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INSURANCE INDUSTRY IN THE SCOPE OF SUSTAINABLE DEVELOPMENT

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Abstract

Subject. This article discusses the role of insurance sector in promoting the ESG agenda and sustainable development issue.

Objectives. The article aims to determine the role of insurance in the sustainable development concept, consider the core principles of the green agenda, proposed by the UN and corresponding associations founded by it and supported in the financial sector, and review the European insurance and reinsurance companies' activities in terms of obligations arising from the sustainable insurance requirements.

Methods. For the study, I used the methods of systems and comparative analyses, synthesis, and comparison.

Conclusions. The insurance industry, together with other financial and non-financial institutions, supports the worldwide reduction of greenhouse gas emissions and contributes to the goal of limiting global warming to 1.5˚C above pre-industrial levels. United by this target, the industry is currently moving through a voluntary regime of ESG-oriented topics to a more regulated and compulsory one that provides for more sophisticated reporting rules, disclosure, and transparency. ESG principles change insurers' risk appetite concerning both underwriting and investment aspects, making companies more sensitive to climate-related risks that, as a consequence, leads to revision of existing own risk and solvency assessments models. The path to sustainable insurance has already become visible and is performed via cut of investments from carbon-intensive industries, change of underwriting principles in terms of exit from not-green products and decrease of own emissions. At the same time, the growing awareness defines the place of climate risk in own risk and solvency assessment models.

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Background

In spite of structural changes penetrating the Russian economy, the global trend with the focus on sustainability issues and ESG agenda (that includes ecological, social and governmental aspects (hereinafter referred to as *ESG*) is gaining momentum. Moreover, in line with the changing landscape of both corporate development and markets' infrastructure sustainability questions, known as core due to its attention to environmental

issues, social responsibility and quality of corporate governance not only may, but should take place in the concept of the new path [1].

Integration of the Russian Federation to the world economy is still of extreme importance, though in new circumstances, that requires high level of conformity to international standards. Existing publications on ESG agenda, being one of key priorities, are mainly concentrated on the European Union thanks to its experience, practice and existing metrics already applied. Simultaneously, presence of key players, including Tier-1 reinsurers, proves that this experience is vital and will be shortly retranslated by chain from reinsurers to insurers and final beneficiaries. Despite current limited field for cooperation with the European Union, experts do believe that sustainability issues and experience gained are relevant due to its global character and universal application [2].

Some researchers argue that ESG-orientation helps the company increase its financial stability and business activity that ultimately has a positive impact on its investment attractiveness and is beneficial to all stakeholders and for the economy in general [3].

There is no doubt that financial market that interacts with different organizations and households has a crucial role and impact on all economic agents. Insurance market is one of the links in this chain. In terms of the ESG concept, insurance is often erroneously associated with just ecological insurance aspect, that is, no doubt, important, but not the only input of the industry to the global spread of the ESG paradigm.

This article suggests paying more attention to such practices. There is still scarce experience on the Russian insurance market in terms of ESG implementation, let alone theoretical aspects, including practices and metrics. Therefore, international experience accompanied by supranational methodologies and best practices, may be of extreme importance for the Russian insurance market players, rating agencies and regulatory authorities, including the Central Bank of the Russian Federation and, as a consequence, other industries and people, benefiting from insurance.

Introduction: The Place of Insurance Sector in Sustainable Development

The insurance industry safeguards the assets of its policyholders by transferring risk from an individual or business to an insurance company. Insurance company is an undertaking that is expected to ensure safe and efficient loss absorption and is meant to remain financially stable and solvent throughout despite any turmoil around to protect interests of parties insured [4]. Proper fulfillment of its obligations is necessary for sane financial market and macro-economic stability. Moreover, insurance companies are well recognized as risk managers, risk takers and risk carriers on both sides of the balance sheet. As a result, the author believes that insurers are supposed to play an important role in fostering sustainable economic and social development.

It goes without saying that the global insurance sector plays a cornerstone role in the management of climate-related risks through different tools of risk modelling, pricing,

underwriting and research. On the one hand, insurance industry is used to handling climate risks on the liability side of the balance sheet and naturally seems to be closer to risk mitigation techniques and ecological issues, than other financial organizations, that derives from existing links to insurance against weather-related events and prevention of catastrophes (both natural and man-made). On the other hand, there is the inversion of the operating cycle that creates resources gained from premiums, making an insurer a system-level investor.

