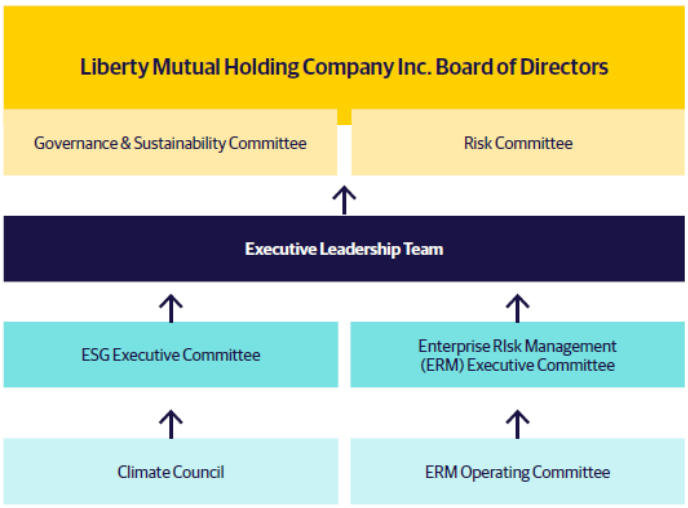
GOVERNANCE - NARRATIVE

Disclose the insurer's governance around climate-related risks and opportunities.

A. ***Describe the board and/or committee responsible for the oversight of climate-related risks and opportunities.***

The Liberty Mutual Holding Company Inc. (LMHC) Board of Directors oversees the ongoing development of our enterprise-wide business strategy and the management and implementation of our climate strategy, with specific responsibilities for oversight, implementation and operationalization delegated to the LMHC Board Risk Committee (BRC) and LMHC Board Governance and Sustainability Committee (G&S).

Graphic A. Liberty Mutual's governance structure for climate-related risk and opportunity



Liberty Mutual's senior leadership and subject matter experts provide updates to the Board on risk and sustainability-related matters, including climate change. These updates include annual briefings from the Chief Risk Officer (CRO) and Chief Sustainability Officer (CSO) and regular updates from experts across Liberty Mutual Investments (LMI), Global Risk Solutions (GRS) and U.S. Retail Markets (USRM).

In 2023, we continued to strengthen our Board and governance to better address the evolving sustainability landscape, inclusive of climate-related risks and opportunities. Our former CEO continues to serve as Chairman of the Board and Chair of our G&S Committee. The G&S Committee and BRC have designated climate-related responsibilities as detailed below.

The Governance and Sustainability Committee meets at least four times annually and provides strategic oversight and performance evaluation of our sustainability practices and priorities, including climate-related topics. As part of its duties, the Committee considers current and emerging sustainability trends and makes recommendations to the Board of Directors for approval as appropriate. The Committee oversees corporate governance disclosures, including the annual Purpose & Impact Report and Corporate Governance Annual Disclosure. The G&S Committee includes membership from the Risk, Investment, Audit and Compensation

Committees of the LMHC Board of Directors, allowing for representation and interconnectivity across the Board. In 2023, the G&S Committee received updates on Liberty Mutual's climate strategy, the Climate Activation Program and the company's progress toward our commitment to reduce Scope 1 and 2 greenhouse gas (GHG) emissions by 50% from a 2019 baseline by 2030, alongside other climate-related metrics and targets.

The Board Risk Committee also has an important role in climate-related oversight. The BRC is responsible for overseeing and reasonably assuring that Liberty Mutual maintains adequate policies, controls and practices within our enterprise risk management (ERM) framework to continuously identify, measure, manage and mitigate critical risks. In 2023, the BRC conducted quarterly reviews of risk indicators and received updates on ERM key risks, including those related to climate, meeting four times throughout the year.

B. Describe management's role in assessing and managing climate-related risks and opportunities.

Liberty Mutual's CEO and President serves as the executive sponsor for sustainability priorities. The CEO and President works closely with our Chief Sustainability Officer, the Chair of the Climate Council, and the Enterprise Risk Management and Public Affairs teams to stay informed and engaged on climate-related issues. Regular briefings equip the CEO and President to drive our climate strategy and risk management efforts forward and ensure we're taking meaningful steps to promote climate action and mitigate risk.

Liberty Mutual maintains cross-functional teams and committees across executive levels and geographies to ensure that management is coordinated in assessing and managing climate-related risk and opportunity across our business. Our climate-related management structure includes:

Executive Leadership Team: Chaired by the CEO, this team manages Liberty Mutual's strategic response to climate change. The team receives quarterly reports and, when necessary, additional timely updates on sustainability and climate-related risks and opportunities. These reports and updates facilitate strategic discussion and permit us to coordinate activities across different departments and stakeholders to achieve our sustainability goals.

ESG Executive Committee: Chaired by the Chief Sustainability Officer and reporting to the Executive Leadership team, the committee is responsible for setting global standards and guidelines across Liberty Mutual and developing recommendations and plans to address emerging risks and opportunities related to sustainability. The Committee includes representation from senior members of strategic business units such as Global Risk Solutions (GRS), U.S. Retail Markets (USRM) and Liberty Mutual Investments (LMI), and functions such as Enterprise Risk Management (ERM), Investor Relations, Finance, Strategy, Legal and Public Affairs. In 2023, the Committee met five times and discussed topics such as Liberty Mutual's Climate Strategy and implementation, global reporting and disclosure governance.

