



[www.ibr.hi.is](http://www.ibr.hi.is)

## MULTINATIONAL INSURANCE COMPANIES AND ENVIRONMENTAL SUSTAINABILITY SOLUTIONS

Lára Jóhannsdóttir  
Brynhildur Davíðsdóttir  
Snjólfur Ólafsson

**Ritstjórar:**  
Auður Hermannsdóttir  
Ester Gústavsdóttir  
Kári Kristinsson

Vorráðstefna Viðskiptafræðistofnunar Háskóla Íslands:  
Erindi flutt á ráðstefnu í mars 2014

Ritrynd grein

Reykjavík: Viðskiptafræðistofnun Háskóla Íslands

ISSN 1670-8288  
ISBN 978-9979-9933-4-6



HÁSKÓLI ÍSLANDS  
VIÐSKIPTAFRÆÐIDEILD

# MULTINATIONAL INSURANCE COMPANIES AND ENVIRONMENTAL SUSTAINABILITY SOLUTIONS

Lára Jóhannsdóttir, nýdoktor, Háskóli Íslands  
Brynhildur Davíðsdóttir, prófessor, Háskóli Íslands  
Snjólfur Ólafsson, prófessor, Háskóli Íslands

## ABSTRACT

Insurers have to deal with environmental sustainability issues in a strategic manner, as such issues have impact on their core business, including insurance policies, claims, and investments. The aim of this paper is to review the academic literature to identify if, and how, multinational insurers deal with environmental sustainability issues and on what levels; institutional, organizational, and individual levels. Secondary data in the form of self-reporting information from three multinational insurance companies is reviewed according to the European Corporate Sustainability Framework for Managing Complexity and Corporate Transformation to examine insurers' environmental sustainability priorities disclosed on their websites and in their reports. The framework components are based on so-called SqEME® Process Management, which is an open standard for developing process-centered architectures of enterprises expressed in four C's Constitution, Chemistry, Construct (or Conduct), and Correspondence (or Control). The purpose is to learn if and how insurers deal with environmental issues in their daily business. This is done by addressing three questions; 1) What does the literature say about environmental actions of insurers? 2) What do multinational insurers say about their environmental actions? and 3) What are the multinational insurance companies doing to address environmental sustainability issues? The study reveals limited literature on the topic, different companies approach of dealing with environmental sustainability issues, actions in all four categories of the above mentioned framework, and actions at different levels.

## INTRODUCTION

Authorities, individuals, environmental non-governmental organizations (ENGOS) and other stakeholders are concerned over the state of the environment, and these concerns have grown considerably in the past few decades. As a result there is an intensifying pressure on corporations in different sectors to assume responsibility for problems arising from the operation (Hoffman, 2000). Growing environmental pressure on various sectors concerns insurers because of their role of assuming risks and dealing with losses. Additionally, environmental risks can be transferred to insurers through investments. Environmental issues also create opportunities for the business sector. Business opportunities for the insurance sector relate to new products, supply chain improvements and investment-related opportunities (Jóhannsdóttir, Wallace, & Jones, 2012). However, Lloyd's of London<sup>1</sup> points out that so far the insurance industry has not taken catastrophic trends seriously

---

<sup>1</sup> The world's leading insurance broker.

enough (Lloyd's, 2006) with respect to actions. Only a small group of insurance companies in North America and Europe report on their environmental performance, although the number is rising (Mills, 2009b). The insurance sector is seen as a relatively low polluting sector, (Tapiola, 2008; The Geneva Association, 2009) which might explain their reactivity in reporting about their actions.

The paper addresses three questions; 1) *What does the literature say about environmental actions of insurers?* 2) *What do multinational insurers say about their environmental actions?* and 3) *What are the multinational insurance companies doing to address environmental sustainability issues?* The underlying hypothesis is that insurers have a role to play in dealing with environmental sustainability issues, and that they assume responsibility in this area – but the academic literature does not necessarily reflect the priorities evident in the insurance industry literature. The paper is structured as followed. The academic literature is reviewed in the next session, followed by a discussion about the papers methodology, then results, followed by discussion and conclusions.

