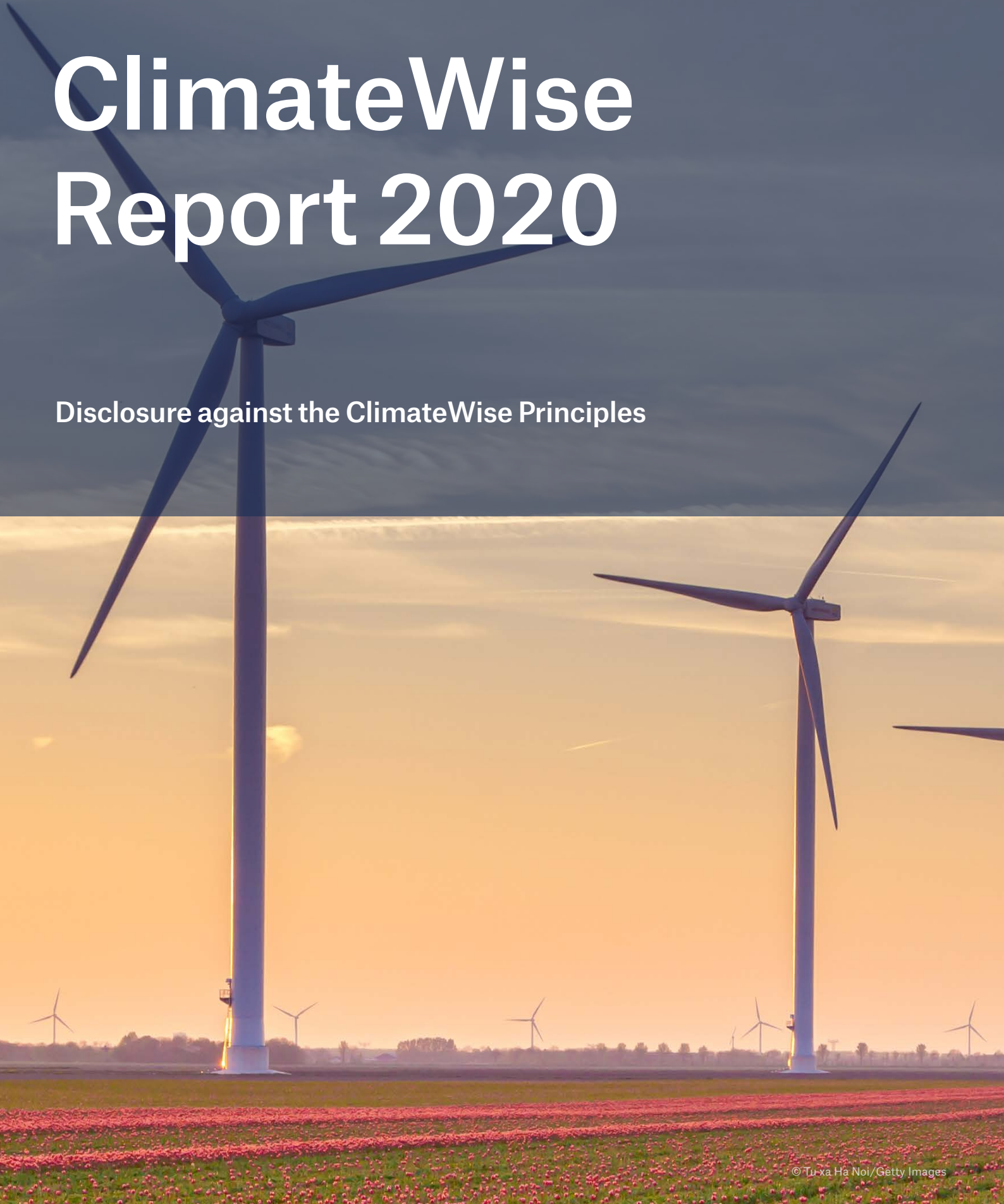


# ClimateWise Report 2020

Disclosure against the ClimateWise Principles



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NOT IF, BUT HOW

Munich RE 

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Dear reader,

Munich Re has joined the ClimateWise initiative as an active member in the beginning of 2020. We want to actively promote the Climate Wise principles by disclosing our climate-related governance, risk management and business activities as well as taking on an active role in the Insurance Advisory Council.

Munich Re's (Group) business model is based on the combination of primary insurance, reinsurance and asset management under one roof. We take on risks worldwide of every type and complexity, and our experience, financial strength, efficiency and first-class service make us the first choice for all matters relating to risk. Our client relationships are built on trust and cooperation. Munich Re stands for exceptional solution-based expertise, consistent risk management, financial stability and client proximity. In the financial services and insurance sector, Munich Re is a pioneer in analysing the consequences of climate change. For more than 40 years, Munich Re has been dealing with climate change and the related risks and opportunities for the insurance industry. In the 1970s, as part of geo-risk research activities within the company, Munich Re began to investigate the causes behind increasingly costly losses from weather-related natural catastrophes. Over the years, the complexity of the issues involved became increasingly clear as scientific advances were made. Today, we are integrated into a comprehensive scientific network that gives us access to the latest findings on climate change, and ensures a high level of quality for our analyses. The different findings from these analyses are consolidated on an ongoing basis and translated into relevant products and services for our clients as well as into recommendations for action for other Munich Re stakeholders.

This is Munich Re's first report under the Climate Wise Principles. The report has been written from the perspective of our reinsurance membership with ClimateWise. However, as we address climate change holistically and strategically in the entire Munich Re Group, we also provide information which goes beyond our reinsurance activities.



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This documents represents Munich Re's disclosure to the ClimateWise Principles. Apart from the information provided in the text, further information can be found by following **embedded hyperlinks**, indicated through orange colouring in selected sections throughout the text.

# Principle 1: Be accountable

## 1.1. Ensure that the organisation's board is working to incorporate the Principles into business strategy and has oversight of climate risks and opportunities.

**Level 1 - Evidence engagement and oversight at the board level through discussion of climate change-related issues (risks and opportunities) at regular committee meetings, including the processes and frequency by which the board and / or board committees are informed.**

The management of the risks and opportunities arising from climate change is an integral component of Munich Re's strategy, and all substantial strategic issues relating to it are handled at Board of Management level.

At least once a year, Munich Re's Group Investment Committee and Group Risk Committee inform the Supervisory Board about material sustainability topics on the basis of the combined non-financial statement. This selection process has highlighted Corporate Responsibility in insurance and investment as one of the relevant issues. Under the "Corporate Responsibility in Insurance and Investment" heading, we have included information on the statutory aspects of environmental, social, and human rights issues. This explicitly includes our core climate protection activities and goals ([Munich Re, Combined non-financial statement 2019](#), p. 4, 9).

Board Position	Oversight of Climate Risks & Opportunities
Chief Executive Officer (CEO)	<p>Oversight of climate change-related governance, reporting lines and responsibilities at Munich Re Group:</p> <ol style="list-style-type: none"> <li>1. Company and business-related risks / opportunities on Group level, supported by relevant committees and experts below board level (further explanation in Sub-Principle 1.2, Level 1).</li> <li>2. Company and business-related risks / opportunities on reinsurance level: reporting received from CEO Reinsurance to ensure integration into our core business strategy.</li> <li>2. Asset management: CEO of MEAG, direct reporting line to CIO Munich Re Group (since March 2019)</li> <li>3. Responsible for corporate responsibility-related climate change projects / activities / issues with a direct reporting line from ML1 of the division "Economics, Sustainability &amp; Public Affairs".</li> </ol>
Chief Financial Officer (CFO)	<p>Climate change-related governance, reporting lines and responsibilities at Munich Re Group:</p> <p>Risk Management:</p> <p>There exists a direct reporting line from the Group CRO, and a dotted reporting line from local CROs.</p> <p>Due to this reporting line described above, the overall responsibility for risk management lies with our CFO.</p>

Chief Investment Officer (CIO)	<p>One pillar of our climate strategy includes business-related activities on the asset management side. Climate change-related governance, reporting lines and responsibilities at Munich Re Group with regard to asset management lie with the CEO of MEAG, with a direct reporting line to CIO Munich Re Group since March 2019.</p> <p>Strategic decisions for sustainable investments are made in the Group Investment Committee (GIC). Since March 2019, the new Chief Investment Officer (CIO) is responsible for the asset management of Munich Re Group.</p>
Reinsurance CEO	<p>Climate Change-related governance, reporting lines and responsibilities at Munich Re Group:</p> <p>At Munich Re, the Reinsurance CEO is responsible for all reinsurance-specific matters relating to climate change. He is assisted by expert teams from the Reinsurance Development department, Corporate Underwriting department and experts from business units.</p>
Chief Risk Officer (CRO)	<p>Climate change-related governance, reporting lines and responsibilities at Munich Re Group:</p> <p>The Group CRO is responsible for organising and implementing an adequate risk management system at Group level and at Munich Reinsurance Company level. This includes developing the risk strategy, assessing all risks throughout the Group, and ensuring the adequacy of risk management processes. This includes also all climate change-related risks.</p> <p>He is responsible for the risk management function.</p> <p>The Group CRO has a direct reporting line to the CFO Munich Re Group, and a dotted reporting line from the local CROs.</p>

## **Level 2 - Evidence of how the board monitors and oversees progress against and the strategic plans, goals and targets for addressing climate change-related issues.**

Where climate change-related issues are business-relevant and affect our strategic plans, goals or targets (climate change-related risks and opportunities to our own operations, investment activities, insurance underwriting activities, or other products and services we provide to our clients), various committees of MR's Board of Management (BoM) are actively involved and decide on these topics. Depending on the specific topic and responsibility, this may involve for example the Parent Board of Management (BoM), the Group Committee (GC), the Strategy Committee (SC), the Reinsurance Committee (RC), or the Group Investment Committee (GIC), in which the above-mentioned Board Members are represented in different constellations.

Basically for most material climate change-related activities a strategy concept for BoM submission is prepared, including defined objectives, deliverables and KPIs. The implementation of actions are steered and achievements are monitored at management level.

In the FY2019, climate change-related topics were discussed in 2 meetings of the Supervisory Board and in 10 meetings of the Board of Management (and related committees on BoM level).

## **Level 3 - Evidence for incorporation of climate change into business strategy and planning and the development of related key metrics and targets, at a board and / or board committee level.**

Incorporation of climate change is manifested in Munich Re's climate strategy in general, as well as in research and business collaborations, carbon footprint assessments & carbon neutrality strategy, coal-

exit & oil sands policy, development of new solutions for clean / green tech etc. Also climate change-related natural catastrophe (nat cat) risk management with strong interlinkages to enormous losses to the insurance industry has strategic awareness and scrutiny.

More information on how our actions are guided by our climate strategy can be publicly assessed in our [Corporate Responsibility Report 2019](#) (p. 35 - 40).

For activities with particular relevance for Munich Re's business, the BoM is regularly receiving reports on progress, developments and results.

Different climate change-related metrics are applied in order to strategically assess different aspects of climate change in our business and organisational strategy. Examples include the application of a standardised, mandatory environmental management system (EMS) that meets the requirements of the international DIN ISO 14001 standard, the incorporation of scenario analysis to provide forward-looking risk exposure analysis, and financial modelling in order to steer our investment portfolio towards net zero – a goal that is in line with our membership in the Net-Zero Asset Owner Alliance.

## **1.2. Describe management's (below board-level responsibility) role in assessing and managing climate risks and opportunities.**

### **Level 1 – Evidence of assigned climate change-related responsibilities to management-level positions or committees; and, a description of the associated organisational structure and how management reports to the board and / or board committees.**

Below board level, there exist a variety of committees and working groups that hold climate change-related responsibilities.

As mentioned above, for activities with particular relevance for Munich Re's business, the BoM is regularly receiving reports on progress, developments and results. This explicitly includes those that relate to climate change and its strategic implications.

#### **Leading Experts:**

Munich Re's Board of Management is supported by dedicated climate change experts (see below) within the MR Group, as well as by Corporate Responsibility and climate change-related committees and internal working groups, departmental managers, and staff in the various units involved with products and questions relating to climate change risks and opportunities.

- **Climate change-related Strategy & Positioning (Reinsurance):** Division Reinsurance Development (RID) - therein Climate Change Center of Competence, Global Head Climate & Public Sector & Chief Climate and Geo Scientist
- **Assessment of climate change-related Physical & Transition risks:** Division Corporate Underwriting (CU): Head of Research on Climate Risks and Natural Hazards; two Head of Sections (ML3) within CU.
- **Climate change-related Liability risks (as part of Transition risk assessment):** Division Corporate Underwriting, Head of Section (ML3), and Division Global Clients / North America, Leading expert Liability and Insurance Law
- Climate change-related **sustainability projects** of Munich Re (Group) (direct report to Group CEO): Management Level 1 & 2, Division Economics, Sustainability & Public Affairs (ESP)
- **Investment-related climate change duties:** Group Investment Management and MEAG in close cooperation with the leading internal climate experts; examples include integration of Munich Re's Physical Climate Risk Assessments into investment decisions.
- **Reputational Risk Committee (RRC):** Reputational risks are identified, analysed, assessed and monitored with the aid of qualitative processes. RRCs are in place for the business fields

of primary insurance and reinsurance and also in asset management. RRCs assess potential ESG (including climate change-related) and reputational risks resulting from individual transactions. RRCs make an assessment of the likelihood and severity of impact of the risks assessed, and then decide whether the risk should be rated as critical and how it should be handled (e.g. reject, implement risk mitigation measures). The Group's chief legal and compliance officer is represented in all RRCs to ensure consistency across the Group. In case the business unit disagrees with the RRC's recommendation, the issue can be escalated to the Board level (e.g. Reinsurance to the Global Underwriting and Risk Committee (GURC)) for final decision. The GURC consists of at least 3 members of the Reinsurance Committee (Board of Management). In the Internal Risk Report we regularly detail any significant reputational risk for MR.

All responsibilities described above also include the assessment and managing of climate change-related risks and opportunities (resp. clean technology-related issues).

A rough count shows that at Munich Re's headquarter in Munich alone, far more than 100 employees are now dealing with topics relating to climate change, nat cat and renewable energies / green solutions.

## **Level 2 – Evidence of the processes by which management is routinely informed about, reviews and manages climate change-related issues.**

As mentioned in Sub-Principle 1.1, the responsibility for climate change-related governance, reporting lines and responsibilities at Munich Re Group lies with the CEO and within the Group Management Board. This implies the merging of climate change-related information, the creation of a holistic picture, and the derivation of strategic implications regarding climate change-related risks and opportunities.

Strategic decisions, development plans and goals are then communicated to the respective committees, which are responsible to implement, monitor and evaluate the progress against these plans and goals. The Committee Heads act as secretaries and managers of these committees, responsible to mainstream relevant information from the board into the committees. Committees often also comprise the aforementioned Leading Experts (Level 1) of selected climate change-relevant topics.

## **Level 3 – Evidence of how management (through specific positions and / or management committees) monitors and assesses the implementation of strategic plans, goals and targets agreed by the board / and or board committees to address climate change-related issues.**

At management level, the monitoring and assessment of climate change-related strategic plans, goals and targets lies within the responsibility of every individual manager. Managers work in close collaboration with their unit teams as well as managers of other units across the Group. This entails daily exchange with team members and management colleagues on all business-relevant topics, including climate change-related risks and opportunities.

Additionally, more formalized exchange on climate change-related issues takes place via internal digital exchange platforms, webinars, group workshops, internal newsletters and regular roundtables at management level.

The development of climate-friendly /green / clean tech products and risk solutions is spread over a number of business units and departments. Hierarchical reporting, as well as cross-hierarchical and non-hierarchical communication is deployed to manage, control and monitor progress against strategic plans and targets. Examples for involved divisions / departments are: Corporate Underwriting, Reinsurance Development Department, Sustainability Department within ESP, Group's Green Tech Solutions department, US subsidiary Hartford Steam Boiler (HSB), New Energy, Life&Health, and others.

