What is the potential and demonstrated role of non-life insurers in fulfilling climate commitments? A case study of Nordic insurers

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A B S T R A C T

Collective actions of stakeholders are required for fulfilling the climate commitments of the Kyoto protocol. The insurance sector’s global influence and societal impact is fairly well documented. The sector influences societies based on its interaction with stakeholders, on its products, business and political stance. As such, it is a critical actor in facilitating key climate change actions of mitigation and adaptation, and has already been recognized as a leading sector in terms of climate adaptation. The aim of this paper is to explore the role of non-life insurers in fulfilling the climate commitments of the Kyoto Protocol. This paper is based on a case study on Nordic non-life insurance companies. The study documents that Nordic insurers are responding to climate-related threats and opportunities in a strategic manner by reducing their own impacts, through their core activities, and by influencing others to act. Although Nordic insurers do not classify their actions into mitigation and adaptation, but classify them according to their core activities, they demonstrate through actions their role as potential allies for nations in fulfilling the Kyoto protocol climate commitments. The study also reveals that the commercial reality of the industry is not the same as the expected contribution to climate commitments, for instance as specified in international conventions and treaties and in the Intergovernmental Panel on Climate Change (IPCC) and industry reports.

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1. Climate commitments and climate change impacts on insurers

The Kyoto Protocol, of the United Nations Framework Convention on Climate Change (UNFCCC), is the key international instrument for dealing with climate change. According to the initial commitment period from 2008 to 2012, industrialized countries were collectively to reach emission reduction targets of at least 5% below 1990 emission levels. The second commitment period, from 2013 to 2020, is based on the Doha Amendment to the Kyoto Protocol. Under the Protocol, countries are to “meet their targets primarily through national measures” (UNFCCC, n.d.-a).

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The key climate change strategies are mitigation aimed at the cause through emission reduction, and adaptation dealing with climate change consequences. A comparative study of national adaptation policies in the European Union (EU) countries shows that the main policy focus was on mitigation for almost two decades, but from 2005 onwards integration of adaptation into national policies has been accelerating (Swart et al., 2009). Goodsite et al., in a 2013 white paper, address climate change adaptation in the Nordic countries and observe that although the Nordic countries have been active in initiating adaptation policy, there are challenges in terms of implementing policy and ensuring that adaptation issues are considered in the wider policy realm.

The insurance sector is highly exposed to climate change because of more frequent and severe weather events causing more claims (CEA, 2009; Dlugolecki, 2009; Mills, 2009a; Munich Re Group, 2008; Vellinga et al., 2001). Climate change risks, particularly outside Europe, are seen so immense that catastrophic events may lead to insurance market failure (Dlugolecki, 2009), meaning insolvency of insurers unable to honor their agreements with clients. In terms of insurance and extreme events, the year 2011 was named annus horribilis by insurance leaders (Courbage and Stähel, 2012).

The Intergovernmental Panel on Climate Change (IPCC)\(^1\) states with “very high confidence” that climate change adaptation actions of industries is still limited, although the insurance sector is leading in terms of adaptation efforts of private entities (Adger et al., 2007). The reason may be that adaptation is critical for commercial success of the insurance sector (Herweijer et al., 2009). As of late 2012, 1148 insurance adaptation and mitigation schemes are known, from 378 insurance entities in 51 countries, mainly developed from the millennium onward (Mills, 2012).

According to IPCC (2012a,b) there is high agreement and robust evidence that insurance-related mechanisms are critical for helping households, businesses, and governments to deal with financial losses from catastrophes, although such solutions are unevenly distributed across regions and hazards, meaning that public-private partnership is often needed to deal with the situation. Hence, insurers are under pressure from international conventions and agreements to act; but articles in the Kyoto Protocol, the UN Framework Convention on Climate Change, and the Bali Action Plan call for insurance solutions, risk management and risk reduction strategies as a way to enhance climate adaptation (IPCC, 2012a,b; UNFCCC, 2007, n.d.-a, n.d.-b, n.d.-c).

Climate change is said to open up opportunities for insurers (Dlugolecki, 2009; LeBlanc and Linkin, 2010; Mills, 2009a; Munich Re Group, 2008; The Geneva Association, 2009). When adverse consequences of climate change become more evident, demand for insurance solutions are expected to grow (CEA, 2009). It is claimed that insurers therefore need to develop new products, modify existing products, build awareness and participate in public policy, disclose carbon risk, promote loss prevention, and align terms and conditions with risk-reducing behavior (Mills, 2009a).

Although the Nordic region is less prone to severe climate change impacts than other parts of the world (Wilbanks et al., 2007), climatic events are well known to Nordic insurers. Among the most recent events is a cloud burst in Copenhagen in 2011, where loss estimation of 91,000 individual losses was DKK 4.9 billion (If P&C Insurance Company, 2012). According to reinsurers, this was the most expensive natural catastrophic event in Europe in 2011 (Richards, 2012). The greatest part of the claims cost was damages to industrial and private buildings, industrial and private chattel, and operating losses (Garne, 2012). In 2011, the Faroe Islands were hit by the storm Berit which, according to insurers’ annual reports, resulted in more than 4000 claims and costs of DKK 71.6 million. The numbers from Denmark correspond to claims notifications from 2 percent of the total population, and 8 percent in case of the Faroe Islands. Denmark has very recently pressured insurance companies to lower private homeowners’ insurance premiums if they implement home improvements for reducing their risk exposure to climate change (Miljøministeriet, 2013).

Climate change impacts, and how they are dealt with, are projected to have different impacts in the Nordic countries because of different economic structures and geographies. There is however commonalities between the countries such as the legal frameworks and collaboration have been taking place in this area for several years (Scherbenske and Dïg, 2011). In a Nordic Countries’ Ministerial Declaration on climate change adaptation from 2006, the need for a strategic Nordic approach to climate change adaptation was already asserted, calling for improved collaboration across national borders and sectors, particularly in the context of the Nordic Council of Ministers and other regional organizations such as the Baltic Council and the Arctic Council. A Nordic Prime Ministers’ Climate Change Declaration from 2009 pledged to create Nordic low-emission societies. Joint Nordic actions are expected to be accomplished through frontier research initiatives and green transportation. The declaration identified specific research focal points, including energy efficiency, wind power, and other renewable energy sources, and Carbon Capture and Sequestration (CCS) technology (Government Offices of Sweden, 2009), but in these areas insurers may become powerful allies in fulfilling Nordic climate commitments. The Nordic Sustainable Development Strategy 2009–2012 in addition included climate and renewable energy as one of its priorities reflecting the need to address climate change at a regional scale (Nordic Council of Ministers, n.d., 2009). Furthermore, over the past five years, research on climate impacts and adaptation has been considerable, laying the groundwork for more informed and effective policies. In their own right, Nordic countries are all positive leaders in many aspects of climate change mitigation and adaptation (Goodsite et al., 2013).

In their approach to climate change the Nordic countries are breaking down the traditional distinction between the policy domains of mitigation and adaptation to ensure that adaptation and mitigation actions complement each other (Goodsite et al., 2013). To describe the Nordic countries integrative climate change approach the term ‘adaptation’ has been emphasized (Langlais, 2009), as separate mitigation and adaptation focus may contradict reality of business

\(^1\) The Intergovernmental Panel on Climate Change, a leading scientific and intergovernmental mechanism for assessing climate change.
sectors in dealing with climate change (Klein and Juhola, 2013). This adaptation strategy needs to be integrated to broader development strategies and plans to truly make an impact, and adopted by industrial sectors affected by climate change, e.g. through sector-specific and cross-sector adaptation strategies (Goodsite et al., 2013).

The objective of this paper is to critically review and compare current literature on the role of insurers in fulfilling climate commitments with practical examples provided from a case study on the insurance industry in the Nordic countries. Based on the strong Nordic environmental profile within the European Union, Nordic insurance companies were considered an interesting subject for this study in the sense that they might reflect this expected Nordic forerunner role and thus set the bar for the industry around the world.

On this basis, the key question we deal with in this paper is; what is the potential and demonstrated role of non-life insurers in fulfilling climate commitments? The paper is based on the hypothesis that the insurance sector has a critical role to play, and that the sector assumes responsibility for dealing with climate change challenges. In Section 2, we discuss insurers’ role in general and from the viewpoint of potential impact on mitigation and adaptation, impacts on policies, and views and expectations of different stakeholders. In Section 3, we discuss the methodology used. Results are presented in Section 4 depicting the commercial reality, or climate-related actions of Nordic non-life insurers. The discussion is structured around insurers’ own climate change themes, but analyzed according to climate change policy domains, as well. In Section 5 we discuss our findings in the wider context of the literature, discussing how active and how effective climate-related actions of insurers are. We discuss the expectations assumed in the hypothesis, versus potential and demonstrated commercial reality.

2. The role of insurers in fulfilling climate commitments

Preventing losses and preserving lives is the ultimate purpose of insurance (Zettervall, 1991). It is therefore not just a financial instrument, per se; it has a vital social element as well (Skipper, 1987). Proper insurance coverage can get people and businesses back on track after claims events that could otherwise ruin their financial conditions. Insuring the most important things in people’s lives is the core of the insurance business. This includes family and health, homes, content of the homes, animals, transportation, leisure activities, as business activities by absorbing risks. It is the risk-sharing role that contributes to economic development as it provides essential conditions for various economic activities to take place (Liedtke, 2007).