## **ENVIRONMENTAL SUSTAINABILITY ACTIONS OF INSURERS**

The academic literature on environmental actions of insurers is almost non-existent, at least not when searching the topics 'insurance', 'sustainability', and 'actions' on the Web of Science, as the eight papers found were not of relevance to the study. When searching the topics 'insurance', 'environmental', and 'actions' 62 papers were found, 10 somewhat relevant to the research question. Insurance is discussed in relation to flood risk management (Clark, 1998; Dawson, et al., 2011), wildfire risk (Collins & Bolin, 2009), interventions at state and federal levels for the purpose of making catastrophic risk insurable (Moreteau, 2010), and demand for insurability of liability with regard to the European Union Environmental Liability Directive No. 2004/35/EC (Vavrova, 2009). Additionally, a historical overview of first-party coverage of property insurance relating to environmental damages and decisions ruled by United States courts in such claims cases can be found (Howard & Mackowsky, 2002). Furthermore, exploring insurance solutions as a part of effective environmental policy program is suggested (Lynch & Wells, 2001). While these papers suggest relevant environmental themes on institutional level they only cover environmental actions of insurers to a limited extent. More recent papers offer suggestion on the role of insurers in enhancing development and utilization of environmentally sound technologies, and the potential and demonstrated role of non-life insurers in fulfilling nations climate commitments (Johannsdottir, Davidsdottir, Goodsite, & Olafsson, 2013a, 2013b).

Expectation of insurers environmental and/or climate actions are put forth in conventions, protocols, action plans, and reports, for instance by the Intergovernmental Panel on Climate Change (IPCC), the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations International Strategy for Disaster Reduction (UNISDR), and the United Nations Environmental Programme (UNEP) where different types of insurance solutions are emphasized and suggested (Johannsdottir, et al., 2013b).

Johannsdottir, et al. (2013) revealed that a variety of industry-led publications exist for instance issued by The Geneva Association, the CEA (now Insurance Europe), ClimateWise, industry associations, reinsurance, and insurance companies. This type of publication places greater emphasis on climate change impact on insurers, stressing the importance of what the sector can do, instead of bringing forth real examples of actions. Furthermore, no thorough assessment of insurers' environmental or climate-related actions has been carried out by the insurance industry. However, in a report issued in 2009 the insurance sector was seen to be reactive with respect to climate change

actions (The Geneva Association, 2009). The only major reports on insurers' climate-related actions on organizational level were issued by the CERES coalition<sup>2</sup> (Mills, 2007, 2009a). These reports suggest positive trends in climate-related actions of insurers, including the number of actions taken and organizations reporting, and in the geographical distribution of actions carried out (Mills, 2009a, 2009b, 2012).

## METHODS

To answer the research questions we rely on secondary data in form of self-reporting information from multinational insurance companies, including data published on web sites, in annual reports, corporate social responsibility reports, sustainability reports, climate change reports, and other types of public documents issued by the companies. The information has in some cases been audited or verified by a third party. The insurance companies included were chosen because they operate internationally, and have been recognized for their environmental efforts. These companies are of theoretical interest because of their leading role in this area.

Allianz Group is recognized for its leading role in disclosing information on their carbon reduction performance according to the 2012 Carbon Disclosure Project (CDP) report. The company ranks among the top 10 performers globally, and is the leader among insurance companies. The company's score was 97 out of 100 in performance band A, and the company is listed in the Carbon Disclosure Leadership Index (CDLI). Annually, the highest scoring companies for disclosure and/or performance enter the CDLI and the Carbon Performance Leadership Index (CPLI) (PwC, 2012). The company's performance has improved significantly since 2010 where the company's score was 82 in performance band B and in 2011 with a score of 92 in performance band A- (Allianz, 2012; PwC & CDP, 2012). Band A (leading) are companies with carbon performance score greater than 80, Band B (fast following) are companies with a performance score of 51 to 80, band C (on the journey), are companies with a performance score of 21 to 50, and Band D (just starting) are companies with a performance scores of or below 20 (McGill, Gledhill, Preston, Logan, & Nieland, 2010). Allianz also ranks globally on the top among insurer on the Carbon Performance Leadership Index (CPLI) with a performance score of 97 in performance band A (PwC & CDP, 2012).

