Sustainability Reporting of the Forest and Paper Sector

Recommendations for improvements of corporate responsibility reports of forest and paper companies based on quality assessments

Annekatrin Petereit
Supervisor: Ola Sallnäs

Swedish University of Agricultural Sciences
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Preface

This master thesis discusses sustainability reporting of the forest and paper sector. It represents the results of quality assessments of corporate responsibility reports published by several large forest and paper companies and provides recommendations for improvements of such reports that are published by the leaders and emerging sustainability reporting bodies of the sector headquartered in North America, Europe and the Asia-Pacific region.

The idea for this research emerged mainly during the policy course of the *Euroforester* study programme that I participated in at the *Sveriges Lantbruksuniversitet (SLU)* in Alnarp, Sweden. It was furthermore influenced by the general media attention and discourse on the issue of sustainability within today's businesses.

I found support for my interests in the topic of sustainability at the *Southern Swedish Forest Research Centre* while studying in Alnarp and started writing this thesis in March 2007 under the teaching supervision of Professor Leif Mattsson and Vilis Brukas. I would like to thank both of my mentors for their help during the development of my master thesis. I would also like to express my gratitude towards my father for his ever open door as well as my sister Franzi and my friend Nele for their open ears and helpful words in difficult times.

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Summary

This master thesis examines the quality of separate corporate responsibility (CR) reports published by companies of the forest and paper sector. It aims to provide recommendations for quality improvements of such reports and thus an enhancement of its usefulness for stakeholders and investors in particular. Quality assessments are conducted and recommendations are presented for the whole forest and paper sector, for emerging sustainability reporters of the sector and finally under consideration of forest and paper companies headquartered in North America, Europe and the Asia-Pacific region.

It is found that corporate responsibility reporting of the forest and paper sector follows general sustainability reporting patterns as examined in previous studies on other sectors. The quality of sustainability performance information provided by the sector is relatively low, with disclosure on social issues being weakest and information on environmental topics being relatively good. It is thus especially recommended to provide more detailed information on social sustainability performance that goes beyond data on workforce numbers, its diversity or occupational health and safety measurements. Additionally, companies of this sector should provide economic sustainability performance information that exceeds these given in annual reports. The revelation of information on environmental biodiversity as well as environmental effects of transport should be enhanced further. However, in contrast to other studies on non-forest and paper sectors, the use of external validation measurements by forest and paper enterprises is higher. Additionally, better quality of information on sustainability performance data was found for issues that are of particular relevance for companies of this specific sector.

Reports of larger companies were generally considered more up to date, more comprehensive and of higher quality than reports published by smaller ones defined as emerging sustainability reporting bodies. The largest differences in the quality of the published material were examined for forestry-related issues and social sustainability performance information, but also concerning the environmental topics of transport and compliance with laws and regulations. More detailed information on behalf of emerging sustainability reporting bodies is thus particularly recommended for the two latter issues as well as for reporting on society and product responsibility. Beyond this, more detailed information should also be delivered with regard to forestry-related certification, illegal logging and carbon sequestration/storage. External validation measurements as the use of GRI guide-

lines and third-party assurance should additionally find more consideration within the reporting of small forest and paper companies.

Clear differences were also detected with regard to the quality of reports published by North American, European and Asia-Pacific forest and paper companies. European companies have used GRI guidelines in the most extensive way and provide the highest level of quality on social and particularly environmental sustainability performance information as well as towards forestry-related issues. North American enterprises however performed best on economic sustainability performance information. In contrast, Asia-Pacific companies provide best quality of information on the forestry-related issue of illegal logging, whereas the quality of sustainability performance disclosure is generally inferior in comparison with the two other regions. Based on the region related findings, corporations headquartered in the Asia-Pacific region are advised to publish non-financial and particularly sustainability reports more extensively and enhance the quality of it by a more detailed and explicit reporting on all sustainability issues as well as information concerning forestry-related certification. Beyond this, more current non-financial reports as well as a more extensive use of external validation measurements are recommended for North American forest and paper companies. Additionally, North American enterprises should enhance the detailedness of reporting on forestry-related issues.

The findings of the thesis enlarge the field of research on sustainability reporting within the forest and paper sector and contribute to an overview of the status quo of corporate responsibility reporting practices in general.

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Abbreviations

AFS	Australian Forestry Standard (Certification)
ATFS	American Tree Farm System
Bn	Billion
CERES	Coalition for Environmentally Responsible Economies
CERFLOR	Programa de Certificacao de Florestas
CO_2	Carbon dioxide
CR	Corporate Responsibility
CSA	Canadian Standards Association
CSR	Corporate Social Responsibility
EHS	Environment, Health, and Safety
EMAS	Eco-Management and Audit Scheme
EPA	Environmental Protection Agency
EU	European Union
FFCS	Finnish Forest Certification Council
FSC	Forest Stewardship Council
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GRI	Global Reporting Initiative
ILO	International Labour Organization
ISO	International Organization for Standardization
IUCN	World Conservation Union (International Union for the Conservation of Nature and Natural Resources)
LEI	Lembaga Ekolabel Indonesia
MNC	Multinational Corporation
NGO	Non-Governmental Organization
NO_x	*A type of* Nitrogen Oxide
OECD	Organisation for Economic Co-operation and Development
PEFC	Programme for the Endorsement of Forest Certification schemes
PR	Public Relation
SEC	Securities & Exchange Commission
SFI	Sustainable Forestry Initiative
SGEC	Sustainable Green Ecosystem Council

SME	Small and Medium-sized Enterprise
SO_x	*A type of* Sulfur Oxide
TBL	Triple Bottom Line
UK	United Kingdom
UKWAS	UK Woodland Assurance Scheme
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
US	United States
WCED	UN World Commission on Environment and Development
WBCSD	World Business Council on Sustainable Development
PDF	Portable Document Format *(Adobe Acrobat)*

1 Introduction

"Sustainability has become an increasingly common term in the rhetoric surrounding business ethics, and has been widely used by corporations, governments, consultants, pressure groups, and academics alike" (Crane et al. 2007: 21). Nevertheless, the popularity of the sustainability term has not always been that of today. It emerged side by side with the environmental problems of globalization in the last century that called for political actions at a national and international level.

The oldest documented application of the sustainability term can be found in the German book *Sylvicultura oeconomica* published in 1713 from VON CARLOWITZ. Therein VON CARLOWITZ announced that the amount of wood cut should not exceed its growth rate. Meanwhile the sustainability idea was therefore already existent for approximately 300 years in the forestry sector, its today's importance and debate can be traced back to the political processes of the 1980s as the foundation of the UN World Commission on Environment and Development (WCED) in 1983 and its final report *"Our Common Future"* of 1987 as well as the 1992 UN Conference on Environment and Development (UNCED) in Rio de Janeiro. The WCED, established by the General Assembly of the United Nations in 1983, was asked to formulate "A global agenda for change" (United Nations 1987: 11) and thus to make progress in environmental politics. In the Commission's final report *"Our Common Future"* sustainable development was defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations 1987: 24) This definition is the most commonly quoted one regarding sustainable development and provides the basis for the debate on sustainability[1] until today.

[1] Giving an overarching **definition** of the terms "sustainability" or respectively "sustainable development" is difficult, due to the fact that these terms have been used with several different and evolving meanings in the public debate and scholarly literature (National Research Council 2000: 21) and no agreement of its meaning does exist within scientific, political or industry circles (Weber-Blaschke et al. 2005: 6). However, a clear distinction can be made between the terms "sustainability" and "sustainable development": Whereas "sustainability" is the target, "sustainable development" is the process towards this goal (Schaltegger et al. 2003: 22).
The definition of sustainability development provided by *Brundtland* considers two key concepts: the concept of needs and the concept of limitations. Whereas social justice is to accomplish between generations and within each generation, the limited capacity of the biosphere and ecosystem to handle human impacts must also be considered (Weber-Blaschke et al. 2005: 8). The concept of sustainability is thus acting on the assumption of three perspectives: the environmental, the social and the economic one. The triadic definition of sustainability published in the Rio document *Agenda 21* is often mentioned as the "traditional" (Weber-Blaschke et al. 2005: 8), "neoclassical" (Gowdyn 2000: 26) or "weak" (Schaltegger: S. 23) concept of sustainability, since it describes an equivalence of the three dimensions ecology, economy and society. In the "modern" (Weber-Blaschke et al. 2005: 9), "ecological economic" (Gowdyn 2000: 26) or "strong" (Schaltegger: S. 23) concept of sustainability the equality of the three components is repeated and human society with its underlying economy is understood as a part of environment. In addition to the dispute on weak and strong sustainability, the meaning of the term is also influenced by different perspectives regarding time and space. Whereas the time horizon implies equity between the generations, the perspective of space considers equity among different regions with completely different economic conditions as well as cultural traditions in the world. Further meanings of sustainability can emerge due to different values and interests, different intentions of the writers on sustainability or different perspectives and approaches of academic disciplines and research traditions (Renn 2005: 25).
However, despite the fact of a considerable number of definitions on sustainability, most of them can be seen as modifications of the definition given in the *Brundtland Report*, taking into consideration the needs and values of the present as well as the next generation.

At the Rio Earth Summit (UNCED) in 1992, the *Brundtland report's* "vision of the interdependence of development and environmental protection" (National Research Council 2000: 22) was elaborated and the term of sustainable development became accepted around the globe. The 1990s and the period following Rio were also a turning point for the environmental awareness of corporate businesses, since environmental concerns became a central part of corporate governance (Redclift 2005: 216).

In 1999 an important step regarding sustainability implementation within the private sector was taken with the announcement of the *UN Global Compact* by the United Nations Secretary-General KOFI ANNAN. The initiative encouraged public and non-public institutions worldwide to voluntarily adopt and report on the devised ten principles related to human rights, labor standards, environment and anti-corruption (Williams 2004: 756). The integration of the private sector into the political process of sustainable development was considered further by the *United Nations Millennium Declaration* resulting from the *Millennium Summit* in September 2000. Therein the member states commit themselves to "give greater opportunities to the private sector, non-governmental organizations and civil society, in general, to contribute to the realization of the Organization's goals and programmes" (United Nations 2000: 9).

At the UN World Summit 2002 in Johannesburg the global policy of sustainability was approved and courses of actions were determined. Emphasizing that corporate responsibility should be enhanced, the topic of accountability for the first time found attention at an UN conference (United Nations 2002: 4). For instance the issue of non-financial reporting has been referenced in the conference's plan of implementation (Palenberg 2006: 9). Additionally the demand for an effective implementation of transnational agreements, international initiatives and national regulations regarding corporate responsibility was addressed (Hauff 2002: 2). The ambition for sustainable development "in its economic, social and environmental aspects" (United Nations 2005: 2) as well as the "adoption of policies that emphasize […] corporate responsibility and accountability" (United Nations 2005: 6) was also attested and taken into consideration at the last World Summit 2005 in New York.

Working on sustainability within the private sector does not only mean to deal with economic, but also with environmental and social considerations. The component of economic sustainability can be seen as being inherent in companies operations, since it means to "secure the long-term economic performance" and to maintain the corporation's "attitude towards and impacts upon the economic framework where it is embedded" (Crane 2007: 26)

The environmental perspective of sustainability refers to the influence of a corporation's activities on the physical environment and addresses a number of critical business problems such as waste production, the impacts on biodiversity, the use of non-renewable resources or the emission of greenhouse gases. The social aspect of sustainability, remaining a relatively new development[2], claims for "social justice" (Crane 2007: 27) and considers aspects of human rights in general as well as several influences on employees, society and customers in particular (cf. GRI 2006: 30ff.) Although the consideration of social concerns into the concept of sustainability has occurred at last, the concept of corporate social responsibility can be traced back to the 1950s when the first publications on social responsibility (CSR) emerged in the US (Carroll 1999: 269). Regarding the integration of CSR and sustainability LOEW states an overlapping area of both concepts and classifies CSR, only covering ecological and social aspects, as an element of the concept of sustainability. (Loew 2004: 11ff.)

The business drivers for a sustainable management or the so called triple bottom line (TBL)[3] are seen in economic benefits, new markets opportunities, improved relationship with stakeholders, external and internal reputation benefits, and cost and risk reduction (Kolk 2003: 288). For three fourths of the world's largest companies economic reasons are most important (see KPMG 2005: 18), since corporate responsibility performance is increasingly in the focus of the financial sector. The *Equator Principles* or Sustainability Indexes as *Dow Jones Sustainability Index (DJSI)* or *FTSE4Good* as well as the emergence of Socially Responsible Investment Funds are developments reflecting this phenomenon.

Corporate reporting is a widely adopted possibility for the presentation of the targets, efforts and achievements concerning the implementation of the sustainability idea within the company's operations. Separate corporate responsibility (CR)[4] reports published voluntarily and regularly in addition to standard annual reports emerged first as environmental reports in the USA at the end of the 1980s. They were initiated mainly by public pressure and aimed at the presentation of the company's influence on environment. Since then reporting on sustainability issues has been widespread among diverse sectors and countries and evolved from pure environmental to a more comprehensive reporting that also provi-

[2] Whereas the maintenance of economic performance is inherent in the business operations and environmental sustainability concerns go back to the early 1980s, social concerns were integrated into the business concept of sustainability not until the 1990s in response to concerns with regard to the impacts on indigenous communities in less developed countries (Crane 2007:27).

[3] The common term "triple bottom line" refers to the underlying social, environmental and economic components of sustainability, which are sometimes also described as "people, planet, profit" (Liebetruth 2005: 44)

[4] Corporate responsibility reports are mentioned as CR reports in the following.

des information on social as well as economic aspects of sustainability[5]. External verification as an essential for the preparation of annual reports as well as the use of widely accepted guidelines such as that of GRI led to an improvement of the quality of non-financial reports in the previous years. Nevertheless, the quality of reports is often referred to as still low since useful performance information is lacking and a number of reports do only include "statements of policies and intention, without real substance" (Kolk 2003: 290).

Meanwhile there is a steady increase in the publication of CR reports visible, research on sustainability reporting has increased simultaneously and is characterised by a large variety of objectives and methodological approaches. A number of studies was aimed at the examination of dependencies between reporting behaviour and country (e.g. Gamble 1996, Holland/Foo 2003, Kolk 2005c) but also took into consideration sector, company size, media exposure, performance or other factors (e.g. Hackstone/Milne 1996, Adams 1998, Bewley/Li 2000, Ho/Taylor 2007). Further research was conducted by focussing at a benchmarking of companies or a general examination of the status quo of corporate responsibility reporting at the global level (e.g. UNEP/SustainAbility 2006, KPMG 2005) within a country (e.g. Milne 2003, Stratos 2005, Clausen et al. 2005, Daub 2006, Langer 2006, Vuontisjärvi 2006) or for a sector (e.g. Hopkins/Whitaker 1999, Mak et al. 2006, Wijk/Person 2007) by an evaluation of the availability as well as the extent or quality of report contents. Studies were based not only on the evaluation of separate types of non-financial reports as environmental or sustainability reports but sometimes also considered published environmental or sustainability information within annual reports or at companies' websites.

Research in the field of corporate responsibility reporting showed an increase in the publication of comprehensive separate sustainability reports and thus also a replacement of the release of corporate environmental reports in the very last few years (e.g. KPMG 2005). Companies of typically "more polluting" industrial sectors and the largest, most visible enterprises were identified as being most active in the publication of company-related sustainability information. Differences in the publication of reports as well as the quality and extent of content were found between several countries. European companies were thereby detected to provide a more complete environmental reporting than US American (e.g. Holland/Foo 2006.) or Asian ones (e.g. Mak 2006). The use of external measurements for an

[5] Regardless of the specific sustainability information included in extra-financial companies' reports, such publications are generally referred to as "non-financial reports" or "corporate responsibility (CR) reports" within this report. The term "sustainability report" is strictly used only for CR reports that include environmental, social and economic sustainability information.

improvement of the reliability of reports as the application of GRI guidelines or external verification was shown to have increased in the last years, whereas US American companies, however, used such measurements to a lower extent than enterprises from other countries (e.g. KPMG 2005). The quality of sustainability performance disclosure was generally described as low (e.g. Daub 2006, Quick 2006), whereby reporting on social issues often found least consideration (e.g. Stratos 2005, Clausen et al. 2005). Only very few studies were conducted on the corporate responsibility reporting of specific sectors and even less concerning forest and paper companies. A study concerning environmental reporting of the forest and paper sector was conducted by Sinclair and Walton (Sinclair/Walton 2003) who evaluated the breadth and depth of reporting on forest management and fibre procurement and found marked regional variations as well as a more prevalent reporting among larger companies. Further research on sustainability reporting extent and quality of the forest and paper sector was done in the cross-sectoral Canadian STRATOS study (Stratos 2005) that examined both the number of reporters and the detailedness of disclosure on sustainability performance in general as well as the three sustainability categories for ten sectors in total. A specific survey on the forest and paper sector's sustainability reporting conducted PwC (PwC 2007) at nearly the same time as this study evaluated the use of GRI guidelines and external verification and examined the extent of disclosure for a number of environmental, economic and social indicators for the largest and the smallest top 100 forest and paper companies. It furthermore analysed regional differences in corporate responsibility reporting. Except for the last mentioned PwC study no systematic research was made on forest and paper companies with different regional origins and sizes concerning the provision of sustainability performance information and quality or usefulness of CR reports in general.

It was thus found worthwhile to conduct a study within the limits of a master thesis that systematically evaluates the quality of CR reports published by enterprises of the forest and paper sector and to provide recommendations for quality improvements of such reports to enhance its usefulness for stakeholders and investors in particular. In doing so, the study at hand uses a sample of 18 of the global top 100 forest and paper enterprises and focuses on the detailedness and explicitness of disclosure and the use of external validation measures in non-financial reports (1) of the whole sector in comparison with other non-forestry sectors, (2) of "emerging sustainability reporters" meaning small forest and paper companies who recently published comprehensive sustainability reports for the first time or do still have only environmental reports available, and (3) of forest and paper companies

headquartered in North America, Europe and the Asia-Pacific region. This means that not only the status quo of reporting on sustainability is examined for the specific sector, but that additionally size as well as regional effects are in the focus of the research.
In contrast to the PwC study that considered only few indicators and the extent of information[6], the research of this master thesis is based on the evaluation of information quality on more than fifty sustainability performance indicators adapted from GRI G3 guidelines and additional six forestry-related indicators. The enterprises' use of GRI guidelines as well as third-party assurance statements as external measures for reports' quality is furthermore evaluated at the three levels of research. Additionally, the availability, the kinds and the timeliness of separate non-financial reports are examined under consideration of an extended sample of 27 forest and paper companies to assess the dependence between reporting activity and company's size or respectively its regional origin. Recommendations for an improvement of the reports' quality are based on the detection of generally sketchy consideration of specific sustainability performance issues as well as examined weaknesses in reporting in comparison with (1) other sectors, (2) the size-related "reporting leaders" and (3) the regional "reporting leaders".

The structure of the thesis is organized as the follows: Section 2 reviews the theoretical backgrounds concerning the practice of corporate responsibility reporting. In addition to a presentation of the development and today's status of non-financial reporting, the focus is furthermore on the factors that influence the company's selection of content issues. Detailed information is also given on specific previous research in the field of non-financial reporting. Section 3 provides a description of the study's methodology. Reference is made to the selection of companies, the evaluation of the availability, types and timeliness of non-financial reports, the assessment of the quality of CR reports and the recommendations for quality improvements. Section 4 represents the findings of the research in four subsections. In the first one, the results concerning the availability, types and timeliness of reports are presented and subsequently discussed. The three following subsections refer to the results, the discussion and the final recommendations concerning the quality of CR reports (1) of the whole forest and paper sector, (2) of "emerging sustainability reporting bodies" or small companies respectively, and (3) of forest and paper companies headquartered in North America, Europe and the Asia-Pacific region. Section 5 gives an overview of the final conclusions and reviews the study's limitations and requirements for further research.

[6] The *extent* of reporting means that specific issues were either reported or not. An assessment of the detailedness or explicitness and thus *quality* of information was not made.

2 Theoretical focus

"Acting responsible can only happen if there is […] transparent reporting" states RAKE and thus emphasizes the importance of reporting on corporate responsibility issues of companies (Rake in KPMG 2005: 2). Adversely PALENBERG announced that serious and well-managed sustainability reporting can be a driver for more sustainable behaviour (Palenberg et al. 2006: 6). Regardless of the differences in their statements both authors nevertheless agree that operating in a sustainable manner and sustainability reporting are closely linked together.

In the following, the historical development of corporate responsibility reporting, today's status and expectations regarding its future development will be described. Further attention is given to the motivations of corporations and to the awareness of stakeholders regarding sustainability reports. The last section covers the main factors that influence the selection of reporting content.

2.1 Development of CR reporting and its status today

Reporting on corporate responsibility issues has not always been the same. Several developments have taken place in the last centuries regarding the addressed issues, the intention of the particular companies, the surrounding backgrounds and the users of information.

2.1.1 Evolution of non-financial reporting

Reporting related to corporate responsibility issues can be traced back to a "first wave" in the 1970s when companies in the US and Western Europe implemented social reporting and accounting in the meaning of "the identification, measurement, monitoring and reporting of the social and economic effects of an institution on society", "intended for both internal managerial and external accountability purposes" (Epstein et al. 1976, cited by Kolk 2005b: 35). Albeit the amount of information published on social issues was limited and did frequently not exceed a quarter of a page (Kolk 2005a: 393), this development can be seen as the first step towards a more comprehensive corporate responsibility reporting. However, as a consequence of the increasing attention regarding economic issues in the 1980s, the number of US American Fortune 500 companies reporting on social issues in

their annual reports declined from 90 percent in 1978[7] to only a few such companies that continued being active in this field (Kolk 2005b: 35). As a result of the consciousness of the impacts of globalization and emerging environmental problems, reporting on non-financial issues reappeared in the late 1980s due to the pressure from non-governmental organisations (NGOs). Consequently, the first separate environmental reports were published in 1989 (Kolk 2005c: 146). Since then, environmental reporting became rather common for many large multinational corporations and to a lesser extent also for smaller firms (Kolk 2005c: 146). Especially the last decade's growth of separate corporate responsibility reporting is mentioned as "strong or […] phenomenal" (Palenberg 2006: 9). Additionally, the reporting became increasingly more comprehensive in the last few years, visible by the publication of a large number of sustainability reports covering not only environmental but also social and economic issues (KPMG 2005: 4). Industrial sectors, with its relatively high environmental impact, always led the way in this development. Sectors with a lesser environmental impact, as for instance the financial or the communication and media sector, were lagging behind in the realisation of non-financial reporting till this day (KPMG 2005: 13).

2.1.2 Today's reporting on corporate responsibility

The following section describes the characteristics of today's non-financial reporting practice. Detailed information is given to the motivations of companies as well as the awareness and expectations of shareholders with regard to the publication of sustainability information.

Corporate responsibility reporting practice and influences

After a steady growth in the number of reporting bodies in the previous years, it is estimated today that more than 1,900 institutions worldwide publish non-financial reports[8]. PALENBERG also states that nearly *all* companies in the industrialized world can be expected to publish information related to corporate responsibility due to legal requirements (Palenberg 2006: 9). The 2005 KPMG study found 52 percent of the world's largest companies[9] were publishing separate CR reports, which means an increase of seven percent absolute in

[7] The survey was conducted from Ernst & Ernst in the US in 1978 (see Kolk 2005b: 35).

[8] However, it is difficult to estimate an exact figure, since the responsibility reports can be scattered across various documents and sometimes reports are not accessible for the public. (Palenberg 2006: 9)

[9] The study of KPMG evaluated the reporting of the top 250 companies of the Fortune Global 500 and additionally the top 100 companies of 16 countries. Differently titled reports as "sustainability reports", "sustainable development reports", "CR reports" and "corporate social responsibility reports" are consolidated under the designation "corporate responsibility report". (KPMG 2005: 6).

comparison with 2002 (KPMG 2005: 9). Since the "links between the evolving sustainability agenda and the wider market opportunities are now better understood" (UNEP 2006: 2), there can also be seen an apparent "increasing professionalism" (Molenkamp in KPMG 2005: 3) in the reporting practice. Nevertheless, this professionalism does not mean any homogeneity in the field of corporate responsibility reporting. There rather exists a "wide variety of reports […] with substantial differences in length, approach, scope, and depth" (Kolk 2005a: 395), even if they are titled similarly. One highly important reason for this inhomogeneity and thus complicated comparability of non-financial reports is the voluntary practice (Palenberg 2006: 9). Neither exists there a global standing rule nor is there legislation for mandatory reporting in almost any countries. However, despite the voluntariness in the publication of CR reports, internationally accepted guidelines and standards ease the compilation and enhance the comparability of reports. More information on this topic is given later on.

Corporate environmental reports that were published separately from annual reports at the end of the 1980s for the first time can be seen as the "icebreaker" (Molenkamp in KPMG 2005: 3) for a more comprehensive form of corporate responsibility reporting that is common among the large multinational enterprises today. The terminology for this type of reporting, covering environmental as well as social and economic topics to a differing level of detail, varies; terms as "sustainability" -, "sustainable development" -, "corporate responsibility" -, and "corporate social responsibility" reporting are common (KPMG 2005: 6). The term "triple bottom line" reporting is also a synonym for sustainability reporting, but of minor importance in reports' titling. Despite the fact that corporate social responsibility (CSR) only covers the fields of environmental and social responsibility (see Loew 2004: 11ff.), CSR reports are also sometimes classified as sustainability reports[10]. Whereas environmental reports are still produced by a number of companies, the 2005 KPMG study found that comprehensive sustainability reporting "has […] become mainstream" (KPMG 2005: 4) among the worlds largest corporations. 68 percent of the biggest companies published reports including information on economic, environmental and social issues, whereas the remaining companies published "environmental and social", "environmental, health and safety" or pure "social" reports (KPMG 2005: 9).

The quality of CR reports has increased until today as the prevalence of sustainability reports as well as the number and proportion of reports with external assurance (verification)

[10] For instance, in the German document of ENGEMANN "CSR Bericht" (CSR report) and "Nachhaltigkeitsbericht" (sustainability report) are mentioned synonymously (Engemann 2005). KPMG also summarized "sustainability", "sustainable development", "CSR" and "CR reports" under the designation "corporate responsibility report" (KPMG 2005: 6).

among the largest companies show (Palenberg 2006: 14f.). Whereas sustainability reports cover not only environmental but also economic and social issues, third-party verification enhances the reliability of the published information. Another reason for the improvement of the reports' quality can be seen in the common use of the guidelines of the Global Reporting Initiative (GRI) (Kolk 2005b: 3). Nevertheless, and despite an "information overkill" (Pleon 2005: 7), the overall reporting quality is still low since many reports do not address relevant issues for stakeholders (Palenberg 2006: 15). The lack of useful performance information or respectively "hard" data that go beyond the formulation of general policies or intentions is criticised in several studies (e.g. UNEP et al. 2006: 9; Daub 2007: 84). Thus non-financial reports are rather often seen as PR instruments than as useful documents for stakeholders (KPMG 2005: 6; Pleon 2005: 6).

Traditionally, corporate responsibility reporting is highly concentrated in the OECD world and induced by pressure from NGOs regarding a greater accountability and responsible corporate behaviour (Palenberg 2006: 10f.). Within the OECD countries, Japan and the UK can be seen as leaders in the publication of CR reports. In 2005, 80 percent of the largest 100 Japanese companies published a separate non-financial report; whereas 71 percent of the 100 largest companies from United Kingdom did so as well[11]. In contrast only 32 percent of the largest 100 US American companies published a separate CR report (KPMG 2005: 10). However, non-financial reporting can be observed to increase also in developing countries due to market pressure and competitiveness. In the *Global Reporters* 2006 survey it is stated that the number as well as the quality of reports coming from non-OECD regions and countries improved considerably (UNEP et al. 2006: 32). South Africa and Brazil are in this connection seen as pioneers concerning the publication of non-financial reports. (Palenberg 2006: 9).

A number of studies found the respective sector as an important determinant for reporting on non-financial issues (e.g. Patten 1991, Hackstone/Milne 1996, Barth et al. 1997, Adams 1998) Thereby the industry effect is usually greater than the before mentioned country effect (Kolk 2005a: 396). Typical "pollution intensive" industrial sectors have always been most active in the publication of non-financial reports (KPMG 2005: 4; Kolk 2005b: 35). The 2005 KPMG study showed that the majority of companies with separate CR reports are part of either the "utilities", "oil and gas", "chemicals and synthetics", "mining" and "forest, pulp and paper" sector[12] (KPMG 2005: 12). However, "CSR reporting is moving

[11] For more information with regard to the performance of other countries see: KPMG 2005, page 10f.

[12] KPMG investigated the publication of CR reports among the 100 largest companies in 16 countries. 61 percent of corporations within the "utilities" sector published a separate CR report, which means the highest percentage in comparison with other sectors. 52 percent of

away from the dirty and dangerous" (Pleon 2005: 7) and thus finds growing consideration also by companies of sectors with only slight environmental impact. For instance, the number of banks or insurance companies with separate CR reports has increased considerably in the previous few years (KPMG 2005: 12f.).

With regard to the companies' size reporting on corporate responsibility is common among the largest corporations, but exceptional for small and medium-sized enterprises (SMEs) (Palenberg 2006: 12). This phenomenon can be explained by four important factors at least: (1) the visibility of companies and thus the pressure from the public, (2) the pressure from competitors, (3) the capacity to produce reports, and (4) the return of the investment (production of a report). Pressure from the public mostly concentrates on the most visible and thus largest multinational corporations. Thus, primarily the largest companies are most active in disclosing information on their environmental and social performance. (Kolk 2003: 289). Pressure is also exerted on corporations due to the publication of non-financial reports by competing companies. This matter of fact already resulted in wide-spread reporting among the largest enterprises, caused by expected disadvantages in case of non-reporting and "clearly herding effects" (Palenberg 2006: 21). Due to the fact that only a very small number of SMEs is publishing non-financial reports (Palenberg 2006: 13), a bandwagon effect is hardly to expect. Furthermore it is assumed that only large companies have the capacity to produce non-financial reports, whereas resources are lacking for SMEs (Toal 2007: 4). Additionally the correlated investment of time and money for the production of CR reports would not produce a good an acceptable return for SMEs (Palenberg 2006: 13). A number of studies as those conducted by ADAMS (1998), ALNAJJAR (2000), BEWLEY/LI (2000), CORMIER/MAGNAN (2003) and HO/TAYLOR (2007) found an increase in voluntary disclosure with increasing firm size.

In addition to the pressure and expectations of stakeholders, the resource-limited ability to report and regardless of legal requirements, the perception of managers concerning the usefulness of reporting can furthermore be assumed as an important factor with regard to promotion and development of reports publication (Kolk 2005a: 396). On the other hand it is unclear, how far the performance of a company is influencing its reporting activity (Kolk 2005a: 396), since several studies arrived at different conclusions.

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companies within the "oil and gas", the "chemicals and synthetics" as well as the "mining" sector and 50 percent of companies within the "forestry, pulp and paper" sector did so. For more information see KPMG 2005, page 12f.

The companies' view: Motivations for non-financial reporting

Except for regulatory requirements influencing the reporting practice, companies have various reasons to publish sustainability performance information. Following the legitimacy theory that was adopted and approved in several previous studies (e.g. Patten 1992, Neu et al. 1998, Milne/Patten 2002, O'Donovan 2002, Staaden/Hooks 2007), voluntary revelation of data legitimizes the companies management and prevents social and governmental sanctions (Berthelot et al. 2003: 17). It must thus be seen as the fundamental background of more specific drivers for corporate responsibility reporting belonging together. KOLK lists a number of specific reasons, e.g. the enhanced ability to track progress against specific targets, the ability to communicate efforts and standards as well as improved all-round credibility from greater transparency and reputational benefits, cost savings identification, increased efficiency, enhanced business development opportunities and enhanced staff moral (Kolk 2004b: 54). Taking the close relationship between sustainability implementation and reporting into account, the study results of the 2005 KPMG survey exploring the driving forces for corporate responsibility can be considered also as drivers for the analogous reporting. The results show that 74 percent of the surveyed companies have economic reasons for corporate responsibility behaviour, whereas 53 percent work on sustainability because of ethical considerations or accordingly because of innovation and learning. Other important drivers are seen in employee motivation, risk management or risk reduction, access to capital or increased shareholder value, reputation or brand, the company's market position, strengthened supplier relationships, cost saving and improved relationships with governmental authorities (KPMG 2005: 18). In a recent study PALENBERG et al. found that shareholder pressure is most important for companies to report. The "strategic management of brand and reputation" has top priority for the publication of non-financial reports, whereas the importance of pressure from competitors ("reporting because competitors are doing so") and pressure from NGOs ranked second and third (Palenberg 2006: 20f.). The 2005 PLEON study also shows that one third of interviewed company representatives see the motivation for reporting in the "creation of business value through CSR", whereas a further third mentioned "engagement and accountability" as key motivation. PR, on the other hand, is only mentioned by 10 percent of the respondents (Pleon 2005: 17). In summary it can be stated that economic interests are the key drivers for companies to publish voluntarily CR reports rather than ethical or political backgrounds.

On the other hand, companies also have several reasons for non-reporting. Managers may refrain from reporting if they assume shareholders do not need specific information or can

find it easily from alternative sources (Berthelot et al. 2003: 6). Moreover, companies are expected not to disclose sustainability information if there are doubts concerning the advantages for the organisation, if customers are uninterested and information will thus not increase sales, in case it is too expensive or too difficult to gather consistent data and revelation of date could damage the reputation of the company, have legal implications or wake up "sleeping dogs" (Kolk 2004b: 54).