Therefore, we believe that insurers are expected to become pioneers of implementation of ESG principles at different levels of governance. This means that the impact of measures taken by (re)insurers seems to be significant like the impact of ESG implementation to the sector.

Although there are a few publications that analyze the impact of sustainable development on insurance industry that unveil the concept of ESG and its influence on insurers and infrastructure of the market [5, 6], the concept of ESG in different rating agencies specializing on ESG [7], we believe that there is still limited experience and some open issues require additional insight both at theoretical and practical levels. Some experts consider the issue as a mix of challenges and opportunities for insurers, claiming that despite all pressing issues ahead, climate strategy can bolster the underwriting business and is likely to improve investment performance and overall competitiveness[1].

Review of Supernational Basics of *Sustainable Insurance*

To better understand this concept, it makes sense to review the basics and understand where these initiatives come from and how they are being developed.

UN Environment Programme defines *Sustainable Insurance* as a strategic goal that combines responsible and forward-looking approach aimed at risk reduction through development of innovative solutions, identification, assessment and monitoring of risks, and contribution to environmental, social and economic stability [8]. Insurers are already known and acknowledged by the United Nations for participation in different sustainability activities like food programmes through crop protection initiatives and health and safety products offered in low-income communities.

There are four main principles proposed at the Rio+20 Summit in June 2012 by the United Nations Environment Programme Finance Imitative (Principles for Sustainable Insurance (PSI) Initiative). The main idea is to consider ESG as DNA being core of the company's operational activity[2].

[1] Waddell R., Beal D., Cockerill D. Insurers Take Up the Climate Fight. BCG, August 19, 2020. URL: https://www.bcg.com/publications/2020/insurers-take-up-the-climate-fight

[2] PSI Principles for Sustainable Insurance. RIO+20 United Nations Conference on Sustainable Development' published by UNEP FI in June 2012. URL: http: www.unepfi.org/psi/the-principles/

- *Principle 1*: Decision-making environmental, social and governance issues relevant to insurance business that is appealed to embed ESG in all strategic and operational activities, including product development, marketing and sales management and investments.

- *Principle 2*: Raise awareness of environmental, social and governance issues, manage risks, develop solutions through clients, partners and suppliers.

- *Principle 3*: Promotion of widespread actions through cooperation with governments, regulators and other policymakers and stakeholders.

- *Principle 4*: Accountability and transparency in regulatory disclosures.

At the beginning of 2023, there have been 139 (re)insurance and insurance-related undertakings from different countries all over the world that have signed the Initiative. A part of them is committed to regular disclosure and reporting. The principles have been created with no special intention to make them legally binding, however, not many things have been done on a voluntary basis that has made some regulators to proceed with additional guidance. Simultaneously, there is another milestone platform – Sustainable Insurance Forum – for insurance supervisors and regulators who want to address sustainability issues, share knowledge, and identify best practices[3]. Currently, there is the 2021–2023 programme realized designed to focus on the following subjects.

1. Climate-related risk on the insurability of assets.

2. Sustainability beyond climate change.

3. Climate risks in actuarial processes.

An important achievement of the Sustainable Insurance Forum (SIF) is an issuance in collaboration with the International Association of Insurance Supervisors (IAIS) of an issue paper providing descriptive per country guidelines combining practice, examples and challenges devoted to Climate Change Risks and its influence on the insurance sector.

The Paper distinguishes risks that are to be taken into consideration by insurance companies and supervisors, and addresses them from two sides: underwriting and investment ones. There are three core risks:

– *physical risks*: those physically tangible and arising from catastrophes and extreme weather events and consequences on underwriting process;

– *transition risks*: risks associated with transition to a new normal of green economy;

– *liability risks* that arise simultaneously.

[3] Sustainable Insurance Forum. URL: http:www.sustainableinsuranceforum.org

The Paper demonstrates that climate change may manifest in different ways across different insurance business lines and all over the (re)insurer's business activity.

