

## 2021 Climate Risk Survey – Company Response

Group Code: 0088 – The Hanover Insurance Group

Company Codes: 22292, 22306, 36064, 41840, 31534, 10815, 42552

### I. Governance

Oversight of Environmental, Social, Governance (ESG)-related risks and opportunities is the responsibility of both the entire Board and committees of the Board. In general, ESG-related governance is codified in the charter of the Board's Nominating and Corporate Governance Committee; however, certain aspects of ESG, such as oversight of the company's risk management policies and procedures, and data security and privacy, are the responsibility of the Audit Committee and are contained in the committee's charter. The full Board also receives periodic updates on ESG topics, including sustainability and environmental matters including the effect of increasingly severe weather and weather-related events associated with climate change.

The Board and its Audit Committee regularly receive reports and presentations from key members of the enterprise risk management group and management, including the company's Chief Executive Officer, Chief Financial Officer, Chief Risk Officer, Chief Information Security Officer, Chief Privacy Officer, Chief Actuary, and General Counsel on matters which, in its or management's view, merit attention from a risk management perspective, such as catastrophe risks (including the risks of climate change for increased severity and frequency of weather-related catastrophes and changing weather patterns), insured property exposure aggregation levels, ex-catastrophe underwriting risk (including as a result of increased non-catastrophe weather-related events), reinsurance levels and creditworthiness of our reinsurers, the investment portfolio, litigation and regulatory matters, capital considerations, growth plans, matters relating to human capital management, and other material ESG risks.

Climate-related opportunities, to the extent that they are material to the organization, are integrated into our business plans and strategy, and are overseen by the Board as part of its regular review of The Hanover's strategic objectives.

The Board has oversight responsibility of the company's Chief Executive Officer and management of ESG topics. The executive leadership team has established a cross-disciplinary management group known as the ESG Council, which is headed by our EVP and General Counsel, and is comprised of business and functional leaders across the organization involved in ESG matters. The ESG Council has a formal written charter that establishes its mission to support the company's ongoing commitments and initiatives related to ESG, including corporate social responsibility, sustainability, and other policy matters relevant to the company

and its stakeholders. The council assists the company in: (a) developing general strategy relating to ESG matters, (b) creating, implementing, and monitoring initiatives and policies based on that strategy, (c) the drafting and coordination of communications with employees, investors and other stakeholders with respect to ESG matters, (d) monitoring and assessing developments relating to, and improving the company's understanding of ESG matters, and (e) efficient, timely and accurate disclosure of ESG matters to internal and external stakeholders. The ESG Council's primary charge is one of oversight, such that the primary responsibility and ultimate decision-making with respect to the company's underlying programs and policies remains with senior management, and the business units and functions currently responsible for such matters.

Disclosure of matters related to climate change that are material to the company occurs at the group level, via periodic filings with the U.S. Securities and Exchange Commission, and at the insurance company level via the annual Own Risk and Solvency Assessment (ORSA) reporting. Other climate-related disclosures are from time to time requested by regulatory and quasi-regulatory authorities, and those requests are typically addressed at the insurance company level. In each case, such disclosures are coordinated through the finance and accounting, enterprise risk management and legal departments, in collaboration with business units and other constituents of the ESG Council and various disclosure working groups.

### ***Responsible Investment Policy***

The Hanover has published an ESG investment policy in which we commit to protect our environment, make a difference in our communities and govern our actions with integrity. Among other considerations and factors, The Hanover's ESG policy establishes guidelines and environmental factors to incorporate in our decision making as part of our fundamental investment research process. Specific environmental factors we have adopted to align our investment holdings with our commitment to protect the environment include: 1.) Support, in recognition of climate change, investment in electric utilities with: (i) low or declining coal exposure in their generation mix, (ii) increasing exposure to renewable sources of energy production, or (iii) a demonstrated commitment and progress toward achieving a reduced carbon footprint. Accordingly, we will not make new investments in the securities of companies that will rely on coal for more than 25% of their fuel to generate electricity after 2025. Existing investments that exceed this threshold will be phased out by 2025. 2.) Caution toward investment in companies or entities that are involved in: (i) mining or processing thermal coal, (ii) development of any new coal mine or coal power infrastructure, and (iii) producing, processing, or shipping crude oil produced from tar sands. Accordingly, we will not make new investments in the securities of companies in the coal and tar sands industries that will generate more than 25% of their revenue from mining or processing thermal coal after 2025,

(ii) are in the process of developing, or have plans to develop, any new coal mine, new coal plant or new coal infrastructure, and (iii) will have more than 25% of their oil reserves in tar sands and/or will generate more than 25% of their revenue from the shipment of tar sands oil after 2025. Existing investments that exceed these thresholds will be phased out by 2025.