Enterprise Risk Management (ERM) Executive Committee: Chaired by Liberty Mutual's CEO and President, the Committee has oversight responsibilities to define organization-wide ERM roles and responsibilities, establish accountability, guide the ERM implementation process, set group-wide risk tolerances, approve risk mitigation plans and monitor ERM effectiveness. This Committee is comprised of executive leaders responsible for business units and corporate functions.

The Office of Sustainability: Headed by the CSO, the Office of Sustainability directs the company's sustainability strategy and ambition to promote resilience and inclusive growth. Our climate strategy is a fundamental part of the overall sustainability approach. The team aligns climate-related efforts across the company, gathers and oversees climate data and disclosures and facilitates climate-related strategic engagement and informed decision-making across the enterprise.

The Climate Council: Chaired with a senior office member from the Office of Sustainability, the Climate Council is a cross-functional group responsible for advancing the company's climate strategy and overseeing the Liberty Mutual Climate Transition Center. It aids in information exchange on emerging climate-related issues and advancing internal climate-related policy and business initiatives. The council, which includes members from all business units as well as the Office of Sustainability, ERM, Public Affairs and Finance, meets monthly to assess strategic progress and suggest adjustments. Climate Council members contribute to annual climate-related reporting and form sub-groups for specific issues.

In 2023, the charter was expanded to include nature, and the council structure evolved to reflect company priorities. Monthly discussions covered regulatory impacts and opportunities, public policy considerations, geopolitical impacts, emerging reporting frameworks, ESG integration efforts, the launch of the Climate Activation Program, the development of Climate Transition Center thought leadership and product innovation updates. This year, through ongoing assessment of key risk themes, the Council also evaluated climate liability as a transition risk and the rising concern of nature risk.

Enterprise Risk Management (ERM): Liberty Mutual's ERM function is led by the Chief Risk Officer and is responsible for group-wide ERM reporting, conducting stress testing and scenario analysis, facilitating the ERM committees and coordinating ERM initiatives across the business units. The Chief Risk Officer also chairs the Catastrophe Underwriting Risk Committee (CatCo), overseeing the responsibilities for catastrophe underwriting risk across the organization, and the Emerging Risks Committee (ERC), responsible for emerging risks that may materially threaten Liberty Mutual's operations, financial results, objectives and strategic priorities.

Liberty Mutual ERM has a Research and Development (R&D) team which is made up of climate and atmospheric scientists, engineers, and other catastrophe modeling and analytics experts. The team is charged with evaluating catastrophe models and shaping Liberty Mutual's view of risk including work to understand and assess physical and transition climate-related risk. This includes working closely with the Office of Sustainability and members of the Climate Council.

Our comprehensive governance approach focuses on integration and collaboration across business units and enables the establishment of integrated working groups as needed. Liberty Mutual's business-level leadership continues to strengthen expertise and accountability for climate-related risks through sustainability teams within GRS, USRM and LMI. Representatives from these sustainability teams are members of the enterprise sustainability governance bodies. Some of our subsidiaries and branches also have designated sustainability teams.

GOVERNANCE – CLOSED ENDED QUESTIONS

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

STRATEGY - NARRATIVE

Disclose the actual and potential impacts of climate-related risks and opportunities on the insurer's businesses, strategy, and financial planning where such information is material.

A. ***Describe the climate-related risks and opportunities the insurer has identified over the short, medium, and long term.***

We have adopted a pragmatic approach to identifying and analyzing the climate-related risks and opportunities impacting Liberty Mutual's business in the short-, medium- and long-term, analyzing systems-level insights alongside a portfolio-level assessment. As climate-related science continues to evolve, we continue to monitor scientific developments and to refine our processes for identifying and managing climate-related physical and transition risks. We aim to leverage the latest, credible and peer-reviewed sources to better understand the scientific, social, economic and technological trends embedded in climate and integrated assessment models and to identify interconnections, understanding feedback loops and dynamic behavior.

We recently updated our systems-level climate scenario framework with the November 2023 Network for Greening Financial System (NGFS) long-term climate macro-financial scenarios. These scenarios reflect recent GDP impacts across Europe, Asia, and the United States, population trends and national climate pledges, including responses to the energy crisis following the war in Ukraine and policy delays.

Through our systems-level analysis, we have identified policy change as the most imminent source of transition risk and opportunity in the short term, with rising economic and technology risks in the medium and long term, as the primary energy mix shifts at different rates across geographies. The transition to a low-carbon economy is dependent on both global and regional climate policies, regulations, and agreements. Risk stemming from potential clashes between policy actions taken by governments and their implementation timelines can impact local and global economies. As a result, it becomes crucial for organizations to consistently assess and integrate the risks arising from divergent public policies. This dynamic environment demands a