Climate Risks in the Scope of Insurance

Climate risks have legitimately been posed as top priority ones as the tendency for an increased frequency and severity of natural catastrophes is gaining momentum. In accordance with the data provided by Swiss Re Sigma Institute, global economic losses from natural catastrophe events account for 96% of all catastrophes occurred: in 2021, registered losses were equal to USD 270 billion that maintained a long-term trend of 5–7% growth annually on a 10-year moving average basis. If we have a close look at the economic damage from such natural events, the trend line would demonstrate a growing trend that leads to both quantitative increase in the number of events and number of registered losses[4].

Severe weather events are recognized as the main driver of overall losses generated by global warming as a consequence of climate changes and socio-economic development multiplied by urbanization effect as a factor for concentrated population. Unfortunately, the trend line demonstrates that only a part of all losses occurred is insured: USD 111 billion in 2021 that is just above 41% of the total losses that is respectively close to Year 2020 with USD 81 billion insured from the total of USD 190 billion (42.6%). Preliminary, the 2022 data shows the same level of covered USD 115 billion out of USD 260 billion economic damage[5].

This is known as a *protection gap* that in money terms stays at the level of USD 143 billion on a 10-year average and is respectively represented and followed by the annual Swiss Re Institute Natural Catastrophe Resilience Index (NatCat-RI) that monitors exposure to three key perils: storms, earthquakes, and floods[6]. In relative figures, it stays at about 24% level that means that 76% of global exposure is unprotected. The percentage may vary depending on the region and country, presence of special protecting programs, insurance penetration and economic development in general[7]. As an example, we can refer to recent floods in Germany, happened in 2021 as a result of severe rainfalls, where, despite preliminary expectations for high insurance density in the country, only 46% of

[4] Bevere L. Natural Catastrophes in 2021: The Floodgates Are Open. Swiss Re Institute, March 30, 2022. URL: https://www.swissre.com/institute/research/sigma-research/sigma-2022-01.html

[5] Hurricane Ian drives natural catastrophe year-to-date insured losses to USD 115 billion, Swiss Re Institute estimates. URL: https://www.swissre.com/press-release/Hurricane-Ian-drives-natural-catastrophe-year-to-date-insured-losses-to-USD-115-billion-Swiss-Re-Institute-estimates/2ab3a681-6817-4862-8411-94f4b8385cee

[6] Barabanova V.V. *Rol' strakhovogo mekhanizma v razrabotke sistemy zashchity naseleniya ot riskov prirodnykh katastrof. V kn.: Sovremennaya model' razvitiya strakhovogo rynka: prioritety i vozmozhnosti: sbornik trudov XXIII mezhdunarodnoi nauchno-prakticheskoi konferentsii* [The role of insurance mechanism in the development of a system for protecting the population from the risks of natural disasters. In: Modern insurance market development model: priorities and opportunities. Proc. 23rd Int. Sci. Conf.]. St. Petersburg, Saint-Petersburg State University Publ., 2022, pp. 106–114.

[7] Issue Paper on Climate Change Risks to the Insurance Sector. IAIS-SIF, July 2018. URL: https://www.insurancejournal.com/research/app/uploads/2018/08/IAIS_and_SIF_Issues_Paper_on_Climate_Change_Risks_to_the_Insurance_Sector_-1.pdf

dwellings was found insured against natural perils with the aggregate total loss amounting to EUR 30 billion [9].

This is due to a changing landscape of catastrophes: most events are associated not with single catastrophe events ("primary perils"), but with so-called "secondary perils" that account for more than 70% of insured losses resulting mostly from severe convective storms and wildfires. These are high-frequency, low-to-medium-severity events such as river floods, thunderstorms, hail, wildfires drought, landslides amplified by climate change or events resulting from primary perils (tsunami following an earthquake etc.)

The problem for such "secondary perils" derives from its assessment. If primary risks (like earthquakes and large known floods) are already well-monitored and, consequently, modeled by insurers at least in advanced markets, assessment of secondary perils is more sophisticated as they are more difficult to predict and track. Researchers argue that the overall picture and understanding is still incomplete, and here, (re)insurers are called to pay more attention to this topic and raise more awareness to such perils. This concerns not only scientific approach that includes data analysis and risk modelling, but also a call for actions.