## **II. Strategy**

The Hanover is committed to protecting our environment, making a difference in our communities, and governing our actions with integrity. We believe these values are essential to our success as a leading property and casualty insurance company providing insurance solutions in a dynamic world. We recognize climate change poses new and emerging risks, as well as opportunities to make The Hanover and its stakeholders more resilient in the years to come.

### ***Identified Climate-related Risks and Opportunities***

#### **Risks**

The Hanover recognizes the risks climate change poses to our environment, the implications of increased weather occurrences and severity on our customers, and the impact our employees have on the environment as they perform their job functions and commute to and from work. The financial risk that climate change brings to The Hanover primarily relates to the impact it may have on the frequency and/or severity of weather events, and the resulting impact those events may have on the property and casualty coverages we provide. Our greatest defense to the potential impacts of climate change on our business is to manage our exposure concentrations in any one geographic area, leverage external and internal catastrophe and other models, and utilize reinsurance.

#### **Opportunities**

Climate change offers an opportunity for The Hanover to strengthen its financial resilience by managing its exposure footprint and containing the severity of a 1-in-250, or extreme loss event, within a specified risk tolerance. By establishing resiliency to climate change, we believe that we can maintain a strong financial foundation and can continue to deliver on our promise to our insureds. We continuously manage volatility and concentration risk by leveraging models and third-party scores to identify areas to address through pricing, as well as reinsurance terms and conditions. We purchase facultative, property per-risk and catastrophe treaty reinsurance to protect areas of concentrated risk, as well as to mitigate possible impact from extreme events. We will continue to evaluate our rate structure, underwriting guidelines, and coverage offerings in response to changes in weather patterns, as well as developments in building and community resilience.

We consider climate risk and opportunities through both our annual strategic planning process and ongoing business management, as well as through our long-term strategic planning efforts.

Time Horizon	Climate Risks	Climate Opportunities
Short Term 1-5 Years	<ul style="list-style-type: none"> <li>Increased volatility (frequency/severity) of weather events</li> </ul>	<ul style="list-style-type: none"> <li>Promote green endorsements and coverages</li> <li>Support building resiliency through evolving building code standards and compliance to ordinance or law coverage</li> </ul>
Medium Term 5-10 Years	<ul style="list-style-type: none"> <li>Potential changes to the Atlantic hurricane patterns impacting exposure concentration</li> <li>Potential for regulatory changes constraining insurer underwriting responses</li> </ul>	<ul style="list-style-type: none"> <li>Leverage loss control services to educate insureds on preventative measures (e.g., contractual language, green endorsements, storm preparedness)</li> <li>Deepen underwriting and loss control staff training on evolving and unique climate exposures</li> </ul>
Long Term 10-30 Years	<ul style="list-style-type: none"> <li>Changes to availability of reinsurance coverage to protect economics</li> <li>The potential for sea level rise to alter the coastline and the associated risk to local economies</li> <li>Climate-related litigation</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation of risk over time by growing our casualty portfolio to balance property exposure</li> <li>Evolution of tools and models to aid in climate-change scenario modeling and exposure management practices</li> <li>Advancement in pricing to reflect loss mitigation through enhanced building codes and resilient building features</li> </ul>

### ***Climate Resiliency***

The Hanover works closely with policymakers and regulators, including legislators and the National Association of Insurance Commissioners, and is an active participant in the American Property Casualty Insurance Association and the Insurance Institute for Business and Home Safety (IBHS). Through our involvement in and collaboration with these organizations, we work

to protect our natural environment and resources, while advocating for sustainable building codes and resilient communities.

