant was completely redesigned in 2006 with a view to optimising efficiency, added value and flexibility (p. 18). The paint shop switched its entire energy supply to methane gas obtained from a nearby waste disposal site, thus helping the BMW Spartanburg plant to **decrease its carbon dioxide emissions by 53,593 tons in 2006** (p.19); High environmental and quality standards are maintained at all BMW Group sites. This was borne out once again in December 2006 when the certification audit of the production function, in accordance with DIN EN ISO 9001 and DIN EN ISO 14001 respectively, was successfully concluded (p.28).

Over the last ten years, for example, energy consumption has been reduced by more than 26% and CO_2 emissions by approx. 24% (using natural gas, district-wide heating and combined heat and power generation technologies as well as innovative energy projects that have been implemented at various BMW Group sites, groundwater cooling system to air-condition parts of the Research and Innovation Centre reduces CO_2 emissions by approx. 5,000 tons a year. Integrated painting process used at the MINI plant in Oxford, reduces the number of paint layers necessary from four to three (p. 28-29). All BMW Group vehicles are already optimised at the development phase by subsequent **recycling**. Moreover, many components installed into BMW Group vehicles are made out of materials derived from recycled parts. This saves valuable resources and conserves the environment (p.29). The BMW Group's environmental care activities also cover **logistics** with a focus on more ecologically sound transportation methods, such as ship and rail. In 2006: 32% of over-land transportation by rail (p. 29). **Energy consumed per unit pro-**

duced in MWh 2002-2006: 3.21-2.90; CO_2 emissions per unit produced in tons 2002-2006: 0.98-0.94 (graph on p.30).

[Evaluation: 3]

A.6 Statements in the section risk management (2.4)

Specific industry risks

Changes in fuel prices, which may be either market-induced or due to governmental tax policies, and the increasingly stringent requirements to reduce fleet fuel consumption as well as CO_2 and NO_X emissions, all **continue to place high demands on the BMW Group's engine and product development.**

The statutory regulations for CO_2 emissions targeted by the European Commission could have a materially adverse effect on the business development of the Automobile segment and consequently on the group's profitability (p. 59). A comprehensive Supplier Relationship Management system, which also takes social and ecological aspects into account, helps to reduce risk exposure (p. 59). Changes in the regulatory environment may impair the sales volume, revenues and earnings performance of the BMW Group in individual markets or economic regions (p. 60).

[Evaluation: 3]

A.7 Legal proceedings (2.4)

No reporting concerning environmental complaints/legal proceedings.

A.8 Reporting about lobbying activities regarding reductions in fuel consumption and/or further measures in climate change policies/regulations at EU level, in other important markets or at a global level (2.5)

The BMW Group supports the **Kyoto targets** and has been working intensively for years to reduce its fleet's fuel consumption (p. 30). In recent years, there has been good progress in reducing the fuel consumption level of the fleet. In accordance with the agreement made by the German Automobile Industry (VDA) to reduce fleet consumption by 25 % in the period from 1990 to 2005, the BMW Group has contributed significantly to this commitment by **reducing its fleet consumption by almost 30%** [also reported relatively in a graph on p. 31]. The BMW Group is also making an active contribution towards fulfilling the voluntary commitment given by the European Automobile Manufacturers (ACEA) to the EU Commission. This voluntary commitment envisages a 25% reduction in CO_2 emissions over the period 1995 to 2008.This means that the European fleet average for passenger cars should be reduced to 140 gram per kilometre by the year 2008 (p. 30). The potential reduction in fuel consumption offered by EfficientDynamics measures in BMW1 Series is 14-19%. "In this way, the BMW Group is making a signifi-

cant contribution to lowering fleet fuel consumption within the context of the voluntary ACEA commitment." (p. 32). The introduction of BMW "Hydrogen 7" will create a momentum to increase hydrogen supply coverage. BMW calls on the relevant networking partners in the fields of politics, science, research and business to build up infrastructures and promote technologies related to hydrogen as an energy source (p. 33).

[Evaluation: 4]

A.9 Projection / Outlook (for more than two years) (2.6)

An economic outlook for the automobile industry / BMW in 2007 is provided on page 62. BMW Group aims to continue its growth course in the coming years and, in comparison to the sector, will continue to generate above-average returns (p. 63).

A.10 Conventional vs. Sustainable ratings (2.7)

Business sustainability aspects are becoming increasingly important as an element of the BMW Group's capital market work, regular capital market discussions focused on Socially Responsible Investment (SRI), SRI Roadshows in London and Paris. BMW is again included as sector leader in the Dow Jones Sustainability Index, and with that BMW is the only enterprise in the sector that has been included in this important group of indices for sustainable investment for the eighth time in succession. For the last five years, it has also been a member of the relevant FTSE4Good index group. For the second time: Carbon Disclosure Project "Best in Class in 2006" for its strategy in the face of climate change, now included in the Climate Leadership Index. (CDP is evaluating companies on the basis of how they face up to the challenges of climate change (pp. 39-40).)

[Evaluation: 4]

A.11 Other information (2.8)

Production at the Steyr.

The plant now operates without creating any waste water (p. 19).

New financial reporting rules: IFRIC 5 (Rights to Interests arising from Decommissioning, Restoration and Environmental Rehabilitation Funds) (p. 78)

A.12 Accountant (2.9)

KPMG

4.2 DaimlerChrysler

B.1 SD-KPI 1: Fleet consumption (2.2)

No reporting on this Sustainable Development Key-Performance Indicator.

[Evaluation: 6]

B.2 Opportunities and risks of regulative measures regarding the fleet consumption for the whole company (2.2.1.)

Innovation & Technology Leadership is **evaluated by** the **success factors** drive-system technology, safety, reliability and customer satisfaction. The parameters measured include the results of crash tests or **fuel-consumption figures** (p. 37).

The overall expansion of worldwide **automotive markets slowed down** slightly in 2006. Global demand for passenger cars continued to grow at a positive rate (+3%), but slower than in the prior year, which is **due to steady increases of the prices for crude oil and fuel** (p. 39). Sales of passenger cars and commercial vehicles in the **United States** decreased slightly to 17.1 million units (2005: 17.4 million), partially as a result of higher financing costs caused by the continuous increase in interest rates and **repeated sharp fuel price rises**. The latter **led to a change in customer preferences**. In a comparison of vehicle segments, **small and fuel-efficient cars profited considerably at the expense of minivans, SUVs and pickups. The Chrysler Group posted an operating loss of €1,118 million in 2006**, compared with an operating profit of €1,534 million in 2005. […] These factors reflect the continuing difficult market environment in the United States during 2006 marked by an overall decline in industry sales, a **shift in consumer demand towards smaller, more fuel-efficient vehicles due to higher fuel prices** as well as the impact of higher interest rates. **These negative factors were partially offset by the market success of the new models**, most of which were launched in the second half of the year. **Several of these vehicles target this shift in consumer demand**, resulting in a positive earnings contribution during the fourth quarter of the year (pp. 39-40, 44); […] led to slightly lower research and development expenditure of €2.2 billion at the Mercedes Car Group.

Nonetheless, we succeeded in accelerating the ongoing development of drive-system technologies and emission reductions. The Chrysler Group's total research and development expenditure of €1.6 billion was lower than in the prior year. The focus was […] on hybrid vehicles: the Chrysler Group will launch a hybrid version of the Dodge Durango – its first hybrid model – in 2008 (p. 55).