As a result, it is evident that with climate change that has already become evident, climate risks have proven to be placed in the priority list. This confirms the hypothesis that the insurance sector may be influenced via different angles: via original activity being associated with risk carriage and potential losses that may cause damage to financial stability of an undertaking, via transition period that would change the landscape and make companies adapt to the new normal and, last but not list, via investments that are expected to change the direction [10].

As a result, climate risk has become in the focus of insurance companies which thus have started gradually building a climate risk management system, improving approaches to risk identification and assessment. Moreover, climate risk can influence some other risks (*Table 1*).

ESG Call for Actions

The climate change is the trigger that forces the European insurers to reconsider underwriting and investment strategies. Insurance companies plan to cease insuring companies in carbon-intensive industries.

This call for actions coming from the ESG regulations becoming a new normal includes continuous work regarding the domain of mitigation of climate risks both at micro- and macro-economic levels. There are the following steps expected from the global insurance industry:

- Micro-economic level:

1) revision of underwriting policies revising risk-appetites to underwritten products;

2) reassessment of actuarial models;

3) update of risk-based approach principles and own risk and solvency assessment models to withstand potential increase of claims resulting from whether-relates events, specify stress-tests and scenario analysis;

4) update of investment policy through a shift to the green economy away from stranded assets.

- Macro-economic level:

1) assure due fulfillment of obligations strengthening economy;

2) support ESG initiatives proposed by supervisory authorities and advance effort to address climate change itself; for example, promoting energy transition and shifting business to lower carbon footprints.

- Worldwide level: apply best practices and enhance industry collaboration in terms of risk assessment (to climate risk), its actuarial estimations, mitigation, work with big data and statistics.

Since 2020, some steps have already become evident, that is why it is important to revert to the practical side and check what is already being done.

ESG Actions by Insurers

In a couple of years, we have seen a number of global insurers pushing the progress are showing public position in the cut of investments in carbon-intensive industries. Representatives of insurance industry constitute 45 of 74 members – institutional investors of the UN-convened Net-Zero Asset Owners Alliance founded in 2019 convened by the UNEP's Finance Initiative and Principles for Responsible Investment with the idea to enhance existing initiatives. This Alliance that includes the world's largest investors, governing the portfolio of USD 10.6 trillion, has set a goal to reduce carbon emissions to net-zero by 2050[8].

In July 2021, eight (AXA as Chair; Allianz; Aviva; Generali; Munich Re; SCOR; Swiss Re and Zurich Insurance Group) of the above-mentioned 45 members – world's leading insurers and reinsurers announced the launch of the pioneering Net-Zero Insurance Alliance (NZIA) and have committed to transition of their insurance and reinsurance underwriting portfolios to net-zero greenhouse gas (GHG) emissions by 2050, consistent with a maximum temperature rise of 1.5˚C above pre-industrial levels by 2100.

[8] Alliance 2025 Target Setting Protocol – United Nations Environment – Finance Initiative. URL: https://www.unep.org/resources/report/alliance-2025-target-setting-protocol

The way to targets that should be science-based is to be chosen by each company itself. This concerns setting underwriting criteria and guidelines for GHG-activities that an insurer is exposed to via engagement with clients and potential clients toward net-zero transition pathway, improving claims settlement procedure according to eco-friendly norms. To continue this tendency, the Executive Director of the UN Environment Programme (UNEP) urges other players follow the examples set by present members of this pioneering alliance. The Alliance is expected to grow with the aim to become officially part of the Glasgow Financial Alliance for Net-Zero (GFANZ).

Currently, the UN-converted NZIA represents already a group of over 20 leading insurers generating more than 11% of world insurance premiums. Since July 2021, the Alliance has already achieved some progress in defining and shaping strategies and methodologies. However, there are still many open issues that the members are working on in cooperation with some other providers and associations. These issues are focused on new targets including elaboration of available metrics for insurance and reinsurance portfolios that, together with other engagement targets, remains one of the main challenges in the absence of established metrics. It is an important admission to bear in mind that underwriting risk does not depend on the ESG strategies (namely, lower carbon emissions) and remains the core insurer's responsibility whatever the principles are[9].