The shareholders' view: The usefulness of non-financial reports

Advocates of non-financial reporting suggest that this kind of reports can provide crucial information for consumers and financial markets (Palenberg 2006: 6). Nevertheless, consumers and financial markets are only two addressees of non-financial reports. Whereas conventional annual reports focus mainly on shareholders, investors and financial analysts; CR reports address a much wider range of interested parties as for instance employees, customers, governments, NGOs as well as investors, shareholders and financial analysts (UNEP et al. 2006: 22). Due to this broad circle of assumed interests, reports are commonly too long and too complex (Engemann 2005: 15). Consequently there is rising acceptance of the fact that such reports ask too much of their consumers. And it is a fact that the general public does not use non-financial reports (Pleon 2005: 53f.). However, as a study of GLOBESCAN in 2004 showed, at least half of the respondent customers in the US, in Germany, Australia and Canada have already read, skimmed through or heard about an environmental or sustainability report (Globescan 2004, cited by Engemann et al. 2005: 34). But, if the general public and the customers have low interest in CR reports, who should be in the focus of the companies? The 2005 PLEON study asked stakeholders for their expectations regarding CSR reporting and found the following: A majority of respondents sees "accountability and transparency" as main drivers for reporting (Pleon 2005: 53) and believes that shareholders and investors are the most important target groups (Pleon 2005: 14). Indeed, some parts of the financial community are more and more interested in non-financial reports to get detailed information about non-financial risks and opportunities "especially in such areas as climate change" (UNEP et al. 2006: 8f.). However, interested financial analysts and investors either do not or do only rarely find the information they are looking for and review CR reports often as "PR polemic rather than risk assessment reports" (UNEP et al. 2006: 12). There is further criticism regarding the reliability of information. While truthful reporting concerning mistakes and bad practice as well as the use of external reportting standards can lead to higher credibility (Pleon 2005: 7), external verification con-

ducted with the help of assurance standards[13] is seen as an important measure for the improvement of the reliability of CR reports. However, external assurance that is "an exclusively European phenomenon" (Kolk 2005b: 40) is also criticised due to a perceived lack of benefits for publishing enterprises and distrust towards assurance responsibilities (Palenberg 2006: 22). Other sources expect mandatory reporting as more credible and useful (KPMG et al. 2006: 4) especially for analysts and investors[14]. The activism of governments regarding sustainability reporting, however, "appears to be levelling off" as PALENBERG states (Palenberg 2006: 26). But not only the concern of governments is declining; NGOs seem also to lose interest in non-financial reports, label it as PR (Pleon 2005: 16) and rely increasingly on independent sources (Palenberg 2006: 22). The use and usefulness of non-financial reporting for employees as a further target group[15] in terms of staff motivation or for hiring purposes is difficult to assess due to a lack of data (Palenberg 2006: 23).

So today's non-financial reporting can be seen as the result of an attempt to integrate as much as possible information albeit non-specific for all sorts of stakeholders. This has finally led to dissatisfaction, criticism and a decreasing use of non-financial reports. Additionally, there is fundamental scepticism on non-financial reporting. COOPER for example states that CR reports do not contribute to stakeholder accountability (Cooper et al. 2007: 658), whereas GRAY criticize corporate sustainability reporting as "mission impossible" due to the complexity of organisation's interactions (Gray et al. 2002: 5). Nevertheless, "nobody really debates the need for reporting; […] the real debate is about how to achieve better reporting" (UNEP et al. 2006: 9). How corporate responsibility reporting could be structured in the future will be described in the following.

2.1.3 Future expectations concerning reporting on sustainability

With a "shift from compliance reporting to wider sustainability reporting" (UNEP et al.: 8) in the past, also a change of the addressees can be detected. Whereas the first non-financial (environmental) reports were published because of pressure from NGOs, today financial analysts and investors are increasingly focussed by companies. Current sustainability reporting is thus expected to come forth by disclosing information on value creation in the future (Palenberg 2006: 12; UNEP 2006: 8, 27ff.). This development would not only coun-

[13] Globally effective assurance standards are for instance the *AA 1000 Assurance Standard* issued by the UK-based *AccountAbility* or *the International Standard on Assurance Engagements (ISAE) 3000* developed by the *International Auditing and Assurance Standards Board (IAASB)* of the *International Federation of Accountants (IFAC)* (KPMG 2005: 46).

[14] In the 2005 PLEON study the majority of respondent stakeholders, but mainly financial analysts and less employees, argued for mandatory reporting (Pleon 2005: 11f.).

[15] In the 2005 PLEON study employees as target group are ranked second by the respondents (Pleon 2005: 22).

ter the complaints regarding a "low quality of reporting" (Palenberg 2006: 34), but would also remove the "lack of benefits for companies" (Palenberg 2006: 34). But no only the quality of reporting for the financial community is expected to increase. The quantity of corporate responsibility reporting among companies is assumed to grow in the future in a linear way (Palenberg 2006: 34). However, due to today's CR reports' complexity, a more customized reporting for different groups of stakeholders can be assumed (UNEP et al. 2006: 21f.), as for instance the provision of sustainability information in annual reports for investors and financial analysts. The development from "encyclopaedias" towards prospectuses is one of the trends showed by the *Global Reporters* 2006 survey report. It furthermore predicts a trend from annual reporting to continuous, customized corporate communication, from company level to value chain reporting, from soft (CSR) to hard (boards and investors) issue consideration, from risk management to value and opportunity reporting and from focussing on the OECD world to the consideration of countries as Brasilia, Russia, India and China (UNEP et al. 2006: 30). To what extent these expectations will become reality will be shown by the reporting of the largest companies in the next few years.

2.2 From company's sustainability performance to corporate responsibility reports: Factors influencing the selection of content

The 2005 KPMG survey based on the evaluation of the 250 largest global companies showed that 40 percent of the corporations used the GRI guidelines for the selection of report's content. Stakeholder consultation was used by only 21 percent of the reporters, whereas "others" as national standards and legal regulation provided the basis for content selection for 13 percent[16] (KPMG 2005: 20). In the following, detailed information is given on examples of voluntary standards, codes and guidelines, mandatory standards and on stakeholders' involvement as the main sources for content selection.

2.2.1 Voluntary standards, codes and guidelines

There exist several standards, codes and guidelines both at global and national level released by a number of organisations. Global reporting guidelines and standards are published for instance by *AccountAbility* (AA 1000 guidelines), by the *Association of Chartered Certified Accountants (ACCA)*, by the *International Standards Organisation (ISO)*, by *Social*

[16] Business principles as well as AA 1000 principles or risk assessment were only rarely mentioned. For more detailed information see: KPMG 2005: 20.

Accountability (SA 8000), by the *Organisation for Economic Co-operation and Development (OECD)*, by the *UN Global Compact* (ten principles) or by *CERES*, to name just a few[17]. However, most popular for the selection of report content at least for the largest companies are the guidelines of the *Global Reporting Initiative (GRI)* which are described in the following. Examples of national standards are considered furthermore.

GRI guidelines

The *Global Reporting Initiative*, a multi-stakeholder organisation, was founded in 1997 by CERES and UNEP. The objective of the initiative is the provision of guidelines that lead to a "reporting on economic, environmental, and social performance by all organizations […] as routine and comparable as financial reporting" (GRI 2006: 39). The first GRI guidelines, as well as the following editions "agreed by a wide range of stakeholders around the world" (GRI 2006: 3), were released in 2000; the second version was published in 2002 and the third and last publication took place in October 2006. The *GRI Reporting Framework* is intended for voluntary use by organisations of any size, sector or location (GRI 2006: 3) and provides information with regard to a high quality corporate responsibility reporting. The guidelines include general reporting principles and guidance as well as specific indicators concerning the organisation's strategy and profile, its management approach as well as its economic, environmental and social sustainability performance. Additional sector supplements complement the guidelines by the provision of sector-specific performance indicators and by information how to apply the GRI guidelines in the specific sector (GRI 2006: 4)[18]. Reporters are requested to give information to what level (A, B or C) they have applied the GRI guidelines (GRI 2006: 5).

The GRI guidelines can be seen as the main reporting framework today (KPMG et al. 2006: 4) with a popularity that is high among both reporters and stakeholders. 660 organisations in 50 countries are using this document (KPMG 2005: 7) and especially the financial community as an increasingly frequent user of sustainability reports acclaims the application of the guidelines (Pleon 2005: 56).

Examples of national voluntary standards, codes and guidelines

In addition to national standards, the European Union's *Eco-Management and Audit Scheme (EMAS)* provides information regarding the evaluation, reporting and improvement

[17] For further information on global and national standards, codes and guidelines see: KPMG/UNEP 2006: 16ff.

[18] Sectors considered by the GRI with regard to supplementary information are: automotive, financial services, logistics and transportation, mining and metals, public agencies, telecommunications, tour operators and since 2007 also apparel and footwear as well as energy utilities. (Online: *www.globalreporting.org/AboutGRI/FAQs/SecSupAndG3FAQs.htm*; 26.10.2007)

of company's environmental performance (KPMG 2005: 43). EMAS is supported by the Austrian and especially the German government (Kolk 2005b: 37). Except for this standard there are no further guidelines or codes in Germany with regard to the reporting of companies. In contrast, several guidelines and standards related to the reporting on environmental and social issues are to find within the four Scandinavian countries and the Netherlands. For instance, the *Swedish Accounting Standards Board* provides guidelines for the integration of environmental information in the annual report, whereas released standards in Denmark refer also to social and ethical issues. Guidelines regarding the provision of environmental information are also to find in the UK (guidelines for the reporting on greenhouse gas emissions, waste and water published by the *Department for Environmental, Food and Rural Affairs*) and in Japan (Environmental Reporting Guidelines and Environmental Performance Indicator Guidelines for Business released by the *Ministry of Government*). In contrast, no guidelines, codes or standards at all are to find in Canada and the US (KPMG 2005: 44f.).

2.2.2 Mandatory standards

Legislator's influence can be expressed by mandatory regulations with an obligation to report, by incentives for reporters, by voluntary rules or guidelines related to performance or by the transfer of the regulatory power to self-regulating authorities as stock exchanges or stakeholder panels (KPMG et al. 2006: 8). There is no unique global mandatory standard. On the EU level, however, differently aimed directives with regard to responsibility reporting exist. The *EU Accountants Modernization Directive*, e.g., requires from all large and medium-sized companies the inclusion of information on environmental and employee matters related to the development and performance of the company's business in their annual reports[19]. The most comprehensive examples of national mandatory standards can be found in France *(Nouvelles Régulations Economiques)* and in the UK *(Companies Act 2006)*[20]. Both directives require detailed reporting on environmental matters as well as employee, social and community issues from listed companies. In Scandinavia, Germany and some other European countries companies are obligated to report at least briefly on environmental and employee issues in their annual reports. Specific enterprises in Japan have to publish annual environmental reports to satisfy the *Law of Promotion of Environmental-*

[19] For more information on mandatory reporting standards at the EU level see: KPMG et al. 2006, page 22.

[20] Whereas the French *Nouvelles Régulations Economiques* is operative since 2003 (KPMG et al. 2006: 24); the *Companies Act 2006* requires compliance until October 2008 (One World Trust 2007).

ly Conscious Business Activities. Additionally reporting on releases of specific chemical substances and improvements of their management is required. In North America, Canadian companies are obligated to report on financial or operative effects of environmental protection requirements annually. In the US, the *Toxic Release Inventory* binds companies with more than ten employees to submit data on emissions of specified toxic chemicals to the *Environmental Protection Agency (EPA)*. Additionally the *Securities and Exchange Commission (SEC)* requires information on legislative compliance related to environment. Furthermore, employee records including gender and racial profiles have to be published annually.

The mentioned directives are considered to be the most important examples of mandatory standards of selected countries or regions respectively. A more comprehensive list of reporting legislation can be found in the 2006 KPMG publication "*Carrots and Sticks for Starters*" (KPMG et al. 2006).

2.2.3 Expectations of stakeholders

The engagement of stakeholders must be seen as essential in today's business strategy. Thus it is not only desirable regarding the selection of reporting content. Collaborations can help the company to satisfy the stakeholders' demands and enhance corporate accountability by the involvement of stakeholders in the corporate decision-making (Crane et al. 2007: 190). Three stages of stakeholder engagement are described in the 2006 *Global Reporters* survey: The first and lowest level of engagement is seen in stakeholder information; the medium level constitutes stakeholder involvement in issue identification and management; whereas a partnership with stakeholders delivering solutions to sustainability issues is considered the highest level (UNEP et al. 2006: 27). No legal standards exist concerning the involvement of stakeholders. The global (voluntary) standard *AA 1000* and specific GRI indicators, however, refer to the stakeholder engagement process (KPMG 2005: 21). GRI explicitly states that the company's sustainability report should be based on the expectations and interests of stakeholders with regard to its scope, boundary, application of indicators and assurance approach (GRI 2006: 10). "Stakeholder dialogue" (KPMG 2005: 5) is referred as generalized measure for determining stakeholders interests within the engagement process. More explicitly, the identification of reporting issues that stakeholders are interested in, can emerge from the evaluation of media reviews, website hits, reader surveys, socially responsible investment (SRI) reports, stakeholder interviews, peer benchmarks or external commitments (UNEP et al. 2006: 19). Nevertheless, stakeholders'

involvement is not realized satisfactorily until today by most companies. For instance, only 21 percent of the 250 world's largest enterprises declare to undertake systematic engagement to identify the information needs of stakeholders and only 32 percent invited feedback from readers on their reports (KPMG 2005: 21).

To conclude, sustainability reporting as a whole is of importance in particular for large and visible companies, but also for smaller ones to obtain a competitive advantage. Nevertheless, there are two main challenges for enterprises with regard to sustainability and related reporting. Firstly, reporting should include hard facts and information useful for investors and financial analysts. Secondly, the implementation of the sustainability idea within the daily business should be of at least similar interest as reporting. In this context KPMG states that "reporting is only the tip of the iceberg"; whereas "the emphasis should be on performance" (KPMG et al. 2006: 5).

2.3 Research on corporate responsibility reporting

Not only is there a high awareness of sustainability reporting among companies and their environment. The research on the implementation and the reporting of sustainability has increased considerably in the last few years as well. As LANGER states there are presently about 450 projects dealing with corporate sustainable development, with most of them examining and ranking the quality of sustainability reports (Langer 2006: 582). According to the reporting practice and development, previous examinations referred mainly to environmental reports. Today's studies however use frameworks for the evaluation of the extent and quality of comprehensive sustainability reports. Despite the large number of studies evaluating the content of reports, however, few of them are related to the examination of sustainability reports from specific sectors and even less have examined non-financial disclosures from forest and paper industry companies. In the following an overview is given on previous studies related to corporate responsibility reporting in general and with respect to sectors as well as concerning the forest and paper industry sector.

2.3.1 Previous research at international and national level

The majority of surveys on corporate responsibility reporting are cross-sector and limited to the largest companies. Next to country-wide and cross-national surveys examining re-

porting practices or "status quo" of reporting, several studies are aimed at a companies' ranking.

An international benchmark survey is conducted by UNEP/SustainAbility every two years with the objective to present a ranking list of 50 global companies with the best quality CR reports. The results of the last sustainability benchmark survey showed an increased awareness of the link between the sustainability agenda and market opportunities (UNEP et al. 2006: 2). The three leading companies in the ranking list are in the UK's telecommunication services, financial services or oil & gas industry. No forest and paper company is among the best reporters. Further studies ranking companies with regard to the quality and extent of their sustainability reports are conducted at a national level among others by STRATOS for Canadian companies since 1999 every three years (last: 2005), by DAUB for Swiss enterprises (Daub 2006, 2007), by MILNE et al. for New Zealand's companies (2003) and by CLAUSEN et al. (2005) or QUICK and KNOCINSKI (2006) for German corporations. Mainly the largest national companies were considered; one exception is the Swiss study where also small and medium sized companies were included as far as they report on sustainability. Along with the companies' ranking, MILNE concludes that the quality and especially completeness of sustainability reporting of New Zealand's companies is weak in comparison with the reporting of SustainAbility's global leaders (Milne 2003: 12); whereas the other studies found considerable weaknesses regarding the general performance reporting. In the Swiss study of DAUB the performance reporting quality reached only 29 percent and thus scored lowest of the four reporting categories (Daub 2006: 571). STRATOS found the quality of social performance reporting of Canadian companies being weakest (reaching an average score of 36 percent), while economic performance reporting was examined as strongest, by a margin, by reaching an average score of 62 percent (Stratos 2005: ii). In the German companies' survey of CLAUSEN environmental performance issues led to a reporting fulfilment of 48 percent, whereas social reporting scored only 33 percent. Economic information was not considered (Clausen et al. 2005: 13). QUICK found weak reporting on social and environmental performance issues (each 40 percent average score) and a completely insufficient reporting on economic topics (average score < 15 percent) for German companies (Quick et al. 2006: 615).

Aside from these benchmark surveys, studies were conducted for the examination of the development and status quo of corporate responsibility reporting at national and international level. KPMG in cooperation with the University of Amsterdam is conducting international corporate responsibility reporting surveys every three years since 1993. The last

survey of 2005 analysed trends in reporting practice of the world's largest companies including the top 250 companies of the Global Fortune 500 and additionally the top 100 companies from 16 countries with regard to the country, sector and assurance issues. Additionally a more detailed analysis of the reporting contents of the Global Fortune 250 companies was made using a checklist of topics. The survey showed a substantial increase in corporate responsibility reporting between 2002 and 2005 and a dramatic change from purely environmental reporting to a more comprehensive sustainability reporting. Japan and the UK had the highest share of separate responsibility reporting; whereas the highest increases were assessed for Italian, Spanish, Canadian and French companies. Regarding the sector, typical industrial sectors continued to lead in non-financial reporting. Assurance on reports was examined as relatively common for companies in Europe, Japan, Canada, Australia and South Africa, but unusual for US companies. Whereas the KPMG study can be seen as the most comprehensive one regarding global reporting trends; several studies conducted comparisons of non-financial reporting between specific countries.

ADAMS et al. (Adams et al. 1998) examined the disclosure of environmental, employee and ethical information within annual reports of six European countries and found German companies' reporting as the most comprehensive and Swiss reporting as the weakest one. He concluded size and sector as important determinants for reporting. GAMBLE (Gamble 1996) examined the environmental disclosure in annual reports of companies of 27 countries and nine sectors and found highest disclosure levels in reports from the US, the UK and Canada. CRAIG and DIGA (Craig/Diga 1998) examined non-financial disclosure practices in annual reports of Singapore, Malaysia, the Philippines, Indonesia and Thailand. They detected a publication of politically or socially sensitive information and a strong orientation towards the expectations of capital providers. HOLLAND and FOO (Holland/Foo 2003) compared environmental reporting practices within annual reports of companies in the UK and the USA and found a higher reporting extent of firms in the UK and different emphasis on environmental items. KOLK (Kolk 2005c) investigated differences in patterns and trends in environmental reporting by multinationals from the USA, Japan and Europe. The results showed that the regional effect of reporting practices had increased in importance and notable divergence was existent for both the disclosure in general as well as for the reporting content. HO and TAYLOR (Ho/Taylor 2007) examined annual, separate and website reports of the largest companies from Japan and the USA for the evaluation of the extent and dependence of TBL reporting by using a criteria framework based on GRI. They concluded that reporting was more intense for larger firm sizes, lower profitability,

and lower liquidity as well as for manufacturing industries and stated that the reporting extent of Japanese firms was higher than this of companies from the USA.

Beyond these examples of international or cross-country studies a number of national studies had been conducted to investigate the extent and quality of corporate responsibility reporting. HACKSTONE and MILNE (Hackstone/Milne 1996) conducted a study on the social and environmental disclosure in annual reports of companies in New Zealand and found that information was mostly declarative and good news and mainly on human resources issues. They concluded firm sector and firm size as important determinants for reporting. VUONTISJÄRVI (Vuontisjärvi 2006) investigated the extent of human resources information in annual reports of the largest Finnish companies. Besides an overall inconsistency and incomparability of reports, he detected a good reporting on training and staff development and a lack of reporting on equal opportunities that was going beyond a pure disclosure of age and gender structure. GREENALL and YACHMIN (Greenall/Yachmin 2001) examined the trends and patterns of CSR reporting of industrial companies in Canada and found that the issues, the scope and detail varied between the corporations. Additionally they concluded a weak social reporting in comparison with environmental reporting and a slower development of CR reporting in Canada than in Europe. LANGER (Langer 2006) investigated the quality of sustainability reports of Austrian companies using the reporting quality of multinational corporations as benchmark. The study showed a substantial heterogeneity among the Austrian reports and substantial differences between Austrian reports and those of large MNCs. LANGER noticed that a high level of standardization due to ISO 14001 or EMAS influenced the reporting on environmental sustainability performance.

A number of studies devoted to the evaluation of responsibility reports were also conducted with regard to specific research problems as for instance the linkages between sustainability reporting and corporate governance (Kolk 2006) or the interrelation between reporting quality and the implementation of sustainability (Kolk 2004a). Additional research on specific reports, several studies on the practice, expectations and influences on corporate responsibility reporting were conducted as interview studies or literature reviews (e.g. Munkelien/Gravlien 2003, Hedberg/Malmborg 2003, Hammond/Miles 2004, O'Dwyer 2005).

2.3.2 Previous research on sector-specific corporate responsibility reports

Sector-specific research concerning the examination of non-financial reports is scarce. STRATOS as well as KPMG examined sector effects and specifics within their surveys on

sustainability reporting in Canada (Stratos 2005) or at an international level (KPMG 2005). STRATOS investigated the publication of sustainability reports among 13 sectors in Canada and assessed the reporting content with regard to sustainability performance information of ten sectors. The results show that the number of reporters was highest for the financial, mining and forest products sector; meanwhile the IT & telecommunication sector showed the best performance reporting in total as well as in each segment of the triple bottom line. With a research basis of the 250 largest global companies and the top 100 companies of 16 countries, KPMG determined the percentage of reporters and the incidence of assurance for 16 sectors and showed that the total number of separate responsibility reports was highest for the finance, securities and insurance sector. The highest reporting ratio was detected for industries with considerable impact on environment as the utilities, oil and gas, chemicals and synthetics, mining as well as for the forestry, pulp and paper sector. Assurance was most common for the utilities and mining sector with more than 50 percent of separate reports including an assurance statement. However, only two of 13 examined reports of the forestry, pulp and paper sector were verified. Some more examples of sector-specific studies can be found for by HOPKINS and WHITAKER who examined environmental reports from the water sector. The authors found considerable variation in the extent and quality of environmental information (Hopkins/Whitaker 1999). A survey conducted by UNEP/SustainAbility arrived at a similar conclusion concerning the environmental reportting of oil companies (UNEP/SustainAbility 1999). MAK et al. (Mak et al. 2006) examined the status and progress of separate environmental reports of Asian and European airlines and found varying degrees of efforts and resources to produce stand-alone reports as well as a richer reporting of European companies. WIJK and PERSON (Wijk/Person 2007) conducted a survey on tour operators. They examined a weak reporting performance in comparison with other sectors, a better performance of large companies in comparison with small and medium sized ones and saw only minor differences between companies from the UK, Germany and the Netherlands.

2.3.3 Previous research on reporting of the forest and paper sector

Four research studies can be mentioned with respect to the corporate responsibility reporting of the forest and paper sector.

Based on their 2002 sustainability reporting survey (KPMG 2002a), KPMG determined that 43 percent of the largest 28 forest-related companies in 13 countries produced CR reports. They conducted further research on the sector (KPMG 2002b) with a sample of 43

forest, pulp and paper enterprises headquartered in the USA, Canada, Sweden, Finland and Japan and detected a considerable high share (78 percent) of reports on environment, health and safety (EHS). 94 percent of the sample companies were identified to report on environmental and sustainability certification programmes such as ISO 14001, FSC, AFPA, SFI, CSA Z809 or PEFC; whereas only US enterprises had reports without any certification statements. KPMG found less reporting on a code of conduct and verification of reports for forest and paper companies than the average of the previously examined Global Fortune 250 or the alternative top 100 companies. SINCLAIR and WALTON (Sinclair/Walton 2003) investigated the environmental reporting of the global top 100 forest and paper companies with particular consideration of information on forest management and fibre procurement. They concluded a more prevalent reporting among larger companies and marked regional variations. Markets and preferences for specific certification schemes were identified as potential influencing factors for these regional reporting variations. The STRATOS survey (Stratos 2005) examined the sustainability performance reporting of four Canadian forest products companies and identified the sustainability performance reporting quality of this sector as significantly below the average of surveyed ten sectors. Forest products companies showed the lowest average score of all sectors for social performance reporting, the second lowest average score for economic performance reporting and the fourth last average score for environmental performance reporting. The most recent survey conducted by PwC (PwC 2007) examined the sustainability reporting among the global top 100 forest, paper and packaging companies and follows a similar approach as the study at hand. The main findings are that (1) 61 percent of the companies had some kind of sustainability report[21], (2) reporting on air emissions and energy usage and efficiency was most common among environmental sustainability information with more than 80 percent of companies included information on these issues. (3) Health and safety metrics were considered by 67 percent of the reporters and thus as the most important social sustainability performance, (4) the number of employees was the most reported issue within the field of economic sustainability, (5) over half of the companies reported on certified land or the percentage of certified fibre procured, whereas 46 percent indicate that companies have chain-of-custody certification, (6) 18 percent of the reports included external assurance statements, and (7) nearly half of the enterprises used GRI guidelines for the preparation of their reports. The

[21] In accordance with PwC the following different forms of reporting were considered as sustainability reports: a separate environmental or CSR reporting document, environmental or CSR reporting included within the company's annual report, and a web-based environmental or CSR report. Report titles that were examined included CSR reports, sustainability reports, environmental reports, environment, health and safety (EHS) reports, annual reports and reports by any other title that included discussion and/or quantitative analysis of the company's environmental or sustainability performance and initiatives.

regional results show North American companies having the lowest frequency of utilizing external validation either in the form of external assurance statements or use of the GRI standard. Data on health and safety performance and environmental regulatory compliance were very common among North American reports. European companies published the highest share of sustainability reports in comparison with other regions. They were more likely to obtain external verification of their sustainability reports, although they had the lowest frequency of presenting information related to environmental regulatory compliance. Asia-Pacific companies were strong users of GRI guidelines, but had the lowest frequency of reporting on social and economic sustainability issues compared to other regions. Companies from Latin America had a strong sustainability reporting both in terms of numbers of reports as well as metrics included. With regard to company size PwC found a higher reporting frequency for larger (higher ranked) companies. They also concluded, however, that financial ranking does not necessarily impact the scope or quality of reporting because of the finding that third-party assurance ratio as well as the frequency of reporting on environmental metrics was similar for the largest and smallest companies.

Overall it can be seen that the field of research concerning corporate responsibility reporting is large. Nevertheless, only few researches were done with regard to Asian companies or examining the differences in European, North American and Asian reporting practice. Examinations of the corporate responsibility reporting and its quality within the forest and paper industry sector are rare. The most comprehensive survey on the current status of sustainability reporting within the forest and paper sector was conducted almost simultaneous with this study by PwC (PwC 2007). Nevertheless, it considers only few indicators regarding sustainability performance, does only evaluate the mention of issues rather than the quality of disclosure and does not provide any recommendations for a higher quality of reports. It was thus found worthwhile to conduct a study on the assessment of CR reports published by forest and paper companies and focus particularly on the quality of such disclosures as well as on size and regional effects.

Seven hypotheses, formulated in context with previous researches, are to be tested:

(1) There are no differences in the availability, timeliness and kinds of CR reports with regard to the regional origin of forest and paper companies.

(2) Non-financial reports of smaller companies are less numerous, include outdated information and are referred to more often as environmental or social than comprehensive sustainability reports

(3) No considerable differences in sustainability performance reporting are to be found for the forest and paper sector in comparison with other sectors, meaning a comprehensive environmental performance reporting and a lacking of detailed social performance reporting.

(4) The use of GRI guidelines and third-party verification as external measures for an improvement of the quality of reports is higher among forest and paper companies of larger size.

(5) Similarly, the quality or detailedness and explicitness of published economic, environmental and social sustainability performance information as well as forestry-related data is higher for larger than for smaller forest and paper enterprises. However, the difference in information quality is smallest for environmental performance reporting and largest regarding social performance disclosure.

(6) The use of external measures for an improvement of report quality is inconsistent among the regions. Whereas North American companies use GRI guidelines and external assurance statements to the lowest extent, the use of GRI guidelines and external verification of reports is highest for European enterprises.

(7) The detailedness and explicitness of sustainability performance information of forest and paper companies is regionally different. European companies provide the relatively highest level of quality of sustainability performance information. Regional differences are also existent with regard to the quality of forest-related information; with North American and European companies providing more comprehensive information on forest certification and Asian companies reporting better on illegal logging. Reporting on carbon sequestration and storage is similar between the regions.

3 Methodology

3.1 Selection of companies

The study is conducted on a core sample of 18 companies and an extended sample of 27 companies selected from the PwC Top 100 list 2006 for the forest, paper and packaging sector[22]. The enterprises were selected considering their regional origin[23] and their size[24] or ranking. For a better homogeneity and thus comparability, only forest and paper companies were considered; meanwhile pure packaging companies were excluded[25].

Respectively three North American, European and Asian forest and paper companies were selected from the top of the list (i.e. ≥ rank 1; later on called "largest" companies) to represent the largest enterprises and thus supposed well-established sustainability reporters of the sector. Another three companies of each region were selected from the middle of the Top 100 PwC list (i.e. > rank 45; later on called "small" companies or "emerging sustainability reporters") to cover forest and paper enterprises whose sustainability reporting is expected to be emerging. It is important to note, that the used term of a "small" company used here is not identical with the definition of small and medium sized enterprises (SMEs) in terms of the EU Commission (EU Commission 2003: Annex) [26]. Additionally and exceptionally for the examination of size-related effects on the availability, the kinds and timelines of CR reports, nine companies were selected from the bottom of the list (i.e. ≤ rank 100; later on called "smallest" forest and paper companies). An overview of the sample companies is provided by *table 1*.

[22] The PwC Top 100 list includes "the 100 largest forest, paper and packaging companies in the world, ranked by sales revenue" (PwC 2006: 1)

[23] Information given by PwC list was trusted; i.e. information regarding the regional origin and the sales volume (ranking) was not tested separately.

[24] "Size" is based on the annual sales revenue of the company and used simply as "size" throughout the whole study.

[25] Business segmentation was first checked by "www.corporateregister.com". If there was no company information available, "http://wrightreports.ecnext.com" was used for an evaluation by reading the business description and checking the categorization of "major industry" and "sub industry". If there was also no information available, the specific company website was checked and evaluated if fitting to the "paper & forest" sector (name with affix "paper"; products: paper, paperboard, tissue, lumber, logs; exclusion if "packaging" was considerably emphasized).

[26] A small enterprise in terms of the definition of the EU Commission employs fewer than 50 persons and has an annual turnover and/or annual balance sheet that does not exceed EUR 10 million.

	North America	Europe	Asia
"largest"	***International Paper*** (1; US)	***Stora Enso*** (3; Finland)	***Oji Paper*** (8; Japan)
	Weyerhaeuser (2, US)	***Svenska Cellulosa*** (5; Sweden)	***Nippon Unipac*** (10; Japan)
	MeadWestvaco (13; US)	***UPM*** (7; Finland)	***Asia Pulp and Paper*** (20; Singapore)
"small"	***Plum Creek*** (56; US)	***Lecta Group*** (46; UK)	***Hansol Paper*** (54; Korea)
	New Page (57; US)	***Myllykoski*** (52; Finland)	***APRIL*** (58; Singapore)
	Catalyst (59; Canada)	***Portucel*** (65; Portugal)	***Hokuetsu Paper*** (62; Japan)
"smallest"	***Interfor*** (91; Canada)	***ENCE*** (89; Spain)	***Nine Dragons Paper*** (96; China)
	Schweitzer-Mauduit (92; US)	***Mercer International*** (93; Germany)	***Yuen Foong Yu Paper*** (98; Taiwan)
	P.H. Glatfelter (97; US)	***Excompta Clairefontaine*** (94; France)	***EN Paper*** (99; Korea) former: *Shinho Paper Manufacturing*

Table 1: ***Size and regional origin of all companies selected for the study from the PwC TOP 100 list (2006).*** *"Size" is determined by the annual sales volume. Information in brackets: rank and country of origin.*

Finally the core sample consisted of nine largest and nine small companies or respectively of six North American, six European and six Asian forest and paper enterprises. The extended sample comprised nine smallest enterprises following an equal regional distribution. Whereas the annual sales revenue of the largest companies ranges from US$ 24.1 bn to US$ 4.8 bn the same figure is ranging from US$ 2.0 bn to US$ 1.3 bn for the group of small forest and paper enterprises and from US$ 0.71 bn to US$ 0.57 bn for the smallest ones.

3.2 Evaluation of the availability, timeliness and kinds of CR reports

Companies' websites of the extended sample were checked for the publication of CR reports[27] between April, the 13th and April 23rd 2007[28]. The most current corporate responsibility report as PDF document or exceptional online version was considered. The title was used for the determination of the kind of report, irrespective of the effective content. In case of more than one published non-financial report, only the one referring to corporate level was considered. The results were described with regard to the three groups of different sizes as well as for the three regions.

[27] The terms *corporate responsibility report* and *non-financial report* are used synonymously and instead of the common term *sustainability report* in this study since not all examined reports were sustainability reports in the strict sense covering information on economic, environmental as well as social issues, but were instead also environmental or social responsibility reports.