# Principle 2: Incorporate climate change-related issues into our strategies and investments

## 2.1. Evaluate the implications of climate change for business performance (including investments) and key stakeholders.

Level 1 - Describe priority climate change-related risks and opportunities across the business and its investments (considering relevance to the nature of the business) by sector, geography, business segment and over the short, medium, and long term, defining these time horizons.

Time Horizons	From (years)	To (years)
Short-term	1	3
Medium-term	4	10
Long-term	11	41

Furthermore, in climate research we also consider another time horizon, namely remote future (2060-2100), which is, however, far from business horizons and thus not explicitly considered across the business and its investments.

**Climate change-related risks:**

Risk Category	Time Horizon	Explanation
Current regulation	Short-term	Possible risk of non-adequate anticipation of changes in policies and regulatory requirements due to the need to mitigate greenhouse-gas emissions, e.g. affecting carbon-intensive sectors.
Emerging regulation	Short-term, Medium-term	Risk of non-adequate anticipation of changes in policies and regulatory requirements due to the need to mitigate greenhouse-gas emissions, e.g. affecting carbon-intensive sectors.
Technology	All time horizons	We expect risks involved with the transition to a low-carbon economy to impact our underwriting business performance. For example, Munich Re has already arrived at decisions shrinking cover offerings for coal-based and oil sands industries. Over the next decades, developments in technology, systems and associated markets (e.g. smart and digital technologies for steering various systems more efficiently regarding energy and resource consumption, as well as further upscaling of renewable energies, steering towards low-carbon products and services) will in some sectors gradually change the characteristics of insured assets, businesses, processes. Thereby new product designs will be fostered, making new risk assessment approaches necessary without damage and loss history. Good understanding and underwriting performance will be a consequence of adjustments to these changes in terms of new demands for adequately designed insurance products



		including adequate risks assessment preconditioned by professional expertise.
Legal	Medium-term	As a reinsurance company, we specifically consider the risk of potential liabilities in the context of climate change, i.e. the impacts that could arise if parties who have suffered damage due to the effects of climate change seek compensation for their losses. Some of these claims may only arise years or even decades in the future, but have the potential to hit carbon extractors and emitters – and, if they have liability cover, their insurers – considerably.
Market	All time horizons	Market changes due to climate change are observed and assessed on management level and reported to Board level.
Reputation	All time horizons	<p>We have set in place Reputational Risk Committees (RRCs) for each field of business. These committees analyse and assess specific reputational issues and ESG risks relating to individual transactions, and make recommendations on accepting or rejecting a particular risk. An assessment by the Sustainability unit is mandatory.</p> <p>Risks stem from pressure by NGOs, media, socially responsible investment (SRI) rating agencies etc. like we have seen in 2017/18 regarding decarbonisation / divestment / coal exit campaigns by several NGOs.</p>
Acute physical	All time horizons	<p>According to our analyses, climate change already contributes to changes in hazard incidence in regions with substantial insurance exposure. For example, it contributes to increases in days with high maximum temperature levels, leading to more frequent large wildfire events in the western USA and other regions, and more agricultural drought events in the Mediterranean and in other regions.</p> <p>Another example: Higher levels of moisture in the atmosphere through increased evaporation at warmer ocean surfaces and increased water vapor holding capacity of warmer air may have contributed to an increase in severe thunderstorm activity (large hail, tornado, straight-line wind) in the U.S.A. east of the Rocky Mountains, and also to increases in severe thunderstorm activity (hail, gusty winds) in some regions of Europe. For the future, further changes in climate related hazard incidence in regions with substantial insurance exposure are expected. The following changes are expected by climate science (without ranking) for coming decades: More high-intensity landfalling tropical cyclones in regions with high coastal exposures, more heavy precipitation events and large river flood events, more frequent storm surge events due to future sea-level rise. In the remote future, also higher losses from strong European winter storms are expected. Other factors of influence on risk are the existence of natural catastrophe vulnerability-reducing strategies (e.g. improvements of building codes), and the maintenance of a risk diversifying potential across continents and regions.</p>
Chronic physical	All time horizons	See answer above on acute physical risks also in relation to chronic physical risks. Theoretically one can differentiate a chronic and an acute dimension. In practical terms it is often not a clear-cut difference.

		For instance, rising sea levels (chronic) is aggravating flooding from storm surge (acute), and more intense heatwave (acute) are intertwined with increasing average temperature levels / global warming (chronic), etc.
Asset Management	All time horizons	Our asset manager MEAG incorporates ESG issues into investment analysis and decision-making processes. This includes also the effects relating to climate change. Our aim is to make the bulk of our investments sustainable.

#### Climate change-related opportunities:

Opportunity Category	Time Horizon	Explanation
Products and services	Short-term	<p><b>Insurance solutions for renewable energies and new technologies:</b></p> <p>Munich Re seeks to aid the breakthrough of climate-friendly and sustainable technologies. Insurance solutions protecting against specific risks, thereby enhancing the appeal of the technologies for investors and strengthening their financing viability, are one component in this context.</p> <p><b>Examples:</b></p> <p>Performance guarantee covers for solar module manufacturers and solar farms, fuel cells and LED light technology, performance guarantees for batteries and bioenergy plants.</p> <p>Insurance cover for solar as well as off- and onshore wind farms secure the construction phase, or protect against loss of profits (reduced yield / lack of wind cover) or serial losses.</p> <p>Productivity risk insurance for geothermal projects covers operators' costs for unsuccessful geothermal drilling projects.</p> <p>Insurance covers for electrical energy storage systems (EES), specifically EES Performance Warranty Cover and EES Investment Project Cover.</p> <p>ERGO: Reduced yield insurance for operators of photovoltaic solar power plants: This extended cover offers protection if the expected annual energy yield is not met due to lower global radiation or defective components.</p> <p>Various standard insurance covers against natural hazards as well as P&amp;C covers for "green" infrastructure and technologies offered by MR Group.</p> <p>For more evidence on our climate change-related products and services, see Sub-Principle 3.2, Level 1.</p> <p>As part of the UN initiative, Sustainable Energy for All (SE4ALL), which targets the sub-Saharan region, Munich Re developed the risk transfer</p>

		<p>solution African Energy Guarantee Facility (AEGF) in collaboration with the European Investment Bank (EIB) and two primary insurers. This offers protection against political risks in order to facilitate private investment in the use of renewable energies. As a sustainable (re)insurance pool, the AEGF has a structure involving risk transfer tranches, which can be assumed by insurers and private financial institutions.</p> <p>For further details / examples please see also our <a href="#">Corporate Responsibility Report 2019</a> (p. 36 - 40).</p>
Products and services	Short-term	<p><b>Climate &amp; Natural Catastrophes (nat cat) Insurance Solutions for developing &amp; emerging countries:</b></p> <p>The overall aim of these solutions is to promote (weather-and yield index-based) risk transfer solutions, to reduce the risk of loss and damage from extreme weather events and natural disasters as well as to provide immediate liquidity to countries after major natural catastrophes.</p> <p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>- Caribbean Catastrophe Risk Insurance Facility (CCRIF), Caribbean states</li> <li>- Fondo Nacional de Desastres Naturales (FONDEN), Mexico</li> <li>- Natural Disaster Insurance Scheme (NNDIS), Sri Lanka</li> <li>- HDFC ERGO micro insurance policies</li> </ul> <p>We also offer agro-related solutions of all-natural perils (drought, excessive rainfall, frost, windstorm, etc.) and insurance of forestry plantations</p> <p>For further details / examples please see also our <a href="#">Corporate Responsibility Report 2019</a> (p. 36 - 40).</p>
Products and services	Short-term	<p><b>Client Awareness Building for Adaptation &amp; Mitigation:</b></p> <p>Munich Re offers various services and tools that help our clients to better understand and prepare for climate change-related issues. These services and tools apply for adaptation and mitigation needs and we expect an increased demand for such services in the next years.</p> <p><b>Examples:</b></p> <p>Location Risk Intelligence Platform:</p> <p>Munich Re's, Location Risk Intelligence Platform, formerly known as NATHAN, is a cloud-based analysis tool to help clients in assessing risks from natural hazards or climate around the world – from individual locations to entire portfolios. In the Natural Hazards Edition, risk assessment is carried out using a series of map layers with hazard and risk ratings based on Munich Re's nat cat risk models. Assessments in the Climate Change Edition (new) are based on internationally agreed scenarios for greenhouse gas emissions, the so-called Representative Concentration Pathways (RCP) scenarios up to 2100. Thanks to their</p>

modular structure, each of the two products can be supplemented at any time with the other assessment model. More information on both editions of the Location Risk Intelligence Platform can be found in Annex 04 and 05 to this report.

#### NatCat SERVICE:

Since 1974, Munich Re has been systematically recording events and loss data from around the world. NatCat SERVICE, our database on both current and historical natural catastrophe losses, is one of the most comprehensive databases worldwide with more than 45,000 data sets. It forms the basis for a wide range of information, tools and services for risk assessment and can offer many different types of analysis. Ultimately, it also effects the design of our insurance products. It is also used by scientific and institutional facilities and the media.

#### Speeches, keynotes and conferences:

Our key climate experts are continuously engaged in exchange with clients on various aspects of on climate risk mitigation and adaption in different regions and sectors. As such, we provided expertise in the form of speaking engagements, keynotes and panel discussions with client involvement on over 60 occasions in 2019.

Another activity in this regard is our cooperation with Suncorp Group, an Australian insurance, banking and finance corporation and the University of Brisbane. The aim of this cooperation is to convey awareness of climate change-related risks and opportunities in the context of Suncorp's business strategy. Therefore, C-level executives were trained by our key climate experts and subsequently, knowledge gains and expertise was passed down to the management and employee level.

#### cDays:

Apart from that, our client conference "cDays" works as our annual get-together for provoking thought leadership. Here, we jointly discuss new trends, innovative ideas and product solutions for the insurance industry. In 2019, our "cDays" focused on global challenges, explicitly addressing climate change. We hosted 150 participants from 30 different countries (including 40 clients), and enjoyed more than 75 speakers (incl. 3 Munich Re board member) throughout the conference.

#### Webpage:

On our webpage, we regularly introduce new information campaigns in our online magazine [TOPICS Online](#), where, besides other topics, we prominently address the issue of climate change-related risks and challenges to adapt to and to mitigate climate change.

Markets	Short-term	<p><b>Improved ratings by sustainability / ESG indexes through involvement in climate initiatives:</b></p> <p>We wish to contribute our expertise as a valuable partner for political decision-makers, industry organizations, research entities and other enterprises.</p> <p>See Sub-Principle 3.2, Level 1 for more information on our main initiatives and commitments.</p>
Resource efficiency	Long-term	<p><b>Environmental Management System (EMS):</b></p> <p>The Munich Re (Group) Strategy Committee decided in September 2015 to continue our successful environmental and climate protection strategy until 2020.</p> <p>The consistent implementation of strategy has paid dividends: We have already reached our carbon emissions savings target of 35% less carbon dioxide (kg per employee in 2009–2020) in 2017.</p> <p>Especially energy savings have a cost impact: since 2009 our energy consumption decreased about 21% per employee. Assumed average cost of about €90 per MWh, energy cost per employee decreased from 1.035€ to 819€ in 2019.</p> <p>Due to annually differing numbers of employees and their energy consumption , we cannot provide absolute financials for energy saving.</p>
Products and services	Short-term	<p><b>Energy Efficiency Insurance:</b></p> <p>HSB, our wholly-owned subsidiary, has a suite of products that insure the technical risk associated with IOT, energy efficiency and distributed generation projects (e.g. Solar, Cogeneration, and Energy Storage).</p> <p>HSB's Energy Efficiency Insurance insures the technical performance risk associated with the deployment of energy conservation measures in commercial, residential, government, healthcare and industrial facilities. To date HSB has insured energy savings improvements in over 5 million square feet of buildings</p> <p>HSB's Energy Shortfall product insures the technical performance risk, including lower than normal irradiance of utility scale solar PV installations. HSB has insured over 1 GW of solar PV installations in North America</p> <p>HSB, in collaboration with Verisk Climate, developed a Blackout Risk Model™ which can be used as a tool to support resiliency efforts relative to potential power grid outages. The detailed model focuses on the US Power grid infrastructure and incorporates extensive data on four peril categories: Hurricanes, winter storms, thunderstorms, and equipment failure/operator error. The model also incorporates a US country wide, population weighted, tree density model which accounts for the proximity of trees to power lines.</p> <p>Responding to this dynamic landscape, HSB has developed a suite of insurance products and services that helps our customers protect and optimize their investments in the following technologies:</p>

		<ul style="list-style-type: none"> <li>- Solar / photovoltaic installations</li> <li>- Biomass or biofuel power plants</li> <li>- Hydroelectric plants</li> <li>- Geothermal plants</li> <li>- Wind turbines</li> <li>- Fuel cell installations</li> <li>- Anaerobic digester plants</li> <li>- Ethanol plants</li> <li>- Biodiesel plants</li> <li>- Battery storage installations</li> </ul>
Resilience	Short-term	<p><b>Early climate risk identification:</b></p> <p>In order to early identify and detect climate change impact on natural catastrophe risk and associated lines of business, Munich Re since long is interwoven with climate science, not only by employment of highly-qualified climate scientists for risk assessment &amp; modelling purposes, but also by participating in science initiatives, initiating and conducting collaborative projects together with scientific facilities, publishing on research projects in peer-reviewed scientific journals. Topics range from internal climate variability such as El Nino / La Nina, to climate change impacts on severe convective storms (hail, thunderstorm gusts) or winter wind storms and floods in Europe.</p> <p><b>Examples of initiatives:</b></p> <p>Project ARCS (Analysis of changes in the risk of severe convective storms in Europe), collaborative project with European Severe Storms Laboratory: analysing trends in thunderstorm hazards and risk over recent decades and climate-model-based projection into future periods.</p> <p>Participation of Munich Re in a HORIZON2020 scientific project "Climate Advanced Forecasting of Sub-seasonal Extremes (CAFE) with a co-supervisor's role for a PhD project.</p> <p>Engagement as a scientific advisor in the Scientific Advisory Boards (SAB) of the large project <b>ClimXtreme</b> focussing on climate change impacts on natural catastrophe events in Europe.</p> <p>For more information on climate change-related research, see also evidence provided under Sub-Principle 2.1, Level 4 - section on early climate risk identification, and Sub-Principle 2.3, Level 4.</p>
Asset Management	All time horizons	We see business opportunities through investments in renewable energy and infrastructure projects contributing to climate change adaptation and mitigation.

## **Level 2 - Evidence of the identified impact of climate change-related risks and opportunities on members' business, strategy and financial planning.**

Generally, we expect the risks and opportunities displayed in 2.1. Level 1 to have the potential to significantly affect our business strategy and our financial planning in the short, medium or long term.

### Physical climate risks:

Our objective is to ensure efficient premium calculation and identify unknown accumulation risks. It is important for Munich Re to incorporate climate change-related risks in underwriting policies because changing frequencies and intensities of weather hazards potentially have a substantial impact on our clients' and our own NatCat book and balance sheet. An example for the way of influence on Munich Re's underwriting strategy was California wildfire. For more information on California Wildfire, check Sub-Principle 2.2, Level 1.

### Procurement:

The benchmark in our procurement decisions is best total value in terms of the criteria quality, time and cost, but environmental and social aspects and good management practices also play a crucial role. Therefore, Munich Re has set out the applicable regulations and operational principles in its procurement principles, which are authoritative for all purchasing processes and manifested in our procurement guidelines. They include various award criteria, supplier requirements, principles relating to human rights, labour standards, the environment and anti-corruption, as well as the objectives for partnerships. We also obligate our suppliers to recognize the UN Global Compact.