Additional key areas of R&D activities at DaimlerChrysler were the further development of conventional drive-system technologies to **make engines even cleaner and more fuel efficient**. In order **to reduce CO_2 emissions** even further and to enable DaimlerChrysler to supply vehicles offering long-term sustainability, we are also working on lightweight components, alternative propulsion systems such as hybrid drive and fuel cells, and electronic systems for the improvement of vehicle safety (p. 55).

DaimlerChrysler **spent a total of €1.7 billion on environmental protection in 2006 (2005: €1.5 billion)**. Our prime goal in this area is to **make mobility sustainable for the future**. Therefore DaimlerChrysler permanently work on improving their products' environmental compatibility, **further reducing the fuel consumption and emissions of the gasoline and diesel engines, and developing alternative propulsion systems**. We use environmentally friendly production methods and **promote the improvement of fossil fuels and the development and application of regenerative fuels.**

In recent years, we have made further progress regarding the manufacturing processes and the emissions of their vehicles. **Since 1990, we have reduced the fleet consumption of our passenger cars in Germany by 30%**. In the past 15 years, we have reduced the exhaust emissions of our passenger cars by more than 70%, and have reduced emissions of particulate matter by more than 95% (p. 55). The Chrysler Group is working hard on the comprehensive renewal of its product range and on meeting the market's demand for more economical vehicles with lower fuel consumption (p. 75). The program comprises a combination of measures designed to increase revenues and reduce costs. In the long term, the redesigned business model will focus on achieving enhanced global presence and a shift in the product mix towards smaller and more fuel-efficient vehicles (p. 77). By further developing drive technologies and making increased use of lightweight components, we will make automobiles even more efficient, cleaner and more economical, thus reducing emissions, including carbon dioxide (p. 78). Significant expenditure is also planned for new technologies, with which we intend to improve the safety, environmental compatibility and fuel economy of road vehicles (p. 79).

[Evaluation: 4]

B.3 Opportunities and risks of regulative measures regarding the fuel consumption of different types of vehicles (2.2.2.)

DaimlerChrysler AG is a party in a joint venture for the development of **fuel cell systems**, and we are party to an agreement concerning the intellectual property rights in connection with a joint venture for the development of a hybrid drive system, which in the case of a change of control of one of the partners involved, allows the other partners to terminate the agreement (p. 34). With its **BLUETEC technology**, Mercedes-Benz is paving the way for a new generation of powerful and clean high-tech diesel engines (p. 37); with the Mitsubishi Fuso Canter Eco **Hybrid**, we offer our customers the world's cleanest vehicle in the light-truck segment (p. 37); in Western Europe, unit sales of commercial vehicles also increased once again in 2006. Truck sales were boosted in this market by pull-forward purchases triggered by the introduction of digital tachographs in May 2006 and the mandatory introduction of the Euro 4 emission limits in fall (p. 40).

DaimlerChrysler states that Unit sales of the **smart fortwo** developed positively. More units were sold than planned in the ninth and last year of production before the changeover to the new model (p. 40). Unit sales by Trucks NAFTA increased by 3% to 208,300 vehicles. This increase was primarily due to the effect of purchases being brought forward because of stricter emission regulations (EPA 07) effective as of January 1, 2007. Trucks Asia made progress compared with the prior year, selling 186,600 vehicles (+4%) of the Mitsubishi Fuso brand. This was the result not only of advance-purchase effects

caused by the introduction of new emission standards, but above all reflected regained customer confidence following our quality offensive (p. 40). The results of both years were significantly affected by special items. There were **expenses of € 946 million in connection with the discontinuation of production of the smart forfour** in 2006, while the realignment of the smart business model in 2005 resulted in charges of €1,111 million (p. 44).

Research and development expenses amounted to €5.3 billion in 2006 compared to €5.6 billion in 2005. Research and development expenses as a proportion of revenues were 3.5% (2005: 3.8%). The decrease is partially due to the fact that the prior-year figure includes research and development expenses for the smart forfour and higher expenses for the smart fortwo successor model. The deconsolidation of the off-highway business and currency effects also contributed to the reduction (p. 51).

Important milestone with **BLUETEC technology**: BLUETEC trucks are able to fulfil the strict Euro-5 emission limits that will come into force in October 2009. Mercedes-Benz sold 24,900 BLUETEC trucks in the year 2006. And all of our buses have been equipped with BLUETEC as standard equipment since the fall of 2006. In summer 2006, Mitsubishi Fuso started series production of the Canter Eco Hybrid, the world's most environmentally friendly light-duty truck.

Cars with BLUETEC will fulfil the strictest exhaust-emission limits worldwide. This new technology was launched in the United States and Canada in October 2006 in the Mercedes-Benz E320 BLUETEC. It is the **cleanest diesel car in the world**, due to its combination of optimized engine management and the new technology for exhaust-gas after treatment.

As of the year **2008,** it is planned to gradually launch **passenger cars on the European market with BLUETEC technology**. A precondition for this is the availability of low-sulfur diesel fuel all over Europe (p. 55).

DaimlerChrysler invested a total of € 5.9 billion in property, plant and equipment worldwide in 2006 (2005: €6.6 billion). Investments in property, plant and equipment of **€ 1.7 billion at the Mercedes Car Group** were slightly higher than in the prior year. The division's main capital expenditure was for production equipment for the new C-Class and the new smart fortwo (p. 60).

[Evaluation: 4]

B.4 Opportunities and risks of oil price changes and impacts on purchase decision of consumers (2.2.3.)

see 2.1: Global demand for passenger cars continued to grow at a positive rate (+3%), but slower than in the prior year **due to repeated increases in the prices of crude oil and fuel** (p. 39); Sales of passenger cars and commercial vehicles in the **United States** decreased slightly to 17.1 million units (2005: 17.4 million), partially as a result of higher financing costs caused by the continuous increase in interest rates and **repeated sharp fuel price rises**.

[Evaluation: 3]

B.5 SD-KPI 2: Opportunities and risks with regard to energy and greenhouse gas intensity of the production and impacts of necessary changes in the production (2.3 + 2.3.1.)

The **section "Sustainability" was not analysed within this survey**, because it is not audited. The audited parts are only the accompanying consolidated balance sheets of DaimlerChrysler AG and subsidiaries ("DaimlerChrysler") as of December 31, 2006 and 2005, and the related consolidated statements of income, changes in stockholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2006. (pp. 98-109)

[Evaluation: 6]

B.6 Statements in the section risk management (2.4)

Industry and business risks

[…] In some markets, the United States in particular, higher fuel prices have caused many consumers to prefer smaller, more fuel-efficient vehicles. This tendency could necessitate additional measures to enhance the attractiveness of less fuel-efficient vehicles, especially at the Chrysler Group, which would have adverse effects on our profitability. A further shift in the model mix towards smaller vehicles with lower margins would also place an additional burden on the Group's financial position, cash flows and profitability.

Product quality

[…] technical complexity continues to grow as a result of additional features, for example for the fulfilment of various emission and fuel-economy regulations, which increases the danger of vehicle malfunctions.

Legal and political frameworks also have a considerable impact on DaimlerChrysler's future business success. Regulations concerning exhaust emissions and fuel consumption and the development of energy prices play a particularly important role. The Group monitors these factors and attempts to anticipate foreseeable requirements during the phase of product development (p. 69). **[Evaluation: 3]**

B.7 Legal proceedings (2.4)

Other Notes:

Various legal proceedings, claims and governmental investigations are pending against DaimlerChrysler AG or its subsidiaries on a wide range of topics, including vehicle safety, **emissions and fuel economy**, financial services, dealer, supplier and other contractual relationships as well as intellectual property rights, product warranties, environmental matters and shareholder matters. Some of these proceedings allege defects in various components (including occupant restraint systems, seats, brake systems, tires, ball joints, engines and fuel systems) in several different vehicle models or allege design defects

relating to vehicle stability (rollover propensity), pedal misapplication (sudden acceleration), brakes (vibration and brake transmission shift interlock) or crashworthiness.