[28] In case there could not be found a report or if the non-financial report was older than three years, the companies were contacted via email and asked for their current corporate responsibility report. Feedback on these email requests was low. Eleven companies were contacted, only three of them answered. Nevertheless, none of them could provide the requested report, but referred to the published information on the homepage. That's why only companies' homepages were used for the collection of reports.

3.3 Evaluation of the quality of CR reports

High-quality CR reports were defined as to include top quality performance information in terms of detailed and explicit disclosure on specific sustainability issues. They are to be prepared on accepted standards as well as to be third-party verified. Following this definition, the use of GRI guidelines and the inclusion of third-party assurance statements are examined. Additionally the quality of published sustainability performance information and specific sector-related disclosure is evaluated by using disclosure indicators or respective issues that should be reported on. These assessments were conducted (1) for the nine "largest" forest and paper companies as shown in *table 1* to receive an overall picture of sustainability performance information disclosure of the forest and paper sector and thus results comparable with previous studies that considered other sectors, (2) for the core sample of 18 companies to examine the differences between the largest companies and the smaller ones as supposed emerging sustainability reporters; and (3) for the core sample of 18 companies to examine differences in reporting between companies headquartered in North America, Europe and the Asia-Pacific region.

Non-financial reports as selected for the evaluation of the availability, timeliness and kinds of reports of the core sample were used as data base. An annual report was considered and examined only in case that no other report was available. In case of an exceptional online report version, the related pages were copied and transformed into a PDF for further research.

3.3.1 Development of indicators

To assess the quality of information disclosure, the detailedness and explicitness of several reporting issues had to be examined. For this reason two main groups of such issues or respectively indicators were considered:

- General sustainability performance indicators; i.e. economic, environmental and social performance indicators.
- Forestry sector-specific indicators related to sustainability.

GRI G3 sustainability performance indicators served as the basis for the selection of economic, environmental and social indicators for the quality assessment. All GRI "core" performance indicators were selected; for the environmental reporting also "additional" performance indicators were considered. Adoptions were partly made with regard to environmental performance indicators. Some of them were summarized in case that similar infor-

mation was asked for repeatedly. Additionally indicators were summarized when there was no information at all for an indicator that was considered to be of low importance[29]. In two cases, indicators were newly formulated[30] and used instead of related ones, since information on these new topics was considered to be more relevant.

Economic performance reporting		Environmental performance reporting		Social performance reporting	
Grouping	Indicator	Grouping	Indicator	Grouping	Indicator
Economic performance reporting	EC1, EC2, EC3, EC4	**Materials**	EN1, EN2	**Labour practices and decent work**	LA1, A2, LA4, LA5, LA7, LA8, LA10, LA13, LA14
Market presence	EC6, EC7	**Energy**	EN3s, EN5s, EN6n	**Human rights**	HR1, HR2, HR4, HR5, HR6, HR7
Indirect economic impact	EC8	**Water**	EN8s, EN10n	**Society**	SO1, SO2, SO3, SO4, SO5, SO8
		Biodiversity	EN11s, EN13, EN14, EN15	**Product responsibility**	PR1, PR3, PR6, PR9
		Emissions, effluents and waste	EN16, EN17, EN18, EN19, EN20, EN21, EN22s, EN23, EN25		
		Products and services	EN26, EN27		
		Compliance	EN28		
		Transport	EN29		
		Overall	EN30		

***Table 2:* Content groupings of sustainability performance indicators used to evaluate the quality of information.** *The indicators as well as their initials are based on GRI G3 performance indicators. Suffixes "s" and "n" differentiate summarized or newly formulated indicators.*

Each indicator was integrated into a specific grouping, summarizing the focus of underlying issues. These altogether 16 content groupings referring to economic, environmental and social sustainability performance can be taken from *table 2*. A detailed list and description of the underlying sustainability performance indicators can be found in the *appendix*.

The selection of forestry-related indicators is based on the idea of sustainability with regard to the specific source *forest*. Six indicators were developed under consideration of the ten key issues related the sustainable procurement of wood and paper-based products published by WBCSD[31] (WBCSD 2007: 4). As a result, three indicators refer to forestry-related certification (F1: "Share of certified owned or managed forests", F2: "Share of chain-of-custody certification" and F3: "Amount of certified input material/fibre"). One indicator considers the problem of illegal logging (F4: "Policies, programmes and actions for the prevention of illegal logging"). Two further indicators refer to reporting on carbon sequestration (F5: "Carbon sequestration due to company's forests") and carbon storage (F6: "Carbon storage due to company's products").

[29] For summarized environmental performance indicators suffix "s" was given.

[30] For newly formulated environmental performance indicators suffix "n" was given.

[31] Referring to WBCSD key issues regarding sourcing and legality aspects are the **origin** of products, **information accuracy** concerning the credibility of product's information, and the **legality** of the production. Environment-related key issues in the procurement of wood and paper-based products are the **sustainability** of forest management, the protection of **special places**, the consideration of **climate change**, the application of controls for **environmental protection**, the appropriate use of **recycled fibre** and **other resources**. The social aspect of sustainable procurement listed by WBCSD refers to the needs of **local communities or indigenous peoples**.

3.3.2 Evaluation of the quality of information

To evaluate the detailedness and explicitness and thus the quality of given information, a scoring system similar to the one of DAUB (Daub 2006, 2007) was used. Zero points were given for a report in case there was no information available for one indicator; meanwhile one point was given in case of patchy information, two points for good information and three points in case that the reporting on the indicator was detailed and explicitly. *Table 3* provides some examples for patchy, good and detailed information with regard to specific indicators. More information regarding the expectations related to patchy, good and detailed information is given in the table of indicators in the *appendix*.

	Patchy information (1)	Good information (2)	Detailed information (3)
Indirect economic impacts (EC8): Development and impact of infrastructure investments and services provided primarily for public benefit through commercial, in-kind, or pro bono engagement	*specific projects for public benefit mentioned in general or general statements regarding infrastructure investments*	*projects mentioed in general and total amount of money spent or detai-led description of projects*	*projects, total amount spent and development/ impact of infrastructure investments mentioned explicitly*
Emissions, effluents and waste (EN16): Total direct and indirect greenhouse gas emissions by weight	*general statements regarding generated greenhouse gas emissions*	*emissions by weight, but no breakdown into "direct" or "indirect" emissions or no statement if fossil-derived emissions*	*"direct", "indirect" and "fossil-derived" green-house gas emissions by weight mentioned explicitly*
Human rights: Non-Discrimination (HR4): Total number of incidents of discrimination and actions taken	*general statements regarding policies and/or intentions related to non-discrimination*	*actions taken: code of conduct with statements regarding non-discrimi-nation mentioned explicitly*	*explicit statements concerning the number of incidents and action taken*

***Table 3:** Examples for the assessment of information quality with regard to specific indicators*

The values reached for each company's report were then summarized among the different sizes and regional origins of enterprises and presented as a percentage ("reporting percentage"), taking the maximum receivable points as 100 percent. After the calculation of the reporting percentage per indicator for each size and regional origin of companies, the percentage for the defined economic, environmental and social indicator groupings was calculated as an average of the reporting percentages of the underlying indicators. Afterwards, the content groupings were summarized in the same manner to calculate the information quality percentages of the total economic or respectively environmental and social sustainability performance disclosure. The information quality percentage of the total sustainability performance reporting was finally calculated as an average of these three categories. This procedure as presented in *picture 1* guarantees an equal consideration of the "three pillars" of sustainability in the reporting of companies.

The similar procedure, except for the last summarisation of information quality percentages, was also applied for the evaluation of the information on the groupings of forest certification, illegal logging and carbon sequestration/storage.

Methodology concerning the quality assessment of sustainability performance information	
Evaluation of the detailedness and explicitness of reporting on a specific indicator within a single report → **Use of values 0, 1, 2, or 3**	*e.g. "Direct and indirect greenhouse gas emissions by weight" (2)*
Summarisation of the reporting quality values amongst largest and small companies or respectively North American, European and Asian companies of the sample → **Calculation of the reporting percentage of a specific indicator**	*e.g. "Direct and indirect greenhouse gas emissions by weight" (62%)*
Summarisation of the information quality percentages of each indicator according to the economic, environmental or social performance grouping → **Calculation of the average reporting percentage of issue groupings**	*e.g. "Emissions, effluents and waste" (46%)*
Summarisation the reporting percentages of reporting groupings according to the sustainability category → **Calculation of the average reporting percentage of the sustainability category**	*e.g. "Environmental performance reporting" (36%)*

***Picture 1:** Procedure for the assessment of the quality of published economic, environmental and social sustainability performance information among companies of different sizes and regional origin.*

As shown in *table 4*, the quality of information according to the received percentages is categorised as "high" when reaching 71 to 100 percent, "moderate" when reaching 41 to 70 percent and "low" when reaching 11 to 40 percent. "No" quality of information is present in case the reporting percentage was below 11 percent.

Information quality percentage	Quality definition
0-10	"no"
11-40	"low"
41-70	"moderate"
71-100	"high"

***Table 4:** The definition of information quality according to the received percentage*

Relative difference in information quality between two reports or groups of reports	Definition of quality differences
0%	"identical" quality
> 0% - < 5%	"similar" quality
≥ 5% - < 25%	"minor" differences
≥ 25% - < 50%	"noticeable" differences
≥ 50% - < 75%	"considerable" differences
≥ 75% - 100%	"fundamental" differences

***Table 5:** Definitions of differences in information quality between two reports or groups of reports*

A further definition is made with regard to the similarity of disclosure quality among sizes and regional origins and presented in *table 5*. The quality of information for one element (indicator, grouping or sustainability category) is classified as similar if the relative difference of the reporting percentages is lower than five percent. Additionally, the difference in information quality of reports is defined as "minor" in case that the relative difference of information quality between two groups of reports is six to 25 percent, the difference is "noticeable" when the relative difference lies between 26 and 50 percent and it is "considerable" when reaching 51 to 75 percent. If the relative difference of information quality percentages is 76 to 100 percent between two reports or groups of reports, it is categorised as "fundamental" difference. The relative difference thereby describes how much lower the information quality percentage of the group with the lower disclosure quality is.

3.4 Recommendations for quality improvements of CR reports

Recommendations for improvements concerning reporting quality of the forest and paper sector in general are based on the identification of issues with low quality of information and the comparison of the results with previous studies' findings on other sectors.

Recommendations for the reporting of small forest and paper companies as emerging sustainability reporters are based on report's quality of the largest enterprises and thus a comparison of the use of quality measures and sustainability performance disclosure between the two different-sized companies groups. Recommendations concerning the provision of sustainability performance information are given in case of an examination of considerable and fundamental differences between the two different-sized groups. Additionally, an improvement of disclosure quality is recommended for specific sustainability indicators in case that at least two thirds of the companies do not provide any information at all on them.

Recommendations for forest and paper companies with different regional origin are based on the idea of the provision of regionally independent sustainability performance information disclosure for stakeholders and thus on a regional comparison of the information quality results. Disclosure quality of the regional companies group that is performing best on sustainability performance issues is used as benchmark for the two remaining groups. Improvements in disclosure quality on specific sustainability issues are recommended for North American, European or Asia-Pacific forest and paper companies if considerable or even fundamental differences were examined and, furthermore, in case that at least two thirds of the companies within the regional group do not provide any information on them.

4 Results and discussion

4.1 Availability, types and timeliness of corporate responsibility reports

19 of 27 or 71 percent of the examined forest and paper companies published a separate non-financial report at their website. Among them 13 were "sustainability" reports, two were "environmental and social responsibility" reports and four were "environmental" reports. Furthermore ten reports included data from 2006, six included data from 2005 and three reports referred to data before 2005.

4.1.1 Companies' sizes and the availability, type and timeliness of CR reports

A clear trend is visible for the dependence of the availability and type of non-financial reports on the corporate size. Whereas all of the largest and eight of nine small companies do publish a non-financial report via their websites, only two of the smallest do so. Similarly, *only* annual reports are available in case of one of the nine small and four of the nine smallest companies. Three of nine smallest companies publish neither a financial nor a non-financial report; all larger sized companies have at least an annual report available at their website.

With regard to the types of non-financial reports, comprehensive "sustainability reports" are most common among the largest companies with seven of nine enterprises publishing this type of report[32], meanwhile five of the nine small and only one of the nine smallest companies do so. The largest companies that publish no "sustainability report" have an "environment and social responsibility report" available that include environmental and social sustainability information. One third of the reports

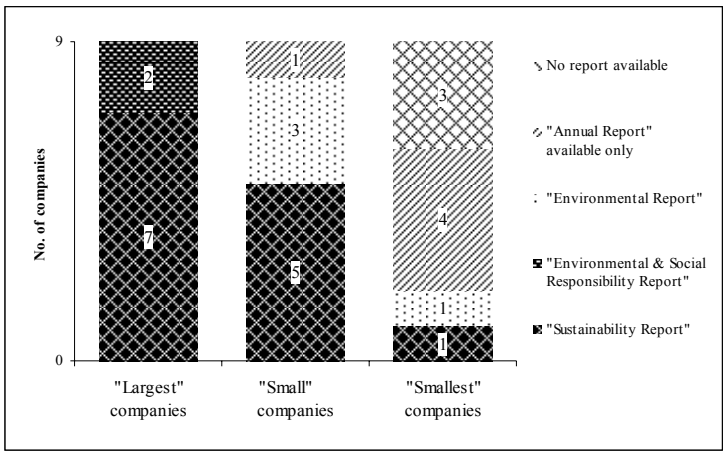


Diagram 1: ***Size-related comparison of the availability and types of non-financial reports.*** *The availability as well as the comprehensiveness of CR reports is decreasing with declining size of companies.*

[32] *MeadWestvaco*'s „Stewardship and Sustainability Report" (online information), *Oji Paper*'s "Environmental and Sustainability Report" and *New Page*'s "Sustainable Development Report" are considered as "sustainability reports" only.

published by small companies are "environmental reports", making this kind of report the one with the highest share among the three company-size segments and the second highest share of reporting types within the group of small companies. Among the smallest companies only one "environmental report" is published next to one "sustainability report". *Diagram 1* provides an overview of the results regarding the availability and types of reports.

The results also show a considerable higher timeliness of CR reports' data published by larger companies. Seven of the nine non-financial reports of the largest companies refer to data of year 2006[33], while only three of the eight small companies' reports and none of the smallest ones do so. Similarly, no non-financial report of the largest company group, but 25 percent of the small and 50 percent of the smallest forest and paper companies' non-financial reports include data older than of year 2005. The results are represented in *diagram 2*.

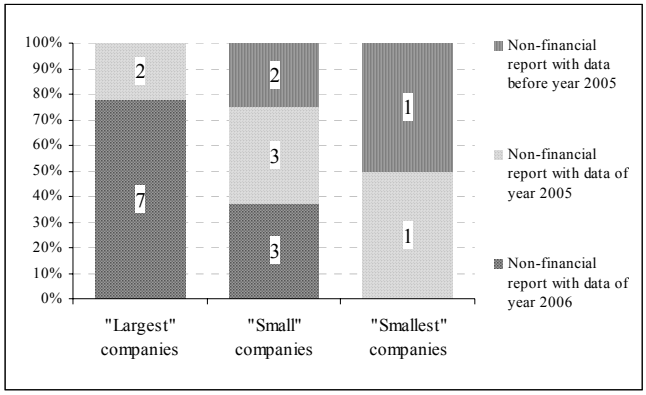


Diagram 2: ***Size-related comparison of the timeliness of non-financial reports.*** *The timeliness of published information of non-financial reports is decreasing with declining company size.*

4.1.2 Regional comparison of the availability, types and timeliness of reports

Seven of nine of both North American and European, but only five of nine Asia-Pacific companies have non-financial reports available at their websites. All North American companies do publish at least an annual report via their website, meanwhile one European and two of nine Asia-Pacific companies have no reports available at all.

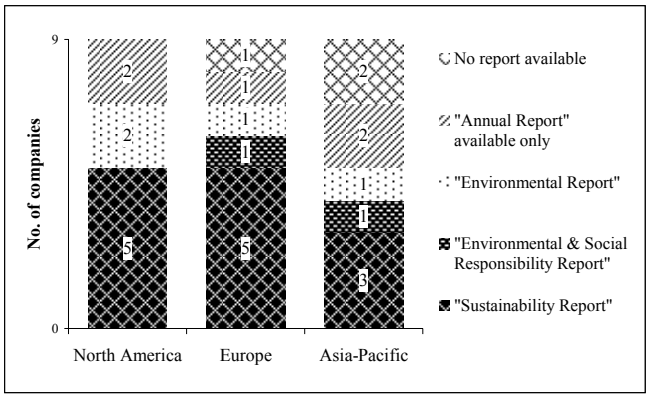


Diagram 3: ***Regional comparison of the availability and types of non-financial reports.*** *North American and European companies show a relatively similar availability and distribution of types of non-financial reports. Asia-Pacific enterprises, however, have a lower number of reports available at all as well as a lower share of non-financial reports and sustainability reports in particular than companies of the two other regions.*

Five and thus the majority of both North American and European companies do publish a "sustainability report", meanwhile

[33] Each report including data of year 2006 is classified as "non-financial report with data of year 2006" regardless of the fact that only a period of the whole year can be referred to. In case of reports that include data of more than one year only the latest year is considered, i.e. each report is considered only once.

only three out of nine Asia-Pacific companies have this type of report available. "Environmental and social responsibility reports" are available for one European and one Asia-Pacific company. "Environmental reports" are published by two North American companies and by both one European and one Asia-Pacific company. Whereas the availability and the distribution of types of North American and European non-financial reports is relatively similar, Asia-Pacific companies have the least reports available at all and published the lowest number of non-financial reports as well as comprehensive sustainability reports in particular. Please use *diagram 3* for an overview of the results.

The highest percentage of non-financial reports with most current information is to find for Asia-Pacific companies with 80 percent of the non-financial reports referring to data of 2006; meanwhile only 57 percent of the European and 25 percent of the North American non-financial reports do so. Notwithstanding this trend, data of available CR reports of European companies refer exceptionally to 2006 and 2005, whereas one Asia-Pacific report and two North American reports include data from before 2005. At all, reports from North American companies include the lowest share of data from 2006 and the highest share of data older than from 2005, indicating a tendency of slender timeliness. *Diagram 4* provides an overview of the results.

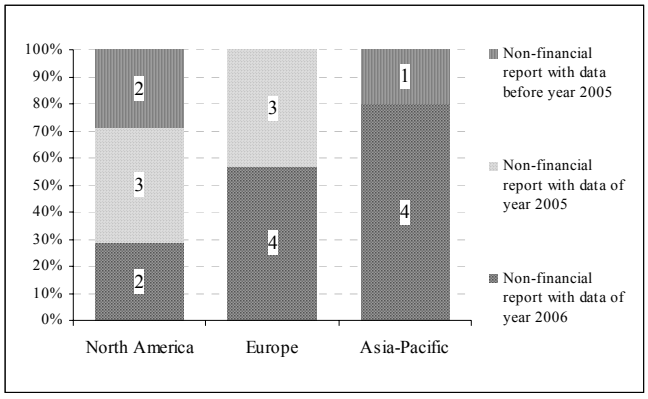


***Diagram 4:* Regional comparison of the timeliness of non-financial reports.** *Whereas the share of non-financial reports with data from 2006 is highest for Asia-Pacific companies, European non-financial reports provide data not older than of year 2005. North American companies' reports, however, include the lowest share of data from year 2006 and the highest share of data before year 2005.*

4.1.3 Discussion of the results

71 percent of the sample companies that belong to the global top 100 have published a separate corporate responsibility report, mainly as a sustainability report. Compared to the results of the 2005 KPMG reporting survey (KPMG 2005) that found 33 percent of the top 100 companies of 16 countries have published separate non-financial reports, this new sector-specific results indicate forest and paper companies as being very active in the publication of CR reports. Compared to the sector-specific 2002 KPMG study (KPMG 2002) which found only 37 percent of 44 large forest and paper enterprises publishing non-finan-

cial reports, the results indicate considerable progress in the reporting practice of the forest and paper sector since year 2002.

There is a clear trend concerning a correlation between the company size and the availability, comprehensiveness and timeliness of CR reports. The availability and timeliness of non-financial reports as well as the share of sustainability reports as the most comprehensive form of CR reports is declining with decreasing company-sizes. These results are consistent with previous study results that determined reporting as being dependent on the firm size (e.g. Adams 1998, Ho/Taylor 2007 etc.). The often mentioned reason of limited resources of small and medium-sized enterprises for the preparation of CR reports as well as the fact that larger companies are much more in the focus of the public are assumed to be valid also for the forest and paper sector.

Concerning the regional influence on availability, comprehensiveness and timeliness of reports trends become less clear. However, there is a tendency that Asia-Pacific companies are less active in the publication of CR reports and sustainability reports in particular. This could be due to a more internal environmental accounting orientation of included Japanese companies in comparison with the more external, broader sustainability orientation of enterprises from the US or Europe (see Kolk 2005c: 158f.). Additionally, the result can be influenced by the inclusion of companies from countries as China and Taiwan where a reporting tradition on corporate responsibility is still developing and thus not widespread. Another problematic area could be related to the fact of language barriers, meaning that a non-financial report could indeed exist but is either not available in English or not to find due to a limited English version of the website.

Another tendency is obvious with regard to lower timeliness of North American CR reports in comparison with Asia-Pacific or European ones. The availability of reports, however, can be influenced by the examination period in April 2007. As a repeated website check in November 2007 showed, two 2005 North American reports have indeed been updated and refer now to data of 2006. However, also a 2005 European report has been replaced by a 2006 version, meaning that the percentage of reports with data of 2006 is still lowest for North American companies. Nevertheless, a limitation is given concerning the high percentage of Asia-Pacific non-financial reports referring to data of 2006. Due to the reporting period ending at March, the 31st each year, Asia-Pacific reports are called 2006 versions, albeit they do not include data of the whole year as North American or European companies' reports do. Considering this fact, European non-financial reports can be assumed as the ones with the highest timeliness.

To conclude, the first hypothesis can be fully supported. Non-financial reports are less frequently available, less up to date and less comprehensive the smaller a forest and paper company is. However, the second hypothesis is dissented since regional uniformity is not given. Whereas Asia-Pacific companies' CR reports tend to be less frequently available, reports from North American companies show a tendency of lowest timeliness. In contrast, the timeliness of European non-financial reports tends to outperform the other two regions.

4.2 Corporate responsibility reporting quality of the forest and paper sector in general and in comparison with other sectors

Due to the fact that most previous studies refer only to the largest companies of several sectors, the assessment of the overall reporting quality of forest and paper sector is also based on the examination of the largest enterprises. The results are presented in the following.

4.2.1 The use of GRI guidelines and external report verification

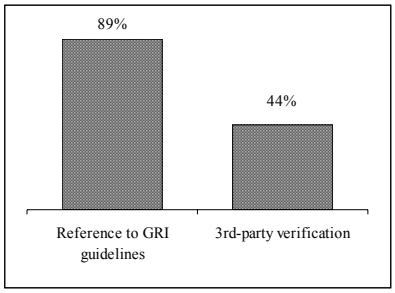


Diagram 5: ***The share of GRI use and third-party verification among the largest forest and paper companies.*** *Almost all of the largest forest and paper companies referred to GRI guidelines, whereas less than half of them included an assurance statement.*

As shown in *diagram 5*, eight of nine or 89 percent of the largest forest and paper companies referred to GRI guidelines in their CR reports. Six of nine or 67 percent of the examined reports included a GRI content index pointing out issues reported and not reported on. External verification as a further measure for the improvement of report quality is used to much lower extent. Only four of nine or 44 percent of CR reports included an assurance statement.

4.2.2 The quality of published sustainability performance information

The total sustainability reporting quality in terms of detailed and explicit disclosure on sustainability performance of the largest forest and paper companies is relatively low, reaching only 41 percent in total, which scantily meets the definition of moderate information quality. Among the three sustainability reporting categories, environmental performance information reaches 56 percent and is most detailed and explicit in comparison with social and economic performance reporting. The quality of social as well as economic performance information is low and amounts for only 32 or respectively 36 percent. Please use *table 6* for an overview of the results.

Sustainability performance reporting	Quality percentage	Information quality
Social sustainability performance information	32%	low
Economic sustainability performance information	36%	low
Environmental sustainability performance information	56%	moderate
Total sustainability performance information	**41%**	**moderate**

***Table 6:* The quality of sustainability performance information published by the largest forest and paper companies.** *The quality of performance information is defined relatively low, especially with regard to social and economic performance data.*

Information quality is highest for reporting on environmental investments and expenditures (grouping: "overall") as well as for reporting on materials where 74 or respectively 72 percent are reached. In both cases detailed information is given by five of nine companies on average. The quality of information on the content groupings of energy and water consumption also ranked highest, although it is defined only as moderate due to 68 or respectively 65 percent. *Table 7* provides an overview of the information quality results of all groupings.

Content / indicator groupings	Quality percentage	Information quality	No information is given by Ø *x/9* largest companies	Detailed information is given by Ø *x/9* largest companies
Economic performance groupings				
Economic performance	22%	low	6	1
Market presence	26%	low	4	0
Indirect economic impacts	59%	moderate	0	1
Environmental performance groupings				
Materials	72%	high	1	5
Energy	68%	moderate	1	3
Water consumption	65%	moderate	1	4
Biodiversity	37%	low	3	1
Emissions, effluents and waste	45%	moderate	3	2
Products and services	43%	moderate	1	1
Compliance	59%	moderate	2	4
Transport	41%	moderate	3	2
Environmental investments (Overall)	74%	high	0	5
Social performance groupings				
Labour practices and decent work	41%	moderate	3	2
Human rights	19%	low	5	0
Society	35%	low	4	1
Product responsibility	31%	low	3	0

***Table 7:* Information quality of all sustainability performance content groupings provided by the largest forest and paper companies.** *The quality of reporting is high for only two environment-related groupings and low especially for social as well as economic performance issues.*

High information quality was examined among the largest forest and paper companies' reports for only seven of the underlying indicators. This is shown in *table 8*. Only one of the indicators is not an environmental one, but refers to rates of injury, occupational diseases,

Performance indicators with *high* information quality	Category	Quality percentage	No information is given by *x/9* largest companies	Detailed information is given by *x/9* largest companies
LA7: Rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities by region	Social	85%	0	5
EN14: Strategies, current actions, and future plans for managing impacts on biodiversity	Environment	85%	0	5
EN20: NOx, SOx, and other significant air emissions by type and weight	Environment	85%	0	5
EN22s: Total weight of waste by type and disposal method	Environment	82%	0	5
EN2: Percentage of materials used that are recycled input materials	Environment	78%	1	5
EN16: Total direct and indirect greenhouse gas emissions by weight	Environment	74%	1	4
EN30: Total environmental protection expenditures and investments by type	Environment	74%	0	5

Table 8: ***Sustainability performance indicators for which high quality disclosure is provided by the largest forest and paper companies.*** *The vast majority of indicators for which high information quality is reached by the largest forest and paper companies refer to environmental performance.*

lost days, absenteeism and the number of fatalities. High reporting quality is furthermore given concerning the management of the impacts on biodiversity, SO_x, NO_x and greenhouse gas emissions, waste, recycled input materials as well as environmental expenditures and investments.

In contrast, reporting on three out of total four social, two out of total three economic and one out of total nine environmental groupings is characterized by low quality information as shown in *table 7.* Information quality of the content groupings human rights and economic performance is especially low. More than half of the largest companies do not provide any information for these issues. Among the sub-groupings concerning human rights, information quality concerning freedom of association and collective bargaining is lowest of all with only seven percent, whereas information quality on child and forced/compulsory labour is highest with 30 percent. With regard to the grouping of economic performance, the quality of information is moderate related to basic information as revenues, operating costs and employee compensation (indicator EC1; reaching 44 percent), somewhat lower concerning reporting on climate change and expected financial risks and opportunities (indicator EC2) and considerably low for reporting on the coverage of defined benefit plan obligations (EC3) and financial assistance received from governments (EC4).

Low quality of information must be stated as well concerning the economic content grouping of market presence, the social groupings product responsibility and society as well as the environmental grouping of biodiversity. Whereas the society-related content sub-grouping and indicator of community (SO1) scores well with 70 percent, information quality on sub-groupings corruption and public policy participation is low with 16 or respectively 19 percent. With regard to the social grouping of product responsibility there is almost no information available concerning the sub-grouping and indicator of market communication (PR6), but moderate quality of information regarding customer health and safety (PR1) as

well as product and service labelling (PR3). A detailed overview of the results is given in the *appendix*.

No information at all is given by the largest forest and paper companies for underlying indicators referring to the coverage of benefit plan obligations, the ratio of basic salary of men to women and the percentage of investment agreements with human rights clauses as shown in *table 9*. Additionally, the quality of information on further seven specific underlying indicators is defined as being "no" quality, due to a received quality score of only seven percent. Among them there are three environmental indicators (EN17, EN19, EN25) related to other greenhouse gas emissions, emissions of ozone-depleting sub-stances and the biodiversity value of waterbodies that are affected by water discharge. The three social indicators among them (HR5, SO2, PR6) are related to reporting on the risk for collective bargaining and freedom of association, the percentage/number of business units analysed for risks related to corruption and market communications. The economic indicator with "no" information quality refers to significant financial assistance received from government (EC4) and was already mentioned before.

Performance indicators with no information available at all	Category
EC3: Coverage of the organization's defined benefit plan obligations	Economic performance
LA14: Ratio of basic salary of men to women by employee category	Social performance
HR1: Percentage/number of significant investment agreements with human rights clauses or human rights screening	Social performance

***Table 9:** Sustainability performance indicators for which no information at all is published by the largest forest and paper companies*

Next to the best and the worst reported issues, moderate reporting quality is examined for the economic content grouping of indirect economic impacts considering information on commercial, in-kind and pro bono engagement, as well as for the social content grouping of labour practices and decent work. With regard to the labour and work grouping, information quality of the underlying indicators is highly inhomogeneous. Whereas information quality is highest for reporting on occupational health and safety data (LA7; reaching 85 percent), for data on total workforce (LA1; reaching 70 percent) and for workforce diversity measurements (LA13; reaching 70 percent), there is no reporting at all on the ratio of basic salary of men to women (LA14) as mentioned before and low information quality concerning minimum notice periods regarding significant operational changes (LA5; reaching 15 percent), employee turnover (LA2; reaching 22 percent) and the percentage of employees covered by collective bargaining agreements (LA4; reaching 26 percent).

Moderate information quality must be stated as well for the environmental groupings referring to transport, the environmental impact of products and services, compliance with environmental laws and regulations as well as emissions, effluents and waste. The final score

of the last mentioned grouping is a result of highly variable scores of underlying indicators. Whereas three of the indicators of the content grouping of emissions, effluents and waste are among the best reported ones at all (EN16, EN20, EN22s), three others (EN17, EN19, EN25) belong to the ones with "no" quality. Low information quality is also examined for the reporting on spills (EN23; reaching 11 percent).

An overview of all information quality results of indicators, social sub-groupings and sustainability performance information groupings for the largest forest and paper companies is to find in the *appendix.*

4.2.3 Discussion of the results

The use of GRI guidelines among the largest forest and paper companies is considerably high with all except one companies referring to the guidelines. In the 2005 Canadian STRATOS study (Stratos 2005) as well as the 2005 global KPMG study (KPMG 2005) only 40 percent of the examined companies mentioned GRI guidelines for the selection of content. Nevertheless, in the KPMG study 100 percent of the reporters of the oil and gas as well as the chemicals and pharmaceutical sector referred to GRI. Since sectors with high environmental impact have always been forerunners in corporate responsibility reporting due to higher pressure from NGOs and other stakeholders, the common use of GRI guidelines as measure for the quality improvement among the two before mentioned sectors seems to be corollary. It is also the relatively high impact on environment of the forest and paper companies that can serve as an explanation for the high use of GRI guidelines among forest and paper companies.

The share of forest and paper companies' reports with external verification is also relatively high in comparison with other studies. Whereas 45 percent of the non-financial reports include a third-party assurance statement, only 18 percent of the reports examined by STRATOS (Stratos 2005) had shown such statements. The share of verified reports of the largest forest and paper companies would be even higher if the *OJI Paper*'s report presenting a professor's independent opinion on the report would have been referred as external verification. In the 2005 KPMG study the share of verified reports for all sectors except mining and utilities was below 50 percent. The reason for the relatively high number of externally verified reports among the largest forest and paper companies is thus again to be seen in relation to the sector's environmental impact and its efforts towards reliable high-quality reports.

Albeit defined as moderate, the total sustainability performance disclosure quality of the largest forest and paper companies' CR reports is relatively low, reaching only 41 percent. This is consistent with other studies that found weaknesses in reporting on sustainability performance information or "hard" facts (e.g. Daub 2006, Quick 2006). A further similarity to previous studies is the higher degree of reporting on environmental performance in comparison with published economic and social performance information (e.g. KPMG 2005, Perrini 2005, Greenall 2001). Several reasons are supposable for the better reporting quality of environmental issues. As LANGER states, widespread ISO 14001 and EMAS certification has considerable influence on the comprehensiveness of environmental reporting (Langer 2006: 594), meaning that specific environmental data must be published anyway and are not only measured for the preparation of the sustainability report. Legal requirements as for example the US *Toxic Release Inventory* or the Japanese *Pollutant Release and Transfer Register Law* are also drivers for a higher environmental performance information quality since they require specific data measurements. Another reason for the better reporting on environment-related issues could be the longer history of this type of reporting as well as in the easier measurability and description of data due to quantity units. Considering the content groupings and specific underlying indicators for which the quality of reporting is highest, the last mentioned reason of an easy measurability seems to be evident. Data on environmental investments, materials, water consumption, and energy input as well as waste disposal, SO_x/NO_x and greenhouse gas emissions are easy to quantify and thus to present.