In 2022, The Hanover signed the IBHS principles of climate change adaption, which outline the steps policymakers, in collaboration with the insurance industry and other private sector stakeholders, should take to improve the resiliency of American homes, businesses and communities to adapt to a changing climate. Several of The Hanover's senior leaders are members of the IBHS Board of Directors. Moreover, The Hanover's Chief Strategy Officer is a member of the ESG Council and responsible for ensuring that ESG-related factors, including climate change, are integrated in the company's long-term strategy efforts.

In 2022, we launched the Green Team, an employee-led advisory group. The mission is to lead resiliency action and nurture a sustainable mindset among employees through education and community engagement, in support of our commitment to be a socially responsible organization. The team is organized around three main topics:

- Education - Strengthen knowledge of ESG practices, with a focus on the role individuals and our company play in building climate resiliency
- Community - Establish "green champions" across our company to compile resources and offer opportunities for employees to get involved both internally and externally
- Business Alignment - Develop a feedback loop between employees and senior leaders to exchange ideas and knowledge on environmental topics, seeking ways to communicate this information and elevate The Hanover brand

The Green Team will focus on important ways to continue to drive awareness and action to enhance our efforts toward long-term sustainability.

To provide key constituencies, including our employees, business partners and agents, shareholders and the general public, with transparency on ESG topics, including topics related to climate, the company published its inaugural Global Reporting Initiative (GRI)-referenced content index on its website in 2018 and can be found by visiting [www.hanover.com](http://www.hanover.com). In 2021, the company cross-referenced the index to the Task Force on Climate-related Financial Disclosures (TCFD) framework.

### ***Products and Services***

The Hanover provides various products and offerings to encourage policyholders to reduce losses caused by climate change-influenced events. Current offerings include:

- "Green Coverage" offering from our Personal Lines business that enables homeowners to request restoration work with environmentally friendly materials after a loss;

- “Green Advantage” offering from our Commercial Lines business that covers additional costs to restore green-certified buildings to current standards, to perform air quality testing, and to recycle debris;
- Sprinkler credits and loss control services to reduce hostile fires and water use;
- Safety and disaster preparedness materials via participation in and sponsorship of International Business and Home Safety. The Hanover also provides materials via our [Loss Control Portal for agents and policyholders to prepare for severe weather events](#);
- Aerial imagery, including a drone program, to assist with roof inspections and wildfire risk assessments;
- IoT sensors for businesses to detect leaks or freezing conditions to minimize loss

In addition, our risk solutions consultants connect with the policyholder to understand the business’s specific challenges and offer insight about emerging trends, experience and other factors impacting the policyholder’s industry.

### ***Transition to a Low Carbon Economy***

In the past several years, The Hanover has taken many steps to reduce emissions and energy consumption at our owned facilities. Low-flow plumbing fixtures and upgrades to refrigeration equipment have contributed to meaningful reductions in water use. Modernization of mechanical HVAC equipment and controls have reduced natural gas consumption and carbon emissions. New windows and roofing systems have improved insulating value of building envelopes and reduced energy use for heating and cooling. In 2018 exterior lighting was replaced with energy-efficient lighting at our Worcester, Mass. campus resulting in a 131,000 kilowatt hour reduction in electricity use.

In 2021, we began installation of new interior LED lighting within our main facility in Worcester, Mass. that is anticipated to reduce electricity use by approximately 1 million kilowatt hours. Many of our owned facilities have been Energy Star certified, recognizing The Hanover’s commitment to efficient use of water and energy and the associated reduction in carbon emissions.

In addition to the management of our facilities, The Hanover recognizes the impact its employees have on the environment as they commute to and from work and has long supported the use of alternate forms of travel to reduce greenhouse gas emissions. With the recognition that electric cars materially contribute to the reduction of carbon emissions and a healthier planet, we have invested in electric car charging stations for employees and visitors at

the company's headquarters. With Massachusetts anticipating that 300,000 electric vehicles will be on the road by 2025, we are proud to help pave the way for widespread use of alternative fuel vehicles. The Hanover also supports employee flexible work arrangements, allowing many employees to work from home, further improving air quality and reducing traffic on our congested roadways.