Some of these proceedings are filed as class action lawsuits that seek repair or replacement of the vehicles or compensation for their alleged reduction in value, while others seek recovery for damage to property, personal injuries or wrongful death. Adverse decisions in one or more of these proceedings could require us to pay substantial compensatory and punitive damages, or undertake service actions, recall campaigns or other costly actions (p. 194).

B.8 Reporting about lobbying activities regarding reductions in fuel consumption and/or further measures in climate change policies/regulations at EU level, in other important markets or at a global level (2.5)

Legal and political frameworks also have a considerable impact on DaimlerChrysler's future business success.

Regulations concerning exhaust emissions and fuel consumption and the development of energy prices play a particularly important role. The Group monitors these factors and attempts to anticipate foreseeable requirements during the phase of product development (p. 69).

[Evaluation: 5]

B.9 Projection / Outlook (for more than two years((2.6)

The statements made in the Outlook section are based on the operative planning of the DaimlerChrysler Group for the years 2007 through 2009. Based on the divisions' projections, DaimlerChrysler should achieve a significant increase in profitability in the planning period of 2007 through 2009 (p. 77).

B.10 Conventional vs. sustainable ratings (2.7)

According to S&P, the outlook revision acknowledged the structural improvements at the Mercedes Car Group, which had successfully been tackling its quality problems, and the improvements at the **so-far unprofitable smart brand**. (p. 62); Moody's downgraded the long-term ratings of DaimlerChrysler AG and its subsidiaries from A3 to Baa1, and placed all long-term ratings under review for possible downgrade […] **further financial pressure resulting from** […] (ii) the **effects of shifting consumer trends away from more profitable large SUVs and light trucks, with which the Chrysler Group generates most of its revenues**, to more fuel-efficient, less profitable smaller vehicles (p. 62).
[Evaluation: 3]

B.11 Other information (2.8)

The **section "Sustainability" was not analysed within this survey**, because it is not audited. The audited parts are only the accompanying consolidated balance sheets of DaimlerChrysler AG and subsidiaries ("DaimlerChrysler") as of December 31, 2006 and 2005, and the related consolidated statements of income, changes in stockholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2006. (pp. 98-109)

B.12 Accountant (2.9)

KPMG

4.3 Fiat

C.1 SD-KPI 1: Fleet consumption (2.2)

No reporting on this Sustainable Development Key-Performance Indicator.

[Evaluation: 6]

C.2 Opportunities and risks of regulative measures regarding the fleet consumption for the whole company (2.2.1.)

[…] Fiat is developing products with the lowest impact on the environment by reducing energy consumption, cutting emissions and increasing efficiency. In addition, the section illustrates research work carried out and its applications on environmentally-friendly mobility and traffic safety (p. 16).

Powertrain Research and Technology

The major objective [..] is to develop and apply innovative technologies for improving powerplant performance, cutting engine and vehicle emissions and boosting fuel economy. The Centro Ricerche, Fiat's most significant accomplishments for 2006 in this area are […]two-cylinder spark ignition engine, alongside Multiair electronic valve control technology (p. 17).

Downsizing is another stepping stone in **Fiat Powertrain Technologies' strategic path** towards achieving minimal CO_2 emissions. (p. 17)

For the future, work will continue on **developing the technological leadership of the common rail engine** (latest generation Multijet), relaunching the Fire family and gasoline engines in general, improving quality and **reducing fuel consumption**. (p. 75)

[Evaluation: 4]

C.3 Opportunities and risks of regulative measures regarding the fuel consumption of different types of vehicles (2.2.2.)

Hydrogen

For all of the intense effort that has gone into development and testing, hydrogen powered vehicles plying our streets and highways are still a long way in the future. But with an eye to that future, the **Fiat Group is concentrating on small, fuel cell city cars**: the Seicento Elettra H2 Fuel Cell unveiled in 2001, the Seicento Hydrogen in 2003, and now the Panda Hydrogen fuel cell, developed jointly with Fiat Auto.

The new car's performance is comparable to that of the conventional fuel-burning standard production Panda: with a 60 kW propulsion system, the fuel cell car reaches a top speed of 140 kph, accelerates from 0 to 50 kph in five seconds, and can climb 23% grades. Cruising range is 220 kilometres, and refuelling takes less than five minutes (p. 17).

Panda Multieco

A joint development by the Centro Ricerche Fiat, Powertrain Research and Technology in cooperation with Fiat Auto, the Panda Multieco concept with the most forward-looking applications of environmentally friendly processes and materials for both the interior and the body. This combination **cuts carbon dioxide emissions by 42% in the urban cycle and by 32% in the New European Driving Cycle (NEDC), where it produces only 90 g/km** (p. 18).

In 2006, Elasis continued its development and product engineering work on **Fire series engines**. This work focused on **reducing consumption and toxic emissions to meet Euro 5 limits**, on increasing performance, on improving quality and reliability, and on cutting costs. During the year, the Fire 1.4-litre 16-valve Starjet engine was put into production. Installed on the Fiat Grande Punto, the new engine combines excellent fuel economy with sparkling performance (p. 20).

In Brazil, the Sector delivered 464,800 cars and light commercial vehicles. It increased its sales by 15% from 2005 and confirmed its leadership position on the market. This excellent result is mainly attributable to the **success of flex versions** (which run on both alcohol and gasoline) of the Palio and Mille models, as well as the Fiat Idea, voted Carro Do Año (Car of the Year) in Brazil (p. 63).

The **Panda Hydrogen** was presented in February, as the prototype of an alternative fuel vehicle. In October, the model year and the typically sporty 100 HP version were presented. In March 2006, the diesel version of the Sedici was presented (p. 64); the Bravo was launched in Rome on January 31, 2007. This is the new model with which the Fiat brand intends to regain top positions in the medium-size segment, which is the most important in Europe. Highly stylised, it was designed with great attention to safety and equipped with top-rated engines in terms of environmental friendliness and performance. (p. 64)

Innovation also involved prototypes of low-emission light commercial vehicles with diesel and methane internal combustion engines (p. 72).

In the **methane engine** segment, activity continued with introduction of the Fire 1.2 CNG (Compressed Natural Gas) engine to be used on the Panda, p.75)

Huge resources were allocated in 2006 for the development of cutting-edge **powertrains** in terms of **exhaust emissions**. These involve projects that aim at compliance with the Euro 5 and Euro 6 standards. The target date for start of production on Euro 5 powertrains is the second half of 2008, in advance of the deadlines envisaged in applicable EU regulations (p. 75).

Looking to the future, FPT - I&M plans to reinforce its technological leadership in the field of engines for the whole range of truck, agricultural, industrial, and marine applications […] while also reducing fuel consumption (p. 75). Good sales performance was also achieved by the Tetrafuel system (which enables environmentally-friendly vehicles to run on four fuel types) which combines the ability to meter four types of fuel in a single control unit, supplied to Fiasa in Brazil (p. 76). **[Evaluation: 3]**

C.4 Opportunities and risks of oil price changes and impacts on purchase decision of consumers (2.2.3.)