Whereas previous research data concerning the comparison of reporting quality on environmental investments and expenditures are lacking, a strong emphasis on emissions, especially greenhouse gas emissions, is also to find in other studies having evaluated the reports of non-forest and paper sectors (e.g. KPMG 2005, Perrini 2005, Stratos 205, Langer 2006). Similarly, information quality on energy issues and wastes is also identified as high in other studies (see Stratos 2005, Perrini 2005). However, there is a tendency that the extent and quality of reporting on raw materials as well as water consumption is somewhat lower by non-forest and paper companies (see Perrini 2005, Stratos 2005). The higher reporting of forest and paper companies on these issues seems to be logical since this industry is synonymous with considerably high water consumption as well as raw material input. High quality reporting is also present in this study concerning indicator EN14 referring to strategies, actions and future plans to manage impacts on biodiversity. In contrast, the total information quality of biodiversity reporting, however, performed lowest among the envi-

ronment-related groupings. The reason for this disaccord may be that most companies represent projects for the protection of specific sites/species or environment in general, but do not provide any detailed information on the location and size of specific areas or habitats with high biodiversity value or the number of red-listed species affected by operations. Comparisons of the reporting quality on biodiversity to other studies are difficult due to lacking information. However, in the 2005 STRATOS study the average score of reporting on land use, biodiversity, habitat and species also ranked next to last among the environmental performance criteria (Stratos 2005). A main reason for low reporting quality on biodiversity in general could lie in the fact that necessary performance measurements are complex and based on many determinants. In case that detailed data on biodiversity are not required by laws or certification schemes or influenced by pressure from the public, companies are most likely not willing to pay for such efforts.

Similarly, complicated measurements or difficult presentation of most social performance information could also be the reason for unsatisfying results regarding the quality of social reporting. The overall social performance reporting of the largest forest and paper companies is, albeit only slightly, lower than the total economic performance reporting. Social performance reporting is also weakest in previous studies on other sectors as this of STRATOS (Stratos 2005) or GREENALL (Greenall/Yachmin 2001). However, other studies found a relatively good social performance reporting compared to the economic one (e.g. KPMG 2005, Langer 2006, Quick 2006), meaning that there is no generally admitted trend concerning the ranking of social and economic information provided by companies' responsibility reports. An analogue result of all studies, however, is the concentration on traditional social reporting issues as workforce numbers, diversity and especially health and safety measures. This is also the case in the present study and visible by the fact that the only one of the four social performance groupings with moderate and therefore best information quality is the one referring to labour practices and decent work. The only social indicator with high quality of information available refers to health and safety measures as the number of injuries, lost days and fatalities (LA7). Information on occupational health and safety also received highest scores among social issues in previous non-forest-related studies (e.g. KPMG 2005, Stratos 2005, Perrini 2005). As mentioned before in results of previous studies reporting quality on social indicators referring to workforce numbers and its regional distribution (LA1) as well as to its diversity according to gender or age (LA13) is also considerably higher than reporting on other social indicators in the study at hand. This again supports the assumption that reporting quality is especially high for issues that are easy to

measure and relevant not only for the preparation of CR reports. Information on training hours per employee, however, is albeit relatively easy to measure, but only of moderate quality. This is contradictory to the results of previous studies where good information on employee training was found (see KPMG 2005, Perrini 2005, Vuontisjärvi 2006). With regard to the low quality of information concerning employee turnover (LA2) or minimum notice periods regarding significant operational changes (LA5) no data are available in previous studies. A reason for the low reporting quality on these issues, however, could be that employee turnover and notifications could be understood slightly negative and are thus not reported to prevent damages of the reputation of the company.

For three fourths of the social performance information groupings as well as for the majority of underlying social indicators, reporting quality is low or even defined as having "no" quality. Information quality on human rights including issues of child or forced/compulsory labour, discrimination as well as freedom of association and collective bargaining is particularly low. This is consistent with previous report surveys (e.g. KPMG 2005, Stratos 2005, Kolk 2004a). Albeit there are commonly general statements with regard to the prevention of child and forced labour, non-discrimination and freedom of association as well as its anchorage in the code of conduct, detailed information on human rights is lacking. Several reasons can be assumed for this lack of information or non-reporting in general. One reason, as mentioned before, is that the measuring and presentation of data would be too difficult or too expensive. Another reason could be that indicators are simply irrelevant for the sector or do not emerge within the operations of the specific company. The lack of information on investment agreements with human rights clauses (HR1) for instance could be due to irrelevance for forest and paper companies. The relatively low information quality of reporting concerning compliance with laws and regulations (environmental grouping "compliance" and social performance indicators SO8, PR9) could also be the result of the fact that companies that did not have to pay fines or were affected by non-monetary sanctions do not report about it. Other examples of indicators whose low information quality is most likely due to the fact that they do not emerge at companies, is the reporting on financial assistance from governments (EC4), the emissions of other greenhouse gases (EN17) or emissions on ozone-depleting substances (EN19). Additionally, also exceptional events as fatalities or spills (EN23) are most likely to be not reported if they do not occur. The low reporting on details concerning human rights could be also a result of the non-emergence of events. If companies and their suppliers are not faced with incidents of child or forced labour or risks regarding the freedom of association and collective bargaining, they

will most likely not report about this in detail. On the other hand, it is also supposable that reporting on specific performance issues is intentionally ignored to cover up bad performance, since it could lead to an decrease in cash flows (see Verrecchia (1983), cited by Berthelot 2003: 3). This could also lead to low information quality of human rights indicators among the largest forest and paper companies and is supposable especially for reporting on the incidents of discrimination. The total lack of information on indicator LA14 could additionally be attributed to the reason of covering up bad performance. Albeit it is not uncommon that salaries of women are lower than the ones of men, there is no reporting at all on this issue. Irrespective of this assumption, a lack of reporting on equal opportunity that goes beyond data related to age and gender is also found in the previous study of VUONTISJÄRVI (Vuontisjärvi 2006). Reporting on specific issues can also be intentionally ignored to prevent competitors from receiving important information. It is possible that the low reporting quality of the economic grouping of market presence and thus information on locally-based suppliers and local hiring is due to concerns about competitors.

The second-lowest quality score is received for the content grouping of economic performance. Again most detailed information is provided for an indicator (EC1) whose database is relatively easy to measure and not singularly prepared for the corporate responsibility report, information quality of other related indicators is low. Relatively good reporting on key financials can be found in other studies (e.g. KPMG 2005, Stratos 2005, Langer 2006). However, information quality given on expected financial risks and opportunities due to climate change is, albeit low, relatively high in comparison with other indicators. Unfortunately, comparably detailed results of other studies are not available. The only study examining the awareness of climate change is the one of KPMG that found 85 percent of examined companies addressing climate change in general (KPMG 2005).

The quality of information on the social content groupings product responsibility as well as society is also low among the largest forest and paper companies. Comparable information of other studies is hardly available especially with regard to product responsibility. However, as the quality of information on the sub-groupings customer health and safety as well as product labelling is highest within the product responsibility content grouping, the extent of information on product labelling is also relatively high in the study of PERRINI (Perrini 2005). CLAUSEN, however, found a low reporting quality for the social aspects of products and services (Clausen 2005).

Regarding reporting on society, information quality is especially low for reporting on corruption and public policy participation. Information on public policy participation was also

hardly to find in the survey of UNEP/SustainAbility (UNEP et al. 2006). One reason for the low information quality on public policy participation could be seen in the fact that a candid reporting would mean a public political positioning which could influence the behaviour of stakeholders towards the company. The problem of corruption was addressed relatively frequently among the examined European reports studied by PERRINI (Perrini 2005), but KPMG, on the other hand, found relatively low information on policies for corruption. Low reporting on corruption could be due to the fact that the companies are not aware of the risk of corruption, feel confident that corruption does not appear or want to cover up bad performance to prevent a damage of the company's reputation. The quality of information on the sub-grouping community is however relatively high, reaching 70 percent. This is surprising, since the measurability of community impact and involvement is more difficult than gathering data on workforce. Nevertheless many companies refer to programmes and actions with regard to community involvement in their CR reports. Other studies also found relatively good reporting on community related issues. A number of them, however, examined not the involvement of or collaboration with communities but the issue of community spending/philanthropy (KPMG 2005: 25). This specific kind of information is collected in this study as economic performance information. Since reporting on commercial, in-kind and pro-bono engagement is also common in the CR reports of the largest forest and paper companies, the content grouping of indirect economic impacts shows highest information quality among the three economic ones.

With regard to the environmental content grouping of transport, it is surprising that information quality for this issue is only at 41 percent and is thus among the environmental groupings with lowest information quality. Other studies do unfortunately not present any data regarding environmental impacts of transportation. A reason for low quality reporting, however, could be that transportation of raw material as well as products is carried out by external contractors whereby forest and paper companies do not feel responsible for generated environmental impacts. The likewise relatively low reporting of environmental impacts of products and services could be due to inappropriate underlying indicators whose applicability to forest and paper products is limited. Comparisons to other studies are impossible due to lacking data.

Overall comparing the information quality results of the study at hand with results of previous studies on other sectors is very difficult due to differing methodological approaches. Whereas some studies considered only separate CR reports (KPMG 2005,

Stratos 2005), others also referred to sustainability information in annual reports (e.g. Daub 2006). Additionally, the selection of indicators and the elaboration of scoring systems are varying, meaning that specific reporting issues can be summarized with others or even left out. Also the regional focus is differing. The only global cross-sector study was conducted by KPMG. Unfortunately it only examined the extent of reporting, i.e. if issues are mentioned or not, and did not consider the quality (detailedness) of information. Information quality was only assessed by studies with national focus (i.e. Stratos 2005, Daub 2006, Langer 2006, Quick 2006), whereby country effects could largely have influenced the results. In addition to divergent methodological frameworks and restrictions due to regional limitations, the comparability between studies on reporting is hindered or even impossible because of varying effects of sector compilations and company sizes which interfere with each other. Finally and irrespective of the methodological approaches, the information published in CR reports is subject to time effects, which means that study results found few years earlier are hardly comparable to present-day results. Due to these mentioned difficulties, comparisons with other sector results are only roughly possible and can not go into detail.

Another problem with regard to the overall information quality of CR reports emerges due to the use of the 2006 GRI performance indicators as basis for the evaluation framework. Because a number of selected forest and paper companies still used 2002 GRI guidelines for the preparation of their non-financial reports, the low information quality on some indicators can also be related to the revision of guidelines and thus adding of completely new indicators in 2006. This is the case e.g. for indicator EC3 referring to the coverage of defined benefit plan obligations for which no information was available at all.

Nevertheless, the general picture shows that information provided by CR reports of forest and paper companies is relatively similar to those of other sectors. Rather good information is to find concerning environmental issues, whereas detailed economic and social information is lacking. That's why the third hypothesis can be fully supported. Small differences in the provision of information, however, exist due to sector-specific operations as for instance the information on water consumption and raw material input.

4.2.4 Recommendations

The use of GRI guidelines and external verification among the CR reports of the largest forest and paper companies is relatively intense; nevertheless third-party assurance of reports

should be advanced for a higher quality of reports. The main focus, however, should be on the improvement of the disclosure of sustainability performance information.

Most efforts should be made with regard to the disclosure of economic and social sustainability performance information. However, more detailed reporting is also desirable with concerning the topic of biodiversity and the environmental impacts of transportation. Forest and paper companies should report not only on specific projects for the protection of specific areas or species, but also on the location and amount or respectively share of protected forest areas, sites and habitats with high biodiversity value and red-listed or protected species that are influenced by the company's operations. Detailed information should also be available on the fuel consumption and emissions related to the transportation of raw materials as well as products.

More detailed information is necessary regarding economic performance data exceeding that of annual reports. In particular, information on financial implications due to risks and opportunities of climate change should find further emphasis. Additionally, forest and paper companies should report more extensively on their market presence, meaning that explicit and detailed information should be provided concerning the company's spending on locally-based suppliers and with regard to local hiring procedures at least for the most important locations of operations.

Regarding social performance reporting almost all reporting issues except the traditional ones as the number and diversity of workforce and data on occupational health and safety as well as community involvement should be taken into consideration more extensively. The most important fields for quality improvements of social performance information are related to human rights, to corruption, public policy participation and market communication. Better information disclosure on human rights can be achieved by the publication of detailed information concerning human rights screening of suppliers and by explicit statements regarding incidents of discrimination and actions taken against. Furthermore, higher quality of human rights reporting can be achieved by more extensive disclosure of information on the identification of operations having a risk for the freedom of association and collective bargaining as well as the incidence of child labour and forced/compulsory labour. The description of actions against child and forced/compulsory labour and for the support of the freedom of association and collective bargaining should also be considered more extensively within the CR reports of forest and paper companies. In the same way, information quality on corruption can be improved by more explicit disclosure concerning the risks of corruption within the company, training of employees for the prevention of

corruption and actions taken in response of. More explicit reporting is additionally desirable with regard to public policy positions and participation in public policy development and lobbying. The quality of information should also be improved considerably with regard to market communications, which means more detailed statements concerning the company's adherence of laws, standards and voluntary codes related to advertising, promotion and sponsorship. Irrespective of the fact that the information quality regarding labour practices and decent work is relatively good, the provision of information should be improved concerning data on employee turnover, employee coverage by collective bargaining agreements and differing salaries of women and men. Reporting on training of employees should also receive more attention in the forest and paper sector.

The guidelines of GRI should definitely be used for the preparation of sustainability reports in the forest and paper sector further on. A considerable improvement with regard to higher transparency and thus reporting quality, however, is seen if information is provided for each listed performance indicator, irrespective of the fact that it is of irrelevance for the specific company. Instead of discount information on specific issues, explicit statements should be given in cases that specific incidents did not take place. This is desirable for instance with regard to reporting on financial assistance from governments, concerning fines and sanctions for non-compliance with environmental or social-related laws and regulations, the occurrence of spills and incidents of discrimination, since it would avoid assumptions of concealed bad sustainability performance. This recommendation is consistent with the studies of GROSSMAN (1981) and MILGROM (1981) and their argumentation that if investors believe managers are withholding information, they will consider the undisclosed information as negative (Grossman 1981/Milgrom 1981, cited by Berthelot 2003: 3)

4.3 Corporate responsibility reporting quality of emerging sustainability reporters of the forest and paper sector

In the following section the results concerning the quality of reports of small forest and paper companies whose corporate responsibility reporting activity is expected to be a relatively new phenomenon caused by bandwagon effects are presented and discussed in comparison with the quality of reports provided by the largest forest and paper enterprises. At the end of the section, recommendations are given for improvements of the quality of reports and sustainability performance disclosure in particular.

4.3.1 The use of GRI guidelines and external report verification

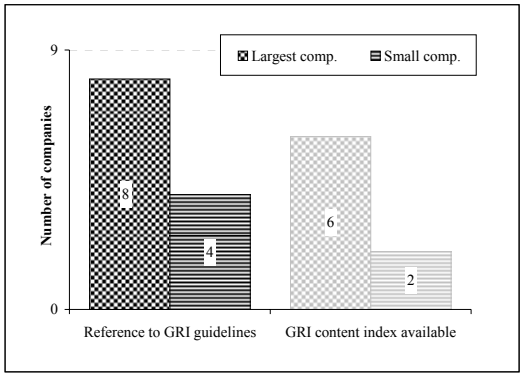


Diagram 6: ***The reference to GRI reporting guidelines and the availability of a GRI content index of the largest forest and paper companies in comparison with small companies***

As shown in *diagram 6* only four of the nine small and thus half the amount of the largest examined forest and paper companies refer to GRI guidelines within their CR reports. A GRI content index is to find in only two of the nine small companies' non-financial reports, but in six reports of the largest enterprises.

Similarly and as presented in *diagram 7* only two of the small, but four of the largest companies' reports include an external assurance statement. Whereas both full and partial verification is received by two of the largest forest and paper enterprises, only one report of the small enterprises is fully verified.

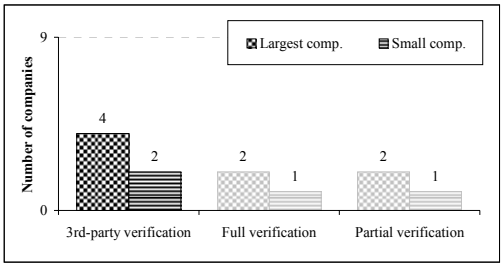


Diagram 7: ***External verification of corporate responsibility reports of the largest and small forest and paper companies***

4.3.2 The quality of published sustainability performance information

Whereas the total sustainability performance information quality of the largest forest and paper companies amounts for 41 percent, small companies report's quality reach only 25 percent. It means that information quality of small companies is 40 percent lower than the quality of information provided by the largest companies. The difference between largest and small companies' reports is thus noticeable. The quality of reports of small companies is worse for all categories of sustainability than the information quality of the largest enterprises. Minor differences are examined concerning the quality of economic performance information, whereas the difference with regard to social performance reporting is considerable. The environmental performance quality of reporting between the two different sized groups is noticeably different. *Diagram 8* and *table 10* provide more detailed information regarding the received quality percentages and differences between largest and small companies' reports.

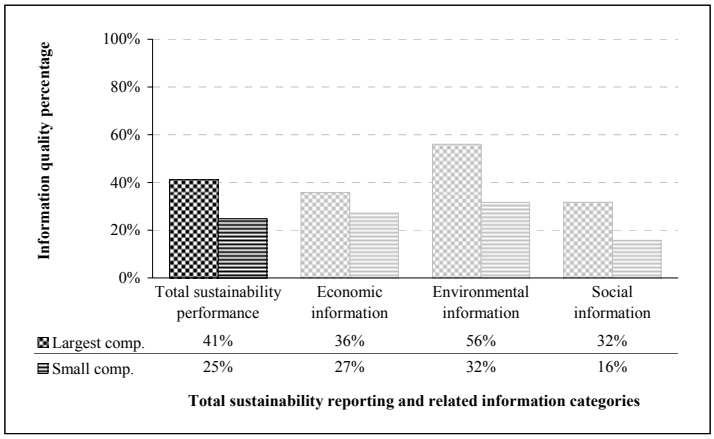


Diagram 8: ***Total sustainability performance information quality of the largest and small forest and paper companies.*** *The quality of performance information provided by the largest companies in total as well as for the three categories is markedly better than the one of small companies.*

Sustainability performance information	Absolute difference	Relative difference	Reporting quality differences are
Economic performance information	9%	24%	minor
Environmental performance information	24%	43%	noticeable
Social performance information	16%	50%	considerable
Total sustainability performance information	**16%**	**40%**	**noticeable**

Table 10: ***Differences in performance information quality between the largest and small forest and paper companies.*** *The quality of total sustainability performance information provided by small companies is absolutely 16 percent and thus relatively 40 percent lower than the quality of information provided by the largest companies, which means noticeable differences between the two groups. The differences are minor with regard to economic performance reporting, noticeable concerning environmental information and considerable regarding social performance reporting.*

As presented in *table 11* the difference in information quality is noticeable for the majority of the sustainability performance information content groupings, meaning that reporting quality of small companies is one fourth up to a half lower than the quality of largest companies' reports. Identical quality of information of the different sized groups of companies is to find for reporting on economic performance. There is no further content grouping for which the information quality is identical, similar or with only minor differences. However, the reporting quality of underlying indicators is not identical except for one single indicator (EC4) referring to financial assistance from governments. Instead, for two of the four indicators of the grouping, i.e. these considering financial basic data (EC1) and the coverage of benefit plan obligations (EC3), the quality of information provided by small companies is even better than those of the largest ones. Information quality for the remaining content groupings of market presence and indirect economic impacts is better for the largest enterprises with noticeable differences. *Diagram 9* provides an overview of the received information quality percentages concerning economic performance information.

Content / indicator groupings	Relative difference	Difference of information quality is
Economic performance groupings		
Economic performance	0%	-
Market presence	29%	noticeable
Indirect economic impacts	31%	noticeable
Environmental performance groupings		
Materials	38%	noticeable
Energy	25%	noticeable
Water consumption	49%	noticeable
Biodiversity	35%	noticeable
Emissions, effluents and waste	33%	noticeable
Products and services	43%	noticeable
Compliance	75%	fundamental
Transport	82%	fundamental
Environmental investments (Overall)	25%	noticeable
Social performance groupings		
Labour practices and decent work	41%	noticeable
Human rights	44%	noticeable
Society	65%	considerable
Product responsibility	50%	considerable

Table 11: ***The differences in information quality of the largest and small forest and paper companies.*** *Relative percentages describe how much lower the quality of sustainability information provided by small companies' reports is. For the most issues, the difference in reporting quality is noticeable.*

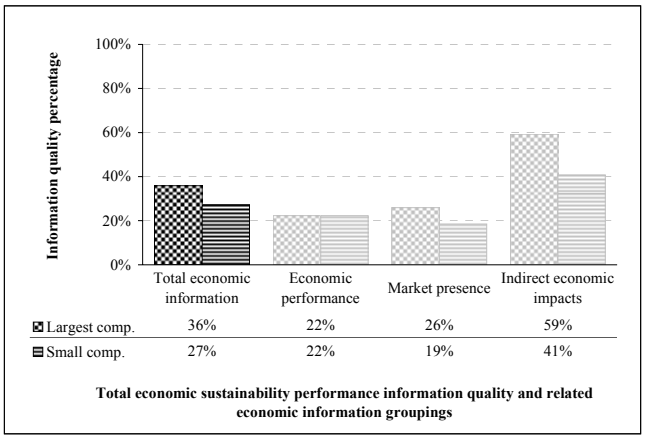


Diagram 9: ***The quality of economic sustainability performance information disclosed by the largest and small forest and paper companies.*** *Largest companies perform better than the small ones in total as well as for the two content groupings of market presence and indirect economic impacts. Disclosure quality for the grouping of economic performance, however, is identical for the different sized groups of enterprises.*

For two environmental content groupings, namely compliance and transport, the information quality provided by small forest and paper companies is very low and thus fundamentally different of that of the largest ones. Similarly, the two underlying indicators (EN28, EN29) are the only ones for which the difference in disclosure quality is that high. The differences between the two company groups are examined as noticeable for the remaining seven environmental content groupings. As shown in *table 11* before, the smallest differences among these groupings are examined for reporting on energy and environmental investments with each 25 percent lower reporting of the small companies group. The largest differences exist for reporting on water consumption as well as concerning products and services. *Diagram 10* provides an overview of the information quality of small companies in comparison with the largest ones.

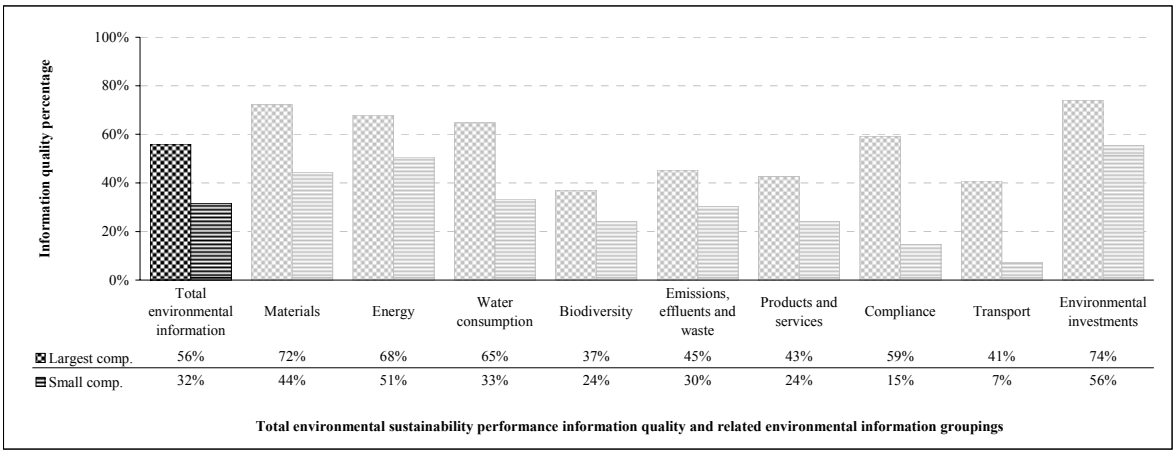


Diagram 10: ***The quality of environmental sustainability performance information disclosed by the largest and small forest and paper companies.*** *The information quality provided by reports of small companies is moderate for the content groupings of environmental investments, energy and materials. The differences between the quality of reporting of the largest and small companies, however, are smallest for reporting on environmental investments and energy, and largest with regard to water consumption, materials and the grouping of products and services.*

With regard to the underlying environmental performance indicators, moderate and thus best information quality of small enterprises is examined for only eight of the 25 reporting issues. For three of them (EN19, EN25, EN29) the information quality percentage achieved is below ten percent.

The quality of reporting of small companies is better than those of the largest ones for indicators related to the size and location of land with high biodiversity value (EN11s), the emissions of other greenhouse gases (EN17) and to the number of spills (EN23). Regarding the last mentioned indicator, the information quality of small companies is moderate and thus fundamentally different to the quality of the largest ones, whereas the differences are smaller and the quality of disclosed information is only low or even defined as being "no" quality concerning the two other indicators. Identical information quality is found for environmental indicator EN25 related to the discharge of water and effected water bodies. Information given on this indicator, however, is also very low for both the largest and small companies. Minor differences are detected for only three indicators. Two of them refer to energy consumption and energy conservation (EN3s, EN5s), whereas the third one refers to reporting on the number of red listed and protected species (EN15).

For nine environmental indicators, noticeable differences were identified between the largest and small companies. Within this group of indicators, the reporting quality is still equal at the most for information on material input (EN1), SO_x, NO_x and other air emissions (EN20), waste disposal (EN22s) and the percentage of products that are reclaimed (EN27). For seven of the underlying environmental indicators the differences between the companies groups are considerably big. This is the case for the disclosure on greenhouse gas emissions (EN16) and initiatives to reduce greenhouse gases (EN18), water withdrawal (EN8s) and water discharge (EN21), environmental impacts of products and services (EN26), the increasing use of renewable energy (EN6n) and emissions on ozone-depleting substances (EN19), though reporting on the last mentioned indicator is very low for both the largest and the small companies. As mentioned before, the differences in reporting are fundamental with regard to the indicators related to compliance and transport.

The quality of information on social performance in reports of small companies is generally very low for all content groupings as presented in *diagram 11*. It is also

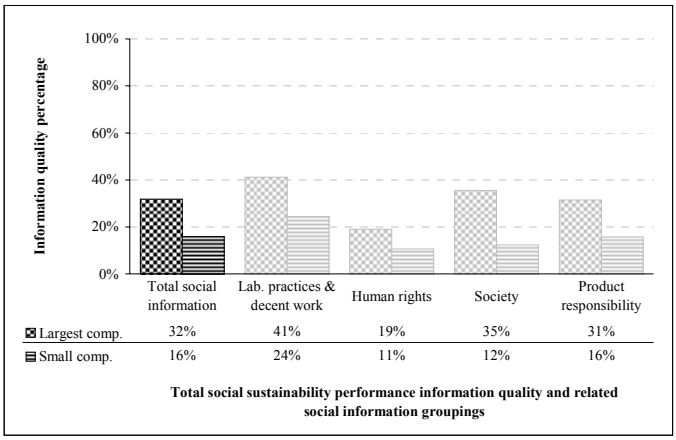


Diagram 11: ***The quality of social sustainability performance information disclosed by the largest and small forest and paper companies.*** *The quality of information provided by small companies is very low in total as well as for three of the underlying content groupings. The difference in disclosure in comparison with the largest companies' reporting is considerable and thus highest concerning the content groupings of product responsibility and especially concerning society.*

low for all underlying indicators except the one related to workforce (LA1) and data on occupational health and safety (LA7). Similarly to the quality of information provided by the largest companies, the quality is highest for the content grouping of labour practices and decent work, whereas it is lowest for reporting on human rights. The quality difference between the largest and the small companies is noticeable for reporting on labour practices/decent work and also human rights and considerable concerning the information quality on society and product responsibility (see *table 11*).

Small companies provide more detailed disclosure and thus better information quality than the largest ones for the sub-grouping and synchronous indicator related to the freedom of association and collective bargaining (HR5) and for indicator LA14 considering the ratio of salary of men to women. Identical information quality is to find for disclosure concerning the sub-grouping and indicator of market communications (PR6), and indicators related to data on employees' turnover (LA2) and investment agreements with human rights clauses (HR1). However, general information disclosure quality for the before mentioned indicators is very low or even not existent. Minor differences for the information quality are examined for the content sub-grouping of employment due to identical reporting quality on the indicators of employee turnover and workforce. Noticeable differences are detected for the three sub-groupings and synchronous indicators of training and education (LA10), product and service labelling (PR6) and compliance with laws and regulations related to product responsibility (PR9).

For the majority of social performance information sub-groupings the differences in quality between the largest and small companies' reports are considerably big. Information quality percentages received by small companies are at best only half of that of the largest companies for eight of 14 content social sub-groupings. Labour/management relations, occupational health and safety as well as diversity and equal opportunity are sub-groupings with considerably different reporting quality related to the social content grouping of labour practices and decent work. Furthermore, reporting on human rights issues of non-discrimination as well as child and forced/compulsory labour is considerably different. Additionally, society-related disclosure quality is considerably different between the companies' groups concerning information on community, corruption and compliance with laws and regulations. Similarly, considerable differences were examined for ten of the underlying 25 social performance indicators. A detailed list is to find in the *appendix*.

Fundamental differences in information quality are found for three social sub-groupings and five of the underlying indicators. Among these sub-groupings with fundamental diffe-

rences in information quality one is related to the grouping of human rights and refers to investment and procurement practices. The two others are indicators and sub-groupings at the same time and refer to public policy positions and participation (SO5) and to health and safety impacts of products and services (PR1). Additionally fundamental differences are detected concerning disclosure on human rights screening of suppliers and contractors (HR2), the analysis of business units for the risk of corruption (SO2) and training in anti-corruption practices and procedures (SO3). However, even the largest companies provide very low quality of information concerning indicators SO2, SO3, SO5 and HR2, whereas moderate disclosure quality is only given by them with regard to indicator PR1.

4.3.3 The quality of published forestry-related information

The information quality for forestry issues amounts for 63 percent for the largest forest and paper companies and for only 24 percent for the small ones. This means a moderate disclosure quality of the largest and a low quality of the small enterprises and again considerable differences between the two companies groups. High information quality is to find for reporting on certification and the prevention of illegal logging in the reports of the group of largest companies. Moderate quality is to find concerning disclosure on carbon sequestration and storage. The information quality provided in the reports of the small enterprises is low for all forestry-related content groupings and considerably different in comparison with the quality of the largest enterprises in total as well as for all content groupings. Detailed information concerning the percentages of information quality is to find in *diagram 12*.

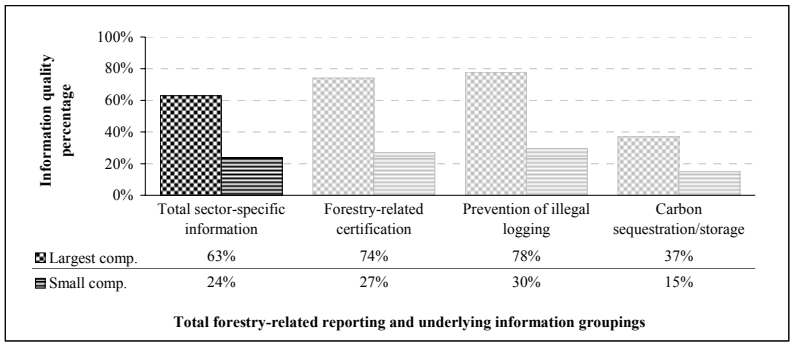


Diagram 12: ***The quality of forestry-related information disclosed by the largest and small forest and paper companies.*** *Whereas the total information quality in reports of the largest companies is moderate and even high for the content groupings of certification and illegal logging, it is only low for the group of small enterprises. The differences in quality between the largest and the small enterprises are considerable in total as well as for all forestry-related content groupings.*

With regard to the related indicators, the quality of information provided by the largest companies is highest for reporting on certification of owned or managed forests, certified input material and the prevention of illegal logging. Highest quality of information in small companies' reports is to find for disclosure on chain-of-custody certification. As a result, the quality difference between disclosure of the largest enterprises and the small ones is so-

lely noticeable, whereas the quality difference for the other forestry-related indicators is considerable. The most important quality differences are to find for reporting on certification of forests and certified input material. The information quality on carbon storage due to products is markedly low for both the largest and small companies. *Table 12* presents an overview of the information quality of disclosure by the largest and small forest and paper enterprises.