A range of views is evident in the insurance climate change literature. In principle the different views can be divided into four different literature categories. In some cases the similar views are evident, but in others different emphasis are identified. At the end of this section we summarize these different views.

The first category is the science-policy literature such as from 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 United Nations Environmental Programme (UNEP), including expectations put forth in convention, protocol, action plans, and reports.


The third category includes industry-led publication such as from The Geneva Association, The Chartered Insurance Institute (CII), ClimateWise, the CEA (now Insurance Europe), industry associations, reinsurance and insurance companies, papers presented at insurance climate conferences, and reports from the United Nations Environmental Programme Finance Initiative. A part of this literature is a business-led publication, e.g. from greenbiz.com. The forth category includes reports from other stakeholders, for instance issued on behalf of the CERES coalition, including the Insurer Climate Risk Disclosure Survey 2012, Climate Risk Disclosure by Insurers: Evaluating Insurer Responses to the NAIC Climate Disclosure Survey, and from Risk to Opportunity reports – Insurer Responses to Climate Change issued in 2007 and 2008.

The literature claims that insurers need to take active role in the climate debate, lobbying for more effective climate policies (Dlugolecki, 2009; Mills, 2007). The climate debate is seen vital for insurers, because if governments fail to act, sizable markets become uninsurable in the future (Dlugolecki, 2009), putting the insurance sector at risk, and, in essence the entire economy (Mills, 2007). For the insurance sector, climate risk consists not only of extreme weather events but also of factors such as the location of new building areas, density of buildings, and outdated building regulations.

The IPCC TAR report included a separate chapter on insurance, and other financial services, based on its potential to serve as an indicator for the socio-economic impacts of climate change (Vellinga et al., 2001). The fourth Assessment Report (AR4), published in 2007, offers selected examples of adaptation actions by sectors including agriculture crop insurance and insurance related to infrastructure and settlement in coastal areas (Wilbanks et al., 2007). The fifth Assessment Report (AR5), due in 2014, will contain a discussion about key economic sectors and services, including supply chains, systemic risk, and insurance (IPCC, n.d.).

In 2009, leaders of the world’s largest insurance and reinsurance companies issued a Kyoto Statement of the Geneva Association focusing on the roles of customers, policy makers, the United Nations Climate Change Conference in

2 A global partnership between the United Nations Environment Programme and the financial sector.
3 Ceres is a coalition of investors, companies, and public interest groups advocating sustainable leadership.
4 IPCC Third Assessment Report.
5 International insurance think tank focusing on issues of strategic importance for insurers.
2009 (COP15), and the insurance industry in addressing climate change. They stated insurers’ willingness to play a key and collaborative role in the global effort to deal with climate risks, through co-financing low-carbon energy development projects, developing building codes, conveying in partnership with policy makers customers climate risk levels, risk management, and risk reduction, and by providing a complementary mechanism within the climate adaptation framework (Liedtke et al., 2009).

Furthermore, in the year 2009 The Geneva Association laid a common ground for climate action by the insurance sector by publishing the report, The insurance industry and climate change – Contribution to the global debate (The Geneva Association, 2009). In this report, The Geneva Association introduced a four-level framework for evaluating climate change actions of insurers. At level 0 insurance companies are inactive with respect to climate change actions, at level 1 they are reactive, at level 2 they are proactive, at level 3 they are developed, and at level 4 they have reached the stage of integrating climate change emphasis into their core business, and their efforts in this field “drive risk management, profitability and growth” (The Geneva Association, 2009, p. 2). When the report was published insurance leaders assumed that the global insurance sector was reactive (level 1) with respect to climate change actions. The Geneva Association emphasized that the proactive position (level 2) would be feasible within the year 2010, and the developed position (level 3) within a relatively short, but undefined, time frame. A quantitative study demonstrating the actual situation within the insurance sector has not been carried out so far.

Fulfilling climate commitments is not plain and simple. Barriers for climate-related actions have been observed, but these barriers may influence to what extent insurers engage in climate-related actions, and how effective these actions are. In 2002, United Nations Environment Programme Finance Initiative (UNEP FI) identified four types of barriers preventing insurance companies from addressing anthropogenic climate change in a timely manner. These are cognitive, political, analytical, and market operational barriers (Dlugolecki and Loster, 2003). More specifically, Dlugolecki and Loster describe the first barrier, the cognitive barrier, as an internal barrier where environmental issues are seen marginal to companies’ bottom-line performance. Dlugolecki and Loster claim that the second barrier, the political barrier, hinders actions of the private sector, as there has been, and still is, a considerable setback in creating political frameworks for assigning international carbon management and adaptation measures. Furthermore, this is seen as a governmental leadership issue and regulatory and policy issue, as there is uncertainty about regulators’ commitment to uniform establishment and implementation of long-term, binding emission-reduction targets. In developing countries, there is also a substantial restriction on foreign financial institutions according to Dlugolecki and Loster. The third barrier, the analytical barrier, is viewed as an insufficient analysis and information from key advisors offering services to the insurance sector resulting from low climate change awareness of the advisors. In addition, as stated by Dlugolecki and Loster, financial benefits of climate-friendly projects are poorly understood, and lack of data availability on corporate climate change strategy makes it difficult for insurers to analyze potential climate-related business risks. This includes understanding how climate change regulations will impact the financial sector. The fourth barrier, the market barrier, is that clean technology does not hold commercial gains (Dean and McMullen, 2007; Dlugolecki and Loster, 2003), and does therefore not yield an acceptable outcome for investors.

Additionally uncertainty has been identified as a barrier, meaning that a considerable time has been spent on getting climate change forecasts right. The argument for delaying action is that there is still “weakness and ambiguity of signals about climate change and the uncertainty about benefits flowing from adaptation measures” (Berkhout et al., 2006, p. 135). A quote from David Kodama, senior director of research and policy analysis for Property Casualty Insurers Association of America, exemplifies this barrier; “…climate change is a particularly complex issue and its causes, effects and the relevant variables that impact it are multifaceted and not well understood” (Gunther, 2012). Lack of direct pressure has also been discussed as a barrier to insurers’ actions. Pressure to adapt is to a greater extent indirect through suppliers and investment options; hence the notion is that there is less need to act on that pressure. Additionally, resources required for adaptation actions may also be controlled by actors outside insurance companies (Berkhout et al., 2006), for instance municipalities which may have to adjust local infrastructure to prevent property losses covered by insurers. Company size is yet another barrier influencing climate-related actions of insurers. In a recent study analyzing insurers’ climate risk and disclosure, it is evident that insurance companies “show significant weakness in their preparedness to address the effects climate change may have on their business”, and that while a small number of industry leaders are addressing climate change as a strategic issue to ensure competitiveness as climate change impacts unfold, this is to lesser degree evident in smaller insurance companies, and in U.S. owned companies (Leurig and Dlugolecki, 2013, p. 6).

Table 1 summarizes common climate change themes related to insurance (Adger et al., 2007; Arnold, 2008; Bosse et al., 2009; CEA, 2009; Dlugolecki, 2009; Mills, 2009a; Munich Re Group, 2008; The Geneva Association, 2009; Warner et al., 2009), structured around climate change policy domains. Insurer’s core activities relate to insurers’ main activities, i.e. protecting clients and their properties and repairing after claims events. As institutional investors, insurers can use their funds for investing in mitigation and adaptation solutions. Reducing impacts through their operations enhances insurer’s credibility when lobbying for governmental improvements, and influencing others to act. Additionally, insurers can transfer adaptation technologies (Lloyd’s, 2008; Ranger and Ward, 2010), e.g. by sharing their expertise with wide groups of stakeholders.

Although climate change policy places mitigation and adaptation into separate domains (Goodsite et al., 2013; Klein and Juhola, 2013), there is often synergy between them, which allows insurers to contribute through both strategies simultaneously (Sato and Seki, 2010). The following section is structured around mitigation, adaptation, climate change impacts on policies through insurers, and summary of different stakeholders views toward insurers’ climate related actions.
Table 1 – Role of insurers in dealing with climate change challenges.

<table>
<thead>
<tr>
<th>Mitigation</th>
<th>Adaptation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insurer’s core activities</td>
<td>Insurer’s core activities</td>
</tr>
<tr>
<td>Products</td>
<td>Risk pooling/transfer through insurances</td>
</tr>
<tr>
<td>Procurement for claims</td>
<td>Risk transfer through micro-insurances</td>
</tr>
<tr>
<td>Sustainable claims handling</td>
<td>Raise risk awareness</td>
</tr>
<tr>
<td>Transfer risk through insurance</td>
<td>Incentivize actions</td>
</tr>
<tr>
<td>Investments</td>
<td>Investments</td>
</tr>
<tr>
<td>Investment in clean technology</td>
<td>Investment and risk financing</td>
</tr>
<tr>
<td>Own operation</td>
<td>Transfer of technology</td>
</tr>
<tr>
<td>Energy efficiency</td>
<td>Risk expertise</td>
</tr>
<tr>
<td>Procurement for the office</td>
<td>Increase deployment of technology</td>
</tr>
<tr>
<td>Land use planning and building codes</td>
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Synthesized from Adger et al. (2007); Arnold (2008); Bosse et al. (2009); CEA (2009); Dlugolecki (2009); Lloyd’s (2008); Mills (2009a); Munich Re Group (2008); Ranger and Ward (2010); The Geneva Association (2009); Warner et al. (2009).

2.1. Mitigation

Insurers’ mitigating efforts discussed in the following subsections are subdivided into (1) insurance core business activities, (2) investments, and (3) own operations, and related subthemes, as presented in Table 1.