Fiat did not provide corresponding information in this section. **[Evaluation: 6]**

C.5 SD-KPI 2: Opportunities and risks with regard to energy and greenhouse gas intensity of the production and impacts of necessary changes in the production (2.3 + 2.3.1)

In the section on environmental responsibility [of the separate not accounted Sustainability Report], the Group provides a comprehensive view of its attention to ensuring sustainable manufacturing practices at its production plants […] (p. 16). **[Evaluation: 5]**

C.6 Statements in the section risk management (2.4)

Nothing has been reported concerning the section risk management. **[Evaluation: 6]**

C.7 Legal proceedings (2.4)

Nothing has been reported concerning legal proceedings. **[Evaluation: 6]**

C.8 Reporting about lobbying activities regarding reductions in fuel consumption and/or further measures in climate change policies/regulations at EU level, in other important markets or at a global level (2.5)

In view of cutting CO_2 emissions, and thus fuel consumption, the CAFE (Corporate Average Fuel Economy) plan agreed on with Fiat Auto continued. This will make it possible to respect the fuel consumption limit self-imposed by European car makers (p.75).

[Evaluation: 5]

C.9 Projection/Outlook (more than two years) (2.6)

Nothing has been reported concerning projections. **[Evaluation: 6]**

C.10 Conventional vs. sustainable ratings (2.7)

No reporting on climate change issues. **[Evaluation: 6]**

C.11 Other information (2.8)

Sustainability Report Economic on environmental and social responsibility.

Now in its third year [..]. The Report is posted in the Sustainability section of the Group's website at www.fiatgroup.com (p. 16).

C.12 Accountant (2.9)

DELOITTE & TOUCHE

4.4 PSA Peugeot Citroën

D.1 SD-KPI 1: Fleet consumption (2.2)

No reporting on this Sustainable Development Key-Performance Indicator.

[Evaluation: 6]

D.2 Opportunities and risks of regulative measures regarding the fleet consumption for the whole company (2.2.1.)

Strategic Strengths

PSA Peugeot Citroën recognized innovation capabilities to **support sustainable mobility**. Aware of the environmental and social impacts of its products, PSA Peugeot Citroën markets cars equipped with technologies that address these challenges. The Group is developing **innovative products that express a strong brand image and appeal to car buyers, while sustaining its leadership positions in critical automotive technologies in the areas of environmental protection**, safety and the driving experience. PSA Peugeot Citroën's **success in reducing CO_2 emissions** has made it **Europe's leading manufacturer of fuel-efficient vehicles**. The Group is consolidating its leadership in diesel engines. Now widely recognized for its environmental performance, the Group's direct-injection, common rail HDi technology reduces CO_2 emissions by 20% compared with the previous generation diesels and by 30% compared with gasoline engines (p. 10).

Farther out, a wide variety of research programs are being conducted to align the automobile with a long-term commitment to sustainable mobility (p. 10).

The constant challenge of reducing greenhouse gas emissions:

Having made considerable progress in reducing pollutant emissions, the Group has now set a priority objective of reducing the amount of CO_2 emitted by Peugeot and Citroën vehicles.

PSA Peugeot Citroën believes that automobiles should be harmoniously integrated into their environment, which is why it is helping to abate the greenhouse effect by developing new technologies that improve fuel efficiency and reduce emissions. The focus is on improving internal combustion engines and promoting the more widespread use of biofuels, natural gas and other alternative energy sources, while also exploring future-facing technologies like diesel-electric hybrids and hydrogen fuel cells. **But to significantly reduce overall emissions of CO_2 – the only way to make a real impact on the environment— the Group is promoting technologies that can be deployed on mass-produced models**.

As part of its commitment to extending its **research** beyond the realm of cars, PSA Peugeot Citroën is also investing in major environmental and scientific initiatives, such as the **Peugeot carbon sink project in Brazil created in partnership with France's national forest service ONF**. While implementing this strategy, the Group is also actively integrating eco-design practices to make its cars highly recyclable (p. 90).

During the year, the Group also pursued its **commitment to downsizing,** to develop smaller, more fuel-efficient engines that deliver the same performance as the preceding larger models. This strategy **has driven a 10% improvement in fuel efficiency** while maintaining the same torque and power output. The Group sold more than 460,000 vehicles emitting less than 120 grams of CO_2 per kilometer in Europe in 2006 and has sold more than 1,500,000 since 2001.

This means that in 2006, the Group accounted for 38% of all European sales of vehicles emitting less than 120 grams of CO2 per kilometer and more than 62% of those emitting less than 110 grams of CO2 per kilometre (p. 90).

[Evaluation: 3]

D.3 Opportunities and risks of regulative measures regarding the fuel consumption of different types of vehicles (2.2.2.)

The Group's common-rail, direct-injection **HDi diesels** reduce CO_2 emissions by 20%, compared with the previous generation diesel and by 30% compared with gasoline engines. PSA Peugeot Citroën manufactured more than 1.4 million cars equipped with common-rail HDi powerplants in 2006, bringing total output to nearly 9.3 million units since 1998 (p. 90).

In Brazil, the world's largest producer of ethanol, the Group sells flex-fuel cars (the Peugeot 206 and 307, and the Citroën C3 and Xsara Picasso), with engines that automatically

adjust to biofuel/gasoline blends in varying proportions. These engines will be introduced on selected models in Europe beginning in mid-2007 (p. 91).

As another alternative fuel solution, the Group is exploring the possibilities offered by **compressed natural gas** (CNG) which, in comparison to conventional fuels, is high calorific, reduces greenhouse gas and other emissions by 20% compared with an equivalent gasoline engine and burns very quietly. The Group has signed the third CNG protocol aimed at developing this path in France (p. 91).

The combination of the **HDi diesel with a diesel-electric powertrain** delivers truly breakthrough performance in terms of fuel efficiency and CO_2 emissions. The Hybrid HDi can also run in battery only, zero-emissions mode. On a **compact family car, consumption falls to a remarkably low 3.4 liters per 100 kilometers (combined cycle), for CO_2 emissions of just 90 grams per kilometre**. Compared to the same vehicle fitted with an already very efficient HDi engine, the technology results in an **almost 30% improvement in fuel economy**. But the **extra costs must be reduced** so as to narrow the price gap between a hybrid and a conventional diesel to a more affordable level, similar to the one currently existing between a HDi and a gasoline engine. By capitalizing on research being conducted in partnership with research laboratories and equipment suppliers, the Group plans to **launch its first hybrid HDi cars in 2010**. (p. 91).

Hydrogen fuel cells offer a longer-term solution for the environment (p. 91). Research programs are aimed at making the development of automotive fuel cell technology both technically and financially feasible. The **challenges involved – lowering fuel cell costs, integrating fuel cells into vehicles, and storing and distributing hydrogen** – are often beyond the carmaker's control. As a result, the Group plans to gradually **introduce the technology beginning around 2020** (p. 92).

Tables for Peugeot and Citroën (2006): Environmental Indicators. Automobile fuel consumption and emissions.

The tables are not exhaustive. **The models were selected on the basis of their sales and environmental performance.** For each model, the table shows data for the gasoline and diesel versions offering the lowest CO_2 emissions and fuel consumption. Models in boldface are the best-selling gasoline or diesel version.

In certain cases, the best selling model is also the most fuel-efficient. (pp. 97-98)

[Evaluation: 2]

D.4 Opportunities and risks of oil price changes and impacts on purchase decision of consumers (2.2.3.)