Other top performers in the financial category were UBS, Goldman Sachs Group, Swiss Re, Wells Fargo, and ACE. ACE is included because it is one of the world's insurance leaders in property and casualty insurances, and because of its leadership in carbon emission reduction recognized by the CDP (ACE Group, 2013c). Axa Group has according to the CDP report a score of 88, in performance band A (PwC & CDP, 2012). Other insurance companies with a higher performance score are excluded because their core focus is not insurance, or because they do not offer the same global exposure as Allianz and Axa (PwC & CDP, 2012). In 2012 both Allianz and Axa reported according to the Global Reporting Initiative (GRI) G3.1 guidelines, resulting in A+ performance score (Global Reporting Initiative, n.d.). Dow Jones Sustainability Index also ranks sustainability performance of companies on a global scale. Allianz was the industry group leader in 2013 according to the Index results (RobecoSAM, 2013). Allianz also satisfied the requirements of the FTSE4Good Index in 2013 (Allianz SE, 2013).

Companies' profiles are shown in table 1. ACA is much smaller in size than Allianz and AXA, both in terms of financial numbers and number of employees. There is no obvious reason found on the companies' websites for this difference except that Allianz and Axa offer asset management, savings

---

<sup>2</sup> Ceres is a coalition of investors, companies, and public interest groups advocating sustainable leadership.

and retirement solutions to clients' which might explain the companies' size difference. The core business is however similar as well as the global distribution of the businesses.

Table 1. Companies profiles.

	Allianz SE	ACE Group	AXA Group
<b>Location</b>	Germany	Switzerland	France
<b>Number of countries with operation</b>	70	54	57
<b>Product and services</b>	Property & casualty; Life/health; Asset management	Property and casualty; accident & health; life insurance & reinsurance	Property & liability; protection & health; savings & retirement
<b>Total Revenues</b>	106,383million Euros	\$21,593 million (15,737 million Euros)	90,126 million Euros
<b>Net Income</b>	5,591million Euros	\$2,706 million (1,971 million Euros)	4,152 million Euros
<b>Number of employees</b>	144,000	19,000	160,000
<b>Number of clients</b>	78 million	n/a	102 million
<b>Ownership style</b>	Stock exchange listed	Stock exchange listed	Stock exchange listed

### Analysis framework

Insurers actions are analyzed according to the four focus points introduced in the European Corporate Sustainability Framework for Managing Complexity and Corporate Transformation (SqEME Foundation, 2007; van Marrewijk, 2003; van Marrewijk & Hardjono, 2003), see fig. 1. The framework components are based on so-called SqEME® Process Management, which is an open standard for developing process-centered architectures of enterprises expressed in four C's (or four windows) Constitution, Chemistry, Construct (or Conduct), and Correspondence (or Control). The model components are collectively named consistency check. Constitution explains the drivers behind actions and the essential characteristics of the organization. Chemistry describes what makes the company tick, e.g. learning, motivation, interactions or communication. Construct relates to the work, e.g. functions, rules, and actions. Control highlights monitoring or the evaluation of performance, e.g. auditing and reporting. For further clarification the following questions are used to explain each component; *Where to go? How to get there? What to do? and Where are we?*

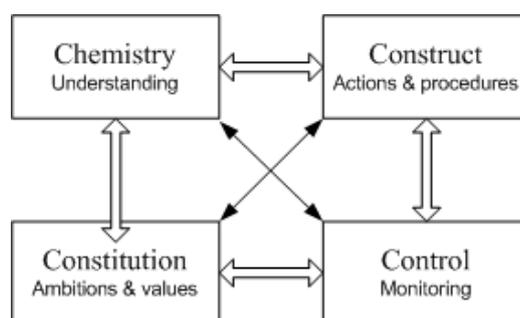


Fig. 1 The SqEME used as a consistency check (SqEME Foundation, 2007; van Marrewijk, 2003; van Marrewijk & Hardjono, 2003).

## RESULTS

This section focuses on environmental actions of multinational insurers. The first half concentrates on what the multinational insurance companies have to say about their actions, and the second half addresses their actions in accordance with the SqEME® Process Management framework.