Besides, many European (re)insurers have already in place different quantifiable ESG targets that generally refer to the same aspects as NZIA: decarbonization covering all areas – underwriting, asset management, risk management. European reinsurers intend to withdraw support both through investment and underwriting for thermal and oil producing companies simultaneously reducing their own emissions.

Traditionally, insurers' activity may be regarded through the scope of assets and liabilities that are although interrelated parts of the balance, but different in terms of fulfillments. Namely, one of the first studies exploring possibilities of the insurance industry in ESG development consider separately assets, liabilities and corporate governance [11]. Such an approach, in our personal way of thinking, seems reasonable and requires further investigation.

To review actual examples of implementation of the ESG principles, we suggest paying direct attention to Tier-1 Global Reinsurers[10], that tend to play a proactive role in addressing the issue.

The way ESG penetrates reinsurers refers primarily to decarbonization covering all areas: asset management, underwriting, and own operations. Europe-domiciled companies intend to withdraw support both through investment and underwriting for thermal and oil

[9] Insuring the Net-Zero Transition: Evolving Thinking and Practices – UNEP FI's Principles for Sustainable Insurance Initiative. April 2022.
URL: https://www.unepfi.org/wordpress/wp-content/uploads/2022/04/Insuring-the-net-zero-transition.pdf

[10] Top 50 World's Largest Reinsurance Groups – 2021 Edition.
URL: https://news.ambest.com/articlecontent.aspx?refnum=311820&altsrc=43

producing companies together with reduction of their own emissions. We propose to consider these practices in *Tables 2a* and *2b* split for asset-side and investment-side. These tables are provided for a comparative analysis so as the readers could, *first*, pay attention to some similarities in the global direction followed by reinsurers in terms of ESG implementation, *second*, visualize differences, and, *last but not least*, get used to the general background in terms of timeline and schedule.

Some companies have detailed reporting and targets for middle and long-term perspective with rough figures, while others tend to pursue more general rules within adopted initiatives over 2050-year horizon.

As it is seen, most companies are moving in the direction of gradual withdrawal of thermal coal and oil sand. It is necessary to mention that all Tier-1 Reinsurers have elaborated special pages on their websites for sustainable development and submit annual reports regarding sustainable development and achievement of quantitative and qualitative targets. 2021 Reports have shown not only targets, but already some achievements within set priorities. Besides, Swiss Re plans to invest USD 750 million in renewable energy as well as increase green investments to USD 4 billion by the end of 2024.

An analysis of the quantitative targets shows that both investment and underwriting policies in respect of carbon-related industries are hardening with thresholds for acceptable percentage of not-green revenue generated by incoming business constantly lowering. The directions followed by reinsurers are basically the same. The process has already started from direct and facultative business, while Treaty business is still pending (except for Swiss Re that has already introduced changes to Treaty guidelines) that is expected to have a direct impact on primary insurers and their policies.

Rating Agencies' View on Insurers

ESG factors are expected to have a direct impact on the creditworthiness of an insurer and effect an insurer from different angles. This explains increased attention of rating agencies to ESG topic for assessment of insurers. ESG ratings are aimed at assessment of KPIs and other indicators within sustainability issue and metrics elaborated by rating providers. The global interest towards ESG made rating agencies provide their own metrics. Some methodologies are open and free, while recently, there is information about less transparent access to data available and its commercialization.

Still, only 13% of rating actions taken between April 2020 and March 2021, according to AM Best estimations, were due to ESG factors. Among primary ESG factors taken into consideration, there are: stress-testing for natural catastrophe and weather-related events; other environmental risks (including liability risks); reputational risks associated with ESG and governance within ERM building block being the main driver for both positive and negative rating actions. Therefore, a resilient insurance industry depends on holistic and far-sighted risk management in which ESG issues are considered.

The global investment trend towards sustainable investments and ESG, according to experts, has a long-term positive effect for the whole investment activity as such companies are known to perform better in comparison to traditional assets [12, 13]. Another research based on American insurance companies shows that more solvent insurance companies demonstrate the highest level of ESG awareness [14].