Nothing has been reported. **[Evaluation: 6]**

D.5 SD-KPI 2: Opportunities and risks with regard to energy and greenhouse gas intensity of the production and impacts of necessary changes in the production (2.3 + 2.3.1.)

At least 95% of the average weight of new Peugeot and Citroën vehicles is **reusable and recoverable**, according to prevailing ISO standards and the Group's own calculations (p. 93).

Lowering energy consumption

All car making processes are energy intensive, whether foundry work, the cooling of machine tools, paint drying or heat treatment processes. The Group is committed to develop **action plans to reduce energy consumption at all its plants**. Among the most remarkable initiatives undertaken in recent years has been the installation of waste-to-energy units at three facilities.

Participation in the CO_2 emissions trading scheme

Seven plants in France and one in England that produce CO_2 from combustion installations that rated over 20 MW have been covered since 2005 by the procedures for transposing the European Union Directive on greenhouse gas emissions trading for the period from 2005 to 2007. Two plants in Spain joined the scheme in 2006. In France, the allowances for the first phase are calculated based on data for the 1996-2002 period. **Since 1996, despite a sharp increase in the number of vehicles produced at the plants concerned, the Group has succeeded not only in containing total CO_2 emissions but even in reducing them for installations rated over 20 MW**. This performance reflects the initiatives deployed since 1990 to reduce fossil fuel consumption (p. 94).

Environmental Indicators and air emissions from combustion plants

Emissions are calculated on the basis of energy consumption in compliance with the ruling of July 28, 2005 in the case of carbon dioxide and the circular of April 15, 2002 for all other gases.

Greenhouse gas emissions

Calculations in tonnes CO_2, N2O, CH4; **Total CO_2 equivalent:** 2004 (714,372); 2005 (687,496); **2006 (631,716)** (p. 102)

[Evaluation: 3]

D.6 Statements in the section risk management (2.4)

Manufacturing risks

Systematic prevention programs deal, in particular, with fire risks, risks concerning the supply of components and the protection of vehicle inventories. The Group invests in data protection and back-up programs, data processing centre security programs and training in data control techniques for employees. **Special attention is paid to the environmental impact of manufacturing facilities**. The design specifications of plant and equipment include processes and devices to control pollution and environmental risks. The corporate

Risk Management and Prevention Department centrally manages environmental risks related to manufacturing operations and regularly reports Group-level environmental data. The structures dedicated to managing environmental risks, at the Automobile Division's production plants and elsewhere in the organization, comply with ISO 14001 environmental management standards. Worldwide, 24 of the main Automobile Division production plants were ISO-certified as of end-2006. The ISO certification program is supported by annual capital expenditure budgets for environmental projects.

All industrial projects are reviewed by the design department; plant-concerned, technical department experts and Group environmental specialists in order to identify the potential risks and devise appropriate responses (p. 127). **[Evaluation: 4]**

D.7 Legal proceedings (2.4)

The Group **did not have to pay any penalties** concerning the environment in 2006 (p. 104).

D.8 Reporting about lobbying activities regarding reductions in fuel consumption and/or further measures in climate change policies/regulations at EU level, in other important markets or at a global level (2.5)

The Group strongly encourages the **use of biofuels**, which can be blended in substantially high proportions in Peugeot or Citroën vehicles without any technical modifications.

PSA Peugeot Citroën regularly **shares its experience** as a carmaker by **t**aking part in discussions on the technical, business and political issues raised by biofuels. It also **supports the development of biofuels** by validating potential applications under local energy policies.

In France, for example, the Group is a **member of the Diester Partners association**, which encourages the use of Diester® in three ways: 1. Forming a network to exchange information about using Diester® in higher percentages than the standard 5% (mainly in a 30% blend); 2. Promoting Diester®'s technical and environmental benefits to captive fleet managers; 3. Acting as a preferred interface with French and international authorities. (p. 91).

[Evaluation: 5]

D.9 Projection / Outlook (more than two years) (2.6)

Nothing has been reported. **[Evaluation: 6]**

D.10 Conventional / sustainable ratings (2.7)

No reporting on climate change issues. **[Evaluation: 6]**

D.11 Other information (2.8)

Stockholder Relations:

Visit www.sustainability.psa-peugeot-citroen.com to read the latest news about the Group's commitment to responding to the major human resources, social and environmental issues facing today's world (p. 254).

D.12 Accountant (2.9)

PWC

4.5 Porsche

E.1 SD-KPI 1: Fleet consumption (2.2)

No reporting on this Sustainable Development Key-Performance Indicator. **[Evaluation: 6]**

E.2 Opportunities and risks of regulative measures regarding the fleet consumption for the whole company (2.2.1.)

The equity investment in Volkswagen AG is mentioned (p. 15), but not regarding the possible goal of a reduction of the fleet consumption. Porsche reported that a rise in fuel prices and increasing demands to reduce fleet consumption and exhaust emissions are leading to ever-increasing standards for engine and product development (p. 18).

[Evaluation: 6]

E.3 Opportunities and risks of regulative measures regarding the fuel consumption of different types of vehicles (2.2.2.)

No relevant information was provided:
Carrera: customers going for the higher-performance model
Boxster: include modern, lower-consumption engines (p. 12)
The high-performance sports car Carrera GT phased out in May 2006. This success was driven by the sports car series (p. 13).

[Evaluation: 6]

E.4 Opportunities and risks of oil price changes and impacts on consumer's purchase decision (2.2.3.)

[…] the factors buoying the economy were far stronger than any negative effects caused especially by the rise in the price of oil, which at times was extreme (p. 12).

A further increase in crude oil and raw material prices could also restrict Porsche's profitability. Raw materials and crude oil form the basis for several components; rise in fuel prices […] leading to ever-increasing standards for engine and product development (p. 18). Although the effect of crude oil price increases on demand is difficult to quantify, expansion of the world economy is likely to continue and the prospects for 2007 are basically favorable (p. 20). […] **The oil price remains one of the largest risks for the global economy** (p. 21).

[Evaluation: 4]

E.5 SD-KPI 2: Opportunities and risks with regard to energy and greenhouse gas intensity of the production and impacts of necessary changes in the production (2.3 + 2.3.1.)

Capital expenditures on property, plant and equipment and intangible assets: 361.7 million Euro. This included measures related to environmental protection (p. 16).

[Evaluation: 5]

E.6 Statements in the section risk management (2.4)

No reporting concerning risk management. **[Evaluation: 6]**

E.7 Legal proceedings (2.4)

No reporting concerning environmental complaints/legal proceedings. **[Evaluation: 6]**

E.8 Reporting about lobbying activities regarding reductions in fuel consumption and/or further measures in climate change policies/regulations at EU level, in other important markets or at a global level (2.5)

Porsche did not provide corresponding information in this section. **[Evaluation: 6]**

E.9 Projection / Outlook (more than two years) (2.6)

Nothing has been reported. **[Evaluation: 6]**

E.10 Conventional vs. sustainable ratings (2.7)

No reporting on climate change issues. **[Evaluation: 6]**

E.11 Accountant (2.9)

ERNEST & YOUNG

4.6 Renault

F.1 SD-KPI 1: Fleet consumption (2.2)

No reporting on this Sustainable Development Key-Performance Indicator.

[Evaluation: 6]

F.2 Opportunities and risks of regulative measures regarding the fleet consumption for the whole company (2.2.1.)

The main non-product related investments were in quality, working conditions and the environment, as in 2005 (p. 52).