The Hanover offers the following programs to engage, attract, motivate, and encourage the health of a diverse work force, including:

- On-site fairs at our main campuses to educate employees on how to reduce their carbon footprint through solar energy, composting, the use of sustainable products and more;
- Numerous health and wellness program offerings;
- Financial counseling to assist employee well-being;
- Flexible work arrangements;
- Volunteer opportunities to clean up and improve the community; and
- Local sourcing with seasonal activities such as a weekly farmers market and local vendor fairs at the company's headquarters

### ***Climate-related scenarios***

The risk function is in the process of developing a climate-related scenario framework to facilitate responses to a variety of differing types of impact scenarios, alternative simulation catalogs, discrete scalar factors on frequency or severity, and addition of new sources or non-model risks. The goal is to assess potential impact with more focus on the near term, recognizing the greater uncertainty related to medium- and long-term impacts. As a first step, our reinsurance advisor, Guy Carpenter, assisted to execute the Bank of England climate scenario, which associated temperature increases with higher frequency and severity of category 4 and 5 hurricanes, increases in hurricane induced precipitation, as well as sea level rise. The results focused on hurricane and precipitation flood only, utilizing the AIR model against third quarter 2021 exposure. AIR estimated industry impacts of a 19-to-68 percent increase in average annual losses by 2023 depending upon policy actions to mitigate. According to the model estimates, The Hanover may experience considerably smaller impacts compared to the industry around the mean, and even lower impacts in the tail (1-in-250), likely due to geography and methodology.

### **III. Risk Management**

The Hanover recognizes the risks climate change poses to our environment, and the implications of increased weather severity on our customers. A robust governance structure ensures the proper understanding and oversight of climate risks and opportunities. The enterprise risk management (ERM) function closely manages exposure concentrations and continues to partner with business units to develop tools to better understand and manage aggregation risk, including the development of a framework to analyze and conduct scenario analysis. Climate scenarios are complex, and we expect this process to evolve over time.

#### ***Identifying and assessing climate-related risks***

The Hanover seeks to monitor and control risk exposure through an enterprise-wide risk management framework, which includes management, modeling and monitoring of catastrophe underwriting risk. The Hanover's risk governance is robust, with business unit risk structures supported by an ERM function. The ERM function, in partnership with the Enterprise Risk Management Group (ERMG), is responsible for identifying, monitoring, and analyzing material, corporate-level risks and emerging issues. Together, the team classifies, assesses, and manages risks, ensuring proper governance across the enterprise. ERMG membership includes individuals from each functional area of the organization spanning underwriting, business units, technology, legal, human resources, finance, internal audit, compliance, actuarial, claims and facilities. A risk register is maintained and updated quarterly, and each risk is assessed in terms of its likelihood of materialization, its mitigated financial magnitude, and the time horizon over which it might exist or emerge. Each risk in the risk register is owned by a member of ERMG, and the risk team meets with each risk owner to capture new risks and review and refresh risk assessments at a minimum annually, and up to quarterly, for the most material risks.

Climate change and weather severity is a top risk on The Hanover's current and emerging risk register, and is tracked, researched, analyzed, and reported by the ERM function. Regular updates are provided to the corporate Group Risk Committee (GRC), Aggregation Working Group, ERMG, Investment Committee, and ESG Council. The Chief Risk Officer presents on the ERM program, including updates to The Hanover's top current and emerging risks, to the Audit Committee of the Board five times per year, and to the Board of Directors annually.

#### ***Management of underwriting risk***

The management of underwriting risk, including climate change, starts with the Chief Underwriting Officer and corporate underwriting team to set guidelines and corporate appetite



guardrails that apply to all lines of business (e.g., hurricane risk). The team works in collaboration with business units to fulfill their specific strategies. Business unit leaders create and review underwriting guidelines within established guardrails and for each line of business, industry and/or class of business that specify the nature and characteristics of the risks The Hanover is willing to accept. Underwriting authority letters are granted to each individual underwriter in the organization. Authority letters provide specified limits of authority and outline a clear escalation path as risks increase in size and complexity.