### Companies approach to sustainability

Allianz main focus is on sustainability, and corporate responsibility (CR), based on the principles of sustainable development (SD). Sustainability is considered to be evolving continuously as a strategic business issue. As a result the company has adapted its government setup, organizational structure and the way the company handles sustainability issues (Allianz Group, 2014b). Based on the SD principles the company strives to safeguard natural resources, incorporate sustainable business practice into its products and services, underwriting, and investments, and to find new solutions to address local and global issues. The company proactively communicates with and engages various stakeholders on environmental, social and governance (ESG) issues in order to build long-term relationship and gain understanding of stakeholders needs. Furthermore, transparency about the company's ESG performance is emphasized through publications of various reports. The SD focus is believed to combine long-lasting economic value-creation with a forward-looking approach to run the business in an environmental and social responsible way (Allianz Group, 2014c). The company's responsibility can be expressed through the following quotation from Michael Diekmann, Allianz chairman of the board of management: "The climate won't wait for us to finish our homework" (Allianz Group, 2012), therefore actions are needed. National and international commitments, membership, and partnership including the Carbon Disclosure Project, Microinsurance Network, Munich Climate Insurance Initiative (MCII), Transparency International, UN Global Compact, United Nations Environmental Program Finance Initiative (UNEP FI), ClimateWise, and the International Red Cross suggest the company's ambition and engagement in contribute to sustainable development through actions and transparency (Allianz Group, 2014a).

Climate change is the first major environmental theme brought up in the ACE Group 2013 environmental report, as it affects the company, its clients, shareholders, employees, and the community. The company ties its philanthropy actions to sustainability emphasis. Furthermore, ACE claims that there is a growing demand for environmental solutions. The company has responded by establishing specialty practices in several offices internationally. ACE takes part in, and supports scientific-based research concerning climate change, including the Geneva Association, ClimateWise, the Business Roundtable, the Reinsurance Association of America's (RAA) Extreme Events Committee, the Insurance Institute for Business and Home Safety (ACE group, 2013b).

AXA Group uses the term corporate responsibility (CR) to explain how it contributes to economic, environmental, and social performance. AXA claims that it has a role to play in protecting the environment and supporting the communities in which it operates, thereby to help create stronger and more sustainable societies. In the long run this will create sustainable business preferred by the customers, employees, and other stakeholders. A part of the company's responsibility towards its shareholders it to monitor emerging risks that may impact future performance of the firm if not considered in the companies underwriting processes. This includes risks related to climate change and catastrophic exposure, genetically modified organisms (GMOs), and health and technological-related issues. Viewing the company's goals reveals that target deadlines have in some cases expired, e.g. energy efficiency targets that were already achieved in 2009 (AXA Group, 2013b).

## Four windows on environmental sustainability actions of insurers

In this section each component of the SqEME® Process Management framework is discussed, starting with the constitution that sets the direction in which the company is heading. Table 2 only shows example from Allianz and AXA, the strategic orientation of the ACE group were not expressed in similar manner on the company's website or in its reports, although ACE recognizes its responsibility to provide solutions to help clients manage their environmental risks, and the responsibility for reducing the company's own environmental impacts (ACE group, 2013a). The table reveals that institutional and organizational principles are used as guiding principles to operationalize sustainability strategies. Policies and future goals are also put forth.

Table 2: Constitution – or companies' environmental sustainability directions

Company	Constitution	Description	Type	Result
Allianz	Climate change strategy	Sense of direction	Strategy	Operationalize strategy
	Allianz Code of Conduct	Sense of direction	Principles	Operationalize strategy
	UN Global Compact	Sense of direction	Principles	Operationalize strategy
	OECD Guidelines for Multinational Corporations	Sense of direction	Principles	Operationalize strategy
	Reduce carbon footprint by 35%	Sense of direction	Targets	Goal for 2015
	Reduce energy usage by 10%	Sense of direction	Targets	Goal for 2015
AXA	CR at the core of the business	Sense of direction	Strategy	Operationalize strategy
	CR, environmental management and 4 Rs" strategies	Sense of direction	Strategy	Operationalize strategy
	Principles for responsible investments (PRI)	Sense of direction	Principles	Operationalize strategy
	Environmental buildings acquisition policy	Sense of direction	Policy	Operationalize strategy

Source (Allianz Group, 2006, 2012, 2014a, 2014b, 2014c; AXA Group, 2013a, 2013c)

Once companies have established their sustainability direction, it is important to understand in greater detail the relevant factors for establishing environmental norms supporting the implementation that needs to take place. A part of the understanding is to recognize cause and effect relationship between environmental issues, influential factors, and risks, opportunities affecting the companies. Furthermore, appropriate structure and processes needs to be in place in order to establish norms. Examples of chemistry factors evident in companies data are found in table 3 (SqEME Foundation, 2007).