2.1.1. Insurers’ core activities influencing mitigation

Through development and promotion of products with climate-related benefits, and by using price incentives, it is proposed that insurers can guide customers towards improved energy efficiency (Dlugolecki, 2009). This can be done through mass insurance categories of transportation and properties where collective emission reduction impacts are high. Insurers can also raise public awareness, perform energy reviews of buildings, implement certification schemes or influence new building and technical standards, but these standards may include requirements to limit energy consumption (Pérez-Lombard et al., 2008). New sustainable mobility business models are being developed, including electrification of vehicles, alternative technologies and fuels, growth in mobility by demand models, etc. and these models raise new issues for insurers (Williams, 2011). These models and issues, and if and how they are implemented by insurers, however, have receive limited discussion in the insurance literature.

Because of their relative size compared to suppliers, insurers are in a position to influence manufacturers and suppliers towards developing low-carbon products (Dlugolecki, 2009), employ efficiency in material consumption, thus reducing the overall supply chain emissions by placing specific requirements in tenders, and by offering guidelines for claims partners, e.g. Folksam’s building environment guide, and ClimateWise sustainable claims footprint methodology (ClimateWise, 2011; Folksam, 2012). It is not known based on the literature if these guidelines lead to mainstream action within insurers’ supply chains or not.

Revision of claims processes can also have mitigating effects. Using second-hand spare parts in vehicle claims can significantly reduce greenhouse gas (GHG) emissions, offering financial benefits, as well (Meyricke and ClimateWise Sustainable Claims Steering Group, 2010). Financing reconstruction of buildings and enhancing energy efficiency when rebuilding or retrofitting is another mitigation effort insurers are able to employ. The literature does not discuss to what extent these methods are employed.

In partnership with the energy sector, it is suggested that insurers can support growth of clean energy production by developing risk transfer solutions. Capacity growth is expected in solar energy, wind power, hydrowaterpower, and bio-energy production. However, there are financing, political, and regulatory risks, particularly at the early stages of renewable energy development projects. Because of the risks, the energy sector expects to use a broad range of solutions to transfer these risks, including weather derivatives and insurance (Economist Intelligence Unit and Swiss Re, 2011). A profound reduction in global greenhouse gas emissions from energy is needed, but the literature does not illustrate to what extent the insurance sector contributes to global greenhouse gas emission reduction. For instance it is suggested that renewables have tremendous potential, both from an energy security and economic perspectives (RSA and WWF, n.d.), but what insurers are actually doing in offering solutions is to a limited degree covered in the literature. For instance, insurers may claim that they are ready and able to underwrite renewable energy risk in numerous countries, but do not spell out exact number of countries and the capacity of the total energy productions insured contributes to renewable energy production.

Manufacturers, together with government agencies and insurers, can develop liability solutions supporting development of climate-friendly technology entailing catastrophic risk potential for third parties, for instance related to carbon capture and storage (CCS) solutions (Dlugolecki, 2009; The Geneva Association, 2009). This requires a comprehensive knowledge of the risks, as knowledge is a precondition for any insurance solution (CEA, 2009). So far, only a number of small-scale demonstration projects exist in this field (Willis Limited, 2009).

2.1.2. Investments

Mitigation strategy requires investment in renewable energy solutions, and energy-efficient technology. Through investments, insurers can encourage the business sector to develop climate-friendly products, and low-carbon design by real estate developers. Screening potential investments from climate perspective, and active ownership where carbon reduction and disclosure is emphasized, may be used to influence mitigation (Garz et al., 2004; PriceWaterhouseCoopers, 2001). Investments, including catastrophe bonds and carbon funds, are yet other options (Dlugolecki, 2009). As institutional investors, insurers and pension funds invest globally between $25 and 55 trillion, depending on sources, in long-duration investments, mostly in fixed income instruments, to match long-term liability commitments.
(Faber, 2011; Mills, 2012). In comparison, it is estimated that around $23 billion were invested in mitigation technologies, securities, and financing (Mills, 2012) or only a small fragment of the total investment capacity. It is proposed by the World Economic Forum Insurance and the Asset Management Council that establishment of political frameworks must be established before insurers can invest at scale in low-carbon economic growth (Faber, 2011). This validates the political barrier recognized earlier in the paper, and the gap between investment capacity and actual investments in low-carbon solutions.

2.1.3. Own operations

Lead by example is seen important for insurers, since they signal risk awareness and credibility based on how they handle their own energy affairs and emissions (Garz et al., 2004). It is suggested that insurers can signify commitment, for instance by measuring their climate impacts, establishing reduction targets, disclosing carbon footprints, offsetting emissions, modify business travel arrangements (CEA, 2009), and by purchasing renewable energy. Even if leading insurance companies are carbon neutral (Mills, 2012) it is only a minor contribution insurers can make, compared to major contributions suggested in the literature related to core activities and investments.

2.2. Adaptation

Examples of insurers’ adaptation efforts discussed in the following sections are subdivided into (1) insurance core business activities, (2) investments, and (3) transfer of technology, and related subthemes, as presented in Table 1.

2.2.1. Insurers’ core activities influencing adaptation

Policyholders can off-load their risks by buying insurance coverage. Through pooling and transferring mechanisms, costs of individuals, businesses, and public bodies events out, protecting the economy from negative economic impacts of climate-related hazards (Spiegel, n.d.). Solutions used can be conventional insurance products, or financial instruments such as index-based solutions, weather derivatives, or catastrophe bonds (Dlugolecki, 2009).

Although there is a growing interest in offering financial solutions to the poor, and that micro-insurance solutions have been developed in recent years, these schemes still do not reach the vast majority of the poor (Arnold, 2008). These solutions are still at early stage, but the interest is growing, as suggested by hundreds of participants from around the globe taking part in an international micro-insurance conference held in 2013 (Munich Re Foundation, 2013). Moreover, the growth rate of non-life insurance premiums in industrialized countries is low, or around 1 percent, compared to 8.4 percent in emerging markets, which only accounts for 15 percent of the world’s insurance premiums (Swiss Re, 2011), suggesting future growth opportunities in finding solutions for the needs of emerging and developing markets.

Adaptation requires behavioral changes (Klein et al., 2007). It is therefore proposed that premiums should reflect the climate hazard policyholders are exposed to, in order to influence actions (Dlugolecki, 2009; Lloyd’s, 2008; Surminski, 2010; Warner et al., 2009). The benefit of risk-based pricing is that policyholders, both businesses and homeowners, may take preventive measures for the purpose of lowering premiums (Herweijer et al., 2009). So far the relationship between risk-based pricing and behavioral changes of clients appears to be hypothetical, supported by simulations to see if discounts on flood insurance policies influence mitigation measures (Botzen et al., 2009), rather than legitimated by real evidence from the insurance sector. It is also suggested that vast number of insurance stakeholders, including clients and business partners, industry, government and regulators, the general public, and academia can be influenced through products, pricing, insurance terms, business contracts, media campaigns, public-private partnerships, and research projects in order to advance adaptation (ClimateWise, The Geneva Association, Munich Climate Insurance Initiative (MCII), and United Nations Environment Programme Finance Initiative (UNEP FI), 2010). Insurers may incentivize loss reduction by informing stakeholders about the risk they face, by providing advice on how to prevent or minimize losses, and to provide information on insurance options available (ClimateWise, 2010). Raising awareness and promoting actions is seen as perhaps the most positive adaptation measure insurers can take (Lloyd’s, 2008; Surminski, 2010, Warner et al., 2009). It is suggested in the literature that insurers can influence the development of planning of building areas and building standards, such as was the case when insurers encouraged stricter building standards for the purpose of preventing building fires losses (Mills, 2007). In this respect, size and bargaining power gives insurers weight in negotiating governmental spending on adaptation measures such as flood defenses. Insurers can also finance risk reduction projects directly to avoid large compensation claims (Warner et al., 2009). Analyzing loss trends and learning from loss experience is seen crucial, as the experience offers the chance of developing guidelines and contingency plans to deal with catastrophic events and determine future design after losses (Dlugolecki, 2009). Sharing of information is also critical, as it will strengthen early warning mechanism for weather-related events (UNEP, 2002). Anecdotal evidence exists in the insurance history on how insurers have advocated for stricter building codes (Mills, 2009b), but does not appear to conform to mainstream methods used in climate risk-prone areas hitherto.

It is proposed that insurers need new models to better predict climate change, and reduce reliance on historical loss data to predict future scenarios. Insurers are considered willing to collaborate with providers of data, research institutes and other relevant stakeholders to develop different types of information services needed, including sector analysis, regional scenarios, project databases and databases on weather events, climate loss and catastrophe models and loss databases (von Flotow et al., 2011). Various types of partnership in modeling and data sharing can be found in the literature, suggesting development in this area, although the effect of this development is poorly known.

Studies have shown that insurers are already exploring fields of climate-related risk management and advisory services, which enable the public sector, businesses, and investors to adapt to climate change (Mills, 2009a, 2012). These
types of services include assessment of physical risks, prioritizing risk mitigation actions, providing guidance in risk transfer options and development of business contingency plans (Herweijer et al., 2009). The dissemination of these types of services is not known, for instance because of different reporting methods used by insurers, and lack of transparency, making it difficult to get an overview of the situation.