The Aggregation Working Group is responsible for exposure management, as well as monitoring and managing catastrophe risk and risk concentrations as they relate to each peril and region – hurricane, other wind, winter storm, earthquake, hurricane-induced precipitation, flood, wildfire, and terrorism. The Underwriting Committee is responsible for assisting executive management in exercising its oversight of the underwriting risks and controls that have a material impact on the company. The committee conducts research on underwriting topics, reviews performance against established risk tolerances, and directs actionable items toward the appropriate businesses. The GRC considers the current and emerging risks and mitigation actions underway for each of the six major sources of risk. All members of the executive leadership team are members of the GRC, along with the Chief Risk Officer, Chief Actuary, and Treasurer. The committee meets quarterly, and the results are reported to the Board of Directors.

In addition to the robust governance structure, regular engagement with business leaders, finance officers, underwriting professionals, actuarial staff and the claims unit provide collaboration opportunities and prompt development of new risk management strategies and reporting tools to better inform risk selection and management across the enterprise.

### ***Risk monitoring and modeling***

The risk function developed new climate risk monitoring reports in the first quarter of 2022, aligned to the New York Department of Financial Services guidance, to define and show progress against mitigating the following categories of risk: reputational, pricing and underwriting, liquidity, credit, market, legal and regulatory, business continuity, and strategic risk. Risks in these categories are not of equal size or materiality, with enterprise risk management primary focus on physical risk, including pricing and underwriting. We have limited exposure to industries most susceptible to transition risk. Commercial Lines premium in high carbon sectors, defined as coal, oil and gas, utilities, and transportation, represents roughly two percent of The Hanover's Commercial Lines gross premium, and one percent of The Hanover's total gross written premium.

As described above, we are in the process of developing a climate-related scenario framework to facilitate responses to a variety of differing types of impact scenarios, alternative simulation catalogs, discrete scalar factors on frequency or severity, and addition of new sources or non-model risks. The goal is to assess potential impact with more focus on the near term, recognizing the greater uncertainty related to medium- and long-term impacts. As a first step, reinsurance partner Guy Carpenter, assisted to execute the Bank of England climate scenario which associated temperature increases with higher frequency and severity of category 4 and 5 hurricanes, increases in hurricane induced precipitation as well as sea level rise. The results focused on hurricane and precipitation flood only, utilizing the AIR model against third quarter 2021 exposure. AIR estimated industry impacts of a 19-to-68 percent increase in average annual losses by 2023 depending upon policy actions to mitigate. According to the model estimates, The Hanover may experience considerably smaller impacts compared to the industry around the mean, and even lower impacts in the tail (1-in-250), likely due to geography and methodology.

We have built internal tools to analyze historical data and trends to identify possible signs of climate change impacting both catastrophe and non-catastrophe weather-related losses. For example, the hurricane region analysis is an internal aggregation model aimed at measuring potential hurricane losses relative to our market share. The tool provides insight into where we have micro-concentrations that could lead to outsized losses for smaller events that are within our reinsurance retention and take targeted actions around reducing those concentrations.

In addition, in 2020 we developed an internal tool to measure the relative profitability of all lines against the relative contribution to probable maximum loss (PML) for a business unit and geography. This tool informs the strategic planning process to ensure catastrophe capacity is used efficiently. In addition to contrasting all lines profitability with relative PML contributions, the tool measures catastrophe profitability by accounting for the average annual loss (AAL), reinsurance cost and capital cost relative to the property rates and an established target rate for ex-catastrophe losses and expenses. State managers, chief underwriting officers and business unit leaders across the organization use the tool to inform planning and decision making.

### ***Liability and Transition Risk***

Climate change creates the potential for litigation to emerge related to green-house gas emissions in general liability lines, responsible climate risk disclosure and oversight in management liability lines and in professional liability lines for insureds such as architects and engineers. Exposure to climate liability is limited by the underwriting risk appetite being restricted to private company management liability, through appropriate use of pollution

exclusions on general liability and umbrella policies and through education and training for professional liability insureds and underwriters.

Transition risk is also mitigated through underwriting risk appetites. The Hanover does not have an appetite to write carbon-intensive sectors. Commercial Lines premium in 'high carbon sectors' represents roughly two percent of The Hanover's Commercial Lines gross premium, and one percent of The Hanover's total gross written premiums; see section IV. Metrics and Targets for more detail.