The Renault [T] ("square T") technology plan, launched in 2005, consists of preparing, analyzing, prioritising, scaling research and advanced technology activities so that they are consistent with the strategic priorities of Renault's Commitment 2009 in the following three main topics: safety; CO_2 and the environment as well as travelling comfort (p. 56).

Today Renault is among the top three carmakers in Europe in terms of reduced CO_2 emissions and fuel consumption. The range of available energies is progressively expanding. In Renault's Commitment 2009, a key performance indicator was set up to monitor progress in relation to the following commitment: "As of 2008, sell one million vehicles emitting less than 140 grams of CO_2 per km, with one-third of them emitting less than 120 grams." In 2005 in the 15-Member states of the EU, according to monitoring by the Association Auxiliaire Automobile (AAA), 568,789 vehicles were sold by Renault that emitted 140 grams or less of CO_2 per km, with 210,232 of them emitting 120 grams or less of CO_2 per km. Renault began providing this information to customers in January 2006; before it was legally obligated to do so (p. 86).

In biofuels, by 2009: gasoline vehicles: 50% of vehicles compatible with 80% ethanol mixes; diesel vehicles: 100% of vehicles compatible with 30% diester mixes.

When it comes to fuel consumption and CO_2 emissions, **Renault is already one of the three top-performing manufacturers in Europe**. The **aim** of the Renault Commitment 2009 ambitions is to **maintain this position** (pp. 56-57).

Renault is an active member of the Alliance for Synthetic Fuels in Europe (ASFE), formed in March 2006 in Brussels (p. 58).

The **life-cycle analysis** makes it easier to decide on the **best trade-off between environmental impacts that are often contradictory** and where the best compromise has to be found. For example between CO_2 and pollutant emissions, safety and weight; in the final decision on a product; or between the ELV phase and manufacturing at suppliers' in the process chain. Renault has gone further by including an **indicator** that combines the life-cycle analysis for each technology and alternative energy with their economic characteristics (technology cost, fuel prices, tax aspects, etc.).

This **"cost per ton of CO_2 avoided"** provides a **measure of environmental and economic efficiency** and a way to **rank these alternative solutions**. This comprehensive vision of all the greenhouse gases over the complete life cycle enables Renault and the Renault-Nissan alliance to work on a broad range of technologies (hybrids, fuel cells, on-board power management) as well as on today's and tomorrow's biofuels. **These solutions will be applied to Renault's vehicles when there is market demand for them, taking into account local resources** (p. 85). **[Evaluation: 2]**

F.3 Opportunities and risks of regulative measures regarding the fuel consumption of different types of vehicles (2.2.2.)

A new **gasoline engine**, the TCE 100hp, will be fitted on Clio, Modus and Twingo GT in first-quarter 2007. It combines the power of a 1.4 engine with the torque of a 1.6 engine and the consumption of a 1.2. Emitting just 140g of CO_2 per km, it is expected to become the new benchmark in terms of fuel consumption at this level of horsepower (p. 10).

Method 2 entails the creation of a project team, led by the head of Environmental Planning, to work cross-functionally and achieve the "120-140g" objective under Renault Commitment 2009. This effort **involves the engineering units in developing solutions to bring emissions down to about one hundred versions of the range to below the 120 gram and 140 gram limits**, and the commercial function for the **development of a marketing plan to sell the one million cars with these ratings** (p. 87).

Table: Results of the most representative gasoline and diesel versions for passenger car sales in 2006, e.g. fuel consumption and CO_2 emissions (p. 221).

[Evaluation: 2]

F.4 Opportunities and risks of oil price changes and impacts on consumer's purchase decision (2.2.3.)

Renault has gone further by including an indicator that combines the life-cycle analysis for each technology and alternative energy with their economic characteristics (technology cost, **fuel prices**, tax aspects, etc.). **[Evaluation: 5]**

F.5 SD-KPI 2: Opportunities and risks with regard to energy and greenhouse gas intensity of the production and impacts of necessary changes in the production (2.3 + 2.3.1.)

Graph: Energy consumption from 1998 to 2006 (MWh/vehicle): 1998: 2.42; 2006: 2.42.

Since 2003, total direct emissions of greenhouse gases have decreased from 755 GteqCO_2 to 688 GteqCO_2 in 2006 (p. 86).

Key Environmental Objectives

Cutting energy consumption per vehicle manufactured by 2.5% annually (Manufacturing cut CO_2 emissions by 45% compared with 1998). (p. 107) **[Evaluation: 3]**

F.6 Statements in the section risk management (2.4)

Renault is dedicated to make vehicles that are **environment-friendly** in terms of design, manufacture, operation and recycling. The Group also pays attention to the security and safety of people and facilities and to the impact of malfunctions arising from incidents such as fire, natural disasters, chemical spillage and so on (p. 20).

Risk factors apart from the systems and policies to reduce the environmental impact of Renault vehicles in the design, manufacture, operation and recycling phases (see Chapter 3.2 Environmental Performance).

Environmental risks are comprised of three aspects: environmental impact of malfunctions in plants; harm to individuals (staff and people living near the plants) as well as pollution of soil and groundwater due to past activities […] (p. 61).

[Evaluation: 5]

F.7 Legal proceedings (2.4)

Nothing has been reported. **[Evaluation: 6]**

F.8 Reporting about lobbying activities regarding reductions in fuel consumption and/or further measures in climate change policies/regulations at EU level, in other important markets or at a global level (2.5)

In 1998 carmakers made a commitment to the European Commission to bring average emissions down to 140 g of CO_2/km for total cars on the road, i.e. 25% lower than in 1995. The rating varies with the breakdown of sales. Negotiations are in progress to reach a **new target of 130 g of CO_2/km by 2012**. This CO_2 emissions indicator is called **CAFE** (Corporate Average Fuel Economy) for **Europe**.

Renault's CAFE indicator remained stable in 2005, placing Renault once again among the top three European carmakers (p. 87).

Environmental information relating to automobile products is governed by standards or regulations, stipulated in the approvals required for releasing a product. These cover fuel consumption, CO_2 emissions, pollutant emissions, noise and safety requirements. As part of the same process, automakers worked with the European authorities to agree on a regulatory percentage of vehicle weight that must be recyclable after December 15, 2008 (p. 95).

[Evaluation: 3]

F.9 Projection / Outlook (more than two years) (2.6)

Group sales will begin to grow again in 2007 (p. 55).

F.10 Conventional vs. sustainable ratings (2.7)

Ratings in 2006: **Innovest's Automotive Report,** released in June 2006, ranks Renault second, with an **AAA** rating out of the 19 carmakers analyzed.

Renault scored excellent ratings in the **2006 SAM Sustainability Yearbook**, and will consequently be **included in** both the **Dow Jones** Sustainability World Index and Dow Jones STOXX Sustainability Index for 2006/2007.

oekom scored Renault a B rating in 2006 and the Group was **ranked first** out of the 17 automakers analyzed […] (pp. 109-110). **[Evaluation: 3]**

F.11 Other information (2.8)

Communicating on environmental impacts

One of the fundamental principles of Renault's sustainable development policy is regular progress in improving the quality of information and making it available to all audiences. Non-financial sustainable development data have been included in Renault's registration document since FY 2002. Since 1999 the environmental data from the Automobile industrial have been verified by the Renault group's statutory auditors (p. 95).

F.12 Accountant (2.9)

DELOITTE, ERNEST & YOUNG

4.7 VW

G.1 SD-KPI 1: Fleet consumption (2.2)

No reporting on this Sustainable Development Key-Performance Indicator.