2.2.2. Investments

As one of the world’s largest institutional investors, it is claimed that insurers need to consider high-risk countries and regions to influence adaptation measures in these locations to reduce risks that otherwise can transfer into their investment portfolios (Herweijer et al., 2009). Furthermore, Herweijer et al. (2009) advocate that insurers need to identify climate-sensitive sectors and companies so they can be targeted strategically to reduce their climate exposure over the lifetime of the investments. It is claimed that insurers are not using this type of forward-looking method so far, meaning that these are suggestions, not supported by industry data about their deployment.

The insurance sector itself proclaims that in flood or storm-prone areas of developing countries, resilience can be enhanced through investing in defenses, for instance flood barriers and natural infrastructure, such as wetlands, mangroves, native forests, drainage system, early warning systems and building codes (The Geneva Association, 2009; UNEP Finance Initiative, 2007, 2010).

Investment options also include insurance-linked securities, including catastrophe risk (CAT) bonds, reinsurance sidecars and weather derivatives, which enable risks to be sold internationally in capital markets, providing funds for catastrophic loss events. CAT bonds, mainly issued by insurers, are regarded as the most promising solution of risk-linked securities (IPCC, 2012a,b). Development of this mechanism is, however, in its early stage when it comes to dissemination and accessibility.

2.2.3. Transfer of technology

Insurers can enable deployment of adaptation and mitigation technology (Ranger and Ward, 2010), although the literature mostly offers adaptation examples with the exception of investment in mitigation technology, e.g. renewable energy. Project Catalyst6 proposes that a variety of clean technology mechanisms should be used to drive down costs and increase deployment around the globe, including advisory services, finding relevant partners, and offer Intellectual Property Rights (IPR) infringement insurances, as these can be among key barriers to overcome, particularly in start-up projects (Project Catalyst, 2009).

Public-private partnerships are expected to boost individual and institutional capacity building. Development of risk and vulnerability assessment tools, for instance flood zoning, can help insurers signal risks to clients through pricing, design risk reduction activities, as well as to control their own climate risk exposure (ClimateWise, 2010). Insurers have expertise in loss prevention and recovery, meaning that governing of restoration projects expertise can be utilized, although climate-related risk is covered by public pools.

Insurers can additionally partner with the public sector to develop planning policies, guidelines for local planners and enhancement of building codes, taking into consideration development lifespan (CEA, 2009; Herweijer et al., 2009; Surminski, 2010). New building standards can have a positive impact on insurers through energy savings, and because more resilient buildings can reduce claims (Wilkins, 2010). Insurers can act as early warning systems when the number of claims increases in particular areas. Land-use planning with impacts from insurers can reduce flood risks, as poor land use policy and urbanization are key elements of rising flood risks (Lloyd’s, 2008). Analyzing building claims can be used to improve building standards so properties withstand climate-related risks, such as floods and storms, in a cost-effective way, while they would also take into account energy-efficiency (Wilkins, 2010). What can be done is, to a greater extent, more evident in the literature than what is actually done vis-à-vis transfer of technological know-how.

2.3. Climate change impacts on policies through insurers

Climate change impacts on insurers can force them to act, e.g. by lobbying for stringent climate change policies if government actions are not sufficient to reduce society’s vulnerability. Insurers may also put in place stringent insurance terms on buildings, or building materials in high risk areas as suggested in other categories, refuse to offer protection for such properties, or raise premiums (Clemo, 2008). Clemo (2008) suggests that this can cause developers to lose potential buyers of properties. This also forces governments to take political action, as it should not be the outcome of government policy to encourage building projects in hazardous areas (Pompe and Rinehart, 2008). Insurers that anticipate liability risk originating from climate change can respond by constructing liability terms where climate-change claims are excluded if caused by unjustifiable risky behavior of their clients (Mills, 2012). Because of the economic impacts on insurers, it is emphasized that climate change will alter insurance markets, meaning that public debate on insurance mechanisms and government policy needs to take place (Grace et al., 2005), if insurance solutions are to be available and affordable in the future (Mills et al., 2005).

Only one pan-Nordic study has been conducted on the topic discussed in this paper. This study was issued by the Nordic Innovation, on behalf of the Nordic Council of Ministers. The research was conducted by Gaia Consulting Ltd. in Finland, and results issued in a report called; The role of the insurance industry in environmental policy in the Nordic countries (Ahvenharju et al., 2011). The focal point was environmental policy in general, and what role insurers have to play in developing policy, e.g. flood risks policy. The key contribution was to define three types of interactions occurring between the Nordic insurance industry and various environmental policy actors, and the role of insurance in implementation of environmental policy. The study suggests that insurance can be a feasible solution for risk management in cases were (a) no policy requirement to reduce risks through specific obligations exists yet, (b) risks involve high costs and lead to the actor

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6 An initiative of the Climate Works Foundation, a global, non-profit philanthropic foundation.
being unable to meet these costs, (c) current instruments are deemed ineffective, and (d) the role of state compensation is seen as diminishing (Alvenharju et al., 2011).

Verification of how insurers live up to the challenge of influencing climate change policies are not easy to find, and a recent study has shown that relatively few insurers intervene in the policy-making process (Leurig and Dlugolecki, 2013). Furthermore, earlier evidence suggests that insurers have failed to influence crucial changes in climate politics as initial optimistic, e.g. commentators and environmentalists, envisioned (Paterson, 2001).

2.4 Summary of different stakeholders views towards insurers climate actions

In this section, we sum up the literature discussion by describing different stakeholders views towards insurers climate actions evident in the four categories of literature identified at the beginning of this section.

The science-policy literature focuses mostly on the expectations and role of the insurance industry in dealing with climate change, calling for different types of insurance solution, both in developed and developing countries (see for instance Adger et al., 2007; Alvenharju et al., 2011; Arnold, 2008; Goodsite et al., 2013; UNEP, 2002). Kyoto Protocol, the UN Framework Convention on Climate Change, and the Bali Action Plan for instance all call for insurance solutions, risk management and risk reduction strategies as a way to enhance climate adaptation (IPCC, 2012a,b; UNFCCC, 2007, n.d.-a, n.d.-b, n.d.-c, n.d.-d). Insurance mechanisms are seen critical for helping households, businesses, and governments to deal with financial losses caused by catastrophes (IPCC, 2012a,b), and the insurance sector is seen serving as an indicator for the socio-economic impacts of climate change (Vellinga et al., 2001). This literature category only provides a few examples of real actions taken (Wilbanks et al., 2007).

The academic literature is published in journals with specific insurance focus or in journals with a broader scope. The academic insurance literature concentrates on the importance of insurance in society (Skiper, 1987), the purpose of insurance (Zettervall, 1991), the role of insurers in the modern economy (Liedtke, 2007), threats, opportunities and commercial success related to climate change (Herweijer et al., 2009), mapping of climate-related actions of insurers (Mills, 2009b), barriers for climate change actions of insurers (Dlugolecki and Loster, 2003), and climate change impacts on SMEs (Clemo, 2008). The academic literature published in various journals with a broader scope, includes risk based pricing and clients’ willingness to adapt (Botzen et al., 2009), insurers’ role in climate adaptation (LeBlanc and Linkin, 2010), hurricane risk, policy risk and price increase (Grace et al., 2005; Pompe and Rinehart, 2008), proactive approach to climate change (Mills, 2007), and barriers to actions (Berkhout et al., 2006). Related to insurance core business are discussions about energy efficiency in buildings (Pérez-Lombard et al., 2008), and limited commercial gains of clean technology (Dean and McMullen, 2007), both areas where insurers can have positive impacts on development. Furthermore, insurers are seen as having failed to respond to expectations put forth in climate politics, thus not living up to the initial expectations of environmentalists and commentators (Paterson, 2001). This literature does only to a limited extent cover real actions in response to the expectations evident in the science-policy literature.

The industry-led publication covers various topics including insurers’ climate statements (Bosse et al., 2009; ClimateWise, 2010; Liedtke et al., 2009), and climate change impacts on insurers and insurers’ role in dealing with climate-related issues (e.g. CEA, 2009; Courbage and Stahel, 2012; Economist Intelligence Unit and Swiss Re, 2011; Garne, 2012; If P&G Insurance Company, 2012; Lloyd’s, 2008; Richards, 2012; Sato and Seki, 2010). Risk and opportunities related to climate change are also evident (Dlugolecki, 2009; Gazz et al., 2004; Munich Re Group, 2008; Ranger and Ward, 2010), as well as discussion regarding availability of insurance climate-related products (UNEP Finance Initiative, 2007). New solutions are discussed, for instance solutions related to micro-insurance (Munich Re Foundation, 2013), biodiversity and ecosystem services (UNEP Finance Initiative, 2010), carbon capture and storage solutions (Willis Limited, 2009), and various other adaptation and mitigation solutions and actions (Surminski, 2010; The Geneva Association, 2009). Barriers for climate change actions are identified (Gunther, 2012), as well as the need for multi-level approach to climate change (Wilkins, 2010), and information need of the finance sector with respect to climate change, e.g. catastrophe models and loss databases (von Flotow et al., 2011). This literature puts a greater emphasis on the impact of climate change on the insurance sector, bringing forth examples of what the insurance sector can do, instead of highlighting real examples of action. Comprehensive assessment of insurers’ climate-related actions was not found. Instead, the insurance sector was believed to be reactive with respect to climate change actions in an industry report published in the year 2009 (The Geneva Association, 2009). A study demonstrating the actual situation based on The Geneva Association framework, or tracking the development, has not been carried out within the insurance industry since this report was issued.