### ***Climate Resiliency***

The Hanover works closely with policymakers and regulators, including legislators and the National Association of Insurance Commissioners, and is an active participant in the American Property Casualty Insurance Association and the Insurance Institute for Business and Home Safety (IBHS). Through our involvement in and collaboration with these organizations, we work to protect our natural environment and resources, while advocating for sustainable building codes and resilient communities.

In 2022, The Hanover signed the IBHS principles of climate change adaption, which outline the steps policymakers, in collaboration with the insurance industry and other private sector stakeholders, should take to improve the resiliency of American homes, businesses and communities to adapt to a changing climate. Several of Hanover's senior leaders sit are members of the IBHS Board of Directors. Moreover, The Hanover's Chief Strategy Officer is a member of the ESG Council and responsible for ensuring that ESG-related factors, including climate change, are integrated in the company's long-term strategy efforts.

### ***Products and Services***

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our [Loss Control Portal for agents and policyholders to prepare for severe weather events](#);

- Aerial imagery, including a drone program, to assist with roof inspections and wildfire risk assessments;
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In addition, our risk solutions consultants connect with the policyholder to understand the business's specific challenges and offer insight about emerging trends, experience and other factors impacting the policyholder's industry.

### ***Investment risk***

We believe that as the world increasingly moves toward a lower carbon-based economy to lessen the impact of climate change, environmental factors could influence the sustainability of an investment and its risk and return profile. For these reasons, we consider the impact of climate change and environmental issues as important factors to include in the fundamental research process we employ to manage investment assets.

We incorporate environmental factors in our decision making for asset allocation and screening for security selection for publicly listed common stocks and fixed income securities of corporate and municipal issuers. Our investment professionals employ both qualitative and quantitative screens of environmental factors to identify industry and company specific risks and opportunities. We utilize guidelines published by external resources such as Principles for Responsible Investment, Principles for Sustainable Insurance and Global Coal Exit List to inform our investment professionals and help them to develop and maintain a better understanding of the investment implications of environmental factors. We have found that by having a greater awareness of how environmental factors can enhance returns and better manage risks, our investment professionals demonstrate a higher level of integration of environmental factors into their investment decision making. Findings from this process are incorporated with other relevant information as part of our broader investment decision-making process.

This awareness leads us to favor investments in companies with a demonstrated commitment toward a reduced carbon footprint and increased reliance on cleaner and or renewable energy sources. In addition, since climate change can affect weather patterns, our investment decision making recognizes that certain regions and parts of the country are more vulnerable to rising ocean levels, coastal flooding and storms, drought, wildfire and other natural disasters.

The ERM function works in close collaboration with Opus to monitor matters in relation to asset allocation, financial market risk and liquidity risk. Risk management is embedded into rating

agency debt ratings, such as Standard & Poor's and Moody's, which are regularly leveraged to inform decision making. We will continue to enhance our practices, including investment climate-related scenarios, as guidance and standardization becomes available.

#### **IV. Metrics and Targets**

The risk of climate change to property exposures is analyzed through running sensitivity tests on licensed third-party catastrophe models including RMS and AIR. These models contemplate the frequency and severity of natural perils, which may get impacted by climate change. We perform back-testing of catastrophe model loss distributions against historical losses to ensure these models capture historical volatility, as well as the potential for more extreme weather events.

Catastrophe risk is analyzed on quarterly basis using these models along with exposure concentration assessment models built in-house to proactively manage our aggregations. The company maintains catastrophe risk appetite statements and risk tolerances against which we target and assess exposure to annual aggregate catastrophe losses. Risk appetites are established at three points in the risk distribution to govern acceptable risk levels. They are a primary control in the ERM framework, and they provide guardrails to protect the financial stability and security of the organization. Catastrophe risk appetites are monitored and reported to the GRC quarterly.

An internal risk assessment concluded that the largest climate change risk to the organization would stem from potential changes to the Atlantic hurricane patterns, and our largest areas of exposure are the Northeast and Texas. Conversely, we do not write personal lines business in Florida, Texas or California. We purchase facultative, property per-risk, and catastrophe treaty reinsurance to mitigate losses from catastrophes and leverage the AIR and RMS models, along with historical losses, to assess the effectiveness of the reinsurance program.