[Evaluation: 6]

G.2 Opportunities and risks of regulative measures regarding the fleet consumption for the whole company (2.2.1.)

Sustainable economic success demands competitive costs, innovative products and efficient processes. Customer satisfaction is the focal point of VW's efforts. Among the Volkswagen Group's key advantages are the expertise and commitment of its employees. **The responsible use of environmental resources is a priority in all parts of the Group**. **The efficiency of a company's value drivers can be measured by means of financial and non-financial performance indicators.** The key financial performance indicators for the Volkswagen Group are presented in detail in the "Net assets, financial position and results of operations" chapter. **The following section concerns non-financial value drivers, including** processes in the areas of research and development, procurement, production, sales and quality assurance. Furthermore, our employees and **our responsible approach to environmental matters contribute to the sustainable increase in our enterprise value** (p. 86). In 2006, our **research and development** activities again focused on improving the functionality, quality, safety standards and environmental compatibility of Group products (p. 86).

Drivetrain and Fuel Strategy

Particularly when it comes to developing powertrains, Volkswagen adheres closely to the requirements of sustainable mobility. We help to reduce local emissions and gases that are harmful to the global environment, and also to lessen dependency on oil (p. 99). **In the long term, we are concentrating our efforts on developing renewable hydrogen for fuel cells**, an approach with the **highest level of sustainability in terms of fuel-efficiency and emissions**. In 2006, important progress was made in our high-temperature **fuel cell research**. Thanks to the use of electrodes permitting a higher operating temperature for fuel cells, the new system is smaller, more efficient and less expensive than any fuel cells to date (p. 99). The **main focus of our fuel strategy** is on the **diversification of energy sources**. This means that a variety of materials will be used to generate fuels that are sold in existing filling stations and which can be used in modern vehicles all around the world. **Biomass**, which is **virtually CO_2-neutral**, plays a **central role** in this regard. In addition to oil and natural gas, it can be used to generate synthetic fuels, similar to modern diesel fuels. However, these fuels – particularly those based on biomass – are virtually free of sulphur and aromatics compared with conventional diesel fuel. This means that they are **fully compatible with other drivetrain components while significantly reducing both emissions and dependency on fossil fuels**.

Our next step will be to use new manufacturing processes to give fuels special properties that correspond to specific engine requirements. This will pave the way for **new com-**

bustion systems that will reduce fuel consumption and emissions even further. The **Combined Combustion System** (CCS) developed by Volkswagen is based on the use of these fuels. This system **combines the benefits of diesel and petrol engines** and may well prove to be one of the most important new engine concepts of the coming decades (p. 99).

Outstanding Environmental Protection

Due to the low emission and consumption values of its models, **Volkswagen was named the most environmentally friendly automobile manufacturer** in the "Alternative Powertrain Study" conducted for the first time in **2006** by the J.D. Power market research institute. The institute analyzed 37 car brands in the USA from a number of environmental aspects. Volkswagen performed extremely well in this study, with three models – Golf, Jetta and New Beetle – in the top 30 lowest-emission petrol and hybrid passenger cars; in addition, our diesel fleet was singled out as being particularly innovative (p. 99).

Group Strategy 2015 - Main Areas For Future Development

To an ever increasing extent, customer demand for individualization is determining the development trend in the automotive sector. In addition to this are **legal and social requirements regarding the responsible use of available resources**. Thus, the challenge facing the Volkswagen Group in the future is, on the one hand, to further diversify its products and, on the other hand, **to develop resource-friendly vehicles and powertrain concepts. The use of new, renewable energy sources is becoming increasingly important** regarding the finite nature of fossil fuels and the mounting climate debate (p. 112).

Investment and Financial Planning 2007 to 2009

Most of the total **amount invested in property, plant and equipment** in the Automotive Division during the planning period (**€11.8 billion**) will be spent on modernizing and extending the product range. **The main focus will be on successor models and new derivates in virtually all vehicle classes**. In this way, the Volkswagen Group continues its model initiative with a view to covering its markets more effectively. **In terms of powertrain production, new generations of petrol engines with improved performance, fuel efficiency and therefore lower emission levels will be introduced**. In future, we will use common rail technology for our diesel engines (p. 114).

[Evaluation: 4]

G.3 Opportunities and risks of regulative measures regarding the fuel consumption of different types of vehicles (2.2.2.)

The fuel consumption in l/100 km of the **Bentley Continental GTC** amounts to 26.2 urban and 11.9 extra-urban; 17.1combined. **CO_2 emissions in g/km are 410** (pp. 64-65).

The **Veyron 16.4** sets **new standards** with 736 kW (1,001 PS) and 0–100 kph acceleration in 2.5 seconds. Fuel consumption in l/100 km: 40.4 urban; 14.7 extra-urban; 24.1 combined. **CO_2 emissions in g/km amount to 574** (pp. 79-80).

Following the great success of the Caddy and Touran EcoFuel natural gas models, the **new Touran** also comes with a **natural gas** option as a further contribution towards reducing fuel consumption and emissions (Caddy Life EcoFuel: fuel consumption in kg/100 km: 8.2 urban; 4.7 extra-urban; 6.0 combined; CO_2 emissions in g/km amount to 157 / Touran EcoFuel: fuel consumption in kg/100 km: 8.1 urban; 4.5 extra-urban; 5.8 combined; CO_2 emissions in g/km amount to 153 (p. 87).)

[…] The **SEAT Leon Cupra**'s fuel consumption in l/100 km amounts to 11.4 urban; 6.5 extra-urban; 8.3 combined. **CO_2 emissions in g/km are 199** (pp. 90-91).

Diverse Environmental Protection projects undertaken by group brands

In 2006, in line with the Group's environmental principles, the brands undertook a variety of environmental protection projects. With the market launch of the **Polo BlueMotion**, the Volkswagen Passenger Cars brand started a sustainability initiative aimed at **preserving the world's resources**. In future, the designation BlueMotion will be used to indicate the **most economical version of a model**. Detailed measures such as longer gear ratios, aerodynamic fine tuning and engine modifications **reduce consumption, emissions** and ultimately the cost of running a vehicle, without compromising its dynamics (p. 98). With its victory in the Le Mans 24 Hours race, Audi furnished impressive proof that fuel efficiency and driving dynamics are not necessarily mutually exclusive.

With regard to petrol engines, our use of **TSI technology** – a petrol direct injection with integrated supercharger – builds on the successful TDI engine concept. TSI engines have **consumption levels of up to 20% less than other fuel injection engines** while retaining the same exceptional driving dynamics.

A further example of highly efficient drive technology is the **direct shift gearbox (DSG)**, which is considerably more effective than conventional automatic gearboxes, and **reduces fuel consumption by 15%**.

Hybrid drives play a central role in our drivetrain strategy in addition to petrol and diesel engines. Together with strategic partners and international universities, we are working intensively to **integrate hybrid drives in future series projects**. With the presentation of the Audi Q7 hybrid at the International Motor Show 2005 (IAA) in Frankfurt, the Volkswagen Group demonstrated its formidable potential in this area.

There is a high demand for the **Touran and Caddy-EcoFuel models** that were launched in the course of 2006. These are capable of **running on either natural gas or petrol**. **In natural gas mode, they emit up to 25% less CO_2**. Sulfur dioxide, soot and other particle emissions are almost completely eliminated (p. 99).