The view evident in the final category is mainly evident in Ceres and, with exceptions, NGOs reports. These include reports mapping out insurers’ climate change actions where the aim is to transform the general mindset from risk to opportunities (e.g. Mills, 2009a,b, 2012). Availability and affordability of insurance is also discussed (Mills et al., 2005), insurers’ weaknesses in regards to their preparation for addressing climate change (Leurig and Dlugolecki, 2013), and the challenges, risks, opportunities, and benefits of renewable energy (RSA and WWF, n.d.), and the utilization of various clean technologies (Project Catalyst, 2009). This literature demonstrates positive trends in the climate change actions of insurers, including the number of actions taken, the number of organizations reporting, and the geographical distribution of actions (e.g. Mills, 2009a,b, 2012). Ceres reports appear to be the most comprehensive work done in order to track the development of climate change actions taking place at the moment within the insurance sector.

3. Case selection and research methods

The Nordic countries have a strong climate profile within the European Union (EU) in the sense that they are “considered
forerunners in environmental protection and they all have strong views of and interests in EU Environmental Policy” (Magnúsdóttir, 2009, p. 2). According to Magnúsdóttir’s findings, Nordic countries are believed to be more influential than their small size indicates, able to act as environmental forerunners by using their positive image, which is based on their expertise and/or national examples. Nordic nations believe they have a role to play in European and global development in the environmental arena (Norden, n.d.), and one of their shared values is “respect for nature” (Lindholm et al., 2005). This Nordic environmental forerunners role was an influential factor when selecting Nordic insurance companies as a case for this study.

For theoretical purpose 2-4 of the biggest Nordic non-life insurance companies in terms of market share, nationally or regionally, were included in this case study, comprising 16 companies’ altogether. Tables 2 and 3 list the biggest insurance companies operating in the Nordic region. Insurance companies in the islands communities (Table 2), Åland, Faroe Islands, and Iceland, are small and medium sized (SMEs), meaning that they employ between 50 and 249 persons (Eurostat and Schmiemann, 2009). All of these companies permitted access to their executives and specialists for interviewing.

Companies operating on the mainland, Denmark, Finland, Norway and Sweden, are listed in Table 3. These companies are large, with 250 or more persons employed (Eurostat and Schmiemann, 2009), in this case between 400 and 7 thousand employees. Companies marked with the same gray-scale color belong to the same insurance group, meaning that these are 12 individual insurance entities. Of these 12 insurance companies/groups, 8 allowed primary data to be collected through interviews at their sites.

Companies’ sites were visited to interview insurance executives and specialists. Interviews took place from September 2009 through September 2010. Data was collected in the participants' natural setting. A series of interviews with 74 persons from different functional areas were conducted, see Table 4. Each company selected interviewees based on their expert knowledge in this field. In the islands companies, most of the interviewees came from administration and claims and loss prevention divisions. In the mainland companies, many of the interviewees came from Corporate social responsibility (CSR)/sustainability functions, in addition to the same division as in the case of islands companies.

A study including companies of different size, in different countries, and persons holding different positions within the companies requires flexibility (Easterby-Smith et al., 2002). Therefore, open in-depth interviews (Ritchie et al., 2003) were conducted. Instead of using semi-structured interview framework the subject matter, insurance business and environmental and climate issues, was explained to each interviewee which then had the freedom of discussing his/hers area of expertise and actions taken by the company within these boundaries.

3.1. The research methodology

Fig. 1 is a flow-chart showing the key steps of the research methodology. The first step was to define research boundaries and select companies to be approached. Companies were selected based on their size, but research boundaries

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<tr>
<th>Table 2 – Insurance companies operating in islands communities (SMEs).</th>
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<tr>
<td>Åland</td>
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<td>Ålands Ömsesidiga</td>
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<td>Alandia Corporations</td>
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<th>Table 3 – Insurance companies operating on the mainland (large companies).</th>
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<tr>
<td>Denmark</td>
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<td>Codan</td>
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<td>Alm Brand</td>
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<td>TrygVesta (now Tryg)</td>
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<td>TopDanmark</td>
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<th>Table 4 – Number of sites, interviews, interviewees and participant’s observations.</th>
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<tr>
<td>Companies location and size</td>
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<td>Employees &lt;250</td>
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<tr>
<td>Åland</td>
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<tr>
<td>Faroe Island</td>
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<tr>
<td>Iceland</td>
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<tr>
<td>Employees &lt;7000</td>
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<tr>
<td>Denmark</td>
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<tr>
<td>Finland</td>
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<tr>
<td>Norway</td>
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<td>Sweden</td>
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were based on an insurance climate change statement issued at the Nordic insurance climate conference in 2009. According to the statement, insurers’ core activities with respect to climate change include (1) products, (2) loss prevention and claims settlement, (3) investments, (4) own operation, and (5) follow up/benchmarking of actions. The second step in the process was to contact potential companies. Conference participants’ e-mail addresses were used to contact the companies to gain access. The third step was making field trips to the companies. The focus was also on multiple sources of data, including companies’ presentations, reports, and information on websites for triangulation purposes, and to get a broader view on insurers’ environmental activities. A field note framework was developed and filled out for each interview. It included the following topics: (1) access to the company and pre-interview communication, (2) entering the field, (3) field description, e.g. photos, (4) information about interviewee, (5) activity, (6) office equipment and layout (e.g. drawings or photos), (7) events, (8), timeframe, (9) word-by-word interview transcript, (10) leaving the site, (11) and reflections. Additionally, the latest information presented at the Nordic insurance climate conference (NICC) in September 2012 serves as an update for the interview data. The fourth step was analysis of the data, described below. The fifth and final step was a member check, meaning that in some cases interviewees or insurance experts were asked to review drafts of the findings for verification.

3.2. Analysis of data

The analytical process started parallel to data collection. During and after transcription of each interview, the text was read thoroughly line-by-line to see which themes emerged from the data. This was done as an open coding process. In a parallel process, a mind-map for each company was created to keep track of themes, cluster ideas, and provide details supporting the themes (Creswell, 2007). Multiple methods were used for data analysis, for example theme analysis, content analysis, cross-case analysis, and the constant comparative method (Kvale and Brinkmann, 2009; Yin, 2003).

4. Results: actions of Nordic non-life insurers

The results illustrate that Nordic non-life insurers do not discuss their climate-related actions under mitigation and adaptation policy domains (see Table 1). Instead, actions are structured around their core activities. Results are therefore presented in accordance with insurers’ climate change themes, which are (1) internal actions, (2) products and services, (3) loss prevention and claims settlement, (4) investments, (5) influencing stakeholders, and (6) follow-up/benchmarking, although the analysis also allows us to summarize the findings according to the policy domains at the end of the section. Actions are not homogeneous across the companies, as the companies deal with climate change differently, for instance depending on their size, location, core activities, and local risks. The examples provided by insurance leaders are used to emphasize how Nordic insurers take climate-related threats and opportunities seriously, not to make comparisons between companies’ actions.

4.1. Internal actions

Corporate governance, including vision, mission, goals, targets, policies, principles, and standards is of importance when implementing climate change strategies as it directs and controls companies’ actions, and provides the necessary structure, processes, and procedures for both internal and external actions.

- I went through our entire strategy to try to find where does our interest concerning climate fit in with our strategic efforts and interests (Norwegian interviewee).

Companies’ leaders’ commitment, employee awareness, and engagement is an important aspect when implementing climate policies. Climate weeks, eco-driving lessons, workshops, seminars, energy optimization training courses, online training, guidelines, turn-off lights campaigns, blogging on environmental issues, and collecting employees’ ideas are examples of actions taken in this area. Furthermore, interviewees claim that insurers cannot influence others to act, unless they lead by example themselves.

- We cannot go out to anyone and say, well this is a problem, without having done something ourselves (Danish interviewee).
Energy efficiency projects are used to reduce emissions. These include carbon footprint calculations, greenhouse gas audits, reduction targets, and allocation of emissions quotas, reduction targets tied to management bonuses, carbon offsets, use of video conference techniques to reduce business travel, electronic documents, combination printers and two-screen solutions, low-emission vehicles in the company’s fleet, car pooling, joint use of bikes, etc. Housing and energy consumption reduction projects include improved energy consumption of servers/data centers, energy saving solar and heat control glass, and solar cell systems on office roofs.

Leading Nordic insurance companies have signed the Geneva Association Kyoto statement discussed above in Section 2. Furthermore, they emphasize transparency and disclosure through the Global Reporting Initiative (GRI), Carbon Disclosure Projects (CDP), ClimateWise, or national initiatives. Utilization of EMS tools, such as ISO 14001, was also discussed by interviewees.

During the interviews, interviewees emphasized waste reduction and waste handling, both office waste and claims-related waste. However, waste-related emissions are not commonly measured, although efforts to measure CO₂ emissions from fire and water claims exist.

4.2. Products and services

Products with climate-related benefits fall under the mass categories of vehicles and properties, whereas mitigation benefits relate to vehicles, and adaptation and mitigation benefits in case of properties. Premium discounts are offered for vehicles using alternative energy sources, e.g. electricity. Other solutions include insurance based on driving intervals whereas higher mileage means higher premiums, ecolabeled insurance, environmental checking of vehicles, optimizing of motor combustion, ranking of environmentally friendly vehicles on insurers’ websites, and eco-driving lessons for corporate clients.

Mitigation solutions related to properties included free cover of geothermal/solar heating systems in property insurance and extra coverage to install energy efficient appliance after flood/fire.