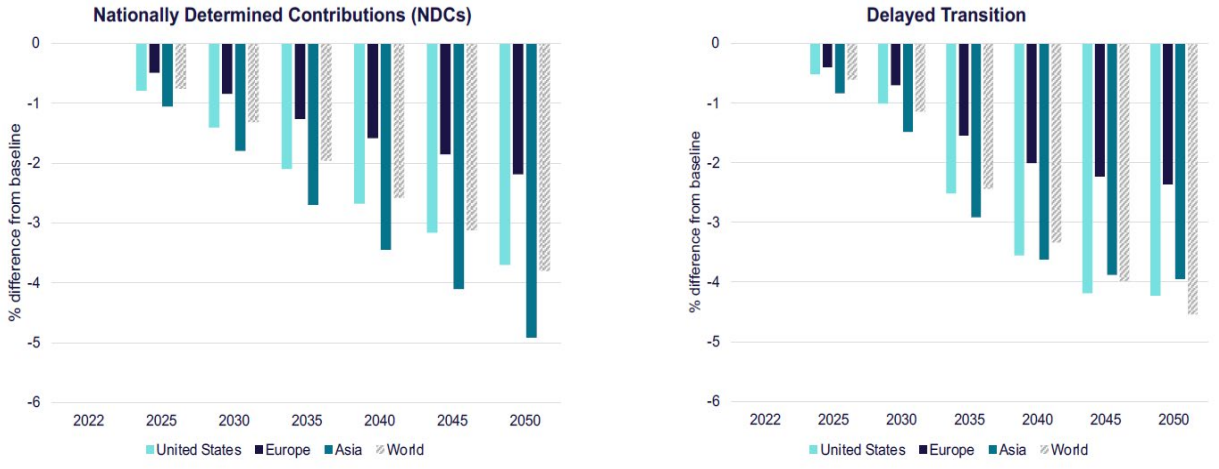
proactive approach, where businesses continuously adapt to the changing circumstances associated with climate policies.

By comparing NGFS scenarios – specifically the Nationally Determined Contributions (NDCs) scenario and Delayed Transition – we can infer significant insights that highlight the likelihood of transition risk for our business and our customers, including:

- Our analysis indicates that distinctive regional and sector specific pathways for the energy transition are likely as climate transition and physical risks will impact each economy uniquely. The formulation of global policies will be contingent upon the specific requirements of regional economies, as is exemplified by the plausible impact to regional GDP under different scenarios in Figure 1. Policymakers will take steps to alleviate the regional impact on their economy, resulting in diverse approaches to policy development across regions. Regulatory requirements focused on the needs of one or a limited subset of economies may have unintended side effects if they are directly translated to a different economy without fully considering those differing transition pathways. Liberty Mutual has a global portfolio of risks, and its distribution of exposures may subject it to higher or lower levels of economic disruption in comparison to peers depending on the relative position of underlying economies along the path to a full energy transition.

Figure 1. Impacts of Gross Domestic Product (GDP) change compared to baseline

The represented GDP impact across regions portrays how market and energy system changes, in addition to the consequences of chronic physical risk impacts, may translate to macro-economic impacts. The relative magnitude of GDP impact in different scenarios helps provide an initial signal as to which regions may be more exposed to transition and physical climate risks. In the NDCs scenario, which has higher physical risk, Asia sees the highest GDP impact from climate change, while in the Delayed Transition scenario, where there is higher transition risk, the largest change is the United States.