### Investment:

Through our investments, we want to promote the use of future technologies to avoid greenhouse gas emissions. In total, Munich Re has invested around 1% of its assets under management (€2.9bn) in renewable energies and green bonds. Furthermore we integrate ESG criteria in all asset classes, when investing in real estate we observe our ESG criteria when performing due diligence for new investments. These steps range from examining the geographic properties of the site, the construction materials and the technical facilities used, through to considering social aspects of investment projects. With work on existing properties, requirements for energy efficiency and the choice of suitable construction materials, partners and proven technologies apply. MEAG encourages its tenants to use its buildings in a sustainable way and has produced an information brochure on the subject.

### R&D:

Geoscientists at Munich Re have been analysing the effects of climate change on the insurance industry since the 1970s. Because of natural and anthropogenic changes to probability distributions for meteorological and hydrological parameters, a risk of change has resulted in the portfolios of Munich Re and its clients. Thus, we invest in models, data and cooperation with science. For instance, we accomplished a collaborative project together the European Severe Storms Laboratory on past trends and future projections of severe convective storms hazards and risk with extensive publishing. Another famous example is Munich Re's NatCat SERVICE, one of the world's most comprehensive databases for analysing and evaluating natural catastrophes. More information on NatCat SERVICE can be found in Sub-Principle 2.1, Level 1 and Sub-Principle 6.2, Level 3.

#### Operations:

We exploit the potential of our own business processes to ensure climate-friendly action. As part of our Group-wide environmental and climate protection strategy, we have set binding targets for reducing CO<sub>2</sub> emissions by 35% by 2020 (basis year 2009). Business operations throughout our Group have been carbon-neutral since 2015. Overall, since 2009, we have been able to reduce our Group-wide carbon footprint by 44% per employee. In the year under review, we procured approx. 90% of our electricity requirements Group-wide from renewable energy sources. And we will renew our environmental and climate protection strategy and targets in 2020.

#### Financial Planning:

The financial planning according to climate risks is mostly done on the level of business units while the large scale financial planning adjustments are done at the (group) controlling level. We monitor internally both the premium income "at stake" through decarbonisation activities and the additional revenues generated by "green" solutions. The responsible management of ESG and climate issues is playing an increasingly important role when it comes to access to capital. Munich Re's strategies and measures described in this disclosure are being rewarded by sustainability-oriented financial players (rating agencies, (institutional) investors etc.) around the world with good to very good ratings and rankings. This ensures our access to capital in the future as well.

Supporting research, initiatives and further development of tools and methods on climate change:

Munich Re is also part of relevant industry climate change-related initiatives and working groups, e.g. the UNEPFI PSI TCFD Insurance Pilot Working Group, Climate Wise (as per Jan 2020, decision to take part already in 2019), Geneva Association etc. In 2019 Munich Re also participated in the CRO Forum's Working Group on "Carbon Footprinting in Underwriting Portfolios". Furthermore, we are a member of UNEP FI's Net-Zero Asset Owner Alliance, committing to achieving a carbon-neutral asset portfolio by 2050. For more information on our research engagement, assess Sub-Principle 2.1, Level 4 and Sub-Principle 2.3, Level 4.

**Level 3 - Evidence that members are developing a business strategy and investment strategy (if relevant) to address the implications of climate change-related issues on both the business and its key stakeholders and have determined a measurable progress plan for action, considering longer time-frames.**

#### Investment Strategy:

In order to ensure that we adhere to our sustainable investment approach, we have established a binding Group-wide Responsible Investment Guideline (RIG), which covers all requirements regarding principles of responsible investments and ESG that concern Munich Re Group investment management, especially on the subject of exclusion criteria for investments. Climate change-related issues are part of the ESG criteria. As part of this strategy, Munich Re no longer invests in companies that derive more than 30% of their revenues from the mining of or generation of electricity from coal. Existing investments not meeting these criteria will be sold. Furthermore, we are a member of UNEP FI's Net-Zero Asset Owner Alliance, committing to achieving a carbon-neutral asset portfolio by 2050. This strategic step that had been discussed and prepared in the second half of 2019.

The ESG ratings used in the investment process for equity and fixed income issuers include material climate change-related risks. For infrastructure investments, physical climate risks are integrated into the due diligence process of every investment decision.



#### Operations Strategy:

We developed a Code of conduct (CoC). Here, among other criteria, our employees are obliged to take ESG aspects into account in their work (including climate change-related issues), and are explicitly referred to Munich Re's approach to improving our CO2 performance.

#### Underwriting Strategy:

Munich Re will no longer insure new coal-fired power plants or new coal mines in industrialised countries, or in the majority of emerging markets. There may be a small number of exceptions in countries where a substantial portion of the population (more than 10%) has no access to electricity. In such countries, cases are analysed on the basis of clear criteria. These include a country's dependency on coal, the natural endowment of renewable energy sources, the climate strategy of the company or country in question, and the technical standards applied. No such exceptions were granted in the financial year 2019.

In 2019 Munich Re extended its fossil fuel exit strategy to oil sands on both the insurance and asset side: It is no longer allowed to sign facultative reinsurance and primary insurance business of new & existing oil sand sites and new & existing oil sand-related infrastructure. On the asset side, Munich Re does not invest in companies that generate more than 10% revenues from oil sands.

In addition, we create internal position papers on (climate) sensitive topics: We have identified seven sensitive topics or sectors: Coal, Arctic Drilling, Oil Sands, Fracking, Mining, Investments in farmland, Banned Weapons. Binding guidelines or best practice recommendations were drawn up for these topics, which are applicable for reinsurance, primary insurance and investment. Questionnaires specifically tailored to the topics were integrated into an ESG tool, which helps our underwriters to systematically take ESG aspects into account when performing risk assessments. Climate change-related criteria are included as part of the "environmental dimension" of our ESG assessments.

#### **Level 4 - Evidence of a leadership position or strong collaboration efforts for encouraging better climate disclosure and further research; demonstrating the use of this information and / or appropriate tools.**

#### Climate Disclosure:

We have been reporting about our climate-related activities – and the research and analytics projects of our GeoRiskResearch / Corporate Climate Centre unit and its succeeding units - for more than a decade. Since 2019, we disclose our climate-related governance, risk management, as well as our business-, investment- and operational strategy by reporting against the Carbon Disclosure Project (CDP).

Munich Re is part of the industry climate change-related Insurance Pilot Working Group of the UNEPFI PSI TCFD initiative. The objective is the development of modern risk assessment tools and industry-wide standards for climate change-related disclosure.

In addition, 2020 will mark the first year of our membership in ClimateWise, for which we are submitting the present disclosure against the ClimateWise Principals.

#### Other reportings include:

- Reporting towards the National Association of Insurance Commissioners in the United States (NAIC)
- Robeco Sustainability Report

- Our own group-wide **CR Report**

#### Further Research:

Munich Re is deeply interwoven with climate science, either by collaborative work with scientific facilities including joint peer-reviewed publications, or by sponsoring research programs. Findings from such analyses on natural hazards, anthropogenic climate change and natural climate variability are constantly improving Munich Re's risk assessment, for instance regarding:

- severe convective storms (Sander et al., 2013, DOI: 10.1175/WCAS-D-12-00023.1; Rädler et al., 2019, DOI: 10.1038/s41612-019-0083-7)
- tropical cyclones (Welker and Faust, 2012, DOI:10.5194/nhess-12-1-2012; Ranger and Niehoerster, 2012, DOI: 10.1016/j.gloenvcha.2012.03.009)
- flood risks (Merz et al., 2014, DOI:10.5194/nhess-14-1921-2014).

#### Other initiatives include:

- Project ARCS (Analysis of Changes in Risks from Severe Convective Storms in Europe), 2016 – 2019
- Project CAFÉ (Climate Advanced Forecasting of Sub-Seasonal Extremes), 2019 – 2022
- Engagement in Insurance Development Forum (IDF) Risk Modelling Steering Group (RMSG)
- Engagement in the Geneva Association (GA)

For more information on these initiatives, refer to Sub-Principle 2.3, Level 4.

## **2.2. Measure and disclose the implications of climate change-related issues for business performance (including investments) and key stakeholders.**

**Level 1 - Disclose key quantitative and qualitative metrics used to measure and manage priority climate change-related risks and opportunities on the business and on key stakeholders and outline how these have and are planning to change over time.**

#### **Risk Metrics:**

Regulation: compliance with current regulation and anticipation of anticipated regulation

Munich Re's and ERGO's Compliance departments ensure compliance with all applicable laws and regulations, and also observe and assess emerging legal regulation, e.g. through interactions with regulatory authorities.

Legal Liability: accumulated claims based on non-compliance; accusations of misleading stakeholders

Liability related to indirect climate liability is likely to increase constantly. Possible scenarios in this context are:

Claims based on non-compliance with regulation (e.g. failure to warn or inform), like shareholder litigation based on financial losses resulting from fines triggered by such misconduct.

Accusations of misleading consumers / the public / legislation / courts by "green washing" to manipulate buying habits.

One example of a potential driver of claims related to climate change (indirect climate liability) is the introduction of limits for greenhouse gas emissions or possible duties to inform / report / disclose the amount of greenhouse gases produced by a product or service. Another example would be a stricter

interpretation of the standard of care / due diligence expected of private or public entities or professionals who have the duty to take preventive measures to avoid / minimize damage caused by the consequences of climate change. Finally, changes to building codes to prevent or minimize damage by extreme weather events could increase costs involved in rebuilding damaged/destroyed buildings covered by liability or property insurance.

A fundamental change in regulation or court decisions could also result in successful claims based on damage caused by the consequences of greenhouse gas emissions as such (direct climate change liability), e.g. rising sea-levels. Even if such claims continue to be unsuccessful, they can lead to substantial defense costs in the US, owing to the absence of a loser-pays rule.

Reputation: percentage of cases to be flagged by our Reputational Risk Committees (RRCs)

We keep track of the percentage of cases that are flagged by our RRCs in the course of the underwriting process.

Physical (acute and chronic): drivers of loss events; peril specific losses; assets committed in regions likely to become more exposed to acute or chronic physical climate risks

The impact of climate (CC or internal climate variability, e.g. ENSO, AMO, PDO) on natural catastrophe risk is accounted for in risk assessment on the basis of the following metrics:

- changes in meteorological / hydrological drivers (i.e. all nat cat perils) of loss events over time in a region, including analyses checking for a causal link to increasing greenhouse-gas concentrations (climate-model-based attribution) or internal climate variability (e.g. Atlantic Multidecadal Oscillation)
- concomitant changes in peril-specific nat cat losses over time, normalized to current levels of destructible wealth. The normalization procedure removes the signal of economic growth over time, which per se would cause losses to increase even in the absence of any climate impact.

An example of metrics to detect climate change influence and how they can be expected to change over time can be illustrated around the phenomenon of California wildfire. In this region, strong increases in seasonally averaged maximum temperature levels, which have been driving up dryness of air and forest flammability, have over the decades substantially increased the burned forest area and increased the risk for properties in the wildland-urban interface regions. Accordingly we identified concomitant changes in the temporal evolution both on the hazard side (forest flammability / area burned), and on the side of the associated normalized losses, which can be causally linked to climate change.

To provide a centralised metrics for risk analysis, we use SAFIR, a platform for geospatial data & applications to share natural hazard risk data within our company. Typical analysis tasks answer the questions:

- How many risks are located in which hazard zone?
- What is the spatial distribution and where are the hotspots of portfolios?
- How many locations in a portfolio are affected by a particular nat cat event?

For more information on our application of scenario analysis with regard to physical climate change-related risks, please refer to Sub-Principle 2.3, Level 1.

In the long-term, we expect clear increases in TC hazards, i.e. wind, storm surge and heavy precipitation/flooding driven by climate change, eventually resulting in an enhanced frequency of very strong storms in all basins (Bhatia et al., 2018, DOI: 10.1175/JCLI-D-17-0898.1), and a poleward expansion of the corridor displaying TC activity. Part of this may evolve in a more substantive way

already in the medium-term. Together these changes will materialize a higher variability of seasonal hazard activity and aggregated loss.

Apart from wildfire and severe thunderstorm hazards, which already show or may show an impact from climate change, we expect increasingly substantial effects in the medium- to long-term from other weather-related hazards including tropical cyclones.

We continuously improve and refine our risk models and work with internal figures for risk pricing.

**Asset Management:** carbon footprint of different asset classes within asset portfolio; ESG criteria in different investments

We consider carbon footprinting of our investment portfolio as an effective metric to manage our risk of stranded assets in the light of increasing climate change-related risk exposure and potential corresponding regulation.

### **Opportunity Metrics:**

Economically speaking and from a reinsurance perspective, the key metric to assess and evaluate climate change-related opportunities is the expected premium on the insurance side and the corresponding top- and bottom-line result. Essentially, the balance between losses, administrative costs, risk-based capital costs on the one hand side, and premiums earned on the other hand side, allowing for some profitability, has to be retained.

**Products and Services:** Revenue from “climate change-related” products

We use taxonomies as an orientation to determine whether an insured technology is classified as a low-carbon product.

We define “climate change-related” products (mitigating greenhouse gas emissions) as risk transfer solutions for green technologies that contribute to the transition towards a low-carbon economy. More information on our “climate change-related” products is given in Sub-Principle 3.2, Level 1.

We expect the revenue related to “climate change-related” products to continuously increase over the short, medium and long term.

Regarding products significantly contributing to the adaptation to climate change we do not apply in our definition the EU taxonomy on the regulation on the establishment of a framework to facilitate sustainable investment. This is because nat cat-related risk transfer and risk assessment solutions cannot be classified as directly addressing climate change, but rather serve to manage the risk of particular nat cat events, without specifically referring to the pattern of increased frequency of such nat cat events that is casually linked to climate change. However, we have continuously expanded our (re-)insurance products suite and client base with risk transfer solutions to protecting hitherto uninsured regions and weather related perils. Examples are e.g. parametric trigger covers for precipitation/drought and focussing with our public sector business development strategy increasingly in developing and emerging countries.

**Client Awareness Building for Adaptation & Mitigation:** number of speaking engagements; reception of webpages with climate change-related content

We monitor the number of speaking engagements and select them based on predefined criteria like target audience and topics. They are incorporated in our business development activity within our approach towards clients and the general public. However, we do not measure speaking engagements as a KPI in our client awareness building interactions.

We also monitor and analyse access to Munich Re's webpage and topics. A dedicated focus of these analyses is on topics presented in our TOPICS ONLINE magazine, which includes articles on nat cat and climate change where also provide our expertise, assessments and positionings.

For further evidence around client awareness, please assess our evidence provided in Sub-Principle 6.1.

Markets: ratings by sustainability / ESG indexes

We assess the ratings we receive by different ESG and sustainability-related ratings. We expect the potential impact of increased ESG awareness by investors to have first and second order effects on our business due to increased pressure on the (re)insurance industries and other industries.

Asset Management: volume of capital invested in renewable towards climate change mitigation

Expanding investments in renewable energy and infrastructure projects contributes to climate change adaptation and mitigation.

### **Changes in metrics:**

We are combining the experience / expertise of our scientists, specialist underwriters, lawyers, economists, and actuaries in a company-wide risk management process. Climate change-related risks are monitored, evaluated and integrated into Munich Re's Internal Control System (ICS).

Given a detected change on the loss side concomitant with detected changes on the weather hazard side caused by climate change or internal climate swings, such results on changes in loss distribution properties over time are included in the risk assessment, risk management and pricing processes. This means, they are included in our risk modelling.

Within the internal model, operated by the Risk Management division, we account for changing climate conditions mainly via the model assumptions that are set around frequencies / severities of weather-related hazards.

Please note: For our metrics related to Scope 1, 2, and 3 emissions as well as our environmental management carbon footprinting in our operations and metrics of resource efficiency, please refer to the evidence provided in Principle 4.