As described above, the risk function is also in the process of developing a climate-related scenario framework to facilitate responses to a variety of differing types of impact scenarios, alternative simulation catalogs, discrete scalar factors on frequency or severity, and addition of new sources or non-model risks. The goal is to assess potential impact with more focus on the near term, recognizing the greater uncertainty related to medium- and long-term impacts. As a first step, our reinsurance advisor, Guy Carpenter, assisted to execute the Bank of England climate scenario which associated temperature increases with higher frequency and severity of category 4 and 5 hurricanes, increases in hurricane induced precipitation as well as sea level

rise. The results focused on hurricane and precipitation flood only, utilizing the AIR model against third quarter 2021 exposure. AIR estimated industry impacts of a 19-to-68 percent increase in average annual losses by 2023 depending upon policy actions to mitigate. According to the model estimates, The Hanover may experience considerably smaller impacts compared to the industry around the mean, and even lower impacts in the tail (1-in-250), likely due to geography and methodology.

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In addition, in 2020 we developed an internal tool to measure the relative profitability of all lines against the relative contribution to probable maximum loss (PML) for a business unit and geography. This tool informs the strategic planning process to ensure catastrophe capacity is used efficiently. In addition to contrasting all lines profitability with relative PML contributions, the tool measures catastrophe profitability by accounting for the average annual loss (AAL), reinsurance cost and capital cost relative to the property rates and an established target rate for ex-catastrophe losses and expenses. State managers, chief underwriting officers and business unit leaders across the organization use the tool to inform planning and decision making.

### ***Financed or underwritten carbon emissions***

The Hanover does not have an appetite to write carbon-intensive sectors (defined as coal, oil and gas, utilities, and transportation). Commercial lines premium in 'high carbon sectors' represents roughly two percent of The Hanover's Commercial Lines gross premium, and one percent of The Hanover's total gross written premium:

No.	Commercial Insurance and Reinsurance Gross Premiums by Sector as of December 31, 2021	(USD, \$ in millions)
1	Energy	1
2	Materials	178
3	Industrials	1,104
4	Consumer discretionary	501
5	Consumer staples	151
6	Health care	213
7	Financials (insurance, banks, non-banks)	30
8	Transportation	51
9	Information technology	45
10	Telecommunication services	60
11	Utilities	11
12	Other	677
Total		3,022.00

	Investments / Premium as of December 31, 2021 (USD, \$ in millions)	
	Investments	Underwriting (Commercial Ins.)
Coal	0	1
Oil & Gas	155	0
Utilities	391	11
Transportation	131	51

*Other sector includes commercial and reinsurance premiums from Real Estate = \$315 million and miscellaneous such as repair and maintenance, personal and laundry services, private households, and others = \$362 million*

### **Responsible Investment Policy**

The Hanover has an Environmental, Social, Governance Responsible Investment policy, which can be found on our [corporate responsibility website](#). A summary of our commitments to responsible investing, and our progress to-date is as follows:

**Support investments in electric utilities with**

- Low or declining coal exposure in their generation mix
- Increasing exposure to renewable sources of production
- Commitment and progress toward achieving a reduced carbon footprint

**Support investment in water utilities involved in the management of scarce water resources****No new investments in securities of companies that will rely on coal for >25% of their fuel to generate electricity after 2025****No new investments in securities of companies in the coal and tar sands industries that**

- Will generate >25% of their revenue from mining or processing thermal coal after 2025
- Are in the process of developing new coal mines, plants or infrastructure
- Will have >25% of their oil reserves in tar sands and/or will generate >25% of their revenue from the shipment of tar sands oil after 2025

**Existing investments that exceed these thresholds will be phased out by 2025**

	12/31/19 \$MV	12/31/19 % of assets	12/31/21 \$MV	12/31/21 % of assets	9/30/22 \$MV	9/30/22 % of assets
Exposure to securities of companies that will rely on coal for >25% of their fuel to generate electricity after 2025	\$217M	2.61%	\$149M	1.60%	\$90M	1.05%
Exposure to securities of tar sands producers	\$6.1M	0.07%	\$5.8M	0.06%	\$5.4M	0.06%

**Scope 1, 2, 3 Emissions**

- Scope 1, direct greenhouse gas (GHG) emissions, in 2020 from natural gas used for heating The Hanover's corporate headquarters campus in Worcester, Massachusetts and our Howell, Michigan location were:
  - Carbon dioxide: 1,758 mT
  - Sulphur dioxide: 19 lbs.
  - Nitrogen oxide: 3,048 lbs.