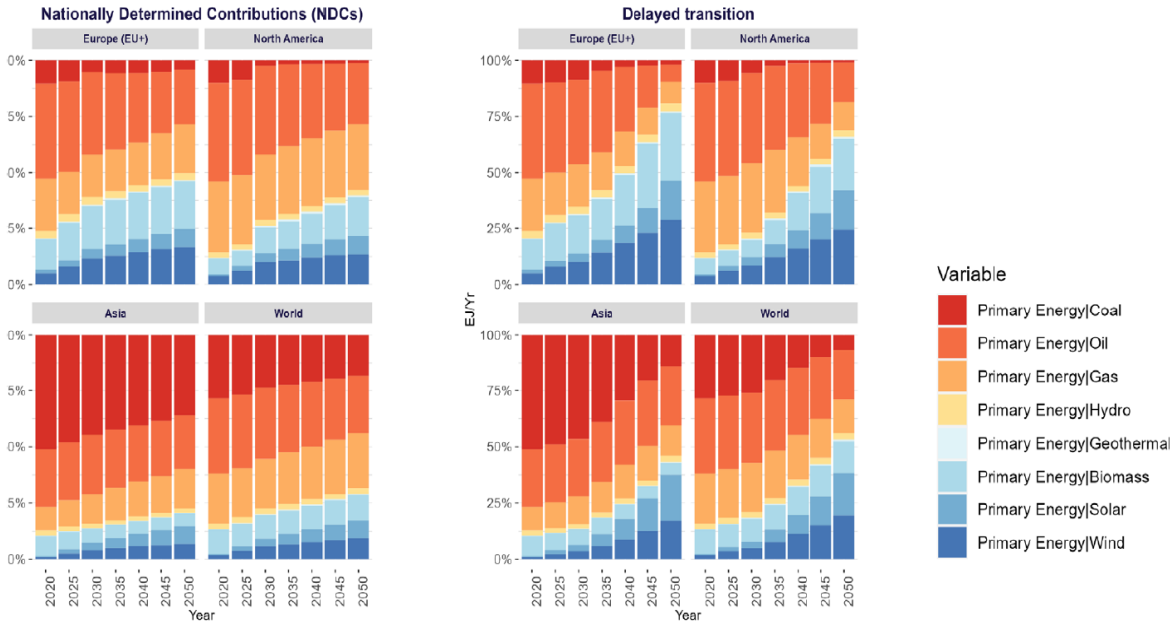


Source: NiGEM Model with GCAM 6.0 Inputs, NGFS V4.0

- Global climate policy alignment will be challenging due to varying national economic needs, and regional coordination will be key. The pace of policy progress will depend on economies' readiness to transition from fossil fuels. NGFS models suggest a continued mix of energy sources, including fossil fuels, renewables, and other low-carbon alternatives. Primary energy mix is impacted by geopolitical dynamics that compromise energy security and affordability. Governments will continue to prioritize reducing dependencies on foreign energy sources and limiting negative impacts to their citizens, challenging a "one-size-fits-all" approach. Additionally, based on our analysis over the years of the data portrayed in Figure 2. and other key variables, many disruptive technology-related risks may become more pertinent at scale in the medium to long term (2030-2040) if the world aligns to an ambitious climate scenario. Particularly for energy sectors where switching costs are low, like primary energy production, the dominant energy mix may change extremely rapidly to new fuel types. This creates a risk if portfolios are overly exposed to a sector in decline, but also an opportunity for a company that has invested in training its underwriters and operations to lean into a growing field. Our Climate Activation Program being rolled out across our Global Risk Solutions (GRS) business unit supports our ability to do this.

Figure 2. Primary energy mix

Primary energy mix is an important indicator for the pace and scale of the transition across regions, as energy consumption across sectors is currently the main driver of emissions. Across society, we heavily depend on energy to power our day-to-day activities, from transportation to electricity for homes and businesses. The mix and scale of primary energy, as referenced in the NGFS graph below, indicates how difficult the transition may be for specific regions.



Source: NiGEM Model with GCAM 6.0 Inputs, NGFS V4.0

Physical risks in the short-term are dominated by changes in physical hazard associated with natural catastrophes. Short-term physical risks may manifest directly, such as increasing

frequency and severity of extreme hurricanes, flood and wildfire. They may also appear indirectly, as access to external capital via reinsurance and the ILS market is reduced when that capital is used to pay claims for increasing natural hazards. A hard reinsurance market reduces access to low attachment and aggregate policies first, resulting in the strongest effects in secondary perils such as severe thunderstorm and wildfire. Notably, in the short term, changes in physical hazard and reinsurance market access may not be readily distinguishable from changes in the underlying insurance markets – inflation, legal system abuse, and growing exposure in risky locations, compound any underlying climate-related trends in hazards and a hardening reinsurance market.

In the medium and long term, in addition to a continuing increase in physical hazard, the odds of larger dislocations stemming from other parts of the finance and real estate sectors continue to increase. Sea level rise and wildfire, in particular, have already shown the potential to impact local real estate markets, impacting the potential for different geographies to grow or shrink in potential market size. Reactionary regulatory responses to rising risk may cause further dislocations in insurance markets, forcing a widening spread between risk and price in the riskiest markets. The pace of critical infrastructure failures in the face of climate change has increased, as power and water systems must cope with a climate that is beyond their design standard. Infrastructure investments are beyond the immediate control of insurance companies, but a lack of investment translates directly into exacerbated loss via time element coverage (power outages) and compounding events (levee and stormwater infrastructure failures). COVID has shown the power of supply chain shocks to drive inflation in the costs of materials needed to rebuild after disasters, and increasing frequency of climate-related disasters may increase the likelihood of such shocks in an interconnected global supply chain.

B. Describe the impact of climate-related risks and opportunities on the insurer's business, strategy, and financial planning.

Our objective is to support our clients and advance action and dialogue on the transition to a low-carbon economy through our climate strategy in three key areas:

Advancing data and discovery: Helping manage climate risk and advancing global understanding and conversation on data and risk discovery and application, putting good information about climate risk into the hands of everyone from policymakers to policyholders.

Supporting adoption of new and alternative solutions: Accelerating the adoption of innovative technologies and alternative energy solutions through risk identification for clients and customers, innovation, underwriting and investments.

Informing and advocating on adaptive solutions: Supporting and advocating for systems and policy solutions that advance resilience and promote sustainability at scale.

Advancing Data and Discovery

At Liberty Mutual, we recognize the importance of reliable and accessible data and are committed to advancing climate and energy transition-related data accessibility and quality for our business, our customers and our industry.

Property and casualty insurers look at climate change impacts differently than other types of financial service companies. We are experts in using science and data to understand physical risks – particularly natural catastrophe risks that could impact our customers' assets. We use these data insights to price risk, and based on that expertise, have a better understanding of how natural catastrophe risks are changing and evolving due to climate risk. This gives us a unique perspective to help the financial industry understand the various financial and economic impacts of climate change. We continue to deepen understanding of physical and emerging risks through research projects and partnerships, expanding on our work around hurricane frequency in the United States, flood risk in Central Europe and wildfire risk.

But climate risk cannot solely be in the hands of insurers. Real estate, investment, zoning, building code and other individual and policy decisions happen in many stages, and long before it is time to underwrite a new policy. Driving good data further up the value chain helps to ensure that we can blunt the worst effects of increasing climate hazards by effectively investing in resilience and adaptation at both the individual and community level.

As climate science continues to evolve, we recognize the need for continued education, partnership, and information-sharing to collaborate on advancing climate data and to ensure that good data is accessible to all. We do this by:

Contributing to research and frameworks: Liberty Mutual continues to explore ways to drive more effective use of climate data in the private sector with our academic partners. We participated in research studies with the National Center for Atmospheric Research (NCAR) and Columbia University focused on the efficient use of climate data and information in the insurance sector. We also engaged in a partnership with MIT consortia, including the MIT Climate & Sustainability Consortium (MCSC), the MIT Energy Initiative (MITEI) and the MIT Center for Energy and Environmental Policy Research (CEEPR). We also contributed to the field of climate scenario assessment for financial and business analysis through engagement with key scientific organizations leading this work, including the Network for Greening the Financial System (NGFS).