Table 3: Chemistry – or companies' environmental sustainability norms

Company	Chemistry	Description	Type	Result
Allianz	Board level commitment	Commitment	Responsibility	Structure & processes
	ESGOffice	Integration of ESG	Specific sustainability topics	Structure & processes
	Allianz4Good initiatives	Integration of sustainability initiatives	Specific sustainability topics	Structure & processes
	Group ESG Board	Policies and ESG standards & investment activities	Specific sustainability topics	Structure & processes
ACE	Monitoring 3,000 environmental regulations	Cause & effect	Understanding	Future strategic orientation
	Climate-risk management process	Cause & effect	Influencing factors	Structure & processes
AXA	Mainstreaming Responsible Investment (RI) with RI Search	Cause & effect	Understanding	Structure & processes

Source: (ACE Group, 2013c; Allianz Group, 2006, 2012, 2014a, 2014b, 2014c; AXA Group, 2013a)

Most of the examples the companies provide to stakeholders are in the construct (or conduct) category, see table 4. This demonstrates the action-orientation of the companies or corporate behavior in response to major environmental challenges, including assignments, tasks, procedures and contracts – or the “full institutional framework of an organization” (van Marrewijk, 2003, p. 216). However, only parts of the companies initiatives are presented in the table because of length limitations. In some cases this reveals a measurable goals the companies are aiming for or have reached.

Table 4: Construct – or companies’ environmental sustainability actions and achievements

Company	Construct	Description	Type	Result
Allianz	Carbon neutral from 2012	Sustainability targets	Actions/interventions	35.6% CO2 reduction per person since 2006
	Microinsurance	Products and services	Actions/interventions	17 million clients in 11 countries in 3 continents
	Green products & services	Products and services	Actions/interventions	130 green products
	Wind and solar projects	Investments	Actions/interventions	€1.3 bn invested, energy to 400,000 European homes
	Smart Repair	Claims handling	Actions/interventions	CO2 cut in claims; resource efficiency
	RIICE partnership; payout in case of crop shortfalls	Pilot project	Actions/interventions	Clients solution in Asia
	Volunteering programs	Corporate behavior	Actions/interventions	Employee engagement
ACE	Environmental risk insurance solutions	Products and services	Actions/interventions	Clients solutions
	Various environmental and climate change products	Products and services	Actions/interventions	Clients solutions
	Renewable Energy Initiative	Products and services	Actions/interventions	Clients solutions
	Advisory services to clients in catastrophe prone areas	Loss prevention	Actions/interventions	Clients solutions
	Consulting clients on carbon footprint management	Climate change targets	Actions/interventions	Clients solutions
	Carbon reduction emphasis	Sustainability targets	Actions/interventions	27% CO2 reduction per person since 2006
	Energy and Environmental Design (LEED) certification	Sustainability targets	Actions/interventions	Achievements in several ACE offices
	Energy Star certification	Sustainability targets	Actions/interventions	Achievements in several ACE offices
	Recycling and sustainable paper purchasing programs	Sustainability targets	Actions/interventions	Implemented in more than 90% of offices
	Volunteering committees and efforts	Corporate behavior	Actions/interventions	Employee engagement
ACE’s charitable foundations	Philanthropy	Actions/interventions	Various stakeholders	