Information on certification issues was evaluated as being detailed and thus scored highest if the company's report included statements with regard to the certification scheme and fi-

Forestry-related indicators and the number of companies with no or detailed information	LARGEST forest and paper companies				Difference			SMALL forest and paper companies	
	No information is provided by x/9 companies	Detailed information is provided by x/9 companies	Information quality					No information is provided by x/9 companies	Detailed information is provided by x/9 companies
Certification of owned or managed forests	0	6	**high**	85%	**considerable**	22%	**low**	6	1
Chain-of-custody certification	2	3	**moderate**	56%	**noticeable**	37%	**low**	3	2
Certified input material	1	6	**high**	81%	**considerable**	22%	**low**	5	0
Prevention of illegal logging	0	4	**high**	78%	**considerable**	30%	**low**	5	1
Carbon sequestration due to company's forests	2	3	**moderate**	56%	**considerable**	22%	**low**	6	1
Carbon storage due to company's products	7	1	**low**	19%	**considerable**	7%	**"no"**	8	0

Table 12: ***The information quality of the underlying forestry-related indicators in comparison of the largest and small forest and paper companies.*** *The differences in disclosure quality are largest for reporting on the certification of owned or managed forests as well as for reporting on the amount of certified input material. The differences are smallest regarding chain-of-custody certification.*

gures by which the share of certified forests, facilities or input material was comprehensible. Six of the nine largest and one of the small forest and paper companies' reports include such information for the certification of owned or managed forests. No information on the certification of forests at all is to find in six reports published by small companies. Scores for patchy and good information were given in case of three of the largest and two small companies due to inexplicit statements regarding the share of certified forests or respectively the publication of targets rather than achieved states concerning forest certification. Whereas all of the largest companies published any information on forest certification and referred to at least one certification scheme, only three of the small ones did so. FSC, SFI, CSA, CERFLOR, SGEC, AFS and LEI are the certification schemes that were mentioned by at least two of the largest companies. Small companies mentioned PEFC, FSC, SFI and LEI as forest certification schemes.

Explicit information concerning chain-of-custody certification is provided by only three of the largest and one small company. Other reports do not give information on chain-of-custody explicitly or did not provide data on certified facilities systematically. This is the case for four of the largest and five of the small companies. Among the companies that mentioned chain-of-custody certification, the certification schemes PEFC, FSC, SFI and CSA are mentioned by the largest as well as small enterprises, whereas AFS is only mentioned by

one of the largest. Two reports of the largest and three reports of the small companies did not include any information on chain-of-custody certification at all.

With regard to the amount of certified raw material, highest scores were reached by six of the largest companies that published the percentage of certified fibre input explicitly. No detailed information is to find for any of the small enterprises. Patchy and good information, meaning regionally restricted data or figures that are represented not systematically, is provided by two of the largest and four small forest and paper companies. No information at all is to find in five reports of the small companies, but in only one of the largest ones. Three of the largest companies referred to certification schemes PEFC, FSC, SFI and CERFLOR concerning their input material, whereas FSC, SFI, CSA and ATFS is mentioned in reports of small enterprises.

The information quality concerning the prevention of illegal logging is high for the largest companies' reports and low for those of the small ones. Highest scores were reached in case that specific actions and programmes were mentioned besides policies against the purchase of illegally logged timber. Four of the largest and one small company provide such detailed information. General statements or specific policies regarding the prevention of illegal logging were identified as patchy or respectively good information and are to find in reports of five of the largest and three small enterprises. Not any information on this issue at all is published by five small companies.

Carbon sequestration and the amount of CO_2 retained by own forests is mentioned explicitly by three largest and one of the small companies. Both two of the largest and two of the small enterprises provide general information on carbon sequestration in their reports. For two further companies of the largest group information on carbon sequestration due to forests is to find only in the glossary. Not any information on carbon sequestration at all is to find in two reports of the largest and six reports of the small forest and paper companies.

The quality of information concerning carbon storage in company's products is even lower. Explicit statements regarding the amount of CO_2 fixed in wood-based products are to find in only one report of the largest companies. The storage of carbon in manufactured products is mentioned in general in the reports of one of the largest and one small company. The majority of companies do not provide any information on this issue.

4.3.4 Discussion of the results

The number of small companies' reports with reference to GRI guidelines as well as with external assurance statements is only half of that of the largest ones. Whereas on the one

hand the nature of examined reports could have influenced these results, it is assumed that mainly size-effects are important for these differences. The kinds of examined reports are more diverse among the small companies that can thus be indeed characterized as emerging sustainability reporters. GRI guidelines are generally not used for the preparation of annual reports; nevertheless one report of this type is included in the sample. Furthermore, this report was excluded concerning the examination of third-party verification of sustainability information, which is also influencing the result. Additionally, two reports of small companies are reports of year 2000 and 2003 and therefore derive from periods where the use of GRI guidelines was not as common as in the last very few years. Irrespective of these influencing factors, GRI guidelines were probably not used due to lower awareness of such guidelines among small companies or lower public interest in their responsibility reports and thus lower ambition for improvements of quality and comparability. Additionally, GRI guidelines could be assessed as inapplicable by companies of smaller size. Financial expenditures for third-party verification in conjunction with lower public interest for smaller enterprises are seen as the main reason for the low number of assurance statements within the group of small companies' CR reports.

Concerning the sustainability performance reporting of emerging sustainability reporters, the reasons for a lack of information in corporate reports are assumed to be identical to these mentioned before in relation with the sector-specific reporting in general. Issues could not be considered if the company is not conscious of it. The likelihood of this fact is especially prominent in case that no common guidelines are used and issues are simply "overlooked". Another reason for a lack of information is that specific incidents do not emerge within a company or in the sector in general or if they are evaluated as being of unimportance for stakeholders. Additionally, reporting on issues can be lacking due to intentional cover-up caused due to bad performance, competition-related cautiousness and difficult and expensive measurability of data.

As the results clearly show, the quality of sustainability performance information given by the group of the largest companies is markedly higher than the quality of information provided by small ones. This is consistent with findings of previous studies that concluded reporting as dependent on firm size (e.g. Adams 1998, Bewley/Li 2000, Ho/Taylor 2007).

Several reasons are assumed to be relevant for these differences as for instance the higher heterogeneity of reports among the group of small companies. Aside from the comprehensive focus of the five sustainability reports of the group, the examined annual report includes almost only economic information, whereas the three environmental reports refer to

economic issues partly in combination with social information. This most likely leads to a lack of specific performance information from the outset. The considerable difference in the quality of social performance information between the reports of the largest and the small companies can be ascribed to this fact among other things. Another reason for differences in the provision and thus quality of information between the two groups of differently sized companies is the inclusion of a small forest management enterprise within the sample. In contrast to the other companies this enterprise does not have to face the environmental problems emerging by the production of paper and is thus not reporting in the same manner as the others. This might contribute to the considerable differences in information quality concerning water consumption, water discharge, greenhouse gas emissions, greenhouse gas reduction initiatives or the increasing use of biofuels. Nevertheless, information on these issues is also not disclosed by other small companies that are actually expected to publish this kind of information in their environmental or sustainability reports. This is surprisingly due to the expectation that this kind of information is relatively easy available for the company, meaning that other reasons as for instance bad performance must be decisive for the differences in information quality. However, limited resources of small enterprises and relatively lower public pressure compared with the one on the largest companies of a sector could lead to simplified responsibility reporting that is using mainly data which are readily available, usable for other documents and not necessarily to measure only for the non-financial report. This is assumed to be another reason for the considerable differences in social performance information between the largest and small enterprises. The differences in information quality are particularly high concerning issues of society and products responsibility, meaning information that is not easily presentable in figures or considered as data which are anyway registered due to company's operations. However, with regard to other social performance information, the difference in quality is lower with regard to information on labour practices and decent work, including easily measurable basic social information as workforce (LA1) or employee training (LA10). For both of these indicators, for which disclosure is generally high, the differences are indeed lowest among the social indicators. Surprisingly, the quality of information on health and safety data (LA7) as well as workforce diversity (LA13) is considerably different to the quality of the largest companies' reports albeit these issues are assumed to be relatively easy measurable and available. The quality of reporting of small companies on both indicators, however, is high in comparison with other social indicators, which means that the considerable difference could be mainly due to especially detailed and explicit reporting of the largest enterprises. A further

reason for differing reporting quality could lie in the regionally more restricted operations of small forest and paper enterprises. This could lead to the neglect of performance information with a more international focus as for instance concerning human rights. Actually, the differences in information quality with regard to child or forced/compulsory labour are considerable, whereas the difference of the grouping of human rights is only noticeable in total. The more national focus of small companies could also explain the relatively low differences concerning the economic indicators of spending on local suppliers (EC5) and especially local hiring (EC6). Finally, also the limited use of GRI guidelines of the group of emerging sustainability reporters is considered to result in marked differences in the performance information quality between the two different sized groups, since specific issues that are considered by the largest companies due to the use of the guidelines are likely to be "overlooked" by small ones.

For seven of the underlying indicators, information quality is examined as better for small forest and paper enterprises. Additionally, the quality of information is almost equal for five performance indicators. For the majority of these issues, however, the information quality is lower than 25 percent for small companies and even lower for the group of the largest ones. Due to the fact that these issues are generally scarcely considered, the better performance could be caused rather accidentally than systematically, since information provided by one single report can determine the group of small companies as the better performing one. A higher disclosure of information and thus effective better reporting quality of the emerging sustainability reporters is only to find with regard to the indicators concerning the economic value (EC1) and the occurrence of spills (EN23). The reporting on the economic value which is better with minor differences for small companies could be influenced by the fact that all companies have their basic financial data available for the preparation of their annual reports making separate measurements unnecessary. The fundamentally better disclosure of small companies on the occurrence of spills must be seen in context with the company's efforts concerning a good and feasible responsibility reporting. Whereas the largest enterprises report on negative environmental incidents mainly by disclosing information on environment-related fines and non-monetary sanctions, it is assumed that these measurements of compliance are negligible for the small ones, which thus restrict their disclosure to information on the occurrence of significant spills.

Furthermore, there are eight indicators for which the quality of information is better of the largest companies' reports with fundamental differences. However, for half of the issues information quality provided by both different sized groups is also very low. Due to infor-

mation quality percentages higher than 25 of the best reporting group, the differences in quality of the remaining four indicators concerning reporting on human rights screening of suppliers and contractors (HR2), health and safety impacts of products (PR1), transport (EN29) as well as fines/non-monetary sanctions for non-compliance with environmental laws and regulations (EN28) are more substantiated. The reasons for that fundamentally different disclosure quality are manifold. The availability or difficult measurement of data in context with limited resources of small companies as well as restricted operations and the lower use of GRI guidelines among them are seen as most important for these fundamental information quality differences.

With regard to forestry-related reporting, considerable differences are examined between the information quality of the largest companies and the emerging sustainability reporters. The provision of information quality related especially to certification and illegal logging by the largest enterprises and the difference to the disclosure of the small companies is markedly higher than for the vast majority of examined sustainability performance information. Public pressure is seen as the main reason for this, since forest and paper companies and especially the largest and most visible ones are occasionally accused to manage forests unsustainable or to use illegally logged timber. Consequently, since public pressure mainly concentrates on the sustainable use of forests and wood and the legality of raw material, reporting on chain-of-custody certification as well as the sequestration and storage of carbon is relatively lower. Irrespective of the assumed lower public pressure on smaller forest and paper companies, the large difference in disclosure quality is also seen in the inclusion of a small company's annual report within the sample. Additionally, there is also an environmental report of a small company that includes no information at all on forest-related issues and is thus influencing the disclosure quality performance of the group of emerging sustainability reporters.

Regarding the content grouping of forest-related certification given information is often provided not very systematically, making it difficult for the reader to grasp the effective amount or share of certified forests, raw material input or chain-of-custody certification. Information partly refers to specific forest areas, kinds of raw material or facilities without any statement regarding further areas, kinds of wood input or mills that are not certified. This is especially the case for the reporting of small forest and paper companies. The problem, nevertheless, occurs as well among the largest ones and was also examined in the previous study of SINCLAIR with regard to the issue of forest certification (Sinclair 2003: 333). Another important reason for the considerable difference in information quality bet-

ween the largest and small companies is seen in the fact that at least three of the nine small enterprises do not own any forests[34], whereas all of the largest companies do so. This is influencing not only the information quality result concerning the certification of forests (F1), but also the quality of disclosure on carbon sequestration due to company's forests (F5). However, whereas all forest-owning companies refer to forest certification to some extent, reporting on carbon sequestration is considered by only some of them. This could be due to lacking public interest and the necessity of additional measurements for the forest and paper companies. Disclosure quality on carbon storage due to wood-based products is even lower among all forest and paper companies and is also ascribed to the low interest of the public and low awareness among the companies. The considerable difference between the largest and small companies' information quality concerning the prevention of illegal logging is mainly seen as a result of lower visibility of small companies and thus lower public pressure. The same reason might be valid for the considerably different reporting on the amount certified input material. The difference could nevertheless also originate from intentionally non-disclosure of information in case that the company does not or only marginally use certified raw material and wants thus prevent criticism. The smallest difference concerning the disclosure on chain-of-custody certification is seen as a result of lower reporting quality mainly due to inexplicitness by the largest and relatively higher quality of disclosure by small companies probably caused by a good availability of data on certified facilities.

To conclude, the fourth hypothesis is fully supported by the results of the study. The use of external measures for the improvement of the reports' quality as GRI guidelines or third-party verification is more frequently among the largest companies or well-established sustainability reporters than among the smaller forest and paper enterprises. The fifth hypothesis, in contrast, is approved only partly. Whereas the disclosure quality of the largest forest and paper companies is indeed higher than the quality provided by the smaller ones that are characterized by an emerging sustainability reporting practice, the difference in information quality is not smallest regarding environmental sustainability performance disclosure but with regard to economic information. In contrast, most different disclosure quality is found for forestry-related reporting.

Irrespective of the affirmation of the hypotheses, the results found in this study contradict the conclusion made by the researchers of the recent research concerning sustainability re-

[34] Statements regarding forest ownership or management are lacking for two of the nine small companies. Only three of the small enterprises state explicitly that they own forests or at least small plantations.

porting of the forest and paper sector conducted by PwC (PwC 2007). They concluded that financial ranking does not necessarily impact the quality of sustainability reporting as they found a similar ratio of GRI reference, third-party verification and frequency of reporting on environmental metrics for the largest and smallest top 100 companies. Neither GRI reference nor external assurance is found as being similar for the two different sized companies groups in the study at hand. Additionally, the quality of provided sustainability performance information is noticeably or even considerably higher for the largest companies in comparison with the small ones.

4.3.5 Recommendations

Much can be done by emerging sustainability reporters of the forest and paper sector to improve the quality of their CR reports. In general, small companies should press ahead with the publication of CR reports at regular intervals to provide stakeholders with sustainability information related to the company's operations and comply with the requirements of accountability. The publication of comprehensive sustainability reports including economic, environmental as well as social performance information should be given special attention. GRI guidelines should be used to much higher extent by small forest and paper companies. This would not only result in disclosure of more relevant sustainability performance information and thus in higher quality of reporting, but would also lead to a better comparability of reports. A more widespread application of external assurance would also enhance the quality of reports of the emerging sustainability reporters. It is, however, questionable, if the improvement of quality achieved would justify the costs of third-party verification. As a basic principle, CR reports should be externally verified if stakeholders are seen as very discerning regarding the company's operations to enhance the reliability of the responsibility disclosure.

With regard to the provision of sustainability performance information, more detailed and explicit reporting is desirable concerning all issues. The following specific recommendations are on the one hand based on detected lacks of disclosure quality in general and on the other hand based on considerable and fundamental differences to the quality of information of the largest companies of the sector. The recommendations, however, do not consider the financial efforts concerning the measurements of data and information that small forest and paper enterprises would be faced with.

Considerable quality improvements are especially possible within the field of social reporting. Concerning the issue of labour practices and decent work, the main focus for im-

provements of information quality should lie on the topics of labour/management relations, occupational health and safety as well as diversity and equal opportunity. Information on human rights and society should also considerably be improved by small forest and paper companies. With regard to human rights more detailed disclosure is desirable concerning investment and procurement practices with regard to human rights clauses in contracts and screening of contractors, incidents of and actions against discrimination, child and forced/compulsory labour as well as support of the freedom of association and collective bargaining. Information should furthermore be provided more extensively on community effects and involvement, incidents of corruption and anti-corruption practices, on public policy participation and development as well as on compliance with society-related laws and regulations. Finally, disclosure on health and safety impacts of products and services should also be enhanced by the emerging sustainability reporters of the forest and paper sector.

The issues of transport and compliance with environmental laws and regulations should furthermore be considered for an improvement of information quality in the field of environmental sustainability reporting. Additionally, disclosure of information on the amount of greenhouse gas emissions and reductions, water discharge and water efficiency improvements, the increasing use of renewable energy as well as environmental impacts of products and services should be enhanced.

With regard to economic performance disclosure more detailed information is desirable especially in respect of financial assistance from governments, the coverage of benefit plan obligations and spending on local suppliers.

Forest-related issues should also find much more consideration within the reports of small forest and paper companies. Especially disclosure on forest certification certified input material, illegal logging, and carbon sequestration and storage should be enhanced. In general, more systematically statements are necessary regarding the certification of forest areas, facilities or input material, meaning that explicit percentages or lists that show the number or amount of uncertified areas or facilities should be provided by emerging sustainability reporters of the sector.

4.4 Corporate responsibility reporting quality in comparison of North American, European and Asian forest and paper companies

In the following section the results concerning the quality of reporting of forest and paper companies headquartered in North America, Europe and the Asia-Pacific region are represented and discussed. At the end of the section, recommendations are given for improvements of the quality of reports and disclosure in particular for companies of each region.

4.4.1 The use of GRI guidelines and external report verification

As shown in *diagram 13* five out of six European, four out of six Asian-Pacific and three out of six North American forest and paper companies refer to GRI guidelines for the preparation of their non-financial reports. A GRI content index is included in four of the North American and the European companies respectively, but only by two of the Asian-Pacific ones.

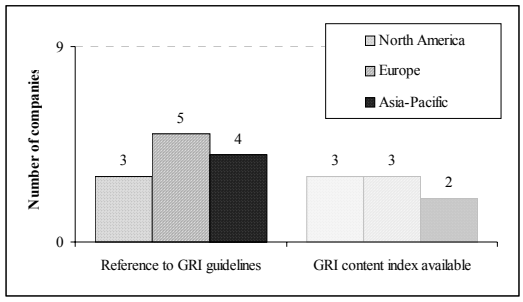


Diagram 13: ***The use of GRI guidelines and the availability of a GRI content index among CR reports of North American, European and Asia-Pacific forest and paper companies***

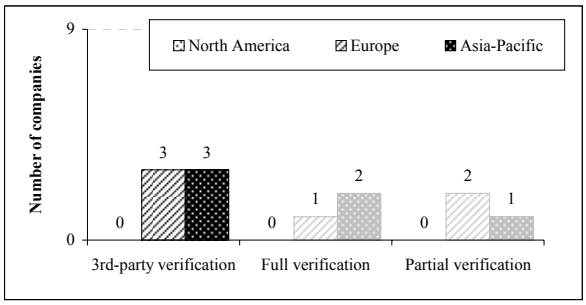


Diagram 14: ***Third-party verification of reports of North American, European and Asia-Pacific forest and paper companies***

As presented in *diagram 14* none of the North American reports is externally verified, whereas three of the six European as well as three of the Asian ones do so. The highest share of full verification is achieved by Asia-Pacific enterprises, whereas only one of the European reports includes an assurance statement covering the whole report content.

4.4.2 The quality of published sustainability performance information

The total quality of sustainability performance information provided by the companies of all three regions is low. Whereas North American reports' quality amounts to 36.6 percent, the information quality percentage of European reports accounts for 36.8, which means a similar disclosure quality. Companies' reports from Asia-Pacific provide a quality that is noticeably lower and amounts to only 27 percent. Whereas North American companies provide relatively highest quality of disclosure on economic issues, European reports score highest in the provision of information on environmental as well as on social topics. The quality of disclosure of Asia-Pacific enterprises is lowest for all of the three sustainability categories. *Diagram 15* gives more detailed information regarding the received percentages for all regions and sustainability categories. The difference in information quality between the regions is relatively lowest concerning social and highest with regard to economic performance disclosure. *Table 13* provides an overview of the differences in sustainability performance information quality between the regions taking the best scoring one as basis for comparison.

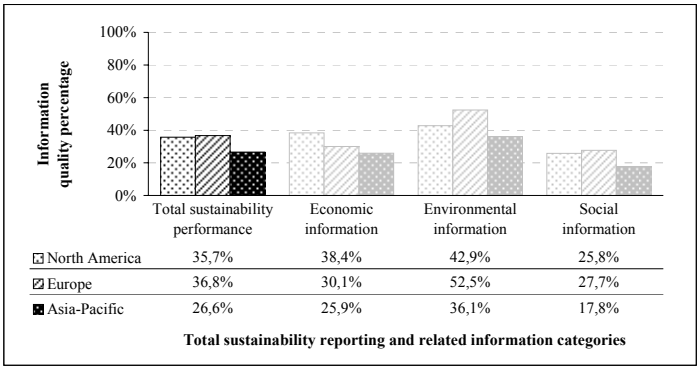


Diagram 15: ***Total sustainability performance information quality of the largest and small forest and paper companies.*** *The quality of performance information provided by North American and European companies is identical, whereas Asian-Pacific companies perform worst.*

Sustainability performance information	Best reporting of companies from	Information quality percentage	Quality difference to NORTH AMERICAN reports	Relative difference	Quality difference to EUROPEAN reports	Relative difference	Quality difference to ASIA-PACIFIC reports	Relative difference
Economic performance information	North America	41%	-	-	noticeable	36%	noticeable	43%
Environmental performance information	Europe	52%	minor	18%	-	-	noticeable	31%
Social performance information	Europe	28%	minor	7%	-	-	noticeable	36%
Total sustainability performance information	**Europe**	**37%**	***similar quality***	**1%**	-	-	**noticeable**	**36%**

Table 13: ***Differences in sustainability performance information quality between forest and paper companies from North America, Europe and the Asia-Pacific region.*** *Whereas European companies provide highest quality in environmental and social performance reporting, North American ones have the most detailed and explicit reporting with regard to economic topics. Asia-Pacific enterprises report worst in total as well as in all of the three sustainability categories.*

Albeit the differences between the regions are largest for the category of economic sustainability disclosure, the underlying content grouping of economic performance is the one with the most similar information quality among the companies. Additionally, the differences of quality in information are also minor for the content grouping related to the environmental impacts of products and services. They are also relatively low for reporting on indirect economic impacts and the social grouping of product responsibility. In contrast, the differences between at least two of the three examined regions are considerable with regard

to the environmental groupings of compliance and transport. *Table 14* shows the differences in disclosure quality for each sustainability content grouping based on the companies' group with best information quality.

Content / indicator groupings	Best reporting of companies from	Information quality percentage	Quality difference to NORTH AMERICAN reports	Relative difference	Quality difference to EUROPEAN reports	Relative difference	Quality difference to ASIA-PACIFIC reports	Relative difference
Economic performance groupings								
Economic performance	Europe and North America	24%	-	-	-	-	**minor**	**18%**
Market presence	North America	31%	-	-	noticeable	27%	**considerable**	**55%**
Indirect economic impacts	North America	61%	-	-	noticeable	27%	**noticeable**	**27%**
Environmental performance groupings								
Materials	Europe	72%	**noticeable**	**38%**	-		minor	19%
Energy	Europe	72%	minor	15%	-		**noticeable**	**38%**
Water consumption	Europe	64%	minor	22%	-		**noticeable**	**48%**
Biodiversity	North America	36%	-	-	**noticeable**	**31%**	minor	15%
Emissions, effluents and waste	Europe	44%	minor	7%	-	-	**noticeable**	**38%**
Products and services	Europe	39%	minor	21%	-	-	**minor**	**21%**
Compliance	North America	67%	-	-	considerable	58%	**fundamental**	**75%**
Transport	Europe	39%	**fundamental**	**86%**	-	-	noticeable	29%
Environmental investments (Overall)	Europe	89%	**noticeable**	**44%**	-	-	noticeable	38%
Social performance groupings								
Labour practices and decent work	Europe	39%	minor	8%	-	-	**noticeable**	**42%**
Human rights	Europe	17%	minor	8%	-	-	**noticeable**	**36%**
Society	North America	30%	-	-	minor	12%	**noticeable**	**49%**
Product responsibility	Europe	28%	**noticeable**	**25%**	-	-	minor	20%

***Table 14:* Differences in quality of sustainability performance information content groupings between forest and paper companies from North America, Europe and the Asia-Pacific region.** *The differences are lowest for the grouping of economic performance, followed by the environment-related grouping of products and services. The differences are highest for the groupings related to transport and environment-related compliance.*

Concerning the disclosure on economic sustainability performance, reporting is most alike for the content grouping of economic performance and most different with regard to reporting on market presence *(cf. table 14)*.

Regarding the underlying indicators, the differences in disclosure quality between the regions are minor concerning the generated economic value (EC1) and they are fundamental concerning disclosure on financial assistance from governments (EC4)[35]. As *diagram 16* presents, North American companies provide the highest information quality in total, on the three related content groupings and all underlying indicators except the one related to financial assistance from governments for which no information is provided at all. The quality of information given by Asia-Pacific companies, in contrast, is lowest in total as well as for all of the three economic

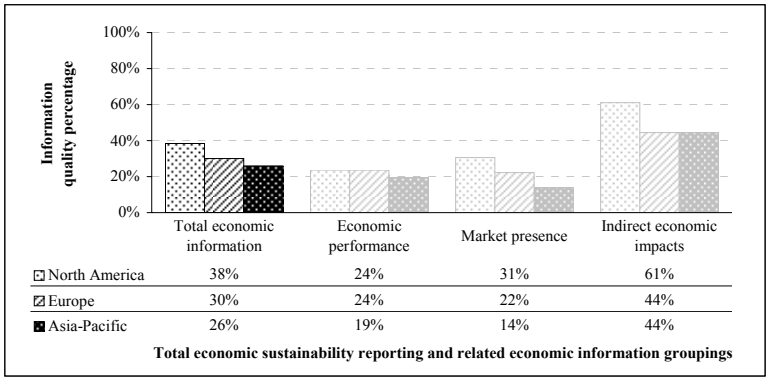
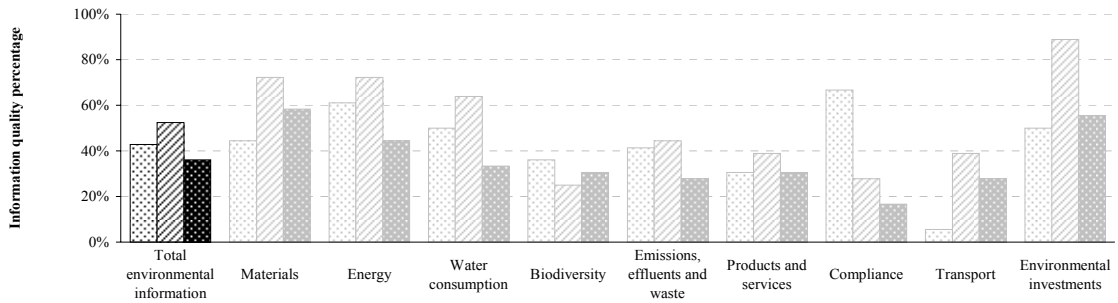


***Diagram 16:* The quality of economic sustainability performance information in reports published by North American, European and Asia-Pacific companies.** *The quality of economic disclosure in total as well as for all content groupings is highest for North American companies and lowest for Asia-Pacific ones. The published economic-related information is generally low for all regions and moderate only with regard to reporting on indirect economic impacts.*

[35] The differences between the regions are also fundamental for indicator EC3, for which, however, the general information quality is very low since the information quality of the best performing group is below 20.

content groupings. The received information quality percentages of Asia-Pacific companies are below 25 and thus very low for the grouping related to economic performance and market presence. Similarly, no information at all is provided by Asia-Pacific enterprises with regard to financial assistance from governments (EC4), leading to fundamental differences in comparison with European disclosure quality. Information quality percentages below 25 are also received by Asia-Pacific enterprises for disclosure on financial risks and opportunities due to climate change (EC2), the coverage of benefit plan obligations (EC3), spending on local suppliers (EC6) and local hiring (EC7). Considerable differences related to the relatively best disclosure of North American companies are thus detected for Asia-Pacific ones for the content grouping of market presence and underlying indicators EC3 and EC6. European companies deliver an information quality that is between those of North American and Asia-Pacific enterprises. They perform also best on the grouping of economic performance, between the two other regions with regard to market presence and similarly worst as the Asia-Pacific companies on indirect economic impacts. No information is provided concerning indicator EC3 referring to benefit plan obligations. Disclosure on the generated economic value is also lowest for European companies among the regions, albeit the differences are only minor. However, information quality is highest for disclosure on financial assistance from governments in comparison with the other regions. All results concerning the received information quality percentages and the regional differences are shown systematically in the *appendix*.

With regard to environmental disclosure, European companies provide relatively highest information quality for all of the nine content groupings except the one of biodiversity and compliance for which the group of North American enterprises scored best. *Diagram 17*



	Total environmental information	Materials	Energy	Water consumption	Biodiversity	Emissions, effluents and waste	Products and services	Compliance	Transport	Environmental investments
North America	42,9%	44,4%	61,1%	50,0%	36,1%	41,4%	30,6%	66,7%	5,6%	50,0%
Europe	52,5%	72,2%	72,2%	63,9%	25,0%	44,4%	38,9%	27,8%	38,9%	88,9%
Asia-Pacific	36,1%	58,3%	44,4%	33,3%	30,6%	27,8%	30,6%	16,7%	27,8%	55,6%

Diagram 17: ***The quality of environmental sustainability performance information in reports published by North American, European and Asia-Pacific companies.*** *The quality of environmental disclosure in total and for seven of the nine content groupings is highest for European companies. The group of enterprises from Asia-Pacific performs worst in total relatively and for five content groupings. Moderate information quality is provided by each regional group concerning materials, energy and environmental investments; whereas low disclosure quality of all regions is to find with regard to biodiversity, products and services and transport.*

provides an overview of the results.

As shown in *table 14* the most similar reporting quality is given for the grouping of products and services, whereas the quality is fundamentally different with regard to disclosure on transport and compliance. Asian companies provide only little information on compliance, whereas North American ones do so with regard to transport. The differences in quality are minor for underlying indicators EN5s referring to energy conservation, EN8s considering water withdrawal, EN14 referring to strategies and actions for managing the impacts on biodiversity and EN27 considering the percentage of reclaimed products. The differences are fundamental with regard to disclosure on water conservation (EN10n), protected habitats (EN13), transport (EN28) and compliance (EN29)[36].

North American companies perform best on disclosure quality for ten of the underlying 25 environmental indicators[37] and provide lowest information quality in comparison with the other regions on eight of them. The indicators for which lowest disclosure quality is provided are related to material input (EN1, EN2), energy consumption (EN3s), water withdrawal (EN8s), the location and size of land in or adjacent to protected areas (EN11s), environmental impacts of products and services (EN26), transport (EN29) and environmental investments (EN30). The difference of disclosure quality in comparison with the regional group with highest information quality percentages is considerable for indicators EN1, EN11s and EN26 and fundamental for indicator EN29.

European enterprises report best of all regions on 14 of the 25 environmental indicators[38] and worst on seven. The indicators for which relatively lowest quality percentages are achieved refer to water withdrawal (EN8s)[39], biodiversity related issues (EN13, EN14, EN15) and the percentage of reclaimed products (EN27). Additionally, there is no information at all on the part of European companies for the two indicators EN19 and EN25 related to emissions of ozone-depleting substances and waterbodies that are affected by company's water discharge for which very low quality of information is provided in general. Disclosure quality is considerably different concerning indicators EN15 and EN27 and fundamentally different regarding indicators EN13, EN19 and EN25.

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[36] The differences are also fundamental for reporting on indicators EN19 and EN25. However, the general disclosure quality is very low, meaning that the best performing group received information quality percentages below 25.

[37] North American companies provide best information quality on environmental indicators EN6n, EN13, EN14, EN15, EN16, EN18, EN20, EN25, EN27 and EN28.

[38] The group of European companies received highest information quality percentages for environmental indicators EN1, EN2, EN3s, EN5s, EN10n, EN11s, EN16, EN17, EN21, EN22s, EN23, EN26, EN29 and EN30.

[39] Disclosure quality percentages received for indicator EN8s are identical and lowest for the groups of North American and European companies. Multiple lowest percentages are also the case for indicator EN3s for the group of North American and Asia-Pacific enterprises and indicator EN27 for the European and Asia-Pacific companies. Similarly, identical highest percentages are received by European and Asia-Pacific companies for indicator EN2, for North American and European companies for indicator EN16 and for North American and Asia-Pacific companies for indicator EN25.

Asia-Pacific enterprises report worst on five of the nine environment-related content groupings and medium for the remaining ones. Concerning the underlying indicators, disclosure quality is best for only four indicators[40] and worst of all regions for 14 indicators. The indicators for which lowest information quality percentages are achieved by the Asia-Pacific group refer to energy consumption, conservation and the increasing use of biofuels (EN3s, EN5s, EN6n), the conservation of water (EN10n), greenhouse gas emissions (EN16) and initiatives to reduce greenhouse gas emissions (EN18), emissions of NO_x and SO_x (EN20), water discharge (EN21), waste disposal (EN22), the number of spills (EN23), environmental impacts of products and services (EN27) and compliance (EN28). In comparison with the best-performing region the differences are considerable with regard to indicators EN6n, EN16, EN18, EN22s and EN23 and fundamental concerning indicators EN10n and EN28.

With regard to social sustainability performance information, European companies deliver the highest level of information quality in total as well as of three of the four content groupings referring to labour practices, human rights and product responsibility as shown in *diagram 18*. The group of North American companies performs best concerning content grouping of society. Differences in disclosure quality are noticeable for all groupings; however, they are smallest for reporting on product responsibility and highest with regard to society. Disclosure quality is lowest for Asia-Pacific companies with noticeable differences in total as well as for the three content groupings of labour practices and decent work, human rights, and society, whereas the differences between North American and European information quality are only minor in total as well as for the three groupings at the same time *(see table 13 and table 14)*. This means most different reporting for Asia-Pacific companies in comparison with the two other regions among the three sustainability performance categories.