**Level 2 - Evidence of a narrative relating to the performance made against these metrics over the past year (including variance analysis relative to plans or forecasts – see Level 4, below). Metrics should be provided for historical periods to allow for trend analysis.**

### **Risk Metrics:**

Regulation: compliance with current regulation and anticipation of anticipated regulation

We monitor external claims based on non-compliance with regulation or accusations of misleading consumers / the public / legislation / courts by "green washing" to manipulate buying habits. These cases are e.g. used for internal compliance training of relevant staff and managers to continuously improve our compliance risk management.

Legal Liability: accumulated claims based on non-compliance; accusations of misleading stakeholders

Estimates of claims based on non-compliance with regulation or accusations of misleading consumers / the public / legislation / courts by “green washing” to manipulate buying habits are available internally, but we cannot communicate any figures, because it may support lawsuits at the level of our clients.

Reputation: percentage of cases to be flagged by our Reputational Risk Committees (RRCs)

In 2019, about 27% of the cases submitted to the RRC were approved with no conditions attached. Roughly 33% of enquiries were approved with conditions attached, and 40% were declined.

Physical (acute and chronic): drivers of loss events; peril specific losses; assets committed in regions likely to become more exposed to acute or chronic physical climate risks

We continuously adjust our risk assessment to the level of changing risk in the tail and frequency portions of the loss distribution. This can serve as the paradigm of the adjustment procedure. If climate change was established as a driver, in many cases a continuation of the trend into the future can be expected. Responses to an identified increase in risk include besides from risk adequate pricing also engagement with clients to reduce vulnerability. For instance, we provide coverage of wildfire losses to Californian utilities only if they have substantial programs in place to improve operations which decrease the threat of igniting vegetation close to equipment.

One of Munich Re’s largest exposures pertains to tropical cyclones (TC), in particular Atlantic hurricanes but also regarding other countries (e.g., Japan, Australia). TC activity varies on different time scales driven by different associated climate drivers of change. According to recent research implemented in our models, hurricane hazards and risks in the North Atlantic are predominantly driven by a multi-decadal natural climate variability called the Atlantic Multidecadal Oscillation (AMO) (Yan et al., 2017, DOI: 10.1038/s41467-017-01377-8). On an even longer time scale, climate change has already increased the probability of extreme rainfall associated with TCs over the decades, e.g. along the Gulf of Mexico, which has already been scientifically linked to climate change as a driver (van Oldenborgh et al., 2017, DOI: 10.1088/1748-9326/aa9ef2; Risser and Wehner, 2017, DOI: 10.1002/2017GL075888; Emanuel, 2017, DOI: 10.1073/pnas.1716222114).

Among the weather-related catastrophes, “Atlantic Hurricane” is the greatest single accumulation-risk exposure. Second in rank is winter storm Europe which is less than half of Atlantic Hurricane regarding the aggregated VaR with return period of 200 years.

Among the weather-related catastrophes, Wildfire U.S. (Risk 4) is close to severe convective storms (Risk 3) in regard of the financial impact figure with a return period 200 years. This means, the estimated range for a 200-year U.S. wildfire event is clearly smaller than Atlantic hurricane (Risk 1) and winter storm Europe (Risk 2).

Asset Management: carbon footprint of different asset classes within asset portfolio; ESG criteria in different investments

As part of our commitment to UNEP FI’s Net-Zero Asset owner Alliance, we are currently assessing methodologies to monitor the carbon footprint of different asset classes within our asset portfolio, i.e. real estate, equities and corporate bonds.

We conducted an initial analysis of our equity and fixed income portfolio regarding Scope 1+2 emissions, exposure to coal, oil and gas as well as regarding transitional and physical risks. This included absolute emissions, weighted average carbon intensity and CO2 intensity per invested million Euro. We are currently in the phase of evaluating the data.

In the course of our involvement in a company as a shareholder, and in particular before casting a vote, social, we analyse if ethical and environmental goals / aspects are part of the company's management.

There must be Corporate Governance codes, Socially Responsible Investment (SRI) and Environmental, Social & Governance (ESG) guidelines in place in the company as are customary in the country in question, that include ethical and environmental topics and that reflect the company's social responsibility. Adding to this engagement, Munich Re and MEAG joined Climate Action 100+, an investor initiative combining the force of more than 450 investors with over \$40 trillion in combined assets under management in Summer 2020. The initiative's goal is to engage from investors' perspective a focus list of the world's largest corporate greenhouse gas emitters to curb their emissions, improve climate change-related governance and strengthen their climate change-related financial disclosures.

Munich Re joins Climate Action 100+ in the role of a supporter to publicly endorse the initiative as an asset owner and, as a thought leader, to set an example for asset managers to follow.

Moreover, MEAG joins the initiative as a participant and commits to at least once a year engage with at least one company from a focus list of highly carbon-intensive companies that has been created by Climate Action 100+, in order to engage them in decreasing their carbon footprint.

Additionally every infrastructure project investment is evaluated against a checklist of ESG-criteria by our RRCs.

### **Opportunity Metrics:**

With regard to premiums as a general metrics to assess business opportunities, also with regard to climate change-related opportunities, every business unit has specific premium targets, which function as an objective function for the fiscal year. The realisation of business opportunities in the context of climate change naturally fall under this objective function as well.

Products and Services: Revenue from "climate change-related" products

Revenues revenues from "climate change" product(s) in FY 2019 stem from different product categories:

- Mitigation products (green tech + energy efficiency products)
- Adaptation products (especially nat cat reinsurance products, parametric risk transfer solutions etc.)
- Software as a service (SaaS): In addition of our climate change related products we have in 2019 expanded our suite of risk measuring services by our Risk Management Partner (RMP) unit. An example would e.g. be the extensions of Munich Re's Location Risk Intelligence Platform (formerly known as NATHAN), which now also includes the calculation of climate risk scores on the basis of IPCC RCP scenarios. We have a dedicated strategy to grow the number of clients licensing our relevant suite of software products.

**Example:** HSB (Hartford Steam Boiler), our wholly-owned subsidiary, has insured over \$18M in energy efficiency products since 2015.

Client Awareness Building for Adaptation & Mitigation: number of speaking engagements; reception of webpages with climate change-related content

We assess the ongoing debate around climate change amongst our clients and continuously engage with them in the form of speaking engagements, keynotes, panel discussions and specifically also via social media.

As mentioned in Sub-Principle 2.1, Level 1, we provided expertise in the form of speaking engagements, keynotes and panel discussions with client involvement on over 60 occasions in 2019, covering and

specifically addressed the issue of risk management and risk modelling. We expect the external as well as internal interest in these topics to continually increase within the next years.

Markets: ratings by sustainability / ESG indexes

For example in 2019, Munich Re has been awarded the best possible rating of "A+" in the 2019 PRI (Principles for Responsible Investment) Assessment, in the module "Strategy and Governance". Only 29% of the 384 "asset owners" participating in the assessment from around the world gained this rating. Within the group of comparable asset owners, the median rating is "A". Munich Re, together with ERGO and MEAG, was among the first German signatories of the UN-supported PRI, and it also played a key role in the drafting of these principles.

The approach of positioning Munich Re as a frontrunner in such ratings is not only about generating long term profitable business but also about creating new insurance markets, enabling new technologies and accelerating measures against climate change by mitigating financial risks and hurdles.

Asset Management: volume of capital invested in renewable towards climate change mitigation

The volume of capital invested in renewable energies such as solar parks and wind farms totalled €1.6bn at the end of 2019.

**Level 3 - Evidence of targets set (quantitative and qualitative over the short, medium and long term) to manage climate change-related risks and opportunities on both the business and its key stakeholders, and a description around performance against targets.**

**Risk Metrics:**

Regulation: compliance with current regulation and anticipation of anticipated regulation

Our key target is to always comply with current regulation. We also want to anticipate upcoming regulation ahead of time in order to adjust our governance, strategy and operations accordingly.

To achieve these targets we are in continuous exchanges with regulators (worldwide, e.g. BaFin, EIOPA, MAS, APRA) on climate change related risk management and reporting topics and provide them e.g. with deep insights in our scientific research activities and modelling tools.

Legal Liability: accumulated claims based on non-compliance; accusations of misleading stakeholders

Our key target is not to breach any compliance rules and face any claims based on non-compliance or accusations of misleading stakeholders. We disclose to our stakeholders our climate-related risk management activities through various communication channels (e.g. homepage, Group Annual Report, annual general shareholder meeting, investor relation events), including reporting under CDP, NAIC (National Association of Insurance Commissioners/USA and Robeco); we also publish annually climate-related risks and opportunity topics in our Corporate Responsibility report.

Reputation: percentage of cases to be flagged by our Reputational Risk Committees (RRCs)

We do not set a quantified target for cases to be flagged or not flagged by our RRCs. The analysis of cases flagged serves the comprehensiveness of the process by making decisions traceable and ultimately serves the monitoring and verification of our underwriting guidelines.



Physical (acute and chronic): drivers of loss events; peril specific losses; assets committed in regions likely to become more exposed to acute or chronic physical climate risks

In our Property & Casualty (P&C) business, clients' aggregated losses from weather extremes under climate change will translate into increasing loss burden on the reinsurance side which imply a need to reflect the changing hazard condition in the risk assessment models per region. In the end, the balance between losses, administrative costs, risk-based capital costs on the one hand side, and premiums earned on the other hand side, allowing for some profitability, has to be retained. The global operations of a reinsurer such as Munich Re is an essential means of diversifying peak risk from natural catastrophes globally, because typhoon Japan and Winter storm Europe are assumed to be non-correlated, as an example. Further risk limitation is achieved by strict accumulation control according to regional budget scenarios/limits, thereby limiting the exposure.

Our estimates of exposure for the coming year to the peak scenarios for a return period of 200 years are €6.3bn (5.0bn) for Atlantic Hurricane (before tax, retained). See MR Group Annual Report 2019, p. 75.

For winter storm Europe, the aggregated VaR for 2019 with a return period of 200 years was € 2.9bn

The overall costs of management cannot be specified in detail. They comprise costs of all employees working on the underwriting side and thereby being involved in risk management, adjusting underwriting and insurance business practices to country-specific regimes of insurance regulation, costs of developing proprietary nat cat risk assessment tools, licensing external risk modelling software, research on nat cat risks, and nat cat data administration and related IT services. A large portion of these costs are interwoven with all-day operations and cannot reliably be separated and specified.

Asset Management: carbon footprint of different asset classes within asset portfolio; ESG criteria in different investments

We have divested our assets (managed by MEAG) from all carbon-intense investments. The threshold for the divestment was lowered to assets with "more than 30% of revenues from coal" from previously 50% of revenues from coal.

In the beginning of 2020, we committed to the Net Zero Asset Owner Alliance, and therefore to an alignment of our asset portfolio to a 1.5° world and net zero emissions by 2050. The board decision to join this alliance was prepared in 2019.

### **Opportunity Metrics:**

Products and Services: Revenue from "climate change-related" products

We have revenue and result (bottom-line) targets on different time scales for basically all of our products and services. However we only disclose high level financial targets to our stakeholders and do not provide detailed revenue numbers on our climate change-related products and services. With regard to premiums and bottom-line results as a general metrics to assess business opportunities, including climate change-related opportunities, every business unit has specific economic targets, which function as an objective function for the fiscal year. The realisation of business opportunities in the context of climate change naturally fall under this objective function as well.

Client Awareness Building for Adaptation & Mitigation: number of speaking engagements; reception of webpages with climate change-related content

We invest substantially in client awareness raising. Examples are B2B client meetings specifically focussing on climate change related risk management topics, client seminars and workshops on climate change, Munich Re's annual "cDays" (Client Management Days) with participants e.g. from primary

insurers and brokers with dedicated sessions on climate change (science, risks and opportunities). More general: Client awareness raising is implemented via various formal and informal communication channels (media, social media, Munich Re subject matter articles in trade magazines) and as such is interwoven and mainstreamed with all-day operations.

Markets: ratings by sustainability / ESG indexes

We have at the Group level dedicated targets for the performance in specific sustainability and ESG indexes. We measure against these targets and monitor our peers performance with their ESG indices. Our aspiration is to be amongst the top performers in sustainability ratings

Asset Management: volume of capital invested in renewable towards climate change mitigation

Our target for the next years is to increase this figure to €2.8bn.

Please note For our metrics related to Scope 1, 2, and 3 emissions as well as our environmental management carbon footprinting in our operations and metrics of resource efficiency, please refer to the evidence provided in Principle 4.

#### **Level 4 - Describe the methodologies used to calculate metrics and targets.**

##### **Risk Metrics:**

Regulation: compliance with current regulation and anticipation of anticipated regulation

Munich Re's and ERGO's Compliance departments ensure compliance with all applicable laws and regulations, and also observe and assess emerging legal regulation, e.g. through interactions with regulatory authorities.

Legal Liability: accumulated claims based on non-compliance; accusations of misleading stakeholders

We monitor and analyse information on accusations and claims of misleading stakeholders (in principle globally). These data and assessments are used internally for training and education purposes to continuously improve our risk management knowledge and practices. Our key target is not to breach any compliance rules and face any claims based on non-compliance or accusations of misleading stakeholders.

Reputation: percentage of cases to be flagged by our Reputational Risk Committees (RRCs)

We internally monitor all cases (including the quota of cases) flagged by our RRCs through internal reporting of the respective reputational risk assessment.

Physical (acute and chronic): drivers of loss events; peril specific losses; assets committed in regions likely to become more exposed to acute or chronic physical climate risks

Fundamentally, the management of natural catastrophe (nat cat) risk such as wind, surge and flood losses caused by tropical cyclones is based on risk models which measure risk per hazard and exposure in a given region. These models represent the underlying portfolio exposure data. They calculate the frequency of losses of varying amplitude by applying a stochastically generated set of hazard events

which represents today's climate, together with a transfer function on vulnerabilities which translates hazard intensity per affected exposure unit in a loss figure.

In terms of asset commitments in regions likely to become more exposed to climate risks, future projections of changing physical risk levels related to natural catastrophes for some decades ahead are relevant in strategic terms, although substantial uncertainty is still involved in most cases. Specialized modellers of Munich Re have developed projections of future hazard activity levels based on state-of-the-art climate model runs, which are also offered to clients under the label Location Risk Intelligence Platform. Based on this tool, we provide a scoring model to evaluate different risk-levels associated with respective peril risks across a client's risk portfolio.

Asset Management: carbon footprint of different asset classes within asset portfolio; ESG criteria in different investments

As mentioned in Sub-Principle 2.2. Level 2, we are currently assessing methodologies to monitor the carbon footprint of different asset classes within our asset portfolio, i.e. real estate, equities and corporate bonds.

Additionally every infrastructure project investment is evaluated against a checklist of ESG-criteria by our RRCs.

### **Opportunity Metrics:**

Products and Services:

As mentioned before, with regard to premiums and bottom-line results as general metrics to assess business opportunities, also with regard to climate change-related opportunities, every business unit has specific economic targets, which function as an objective metric for the fiscal year.

We have revenue and result (bottom-line) targets on different time scales for basically all of our products and services. However we only disclose high level financial targets to our stakeholders and do not provide detailed revenue numbers on our climate change-related products and services. With regard to premiums and bottom-line results as a general metrics to assess business opportunities, including climate change-related opportunities, every business unit has specific economic targets, which function as an objective function for the fiscal year. The realisation of business opportunities in the context of climate change naturally fall under this objective function as well.

Client Awareness Building for Adaptation & Mitigation: number of speaking engagements; reception of webpages with climate change-related content

Our key climate experts are continuously engaged in exchanges with clients on various aspects of climate risk mitigation and adaption in different regions and sectors. As such, we provided expertise in the form of speaking engagements, keynotes and panel discussions with client involvement on over 60 occasions in 2019. We assign our speaking engagements according to their relevance in terms of climate change-related client awareness building. In terms of reception of webpages with climate change-related content, we analyse the external accesses in various dimensions and use this information to provide better focused information, both with respect to the climate adaptation and mitigation related content and our target stakeholder groups.