Table 4: Construct, continues

Company	Construct	Description	Type	Result
AXA	Various sustainability-linked products & services, e.g. XS Depoll" and "ECOSPHERE"	Products and services	Actions/interventions	Clients solutions
	Renewable energy systems risk pooling	Products and services	Actions/interventions	Clients solutions
	Environmental friendly claims management	Claims practices	Actions/interventions	Suppliers relations
	Solar power station on the roof of an 88,000 m2 AXA building	Climate change targets	Actions/interventions	244 tons of CO2 emissions reduction per year
	Light carbon footprint; vehicles, solar panels, waste reduction etc.	Climate change targets	Actions/interventions	Carbon reduction
	Energy consumption	Sustainability targets	Actions/interventions	Energy savings
	"Green" real estate investment management assessment tool	Environmental performance indicators	Actions/interventions	Carbon reduction
	Paperless "Eco Plan"	Corporate behavior	Actions/interventions	Resource efficiency
	Responsible Investments funds e.g. clean tech and ethical funds	Investments	Actions/interventions	Sustainable development
	Research fund; understand & prevent risks threatening human life, societies & environment	Research	Actions/interventions	5-year budget of Euro 100 million
	Corporate responsibility week	Corporate behavior	Actions/interventions	Employee engagement raising €200,000 for charities & NGOs across the globe in 2012

Source: (ACE Group, 2013c; Allianz Group, 2006, 2012, 2014a, 2014b, 2014c; AXA Group, 2013a)

The control category explains the learning process of organizations carried out through monitoring of performance, see table 5. This allows companies to change course if needed, and set new challenging goals. Viewing companies' actions in this category reveals self-assessment as a part of companies control systems, evaluation as a part of sustainability indices or assessment and recognition by third parties allowing for benchmarking of performance.

Table 5: Control – or companies' environmental sustainability evaluation

Company	Control	Description	Type	Result
Allianz	Group Risk Committee	Risk management & monitoring	Self-assessment	Control system
	Group Underwriting Committee	Monitoring	Self-assessment	Control system
	Group Finance Committee	Monitoring	Self-assessment	Control system
	Global Reporting Initiative	Monitoring	Assessment	Evaluation
	DJSI Indices	Indices	Benchmark	Evaluation
ACE	ACE's Corporate Environmental Program is CDP's annual survey	Measure, record, and reduce emissions	Self-assessment	Control system
	Named to the CPLI index	Carbon reduction	Self-assessment	Control system
	Recognition from the U.S. Environmental Protection Agency	Indices	Assessment	Benchmarking
	Recognition from the U.S. Green Building Council	Environmental leadership	Assessment	Benchmarking
	Newsweek's Green Rankings of U.S. and global companies	Environmental leadership	Assessment	Benchmarking
AXA	CO2 criteria in profit sharing agreement	Carbon reduction	Self-assessment	Control system
	Quantitative environmental targets	Energy and water consumption, CO2 emissions	Self-assessment	Control system

Source: (ACE Group, 2013c; Allianz Group, 2006, 2012, 2014a, 2014b, 2014c; AXA Group, 2013a)

## DISCUSSION AND CONCLUSIONS

Evaluating environmental sustainability actions of multinational insurance companies is complicated. The first research question we deal with is *What does the literature say about environmental actions of insurers?* Our study reveals that the academic literature on environmental actions of insurers so far is limited (Collins & Bolin, 2009; Dawson, et al., 2011; Moreteau, 2010), although others, including the IPCC and the UNFCCC, have discussed expectations of what insurers can do to mitigate or adapt to climate-related risks (Johannsdottir, et al., 2013b). Additionally, industry-led publications on this topic exist (The Geneva Association, 2009). Insurers' actions are mainly discussed on institutional levels, for instance environmental impacts on the industry as a whole. The only major reports on insurers' climate-related actions on organizational level were issued by the CERES coalition ((Mills, 2007, 2009a). These reports suggest positive trends in climate-related actions of insurers. The second research question we focus on is 2) *What do multinational insurers say about their environmental actions?* This reveals a different approach to environmental issues, whereas Allianz frames its actions around sustainability and corporate responsibility (Allianz Group, 2012), climate change is the focal point of ACE (ACE group, 2013b), and AXA uses corporate responsibility to explain how it contributes to sustainable development (AXA Group, 2013a). Furthermore, Allianz offers more accessible information about its strategic orientation than the other two companies, for instance by discussing what it strives for, how it is incorporated into business practices, long-term views, and relevant stakeholders. The third research question is *What are the multinational insurance companies doing to address environmental sustainability issues?* To explore if, and how, these companies deal with environmental issues we used the European Corporate Sustainability Framework for Managing Complexity and Corporate Transformation (SqEME Foundation, 2007; van Marrewijk, 2003; van Marrewijk & Hardjono, 2003). Using the four window framework - constitution, chemistry, construct, and control - reveals that actions in all categories exist, although most examples can be found in the construct category. The study brings to light that institutional or organizational principles are used to guide actions, and that actions are carried out on institutional, organizational, and individual levels. The companies however use different types of structure and processes to operationalize their actions and actions are also company specific although similarity exists, e.g. funding, philanthropy, and employee voluntary work. This paper is only a starting point of exploring environmental sustainability actions of multinational insurance companies. One can agree with Michael Diekmann from Allianz where he says "The climate won't wait for us to finish our homework" (Allianz Group, 2012), actions of insurers are needed as well as further research work in this area.