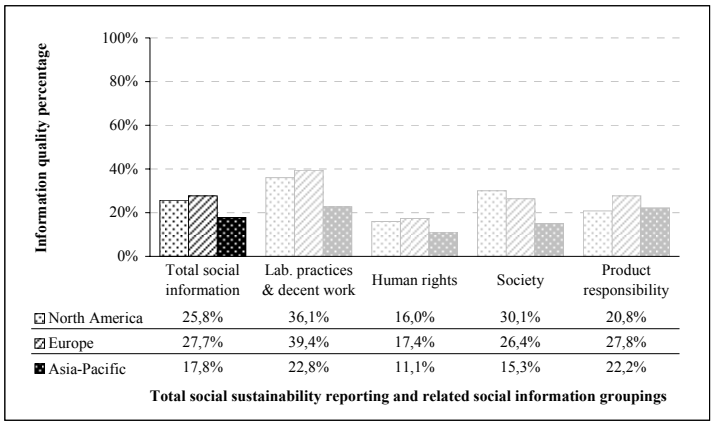

Diagram 18: ***The quality of social sustainability performance information in reports published by North American, European and Asia-Pacific companies.*** *European enterprises provide information quality in total as well as on three of the four content groupings. Whereas a generally low quality of information is available, the differences in disclosure quality between the regions are noticeable for all groupings.*

[40] Asia-Pacific companies provide relatively best information quality on indicators EN2, EN8s, EN19 and EN25.

The general provision of social performance information is low; there is no regional group that provide at least moderate information quality in total or for one of the content groupings. For ten of the 25 underlying indicators and seven of the 17 social sub-groupings no region provides an information quality percentage higher than 25, meaning a generally very low quality of disclosure[41]. High quality of information is only given for European companies' reporting on workforce data (LA1). Moderate information quality is not to find for indicators of the content groupings of human rights and product responsibility, but is given by all regional groupings for indicators LA7 and LA13 referring to occupational health and safety and diversity data. For these two indicators and the sub-grouping of diversity and equal opportunity, the differences in quality between the regions are only minor and thus smallest. Additionally, North American companies provide moderate quality on indicator LA1 and, together with European ones, on the indicator related to community impacts and involvement (SO1).

North American enterprises perform relatively best on 13 of the underlying 25 social performance indicators and nine sub-groupings[42] and worst of all regions on ten indicators and six sub-groupings. Information quality is lowest for the issues of diversity (LA13), human rights clauses in investment agreements (HR1)[43], human rights screening of contractors (HR2) and thus the sub-grouping of investment and procurement practices, on indicator and sub-grouping referring to non-discrimination (HR4), on all indicators and the sub-grouping of corruption (SO2, SO3, SO4) as well as on the indicators and sub-groupings of customer health and safety (PR1), products and service labelling (PR3) and market communication (PR6)[44]. The differences are fundamental for the sub-grouping of corruption and considerable with regard to indicator HR4 and thus sub-grouping of non-discrimination and for indicator SO4[45].

The group of European companies performs best of all regions on 19 social indicators and eleven sub-groupings[46] and worst on only three indicators and one sub-grouping. Lowest

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[41] Very low information quality is given for sub-groupings of labour/management relations, freedom of association and collective bargaining, non-discrimination, corruption, public policy and market communication. Indicators for which the information quality percentage is below 25 even for the best performing regional group are LA5, LA14, HR1, HR2, HR4, HR5, SO2, SO3, SO5 and PR6.

[42] The group of North American enterprises provide information quality that is highest among of all regions on social indicators LA2, LA4, LA5, LA7, LA10, LA14, HR5, HR6, HR7, SO1, SO5, SO8 and PR9. Disclosure quality is also highest for European companies for indicators LA4, LA5, LA7, LA10, HR6, SO5 and PR9 at the same time. Sub-groupings for which North American enterprises provide relatively best information quality are related to labour/management relations, training and education, diversity and equal opportunity, freedom of association and collective bargaining, child and forced/compulsory labour, community, public policy, compliance with society-related laws and regulations and compliance with product responsibility related laws and regulations.

[43] No information at all is provided by any company of any region for indicator HR1.

[44] Disclosure quality is similarly worst for the Asia-Pacific group regarding indicators LA13, SO2, SO3 and PR6.

[45] The differences are also fundamental for indicators SO2, SO3 and considerable for indicator and sub-grouping of market communication. However, the general provision of information is very low for these issues.

[46] European disclosure quality is best among the regions for indicators LA1, LA4, LA5, LA7, LA8, LA10, LA13, HR2, HR4, HR6, SO2, SO3, SO4, SO5, PR1, PR3, PR6 and PR9 and sub-groupings employment, labour/management relations, occupational health and safety, training and education, diversity and equal opportunity, investment and procurement practices, non-discrimination, corruption,

report quality by the European group is given for indicators LA14 considering the ratio of salary of men to women, HR1 referring to human rights clauses in investment agreements and indicator and sub-grouping of compliance with society-related laws and regulations (SO8). Fundamental differences are only to find for indicator LA14. However, the general provision of information on this indicator is very low for all regions.

Asia-Pacific companies show highest disclosure quality for two social indicators and two sub-groupings, whereas however, for each indicator and sub-grouping another region received identical highest quality percentages[47]. The Asia-Pacific group performs worst on 18 of the 25 social indicators and on 12 of the 17 sub-groupings. Information quality percentages are relatively lowest for disclosure on all sub-groupings and underlying indicators referring to the content grouping of labour practices and decent work. They are furthermore lowest concerning indicator HR1, the sub-grouping and indicator related to freedom of association and collective bargaining (HR5) and sub-grouping of child and forced/compulsory labour and underlying indicators HR6 and HR7. Lowest quality is also given for indicators SO2 and SO3 considering reporting on the identification of business units related to the risk of corruption and employee training concerning corruption and the remaining society-related sub-groupings and indicators of public policy participation (SO5) and compliance (SO8). With regard to product responsibility, information quality percentages are also lowest for sub-groupings and related indicators of market communication (PR6) and compliance with laws and regulations (PR9). The differences in quality in comparison with the best performing region are considerable with regard to sub-grouping of employment and related indicator LA1, sub-grouping of child and forced/compulsory labour and underlying indicators HR6 and HR7, sub-grouping of community and related indicator SO1 and indicator LA8[48].

public policy, customer health and safety, products and service labelling, and compliance with product responsibility related laws and regulations. Identical relatively best disclosure quality is provided by North American companies for indicators LA4, LA5, LA7, LA10, HR6, SO5 and PR9 and by Asia-Pacific companies for indicators HR2 and PR3 at the same time.

[47] Information quality of Asia-Pacific companies is relatively best for indicators HR2 and PR3 and for sub-groupings of investment and procurement practices and products and service labelling.

[48] Besides considerable different disclosure quality, the differences are fundamental for indicators LA5, LA14, HR5, SO2, SO3, SO5 and sub-groupings of labour/management relations, freedom of association and collective bargaining, corruption ,and public-policy However, the general provision of information is very low for these issues. Similarly, there is considerably different but generally very low disclosure quality concerning the indicator and sub-grouping of market communication.

4.4.3 The quality of published forestry-related information

As presented in *diagram 19* the total information quality for forestry issues is moderate for European and Asia-Pacific forest and paper companies, but low for North American ones. European companies reached highest scores for disclosure quality in total as well as for reporting on forestry-related certification and carbon sequestration/storage. Enterprises from Asia-Pacific perform best on reporting on illegal logging, but worst on the grouping of forestry-related certification. The quality of information published by the group of North American companies is lowest of all regions for reporting on illegal logging and carbon sequestration. The differences in disclosure quality between the regions are highest concerning the grouping of forestry-related certification and smallest with regard to carbon sequestration/storage. The quality reached for most of the content groupings by each region is low, exceptions with moderate quality, however, are due to European and Asia-Pacific reporting on illegal logging and European and North American reporting on the forest-related certification.

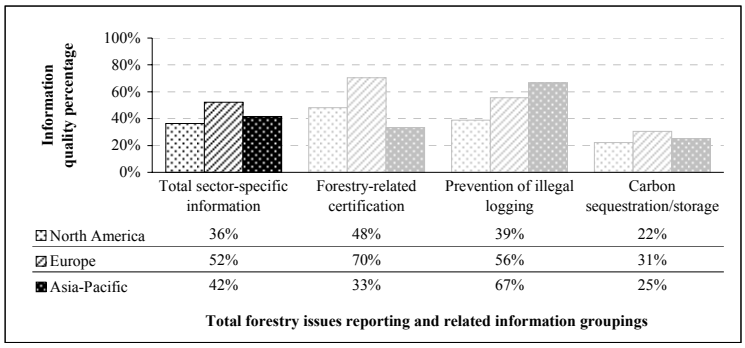
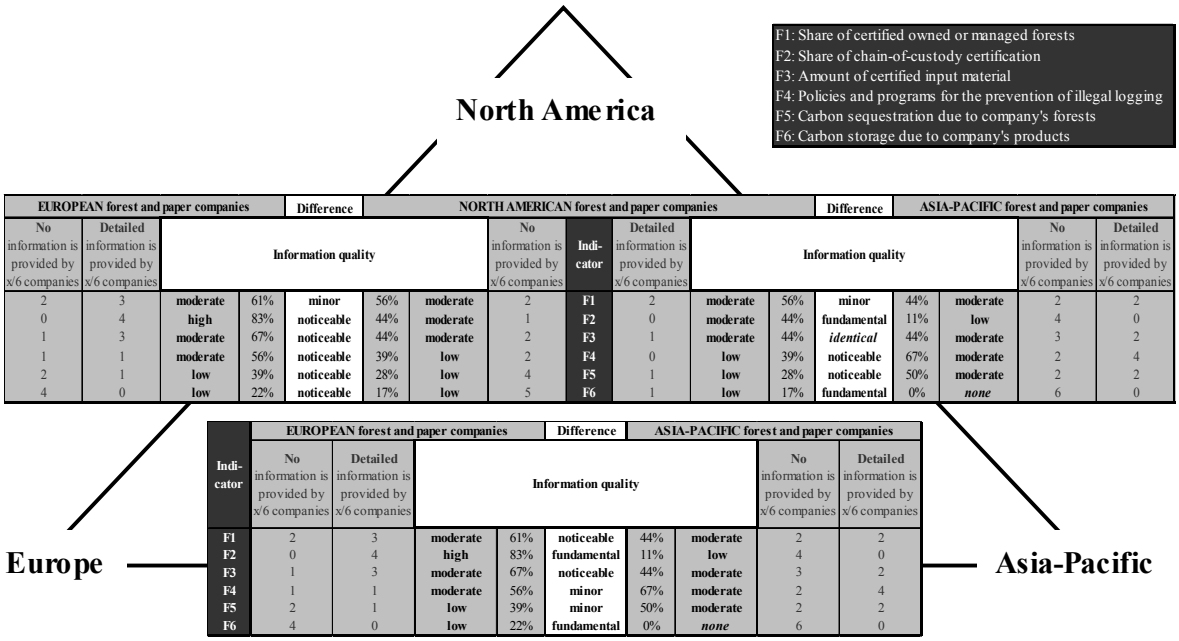


Diagram 19: ***The quality of forestry-related information disclosed by forest and paper companies from North America, Europe and the Asia-Pacific region.*** *European companies perform best in total as well as on the two content groupings of forest-related certification and carbon sequestration/storage, whereas the group of enterprises from Asia-Pacific reached highest quality percentages for disclosure on illegal logging.*

With regard to the underlying indicators, moderate information quality is provided by all regions concerning the indicators related to certification. However, there are two exceptions: European companies provide even high and companies from Asia-Pacific only low quality on chain-of-custody certification (F2), meaning a fundamentally different disclosure quality for this indicator between the regions. Moderate quality is also given by European and Asia-Pacific enterprises regarding the indicator of illegal logging (F4) and by Asia-Pacific ones for the indicator of carbon sequestration (F5). However, no information at all is to find in Asia-Pacific reports concerning carbon storage (F6), which also leads to fundamental differences in disclosure quality. In contrast, the differences in information quality between the regions are smallest, albeit noticeable, concerning indicator F1 referring to the certification of owned and managed forests. *Diagram 20* provides an overview of the received information quality percentages and the differences in disclosure quality between the regions.



EUROPEAN forest and paper companies				Difference			NORTH AMERICAN forest and paper companies						Difference	ASIA-PACIFIC forest and paper companies			
No information is provided by x/6 companies	Detailed information is provided by x/6 companies	Information quality					No information is provided by x/6 companies	Indicator	Detailed information is provided by x/6 companies	Information quality				No information is provided by x/6 companies	Detailed information is provided by x/6 companies		
2	3	moderate	61%	minor	56%	moderate	2	F1	2	moderate	56%	minor	44%	moderate	2	2	
0	4	high	83%	noticeable	44%	moderate	1	F2	0	moderate	44%	fundamental	11%	low	4	0	
1	3	moderate	67%	noticeable	44%	moderate	2	F3	1	moderate	44%	*identical*	44%	moderate	3	2	
1	1	moderate	56%	noticeable	39%	low	2	F4	0	low	39%	noticeable	67%	moderate	2	4	
2	1	low	39%	noticeable	28%	low	4	F5	1	low	28%	noticeable	50%	moderate	2	2	
4	0	low	22%	noticeable	17%	low	5	F6	1	low	17%	fundamental	0%	*none*	6	0	

Indicator	EUROPEAN forest and paper companies		Difference				ASIA-PACIFIC forest and paper companies	
	No information is provided by x/6 companies	Detailed information is provided by x/6 companies	Information quality				No information is provided by x/6 companies	Detailed information is provided by x/6 companies
F1	2	3	moderate	61%	noticeable	44%	moderate	2	2
F2	0	4	high	83%	fundamental	11%	low	4	0
F3	1	3	moderate	67%	noticeable	44%	moderate	3	2
F4	1	1	moderate	56%	minor	67%	moderate	2	4
F5	2	1	low	39%	minor	50%	moderate	2	2
F6	4	0	low	22%	fundamental	0%	*none*	6	0

Diagram 20: ***The quality of disclosure on forestry-related indicators in the regional comparison.*** *The differences in quality are smallest for reporting on the certification of owned or managed forests (F1) and largest for disclosure on chain-of-custody certification (F2) and carbon storage in wood-based products (F6).*

Information on forest certification (F1) was evaluated as being detailed and scored thus highest in case the corporate responsibility report included statements concerning the certification scheme and the exact amount of certified forests. Three of the six European and two of both North American and Asian companies provide such explicit information. Two of the European companies provide a list with certified and uncertified units, whereas the third European enterprise state that all owned forests would be certified. The Asia-Pacific companies mention explicit percentages, whereas the North American ones present a percentage or alternatively refer to the totality of certification of own forests. Less explicit information is given by two North American and two Asia-Pacific reports and by one European. No information on forest certification at all is provided by two North American, two European and two Asia-Pacific enterprises. A number of certification schemes are mentioned in the reports. Whereas at least two North American companies referred to PEFC, SFI and CERFLOR, FSC and SFI is also mentioned by at least two European ones. FSC, SGEC, AFS and LEI are mentioned in at least two reports of Asia-Pacific enterprises. *Diagram 21* represents all certification schemes that were referred to regarding forest certification.

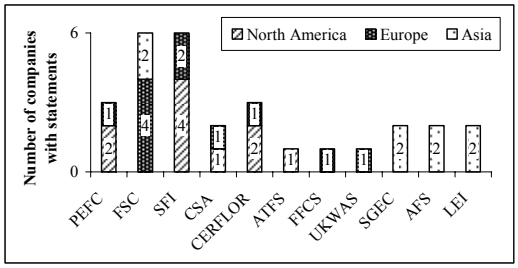


Diagram 21: ***Forest management certification schemes mentioned with regard to certification of owned or managed forests.*** *FSC and SFI are the certification schemes that were mostly mentioned by the examined forest and paper companies.*

Explicit information on the share and used schemes of chain-of-custody certification (F2) is provided by only four European companies. All of them provided data on the certified facilities explicitly either by mentioning them directly in the report or by the publication of a list with certified and uncertified units. Five North American, two other European and two Asia-Pacific enterprises published only patchy or good information. No information at all on chain-of-custody certification is to find in four of the six reports of Asia-Pacific companies and one North American report. North American companies referred mainly to SFI, but also to CSA and FSC, whereas European ones mentioned PEFC and FSC to large extent as certification schemes for chain-of-custody certification. Information on PEFC, FSC and AFS is also mentioned in reports of the Asia-Pacific group, but by only two at maximum. *Diagram 22* provides an overview of the certification schemes that were mentioned by the companies of each regional group.

Detailed information on the amount of certified input material (F3) deliver three European, two Asia-Pacific and one North American company. Each of these did mention the explicit percentage of certified raw material. Three North American, two European and one enterprise from Asia-Pacific provide only unsystematic and inexplicit information on the amount of certified wood material used. In three Asia-Pacific reports, two North American ones and one European no information on certified raw material can be found. Whereas North American companies mention mainly FSC and SFI, but also CSA, ATFS and CERFLOR as the underlying schemes concerning certified raw material, Asia-Pacific ones refer only to PEFC and FSC. Only one European report includes information on the underlying scheme, namely FSC. *Diagram 23* shows the mentioning of certification schemes related to certified input material.

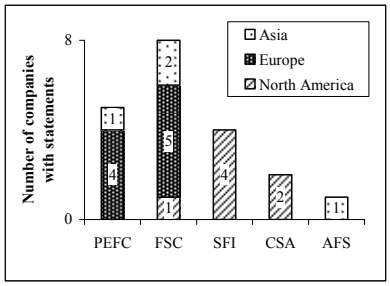


Diagram 22: ***Certification schemes mentioned with regard to chain-of-custody certification.*** *Whereas European companies refer mainly to PEFC and FSC, North American ones mostly mentioned SFI as the scheme related to chain-of-custody certification. PEFC, FSC and AFS were mentioned by Asia-Pacific enterprises to only small extent.*

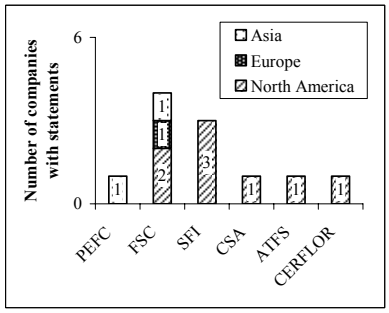


Diagram 23: ***Certification schemes mentioned with regard to the certification of wood-based raw material.*** *Underlying certification schemes are almost only mentioned by North American forest and paper companies. FSC and SFI are the schemes that were referred to in most cases.*

Policies, programmes and actions for the prevention of illegal logging or the purchase of illegally logged timber (F4) are mentioned explicitly by four of the Asia-Pacific companies and one European enterprise. The only mention of raw material – or wood procurement policies or general statements as the one of non-acceptance of ille-

gally logged timber is given by both four North American and four European enterprises. No information on illegal logging at all is to find in one European and both two reports of North American and Asia-Pacific companies.

Explicit disclosure on the amount of sequestrated carbon by company's forests (F5) is given in only one North American and one European report, but in two reports of Asia-Pacific forest and paper companies. General statements on carbon sequestration or information concerning forests as carbon sinks is provided by three European, two Asia-Pacific and one North American forest and paper enterprise. Four North American and two European and Asia-Pacific reports respectively do not include any information on carbon sequestration or CO_2 fixation of forests. The provision of information on carbon storage in products (F6) is even lower. Only one North American company provides explicit data on the amount of CO_2 stored in manufactured products. More general information on carbon storage in products is given in two European reports, whereas no information on the issue at all is provided by the total six Asia-Pacific enterprises, five North American and four European ones.

4.4.4 Discussion of the results

North American companies do obviously not strive much for an improvement of the quality of their CR reports due to the use of GRI guidelines and external verification. Whereas GRI guidelines were referred to by only half of the North American companies, external verification was used by none of them. The low application of third-party assurance among US and Canadian companies is in accordance with previous studies on other sectors (e.g. KPMG 2005: 31) and was also shown in the forestry-related study of PwC (PwC 2007). On the other hand, the results also show that in contrast to the European and Asia-Pacific enterprises all North American companies that referred to the GRI guidelines included a content index within their reports. This means that North American GRI users are more consequent regarding the external comparability of their sustainability reports. Whereas external verification is often mentioned as most prevalent among European companies (e.g. Kolk 2005b: 40), the share of reports with external assurance statements in this study is equally high for companies from Europe and Asia-Pacific. Full report verification is even higher for the Asia-Pacific group than for the European one. The reason for this result is mainly seen in the inclusion of two forest and paper companies that are operating in Indonesia within the sample of six Asia-Pacific enterprises. Since public pressure and awareness regarding illegal logging and deforestation of tropical forests is especially high in this country, forest and paper companies are consequently looking for possibilities to prove the

legality of their operations. This finding is also consistent with the study results of CRAIG and DIGA that examined a strong orientation in reporting towards the expectations of capital providers in Asia-Pacific countries as Singapore and Indonesia (Craig/Diga 1998).

The quality of total sustainability performance information provided by companies from North America, Europe and Asia-Pacific is low. Weak disclosure quality was also found in previous cross-sectoral international researches (e.g. UNEP et al. 2006). At first glance, the quality of sustainability disclosure provided by the companies seems to be similar for European and North American ones, and different only for Asia-Pacific enterprises. However, this result is deceptive and emerged rather by accident, since there are even considerable and fundamental differences in the provision of information between the regional groups when going into detail. Whereas North American companies provide relatively highest quality of economic performance information, European ones show the highest level of information quality concerning environmental issues. Higher reporting extent on environmental issues of European or respectively companies from the UK in comparison with US enterprises was also found by HOLLAND and FOO (Holland/Foo 2003). Disclosure quality of Asia-Pacific enterprises is lowest for all categories. This result is consistent with the previous sector-specific study of MAK who found a richer environmental disclosure of European companies in comparison with Asian ones (Mak 2006). In contrast, HO and TAYLOR detected higher TBL reporting extent of Japanese companies in comparison with US ones (Ho/Taylor 2007). This is, however, not necessarily a contradiction of the results at hand, since the sample of Asia-Pacific companies does not only exist of Japanese enterprises as the North American sample does not only cover US firms.

The differences in performance information quality of the forest and paper companies must be seen as a result of different country-related cultural, legal and economic backgrounds besides company specific issues. North American companies' high disclosure of economic performance information for instance, is mainly attributed to the underlying nature of financing. As the USA and Canada are common law countries, investors, creditors and other interested parties rely largely on public information, whereas public disclosure is of less importance in code law countries as Japan due to a close interplay and private communication between companies, banks and governments (see Ball 1995, cited by Ho/Taylor 2007: 134). Additionally, US companies have been first movers regarding the publication of compliance-related documents as codes of conducts or responsibility reports in general (Kolk 2005c: 160). Since the provision of economic information in CR reports is a relati-

vely new trend, the higher quality of economic-related disclosure of North American companies could also be due to the pioneer position of US enterprises.

European companies' relatively highest disclosure quality of environmental sustainability performance information and the exceptional higher information quality for reporting on spills and waste disposal in comparison with the one of North American's and Asia-Pacific's companies are mainly seen as a result of a different legal background since several guidelines and also legislation for environmental management and reporting exist among European countries.

The generally low disclosure quality of the Asia-Pacific group is also ascribed to different cultural and legal backgrounds and additionally to the heterogeneity of countries and kinds of reports included in sample. As mentioned before, for companies from Japan[49] that is a code law country, public disclosure plays a relatively less role with regard to communication with stakeholders. Additionally, Japanese companies put much more attention on internal environmental accounting practices instead of looking beyond, to social issues and the broader concept of sustainability (see Kolk 2005c: 159). Indeed, the number of comprehensive sustainability reports is lowest for the Asia-Pacific group and the difference for the quality of environmental performance information is smallest among the three sustainability categories for the Asia-Pacific group. Norms and values differing from these existent in the west are also seen as reasons for the divergences in social reporting between Asia-Pacific and North American or respectively European forest and paper companies. As a result of low individualism and high uncertainty avoidance in Japan, KATZ for instance found US enterprises setting value on equality and favourable work conditions, whereas Japanese corporations put emphasis on employee loyalty to the company and group rather than individual achievements (Katz et al. 2001, cited by Ho/Taylor 2007: 133).

Irrespective of the cultural and legal backgrounds of Japan, the sample of Asia-Pacific companies consists furthermore of a South Korean company and two enterprises that are operating in Indonesia. Whereas corporate responsibility reporting has a relatively long tradition in North American and European countries or among Japanese enterprises, it did not start in South Korea until the last very few years and "has still to take root in other countries including […] Indonesia" (KPMG 2005: 14). This phenomenon is seen as a further reason for the low disclosure quality of the Asia-Pacific group. Additionally, the quality of information disclosed by Asia-Pacific companies can also be influenced by the inclusion of

[49] Three and thus half of the Asia-Pacific companies of the sample are from Japan.

an annual report that provides only very few sustainability performance information from the outset.

Only minor differences in disclosure quality are examined for the content grouping of economic performance and within this grouping for the indicator referring to the generated economic value. Since this kind of economic information must be prepared by all enterprises for their annual reports irrespective of the region, the similarity of disclosure quality is consequent. In contrast, fundamental differences are detected for environment-related content groupings of compliance and transport in consequence of especially high disclosure quality of North American companies on compliance and their especially low information quality concerning transport. The reasons for the differences in reporting on fines and sanctions for non-compliance are assumed to be due to different norms and values and especially legal backgrounds among the regions. For instance, the fundamentally different reporting on compliance is ascribed to the strong "compliance-oriented approach" (Kagan/Axelrad 2000, cited by Kolk 2005c: 160) of US American companies.

Different cultural, legal and economic backgrounds are also seen as reasons for the differences in reporting on other content groupings and underlying indicators. Tradition, varying norms and values, specific public pressure and awareness of sustainability issues in the regions of operations, but also varying regulatory arrangements and the nature of financing (see Ho/Taylor 2007: 133ff.) will lead to different emphasis of issues in CR reports among the regions. However, driving forces for reporting on indicators referring to energy conservation (EN5s), water withdrawal (EN8s), programmes and actions for managing the impacts on biodiversity (EN14), the percentage of reclaimed products (EN27) as well as occupational health and safety data (LA7) and diversity information (LA14) must be relatively similar among the three regions since only minor differences for the disclosure of information on these issues were detected. Whereas these reporting issues can be assumed as being of global importance, high impact of specific regional or respectively country-related backgrounds is seen for reporting on market presence, environment-related compliance and environmental effects of transportation as well as for a number of social issues as employment, labour/management relations, non-discrimination, child and forced labour, community and corruption since the differences in quality for these content groupings and social sub-groupings are considerable or even fundamental.

Legal, cultural and economic backgrounds are also seen as decisive for differences with regard to forestry-related disclosure quality. European companies scored highest for all underlying indicators except the one of illegal logging and carbon sequestration, for which

Asia-Pacific reports reached highest information quality percentages. European companies' disclosure quality is especially high with regard to forestry-related certification in general and chain-of-custody certification in particular, whereas it is lowest for Asia-Pacific ones. Market preferences (see Sinclair/Walton 2003: 335) and related public awareness concerning the sustainable use of forests is seen as the main reason for the differences in disclosure quality of information related to certification. The differences in information quality can also be explained by the fact that the Asian region has the lowest proportion of certified forests in comparison with Europe and North America. This could lead to non-reporting of certification issues because companies are simply not faced with, or, on the other hand, in case they want to cover-up bad performance in terms of a very low proportion of certification in comparison with competitors. The higher risk and occurrence of illegal logging in the Asia-Pacific region and especially in Indonesia and thus higher public pressure is assumed to be decisive for the higher disclosure quality concerning the prevention of illegal logging among companies from Asia-Pacific.

To conclude, the sixth hypothesis is approved partly. Reference to GRI guidelines is indeed lowest among the reports of North American and highest for reports of European forest and paper companies. Nevertheless, Asia-Pacific companies' reports include third-party assurance statements to same extent as European ones, whereas none of the North American reports is furthermore externally verified.

In contrast, the seventh hypothesis is fully supported. Unless North American and European reports provide a similar disclosure quality with a very slight winning margin of European enterprises concerning total sustainability performance information, considerable and even fundamental differences are examined for the quality of disclosure when focussing on reporting of specific sustainability issues. There are already noticeable differences in disclosure quality between the two regions with regard to the three sustainability categories, since economic performance information quality was examined best for North American and environmental performance information quality as best for European companies. Sustainability performance disclosure quality of Asia-Pacific reports was found lower with noticeable differences in total as well as for the three sustainability categories of economic, environmental and social performance. Relatively similar sustainability performance information quality for all regions was only found for the content grouping of economic performance including data that are also published in annual reports.

The seventh hypothesis with regard to forestry-related information disclosure is also fully supported. North American and European companies provide indeed highest disclosure on forestry-related certification, whereas Asia-Pacific enterprises have a more detailed disclosure regarding the prevention of illegal logging.

4.4.5 Recommendations

The following recommendations for an improvement of the quality of CR reports of North American, European and Asian forest and paper companies are based on the idea of a regionally independent provision of sustainability performance information. Recommendations are thus given on the basis of detected differences between the regions and the provision of low performance information quality in general.

As found in other studies, North American forest and paper companies can improve the quality of their reports by a higher use of GRI guidelines and especially by the application of external verification. Furthermore, companies of this region should consider a higher timeliness of their published reports, since a relatively high proportion of reports was found including data before year 2005. Much more emphasis should put on disclosure of sustainability performance information concerning environment-related issues of transporting materials and products and its impacts on environment, also concerning raw material input, the size and location of owned or managed land with high biodiversity value, and environmental impacts of products. More qualitative disclosure is furthermore recommended concerning social issues and thus regarding the number of incidents of and actions against discrimination and regarding measures for the prevention of corruption. For these before mentioned issues considerable or even fundamental differences were detected in comparison with the two other regions. Furthermore, more detailed information should be provided regarding the economic topics of the benefit plan's coverage and financial assistance from governments and for environmental topics of emissions of other greenhouse gases than CO_2 and ozone-depleting substances as well as concerning the share of salary of men to women, human rights clauses in investment agreements, and the adherence to laws and codes and standards regarding market communications. For these issues almost no information is to find in North American reports at present. With regard to forestry-related issues, more detailed and explicit information should be provided concerning the proportion of chain-of-custody certification. Additionally, more explicit information of North American forest and paper companies is desirable concerning policies and actions for the prevention of illegal logging as well as with regard to carbon sequestration and storage.

The quality of European forest and paper companies' responsibility reports is relatively best due to the highest proportions of comprehensive sustainability reports, GRI use, verification as well as relatively highest sustainability performance and forestry-related information quality. The application of external verification among European forest and paper companies however leaves room for improvement. More detailed disclosure is eligible on biodiversity issues in general and on protected habitats and red-listed species in particular. Disclosure should furthermore be improved with regard to information on fines and sanctions for non-compliance with environmental laws and regulations. More information is also desirable concerning the coverage of benefit plan obligations, emissions of ozone-depleting substances, the identity and biodiversity value of waterbodies affected by the company's water discharge and, with regard to social performance reporting, the ratio of salary of men to women, investment agreements with human rights clauses, and market communications since the quality of disclosure on these issues is very low. It is furthermore recommended to enhance the quality of disclosure on carbon sequestration and carbon storage for an improvement of forestry-related information.

Most improvements are desirable for the quality of CR reports of forest and paper companies from the Asia-Pacific region. Companies of this region should make more efforts regarding the publication of more non-financial and especially comprehensive sustainability reports. The use of GRI guidelines as well as the application of external verification is amendable, albeit the current proportion of the use of GRI guidelines and third-party assurance is already relatively good. Reporting on the economic sustainability issue of market presence and thus especially the proportion of spending on local suppliers should find more consideration within CR reports of Asia-Pacific companies. With regard to environmental sustainability performance, more detailed disclosure is recommended concerning the increasing use of biofuels, water conservation, the amount of greenhouse gas emissions and its reductions, the number of spills as well as regarding fines and sanctions for non-compliance with environmental laws and regulations. Conspicuous improvements are possible with regard to social sustainability performance disclosure, which is presently considerably or even fundamentally different to North American or European disclosure quality for many issues. Information on employment and workforce data in particular should be published more explicitly. Detailed disclosure is furthermore recommended regarding the share of employees covered by collective bargaining agreements, concerning minimum notice periods regarding operational changes as well as for the issue of education for the prevention of serious diseases. A number of human rights issues should find more considera-

tion in CR reports of Asia-Pacific enterprises, such as the support of the freedom of association as well as the prevention of child and especially forced/compulsory labour. Reporting should also be enhanced in respect of most of society-related issues, which means the publication of information on public policy development and participation as well as the topics of the prevention of corruption and community involvement for impact assessment. Furthermore, disclosure should be improved with regard to the coverage of benefit plan obligations, financial assistance from governments, the ratio of salary of men to women and as regards market communications, for which very low information quality is achieved in general. An improvement of the quality of forestry-related disclosure is possible due to more detailed and explicit information on forestry-related certification in particular. The issue of chain-of-custody certification should thereby be mostly considered in CR reports of Asia-Pacific corporations. The provision of information is furthermore desirable concerning carbon storage, which is currently not considered at all.

It is finally suggested that information should be provided on each listed GRI indicator irrespectively of the fact that specific incidents occur within the forest and paper company's operations or not. This would lead to higher transparency and would enable the reader of the report for a certain comparison of the company's sustainability performance with the performance of another. With regard to forestry-related information, sector-specific guidelines of GRI would be desirable.