Lamborghini, the Murciélago LP640, has a fuel consumption of 32.3 urban; 15.0 extra-urban; 21.3 combined in l/100 km. CO_2 emissions in g/km: 495 (pp. 100-101)

[Evaluation: 6]

G.4 Opportunities and risks of regulative oil price changes and impacts on consumer's purchase decision (2.2.3.)

North America: While demand for light commercial vehicles was lower, primarily due to high petrol prices, new **passenger car registrations increased by 1.5% year-on-year to 7.8 million vehicles** (p. 53).

Asia-Pacific: The Japanese automotive market experienced a **slight decrease in demand**, primarily due to higher fuel prices (p. 54).

Europe: The share of **new passenger car registrations** attributable to diesel vehicles **exceeded the 50% mark** for the first time. While the number of new registrations increased year-on-year in the large Italian and German markets, it decreased in the UK, France and Spain, where demand was curbed by higher interest rates and even higher fuel prices than in 2005 (p. 54).

Risks arising from changes in demand

Demand risks can also arise owing to further increases in oil prices. We counter these risks by developing fuel-efficient vehicles as part of our drivetrain and fuel strategy (p. 104)

For the USA, we expect a slight overall increase in the market as a whole. Rising fuel prices will continue to shift demand from light commercial vehicles to passenger cars (p. 111).

[Evaluation: 3]

G.5 SD-KPI 2: Opportunities and risks with regard to energy and greenhouse gas intensity of the production and impacts of necessary changes in the production (2.3 + 2.3.1.)

Environmental Protection 2002-2006: Investments 19 million Euro in 2006, operating costs 170 million Euro in 2006 (p. 82).

Expenditure On Environmental Protection: Investments for environmental protection **consist of both product-related as well as production-related measures**. The investments in product-related measures relate mainly to the reduction of exhaust emissions. **The investments for environmental protection focused on expenditures on water pollution control and waste management.**

Operating costs relating to environmental protection **result exclusively from production-related measures**. They are broken down into expenditures for the operation of environmental protection equipment and expenditures not relating to such equipment. Operating costs relating to environmental protection were reduced by 12.3% to €170 million due to process optimization.

Operating costs for environmental protection at Volkswagen AG in 2006: Air pollution control 19,9%; Climate protection 4,9% (p. 83).

Environmental management in the group: Our Group environmental policy is characterized by an integrated approach that determines the **impact of products and production processes on the environment** in advance and takes these into account in the early planning stage. Our overriding objective is to develop solutions that are economically and ecologically sound, thereby minimizing the use of resources and reducing costs in the long term. The Group's environmental principles take into account our strategic guidelines as well as technical specifications, for example in the area of production. This ensures that comparable environmental standards exist in the Group's production processes worldwide. **All brands are responsible for implementing these standards in their respective locations** (p. 97).

For the Volkswagen-SiCon process developed together with SiCon GmbH, the EU Commission presented Volkswagen with the "European Business Award for the Environment" in June 2006. In this process, materials are recovered from the end-of-life vehicle recycling process and returned to the economic cycle as secondary raw materials. This environmentally friendly utilization of end-of-life vehicles as a source of raw materials helps to preserve natural resources (p. 99).

[Evaluation: 4]

G.6 Statements in the section risk management (2.4)

Risk Report

Opportunities are outlined in the Report on Expected Developments (p. 103).

Macroeconomic Risk

With regard to global economic growth, we see particular risks in changes in energy and commodity prices, growing protectionism and ongoing imbalances in foreign trade (p. 103).

Procurement Risk

The costs arising from persistently high commodity prices and the limited availability of certain commodities are countered by means of targeted strategies. Together with Research and Development, the Procurement area is investigating the use of alternative and recycled material (p. 103).

Environmental Protection Regulations

European End-of-Life Vehicles Directive - Conventional air conditioning systems still contain Hydrochlorofluorocarbons (HCFCs) as a cooling agent. EU legislation states that, as of January 1, 2010, HCFCs may only be used as a recycled material in existing systems for the purpose of maintenance. […]

Furthermore, there is a general risk of increased environmental protection regulations with a view to limiting global carbon dioxide emissions. As regards EU emissions legislation, stricter requirements are expected to be introduced, primarily affecting diesel technology. However, in the case of light and medium passenger cars, these requirements are

met by optimizing current technology. The exceptional status granted to heavy passenger cars, based on the threshold values of light commercial vehicles, is currently the subject of political debate. As the automotive industry has no experience of emissions aftertreatment for diesel vehicles and as the technology that must now be developed necessitates additional equipment and servicing, it is not possible to predict how customers will accept heavy passenger cars if this special status is withdrawn. The cost difference compared with petrol engines will also increase further. In future, diesel engines will also have to reposition themselves with regard to the obligation to add biofuels to fossil fuels, since diesel particulate filter technology does not permit any significant increase in the amount of biofuels added (p. 105).

[Evaluation: 4]

G.7 Legal proceedings (2.4)

Nothing has been reported. **[Evaluation: 6]**

G.8 Reporting about lobbying activities regarding reductions in fuel consumption and/or further measures in climate change policies/regulations at EU level, in other important markets or at a global level (2.5)

In mid-2006, Volkswagen AG joined the Clean Energy Partnership (CEP). The global demonstration project for emission-free mobility, involving a total of eleven companies, tests the suitability of hydrogen as a fuel for everyday use and determines its systems compatibility.

Through its commitment to this project, Volkswagen AG seeks to promote sustainable and environmentally responsible mobility and to gain key insights from the use of hydrogen technology under conditions similar to customer usage.

Volkswagen is adding a Touran HyMotion to the CEP fleet. The CEP is part of the German federal government's national sustainability strategy and will be in operation until December 2007. The project findings will be presented to the public as soon as the experiences of test customers, technicians and filling station operators have been evaluated (p. 98).

[Evaluation: 5]

G.9 Projection / Outlook (more than two years) (2.6)

The following information on **individual risks** relates to the **2007-to-2009 planning period** (p. 103)

Report on Expected Developments Sustainability ensures a successful future. In spite of high oil and commodity prices, the global economy and global automotive demand will

both continue to grow in 2007. Thanks to its expanded model range and innovative services, the Volkswagen Group expects deliveries to be slightly higher than in 2006 (p. 110)

G.10 Conventional vs. sustainable ratings (2.7)

No reporting on climate change issues. **[Evaluation: 6]**

G.11 Other information (2.8)

Sustainability Issues [not analysed within this survey, reason: not audited] (pp. 10-27)

The Board of Management answers Sustainability Group Topics
– ForMotionplus
– BLUETEC
– South Africa

Further information on Volkswagen AG **environmental management** is available on the website at www.volkswagen-nachhaltigkeit.de (p. 99)

IFRIC 5 Rights to interests arising from Decommissioning, Restoration and Environmental Rehabilitation Funds Jan. 1, 2006 Endorsed by EU Yes Effects Not significant.

G.12 Accountant (2.9)

PWC

CLIMATE MAINSTREAMING

Mainstreaming of Climate Risks and Opportunities in the Financial Sector

Germanwatch
PIK Potsdam-Institute for Climate Impact Research
University of Potsdam
Wuppertal Institute for Climate, Environment and Energy GmbH
DIW German Institute for Economic Research
http://www.climate-mainstreaming.net

contact

Christoph Bals, Project Coordination
bals@germanwatch.org
+49 (0)228 - 60492 11

Axel Hesse, SD-M Sustainable Development Management
hesse@sd-m.de, +49 (0)251-2394678

GERMANWATCH

P I K

Universität Potsdam

DIW Berlin

Wuppertal Institut für Klima, Umwelt, Energie GmbH