## REFERENCES

- ACE group (2013a). ACE and the Environment. Retrieved January 2, 2014, from <http://www.acegroup.com/About-ACE/ACE-the-Environment/ACE-the-Environment.html>.
- ACE group (2013b). *ACE group: Environmental report 2013*. Zurich: ACE group.
- ACE Group (2013c). ACE Recognized for Leadership in Carbon Emissions Reduction by CDP. Retrieved January 7, 2014, from <http://news.acegroup.com/press-release/corporateglobal/ace-recognized-leadership-carbon-emissions-reduction-cdp>.
- Allianz (2012). Carbon Disclosure Project 2012. Allianz is leading the insurance industry for carbon disclosure and performance. Retrieved December 3, 2013, from [https://www.allianz.com/en/press/news/commitment/environment/news\\_2012-09-12.html](https://www.allianz.com/en/press/news/commitment/environment/news_2012-09-12.html).

- Allianz Group (2006). Code of Conduct: Code of Conduct for Business Ethics and Compliance - Group Compliance. Retrieved January 9, 2014, from [https://www.allianz.com/v\\_1339670458000/media/responsibility/documents/allianz\\_code\\_of\\_conduct.pdf](https://www.allianz.com/v_1339670458000/media/responsibility/documents/allianz_code_of_conduct.pdf).
- Allianz Group (2012). *Sustainable Development: Progress Report 2012*. Munich: Allianz SE.
- Allianz Group (2014a). Stakeholder engagement. Retrieved January 8, 2014, from [https://www.allianz.com/en/sustainability/management/stakeholder\\_engagement.html](https://www.allianz.com/en/sustainability/management/stakeholder_engagement.html).
- Allianz Group (2014b). Sustainability management and governance. Retrieved January 8, 2014, from <https://www.allianz.com/en/sustainability/approach/management.html>.
- Allianz Group (2014c). Sustainability strategy. Retrieved January 8, 2014, from <https://www.allianz.com/en/sustainability/approach/strategy.html>.
- Allianz SE (2013). They did it again: Allianz reconfirmed in the FTSE4Good Index 2013. Retrieved December 3, 2013, from [https://www.allianz.com/en/press/news/commitment/community/news\\_2013-06-18.html](https://www.allianz.com/en/press/news/commitment/community/news_2013-06-18.html).
- AXA Group (2013a). Corporate Responsibility in action. Retrieved January 2, 2014, from <http://www.axa.com/en/responsibility/initiatives/>.
- AXA Group (2013b). Strategy and commitments. Retrieved January 2, 2014, from <http://www.axa.com/en/responsibility/strategy-commitments/>.
- AXA Group (2013c). Strategy and commitments: Commitments. Retrieved January 2, 2014, from <http://www.axa.com/en/responsibility/strategy-commitments/Commitments/>.
- Clark, M. J. (1998). Flood insurance as a management strategy for UK coastal resilience. *Geographical Journal*, 164, 333-343.
- Collins, T. W., & Bolin, B. (2009). Situating Hazard Vulnerability: People's Negotiations with Wildfire Environments in the US Southwest. *Environmental Management*, 44(3), 441-455.
- Dawson, R. J., Ball, T., Werritty, J., Werritty, A., Hall, J. W., & Roche, N. (2011). Assessing the effectiveness of non-structural flood management measures in the Thames Estuary under conditions of socio-economic and environmental change. *Global Environmental Change-Human and Policy Dimensions*, 21(2), 628-646.
- Global Reporting Initiative (n.d.). Sustainability Disclosure Database. Retrieved December 3, 2013, from <http://database.globalreporting.org/search>.
- Hoffman, A. J. (2000). *Competitive Environmental Strategy: A Guide to the Changing Business Landscape*. Washington, D.C: Island Press.
- Howard, W. H., & Mackowsky, M. A. (2002). Defending claims for environmental damage under first-party property insurance policies in the United States. *Geneva Papers on Risk and Insurance-Issues and Practice*, 27(2), 215-245.
- Johannsdottir, L., Davidsdottir, B., Goodsite, M. E., & Olafsson, S. (2013a). Insurers' role in enhancing development and utilization of environmentally sound technologies: A case study of Nordic insurers. *Journal of Cleaner Production*.
- Johannsdottir, L., Davidsdottir, B., Goodsite, M. E., & Olafsson, S. (2013b). What is the potential and demonstrated role of non-life insurers in fulfilling climate commitments? A case study of Nordic insurers. *Environmental Science & Policy*, Available online 26 November 2013.