Utilizing electronic services throughout the entire insurance process, including offers, electronic invoices to clients, claims handling, and electronic documents from suppliers, particularly claims suppliers also have mitigating effects.

Renewable energy insurance projects were discussed by some of the interviewees, particularly wind-energy projects, including insurance coverage of such risks. Collaboration in wind-energy projects was also discussed, see also Section 4.4.

Risk assessment and analysis is a precondition before issuing insurance policies. Among initiatives brought up by interviewees were screening of environmental/climate risks of industrial clients, higher premiums on properties in flood risk areas, tighter insurance terms and increased demand on policy holders, e.g. restriction of cover for content in basements, material used, or building methods, higher deductibles per policy, and cap on claims reimbursements. So far, Nordic insurers have not excluded flood risks or cancelled policies in high-risk areas, but the discussion is already taking place.

- We want to insure, that’s why we exist. So far we have not refused to insure (Swedish interviewee).

The interview data suggest that Nordic insurers can place more emphasis on the product side, both by mapping out climate features of existing products to make adjustments, and by developing new products. Collaborating with environmental non-governmental agency (ENGO) is an example of how new types of product development take place. Interview data and secondary data suggest that there is still limited focus on micro-insurance solutions in developing countries, although collaborative efforts of Nordic insurers in the field exist.

4.3. Loss prevention and claims settlement

Accumulated environmental impacts of claims are enormous. One of the biggest contributions of insurers is, therefore, to minimize losses, or influence how they develop, and handle claims that cannot be prevented in a climate-friendly way. The pricing of storm and flood risk in property insurances, terms and conditions, is a method used to influence adaptation actions of clients.

- The best way is to prevent the claims. The second best is to minimize losses when they happen (Finnish interviewee).
- Work on reducing vulnerability and damage reduction is the only feasible way to handle climate change, because the alternative is a price increase (Norwegian interviewee).

In their annual and stakeholders reports published in 2010, several of the insurance companies in Sweden, Finland, and Denmark discuss massive snow loads on roofs causing them to collapse with consequent damages to buildings and contents. This type of risk, affecting private and commercial customers, had not been so common in recent years. An insurance company in Åland took a proactive approach to the situation. The management team collectively created a list of properties at risk. The list was divided between executives, who phoned clients to find out what they had done to minimize the risk. Furthermore, the message was clear:

- We expect you to get rid of the snow as soon as possible. If you don’t, you might get a [reimbursement] reduction in case you have damage or you might not get any compensation at all (Interviewee from Åland).

Loss prevention units and round-the-clock claims services are used to minimize losses. Hiring extra help to deal with loss notifications due to storm damages have been exercised, sponsoring of weather forecasts, development of storm maps, and sending out storm/rainstorm alert text messages to clients. Emergency plans and crisis manuals for major claims have been developed for insurers, as well and for insurers’ clients, abnormal frequency of claims analyzed, loss prevention advice offered to clients through websites, advertisements, brochures, etc.

Claims repairs are mainly done by 3rd party claims suppliers. Interviewees claim that putting pressure on suppliers has a snowball effect, contributing to higher climate
standards of sub-suppliers. Climate criteria and standard provisions are used when selecting suppliers and signing suppliers’ contracts. Other insurers use dialogue or work with suppliers in green supply chain projects to influence their performance.

- Right now they [management] are doing a pilot on integrating responsible procurement principles, where they survey our biggest suppliers and business partners and make sure they talk about CR issues and implement climate issues as well (Female interviewee from Denmark).
- We can make a big difference. The suppliers are starting to see it as competitive advantages if they build up a climate concepts, we’ll choose them instead of their competitors (Male interviewee from Denmark).

Within the supply chain, recycling waste produces considerable environmental benefits, including emission reduction gains. Reusing car-parts, and plastic repairs, are used to reduce impacts of damaged cars. In one company, a full service claims model for electronics is used instead of cash payments. Offering environmental building guidelines, taking part in testing and development of building materials, and rebuilding of houses according to new standards were also mentioned by interviewees.

The biggest Nordic companies in the study collectively take part in a research project of developing a web-based visualization tool where the Nordic Center of Excellence for Nordic Strategic Adaptation Research, NORD-STAR, is the research partner. The tool will be used for advisement and promotion of cost-effective ways for adaptation (NORD-STAR, n.d.), thus reducing customers’ risk exposure and social vulnerability.

4.4. Investments

Several Nordic non-life insurers have signed the UN Principles for Responsible Investments (PRI) used to guide investment decisions, but this is a category where insurers can have great impacts. According to the Principles, environmental, social, and corporate governance (ESG) issues are incorporated into investment analysis and decision-making. Furthermore, companies take active ownership by influencing actions of the companies they invest in, as well as requesting the appropriate disclosure of ESG issues. Screening in and out investment opportunities were mentioned by interviewees, but not necessarily in the context of climate change. Interviewees mainly discussed investments from two sides; (1) the principles, reasons behind investments, and partnerships with investment screening agencies, and (2) investment in renewable energy projects, mainly windmill projects.

- It is interesting to do that because it gives us some kind of good company brand, if we are investing our money there, but they are very profitable also. . . . We are going to invest more and more in the windmills (Interviewee from Åland).

A climate-friendly investment portfolio, half of which is being invested in developing countries, was also an example mentioned by an insurance company, as well as a carbon neutrality project implemented through the Clean Development Mechanism (CDM) of the Kyoto Protocol by investing in an Indian biomass power station (IF P&C Insurance Company, 2010).

4.5. Influencing stakeholders

Through their interconnectivity, insurers can inform and influence actions of various stakeholders, thus supporting the implementation of public climate policies. Many of the interviewees mentioned how their companies raise climate awareness among employees and customers, both individuals and corporate clients. Actions include climate brochures, ranking of low-emission vehicles, eco-driving lessons, sponsoring and/or participating in the Earth hour, climate calculation tools, energy efficiency advice and advice to small and medium-sized companies on how to prevent rainstorm damage.

During the COP15 conference in Copenhagen in 2009, some of the insurers took an active role, e.g. by exhibiting climate risks and solutions in an Arctic tent meeting, by campaigning for 100 places to remember before they disappear, and by offering seminars on renewable energy together with the United Nations Environmental Programme and others. Sponsoring climate awareness and educational programs, taking part in seminars, discussing climate issues in media were also among actions mentioned by interviewees.

Having a voice in public policy discussions, particularly on climate change issues seems to be important to Nordic insurers, as influencing local, national and international authorities is a way to encourage actions and climate policies. This is a way for the insurance companies to raise awareness and influence adaptation efforts, for instance at the municipal level. It is also clear from various interviews that the vested interest of politicians, planners, municipal specialists, and insurers do not always go hand-in-hand, especially when residential or industrial areas are planned in high-risk areas or when the maintenance of infrastructure, e.g. drainage or sewer systems, are insufficient.

- The municipality has not adapted to the changes, so this is twofold issue. It is not just climate change but also how we plan, build and adapt (Swedish interviewee).
- The community thinks its quick gaining, and the problem is that we have this issue here, water in cellars, sewers breaking down with storm floods . . . I can imagine that in some years, if the problem is not faced from a community point of view where will be areas where we can not insure houses (Danish interviewee).

After COP15 the Pan-Nordic companies continued their collaboration by setting up a joint working group. Joint recommendation on climate adaptation and how to reduce climate impacts has been issued. Insurers point out that everyone needs to take action, especially the business sector.

Climate-related decisions must be integrated into daily decisions of the Pan-Nordic companies, and participation in governmental climate initiatives is also emphasized. Influencing adaptation measures was therefore one of the points discussed by interviewees, both by putting a pressure on
authorities and collaborating with them to find adaptation solutions:

- We have to stick our head and say ok this is what we have to offer, let’s work together and let’s learn from each other (Norwegian interviewee).

The message is:

- Insurance companies will not solely carry the risk, authorities, and clients must also carry the risk (Danish interviewee).

Adaptation initiatives include workshops and seminars with local authorities with the purpose of sharing knowledge and state-of-the-art solutions, dialogue with authorities regarding risk of flooding and maintenance of infrastructure, e.g. sewer systems, water pipes and drainage systems, influencing building regulations, and demanding reimbursement after repeated flooding. Nordic insurers also take part in funding research projects and sharing of data, for instance when mapping climate impacts on homes, businesses, and municipalities.

4.6 Follow-up/benchmarking

In a special 2009 Nordic Insurers Climate Conference (NICC) statement, Nordic insurers recognized the importance of following up on action, but this is an enabling condition for climate-related actions.

- First we did a lot of research on what is best practice . . . We looked at our competitors; we looked at the international, global agenda (Danish interviewee).

The Nordic climate conference in 2012 was a way to comply with the statement. Systematic follow-up enables companies to assess where they stand in comparison with their peers. Interviewees also stress the importance of benchmarking best practice performance. Benchmarking is seen as a way to get new ideas and to move things forward, particularly for smaller insurers with limited resources. Transparent reporting is a means for benchmarking.

4.7 Nordic insurers’ climate actions and policy domains

One way to view the climate actions of Nordic insurers with respect to climate change policy domains, and impacts in fulfilling climate commitments, is to use a 2 × 2 matrix (see Table 5) showing mitigation and adaptation policies, and insurers’ internal and external actions. What this demonstrates is that insurers’ internal actions have a low impact on the fulfillment of climate commitments, both mitigation and adaptation, while external actions would result in higher impacts with respect to the pledge of the climate change policies. However, this type of analysis does not uncover the intersection between internal and external actions, as well as the junction between mitigation and adaptation policies.