Markets: ratings by sustainability / ESG indexes

We report to various sustainability / ESG reporting and rating organizations (e.g. CDP, NAIC, Robeco) and assess our ratings by sustainability / ESG indexes individually in a way that we use them to derive

strategic insights for our own climate strategy development. We also monitor and analyse sustainability / ESG indices of our peers and use them for our sustainability and business development considerations.

Asset Management: volume of capital invested in renewable towards climate change mitigation

The target achievement is measured on the basis of internal sustainability reporting (sustainability ratio). In 2019, over 80% of our investments were invested sustainably (of the €216bn in investments that are relevant for calculating the sustainability ratio). We calculate this by applying a series of sustainability criteria for each asset class.

#### **Level 5 - Evidence how climate change-related metrics are incorporated into remuneration policies and practice.**

Remuneration:

Climate change-related metrics are indirectly incorporated into the remuneration practice through the incorporation of ESG. The integration of ESG aspects (including carbon neutrality strategy with climate change-related/eco-efficiency targets, carbon neutrality of the Group and a reduction in carbon emissions of 35% compared to the base year of 2009) into core business was first included in the three-year targets for members of the Board of Management in 2012. Since 2018, ESG criteria have been factored into a newly designed remuneration system, into both, the annual and medium-term bonuses for members of the Board of Management. More detailed information can be found in our [Remuneration Report](#).

Pension Fund:

Munich Re Pension Fund's activities are fully integrated into Munich Re's sustainability strategy. To this end, the MR Pension Fund's investment activities comply with the provisions of the Group-wide Responsible Investment Guideline (RIG) and the associated position papers (the same applies for the CTA). As a matter of principle, hard exclusion criteria are applied to fixed-interest securities and equity investments on the one hand and an ESG integration approach on the other. This also includes maintaining our sustainability standards through appropriate redevelopment of real estate concepts. For investments in fixed-interest investments and equities, we rely on the analyses and classifications of MSCI ESG Research. The "environmental dimension" contains numerous KPIs relating to climate change. ESG integration allows a holistic analysis and a deeper understanding of the risks and opportunities of an investment. ESG integration also leads to better long-term investment decisions and optimises the risk / return ratio of investments.

### **2.3. Incorporate the material outcomes of climate risk scenarios into business (and investment) decision making.**

#### **Level 1 - Describe the process for undertaking scenario analysis, taking into consideration different climate change-related scenarios, including physical, transition and liability risk scenarios. Include scenario analysis methodology timeframes, parameters and key assumptions used.**

The use of climate change-related scenario analysis aims at understanding strategic implications of climate change-related risks and opportunities, and informing stakeholders about the respective practices. Munich Re is willing to achieve these goals by ways which include quantitative and qualitative scenarios. Regarding the assumptions for the future greenhouse gas concentration development, we follow the Representative Concentration Pathway (RCP) scenarios (RCP2.6, 4.5 and 8.5) outlined by the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). We also use RCPs in combination with shared socioeconomic pathways (SSPs), which provide patterns of socio-

economic developments broken down to the economic sectors and services. These are used by scientific projections of climate change impacts assessed by the IPCC to inform international climate policy on possible future outcomes. The RCP scenarios are benchmark both for climate science and for climate policy, and they combine the development of atmospheric greenhouse gas concentrations and associated impacts with a timeline, which is important from strategic business view, allowing for judgements on the strategic relevance of scenario outcomes.

Munich Re's preference for combination of quantitative and qualitative scenario emanates from the fundamental thought figure of climate change impacts being hard to disentangle from a multitude of other factors that will change and collectively challenge Property & Casualty (P & C) insurance business in the future. Our position is fully in line the IPCC report: climate change is interwoven with many factors, partly influencing or even aggravating each other.

### **Level 2 -Evidence of how scenario analysis is used to understand the resilience of the organisation's current business strategy against identified material climate risk and how it has been integrated within core risk assessment processes.**

Given the combination of quantitative and qualitative scenario analysis, it is not only the quantitatively assumed scenario pathway of increasing greenhouse gas concentrations and changing frequencies and intensities of hazardous events, which matters in business terms. Linked to this the question how entire regional insurance markets will evolve, which cannot be quantitatively projected, in particular:

how much insurance capacity will be available (for instance for hurricane wind-related property insurance in Florida),

whether or not the tendency for increasingly moderate soft market – hard market – cycles which has been observed over the last decades will continue, and

whether or not risk mitigation through climate change adaptation will be fostered under the imprint of future catastrophes.

These factors will, among others and together with changing frequencies and intensities of the hazard, combine to imprint Munich Re's P & C business and to shape the response by the business and risk management. Hence, qualitative scenario storylines have to address also insurance markets and their mechanisms as a framework for an individual company's response, as research is not capable of projecting insurance market conditions in a quantitative way.

### **Level 3 - Evidence of how the results from the scenario analysis have impacted on key decision making and how strategies might change to address such potential risks and opportunities identified.**

As per our holistic approach to deriving business strategies and investment decisions against the background of identified and anticipated climate change-related risks and opportunities, the impact of scenario analysis on decision making can hardly be singled out and assessed independently. Major identified impacts of climate change-related risks and opportunities on our business, strategy and financial planning are illustrated in Sub-Principle 2.1, Level 1, 2, and 3.

### **Level 4 - Evidence of strong collaboration efforts in the knowledge sharing of risk management and modelling expertise into business (and investment) decision making.**

Knowledge sharing of risk management and modelling expertise plays an important role within our climate governance approach, not only within but also beyond our organisation, in order to address our stakeholders, peers, and the wider market.

This activity is pursued through our Key Experts on climate change-related risks, namely within CU, RID and IRM. Internally, expertise is disseminated through webinars, working groups and the provision of information and input based on individual requests from respective business units.

Externally, experts from RID and CU are engaged in research cooperations and forums to gain additional insights on modelling expertise, to improve data quality and analysis capacities, and to advocate better standards in risk modelling and scenario analysis. Cooperation partners include our industry peers, brokers, regulators, and academic as well as scientific institutions.

As mentioned in Sub-Principle 2.1, Level 1, we provided expertise in the form of speaking engagements, keynotes and panel discussions with client involvement on over 60 occasions in 2019, covering and specifically addressed the issue of risk management and risk modelling.

Collaboration efforts also include the involvement and steering of research projects. Examples are:

**Project ARCS (Analysis of Changes in Risks from Severe Convective Storms in Europe), 2016 – 2019:**

Financed by the Federal Ministry of Education and Research and Munich Re, this project was a cooperation between Munich Re, European Severe Storms Laboratory, German Aerospace Center, who collectively developed an improved model to evaluate climate models on the probability of heavy hail, heavy rain, and tornados, relying also on the provision of data from the insurance sector. The project resulted in a publication of a technical report and subsequently publication of five studies in technical journals.

**Project CAFÉ (Climate Advanced Forecasting of Sub-Seasonal Extremes), 2019 – 2022:**

CAFÉ is a large international research project, financed under HORIZON2020. In the subproject ESR05 “Improving data-based forecasts of ENSO-related extreme weather anomalies on lead times of several months”, we engaged in improving data-based forecasts of ENSO-related extreme weather anomalies on lead times of several months. Munich Re together with the Max-Planck Institute supervise and manage this subproject. Using the idea of a cooperative mode within the climate network, the forecast scheme shall be improved by including additional information (e.g., by accounting for the state of the Pacific Decadal Oscillation and/or the Interdecadal Pacific Oscillation), and by testing different basic variables (replacing surface air temperatures by oceanic variables such as SST, and using recent ocean reanalysis data).

**Insurance Development Forum (IDF) Risk Modelling Steering Group (RMSG):**

We are a member of the IDF Steering Committee at Board of Management level and also engage in the RMSG. The purpose of this working group is to improve the global understanding and quantification of natural hazards disaster risk by developing, sharing and improving the (re)insurance sector’s modelling capability. As part of the working group, we also support a joint initiative between industry and academia to develop an R&D programme for catastrophe modelling.

**Geneva Association (GA):**

Munich Re is a member of the Geneva Association’s working group “Extreme Events and Climate Risks (EE+CR)”, supporting research, publications and conferences. The objective of EE+CR is to link research on climate change-related risks with issues that are of specific relevance to the insurance industry. MR also actively participates in the Task Force on Climate Risk Assessment in Insurance Industry of the GA.

## Principle 3: Lead in the identification, understanding and management of climate risk

### 3.1. Ensure processes for identifying, assessing and managing climate change-related risks and opportunities are integrated within the organisation (including investments).

**Level 1 - Describe current business practices and processes for identifying, assessing and prioritising climate change-related risks and opportunities (including investment processes) by sector, geography and business segment where possible. This should include the use of standard definitions or risk classification frameworks.**

Please note: Parts of this answer may be drawn from other sections of this report, as we see a significant congruence of Sub-Principle 3.1. Level 1 with other Sub-Principles.

#### **Identifying, assessing and responding to climate change-related risks:**

Regarding **physical** risks, all time horizons apply: short-, medium- and long-term.

Annually renewed reinsurance contracts translate into a high adjustment capability of Munich Re regarding climate change impacts on risk assessment, risk management and prices. Adjustments are fed by processing of most recent data and research insights.

In our client relationships the short-term effects of climatic variability are primarily taken into account in weather risk- and P & C business. Decadal climate variability, e.g. the steering impact of the Atlantic Multidecadal Variability on Atlantic hurricane activity, is important in the context of property risk. Supported by research collaborations, we are constantly researching long-term effects of climate change and its interaction with internal climate variability.

Fundamentally, a reinsurer is steering its nat cat business (pricing and capacity offered per region) according to solvability and budgeting criteria which are statistically fixed, presupposing that the risk models' assessment of loss return periods is adequate. As a consequence, in each future point in time the same level of overall Nat Cat risk as of today can be kept, given that our risk assessment tools reflect the true level of nat cat risk. So the main focus from a nat cat risk management perspective is on the presence: to adequately reflect the level of change brought about by climate change so far. This is particularly important for tail risk, where no observational evidence exists, but from scientific modelling some information on changes can be retrieved. It is here where we have to go beyond measuring risk over past decades and include a forward looking component in order to really arrive at the presence, i.e. to include the trends up to the presence.

Munich Re Group adopts a strategic approach to climate change risks, which are potentially affecting the value drivers within the global risk and asset landscape covered by the Group. Therefore, we are combining the experience/expertise of our scientists, specialist underwriters, lawyers, economists, and actuaries in a company-wide risk management process. Climate change-related risks are monitored, evaluated and integrated into Munich Re's Internal Control System (ICS), involving several method steps in detail:

#### 1. Identifying and assessing climate change-related risk

The impact of climate (CC or internal climate variability) on natural catastrophe risk is accounted for in risk assessment on the basis of:

monitoring of changes in meteorological/hydrological drivers of loss events over time in a region, including analyses checking for a causal link to increasing greenhouse-gas concentrations (climate-model-based attribution) or internal climate variability (e.g. Atlantic Multidecadal Oscillation), and

monitoring of concomitant changes in peril-specific nat cat losses over time, normalized to current levels of destructible wealth. The normalization procedure removes the signal of economic growth over time, which per se would cause losses to increase even in the absence of any climate impact.

## 2. Modelling

Given a detected change on the loss side concomitant with detected changes on the weather hazard side caused by climate change or internal climate swings, such results on changes in loss distribution properties over time are included in the risk assessment, risk management and pricing processes. This means, they are included in our risk modelling. Within the internal model, operated by the Risk Management division, we account for changing climate conditions mainly via the model assumptions that are set around frequencies/severities of weather-related hazards.

Munich Re is deeply interwoven with climate science, either by collaborative work with scientific facilities including joint peer-reviewed publications, or by sponsoring research programs. Findings from such analyses on natural hazards, anthropogenic climate change and natural climate variability are constantly improving Munich Re's risk assessment. For examples, please refer to Sub-Principle 2.1, Level 4 and Sub-Principle 2.3, Level 4.

With regard to Identifying, assessing and responding to **transition** risks, as described in Principle 1, numerous experts from various disciplines at Munich Re are concerned with the impacts of climate change. In addition to physical risks, also political, technological, regulatory and market-related - i.e. Transition - risks are identified and thoroughly analysed. Internal working groups have been set up to share the findings between divisions / departments and to develop strategic responses.

### **Identifying, assessing and responding to climate change-related opportunities:**

As mentioned in Sub-Principle 1.2, a network of dedicated climate change experts within the MR Group, together with the climate change-related committees and internal working groups, departmental managers, and staff at the various units is involved with products and questions relating to climate change risks and opportunities.

In particular, leading experts for specific climate change-related risks & opportunities are in place in:

- Climate Change Center of Competence within Division Reinsurance Development (RID), Global Head Climate & Public Sector & Chief Climate and Geo Scientist
- Assessment of climate change-related Physical & Transition risks: Division Corporate Underwriting (CU): Head of Research on Climate Risks and Natural Hazards; + two Head of Sections (ML3) within CU.
- Climate change-related Liability risks (as part of Transition risk assessment): Division Corporate Underwriting, Head of Section (ML3), and Division Global Clients / North America, Leading expert Liability and Insurance Law
- Climate Change-related sustainability projects of Munich Re (Group) (direct report to Group CEO): Management Level 1 & 2, Division Economics, Sustainability & Public Affairs.

Business development and origination activities are usually implemented through co-creation processes across different units and in collaboration of different climate change experts. The Climate Change Center of Competence also supports closely the global reinsurance-wide Corporate Client Management (CCM) on all climate change related topics and also serves as a platform to generate synergies amongst the various international units.

The Climate Change Center of Competence is also responsible for climate and nat cat related communication. Communication to and from Management and Board are steered through the governance framework illustrated in Principle 1.



## **Level 2 - Evidence current business practice and processes for managing and regularly reviewing climate change-related risks and opportunities including how this informs key decision making (and investment decisions).**

Munich Re's risk assessment is being adjusted every few years to the level of increasing risk in the tail and frequency portions of the loss distribution. This can serve as the paradigm of the adjustment procedure.

For more evidence for governance processes for climate risk review, please assess Sub-Principle 1.1, Level 1, and Sub-Principle 1.2, Level 1 and 2.

One example of how decision making is informed by climate change-related risks is the integration of ESG aspects in the investment process for all relevant asset classes. The ESG Ratings that are used in our ESG integration process for equity and fixed income issuers include material climate change-related risks. Examples are metrics on the management of climate risks, including e.g. GHG emission inventories, carbon reduction targets and respective action plans as well as controversies related to climate change such as climate litigations. Our equity and fixed income holdings were screened in an initial analysis against a set of material climate indicators, including several carbon footprinting metrics (absolute, relative, intensity), climate strategy, exposure to physical risks (acute and chronic) and transition risks (e.g. carbon reserves, fracking, oil sands). We are currently in the phase of evaluating the data to ensure sufficient data quality and coverage and plan to assess our portfolio against these metrics on an annual basis.

For more evidence on climate change-related strategic business and investment decisions, please refer to Sub-Principle 2.1, Level 1, 2, and 3.

## **Level 3 - Evidence how these current business practice and processes are integrated into the organisation's overall risk management framework.**

Munich Re has set up a governance system as required under Solvency II. The main elements of this system are the risk management, compliance, audit and actuarial functions. At Group level, risk management is part of the Integrated Risk Management division (IRM) and reports to the Chief Risk Officer (Group CRO). In addition to the Group functions, there are risk management units in the fields of business, each headed up by its own CRO.

The risk strategy, which is aligned with Munich Re's business strategy, defines where, how and to what extent we are prepared to incur risks. The further development of our risk strategy is embedded in the annual planning cycle, and hence in our business planning. It is approved by the Board of Management, and discussed regularly with the Audit Committee of the Supervisory Board as a material element of the own risk and solvency assessment (ORSA) process

Risk management is done in one integrated process with shared responsibilities on different Lines of Defense (LoD).