- Jóhannsdóttir, L., Wallace, J., & Jones, A. (2012). The Primary Insurance Industry's Role in Managing Climate Change Risks and Opportunities. In J. A. F. Stoner & C. Wankel (Eds.), *Managing Climate Change Business Risks and Consequences: Leadership for Global Sustainability*. New York: Palgrave Macmillan.
- Lloyd's (2006). *Climate Change Adapt or Bust*. London: Lloyd's
- Lynch, T., & Wells, D. (2001). Insuring the future. *Environmental Values*, 10(4), 507-521.
- McGill, A., Gledhill, R., Preston, M., Logan, L., & Nieland, K. (2010). *Carbon Disclosure Project 2010*. London: Carbon Disclosure Project.
- Mills, E. (2007). *From Risk to Opportunity: 2007 Insurer Responses to Climate Change*. Boston: Ceres.
- Mills, E. (2009a). *From Risk to Opportunity: 2008 - Insurer Responses to Climate Change*. Boston: Ceres.
- Mills, E. (2009b). A Global Review of Insurance Industry Responses to Climate Change. *Geneva Papers on Risk & Insurance*, 34(3), 323–359.
- Mills, E. (2012). The Greening of Insurance. *Science*, 338(6113), 1424-1425.
- Moreteau, O. (2010). Catastrophic Harm in United States Law: Liability and Insurance. *American Journal of Comparative Law*, 58, 69-95.
- PwC (2012). *CDP S&P 500 Climate Change Report 2012: On behalf of 655 investors with assets of US\$ 78 trillion*. New York: Carbon Disclosure Project.
- PwC, & CDP (2012). *Business resilience in an uncertain, resource-constrained world: CDP Global 500 Climate Change Report 2012*. London: Carbon Disclosure Project.
- RobecoSAM (2013). Dow Jones Sustainability Indices in collaboration with RobecoSAM. Retrieved December 3, 2013, from <http://www.sustainability-indices.com/review/industry-group-leaders-2013.jsp>.
- SqEME Foundation (2007). *SqEME* (White paper ): SqEME Foundation.
- Tapiola (2008). *Corporate responsibility report 2008: Making Responsibility an Everyday Issue* (CSR report). Tapiola, Espoo Tapiola.
- The Geneva Association (2009). *The insurance industry and climate change - Contribution to the global debate*. Geneva: The Geneva Association.
- van Marrewijk, M. (2003). European corporate sustainability framework for managing complexity and corporate transformation *International Journal of Business Performance Management*, 5(2/3), 213-222.
- van Marrewijk, M., & Hardjono, T. W. (2003). European Corporate Sustainability Framework for Managing Complexity and Corporate Transformation. *Journal of Business Ethics*, 44, 121–132.
- Vavrova, E. (2009). The current demand for the insurability of liability for damage to the natural environment. *Agricultural Economics-Zemledska Ekonomika*, 55(1), 33-39.