The authors of another study devoted to the same sustainable investment topic come to conclusion that these are ecological and social parts that do contribute while corporate governance is still lagging behind [15]. This confirms the necessity to proceed with implementation of corporate governance and other enterprise risk management aspects, one of the examples thereof is the European risk-oriented model ORSA (Own Risk and Solvency Assessment).

Impact on Insurers' Risk Management Techniques and Own Risk and Solvency Assessment (ORSA) Metrics

As per the International Association of Insurance Supervisors' core principles, risk management is to identify and consider all reasonably foreseeable and relevant material risks, borne or potentially borne by insurers[11]. Aside from that, the supervisor should have insurers conduct regular own risk and solvency assessment to assess the adequacy of risk management and current and likely future solvency position.

Currently, the ORSA procedure is implemented as per the regulatory requirements by many countries including the EU, Canada, Switzerland, and China. Among the national peculiarities of the EU ORSA process, the following can be listed.

- No obligatory risk assessment tools (Solvency II provides for insurers' flexibility in choosing their own risk assessment tools).
- Risk assessment boiling down to economic capital appraisal, stress-testing and scenario analysis.
- The roundabout effect the regulator has on the ORSA implementation via giving insurers feedback concerning their annual reports. Local regulators stress the inapplicability of certain instruments for risk assessment, leave remarks on the stress tests and the assessment horizon insurers pick.

Insurance regulators draw the European insurers' attention to the fact that the ORSA procedure should encompass all vital mid-term risks (including the climate risk) on top of the traditional risks present in the standard capital assessment formula. While forming their view on the vitality of the climate risk appraisal, the regulators came to creating the respective regulations (*Table 3*).

[11] Insurance Core Principles and Common Framework for the Supervision of Internationally Active Insurance Groups. Updated November 2019. International Association of Insurance Supervisors (IAIS).
URL: https://www.iaisweb.org/uploads/2022/01/191115-IAIS-ICPs-and-ComFrame-adopted-in-November-2019.pdf

When it comes to insurers, the document reflects the following:

- examples of ESG risk effects on other risks;
- risk management tools for ESG risks;
- obligation to take into account ESG risks in the investment strategy, the underwriting policy, the risk management strategy, purchasing reinsurance and assessing reputational risks;
- necessity to consider ESG risks in ORSA.

Moreover, there is an interesting insight showing transition form letter “E”, responsible for ecology and climate risks that has for a long time dominated the insurers' minds to “S” with all social aspects it may have. This is partially due to the 2022 stagflation crisis, high inflation and increasing cost of living. As a result, regulators have been trying to overcome existing challenges with the help of insurance companies that are known for their scope of activity devoted to protection of interests of natural persons and legal entities.

However, actual practice shows that implementation of ESG practices is not moving at a fast pace. In 2019, EIOPA published recommendations for analyzing climate risks in ORSA procedure in the Opinion on Sustainability within Solvency II Report. Nevertheless, the Opinion implied further work would be needed to define techniques that could be adopted by insurers. Two years later, EIOPA published the following report on climate risk assessment where EIOPA, among other things, presented the results of the research carried out in relation to climate risk assessment of insurance companies. Out of the 1,682 companies polled, only 13% reflected climate risk assessment issues in their ORSA reports, with the majority using a qualitative analysis [16].

When it comes to the rationale behind ignoring climate risks during ORSA, European insurers had the following arguments:

- ambiguity of climate risk (lack of data, information on the effects of climate change in the future);
- difficulty of quantitative assessment (due to the large number of risk drivers relating to climate change);
- long-term nature of climate risk (while the ORSA procedure should cover mid-term risks).

As insurance companies are exposed to climate risks (both physical and transition ones), in order to improve the assessment of the climate risk, the EIOPA has recommended insurance authorities (within two years from the publication of the recommendations in April 2021) oblige insurers to assess climate risks in compliance with the following rules:

- climate risk assessment should be carried out in the short and long term;
- the materiality of exposures to climate risks should be identified with qualitative and quantitative risk management tools;
- the assessment can look into in the relationship between climate and other risks of an insurer and/or analyze the impact of climate risks on the assets and the size of the insurance portfolio;
- climate risk assessment of insurers should be integrated into the ORSA procedure;
- the final ORSA report should disclose information on the climate risk.