Engaging with the scientific community: Liberty Mutual regularly sends delegates to scientific conferences to keep up to date on emerging climate research, which this year included participation at the American Geophysical Union (AGU) and American Meteorological Society (AMS) annual meetings. Climate change is a key focus for both meetings, covering topics related to Liberty Mutual's own areas of interest including event attribution, changes in flood risk, integrating climate models and catastrophe models, emerging perils like post-wildfire debris flows and other impacts of anthropogenic and natural climate drivers.

Partnering with our industry: We actively collaborate with industry bodies like the National Association of Insurance Commissioners (NAIC), American Property Casualty Insurance Association (APCIA), and Institute of International Finance (IIF) to provide feedback on proposed legislation and regulatory frameworks, informed by data, and to align on climate scenario analysis and climate risk metrics for our industry. We also worked alongside the

International Association of Insurance Supervisors (IAIS) to inform the climate risk workstream, sharing our approach to climate scenario analysis and climate modeling.

By engaging in strategic partnerships, we have been able to advance our collective understanding of climate data and modeling.

Supporting Adoption of New and Alternative Solutions

We recognize that the transition to a low-carbon economy is happening rapidly. We are evolving our team, our products and our investments to advance the adoption of innovative technology and alternative energy solutions, and to ensure that we can continue to provide leading risk advisory services for our customers wherever they are on their sustainability journey.

Alternative solutions in our insurance business

We are focused on capacity building to ensure that we have the best talent and insights to advance alternative solutions for our insurance business. We have expanded and equipped our Commercial Energy Transition Risk team to bring strategic focus to the global energy transition affecting current and potential clients across industries. In 2023, we continued to strengthen our Energy Transition Risk team, introducing the Global Head of Strategic Partnerships to work with clients on addressing their risks and opportunities as it relates to the energy transition, and the Director of Strategy and Performance to engage with leaders globally to ensure that local strategies are aligned with the evolving market.

We are proactively discovering and mitigating new risks and opportunities and investing in enhanced data and analytics that allow us to better understand risk and support a low-carbon future for our clients. We have been training underwriters, broker relationship managers, and client relationship managers on new energy technologies for which our clients need coverage. Paired with our support for our customers, we embed climate risk training initiatives, such as our Climate Activation Program, within the business to further empower our underwriters to navigate emerging challenges and opportunities.

We are developing new products to advance the energy transition. As an example, in response to the United States' 45Q income tax credit, which came into effect in 2021 to incentivize the capture of carbon dioxide from qualifying industrial facilities and its disposal in permanent geological storage, Liberty Mutual introduced coverage for site pollution liability and environmental protection through the US Environmental Liability group's Contractors and Environmental Legal Liability product (CELL). In Europe, through a collaboration across regional teams, we developed tailored underwriting for an offshore wind farm that demonstrated our trustworthiness and expertise in the sector.

We believe that to scale the transition and provide the confidence and trust needed in the evolving market, we need to work in partnership with our insurance peers to further understanding of new technologies and early involvement in large-scale renewables projects. We are doing so through active involvement in industry association working groups. For example, as a member of the Geneva Association, an international association of 80 (re)insurance CEOs, Liberty Mutual is helping to clarify the role insurers play in the transition and supporting the development of new

insurability readiness frameworks for emerging technologies, including green hydrogen and Carbon Capture, Utilization and Storage (CCUS). More recently, we provided inputs in the Climate Tech for Industrial Decarbonisation: What role for insurers? report published by Geneva Association in January 2024.

Investing in disruptive innovation

We are also committed to supporting innovation and alternative solutions through Liberty Mutual Investments (LMI). While our investing philosophy is guided by driving strong financial returns and ensuring that we have adequate capital to protect our policyholders, we are a long-term global investor, committed to innovation, and driven by the belief that capital can serve as a force for good.

We believe catalyzing innovation and accelerating the deployment of new technologies is crucial to addressing climate change. This is enhanced by our dedicated Energy Transition & Infrastructure (ET&I) team that has historically emphasized innovative climate-related opportunities as exemplified through our investment in Nexus PMG.

LMI has been actively supporting the global transition to a low-carbon economy for more than a decade. Our ET&I team has a strong track record of generating attractive returns, including across many low-carbon technologies. Through ET&I, Liberty Mutual has invested in:

- The development and construction of some of the world's largest renewable energy and storage resources.
- The circular economy through projects that remove waste byproducts and transform them into valuable energy resources.
- Energy transition onshoring by financing new manufacturing facilities that support both job growth and expansion of the domestic renewable energy value chain.

In addition to the more than $1.23 billion in renewable energy-generation investments across LMI's fixed income and alternative investments, our ET&I team has invested approximately $810 million in emerging energy transition opportunities and strategic investments in climate technology. This diversified portfolio underscores our dedication to supporting a broad spectrum of sustainable solutions. Across more than four decades, we have intentionally made significant allocations to venture capital and early-stage investments with significant exposure to clean-tech, deep-tech and other strategies that are focused on solving critical social challenges.

Informing and Advocating on Adaptive Solutions

As a global property and casualty insurer, we aim to enhance resilience for our customers, our employees and our communities. We utilize data, science-based models and expertise to shape climate adaptation strategies and improve outcomes enhancing resilience.