- 1<sup>st</sup> LoD (Risk taker, takes direct result responsibility): Business and service units
- 2<sup>nd</sup> LoD (Independent risk management function, no result responsibility): IRM
- 3<sup>rd</sup> LoD (Internal audit must not have result responsibility): Audit

Our risk strategy is discussed regularly with the Audit Committee of the Supervisory Board as a material element of the own risk and solvency assessment (ORSA) process. We determine the risk strategy by defining limits and triggers for a number of risk criteria that are based on the capital and liquidity available, and on our earnings target, and provide a frame of reference for the Group's operating divisions.

The incorporation of climate change-related risks in our risk management is secured through the governance and reporting structures depicted in Principle 1.

#### **Level 4 – Evidence how the business assesses its compliance with current and emerging regulatory requirements.**

As mentioned in Sub-Principle 2.2, Level 1, Munich Re's and ERGO's Compliance departments ensure compliance with all applicable laws and regulations, and also observe and assess emerging legal regulation, e.g. through interactions with regulatory authorities.

### **3.2. Support and undertake research and development to inform current business strategies (including investments) on adapting to and mitigating climate change-related issues.**

**Level 1 - Evidence the member's role in developing insurance products and / or new partnerships to support innovation for climate change-related issues mitigation and adaptation. This should include an explanation around how the need for these climate change-related products and innovation has been identified.**

#### **Solutions for clients:**

We cluster our climate change-related activities, products and services under the two main challenges that are implied by climate change as a natural phenomenon. Those two challenges are Adaptation and Mitigation.

Under **adaptation**, the focus lies on first identifying and understanding climate change-related risks of our clients. Adaptation-related activities, products and services are divided once more into three different categories that are based on the benefits they create for our clients. These categories are:

- (1.) understand climate change (sharing expertise and knowledge including training and collaborative dialogue based on over 50 years of opinion leadership in climate risk),
- (2.) measure climate risk (providing forward-looking and analytics tools to integrate climate risks in our clients' strategy and portfolio analysis) and
- (3.) manage climate risk (offering products and services to enable our clients to actively manage their climate change-related risks and increase climate resilience).

Adaptation-related products and services in the three aforementioned categories include:

Understand climate change:

→ sharing expertise and knowledge based on over 50 years of opinion leadership in climate risk

Examples include:

- information campaigns / awareness building on nat cat trends and climate change-related implications for insurance and industry clients (e.g. TOPICS Online, varying climate change-related information campaigns on the Munich Re webpage, contributions via social media etc.)
- provision of historical nat cat data as a basis risk assessment and further analysis (e.g. through our NatCat SERVICE)

Measure climate risk:

- products and services to enable our clients to actively manage their climate change-related risks and increase climate resilience

Examples include:

- Location Risk Intelligence Platform, a cloud-based tool, formerly known as NATHAN. It is available for individual locations or entire portfolios and comprises to different versions.
  - o The Natural Hazard Edition assesses risk based on a series of map layers with hazard and risk ratings based on Munich Re's cat risk model. Further information can be found in the Annex to this report.
  - o The Climate Change Edition assesses risk based on internationally agreed scenarios for greenhouse gas emissions (Representative Concentration Pathways, RCP) until the year 2100. Further information can be found in the Annex to this report.
  - o Thanks to the modular structure, both editions can be supplemented with one another at any time.

Manage climate risk:

- ➔ enabling our clients to actively manage climate change-related risks and increase their resilience

Examples include :

- NatCat reinsurance
  - o substantial **nat cat underwriting capacity** in areas with high exposure to natural hazards
  - o advanced claims management tools, such as **Remote Industries hurricane tool** to accelerate response time for insurers and help their clients to recover as quickly as possible
- Parametric weather & agro insurance
  - o non-catastrophic **parametric weather risk transfer solutions** for all industry sectors, including coverage of nat cat risk for asset portfolios of financial institutions
  - o **parametric agro-insurance** products for crops, agricultural revenue, livestock, greenhouses, and forestry plantations.
  - o Dual trigger products: quantity-adjusting options which combine volumetric (weather) and price (commodity) triggers: So far, Munich Re has developed tools for **standardized parametric trigger products** for earthquakes and tropical cyclones.
- Sovereign and public-private NatCat risk transfer schemes
  - o partnerships with international development banks, donor governments and other stakeholders to provide **reinsurance to private or state-owned local insurers**.
  - o Examples include: Caribbean Catastrophe Risk Insurance Facility (CCRIF) for Caribbean states, Fondo Nacional de Desastres Naturales (FONDEN) for Mexico and Natural Disaster Insurance Scheme (NNDIS) for Sri Lanka

**Mitigation** on the other hand means to slow the pace of climate change and to minimise its extend. Achieving the 2°C target requires new technologies for power generation, energy storage, transport, and industrial production. We therefore craft insurance solutions for such technologies in order to smooth the path to their market entry.

Mitigation-related products and services include risk transfer solutions for green and low carbon technologies:

- **Photovoltaic**
- **On- and Off-Shore Wind**

- [Bioenergy & Waste-to-Energy](#)
- [Geothermal Energy](#)
- [Battery Performance & Fuel Cells](#)
- [Energy Efficiency Insurance](#)

The risk transfer solutions focus follow the approach that by minimising the risk associated with adopting these innovative technologies (e.g. through risk transfer during construction or performance guarantees), we hope to make these technologies more attractive to investors and to accelerate their growth in the market. For more information on the respective technology transfer solution, click on the hyperlinks above.

### **Partnerships:**

We are engaged in a number of formal and informal partnerships on climate-related activities on:

- know-how generation (e.g. research partnerships with Universities, acatech, Geneva Association)
- business development (e.g. “Wirtschaft macht Klimaschutz” (Germany), Australian Business Roundtable (Australia), Insurance Development Forum (IDF) (globally))
- knowledge translation and knowledge transfer on risk prevention (e.g. Insurance Institute for Business & Home Safety (IBHS) (USA))

Over decades, Munich Re also has played an active role in a range of national and international climate protection organisations, such as the United Nations Environmental Programme and the Global Climate Forum. We wish to contribute our expertise as a valuable partner for political decision-makers, organisations and other enterprises.

### UNEP FI's PRI and UNEP FI's PSI:

We are member of various industry initiatives like UNEP FI's PRI initiative and the UNEP FI's PSI initiative. As part of UNEP FI PSI, Munich Re is participating with 22 leading insurance companies in a pilot project to implement the TCFD recommendations. In order to drive our commitment to achieve a GHG-neutral investment portfolio by 2050, we joined the UNEP FI's Net-Zero Asset Owner Alliance.

### Insurance Development Forum (IDF):

We also participate in public private partnerships to develop and market innovative insurance solutions for climate risks, especially through our membership in the Insurance Development Forum (IDF).

Particularly in emerging and developing countries, it is essential to promote adaptation to climate change in the form of insurance-related risk management mechanisms. For more information, please assess Sub-Principle 2.3, Level 4.

### InsuResilience:

Munich Re supports the InsuResilience initiative. Founded in 2015 by the G7 countries, this initiative aims to enable an additional 400 million people in developing and emerging countries to access insurance products covering weather and climate risks by 2020. The initiative is primarily financed by industrialised countries. However, at the same time, as part of the InsuResilience Global Partnership, it relies on the active involvement of the G20 and V20 countries, as well as close cooperation with civil society, insurers and the scientific community.

“Wirtschaft macht Klimaschutz”:

Further engagements include a membership in the German dialogue forum “Wirtschaft macht Klimaschutz“, which engages various companies across all industries in sector specific working groups to develop new strategies for climate protection.

“Verein für Umweltmanagement und Nachhaltigkeit in Finanzinstitutionen e.V.”:

A similar alliance in the German market which we are also engaged in as a member is the "Verein für Umweltmanagement und Nachhaltigkeit in Finanzinstitutionen e.V"., an association particularly addressing environmental management and sustainability amongst financial institutions.

PEIF – Pan-European Insurance Forum:

The PEIF advocates for a carbon tax or an effective emission trading system. It does not favour any of the two instruments over the other, but ask policy makers to incentivize. Munich Re has drafted their position and the Group CEO is a member of PEIF.

Reinsurance Advisory Board (RAB) of Insurance Europe:

The Insurance Europe Reinsurance Advisory Board (RAB) is a specialist representative body for the European reinsurance industry. It is represented at CEO level by seven major reinsurers: Gen Re, Hannover Re, Lloyd’s of London, Munich Re, Partner Re, Scor and Swiss Re, with Insurance Europe providing the secretariat.

One of the key objectives of the RAB is to stimulate and maintain a stable, innovative and competitive reinsurance market environment. It aims to achieve this by promoting a regulatory framework that facilitates global risk transfer through reinsurance and other insurance-linked capital solutions. Munich Re's Reinsurance CEO is a member of the RAB.

German Insurers' Association (GDV):

German Insurers' Association is promoting sound climate risk management in insurance industry, has issued several reports on the topic, and is commenting on upcoming regulation on climate change risk management on the side of regulatory bodies in Europe, in particular EIOPA and BaFin.

Munich Re participated extensively in working committees on climate change risk projections at the German Insurers' Association level, and is actively providing input to the German Insurers' Association commenting on upcoming regulation. Apart from this Association-based working stream, Munich Re also directly talks to regulators worldwide on topics such as climate risks management.

World Economic Forum:

The World Economic Forum is an independent international organization committed to improving the state of the world by engaging business, political, academic and other leaders of society to shape global, regional and industry agendas. The WEF 2015 in Davos highlighted the urgent need to act accordingly.

Chief Risk Officers Forum (CRO Forum):

The CRO Forum is a group of Chief Risk Officers from large multi-national insurance companies that focuses on developing and promoting industry best practices in risk management. One of its core aims is the Emerging Risk Initiative with particular emphasis on the effects of climate change.

As a founding member, Munich Re actively participates in developing best practices endorsed by the Forum. In 2019, we participated in the CRO Forum Carbon Footprinting Working Group.

Net-Zero Asset Owner Alliance (NZAOA):

The NZAOA is an international group of 28 institutional investors (as of 3rd August 2020) delivering on a bold commitment to transition their investment portfolios to net-zero GHG emissions by 2050. As already mentioned earlier (e.g. Sub-Principle 2.1, Level 2), we committed to the Net Zero Asset Owner Alliance, and therefore to an alignment of our portfolio to a 1.5° world and net zero emissions by 2050.

acatech:

The German National Academy of Science and Engineering (“acatech”) is a working academy bringing together high-level experts from the scientific, political and private-sector/industrial community. As member we are part of the topic group “Energy & Resources” fostering energy systems for tomorrow, (in collaboration with the German Academies of Sciences.

#### **Level 2 - Evidence the member's role in improving data quality issues to inform the research and analytics of climate change-related issues.**

For evidence regarding our role in improving data quality issues and to inform the research and analytics of climate change-related issues, please refer to Sub-Principle 2.1, Level 4, and Sub-Principle 2.3, Level 4.

#### **Level 3 - Evidence of how the development of new products / partnerships to address climate change impacts the business and addressed the most significant issues or opportunities as identified by the organisation.**

The products and partnerships described in Sub-Principle 3.2. Level 3 are the result of our climate change and underwriting expertise and knowledge based on over 40 years of opinion leadership in climate risk.

Naturally, the products and partnerships we designed and committed to mirror our engagement towards solving the most significant issues that we have identified in the context of climate change. These are

- the increasing losses related to climatological and meteorological patterns that can be attributed to climate change
- the insurance gap between overall economic and insured losses; we specifically focus on innovative solutions for developing and emerging countries and related partnerships (e.g. multilateral development banks, UN organizations, IDF)
- the technological transformation and the design of favourable risk transfer solutions that is required to accelerate the shift towards a low-carbon economy

## **Principle 4: Reduce the environmental impact of your business**

### **4.1. Encourage our suppliers to improve the environmental sustainability of their products and services, and understand the implications these have on our business.**

#### **Level 1 - Evidence of an environmental / sustainable procurement policy that is applicable across all operations.**

Our responsible corporate governance extends far beyond our core business, and also influences all our procurement activities. The benchmark in our procurement decisions is best total value in terms of the criteria quality, time, and cost. Environmental and social aspects and good management practices also play a crucial role.

We have established appropriate procurement principles for working with our suppliers. Based on the principles of the UN Global Compact, our procurement principles help protect human rights, abolish forced labour and child labour, uphold both the freedom of association and the right to collective bargaining.

Furthermore, they combat corruption and enforce environmental protection. Accordingly – and as a requirement for cooperation – Munich Re expects its business partners to likewise commit to those of our principles that explicitly cover human rights and the protection of our environment.

Click on the links for further information on [central procurement](#) and our [procurement principles](#).

#### **Level 2 - Evidence of work and services undertaken to assess the environmental sustainability of products purchased and any corrective action taken.**

As a prerequisite for cooperation, Munich Re expects all suppliers to comply with the principles laid down in the UN's Global Compact, including principle 7–9 regarding environmental sustainability:

- Principle 7: Businesses should support a precautionary approach to environmental challenges.
- Principle 8: Businesses should undertake initiatives to promote greater environmental responsibility.
- Principle 9: Businesses should encourage the development and diffusion of environmentally friendly technologies.

Procurement departments at Munich Re (primary insurance and reinsurance) are responsible to include relevant corporate responsibility clauses in supplier agreements.

If the environmental sustainability of products we purchase turns out to be insufficient, we actively seek dialogue to remedy any deviations from our guidelines. If this does not prove successful, Munich Re reserves the right to extraordinary termination for good cause.

#### **Level 3 - Describe how broader environmental / climate change-related issues impact your supply chain / value chain and how you have engaged with selected suppliers to improve the sustainability of products and services.**

In 2019, compliance with UN Global Compact criteria was anchored in approximately 78 % of our framework agreements. Should an infringement occur during the term of contract with one of our suppliers, we actively seek dialogue with our contracting parties, as already mentioned before. It is our aim to resolve any conflicts with our guidelines and to improve the sustainability of products and services. If this is not possible, we reserve the right to extraordinarily terminate a given contract for good cause.

For reasons of confidentiality, we do not name any cases in which we interacted with suppliers regarding environmental issues.

## 4.2. Disclose our Scope 1, Scope 2 GHG emissions and Scope 3 GHG emissions using a globally recognised standard.

### Level 1 - Disclose Scope 1 and Scope 2 GHG emissions and Scope 3 GHG emissions.

We calculate our annual carbon emissions in a standardised manner in conformity with internationally recognised methods and conversion factors, such as the GHG Protocol. An external auditing company confirmed that we met the required standards for environmental indicators throughout the Group since 2015 (See our [Independent Auditor's Limited Assurance Report, CR-Report 2019](#), p. 85).

#### Sources of CO<sub>2</sub> emissions:

- **Scope 1:** Direct emissions from primary energy consumption (natural gas, heating oil, emergency diesel power), fuel for company cars,
- **Scope 2:** Indirect emissions from procured energy (purchase of electricity and district heat),
- **Scope 3:** Other indirect emissions (business trips, consumption of paper and water, waste).

Scope 1	Unit	2019**
Direct energy consumption	MWh total	159,443
	MWh/ employee	4.0
CO <sub>2</sub> emissions from direct energy consumption	Metric tonnes (t) total	44,023
	Metric tonnes (t) per employee	1.11

Scope 2 <sup>1</sup>	Unit	2019**
Indirect energy consumption	MWh total	201,455
	MWh/ employee	5.10
CO <sub>2</sub> emissions from indirect energy consumption (market-based)	Metric tonnes (t)	27,226
	Metric tonnes (t) per employee	0.69
CO <sub>2</sub> emissions from indirect energy consumption (location-based)	Metric tonnes (t)	63,813
	Metric tonnes (t) per employee	1.61

<sup>1</sup> Green electricity is considered for the first time in 2016

\*\* These quantitative environmental indicators are verified Group-wide by an external auditing company.