Table 6 provides examples of actions discussed by interviewees throughout Section 4, classified according to insurers’ core activities, and climate change policy domains. The examples put forth in Table 6 provide a good overview of the climate-related activities of insurers, without going into finer details. These examples have not been deemed the most important by the industry, as the industry has so far not evaluated the impacts of insurers’ climate actions (The Geneva Association, 2009). The examples used in the table were brought up by insurance executives and specialists, and in secondary data. These examples have been verified in the sense that they were brought up for discussion in more than one company, addressed by two or more interviewees from the same company and/or supported by secondary data, e.g. insurers reports. As an example issue of corporate governance, categorized in the table under the headings of joint mitigation/adaptation benefits and internal actions, was discussed in all the companies although the companies are in different stages regarding their climate change awareness and emphasis. Furthermore, the companies included in the study, use different ways to address climate-related issues. For instance in the area of employee awareness and engagement it depends on companies size, location, and culture what initiatives companies engage in, e.g. climate weeks, eco-driving lessons, workshops, seminars, online training, turn-off light campaigns, blogging, etc. Therefore such initiatives are all classified as employee awareness and engagement in the table instead of trying to cover them all. The same applies to different energy efficiency projects: they differ between companies, but they all aim for the goal of reducing energy consumption.

The classification in Table 6 demonstrates that joint mitigation and adaptation priorities exist, particularly in relation to internal actions, such as leadership commitment, corporate governance, transparency and disclosure, and principles used. It also stresses the importance of internal actions including vision, missions, targets, goals, and policies that will have an impact in categories of core actions, including products and services, loss prevention and claims settlement, investments, and influencing of stakeholders.

Joint efforts presented in the table relate for instance to product areas, such as properties where mitigation and adaptation benefits co-exist. The same applies to loss prevention and claims settlement, particularly when screening and selecting claims partners, and putting forth provisions in their contracts. Screening of suppliers is not just relevant for claims partners, but for suppliers in general, and is therefore also a part of joint mitigation and adaptation actions related to internal actions. Some actions, such as round-the-clock claims services, are not essentially climate-specific in the sense that these types of actions have been a part of insurers’ core activities for a long time, but Nordic insurers are now more proactive in tying these actions to climate adaptation, with mitigating benefits as well meaning emissions reduction from minimizing claims-related waste. Investment methods,
Table 6 – Examples of climate-related emphasis of Nordic non-life insurers.

<table>
<thead>
<tr>
<th>Internal actions</th>
<th>Products and services</th>
<th>Loss prevention and claims</th>
<th>Investments</th>
<th>Influencing stakeholders</th>
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<tbody>
<tr>
<td><strong>Mitigation</strong></td>
<td>• Various energy efficiency projects&lt;br&gt;• Carbon footprint calculation&lt;br&gt;• Purchase of renewable energy&lt;br&gt;• Carbon neutrality through CDM mechanism&lt;br&gt;• Waste reduction&lt;br&gt;• Solar cells systems&lt;br&gt;• Carbon emission quotas</td>
<td>• Mitigation products related to vehicle categories, e.g. premium discounts and ranking of low emission vehicles&lt;br&gt;• Mitigation benefits of insuring renewable energy production projects, e.g. windmills&lt;br&gt;• Electronic insurance processes for mitigation purpose&lt;br&gt;• Premium discounts or extra coverage for mitigating purpose&lt;br&gt;• Eco-driving lessons</td>
<td>• Investment in renewable energy production projects, e.g. windmills&lt;br&gt;• Climate friendly investment portfolio in developing countries&lt;br&gt;• Investment in a biomass power station in India</td>
<td>• Allocation of CO₂ emission credits on divisional level&lt;br&gt;• Management bonuses tied to carbon reduction targets</td>
</tr>
<tr>
<td><strong>Adaptation</strong></td>
<td>• Risk assessment and analysis tools&lt;br&gt;• Premium raise for adaptation purpose&lt;br&gt;• Tighter terms and conditions, cap on reimbursement, and higher deductables influencing adaptation actions</td>
<td>• Loss prevention advise; various types&lt;br&gt;• Proactive action taken in case of shortfall damages&lt;br&gt;• Sponsoring weather forecasts&lt;br&gt;• Storm maps and storm/rainstorm text alerts&lt;br&gt;• Emergency plans and crisis manuals&lt;br&gt;• Climate risk screening tool for industrial clients&lt;br&gt;• Visual adaptation tool</td>
<td>• Visual adaptation tool</td>
<td>• Insurance collaboration and joint recommendation on climate adaptation&lt;br&gt;• Visual adaptation tool&lt;br&gt;• Pressure on authorities to take adaptation measures&lt;br&gt;• Collaboration with authorities to find adaptation solutions&lt;br&gt;• Funding of research projects</td>
</tr>
<tr>
<td><strong>Joint mitigation and adaptation</strong></td>
<td>• Corporate governance&lt;br&gt;• Vision, mission, goals, targets, policies, principles, standards and EMS tools&lt;br&gt;• Leaders commitment&lt;br&gt;• Employee awareness and engagement initiatives&lt;br&gt;• Climate criteria’s for selecting suppliers&lt;br&gt;• Standard provision in contracts&lt;br&gt;• Transparency and disclosure; GRI, CDP, ClimateWise, national initiatives</td>
<td>• Mitigation and adaptation benefits related to properties&lt;br&gt;• Eco-labeled insurances&lt;br&gt;• Collaboration with ENGO in product development</td>
<td>• Screen in method&lt;br&gt;• Screen out method&lt;br&gt;• Active ownership&lt;br&gt;• PRI principles&lt;br&gt;• Partnership with investment screening agencies</td>
<td>• COP15 initiatives&lt;br&gt;• Lead by example&lt;br&gt;• Transparency and disclosure&lt;br&gt;• Public-private debate and collaboration for mitigation and adaptation purpose&lt;br&gt;• Raise awareness of broad group of stakeholders using various methods&lt;br&gt;• NICC conferences in 2009 and 2012&lt;br&gt;• Workshops and seminars&lt;br&gt;• Media coverage</td>
</tr>
</tbody>
</table>

Follow up/benchmark on a regular basis
such as screening methods, active ownership and the PIR principle, apply both to mitigation and adaptation.

Developing solutions, such as the visual adaptation tool, relates to three categories, including loss prevention, investments, and influencing of stakeholders. In some cases, long-term commitments and targets are manifested, for instance in case of mitigation actions, while in other cases, the examples provided show that insurers are responding to a threatening situation, e.g. the snow-load case, with proactive measures.

4.8. Barriers for actions recognized within the Nordic insurance sector

Several barriers to climate-related actions were observed in this study. Company size is one of the factors. The smaller companies included in the study (see Table 2) are inactive in terms of climate-related actions. In most cases, interviewees from the smaller companies claim that size-related barriers, such as lack of resources, do not hinder actions, they would scale them down to manageable levels. This view does however not result in climate-related actions. Furthermore, the smaller insurance companies included in the study also appear to be isolated from the Nordic insurers’ climate change debate, for instance by not taking part in joint Nordic insurance climate change conferences, where their peer discuss climate related impacts and actions. Analysis of findings also suggest that internal barriers hinder actions, including lack of climate awareness and climate skepticism, negative attitudes towards environmental actions, lack of leadership commitment, and short business horizon. In addition, interviewees from mutual insurance companies suggested that ownership may play a part in the climate commitment of insurers. They suggest that publicly traded companies act under pressure from investors to deliver positive financial outcomes quarterly, and are therefore not able to focus on long-term issues such as climate change. Lack of pressure, including internal pressure and external pressure from various stakeholders, including regulators, customers, and society, was also mentioned by interviewees from the smaller companies.

5. Concluding discussion

In this paper, we have explored the question of the potential and demonstrated role of non-life insurers in fulfilling climate commitments, both through the literature and a case study of Nordic non-life insurers. We have recognized that climate change is an important strategic issue for insurers that have much at stake because of risks and opportunities resulting from climate change (see for instance CEA, 2009; Munich Re Group, 2008; The Geneva Association, 2009; Vellinga et al., 2001). For these reasons, and because of the size and interconnectivity of insurers in societies, it is proposed in the literature that insurers are powerful agents in facilitating mitigation and adaptation actions (e.g. Dlugolecki, 2009; Mills, 2007; The Geneva Association, 2009), thus fulfilling the climate commitments of the Kyoto Protocol. The literature offers a wide range of examples of the expectation of what the insurance sector can do in terms of climate mitigation and adaptation (e.g. Dlugolecki, 2009; Herweijer et al., 2009; Lloyd’s, 2008; Pérez-Lombard et al., 2008; Ranger and Ward, 2010), but evidence illustrating actions or influence of the actions taken are to a lesser degree apparent in the literature (e.g. Leurig and Dlugolecki). The literature can be classified in four categories including the science-policy literature, academic literature, industry-led publication, and Ceres and NGO publication, each with a different expectation and view on insurers’ role in dealing with climate change and actions carried out by the insurance sector.

The Ceres reports, From risk to Opportunity, issued in 2007 and 2009, and Evan Mills’s paper (2012) on the greening of the insurance sector suggest positive developments in insurers’ climate commitments (e.g. Mills, 2007, 2009a,b, 2012). However, the real impacts of these actions still remain unclear. It is, therefore, hard to judge if the insurance sector in general is truly engaged in dealing with climate-related issues, or if the intention is rather to improve insurers’ image. Empirical studies on these issues are therefore of vital importance.