We aim to support resiliency at the individual level by serving as a risk advisor and developing innovative products and services for our customers, ranging from individual home and auto owners to small businesses and large multinationals. Through our retail business, we launched WeatherReady on Liberty+, a digital platform that provides advice, recommendations and tools to enable homeowners to care for their homes. WeatherReady guides customers through how to

build resilience against severe weather. This includes a short assessment and customized science-backed recommendations, informed by the Insurance Institute for Business and Home Safety (IBHS) research. Over 10,000 policyholders have used this tool, and we continue to expand the content to include topics such as disaster preparedness, unexpected weather changes and wildfire resilience.

Amongst our employees, we are promoting resilience and enhancing sustainability through education and empowerment. We continue to expand the Climate Activation Program, providing foundational climate-related education to all leaders across the business. Liberty Mutual's Sustainable Environment Alliance (SEA), an internal employee group, also supports Liberty Mutual's sustainability efforts by promoting education and positive action to protect the environment in which we live and work.

We also believe that we have a responsibility to advance weather and climate-related resiliency in our communities. Through a partnership with SBP, a national disaster recovery and resilience organization, we are leveraging our technical expertise and combined resources to help low-income communities access federal funds for disaster preparedness and recovery. Additionally, in 2023, the Liberty Mutual Foundation partnered with the Massachusetts Farm Resiliency Fund, to support farms in Central and Western Massachusetts impacted by flooding.

To advance resiliency at scale, Liberty Mutual supports and advocates for systems and policy solutions globally, both on behalf of our business and through the Climate Transition Center, with governments and industry groups. We also continue to engage with policy leaders in priority markets to share data and help develop science-informed laws and programs. In January of 2024, we partnered on a FEMA webinar for local and state governments to educate on the importance of building codes. Through the Climate Transition Center, we have also developed papers and videos to amplify experts from Liberty Mutual, as well as from across our industry and other sectors, to ensure that learning is accessible to everyone.

The Liberty Mutual team is proud of having engaged in the annual UN Climate Conference (COP28) in Dubai, advancing cross-sector collaboration and influencing the role of insurance in the transition. We sponsored leading COP28 events for business leaders, the Climate Innovation Summit and Innovation Zone, hosting an important conversation on how finance partners can help de-risk the transition, further detailed below. Liberty Mutual leadership, including our Chief Sustainability Officer, our Global Head of Strategic Partnerships for the Energy Transition, and our SVP for Sustainability Solutions and Business Integration also engaged in official COP28 cross-sector conversations, including with the International Chamber of Commerce (ICC), who participated in the UN negotiations on behalf the business community.

C. Describe the resilience of the insurer's strategy, taking into consideration different climate-related scenarios, including a 2 degree Celsius or lower scenario.

We regularly update our climate scenario framework, to ensure that we are assessing our strategy and business operations against all possible outcomes. We examine a range of scenarios, including three that fall well below a 2oC world, from the Network for Greening the Financial System (NGFS) and Intergovernmental Panel on Climate Change (IPCC). These scenarios include the Net Zero 2050 and Delayed Transition scenarios (focusing on transition risk) and the (Shared

Socioeconomic Pathways Radiative Concentration Pathways) SSP-RCP scenario, SSP1-1.9 (focusing on physical risk). In addition, we explore scenarios above a 2oC world, including the Fragmented World and Nationally Determined Contributions (NDCs) from the NGSF and SSP2-4.5 scenario from the IPCC. These pathways help us understand how transition and physical risks may directionally impact the world and economic setting in which we operate.

While we do physical risk scenario analysis aligned to specific scenarios as part of Liberty's regulatory reporting, such as our responses to CBES, we operationally find the most value in a rigorous regime of reverse stress testing, marginal portfolio sensitivity, and storyline approaches designed to break our portfolios in ways that help us learn what can go wrong and protect the book of business and our customers. For example, reverse stress testing for hurricane frequency has helped us assess how much hurricane frequency can change before our regional risk appetites are at risk and informed our updated view of hurricane risk which has put in place a new rate set to incorporate climate-driven changes in risk up to the present day. Similarly, recent work on temperature sensitivity for catastrophic wildfire risk lets us consider which are the first components of the wildfire portfolio that will see change as temperatures increase, which can inform our accumulation management and strategic growth priorities.

Focus on Business Integration and Innovation

Business integration is key to our sustained resilience. Liberty Mutual is continuing to evolve our business structure to best meet the needs of our customers and the market, and we are proud to have developed robust sustainability and risk governance structures that have evolved to ensure we collaborate and bring the right expertise to each risk amidst business changes. Our emphasis on a sustainable underwriting risk framework and addressing sensitive topics underscores our commitment to managing risks today while assisting customers in navigating opportunities for a more sustainable future. The Office of Sustainability also continues to partner with Global Risk Solutions (GRS) sustainability and other business leaders to ensure that Liberty Mutual's climate strategy is reflected within individual business strategies. Our Enterprise Risk Management team also continues to advance research in partnership with our business, to ensure that our products and services are informed by the latest science and aggregated data available.

As we navigate this dynamic landscape, we're driven by innovation. Solaria Labs, Liberty Mutual's innovation incubator, combines the mindset of a startup with our core capabilities and expertise to develop new products that address unmet customer needs and expand Liberty Mutual's protection offerings, to include the risks and opportunities posed by climate change, such as WeatherReady.