Changes to emission levels are considered significantly less than the 2018 baseline. This is primarily due to the reduced in-building population at both the Worcester and Howell locations due to adjusted work arrangements as a result of COVID-19.

- Scope 2, indirect greenhouse gas (GHG) emissions, in 2020 from utility-provided electricity at The Hanover's corporate headquarters campus in Worcester, Massachusetts and our Howell, Michigan location were:
  - Carbon dioxide: 4,542 mT
  - Sulphur dioxide: 4,327 lbs.



- Nitrogen oxide: 9,212 lbs.

Changes to emission levels are considered significantly less than the 2018 baseline. This is primarily due to the reduced in-building population at both the Worcester and Howell locations due to adjusted work arrangements as a result of COVID-19.

- Scope 3, other greenhouse gas (GHG) emissions, are calculated for business travel and use of company fleet vehicles. GHG emissions were estimated using information provided by our travel partner, miles traveled, and average vehicle fuel efficiency of fleet models provided by vehicle manufacturers. Travel and fleet GHG estimated emissions for 2020 were:

- Carbon dioxide: 2,905 mT
- Sulphur dioxide: 361 lbs.
- Nitrogen oxide: 6,515 lbs.

Scope 1, 2, 3 emissions are updated on an annual basis on previous calendar year results and are published within our GRI referenced index. 2021 emission data will be available by December 31, 2022. To see available emission benchmarking, visit <https://www.hanover.com/why-hanover/our-corporate-commitment/gri-referenced-content-index>

**Closed-ended questions directly correspond to the narrative above, allowing for explanation and qualification of the yes/no answers. Closed-ended questions are voluntary for reporting year 2022 and individual states may elect not to request them.**

### **Governance**

- Does the insurer have publicly stated goals on climate-related risks and opportunities? (Y/N)
- Does your board have a member, members, a committee, or committees responsible for the oversight of managing the climate-related financial risk? (Y/N)
- Does management have a role in assessing climate-related risks and opportunities? (Y/N)
- Does management have a role in managing climate-related risks and opportunities? (Y/N)

### **Strategy**

- Has the insurer taken steps to engage key constituencies on the topic of climate risk and resiliency? (Y/N) \*
- Does the insurer provide products or services to support the transition to a low carbon economy or help customers adapt to climate risk? (Y/N)
- Does the insurer make investments to support the transition to a low carbon economy? (Y/N)
- Does the insurer have a plan to assess, reduce or mitigate its greenhouse gas emissions in its operations or organizations? (Y/N)\*

### **Risk Management**

- Does the insurer have a process for identifying climate-related risks? (Y/N)
  - If yes, are climate-related risks addressed through the insurer's general enterprise-risk management process? (Y/N)
- Does the insurer have a process for assessing climate-related risks? (Y/N)
  - If yes, does the process include an assessment of financial implications? (Y/N)
- Does the insurer have a process for managing climate-related risks? (Y/N)
- Has the insurer considered the impact of climate-related risks on its underwriting portfolio? (Y/N/Not Applicable)\*
- Has the insurer taken steps to encourage policyholders to manage their potential climate-related risks? (Y/N)\*
- Has the insurer considered the impact of climate-related risks on its investment portfolio? (Y/N)\*
- Has the insurer utilized climate scenarios to analyze their underwriting risk? (Y/N)
- Has the insurer utilized climate scenarios to analyze their investment risk? (Y/N)

### **Metrics and Targets**

- Does the insurer use catastrophe modeling to manage your climate-related risks? (Y/N)
- Does the insurer use metrics to assess and monitor climate-related risks? (Y/N)
- Does the insurer have targets to manage climate-related risks and opportunities? (Y/N)
- Does the insurer have targets to manage climate-related performance? (Y/N)

\* Asterisks represent questions derived from the original Climate Risk Disclosure Survey.