Scope 3	Unit	2019**
Other indirect CO <sub>2</sub> emissions (water, waste, paper, travel) - Scope 3	Metric tonnes (t) total	27,144
	Metric tonnes (t) per employee	0.68

**Level 2 - Disclose Scope 1 and Scope 2 GHG emissions and Scope 3 GHG emissions with an absolute or intensity target against a baseline.**

**Intensity Target**

In 2015 we set the company-wide intensity target to reduce our carbon emissions per employee (Scope 1, Scope 2 (market-based) and Scope 3 (upstream)) by 35% until 2020 compared with the base year 2009. In 2017, we already achieved this reduction target with 39% less carbon emissions and in 2019 we reduced our carbon emissions by 44% compared with our base year 2009.

**Absolute Target:**

Since 2015, Munich Re (Group) has been committed to maintaining carbon neutrality in our operational processes. We compensate unavoidable carbon emissions by purchasing carbon certificates. We follow strict requirements when selecting offsetting projects. Thus, every year we have the target to neutralise not avoidable carbon emissions.

For example, at least one of the projects must meet the Gold Standard and be implemented in one of the world's least developed countries. In addition to avoiding carbon emissions, we also place a special emphasis on maintaining social standards. We primarily support projects that promote health, facilitate education, develop local infrastructure, avoid deforestation and maintain biodiversity. To achieve carbon neutrality for the financial year 2019, we obtained carbon certificates from the following projects (see our [Corporate Responsibility Report 2019](#), p. 64):

- Wind farms in the Shandong region in China
- Efficient cooking stoves in Uganda

Munich Re is a partner in the "Alliance for Development and Climate", launched by the German Federal Ministry for Economic Cooperation and Development in 2018. The initiative's aim is to promote voluntary involvement in climate protection activities. It is intended to assist companies and organisations in reducing their emissions wherever possible and to compensate for the remainder by supporting effective climate protection projects in emerging and developing countries. These focuses are, for example, on developing renewable energy systems and on afforestation and forest protection. Munich Re is part of a group of around 200 partners made up of companies, public authorities and civil society organisations.

**Level 3 - Disclose Scope 1 and Scope 2 GHG emissions and Scope 3 GHG emissions with performance trend and accompanying narrative.**

Scope 1	Unit	2019**	2018	2017	2009 (base year)
	MWh total	159,443	165,385	170,440	195,291

Direct energy consumption	MWh/employee	4.0	3.99	4.02	4.13
CO <sub>2</sub> emissions from direct energy consumption	Metric tonnes (t) total	44,023	45,730	47,880	65,932
	Metric tonnes (t) per employee	1.11	1.10	1.13	1.4

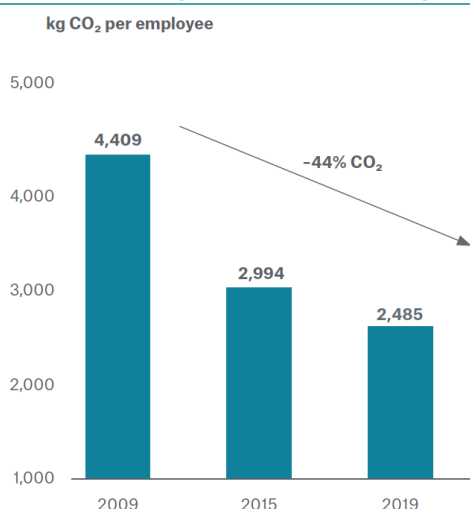
Scope 2 <sup>2</sup>	Unit	2019**	2018	2017	2009 (base year)
Indirect energy consumption	MWh total	201,455	217,714	237,893	348,885
	MWh/employee	5.10	5.26	5.61	7.38
CO <sub>2</sub> emissions from indirect energy consumption (market-based)	Metric tonnes (t)	27,226	31,713	39,834	117,476
	Metric tonnes (t) per employee	0.69	0.77	0.94	2.49
CO <sub>2</sub> emissions from indirect energy consumption (location-based)	Metric tonnes (t)	63,813	68,237	79,426	
	Metric tonnes (t) per employee	1.61	1.65	1.87	

Scope 3	Unit	2019**	2018	2017	2009 (base year)
Other indirect CO <sub>2</sub> emissions (water, waste, paper, travel) - Scope 3	Metric tonnes (t)	27,144	25,581	25,563	33,352
	Metric tonnes (t) per employee	0.68	0.62	0.6	0.71

<sup>2</sup> Green electricity is considered for the first time in 2016

\*\* These quantitative environmental indicators are verified Group-wide by an external auditing company.

## Carbon footprint Munich Re Group



Our Environmental Management System and the commitment of our employees are keeping us on course to achieve or exceed our objectives. We met our carbon reduction target of 35% already in 2017 – with 39% less carbon emissions and, in 2019, we achieved a 44% carbon reduction. In the year under review, we procured approx. 90% of our electricity requirements Group-wide from renewable energy sources. And we will renew our environmental and climate protection strategy and targets in 2020.

For more information about our environmental performance please have a look at our [Corporate Responsibility Report 2019](#) (Chapter Environment p. 58–64 and Key figures p. 73–76).

### Level 4- Describe the methodologies used to calculate GHG emissions metrics and targets.

To calculate the Group-wide carbon savings targets, from 2009 to 2015 (–10%, kg of CO<sub>2</sub> per employee), we used the conversion factors of the Greenhouse Gas Protocol (GHGP) and the Association for Environmental Management and Sustainability in Financial Institutions (VfU) – from 2011 in each case. Green electricity was not included in the accounting, thereby ensuring that the quantitative values remained comparable over the target period. In 2015, a new environmental and climate protection strategy was approved by the Board of Management and the CO<sub>2</sub> savings target was expanded – from 2009 to 2020 we want to achieve Group-wide CO<sub>2</sub> savings (kg per employee) of 35%. The figures from 2017 to 2019 are only comparable to a limited extent with the 2009 figures. This is because different conversion factors are used for the calculation of carbon emissions, and due to differences in the calculation of carbon emissions from renewable energy. From 2016, the Group's carbon emissions is calculated using the latest conversion factors from the GHG Protocol and the VfU. We use the GHG Protocol for the conversion of Scope 1 emissions (direct energy), for electricity falling under Scope 2 emissions (indirect energy), and for the “short- and long-haul flights” components of the “business trips” element of Scope 3 emissions. The Group-wide share of electricity from regenerative sources of 90%\*\* (2018: 86%) is calculated with 0 emissions. A market-based approach is used to calculate the Scope 2 emissions resulting from electricity consumption, taking into account the fact that a share of 90%\*\* was derived from regenerative energy sources and calculated as emission-free. For the remaining electricity consumption, country-specific conversion factors we use that derive from the average local power mix for the conversion to carbon emissions. The VfU conversion factors are taken as the basis for calculating the Scope 2 emissions “district heating” and the Scope 3 emissions from paper, water and waste, as well as the “taxis, hire cars, train journeys” components of the “business trips” element. Business trips with company cars are calculated with individual factors for the fleet in question, assuming they are available. If not, the VfU conversion factor is used.

Protocols / standards we use to calculate GHG emissions:

- The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)
- The Greenhouse Gas Protocol: Public Sector Standard
- VfU (Verein für Umweltmanagement) Indicators Standard

#### 4.3. Measure and seek to reduce the environmental impacts of the internal operations and physical assets under our control.

**Level 1 - Disclose other key environmental quantitative and qualitative data (not GHGs) used to measure and manage priority climate change-related risks and opportunities within the business's operations and outline how these have and are planning to change over time.**

Global renewable electricity consumption:

In 2015 we set the target of 100% electricity from renewable sources in 2020 (compared with our base year 2009). In 2019 we have achieved a Group-wide share of electricity from regenerative sources of 90%.

Energy	Unit	2019	2018	2017	2009 (base year)
Total energy consumption (Scope 1 and 2)	MWh total	360,897**	383,101	408,334	543,365
	MWh/employee	9.10**	9.25	9.63	11.50
Percentage of total electricity consumption from green electricity	Share in %	90**	86	78	28

Low-carbon energy consumption through wind energy

Through our investments in wind energy we save 36,586 metric tonnes CO<sub>2</sub> annually (Scope 2 market-based). This is a voluntary initiative which contributes to our target of 100% electricity from renewable sources Group-wide in 2020.

Energy efficiency in buildings

To increase energy efficiency in our buildings is of high priority to us. Because the installation of LED has a high impact on energy efficiency of lighting, we install LED Group-wide combined with modernisation measures in premises. In addition, in 2019 40% of our staff was employed at ISO 14001-certified locations.

Further, we focus on the energy efficiency of our cooling systems. For example, ERGO replaced its cooling units in the spring of 2019. New technology along with some minor alterations to the cooling supply enabled us to use our cogeneration systems even more effectively. Compared to the previous solution, this saves around 500,000 kilowatt hours a year – and generates an even larger amount of electricity – so ERGO profits both financially and ecologically.

Digital communication

Munich Re promotes the use of digital communication features such as Skype or Microsoft Teams to avoid the frequency of travelling especially to Munich Re's branches and subsidiaries. In order to ensure that our employees are well-equipped to deal with digital communication features, we set up the "Digital School" in 2018. This is a comprehensive digital training programme for all employees in the reinsurance business field with the objective to ensure that each employee has at least a basic knowledge of the digital technologies and trends that affect us.

#### Environmentally friendly mobility

ERGO introduced an Eco and safety driving training for everyone who drives a company car – and with great success: The fleet's carbon emissions have dropped by 20 percent. We also critically examine whether any business trip can be replaced by a Skype conference. We recently developed a mobility concept and our plan is to gradually integrate new mobility services and technologies. It is important to us that our employees are able to organize their mobility mix independently, in a needs-oriented manner, that is flexible and sustainable. So, for example, we plan to expand car sharing and to test a shuttle service between ERGO's Cologne and Dusseldorf locations. The latter would be similar to the daily shuttle service from ERGO-Platz to Dusseldorf Airport and, preferably, all-electric. Additionally, we are currently testing an e-vehicle for use in sales. So far, the feedback has been consistently positive.

#### Sustainable consumables

We have raised the percentage of recycled consumables such as paper (50% more recycling paper in 2019 compared to 2018) and we foster paperless administration through use of electric files. In addition, We have reduced water usage by installing efficient equipment and detecting leakage.

#### Environmental responsibility of our employees

We promote environmental awareness and responsibility among all our staff and motivate them to engage in active environmental protection and continually improve our environmental performance. We create transparency and support staff initiatives and measures.

**Level 2 - Evidence of a narrative relating to the environmental performance made (against these metrics) over the past year showing that the organisation understands how and where it has achieved progress as well as what it needs to do differently. Environmental data should be provided for historical periods to allow for trend analysis.**

We have adopted the carbon footprint of our operational activities as the key indicator for assessing our environmental record. Therefore, we focus on the calculation of the annual carbon emissions that result from our consumption of energy, paper and water, business travel, and waste generation. For our environmental performance against these metrics please see 4.2 and our [Corporate Responsibility Report 2019](#), p. 75 f. Other measures that we pursue (see 4.3 Level 1) are not evaluated to the same extend.

This is done in a standardised manner conformity with internationally recognised methods and conversion factors, such as the GHG Protocol. An external auditing company confirmed that we met the required standards for environmental indicators throughout the Group since 2015.

**Level 3 - Evidence of targets (quantitative and qualitative over the short, medium and long term) set to manage climate change-related risks and opportunities (associated with operational impact), and of variance analysis regarding performance against targets.**

Our environmental targets address climate change-related risks in our operational business. For a description of these targets please assess Sub-Principle 4.2, Level 3. Further, we publish our environmental targets and our performance against these targets in our [Corporate Responsibility Report 2019](#), p.60. We will renew our environmental and climate protection strategy and targets in 2020.

**Level 4 - Describe the methodologies used to calculate metrics and targets.**

Munich Re's data collection is Group-wide executed with a data based system (SoFi) that provides a unique systematic for data gathering and calculation of the carbon equivalents. To calculate the carbon equivalent of paper and water the VfU (Association for Environmental Management and Sustainability in Financial Institutions) conversion factors are taken as the basis. In 2019, 83% of employee are covered by reporting of environmental data. To achieve 100% of coverage, data are extrapolated - on site and on Group level. The resulting CO2 emissions are externally validated by a third party.

**Level 5 - Evidence the organisation's number and nature of environmental impact reduction projects.**

There are three environmental reduction projects:

- Project 1: Low-carbon energy consumption through wind energy
- Project 2: Energy efficiency in buildings
- Project 3: Enhancement of digital communication

For more information on these projects, assess Sub-Principle 4.3, Level 1.

**4.4. Engage our employees on our commitment to address climate change, helping them to play their role in meeting this commitment in the workplace and encouraging them to make climate-informed choices outside work.**

**Level 1 – Evidence of engagement activities conducted throughout the year.**

Employee engagement with respect to business travel:

In cooperation with our travel agency with every request for business travel the respective employee will be informed about the respective carbon impact of the trip to enhance awareness.

For trips within Germany, employees are asked to consider travelling by rail instead of plane.

“Climate-friendly menu”:

From October 2019, about 18,000 employees from Munich Re, ERGO and MEAG in Germany have been able to choose a "climate-friendly menu" once a week in any of the Group's canteens in Germany. The menu offers regional products which, where possible, are organically produced. Thereby, we address the problem of carbon intensive food production and engage our employees in the progress towards a more climate-conscious food consumption.

Employee Commuting:

The majority of our staff works in offices located in cities with a public transport system and bike lanes. At several locations, Munich Re incentivizes its staff to use these systems through offering of "job tickets", a public transport system for a reduced price, or to use the bike offering a leasing system for company bikes offered exclusively to parts of our staff.

"Bit-away-days" 2019

Deleting unused data increases storage space. This in turn saves electricity used to operate and cool systems – and creates less carbon, which reduces impact on the environment and the climate. Happily, the campaign not only reduces the burden on our servers and the environment, but also assists children in need. ERGO employees from ten countries deleted 9,056 gigabytes of obsolete data from their PCs in November 2019 as part of the so-called "Bit-away-days". ERGO donated what it saved on energy costs – a total of around €90,000 – to "Save the Children".

For more information about our engagement activities please see our [Corporate Responsibility Report 2019](#) (p. 58–64).

### **Level 2 - Evidence of a continued programme of engagement aligned to material impacts and measurement of the uptake and impact of the activities conducted.**

As described before (4.4 Level 1), Munich Re and ERGO run an exclusive Corporate Innovation Programme with the DACH Climate-KIC Accelerator, which includes a successful accelerator for cleantech start-ups. Young entrepreneurs who develop businesses focusing on positive climate impact and sustainability are supported financially and through individual coaching by Munich Re experts. The winter batch of 2018/2019 was the biggest to date with nine start-ups selected for the third and fourth accelerator phases. They received €190,000 in direct financial grants from Munich Re and ERGO as well as 660 hours individual coaching, workshop hours and expert mentoring. Over the six-month batch period the start-ups also managed to raise an additional €2m.

### **Level 3 - Evidence of a comprehensive programme of engagement across the business with the implementation of engagement targets (over the short, medium and long term).**

For Munich Re it is of great importance to engage its employees on its commitment to address climate change. Therefore, a variety of engagement measures have been implemented, as described in Sub-Principle 4.4, Level 1.

## **Principle 5: Inform public policy making**

### **5.1. Promote and actively engage in public debate on climate change-related issues and the need for action. Work with policy makers locally, regionally, nationally and internationally to help them develop and maintain an economy that is resilient to climate risk.**

#### **Level 1 - Evidence of engagement activities throughout the year, to influence public policy on climate mitigation and adaptation.**

Our Public Affairs department, responsible for lobbying governments, national and supranational authorities, associations and other organizations on behalf of Munich Re (Group), is located in the Central Division Economics, Sustainability and Public Affairs (ESP). This results in a strong alignment with our Sustainability department. Furthermore, frequent exchanges between the lobbying department, the Climate Change Center of Competence (Reinsurance Development, RID) and our Head of Research concerning climate risks and natural hazards (Corporate Underwriting, CU) are in place.