Further papers continue to appear and provide additional recommendations and corrections to regulation of both underwriting policies and risk management and in pursuit of a more sophisticated own models that would take into consideration ESG factors [17].

It is necessary to mention that European insurers are constantly monitored by regulators and other authorized institutions at different levels. In 2022, EIOPA carried out a pilot survey with 31 volunteering insurance undertakings from 14 European countries on the implementation of climate-related adaptation measures on non-life underwriting practices[12].

Overall, the European insurance market appeared to be at an early stage of adaptation, particularly in context of the retail business, while corporate sector is slowly ahead due to individual solutions and performed risk management to protect businesses at least against climate risks and extreme weather events.

Conclusion

The climate-change problem is a challenge for today's society on the whole and the insurance industry in particular. Insurers and reinsurers are exposed to climate risks, which in turn affect the whole range of other risks (varying from market to reputation risks).

Despite the mid-term nature of the climate risk, it has already become an integral part of internal models within a risk-based approach of many insurance industry participants. However, the research reveals that at this stage, internal measures taken by insurers at this stage are more aimed at bettering their investment and insurance policies rather than at the climate risk assessment. But at the same time, current case studies show that the path

[12] Impact Underwriting. Report on the Implementation of Climate-Related Adaptation Measures in Non-Life Underwriting Practices. EIOPA-BoS-22-593. February 6, 2023.
URL: https://www.eiopa.europa.eu/sites/default/files/publications/reports/impact_underwriting_-_report_on_the_implementation_of_climate-related_adaptation_measures_in_non-life_underwriting_practices.pdf

towards sustainable insurance is already visible and is gaining momentum living space for gradual adaptation of internal models.

Simultaneously, (re)insurers tend to exit from carbon-intensive industries and oil sand exposures both at investment and underwriting levels. This results in new guidelines and strategies being submitted by companies. At present, all Tier-1 reinsurers and International Insurance Groups being pioneers have already adopted the key principles and set strategies with 2050-year horizon that is set as the deadline for so-called Net-Zero emissions that are likely to affect the sector.

The paper shows that insurance industry is underway of serious changes that impact internal landscape and are to influence other financial and non-financial institutions. Moreover, the weight of measures already introduced and projected by insurers is expected to have a larger impact on the whole pathway and enforce the financial market's resilience the new paradigm. And last but not least, insurers, known as risk-carriers, are eligible to be at the head of further knowledge-based and practice-oriented steps towards sustainable development.

Table 1
Climate-related and other risks of Insurers

Risk Type	Possible Impact of Climate Risk
Insurance risk	Climate change can influence the frequency, severity of negative consequences from natural catastrophes, leading to increases in insurance liabilities
Investment risk	The value of an insurer's investment assets can be decreased, if they are invested in sectors exposed to climate risks
Liquidity risk	A lack of reliable and comparable information could create uncertainty on financial markets, including fire sales of carbon-intensive assets, and hence reduce liquidity of these markets
Operational risk	Physical climate impacts may affect the insurer's own assets (including property, equipment, IT systems and human resources), leading to increasing operating costs and business interruption
Strategic risk	Uncertainty over future scenarios may present challenges to insurers, which could inhibit achieving strategic goals
Reputational risk	Climate risk of insurers and their counterparties may also lead to negative reputational impact

Source: Authoring, based on Application Paper on the Supervision of Climate-related Risks in the Insurance Sector. For public consultation. October 13, 2020.
URL: https://www.iaisweb.org/uploads/2022/01/201013-Application-Paper-on-the-Supervision-of-Climate-related-Risks-in-the-Insurance-Sector1.pdf