5 Conclusions

5.1 Overview of the findings and discussion

This study has as its objective an assessment of the quality of CR reports of forest and paper companies taken from the PwC Top 100 list (PwC 2006). It examined the use of GRI guidelines and external verification as measurements for the improvement of the reliability and thus quality of reports and focussed furthermore and in particular on the provision of detailed and explicit sustainability performance information as well as forestry-related disclosure. Based on these assessments, recommendations for an improvement of the quality of CR reports of forest and paper companies were formulated. Quality assessments as well as recommendations were conducted at three levels: (1) for the forest and paper sector in general focussing the reporting practice of the largest enterprises, (2) for so called "emerging sustainability reporters", meaning small forest and paper companies that already publish separate CR reports in the majority but with a large heterogeneity concerning the types of separate CR reports, and (3) for forest and paper companies with headquarters in North America, Europe and Asia.

It was found that corporate responsibility reporting of the forest and paper sector follows general sustainability reporting patterns as mentioned in previous studies focussing other sectors, meaning a relatively good disclosure of environmental sustainability performance information and a weak social sustainability performance reporting that concentrates on data of employees and occupational health and safety records. However, some specifics were assessed that are attributed to environmental effects of the forest and paper sector as for instance a relatively frequent reference to GRI guidelines and more extensive inclusion of external assurance statements than found in pervious non-forest sector researches. Additionally, information quality provided for the issues of water consumption and material input was examined as being relatively higher than in other studies.

It is generally difficult to compass the exact reason for non-reporting of specific sustainability issues. A lack of information and thus low sustainability performance information quality is, however, expected in case that managers are unaware of specific issues (especially in case that no general guidelines as the one of GRI are used), if they assess issues as being unimportant for stakeholders, if they want to cover-up information because of bad performance or competition or if the issue to report about do not emerge within the sector or for the specific company. Difficult and/or expensive measurements of performance data are

furthermore seen as a reason for low quality of performance information within CR reports of forest and paper companies.

As a conclusion of the quality examination of CR reports published by companies of the forest and paper sector, it is especially recommended to enhance the detailedness and explicitness of social performance information. The main focus should thereby lie on labour-related information as employee turnover and minimum notice periods as well as the topic of equal opportunity. Human rights issues as investment and procurement practices, discrimination and the freedom of association and collective bargaining should furthermore find more emphasis within CR reports of the sector. Additionally, more detailed and explicit disclosure is desirable with regard to the social sustainability topics of corruption, public policy participation and market communication. Disclosure quality on economic sustainability information should furthermore be enhanced by going beyond the publication of information presented in annual reports. Forest and paper companies should provide more detailed information especially with regard to their market presence meaning the companies' effects on local suppliers and employees. Concerning environmental performance information higher quality of disclosure is desirable in respect of biodiversity, effects of transporting materials and products, the occurrence of spills and emissions of ozone depleting substances and other greenhouse gases than carbon dioxide.

With regard to the examination of the quality of reports published by emerging sustainability reporters of the forest and paper sector, the results indicate a generally lower reporting activity of small companies. This is conform to the results of previous studies as for instance the one of ADAMS (1998), ALNAJJAR (2000) or HO/TAYLOR (2007). Small forest and paper enterprises have a lower amount of separate CR reports available at their websites and use GRI guidelines as well as external verification of reports to only half of the extent of the largest enterprises of the sector. Reports published by the emerging sustainability reporters furthermore show a lower timeliness of data included in CR reports. The quality of sustainability performance information is generally low and lower than the quality provided by the largest companies with noticeable differences. Smallest differences in sustainability performance information quality were examined for economic-related disclosure, whereas the differences are largest concerning social sustainability performance information. Similar disclosure quality of the largest and small forest and paper companies was found only for the topic of economic performance. In contrast, the differences were considerable or even fundamental regarding the disclosure of the environmental impacts of transport and compliance with environmental laws and regulations as well as concerning

the social topics of society and product responsibility. With regard to the quality of forestry-related performance information considerable and thus the most significant differences for a reporting category at all were detected between the largest forest and paper companies and the group of the emerging sustainability reporters. The differences in the explicitness and detailedness of published information are largest for disclosure on the amount of certified owned and managed forests as well as concerning the amount of certified input material.

The differences in reporting activity and quality of disclosure between the leaders and the emerging reporters of the sector are mainly ascribed to limited financial resources and lower visibility and thus public pressure. Limited financial resources are most likely to lead to the heterogeneity of the types of reports and are also seen as the reason for the lower timeliness of available reports and the lack of specific sustainability information that would be necessary to measure only for the CR report but is irrelevant for the preparation of further company's documents. If the company is not faced with public pressure, it will most likely not be willing to pay for such efforts. Restricted operations of small forest and paper enterprises and thus the non-emergence of specific incidents are additionally seen as a reason for a lack of information and thus lower quality of disclosure.

To conclude, emerging reporters should advance the publication of separate CR reports and particularly comprehensive sustainability reports at regular intervals. More extensive use of GRI guidelines and external assurance statements is furthermore recommended for the improvement of reports' quality published by small forest and paper companies. More detailed and explicit information is desirable concerning all sustainability performance issues as well as forestry-related information. With regard to social sustainability information and disclosure on labour and work conditions in particular, the main focus should lie on reporting of labour/management relations, occupational health and safety, the topic of diversity and equal opportunity. More explicit and detailed reporting of emerging sustainability reporters is also necessary concerning issues of human rights related to investment/procurement practices, non-discrimination, freedom of association/collective bargaining as well as child and forced/compulsory labour. The impacts on community and its involvement, the topic of corruption, public policy participation and compliance with society-related laws/regulations as well as the issue of health and safety impacts of products should additionally find more emphasis in CR reports of small companies of the sector. With regard to environmental sustainability performance information more higher quality of disclosure is necessary concerning the topics related to the impacts of transporting mate-

rials and products, compliance with environment-related laws/regulations, greenhouse gas emissions and reductions, water discharge and efficiency improvements, the increasing use of renewable energy and environmental impacts of products. Emerging reporters of the forest and paper sector should furthermore improve the disclosure quality concerning information on economic topics of spending on local suppliers, the coverage of benefit plan obligations and financial assistance from governments. Considerable improvements of the quality of reports published by small forest and paper companies are finally possible with regard to forestry-related disclosure by more detailed information on the amount of forest certification and certified input material, the prevention of illegal logging as well as carbon sequestration and storage.

In consideration of the regional focus of the study at hand, clear differences in the quality of corporate responsibility reporting are found for North American, European and Asia-Pacific forest and paper companies. This result is compliant to previous studies that also examined regional differences in sustainability reporting (e.g. Holland/Foo 2003, Mak 2006, Ho/Taylor 2007). Whereas the availability of CR reports and the quality of total sustainability performance information is relatively similar for North American and European companies, less non-financial reports and comprehensive sustainability reports in particular as well as lower quality of sustainability performance information as well as forestryrelated disclosure was found for the enterprises of the Asia-Pacific region.

North American companies showed the best quality of economic sustainability performance information and also performed best with regard to disclosure on compliance with environmental laws/regulations by far. On the other hand, North American forest and paper companies provided the lowest timeliness of reports' data, referred to GRI guidelines most seldom in comparison with the other regions and did not use external assurance at all. Furthermore, the quality of total forestry-related information and especially the quality concerning disclosure on illegal logging and carbon sequestration delivered by North American enterprises were examined as relatively lowest among the three regions. Exceptional low information quality for North American companies was also found for the topic of environmental impacts of transporting materials and products.

European forest and paper enterprises provided highest timeliness of reports and the highest share of GRI use among the three regions. They furthermore scored highest in the provision of total environmental and social sustainability performance disclosure. Information quality provided regarding actions related to anti-corruption was evaluated as exceptionally better than for North American or Asia-Pacific companies. Reports published by

European forest and paper companies showed also the highest quality of disclosure concerning forestry-related information in total as well as for all related indicators except the one of illegal logging. In contrast, considerably worst disclosure quality in comparison with the two other regions was found for biodiversity-related reporting concerning protected habitats and red-list species affected by operations.

Forest and paper companies headquartered in the Asia-Pacific region had the highest share of full report verification and best disclosure quality concerning the prevention of illegal logging. In contrast, they had the lowest share of non-financial reports and particularly sustainability reports available and provided lowest quality in total as well as for economic, environmental and social sustainability performance information. Additionally, the quality of disclosure delivered with regard to forest-related certification and especially chain-of-custody certification is lowest among the regions. An exceptional low level of quality in comparison with information given by North American and European companies was found for data concerning spending on local suppliers, the environment-related topics of greenhouse gas emissions and its reduction as well as water conservation, and the social issues of child and forced labour as well as employees' coverage by collective bargaining agreements.

Different cultural, legal and economic backgrounds of the regions and related countries are seen as the main reasons for differences in the use of GRI, external verification as well as in the provision of information on sustainability performance and forestry-related issues. Stakeholders and especially investors with a global focus, however, are assumed to be interested in information that is comprehensive and regionally independent. That means there is much to do for forest and paper companies of each region.

With regard to the availability and types of CR reports, companies from the Asia-Pacific region should make efforts for the publication of more non-financial reports and sustainability reports in particular. North American forest and paper companies should improve the timeliness of available CR reports as well as the share of GRI use and external verification. Companies from the Asia-Pacific region should furthermore provide more detailed and explicit sustainability performance information in general and especially with regard to social issues. A higher quality of disclosure by Asia-Pacific enterprises is furthermore desirable for the issues of forestry-related certification and carbon storage, whereas North American companies should enhance the quality of their disclosure on forestry-related issues in general and illegal logging and carbon sequestration in particular.

A further conclusion of this study is that GRI should make efforts to publish sector-specific guidelines for the preparation of sustainability reports to enhance the quality of disclosure provided by forest and paper companies. Specific forestry-related indicators as used in this study should be developed and published by GRI. Additionally, GRI should provide recommendations for forest and paper companies concerning the application of general GRI G3 guidelines and thus statements which indicators should find particular consideration and which can be excluded because of general irrelevance for forest and paper companies.

5.2 Limitations and further research

A clear limitation of this study is the application of statistical methods since the sample is very small and therefore not appropriate for statistical analysis. As a result the findings of this study must be seen as tendencies. Additional problems emerge due to the fact that scoring systems as the one utilized here for the evaluation of information quality, use an ordinal scale[50], which means that an aggregation or the calculation of an average of the scores for indicators or content groupings, albeit done here, is actually not legitimate.

A further limitation of the study is the restriction to specific CR reports. The most current and sophisticated separate non-financial report was considered for the evaluation, whereas other documents or website content published by the company were not examined. The reason for the restriction to one report is the assumption that stakeholders or investors in particular do not want to search for diverse documents but get the information they need as fast as possible. Additionally, reports were only collected from the websites of forest and paper companies. This could lead to incorrect conclusions regarding the publication of non-financial reports in case a company has prepared a report but did not publish it at the website. At last and with regard to the selection of reports, a limitation of this study is the heterogeneity of non-financial reports, leading to a comparison of comprehensive sustainability reports with environmental or even annual reports.

Moreover, it was found that the differences between the countries of one region are partly larger than the differences between the three regions. This is especially the case for the Asia-Pacific region and thus differences in cultural, economic and legal backgrounds between Japan and Indonesia or Korea, but also for Canada and the USA as the two North American countries. Additionally, there is no homogeneity among the forest and paper

[50] Cf.: JONES and ALABASTER 1999, cited by MILNE 2003: 4.

companies as their operations differ considerably[51] in part, which is influencing the reporting of the sector as a whole.

The comparison of this study's results with other sectors' CR reporting quality is furthermore limited since methodological backgrounds and dates of research differ considerably to some extent. Results are assumed to be incommensurable if studies only examined the extent of published information or restricted their view to specific countries or sectors which lead to characteristic country or sector effects. Additionally, results of previous researches are partly antiquated.

Additionally, the strong orientation on GRI G3 performance indicators and the constriction to economic and social core indicators must furthermore be seen as a limitation of the study. If used indicators did not cover specific aspects of sustainability performance issues, disclosure quality was found as low, albeit companies considered these performance aspects within their reports. Additionally, the majority of forest and paper enterprises still used the 2002 version of GRI guidelines instead of the 2006 (G3) one. Newly developed indicators are thus not considered by the enterprises from the outset, which consequently results in a low quality of information for some issues.

Another problem emerged through subjectivism concerning the scoring of information quality. Whereas only one person, the author of this report, evaluated the quality of published performance information, other studies as for instance the one of MILNE (2003) used two scorers for the evaluation to receive a higher degree of objectivity.

Consequently, further research with regard to the quality of sustainability reporting in the forest and paper sector is desirable and, as a main conclusion, should be based on larger samples and therefore more appropriate statistical analysis.

Differences in sustainability reporting of forest and paper companies and other sectors should be evaluated more systematically by comparing the forest and paper sector with others in one study and thus under consideration of identical methodological approaches at the same time.

Further research is also desirable with regard to progress in sustainability reporting practices within the forest and paper sector. Future studies should examine improvements of the quality of disclosure on sustainability as well as forestry-related issues for the forest and paper sector as a whole, for small companies of the sector as well as concerning different regional origins. Such research would reveal an assumed increase in information quality

[51] The sample of forest and paper enterprises include pure paper and pure forest management companies besides enterprises with mixed (paper production and forest management) fields of operations.

due to more widespread use of GRI G3 guidelines for the forest and paper sector in total. It would furthermore show if small forest and paper companies develop their corporate responsibility reporting towards this of the largest reporters or if they adhere to already achieved quality of CR reports. Finally, such research would give evidence for a trend concerning convergence or divergence in sustainability reporting quality between North America, Europe and the Asia-Pacific region.

A country-related comparison could determine the specific legal and cultural effects influencing the sustainability reporting practices and quality in the forest and paper sector that is relatively difficult to determine in case of a broad view on regions. However, there are only few countries with a relatively high number of forest and paper companies such as Canada, the USA, Japan, Sweden or Finland.

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APPENDIX

I. List of underlying indicators and content groupings

II. Performance information quality: Results per indicator, sub-grouping and content grouping

I. List of underlying indicators and content groupings

Category of performance information	**Grouping of performance information**	**Underlying GRI G3** performance indicator and initial	**Definite indicator** formulation and initial	Additional information regarding the e**valuation** of quality	**Key"words"** used for "word search" with Acrobat
Sustainability performance: Economic issues	**Economic performance**	**EC1**: Economic value generated and distributed, including revenues, operating costs, employee compensation, donations and other community investments, retained earnings, and payments to capital providers and governments		**Detailed information:** at least fourparameters of economic value are mentioned explicitly	"economic" "value" "sale" "income" "revenue" "earning" "cost" "employee" "salar" "donation" "community" "invest" "dividend" "interest" "tax"
Sustainability performance: Economic issues	**Economic performance**	**EC2:** Financial implications and other risks and opportunities for the organization's activities due to climate change		**Patchy information:** general statements and intentions regarding organizsation's activities and climate change **Detailed information:** financial implications or other risks and opportunities due to climate change mentioned explicitly	"climate change" "global warming"
Sustainability performance: Economic issues	**Economic performance**	**EC3:** Coverage of the organization's defined benefit plan obligations		**Detailed information:** coverage of benefit plan obigations mentioned explicitly	"benefit plan"
Sustainability performance: Economic issues	**Economic performance**	**EC4:** Significant financial assistance received from government		**Detailed information:** financial assistance from governments mentioned explicitly and systematically (table, list or specific section in the report)	"government" "assistance" "subvention"
Sustainability performance: Economic issues	**Market presence**	**EC5 (additional):** Range of ratios of standard entry level wage compared to local minimum wage at significant locations of operation		**Not considered:** additional indicator	
Sustainability performance: Economic issues	**Market presence**	**EC6:** Policy, practices, and proportion of spending on locally-based suppliers at significant locations of operation		**Patchy information:** general statements and/or intentions and/or policies regarding suppliers **Good information:** detailed statements and/or intentions and/or policies regarding suppliers or spending on all suppliers mentioned explicitly **Detailed information:** policy, practices and proportion of spending on locally-based suppliers mentioned explicitly	"suppl"
Sustainability performance: Economic issues	**Market presence**	**EC7:** Procedures for local hiring and proportion of senior management hired from the local community at significant locations of operation		**Patchy information:** employment opportunities (provision of jobs) mentioned in general **Good information:** employment opportunities mentioned in detail; specific local hiring programs mentioned in general **Detailed information:** procedures for local hiring and senior management proportion hired from the local community mentioned explicitly	hir" "job" "employ" "recruit"

Category of performance information	**Grouping of performance information**	**Underlying GRI G3** performance indicator and initial	**Definite indicator** formulation and initial	Additional information regarding the **evaluation** of quality	**Key"words"** used for "word search" with Acrobat
Sustainability performance: Economic issues	**Indirect economic impacts**	**EC8:** Development and impact of infrastructure investments and services provided primarily for public benefit through commercial, in-kind, or pro bono engagement		**Patchy information:** general statements regarding infrastructure investments or projects for public benefit mentioned in general **Detailed information:** projects, total amount spent and investments' development mentioned explicitly	"infrastructure" "charitable" "sponsor" "philanthropic" "social commitment"
Sustainability performance: Economic issues	**Indirect economic impacts**	**EC9 (additional):** Understanding and describing significant indirect economic impacts, including the extent of impacts		**Not considered:** additional indicator	
Sustainability performance: Environmental issues	**Materials**	**EN1:** Materials used by weight or volume		**Patchy information:** general statements regarding raw material input (no figures) **Good information:** only wood as raw material mentioned explicitly by weight or volume **Detailed information:** other raw materials by weight (additionally to wood) mentioned explicitly	"material" "fib" "wood" "input"
Sustainability performance: Environmental issues	**Materials**	**EN2:** Percentage of materials used that are recycled input materials		**Patchy information:** paper/fibre recycling mentioned in general **Good information:** total amount of recycled paper/fibre input mentioned (no percentage) **Detailed information:** percentage of recycled paper/fiber input mentioned explicitly	"recycl" "recover"
Sustainability performance: Environmental issues	**Energy**	**EN3:** Direct energy consumption by primary energy source **EN4:** Indirect energy consumption by primary source	**EN3s:** Direct and indirect energy consumption by primary source	**Patchy information:** energy consumption mentioned in general **Good information:** energy consumption mentioned in total or per ton of production	"energy" "fuel"
Sustainability performance: Environmental issues	**Energy**	**EN5 (additional):** Energy saved due to conservation and efficiency improvements **EN6 (additional):** Initiatives to provide energy-efficient or renewable energy based products and services, and reductions in energy requirements as a result of these initiatives **EN7 (additional):** Initiatives to reduce indirect energy consumption and reductions achieved	**EN5s:** Energy conservation, efficiency improvements and reductions achieved	**Patchy information:** general statements and/or intentions regarding energy conservation **Detailed information:** projects for energy efficiency improvements and total reductions achieved (company-wide) mentioned explicitly	"energy" "efficien"
Sustainability performance: Environmental issues	**Energy**		**EN6n:** Increasing use of renewable energy and reduction on the reliance of fossil fuels	**Patchy information:** general statements and/or intentions regarding renewable energy (biofuels) **Good information:** biofuel percentage and intentions to increase the use of renewable energy or decrease the use of fossil fuels **Detailed information:** biofuel percentage and development (increase/decrease) of biofuels/fossil fuels mentioned explicitly	"biofuel" "biomass" "renewable" "fossil" "increas" "decreas" "reduc"
Sustainability performance: Environmental issues	**Water consumption**	**EN8:** Total water withdrawal by source **EN9 (additional):** Water sources significantly affected by withdrawal of water	**EN8s:** Water withdrawal and sources affected	**Good information:** water withdrawal volume in total or per ton of production **Detailed information:** withdrawal volume and sources	"water"

Category of performance information	**Grouping of performance information**	**Underlying GRI G3** performance indicator and initial	**Definite indicator** formulation and initial	Additional information regarding the **evaluation** of quality	**Key"words"** used for "word search" with Acrobat
Sustainability performance: Environmental issues	**Water consumption**	**EN10 (additional):** Percentage and total volume of water recycled and reused	**EN10n:** Water consumption efficiency improvements and reductions achieved	**Detailed information:** intention to reduce water consumption, improvements and reductions achieved mentioned explicitly	"material" "fib" "wood" "input"
Sustainability performance: Environmental issues	**Biodiversity**	**EN11:** Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	**EN11s:** Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	**Detailed information:** location and size of land (owned, leased, managed) in or adjacent to protected areas or areas with high biodiversity value outside protected areas	"diversity" "conserv" "protect" "habitat" "value"
		EN12: Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas			
		EN13: Habitats protected or restored		**Detailed information:** habitats protected or restored mentioned explicitly by type and size	"biodiversity" "habitat" "protect" "conserv"
		EN14: Strategies, current actions, and future plans for managing impacts on biodiversity		**Detailed information:** size of protected (owned or managed) land or management strategies/actions mentioned explicitly	"diversity" "conserv" "protect" "habitat"
		EN15: Number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk		**Detailed information:** number of IUCN Red List species and national conservation list species affected by operations mentioned explicitly	"red list" "conserv" "species" "habitat"
Sustainability performance: Environmental issues	**Emissions, effluents and waste**	**EN16:** Total direct and indirect greenhouse gas emissions by weight		**Good information:** greenhouse gas emissions by weight mentioned, but not explicitly "direct"/"indirect" **Detailed information:** "direct", "indirect" and "fossil-derived" greenhouse gas emissions by weight mentioned explicitly	"emission" "greenhouse" "electricity" "carbon" "fossil" "CO"
Sustainability performance: Environmental issues	**Emissions, effluents and waste**	**EN17:** Other relevant greenhouse gas emissions by weight		**Detailed information:** other relevant greenhouse gas emissions by weight mentioned explicitly	"greenhouse gas" "methane"
Sustainability performance: Environmental issues	**Emissions, effluents and waste**	**EN18:** Initiatives to reduce greenhouse gas (GHG) emissions and reductions achieved		**Detailed information:** initiatives and (company-wide) reductions achieved mentioned explicitly	"emission" "reduc"
Sustainability performance: Environmental issues	**Emissions, effluents and waste**	**EN19:** Emissions of ozone-depleting substances (by weight)		**Detailed information:** ozone-depleting substances by weight mentioned explicitly	"ozone"
Sustainability performance: Environmental issues	**Emissions, effluents and waste**	**EN20:** NOx, SOx, and other significant air emissions by type and weight		**Patchy information:** only NOx or SOx emissions mentioned **Good information:** only NOx and SOx (no other air emissions) mentioned by weight **Detailed information:** NOx and SOx and other air emissions by weight mentioned explicitly	"emission" "NOx" "NO2" "SOx" "SO2"

Category of performance information	**Grouping of performance information**	**Underlying GRI G3** performance indicator and initial	**Definite indicator** formulation and initial	Additional information regarding the **evaluation** of quality	**Key"words"** used for "word search" with Acrobat
Sustainability performance: Environmental issues	**Emissions, effluents and waste**	**EN21:** Total water discharge by quality and destination		**Patchy information:** only water discharge volume or quality mentioned **Good information:** water discharge volume and quality mentioned (no destination) **Detailed information:** water discharge volume and quality and destination mentioned explicitly	"water" "discharge" "effluent"
Sustainability performance: Environmental issues	**Emissions, effluents and waste**	**EN22:** Total weight of waste by type and disposal method	**EN22s:** Total weight of waste by type and disposal method	**Patchy information:** total weight of waste or percentages of the disposal method mentioned **Good information:** total weight of waste and one disposal method mentioned **Detailed information:** total waste volume and at least "landfill waste" weight (volume) and "hazardous waste" weight (volume) mentioned explicitly	"waste"
Sustainability performance: Environmental issues	**Emissions, effluents and waste**	**EN24 (additional):** Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III, and VIII, and percentage of transported waste shipped internationally			
Sustainability performance: Environmental issues	**Emissions, effluents and waste**	**EN23:** Total number and volume of significant spills		**Detailed information:** total number and volume mentioned explicitly or explicit statement that no spills occured	"spill" "leak"
Sustainability performance: Environmental issues	**Emissions, effluents and waste**	**EN25:** Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the reporting organization's discharges of water and		**Detailed information:** explicit description of water bodies affected by water discharges andf runoff	"discharge" "run-off" "water bod"
Sustainability performance: Environmental issues	**Products and services**	**EN26:** Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation		**Detailed information:** initiatives (programs) to mitigate environmental impacts of products mentioned explicitly	"environmental impact" "products" "assess"
Sustainability performance: Environmental issues	**Products and services**	**EN27:** Percentage of products sold and their packaging materials that are reclaimed by category		**Patchy information:** paper recycling rate or paper as recyclable material mentioned **Detailed information:** percentage of products and their packaging materials that are reclaimed mentioned explicitly	"reclaim" "recycle"
Sustainability performance: Environmental issues	**Compliance**	**EN28:** Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations		**Detailed information:** environmental non-compliance incidents and fines or sanctions mentioned explicitly	"penalt" "fines" "sanction" "incident" "non-compliance"
Sustainability performance: Environmental issues	**Transport**	**EN29:** Significant environmental impacts of transporting products and other goods and materials used for the organization's operations, and transporting members of the workforce		**Detailed information:** significant environmental impacts of transports mentioned explicitly	"transport" "distribution"
Sustainability performance: Environmental issues	**Overall**	**EN30:** Total environmental protection expenditures and investments by type		**Good information:** projects mentioned in detail or only total sum of environmental investments/expenditures mentioned **Detailed information:** projects and total amount of environmental investments/expenditures mentioned explicitly	"invest" "expenditure" "protection" "conservation" "project"

Category of performance information	**Grouping of performance information**	**Underlying GRI G3** performance indicator and initial	**Definite indicator** formulation and initial	Additional information regarding the **evaluation** of quality	**Key"words"** used for "word search" with Acrobat
Sustainability performance: Social issues	**Labour practices and decent work: Employment**	**LA1:** Total workforce by employment type, employment contract, and region		**Good information:** total number of employees and regional origin or development of the number of employees mentioned **Detailed information:** total number of employees and regional origin and development/turnover mentioned explicitly	"employee" "workforce"
Sustainability performance: Social issues	**Labour practices and decent work: Employment**	**LA2:** Total number and rate of employee turnover by age group, gender, and region		**Detailed information:** total number and rate of employee turnover by age group, gender and region mentioned explicitly	"turnover"
Sustainability performance: Social issues	**Labour practices and decent work: Employment**	**LA3 (additional):** Benefits provided to full-time employees that are not provided to temporary or part-time employees, by major operations		**Not considered:** additional indicator	
Sustainability performance: Social issues	**Labour practices and decent work: Labour/ Mangement relations**	**LA4:** Percentage of employees covered by collective bargaining agreements		**Good information:** percentage of employees with union membership **Detailed information:** percentage of employees covered by collective bargaining agreements mentioned explicitly	"bargaining" "union"
Sustainability performance: Social issues	**Labour practices and decent work: Labour/ Mangement relations**	**LA5:** Minimum notice period(s) regarding significant operational changes, including whether it is specified in collective agreements		**Patchy information:** procedures in case of significant operational changes mentioned in general **Detailed information:** minimum notice periods regarding significant operational changes mentioned explicitly	"notice"
Sustainability performance: Social issues	**Labour practices and decent work: Occupational health and safety (OHS)**	**LA6 (additional):** Percentage of total workforce represented in formal joint management-worker health and safety committees that help monitor and advise on occupational health and safety programs		**Not considered:** additional indicator	
Sustainability performance: Social issues	**Labour practices and decent work: Occupational health and safety (OHS)**	**LA7:** Rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities by region		**Good information:** injury rate or freqency mentioned and one additional OHS measurement or development of injuries **Detailed information:** at least injury rate or frequency and absentism and fatalities mentioned explicitly	"injur" "absentism" "fatalit" "accident" "lost days"
Sustainability performance: Social issues	**Labour practices and decent work: Occupational health and safety (OHS)**	**LA8:** Education, training, counseling, prevention, and risk-control programs in place to assist workforce members, their families, or community members regarding serious diseases		**Patchy information:** education/training regarding health & safety mentioned in general **Detailed information:** education/training initiatives and programms regarding the prevention of serious diseases described explicitly	"disease" "training" "education"
Sustainability performance: Social issues	**Labour practices and decent work: Occupational health and safety (OHS)**	**LA9 (additional):** Health and safety topics covered in formal agreements with trade unions		**Not considered:** additional indicator	
Sustainability performance: Social issues	**Labour practices and decent work: Training and education**	**LA10:** Average hours of training per year per employee by employee category		**Detailed information:** training hours per employee by category mentioned explicitly	"train" "educat"

Category of performance information	**Grouping of performance information**	**Underlying GRI G3** performance indicator and initial	**Definite indicator** formulation and initial	Additional information regarding the **evaluation** of quality	**Key"words"** used for "word search" with Acrobat
Sustainability performance: Social issues	**Labour practices and decent work: Training and education**	**LA11 (additional):** Programs for skills management and lifelong learning that support the continued employability of employees and assist them in managing career endings		**Not considered:** additional indicator	
Sustainability performance: Social issues	**Labour practices and decent work: Training and education**	**LA12 (additional):** Percentage of employees receiving regular performance and career development reviews		**Not considered:** additional indicator	
Sustainability performance: Social issues	**Labour practices and decent work: Diversity and equal opportunity**	**LA13:** Composition of governance bodies and breakdown of employees per category according to gender, age group, minority group membership, and other indicators of diversity		**Good information:** several diversity measures mentioned, but no information about diversity within management functions or only gender diversity mentioned **Detailed information:** diversity within management functions and at least two more diversity measures (gender, age, minority group membership etc.) mentioned explicitly	"divers" "gender" "women" "minorit" "opportunit"
Sustainability performance: Social issues	**Labour practices and decent work: Diversity and equal opportunity**	**LA14:** Ratio of basic salary of men to women by employee category		**Detailed information:** ratio of basic salary of men to women by employee category mentioned explicitly	"salary" "pay" "gender" "women"
Sustainability performance: Social issues	**Human rights: Investment and procurement practices**	**HR1:** Percentage and total number of significant investment agreements that include human rights clauses or that have undergone human rights screening		**Detailed information:** percentage of significant investment agreements mentioned explicitly	"human right" "investment" "screening"
Sustainability performance: Social issues	**Human rights: Investment and procurement practices**	**HR2:** Percentage of significant suppliers and contractors that have undergone screening on human rights and actions taken		**Good information:** compliance with company's regulations/guidelines regarding human rights and surveys/screening of suppliers/contractors mentioned explicitly **Detailed information:** percentage of suppliers/contractors that have undergone screening on human rights mentioned explicitly	"human right" "supplier" "contractor" "screening"
Sustainability performance: Social issues	**Human rights: Investment and procurement practices**	**HR3 (additional):** Total hours of employee training on policies and procedures concerning aspects of human rights that are relevant to operations, including the percentage of employees trained		**Not considered:** additional indicator	
Sustainability performance: Social issues	**Human rights: Non-Discrimination**	**HR4:** Total number of incidents of discrimination and actions taken		**Patchy information:** policies and/or intentions regarding non-discrimination mentioned in general **Good information:** actions taken: code of conduct with statements regarding non-discrimination mentioned explicitly **Detailed information:** number of incidents of discrimination and actions taken mentioned explicitly	"discriminat" "fair"

Category of performance information	**Grouping of performance information**	**Underlying GRI G3** performance indicator and initial	**Definite indicator** formulation and initial	Additional information regarding the **evaluation** of quality	**Key"words"** used for "word search" with Acrobat
Sustainability performance: Social issues	**Human rights: Freedom of association and collective bargaining**	**HR5:** Operations identified in which the right to exercise freedom of association and collective bargaining may be at significant risk, and actions taken to support these rights		**Patchy information:** policies and/or intentions regarding freedom of association and collective bargaining mentioned in general **Good information:** actions taken: code of conduct with statements regarding freedom of association and collective bargaining mentioned explicitly **Detailed information:** operations identified in which the the right to exercise freedom of association and collective bragaining may be at risk and actions taken to support these rights mentioned explicitly	"associat" "bargain" "union"
Sustainability performance: Social issues	**Human rights: Child labour and forced/ compulsory labour**	**HR6:** Operations identified as having significant risk for incidents of child labor, and measures taken to contribute to the elimination of child labor		**Patchy information:** policies and/or intentions regarding child or forced/compulsory labour mentioned in general **Good information:** actions taken: code of conduct with statements regarding child or forced/compulsory labour mentioned or other measures described explicitly **Detailed information:** operations identified as having significant risk for incidents of child or forced/compulsory labour and actions taken mentioned explicitly	"child "
Sustainability performance: Social issues		**HR7:** Operations identified as having significant risk for incidents of forced or compulsory labor, and measures to contribute to the elimination of forced or compulsory labor			"forced" "compulsory"
Sustainability performance: Social issues	**Human rights: Security practices**	**HR8 (additional):** Percentage of security personnel trained in the organization's policies or procedures concerning aspects of human rights that are relevant to operations		**Not considered:** additional indicator	
Sustainability performance: Social issues	**Human rights: Indigenous rights**	**HR9 (additional):** Total number of incidents of violations involving rights of indigenous people and actions taken		**Not considered:** additional indicator	
Sustainability performance: Social issues	**Society: Community**	**SO1:** Nature, scope, and effectiveness of any programs and practices that assess and manage the impacts of operations on communities, including entering, operating, and exiting		**Patchy information:** involvement of communities mentioned in general **Detailed information:** programs and practices for community involvement or respectively for the assessment and management of the impacts of operations on communities mentioned explicitly	"communit" "public"
Sustainability performance: Social issues	**Society: Corruption**	**SO2:** Percentage and total number of business units analysed for risks related to corruption		**Patchy information:** risk of corruption with regard to company's operations mentioned in general **Good information:** business units with risks related to corruption **Detailed information:** percentage/total number of business units analysed for risks related to corruption	"corrupt" "brib"
Sustainability performance: Social issues	**Society: Corruption**	**SO3:** Percentage of employees trained in organization's anti-corruption policies and procedures		**Patchy information:** anti-corruption policies and procedures mentioned in general **Good information:** employee training in anti-corruption policies and procedures **Detailed information:** percentage of employees trained in organization's anti-corruption policies and procedures	"corrupt" "brib"