Continued learning through the Climate Activation Program

The impacts of climate change will touch every aspect of our business and operations. Integral to keeping our strategy resilient is expanding internal climate-related learning through the Climate Activation Program to ensure that employees understand how their role intersects with the energy transition. In 2023, we rolled-out the Climate Activation Program to create a common understanding across the organization of what climate change looks like, and the impact it has on our industry, our business, and our customers. The program goes beyond climate literacy, engaging Liberty Mutual employees through awareness, alignment, and activation. Our objectives

are twofold: to spark intrinsic motivation within our team to learn and grow, and to promote a growth mindset. We believe that through collaboration and innovation, we can navigate this complex landscape and contribute to a more sustainable future for generations to come.

Throughout the year we worked to extend the Climate Activation Program across levels and geographies, tailoring the three-module program to provide foundational training to approximately 300 senior leaders within Liberty Mutual across eight countries. We also educated external partners at the MIT Climate and Sustainability Consortium, which focuses on collaborative academia-industry initiatives to drive transformative solutions addressing real-world climate and sustainability challenges.

This program solidified individual understanding and empowered action, by focusing on:

- **Making connections between policy and geopolitics on climate transition pathways:** Participants engaged with real-world examples and data, transforming abstract concepts into tangible realities.
- **Promoting cross functional learning:** Collaborative discussions fostered deeper comprehension and facilitated the development of shared solutions.
- **Identifying how individuals can play a role in supporting the transition:** Clarified how each employee contributes to Liberty Mutual's climate goals, fostering a sense of ownership and responsibility.
- **Moving beyond compliance:** Emphasized leveraging climate challenges to gain a competitive advantage, promoting proactive and strategic action.
- **Accessing resources and support**: Directed participants to available tools and expertise within Liberty Mutual, empowering them to tackle climate challenges effectively.
- **Personal learning journeys:** CAP encouraged ongoing knowledge acquisition and championed climate action within each individual's area of expertise.

By establishing buy-in and ownership of climate knowledge, the Climate Activation Program seeks to translate learning into concrete action, building on our climate strategy pillar “Inform and Advocate on Adaptive Solutions”. Looking ahead to 2024, our focus is on scaling the Climate Activation Program organization-wide, embedding climate considerations into day-to-day interactions and activities. We aim to evolve the program with a focus on underwriting for key communities within GRS to continue to advance the resilience of our strategy.

STRATEGY – CLOSED ENDED QUESTIONS

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

RISK MANAGEMENT - NARRATIVE

Disclose how the insurer identifies, assesses, and manages climate-related risks.

A. *Describe the insurers' processes for identifying and assessing climate-related risks.*

Liberty Mutual has twenty-seven established Enterprise Risk Management (ERM) key risks, which are grouped into seven categories for the purpose of ERM reporting. These key risks are defined and organized in a manner that is consistent with how management views and manages risks across the organization.

1. Capital /Economic
2. Market
3. Catastrophe (CAT) Underwriting
4. Attritional Underwriting
5. Credit
6. Operational
7. Talent

Climate change is a cross-cutting risk impacting different areas of an organization's risk profile. As such, in assessing how climate-related risks affect the seven key risk categories, Liberty Mutual is aligned to the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD) and considers physical and transition risks as the two main drivers of financial impact for climate-related risk. While climate-related physical and transition risks may affect multiple of these categories and key risks, CAT Underwriting — specifically covering natural catastrophes — presents the greatest potential severity for realized financial loss within a calendar year.

Climate Transition Scenario Analysis

In 2023, we updated our climate scenario framework to include four of the seven scenarios published by Network for Greening the Financial System (NGFS) including Net Zero 2050, Delayed Transition, Fragmented World and Nationally Determined Contributions (NDCs) portrayed in Figure 1. We've chosen to concentrate on these four scenarios due to their diverse transition narratives and impacts, offering realistic routes for an orderly or disorderly shift to a low-carbon economy, and illustrating potential outcomes if global climate goals are not achieved.