Our Group Lobbying Committee has the objective to coordinate the lobbying activities throughout the entire Group along the Group's lobbying strategy in relation to specific topics. It is responsible for the identification and prioritisation of lobbying topics and for the coordination of the content-specific positioning of the Munich Re Group. The Group Lobbying Committee meets four times a year with representatives of Munich Re, ERGO and MEAG, both from the central and divisional units.

Over decades, Munich Re has played an active role in a range of national and international climate protection organisations, such as the United Nations Environmental Programme and the Global Climate Forum. We wish to contribute our expertise as a valuable partner for political decision-makers, organisations and other enterprises. Thereby, we pursue a holistic approach: On the one hand, we focus on strengthening resilience to minimize the impact of unavoidable impacts of climate change (adaptation). On the other hand, we focus on slowing the pace of climate change and to contribute to achieving the "below 2°C" target by crafting insurance solutions for low-carbon technologies (mitigation).

In terms of public policy engagement, we hold the following positions:

#### Support of the UN Climate Change Conferences

Munich Re is committed to achieving the goals set by the Conference of the Parties (COP) on climate change in Paris and has undertaken to make its own independent contributions to combating climate change.

We closely follow the discourses and decisions at the annual UN Climate Change Conferences and are actively involved in panel discussions, keynotes and other side events on site in order to provide our expertise on climate risk and to exchange on possible solutions and co-ideation potentials to derive at innovative and effective climate risk transfer solutions and enabling solutions for low-carbon technologies.

#### Support of Climate finance

Munich Re's Head of Economics, Sustainability and Public Affairs is representing Munich Re in the Sustainable Finance Committee that advises the German government on the development and implementation of its Sustainable Finance Strategy. The Committee was appointed by the Federal Government on 6 June 2019.

#### Support of stress testing and climate scenario analysis

We talk with regulatory bodies worldwide on climate risk management, including relevant concepts from the TCFD context, such as climate scenario analysis and support regulation on climate risks.

#### Support the transition towards a low-carbon economy:

Munich Re's CEO is urging European policymakers to introduce a meaningful price on carbon emissions that create financial incentives to accelerate the switch from fossil fuel to renewables.

Our CEO also publicly requires a new approach worldwide to limit global warming, whether in terms of power generation based on renewable energies, in transport, energy storage, or industrial production. Munich Re seeks to aid the breakthrough of these climate-friendly and sustainable technologies. Insurance solutions protecting against specific risks, thereby enhancing the appeal of the technologies for investors and strengthening their financing viability, are one component in this context.

Munich Re's CEO stated his position towards carbon emission costs and the need of new technologies (for electricity generation, transport, storage and industrial production) on several occasions, such as



for instance with Interviews (e.g. Financial Times, Handelsblatt), at Munich Re Annual General Assembly, via CEO Statement at Munich Re Corporate Responsibility Report, etc.

In addition, the CEO has sent a clear signal concerning Munich Re's position on the introduction of a meaningful price on carbon emissions, either by emission trading or carbon tax via articles in newspapers.

## **Level 2 - Evidence of prioritising engagement to achieve impact aligned to material climate change-related issues.**

Support the InsuResilience Global Partnership:

Founded in 2015 by the G7 countries, this initiative initially aimed to enable an additional 400 million people in developing and emerging countries to access insurance products covering weather and climate risks by 2020. In 2019 the time horizon of the initiative has been extended to 2025 and the target ambition increased to 500 million people. The initiative is primarily financed by industrialised countries. However, at the same time, as part of the InsuResilience Global Partnership, it relies on the active involvement of the G20 and V20 countries, as well as close cooperation with civil society, insurers and the scientific community. Munich Re supports this initiative with expertise and offered participation in risk transfer solutions (if in line with our risk appetite). We also indirectly support this initiative through our engagement in the Insurance Development Forum (IDF).

Support the MCII Initiative and its projects:

The Munich Climate Insurance Initiative (MCII) was founded back in 2005, following an initiative by Munich Re and representatives from the World Bank, NGOs and academia. Since then, MCII has participated in the global climate negotiations (COPs), providing suggestions on risk management. MCII has also provided technical support in the discussions on dealing with losses from climate change under the UNFCCC Loss and Damage programme and the Warsaw International Mechanism.

In 2019, Climate Change was one of our main areas of focus: We support the resolutions of the Paris climate protection agreement. We factor into our business processes climate effects at risk measurement, business development and asset management levels. We also participate in public and private initiatives to develop and market innovative insurance solutions for climate risks.

## **Level 3 - Evidence of a leadership position or strong collaboration efforts in the engagement of others on matters relating to climate change.**

Examples of our leadership in engaging external stakeholders and society at large on climate change are given below.

### **Climathons 2019**

Munich Re and ERGO sponsored Climathons in four cities in 2019: Munich, Sydney, Vilnius and Tallinn. Under the name "Climathon", Climate-KIC organizes climate protection hackathons worldwide. The common goal is to develop local solutions to urgent challenges posed by climate change and to improve the resilience of cities. Climathon participants have just 24 hours to craft their concepts. Joint teams consisting of students, founders of start-ups, municipal representatives and local business people each worked on different types of challenges tailored to each city's needs. Nearly 400 people – including Munich Re and ERGO employees, trainees and clients – took part in the events we sponsored in the four cities. All in all, 49 teams worked on coming up with solutions to 11 different challenges.

## Tackling Climate Change Together (TCCT)

Our engagement in climate protection is concentrated on the Tackling Climate Change Together (TCCT) initiative which is driven by both Munich Re and ERGO. The initiative supports projects that focus on impacting climate change and sustainable innovation – by contributing experience, expertise and financial assistance.

## Climate-KIC (Knowledge & Innovation Community)

Munich Re and ERGO run an exclusive Corporate Innovation Programme with the DACH Climate-KIC Accelerator. Climate-KIC (Knowledge & Innovation Community) is the European Union's largest public-private climate initiative. It includes a successful accelerator for cleantech start-ups, which supports young entrepreneurs who develop businesses focusing on positive climate impact and sustainability. The programme was launched in 2017. So far Munich Re and ERGO have sponsored 15 start-ups. In 2019 nine start-ups were selected and received €190,000 in direct financial grants and 660 hours individual coaching, workshop hours and expert mentoring.

## Munich Re Foundation:

Through the Munich Re Foundation, we pursue our objective to prepare people for climate change-related risks and to improve their livelihoods. For 2020, the foundation's guiding theme is "Climate change, climate protection". Debates revolve around climate change impacts and resilience strategies, especially in the global south.

## **5.2. Support and undertake research on climate change to inform our business strategies and help to protect our customers' and other stakeholders' interests. Where appropriate, share this research with scientists, society, business, governments and NGOs in order to advance a common interest.**

### **Level 1 - Evidence that the member has supported or undertaken research during the year in question, with a brief description of the research focus, the financial year in which any support was given, outcomes and an explanation of how this research has been used to inform business strategies and advance the common interest.**

Munich Re is deeply interwoven with climate science, either by collaborative work with scientific facilities including joint peer-reviewed publications, or by sponsoring research programs. Findings from such analyses on natural hazards, anthropogenic climate change and natural climate variability are constantly improving Munich Re's risk assessment.

For information on other research collaborations and project examples, please assess Sub-Principle 2.1, Level 1, and Level 4; Sub-Principle 3.2, Level 1.

### **Level 2 - Additional requirement to undertake action to proactively promote knowledge sharing within the industry by sharing the research and engaging others in the research topic.**

We undertake numerous proactive measures to share our research insights and to engage with others on topics around climate change-related risk. Examples include:

#### cDays:

Our client conference "cDays" works as our annual get-together for provoking thought leadership. Here, we jointly discuss new trends, innovative ideas and product solutions for the insurance industry. In 2019, our "cDays" focused on global challenges, explicitly addressing climate change. We hosted 150

participants from 30 different countries (including 40 clients), and enjoyed more than 75 speakers (incl. 3 Munich Re board member) throughout the conference.

#### Online Communication:

On our webpage, we regularly introduce new information campaigns in our online magazine **TOPICS Online**, where, besides other topics, we prominently address the issue of climate change-related risks and challenges to adapt to and to mitigate climate change.

Furthermore, we engage on climate change-related topics and scientific discussions across various social media channels, through press interviews, speaking engagements, keynotes, panel discussions and contributions in scientific journals.

#### NatCat Press Release:

We biannually release our NatCat Press Release, which represent a highly anticipated update on worldwide loss developments across the all natcat peril classes, also broken down for different perils and regions.

#### Research projects and cooperations:

As mentioned before in this report, you can find examples of our research activities, please assess Sub-Principle 2.1, Level 1, and Level 4; Sub-Principle 3.2, Level 1.

#### Client Seminars:

We organize and host climate-specific client seminars in Munich and our International Organization. Through these events we share our own knowledge and data on climate-related topics (science, risk management, business/market development, policy/regulation, technologies), but also invite external experts to discuss their insights with our clients and other internal and external Munich Re stakeholders

### **Level 3 - Evidence that the research addresses key climate change-related risks facing the business. Members are asked to demonstrate that the research plays an integral part in influencing on business strategy and advancing the common interest.**

We generally seek to conduct research projects in collaboration with peers, regulators, scientific institutions and embedded in a context that is relevant to the insurance context. This creates synergies in terms of business relevance for our Group and in terms of advancing knowledge and awareness of climate change-related risks and opportunities for our stakeholders.

Sector-based initiatives that we are engaged in and that are engaged in research activities are:

- Insurance Development Forum
- Geneva Association
- "Wirtschaft macht Klimaschutz"
- "Verein für Umweltmanagement und Nachhaltigkeit in Finanzinstitutionen e.V."
- InsuResilience
- Munich Re Foundation
- acatech
- ClimateWise
- Tackling Climate Change together (TCCT)

For more information on these initiatives, please assess Sub-Principle 2.3, Level 4, and Sub-Principle 3.2, Level 1.

For information on other research project examples, please assess Sub-Principle 2.1, Level 4.

## **Principle 6: Support climate awareness amongst our customers / clients**

### **6.1. Communicate our beliefs and strategy on climate change-related issues to our customers and / or clients.**

#### **Level 1 - Evidence of communicating the organisation's beliefs and strategy on climate change-related issues with customers / clients.**

In order to communicate our beliefs and strategy on climate change-related issues with our customers we offer, regular publications on climate change and natural hazards as well as separate websites on these issues. For more information please visit our different websites on [Climate Change](#), [Extreme Weather](#) and [Natural Catastrophes](#). Other communication measures are displayed in Sub-Principle 5.2, Level 2.

We actively participate in (international) conferences, workshops, roundtables and other forms of information sharing and communication with our climate change expertise. The background of these events can be (insurance) business, science, policy, technology, asset management.

One aspect to highlight here are the cDays, our annual get-together for provoking thought leadership. Here, we jointly discuss new trends, innovative ideas and product solutions for the insurance industry. In 2019, our "cDays" focused on global challenges, such as climate change, digitalization, the growing cyber risks, mobility, good health and well-being. We hosted 150 participants from 30 different countries (including 40 clients), and enjoyed more than 75 speakers (incl. 3 Munich Re board member) throughout the conference.

In addition, we also offer a large variety of climate change-related products and services. An overview is provided in Sub-Principle 3.2, Level 1.

An overview on our political positions and how we communicate them, also towards (potential) clients, is given in Sub-Principle 5.1, Level 1.

#### **Level 2 - Evidence of a robust engagement plan for customers / clients that will result in increased knowledge and awareness.**

In the reinsurance sector we are in close and regular contact with our clients. Thereby, our clients have the opportunity to talk to our experts, to share information as well as to build awareness and get consulting regarding their specific questions and needs in relation to risks and insurance covers for climate change-related issues. We regard our impact through these offerings as high, because clients get consulting which is directly related to their business. Single departments measure and document their engagement (e.g. number of presentations held on climate related topics). Internally, we track number and volume of contracts for the single insurance covers.

#### **Level 3 - Quantitative disclosure of those engaged alongside details of future activities and feedback mechanisms.**

We internally assess access to our websites as well as the number of distributed and downloaded publications. Also clients and partners approach us based on the published contents, in order to get even more detailed information.

Our key climate experts are continuously engaged in exchange with clients on various aspects of on climate risk mitigation and adaptation in different regions and sectors. As such, we provided expertise in the form of speaking engagements, keynotes and panel discussions with client involvement on over 60 occasions in 2019.

Also, as part of our cDays, we assess the success of the conference in detail through individual digital feedback, provided by participants through an online survey tool. A large majority of the participating clients assessed the “cDays” as of high value for their business operations including climate change products and information.

## **6.2. Inform our customers and / or clients of climate change-related risks and provide support and tools so that they can assess their own levels of risk.**

### **Level 1 - Evidence to demonstrate how members have identified areas of behaviour change needed to mitigate climate risk.**

Responses to an identified change in risk include besides from risk adequate pricing also engagement with clients to reduce their vulnerability.

For instance, we provide coverage to Californian utilities only if they have substantial programs in place to improve operations which decrease the threat of igniting vegetation close to equipment.

Another example is the incentivisation of clients to implement measures to decrease exposure or vulnerability towards certain risks, based on potential premium reductions. An example here is the context of nature-based flood barriers such as the restoration of mangroves or the establishment of artificial reefs in order to achieve a reduction in premiums. More information is provided on our [webpage](#).

We also share our knowledge with our customers and clients on risk mitigation which we generate through our formal cooperation with the US-based Insurance Institute for Business & Home Safety.

Lack of market awareness is our biggest obstacle. As unique and bespoke solutions are somewhat niche applications, typical finance and project development markets are not utilizing these “tools”. Our goal is to establish risk mitigation measures for performance and finance in the full ecosystem of new green technologies.

### **Level 2 - Evidence of engagement with customers / clients to encourage climate awareness and promote resilience through knowledge sharing. Where possible this should be tailored to the key risks facing their geographical location.**

When it comes to any adaptation-related product or service incorporating any form of nat cat risk, we pride ourselves to be able to provide our clients with exactly those products and services, that are particularly relevant in their geographical context.

Apart from the locally adjusted provision of products and services, targeted communication acknowledging certain physical or transition risks in particular regions is well established within our social media presence.

Another activity in this regard is our cooperation with Suncorp Group, an Australian insurance, banking and finance corporation and the University of Brisbane. The aim of this cooperation is to convey awareness of climate change-related risks and opportunities in the context of Suncorp’s business strategy, particular in Australia, a region that faces increases in frequency of a variety of nat cat perils. Therefore, C-level executives were trained by our key climate experts and subsequently, knowledge gains and expertise was passed down to the management and employee level.

**Level 3 - Evidence that tools have been provided to customers / clients with guidance on the importance of assessing climate risk across multiple lines of service or countries of operation.**

We provide a variety of tools, in line with our approach to distinguishing the three main benefits we create for clients in the context of adaptation to climate change: understand, measure, manage.

Examples of such tools, already illustrated earlier in this report, are:

- NatCat SERVICE (refer to Sub-Principle 2.1, Level 1, or assess the NCS [webpage](#) (Please note: In 2020 we terminated the free offering of our natcat data. These data and analytics are now provided under IP protection and typically on a fee basis.)
- [Location Risk Intelligence Platform](#), including the Natural Hazard Edition and the Climate Change Edition (refer to Sub-Principle 3.2, Level 1)
- We also provide advanced management tools, such as the [Remote Industries hurricane tool](#) to accelerate response time for insurers and help their clients to recover as quickly as possible.