Category of performance information	**Grouping of performance information**	**Underlying GRI G3** performance indicator and initial	**Definite indicator** formulation and initial	Additional information regarding the **evaluation** of quality	**Key"words"** used for "word search" with Acrobat
Sustainability performance: Social issues	**Society: Corruption**	**SO4:** Actions taken in response to incidents of corruption		**Patchy information:** prevention of corruption mentioned in general (policies, intentions) **Good information:** code of conduct with statements regarding corruption mentioned explicitly **Detailed information:** actions taken preventative & in response	"corrupt" "brib"
Sustainability performance: Social issues	**Society: Public Policy**	**SO5:** Public policy positions and participation in public policy development and lobbying		**Patchy information:** public policy mentioned in general **Detailed information:** positions & participation in general	"poli" "parties" "party" "authorit" "lobby"
Sustainability performance: Social issues	**Society: Public policy**	**SO6 (additional):** Total value of financial and in-kind contributions to political parties, politicians, and related institutions by country		**Not considered:** additional indicator	
Sustainability performance: Social issues	**Society: Anti-competitive behaviour**	**SO7 (additional):** Total number of legal actions for anti-competitive behavior, anti-trust, and monopoly practices and their outcomes		**Not considered:** additional indicator	
Sustainability performance: Social issues	**Society: Compliance**	**SO8:** Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with laws and regulations (related to society)		**Patchy information:** statement regarding "compliance with all laws and regulations" **Good information:** incidents of non-compliance with regard to social issues mentioned **Detailed information:** fines and non-monetary sanctions for non-compliance mentioned explicitly	"fin" "sanction" "compliance" "law"
Sustainability performance: Social issues	**Product responsibility: Customer health and safety**	**PR1:** Life cycle stages in which health and safety impacts of products and services are assessed for improvement, and percentage of significant products and services categories subject to such procedures		**Patchy information:** general statements regarding the health and safety of products **Good information:** products' health and safety assessment procedures/programs mentioned **Detailed information:** life-cycle stages and percentage of products and services categories subject to such procedures mentioned explicitly	"product" "assess" "safety" "stewardship" "life cycle" "responsib"
Sustainability performance: Social issues	**Product responsibility: Customer health and safety**	**PR2 (additional):** Total number of incidents of non-compliance with regulations and voluntary codes concerning health and safety impacts of products and services during their life cycle, by type of outcomes		**Not considered:** additional indicator	
Sustainability performance: Social issues	**Product responsibility: Products and service labeling**	**PR3:** Type of product and service information required by procedures, and percentage of significant products and services subject to such information requirements		**Patchy information:** general statements regarding product labelling or the provision of product information **Good information:** product labelling or provision of information mentioned in detail **Detailed information:** life-cycle stages and percentage of products and services categories subject to such procedures mentioned explicitly	"label" "information"

Category of performance information	**Grouping of performance information**	**Underlying GRI G3** performance indicator and initial	**Definite indicator** formulation and initial	Additional information regarding the **evaluation** of quality	**Key"words"** used for "word search" with Acrobat
Sustainability performance: Social issues	**Product responsibility: Products and service labeling**	**PR4 (additional):** Total number of incidents of non-compliance with regulations and voluntary codes concerning product and service information and labeling, by type of outcomes		**Not considered:** additional indicator	
Sustainability performance: Social issues	**Product responsibility: Products and service labeling**	**PR5 (additional):** Practices related to customer satisfaction, including results of surveys measuring customer satisfaction		**Not considered:** additional indicator	
Sustainability performance: Social issues	**Product responsibility: Marketing communications**	**PR6:** Programs for adherence to laws, standards, and voluntary codes related to marketing communications, including advertising, promotion, and sponsorship		**Detailed information:** programs for the adherence of laws, standards etc. related to marketing communications mentioned explicitly	"marketing" "advertis" "promotion"
Sustainability performance: Social issues	**Product responsibility: Marketing communications**	**PR7 (additional):** Total number of incidents of non-compliance with regulations and voluntary codes concerning marketing communications, including advertising, promotion, and sponsorship by type of outcomes		**Not considered:** additional indicator	
Sustainability performance: Social issues	**Product responsibility: Customer privacy**	**PR8 (additional):** Total number of substantiated complaints regarding breaches of customer privacy and losses of customer data		**Not considered:** additional indicator	
Sustainability performance: Social issues	**Product responsibility: Compliance**	**PR9:** Monetary value of significant fines for non-compliance with laws and regulations concerning the provision and use of products and services		**Patchy information:** statement regarding "compliance with all laws and regulations" **Good information:** statements regarding compliance with laws and regulations concerning the provision and use of products and services **Detailed information:** fines and non-monetary sanctions for non-compliance mentioned explicitly	"products" "compliance"
Forestry-related information	**Forestry-related certification**		**F1:** Share of certified owned or managed forests	**Good information:** certification schemes and area of certified forests mentioned, but not very systematically **Detailed information:** forest management certification mentioned explicitly and systematically (certification schemes and percentage or alternatively (“out of all”) list of certified forests)	"certif" "forest" "PEFC" "FSC" "SFI" "CSA"
Forestry-related information	**Forestry-related certification**		**F2:** Share of chain-of-custody certification	**Good information:** mills' chain-of-custody certification mentioned, but not very systematically or systematically, but not explicitly as "chain-of-custody" certification **Detailed information:** chain-of-custody certification mentioned explicitly and systematically (certification schemes and percentage or alternatively (“out of all”) list of certified mills)	"certif" "custody" "facilit" "mill"

Category of performance information	**Grouping of performance information**	**Underlying GRI G3** performance indicator and initial	**Definite indicator** formulation and initial	Additional information regarding the **evaluation** of quality	**Key"words"** used for "word search" with Acrobat
Forestry-related information	**Forestry-related certification**		**F3:** Amount of certified input material	**Good information:** percentage of certified fiber/wood input mentioned not very systematically or explicit (only for selected facilities, regions or specific materials) **Detailed information:** percentage of purchased certified wood material mentioned explicitly and systematically	"certif" "fibre" "wood" "pulp" "purchas" "supply"
Forestry-related information	**Prevention of illegal logging**		**F4:** Policies, programs and actions for the prevention of illegal logging	**Patchy information:** general statements regarding the prevention of illegal logging or prcurement of illegally logged wood **Good information:** policies for the prevention of illegal logging or procurement of illegally logged wood mentioned explicitly **Detailed information:** policies, programs and specific actions (e.g. surveys) for the prevention of illegal logging mentioned explicitly	"illegal" "source" "logg"
Forestry-related information	**Carbon sequestration & storage**		**F5:** Carbon sequestration due to company's forests	**Patchy information:** "carbon storage" and forests as "carbon sinks" are only mentioned in the glossary of the report **Good information:** carbon "sequestration" or "storage" due to (managed) forests mentioned explicitly **Detailed information:** total amount of CO_2 sequestrated due to company's forests mentioned explicitly	"sequestrat" "carbon" "fixed" "CO2"
Forestry-related information	**Carbon sequestration & storage**		**F6:** Carbon storage due to company's products	**Detailed information:** total amount of CO2 sequestrated due to company's wood-based products	"storage" "carbon" "fixed" "CO2"

II.A Information quality values for each company

Indicator/Sub-Grouping/**Grouping**	**IP**	**WH**	**MW**	**SE**	**SCA**	**UPM**	**OJI**	**NIP**	**APP**	**plum**	**np**	**cat**	**lec**	**myll**	**port**	**han**	**april**	**hok**
EC1	0	3	0	3	1	0	2	2	1	0	3	3	0	0	3	0	1	3
EC2	0	1	2	3	0	1	1	2	0	0	1	2	1	0	1	0	1	0
EC3	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1
EC4	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0
Economic performance																		
EC6	0	2	1	2	1	0	0	1	1	0	0	3	0	0	2	0	0	0
EC7	0	2	1	1	0	0	1	0	1	0	0	2	0	1	1	0	1	0
Market presence																		
EC8	2	3	1	2	1	2	2	1	2	0	2	3	0	1	2	1	2	0
Indirect econ. impacts																		
EN1	1	2	0	1	3	3	3	3	2	0	1	3	1	3	3	0	1	0
EN2	2	3	0	3	2	3	3	2	3	0	1	3	1	2	1	3	1	0
Materials																		
EN3s	2	2	1	3	3	2	3	3	0	0	1	3	3	3	3	2	1	0
EN5s	1	3	2	2	3	1	2	2	1	2	1	2	2	2	2	3	1	1
EN6n	3	2	3	2	1	3	3	2	0	0	2	3	1	0	3	0	0	0
Energy																		
EN8s	3	2	2	1	3	1	2	2	3	0	0	2	2	0	2	0	3	0
EN10n	1	3	2	3	3	3	0	0	1	0	0	3	2	1	2	1	0	0
Water consumption																		
EN11s	1	0	0	0	1	0	0	1	1	1	0	0	0	0	3	0	1	0
EN13	1	2	1	0	0	0	0	1	2	2	0	0	0	0	1	0	1	0
EN14	3	2	3	3	2	2	2	3	3	3	1	1	1	0	3	0	3	0
EN15	2	1	0	0	0	1	1	0	1	2	0	0	0	0	1	0	2	0
Biodiversity																		
EN16	3	3	2	3	3	2	2	2	0	0	2	2	2	0	2	0	1	0
EN17	0	0	0	0	0	0	1	1	0	0	0	1	2	0	1	0	0	0
EN18	2	3	2	3	2	2	2	2	0	0	1	3	1	0	1	0	0	1
EN19	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0
EN20	3	3	3	2	2	2	3	3	2	0	3	3	1	3	3	1	2	0
EN21	2	1	2	2	3	3	2	2	1	0	2	1	1	1	1	1	1	0
EN22s	3	3	1	3	3	3	2	2	2	0	3	2	3	3	2	1	1	0
EN23	0	0	0	1	0	0	0	0	2	0	2	3	2	1	3	0	1	0
EN25	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0
Emissions, effluents, waste																		
EN26	1	1	1	2	3	1	1	2	0	0	0	1	0	1	1	1	0	1
EN27	1	2	0	2	1	1	1	2	1	0	2	2	0	1	1	2	0	0
Products and services																		
EN28	3	3	3	3	0	1	1	2	0	0	1	2	0	1	0	0	0	0
Compliance																		
EN29	0	1	0	1	3	1	3	2	0	0	0	0	1	1	0	0	0	0
Transport																		
EN30	1	3	1	3	2	3	3	3	1	1	2	1	3	3	2	2	1	0
Environmental investments																		
LA1	3	3	2	3	2	2	1	2	1	0	1	2	3	2	3	0	2	0
LA2	2	2	0	1	0	0	0	1	0	0	0	1	1	1	1	0	2	0
Employment																		
LA4	0	2	0	2	3	0	0	0	0	0	0	3	0	0	0	0	0	0
LA5	0	1	0	1	1	1	0	0	0	0	0	2	0	0	0	0	0	0
Labour/Management relations																		
LA7	2	3	2	3	3	3	2	3	2	0	2	3	0	1	2	1	2	0
LA8	0	1	1	1	2	2	0	1	3	1	1	1	2	0	1	0	0	0
Occupational health and safety																		
LA10	2	2	1	1	1	1	1	1	1	0	1	1	1	1	2	1	1	0
Training and education																		
LA13	1	3	1	3	3	2	3	3	0	0	1	2	0	0	2	0	2	0
LA14	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
Diversity and equal opportunity																		
Labour practices and decent work																		
HR1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HR2	1	1	1	1	2	0	0	2	1	0	0	0	0	0	1	0	1	0
Investment and procurement practices																		
HR4	0	1	0	0	2	1	0	2	0	0	0	1	0	1	0	0	1	0
Non-Dicrimination																		
HR5	0	0	1	0	1	0	0	0	0	0	1	1	0	0	1	0	1	0
Freedom of association and collective bargaining																		
HR6	2	1	1	0	2	2	0	0	0	0	0	1	0	0	1	0	2	0
HR7	2	1	1	0	2	2	0	0	0	0	0	1	0	0	0	0	2	0
Child and forced/compulsory labour																		
Human rights																		
SO1	2	3	3	3	3	0	2	2	1	0	1	3	0	0	2	0	1	0
Community																		
SO2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
SO3	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
SO4	0	0	0	2	2	2	1	1	0	0	0	2	0	0	1	0	1	0
Corruption																		
SO5	0	2	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0
Public policy																		
SO8	2	2	0	0	1	1	1	2	1	0	1	1	0	1	1	0	0	0
Compliance																		
Society																		
PR1	2	0	1	2	2	1	2	2	1	0	0	1	0	1	0	0	0	0
Customer health & safety																		
PR3	1	1	0	2	1	2	1	1	2	2	0	1	0	0	2	2	0	1
Products and service labelling																		
PR6	1	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0
Market communication																		
PR9	2	0	0	0	1	2	1	1	1	0	1	2	0	1	1	0	0	0
Compliance																		
Product responsibility																		
F1	2	3	2	3	3	3	3	3	1	3	0	0	0	0	2	0	1	0
F2	2	2	1	3	3	3	1	0	0	0	1	2	1	2	3	0	1	0
F3	3	2	0	3	3	3	3	3	2	0	2	1	2	1	0	0	0	0
Forestry-related certification																		
F4	2	2	1	2	2	3	3	3	3	0	2	0	0	1	2	0	3	0
Prevention of illegal logging																		
F5	0	3	2	2	1	0	3	3	1	0	0	0	1	0	3	0	2	0
F6	0	3	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0
Carbon sequestration/storage																		

IP: International Paper; **WH**: Weyerhaeuser; **MW**: MeadWestvaco *(all largest enterprises headquartered in North America)*
SE: StoraEnso; **SCA**: Svenska Cellulosa; **UPM**: UPM *(all largest enterprises headquartered in Europe)*
OJI: OJI Paper; **NIP**: Nippon Unipac; **APP**: Asia Pulp and Paper *(all largest enterprises headquartered in the Asia-Pacific region)*
plum: Plum Creek; **np**: New Page; **cat**: Catalyst *(all small enterprises headquartered in North America)*
lec: Lecta; **myll**: Myllykoski; **port**: Portucel *(all small enterprises headquartered in Europe)*
han: Hansol Paper; **april**: APRIL; **hok**: Hokuetsu Paper *(all small enterprises headquartered in the Asia-Pacific region)*

II.B Information quality percentages achieved by the groups of the largest and small forest and paper companies and quality differences between them

Indicator/ Sub-Grouping/ **Grouping**	**Size-related evaluation**		**Difference in information quality**	
			Largest companies // Small companies	
	Largest companies	Small companies	**Relative** (worse than)	**Definition of the difference**
EC1	44,4%	48,1%	*8%*	*minor*
EC2	37,0%	22,2%	40%	noticeable
EC3	0,0%	11,1%	*100%*	*fundamental*
EC4	7,4%	7,4%	0%	identical quality
Economic performance	**22,2%**	**22,2%**	**0%**	**identical quality**
EC6	29,6%	18,5%	38%	noticeable
EC7	22,2%	18,5%	17%	minor
Market presence	**25,9%**	**18,5%**	**29%**	**noticeable**
EC8	59,3%	40,7%	31%	noticeable
Indirect econ. impacts	**59,3%**	**40,7%**	**31%**	**noticeable**
EN1	66,7%	44,4%	33%	noticeable
EN2	77,8%	44,4%	43%	noticeable
Materials	**72,2%**	**44,4%**	**38%**	**noticeable**
EN3s	70,4%	59,3%	16%	minor
EN5s	63,0%	59,3%	6%	minor
EN6n	70,4%	33,3%	53%	considerable
Energy	**67,9%**	**50,6%**	**25%**	**noticeable**
EN8s	70,4%	33,3%	53%	considerable
EN10n	59,3%	33,3%	44%	noticeable
Water consumption	**64,8%**	**33,3%**	**49%**	**noticeable**
EN11s	14,8%	18,5%	*20%*	*minor*
EN13	25,9%	14,8%	43%	noticeable
EN14	85,2%	44,4%	48%	noticeable
EN15	22,2%	18,5%	17%	minor
Biodiversity	**37,0%**	**24,1%**	**35%**	**noticeable**
EN16	74,1%	33,3%	55%	considerable
EN17	7,4%	14,8%	*50%*	*considerable*
EN18	66,7%	25,9%	61%	considerable
EN19	7,4%	3,7%	50%	considerable
EN20	85,2%	59,3%	30%	noticeable
EN21	66,7%	29,6%	56%	considerable
EN22s	81,5%	55,6%	32%	noticeable
EN23	11,1%	44,4%	*75%*	*fundamental*
EN25	7,4%	7,4%	0%	identical quality
Emissions, effluents, waste	**45,3%**	**30,5%**	**33%**	**noticeable**
EN26	44,4%	18,5%	58%	considerable
EN27	40,7%	29,6%	27%	noticeable
Products and services	**42,6%**	**24,1%**	**43%**	**noticeable**
EN28	59,3%	14,8%	75%	fundamental
Compliance	**59,3%**	**14,8%**	**75%**	**fundamental**
EN29	40,7%	7,4%	82%	fundamental
Transport	**40,7%**	**7,4%**	**82%**	**fundamental**
EN30	74,1%	55,6%	25%	noticeable
Environmental investments	**74,1%**	**55,6%**	**25%**	**noticeable**
LA1	70,4%	48,1%	32%	noticeable
LA2	22,2%	22,2%	0%	identical quality
Employment	46,3%	35,2%	24%	noticeable
LA4	25,9%	11,1%	57%	considerable
LA5	14,8%	7,4%	50%	considerable
Labour/Management relations	20,4%	9,3%	55%	considerable
LA7	85,2%	40,7%	52%	considerable
LA8	40,7%	22,2%	45%	noticeable
Occupational health and safety	63,0%	31,5%	50%	considerable
LA10	40,7%	29,6%	27%	noticeable
Training and education	40,7%	29,6%	27%	noticeable
LA13	70,4%	25,9%	63%	considerable
LA14	0,0%	7,4%	*100%*	*fundamental*
Diversity and equal opportunity	35,2%	16,7%	53%	considerable
Labour practices and decent work	**41,1%**	**24,4%**	**41%**	**noticeable**
HR1	0,0%	0,0%	-	identical quality
HR2	33,3%	7,4%	78%	fundamental
Investment and procurement practices	16,7%	3,7%	78%	fundamental
HR4	22,2%	11,1%	50%	considerable
Non-Dicrimination	22,2%	11,1%	50%	considerable
HR5	7,4%	14,8%	*50%*	*considerable*
Freedom of association and collective bargaining	7,4%	14,8%	*50%*	*considerable*
HR6	29,6%	14,8%	50%	considerable
HR7	29,6%	11,1%	63%	considerable
Child and forced/compulsory labour	29,6%	13,0%	56%	considerable
Human rights	**19,0%**	**10,6%**	**44%**	**noticeable**
SO1	70,4%	25,9%	63%	considerable
Community	70,4%	25,9%	63%	considerable
SO2	7,4%	0,0%	100%	fundamental
SO3	11,1%	0,0%	100%	fundamental
SO4	29,6%	14,8%	50%	considerable
Corruption	16,0%	4,9%	69%	considerable
SO5	18,5%	3,7%	80%	fundamental
Public policy	18,5%	3,7%	80%	fundamental
SO8	37,0%	14,8%	60%	considerable
Compliance	37,0%	14,8%	60%	considerable
Society	**35,5%**	**12,3%**	**65%**	**considerable**
PR1	48,1%	7,4%	85%	fundamental
Customer health & safety	48,1%	7,4%	85%	fundamental
PR3	40,7%	29,6%	27%	noticeable
Products and service labelling	40,7%	29,6%	27%	noticeable
PR6	7,4%	7,4%	0%	identical quality
Market communication	7,4%	7,4%	0%	identical quality
PR9	29,6%	18,5%	38%	noticeable
Compliance	29,6%	18,5%	38%	noticeable
Product responsibility	**31,5%**	**15,7%**	**50%**	**considerable**
F1	85,2%	22,2%	74%	fundamental
F2	55,6%	37,0%	33%	noticeable
F3	81,5%	22,2%	73%	considerable
Forestry-related certification	**74,1%**	**27,2%**	**63%**	**considerable**
F4	77,8%	29,6%	62%	considerable
Prevention of illegal logging	**77,8%**	**29,6%**	**62%**	**considerable**
F5	55,6%	22,2%	60%	considerable
F6	18,5%	7,4%	60%	considerable
Carbon sequestration/storage	**37,0%**	**14,8%**	**60%**	**considerable**

*cursive: small > largest

II.C Information quality percentages achieved by the groups of North American, European and Asia-Pacific forest and paper companies and quality differences between them

Indicator/Sub-Grouping/ Grouping	Regional evaluation			Difference in information quality North America // Europe		Difference in information quality Europe // Asia-Pacific		Difference in information quality Asia-Pacific // North America	
	Companies from North America	Companies from Europe	Companies from Asia-Pacific	Relative (worse than)	Definition of the difference	Relative (worse than)	Definition of the difference	Relative (worse than)	Definition of the difference
EC1	50,0%	38,9%	50,0%	*22%*	*minor*	22%	*minor*	0%	identical quality
EC2	33,3%	33,3%	22,2%	0%	identical quality	*33%*	*noticeable*	33%	noticeable
EC3	11,1%	0,0%	5,6%	*100%*	*fundamental*	100%	fundamental	50%	considerable
EC4	0,0%	22,2%	0,0%	100%	fundamental	*100%*	*fundamental*	-	identical quality
Economic performance	**23,6%**	**23,6%**	**19,4%**	**0%**	**identical quality**	***18%***	***minor***	**18%**	**minor**
EC6	33,3%	27,8%	11,1%	*17%*	*minor*	*60%*	*considerable*	67%	considerable
EC7	27,8%	16,7%	16,7%	*40%*	*noticeable*	0%	identical quality	40%	noticeable
Market presence	**30,6%**	**22,2%**	**13,9%**	***27%***	***noticeable***	***38%***	***noticeable***	**55%**	**considerable**
EC8	61,1%	44,4%	44,4%	*27%*	*noticeable*	0%	identical quality	27%	noticeable
Indirect econ. impacts	**61,1%**	**44,4%**	**44,4%**	**27%**	**noticeable**	**0%**	**identical quality**	**27%**	**noticeable**
EN1	38,9%	77,8%	50,0%	50%	considerable	*36%*	*noticeable*	*22%*	*minor*
EN2	50,0%	66,7%	66,7%	25%	noticeable	0%	identical quality	*25%*	*noticeable*
Materials	**44,4%**	**72,2%**	**58,3%**	**38%**	**noticeable**	***19%***	***minor***	***24%***	***minor***
EN3s	50,0%	94,4%	50,0%	47%	noticeable	*47%*	*noticeable*	0%	identical quality
EN5s	61,1%	66,7%	55,6%	8%	minor	*17%*	*minor*	9%	minor
EN6n	72,2%	55,6%	27,8%	*23%*	*noticeable*	*50%*	*considerable*	62%	considerable
Energy	**61,1%**	**72,2%**	**44,4%**	**15%**	**minor**	***38%***	***noticeable***	**27%**	**noticeable**
EN8s	50,0%	50,0%	55,6%	0%	identical quality	10%	minor	*10%*	*minor*
EN10n	50,0%	77,8%	11,1%	36%	noticeable	*86%*	*fundamental*	78%	fundamental
Water consumption	**50,0%**	**63,9%**	**33,3%**	**22%**	**minor**	***48%***	***noticeable***	**33%**	**noticeable**
EN11s	11,1%	22,2%	16,7%	50%	considerable	*25%*	*noticeable*	*33%*	*noticeable*
EN13	33,3%	5,6%	22,2%	*83%*	*fundamental*	75%	fundamental	33%	noticeable
EN14	72,2%	61,1%	61,1%	*15%*	*minor*	0%	identical quality	15%	minor
EN15	27,8%	11,1%	22,2%	*60%*	*considerable*	50%	considerable	20%	minor
Biodiversity	**36,1%**	**25,0%**	**30,6%**	***31%***	***noticeable***	**18%**	**minor**	**15%**	**minor**
EN16	66,7%	66,7%	27,8%	0%	identical quality	*58%*	*considerable*	58%	considerable
EN17	5,6%	16,7%	11,1%	67%	considerable	*33%*	*noticeable*	*50%*	*considerable*
EN18	61,1%	50,0%	27,8%	*18%*	*minor*	*44%*	*noticeable*	55%	considerable
EN19	5,6%	0,0%	11,1%	*100%*	*fundamental*	100%	fundamental	*50%*	*considerable*
EN20	83,3%	72,2%	61,1%	*13%*	*minor*	*15%*	*minor*	27%	noticeable
EN21	44,4%	61,1%	38,9%	27%	noticeable	*36%*	*noticeable*	13%	minor
EN22s	66,7%	94,4%	44,4%	29%	noticeable	*53%*	*considerable*	33%	noticeable
EN23	27,8%	38,9%	16,7%	29%	noticeable	*57%*	*considerable*	40%	noticeable
EN25	11,1%	0,0%	11,1%	*100%*	*fundamental*	100%	fundamental	0%	identical quality
Emissions, effluents, waste	**41,4%**	**44,4%**	**27,8%**	**7%**	**minor**	***38%***	***noticeable***	**33%**	**noticeable**
EN26	22,2%	44,4%	27,8%	50%	considerable	*38%*	*noticeable*	*20%*	*minor*
EN27	38,9%	33,3%	33,3%	*14%*	*minor*	0%	identical quality	14%	minor
Products and services	**30,6%**	**38,9%**	**30,6%**	**21%**	**minor**	***21%***	***minor***	**0%**	**identical quality**
EN28	66,7%	27,8%	16,7%	*58%*	*considerable*	*40%*	*noticeable*	75%	fundamental
Compliance	**66,7%**	**27,8%**	**16,7%**	***58%***	***considerable***	***40%***	***noticeable***	**75%**	**fundamental**
EN29	5,6%	38,9%	27,8%	86%	fundamental	*29%*	*noticeable*	*80%*	*fundamental*
Transport	**5,6%**	**38,9%**	**27,8%**	**86%**	**fundamental**	***29%***	***noticeable***	***80%***	***fundamental***
EN30	50,0%	88,9%	55,6%	44%	noticeable	*38%*	*noticeable*	*10%*	*minor*
Environmental investments	**50,0%**	**88,9%**	**55,6%**	**44%**	**noticeable**	***38%***	***noticeable***	***10%***	***minor***
LA1	61,1%	83,3%	33,3%	27%	noticeable	*60%*	*considerable*	45%	noticeable
LA2	27,8%	22,2%	16,7%	*20%*	*noticeable*	*25%*	*noticeable*	40%	noticeable
Employment	44,4%	52,8%	75,0%	16%	minor	53%	*considerable*	44%	noticeable
LA4	27,8%	27,8%	0,0%	0%	identical quality	*100%*	*fundamental*	100%	fundamental
LA5	16,7%	16,7%	0,0%	0%	identical quality	*100%*	*fundamental*	100%	fundamental
Labour/Management relations	22,2%	22,2%	0,0%	0%	identical quality	*100%*	*fundamental*	100%	fundamental
LA7	66,7%	66,7%	55,6%	0%	identical quality	*17%*	*minor*	17%	minor
LA8	27,8%	44,4%	22,2%	38%	noticeable	*50%*	*considerable*	20%	minor
Occupational health and safety	47,2%	55,6%	38,9%	15%	minor	30%	*noticeable*	18%	minor
LA10	38,9%	38,9%	27,8%	0%	identical quality	*29%*	*noticeable*	29%	noticeable
Training and education	38,9%	38,9%	27,8%	0%	identical quality	*29%*	*noticeable*	29%	noticeable
LA13	44,4%	55,6%	44,4%	20%	minor	*20%*	*minor*	0%	identical quality
LA14	11,1%	0,0%	0,0%	*100%*	*fundamental*	-	identical quality	100%	fundamental
Diversity and equal opportunity	22,8%	22,8%	22,2%	0%	identical quality	20%	*minor*	20%	minor
Labour practices and decent work	**36,1%**	**39,4%**	**22,8%**	**8%**	**minor**	***42%***	***noticeable***	**37%**	**noticeable**
HR1	0,0%	0,0%	0,0%	-	identical quality	-	identical quality	-	identical quality
HR2	16,7%	22,2%	22,2%	25%	noticeable	*0%*	identical quality	*25%*	*noticeable*
Investment and procurement practices	8,3%	11,1%	11,1%	25%	noticeable	0%	identical quality	25%	noticeable
HR4	11,1%	22,2%	16,7%	50%	considerable	*25%*	*noticeable*	*33%*	*noticeable*
Non-Dicrimination	11,1%	22,2%	16,7%	50%	considerable	*25%*	*noticeable*	*33%*	*noticeable*
HR5	16,7%	11,1%	5,6%	*33%*	*noticeable*	*50%*	*considerable*	67%	considerable
Freedom of association and collective bargaining	16,7%	11,1%	5,6%	33%	noticeable	50%	*considerable*	67%	considerable
HR6	27,8%	27,8%	11,1%	0%	identical quality	*60%*	*considerable*	60%	considerable
HR7	27,8%	22,2%	11,1%	*20%*	*minor*	*50%*	*considerable*	60%	considerable
Child and forced/compulsory labour	27,8%	25,0%	11,1%	*10%*	*minor*	*56%*	*considerable*	60%	considerable
Human rights	**16,0%**	**17,4%**	**11,1%**	**8%**	**minor**	***36%***	***noticeable***	**30%**	**noticeable**
SO1	66,7%	44,4%	33,3%	*33%*	*noticeable*	*25%*	*considerable*	50%	considerable
Community	66,7%	44,4%	33,3%	*33%*	*noticeable*	*25%*	*considerable*	50%	considerable
SO2	0,0%	11,1%	0,0%	100%	fundamental	*100%*	*fundamental*	-	identical quality
SO3	0,0%	16,7%	0,0%	100%	fundamental	*100%*	*fundamental*	-	identical quality
SO4	11,1%	38,9%	16,7%	71%	considerable	*57%*	*considerable*	*33%*	*noticeable*
Corruption	3,7%	22,2%	5,6%	83%	fundamental	25%	*fundamental*	33%	noticeable
SO5	16,7%	16,7%	0,0%	0%	identical quality	*100%*	*fundamental*	100%	fundamental
Public policy	16,7%	16,7%	0,0%	0%	identical quality	*100%*	*fundamental*	100%	fundamental
SO8	33,3%	22,2%	22,2%	*33%*	*noticeable*	*0%*	identical quality	33%	noticeable
Compliance	33,3%	22,2%	22,2%	*33%*	*noticeable*	*0%*	identical quality	33%	noticeable
Society	**30,1%**	**26,4%**	**15,3%**	***12%***	***minor***	***42%***	***noticeable***	**49%**	**noticeable**
PR1	22,2%	33,3%	27,8%	33%	noticeable	*17%*	*minor*	*20%*	*minor*
Customer health & safety	22,2%	33,3%	27,8%	33%	noticeable	*17%*	*minor*	*20%*	*minor*
PR3	27,8%	38,9%	38,9%	29%	noticeable	*0%*	identical quality	*29%*	*noticeable*
Products and service labelling	27,8%	38,9%	38,9%	29%	noticeable	0%	identical quality	29%	noticeable
PR6	5,6%	11,1%	5,6%	50%	considerable	*50%*	*considerable*	0%	identical quality
Market communication	5,6%	11,1%	5,6%	50%	considerable	*50%*	*considerable*	0%	identical quality
PR9	27,8%	27,8%	16,7%	0%	identical quality	*40%*	*noticeable*	40%	noticeable
Compliance	27,8%	27,8%	16,7%	0%	identical quality	*40%*	*noticeable*	40%	noticeable
Product responsibility	**20,8%**	**27,8%**	**22,2%**	**25%**	**noticeable**	***20%***	***minor***	***6%***	***minor***
F1	55,6%	61,1%	44,4%	9%	minor	*27%*	*noticeable*	20%	minor
F2	44,4%	83,3%	11,1%	47%	noticeable	*87%*	*fundamental*	75%	fundamental
F3	44,4%	66,7%	44,4%	33%	noticeable	*33%*	*noticeable*	0%	identical quality
Forestry-related certification	**48,1%**	**70,4%**	**33,3%**	**32%**	**noticeable**	***53%***	***considerable***	**31%**	**noticeable**
F4	38,9%	55,6%	66,7%	30%	noticeable	17%	minor	*42%*	*noticeable*
Prevention of illegal logging	**38,9%**	**55,6%**	**66,7%**	**30%**	**noticeable**	**17%**	**minor**	**42%**	**noticeable**
F5	27,8%	38,9%	50,0%	29%	noticeable	22%	minor	*44%*	*noticeable*
F6	16,7%	22,2%	0,0%	25%	noticeable	*100%*	*fundamental*	100%	fundamental
Carbon sequestration/storage	**22,2%**	**30,6%**	**25,0%**	**27%**	**noticeable**	***18%***	***minor***	**11%**	**minor**

*cursive: NAM > EUR *cursive: EUR > ASIA *cursive: ASIA > NAM