The literature suggests a wide range of actions, which might be taken by the insurance industry. It includes climate-related insurance coverage, revision of claims processes, investments in renewable energy solutions, raising awareness among different groups of stakeholders, and guiding customers towards energy efficiency. Furthermore, insurers are expected to promote and incentivize loss reduction actions, identify climate-sensitive sectors, take part in public-private partnership and partner in climate modeling, lobby for climate-related actions, and so forth (see for instance Clemo, 2008; Dlugolecki, 2009; Garz et al., 2004; Herweijer et al., 2009; Meyricke and ClimateWise Sustainable Claims Steering Group, 2010; Mills, 2007, 2009a,b, 2012; The Geneva Association, 2009). The literature findings suggest that the insurance sector in general is underperforming compared to its potential in fulfilling climate commitments, due to their reactive approach in dealing with climate change (The Geneva Association, 2009). It should be of concern for the insurance sector, as it may lead to increased climate risk within the sector because of insolvency of insurers unable to honor their agreements, that smaller companies are inactive with respect to climate-related actions (Leurig and Dlugolecki, 2013). This may lead to market failure (Dlugolecki, 2009), reflecting negatively upon the industry as a whole, and changing their regulatory framework.

The results presented in Section 4 exhibit that leading Nordic insurance companies are responding proactively to climate-related threats and opportunities in a strategic manner through actions, for instance by reducing their own impacts, though their core activities and collaboration, by raising awareness in order to influence others to act, and through lobbying as the literature suggests insurers can do (e.g. Dlugolecki, 2009; Herweijer et al., 2009; Lloyd’s, 2008; Mills, 2007, 2009a,b, 2012; Pérez-Lombard et al., 2008; Ranger and Ward, 2010). Nordic insurance industry leaders have been quite outspoken in their statements about the role of the industry, and role of others to act on climate-related issues. Yet some of the actions proposed in the literature were not discussed by interviewees. These include index based solutions, micro-insurances, weather derivatives, catastrophe bonds, carbon capture and storage (CCS) solutions
(Arnold, 2008; Dlugolecki, 2009; The Geneva Association, 2009), and transfer of technology, e.g. through Intellectual Property Rights (IPR) infringement insurances (Project Catalyst, 2009): this means that there are underdeveloped business opportunities related to climate change as for instance suggested by Leurig and Dlugolecki (2013), or that these types of initiatives do not apply to the Nordic insurance business environment. The study does not offer an answer as to why this is the case.

The reasons behind Nordic insurers’ actions are both to minimize their business risk and to maximize gains by utilizing new opportunities, but the pressure on insurers to align their premiums with clients’ adaptation efforts are also heating up (Miljøministeriet, 2013). We demonstrate that insurers are reducing their own emissions, as well as influencing lower emissions of clients, suppliers, and other stakeholders through behavioral changes. Taking precautionary measures on various levels to prevent losses from happening appears to be the best adaptation option according to interviewees. Otherwise, individuals and the business sector will bear the cost directly or indirectly, through higher premiums, tighter terms, own risk, or taxes and fees used to fund governmental pools, interviewees proclaim.

Viewing the Nordic insurers’ role in accordance with climate change policy domains from Table 1 suggests that the mitigation factors of insurers’ core activities, investments, and own operations are all evident to some extent in the actions of Nordic insurers, see Table 6. In terms of climate adaptation, the core activities also came forth with the exception of micro-insurance. Examples also exist with regards to transfer of technology, but less focus appears to be on the climate adaptation investment side.

Our conclusion is that leading Nordic insurers have demonstrated their will and role in assuming responsibility for dealing with climate change issues. Through climate-related actions they have taken proactive measures, thus being a part of collaborative efforts of climate commitments in the Nordic area, and internationally. Although the study of Leurig and Dlugolecki (2013) has uncovered a weakness in the preparedness of U.S.-owned insurance companies, compared to foreign-owned insurance companies, in addressing climate change effects, it is still not possible to demonstrate measurable and comparable performance of individual Nordic insurance companies, partly because actions are not homogeneous across companies (Mills, 2009a), companies have different priorities, and use different disclosure methods. Therefore, it is challenging to evaluate the effectiveness factually. Based on our results, however, one can argue, that the Nordic industry has developed in the direction proposed in the literature. The study of Leurig and Dlugolecki (2013) suggests that only a small number of industry leaders are addressing climate change as a strategic issue. These companies are huge, with written insurance premiums exceeding $300 million. In this sense companies size is relative. The largest companies in this study would be considered to be small on a global scale, although they are large on a regional scale. Thus our findings contradict the findings of Leurig and Dlugolecki (2013) which emphasize that climate-related actions of smaller companies are to lesser degree evident than actions of large companies.

We have highlighted common mitigation and adaptation themes in the literature relevant to the insurance sector (e.g. Dlugolecki, 2009; Surminsiki, 2010; Warner et al., 2009; Williams, 2011; The Geneva Association, 2009), and brought forth examples of actions taken by Nordic insurers in their day-to-day business summarized in Table 6. The study reveals that actions of Nordic insurers are not discussed in accordance with the climate change policy domains of mitigation and adaptation (CEA, 2007), but in relation to insurers’ core activities of products, loss prevention and claims, investments, and insurers’ own operations. This should perhaps not come as a surprise, but this suggests a difference in how policy-makers and industry approach the issue, which may be an obstacle for climate change actions. The co-benefits of ‘adaptigation’ (Langlais, 2009) are also evident in climate related actions of Nordic insurers, thereby supporting ideas of Klein and Juhola (2013) claiming that separate mitigation and adaptation focus may contradict reality of business sectors in dealing with climate change.

The approach of integrating climate change actions with core activities and using insurers’ own terminology of loss prevention instead of adaptation makes it more relevant to the industry in their day-to-day business when acting on climate-related threats and opportunities. As suggested by Klein and Juhola (2013), it allows the relationship between the business and climate change to become more evident and self-explanatory, as it relates to their business reality, thus more easily integrated into business strategies and actions. In Table 6 we have classified actions of Nordic insurers along the line of climate domains, as well as in accordance to insurers’ core activities, thereby making them accessible to policymakers as well as insurers.

Barriers for actions taken have been identified in the literature, including cognitive, political, analytical, market operational, uncertainty and size-related barriers, lack of direct pressure, and control over resources (Berkhout et al., 2006; Dlugolecki and Loster, 2003; Leurig and Dlugolecki, 2013). Our data confirms the existence of some of these barriers, for instance the size-related barrier, lack of direct pressure, and uncertainty about climate impacts (Berkhout et al., 2006) evident in interviewees’ skepticism about climate change. Our study supports Leurig and Dlugolecki’s (2013) findings in the sense that while industry leaders are enhancing their capabilities to deal with climate change, this is not the case among smaller Nordic insurers. Cognitive barriers were brought up, including climate awareness and negative attitude towards climate-related actions, but other barriers did not surface, including market operational and political barriers. What’s more, our interviewees mentioned an isolation factor, where the smaller companies are isolated from the climate change debate as they do not take part in insurers’ climate change conferences, which contributed to their lack of awareness and actions. Lack of leadership commitment and short business horizon are also suggested to hinder insurers’ actions. The literature does not support interviewees claim that ownership may play a part in climate change actions of insurers. This topic, therefore, needs to be explored further. The nature of the insurance business can be viewed as a barrier, as well. Historically, the business is backward-looking as it uses claims statistics to
evaluate the risk, and set premiums accordingly. Climate change requires the insurance sector to look forward, using climate models and scenarios to predict the risk they are challenged with.

Empirical studies on insurers’ real actions in fulfilling climate commitments, thereby supporting national climate change policies, are lacking from the Nordic region, as well as from other parts of the world. Field work of this type is meant to be a starting point for a more thorough investigation of the real impacts of climate-related actions of insurers. Questions of how active and how effective insurers’ actions are – are yet to be explored. Although this study is descriptive, as it is mainly based on interview data, it provides insights into the role of Nordic insurers in fulfilling climate commitments. Our key message to insurers is that relatively small Nordic companies, on a global scale, have demonstrated through actions their commitment in addressing climate change issues, meaning that much larger companies can assume responsibility in fulfilling climate commitments to an even greater extent.

For policymakers, our suggestion is to put forth disclosure requirements, preferable comparable, so the insurance climate risk can be evaluated, as well as the impact of industry climate-related actions.

Our study comes at a time where the need for climate related action is accelerating rapidly, requiring involvement of different stakeholders, including authorities, academia, businesses, and individuals. The literature on insurers’ contributions to fulfilling climate commitments is limited, meaning that scholars have the opportunity to engage in research focusing on the role and contribution of industries such as insurers that have relatively low direct carbon footprints, but may serve as catalysts for actions taken. This article has contributed to this knowledge gap, by identifying and describing Nordic insurers’ practices contributing to the fulfillment of climate commitments, and by demonstrating how insurers define their own actions in comparison with the climate change policy domains. Policymakers and managers must close the language gap suggested for instance in Table 6, and begin speaking the same language, as it may enable companies lagging behind to better understand their role and contribution to solving climate change challenges while running profitable businesses in the long run, as well as enable policy-makers to understand the true potential of the industry in making a difference.

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operation/areas-of-co-operation/environment/nordic-environmental-co-operation (accessed 05.01.12).


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