Table 2a
ESG impact on Reinsurers' investment policy, quantitative goals

Investment Aspect	Munich Re	Swiss Re	Hannover Re	SCOR
Short-term actions	Current: No investments in companies with >30% revenue from thermal coal >10% revenue from oil sands	Exclusion of the 10% most carbon-intensive companies; mining companies that produce at least 20 million tonnes of coal per year; avoid investments in companies >30% revenue thermal coal; >20% revenue oil sands	Responsible Investment Policy. For fossil fuels, exclusion for issuers that generate >25% of their revenue from thermal coal mining/power generation or oil sands extraction	Sustainable Investing Policy. No investments in companies with >10% turnover from thermal coal; coal-fired power generation, coal plant developers; >20% revenue oil sands; >30% arctic oil reserves of their total reserves. Additional restrictions to upstream oil and gas, allowing only best-in-class investments
Middle-term actions (by 2025–2030)	Reduction by 25–29% of investments for Net greenhouse gas emissions (thermal coal 35%; oil and gas 25%)	By 2030 full exit from coal-related assets for listed equities and corporate bond portfolio	Reduce CO_2 load in asset portfolio of 30% carbon footprint in the asset portfolio by 2025	Reduce the carbon intensity of the corporate bond and equities sub-portfolio by 27% before 2025. Exiting thermal coal by 2030 in the EU and OECD and by 2030 in the rest of the world
By 2050	Total net zero	Total net zero	No commitment	Net zero portfolio

Source: Authoring, based on Annual Reports and Sustainability Reports, published on official websites of the reinsurance companies: Munich RE (munichre.com); Swiss Re (swissre.com); Hannover Re (hannover-re.com); SCOR (scor.com)

Table 2b
ESG impact on Reinsurers' underwriting policy, quantitative goals

Liabilities Aspect (Underwriting)	**Munich Re**	**Swiss Re**	**Hannover Re**	**SCOR**
Short-term actions	No insurance for new coal mining, oil sand sites, power plants, related infrastructure (direct and facultative business)	Exclude business support to companies producing world's 5% and 10% most carbon intensive oil and gas from July 2021 and July 2023 respectively. Thermal coal mild exit policy (since mid-2018) for direct, (re)insurance facultative and treaty business	No underwriting of facultative new business in coal-fired power plants. No facultative cover for companies that hold 20% or more of their oil reserves in oil sands and exclusion of oil sans extraction and processing operations	Exclusion of insurance and facultative reinsurance in respect of the construction of all new coal-fired plants, new thermal coal or lignite mines; excluding tobacco industry; incorporation of ESG principles in underwriting. Treaties: screen for exposed portfolios
Middle-term actions (by 2025–2030)	Reduction of capacity insured by 35% for thermal coal	Coal exposure thresholds to be introduced in 2023. Net zero operations by 2030 in OECD countries and by 2040 in the rest of the world	Phased step-by-step reduction of the CO_2 from reinsurance business	Specialty insurance toward a low carbon economy, no coverage for new oil field production projects from 2023, ambition to double the coverage for low carbon energies by 2025
By 2030–2050	Full exit from thermal coal by 2040 and net-zero emissions (oil&gas) by 2050	Net zero operations by 2030 in OECD countries and by 2040 in the rest of the world	Complete withdrawal of CO_2 load in connection with reinsurance of coal-fired power plants or mines for thermal coal in Treaty business by 2038	Net zero operations by 2050

Source: Authoring, based on Annual Reports and Sustainability Reports, published on official websites of the reinsurance companies: Munich RE (munichre.com); Swiss Re (swissre.com); Hannover Re (hannover-re.com); SCOR (scor.com)

Table 3
Regulatory changes in reporting and corporate governance rules in the European Union against the backdrop of ESG implementation

Supervisor	Year	Regulation	
IVASS (Italy)	2018	Regulation No. 38 of July 3, 2018	The Regulation makes Boards apply ecological and social aspects within ORSA
Bafin (Germany)	2019	Guidance Notice on Dealing with Sustainability Risks	Guidance to assess ESG, incl. climate risk
EIOPA (EU)	2019	EIOPA's Opinion on the Supervision of the Use of Climate Change Risk Scenarios in ORSA	
–	2021	Consultation Paper on Application Guidance on Running Climate Change Materiality Assessment and Using Climate Change Scenarios in the ORSA	
–	2022	EU Directive for ESG information disclosure	Stricter measures for non-financial information disclosure for social and ecological risks

Source: Authoring

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Conflict-of-interest notification

I, the author of this article, bindingly and explicitly declare of the partial and total lack of actual or potential conflict of interest with any other third party whatsoever, which may arise as a result of the publication of this article. This statement relates to the study, data collection and interpretation, writing and preparation of the article, and the decision to submit the manuscript for publication.