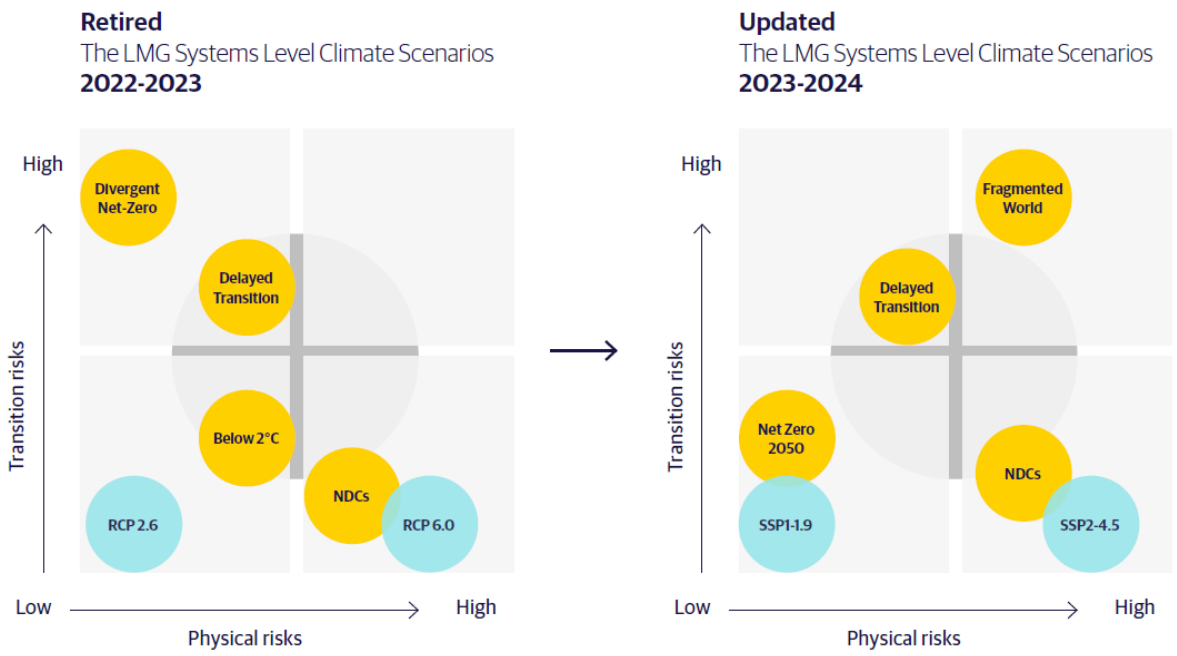
In our analysis, we focus on system-level results from two "stress scenarios" that reflect policy temperature ambitions above and below 2oC: Delayed Transition and NDCs. The Delayed Transition scenario depicts the impacts of minimal global coordination and delayed climate ambition, while the NDCs scenario reflects the current trajectory based on existing climate policies and targets. The combination of these two plausible end members helps us to bracket the range of likely policy outcomes and transition trajectories across countries and sectors. However, as catastrophic physical hazards relevant to property insurers are not adequately captured by existing models, we supplement these models with our view of climate physical risks, as our insured business is primarily impacted by physical catastrophe risks.

Figure 3. Liberty Mutual Climate Scenario Framework

High Transition Risk	High Transition & Policy Risk	High Transition & High Physical Risk	High Physical Risk
Policy Temperature Ambition: 1.4°C	**Policy Temperature Ambition:** 1.6°C	**Policy Temperature Ambition:** 2.3°C	**Policy Temperature Ambition:** 2.6°C
Net Zero 2050	**Delayed Transition**	**Fragmented World**	**Nationally Determined Contributions (NDCs)**
Emissions reach zero around 2050, giving at least a 50% chance of limiting global warming to below 1.5°C by 2100. Assumes **ambitious climate policies are introduced immediately and high technological innovation**. Carbon dioxide removal (CDR) is used but kept to the minimum possible.	Transition and physical risks are higher than in the Net Zero 2050 scenario. Assumes global emissions do not decrease until 2030. Strong policies are then needed to limit warming to below 2°C. **Policy action is not introduced until 2030**, and the level of action differs across countries and regions based on currently implemented policies. CDR is assumed to be very low.	Assumes delayed and divergent climate policy ambition globally, leading to **elevated transition risks** in some countries and **high physical risk everywhere** due to the overall ineffectiveness of the transition. Countries without net zero targets **follow current policies**, while other countries achieve theirs partially (80% of target).	Assumes that only currently implemented policies are preserved. Emissions continue to increase until 2080, leading to about ~2.5 – 3°C of warming. Assumes **moderate to severe physical risks, lower transition risk**.

SSP1-1.9	RCP-SSP Mapping to NGFS Scenarios	SSP2-4.5
A very low emission scenario, CO_2 emissions peak around 2050, following a decline that becomes negative in 2100 Global average surface temperature increase of 1.0° to 1.8°C by 2100, with a best estimate of 1.4°C	SSP1-1.9 Maps to the Net Zero scenario temperature ambition SSP2-4.5 Maps to the NDCs scenario temperature ambition	An intermediate emission scenario, CO_2 emissions continue around current levels until 2050, then decrease but do not reach net zero by 2100 Global average surface temperature increase of 2.1° to 3.5°C by 2100, with a best estimate of 2.7°C

Sources: Scenario framework based on the NGFS 4th scenario vintage and IPCC 6th Assessment.



Note: Network for Greening the Financial System (NGFS) Framework used as a foundation. Graphic is for illustrative purpose only.

Approach to identifying and assessing physical risk

As a property and casualty insurer, identifying and assessing extreme physical risks are core functions for Liberty Mutual. We take a data-driven approach, and ensure our data is aligned with the latest and most robust research available. We follow a four-pillar strategy to enable continuous progress toward capturing and quantifying climate risk to our organization:

(1) Prioritize by science and materiality

Climate change impacts introduce a range of risks that directly affect property. To assess these risks, we use a prioritization framework that is guided by underlying science and accounts for potential repercussions for our book of business. Liberty Mutual's high-priority perils are hurricanes, floods, and wildfires. Beyond these, we monitor scientific literature regarding other perils, like tornadoes, hail, extratropical storms, and winter storms, to prepare to act should they attain a higher level of combined risk and impact.

(2) Invest in data quality to differentiate from peers

Liberty Mutual has made substantial investments in geospatial analytics to assess the characteristics of our underlying exposure data. High quality location information is a critical part of catastrophe management, particularly for high resolution perils like flood that are experiencing climate-related changes in risk. We also continually invest in upgrading our understanding of hazards, deploying custom hazard products and portfolio analytics to integrate the latest climate research into our view of risk.

(3) Focus on sub-perils that drive loss

Our approach to risk management extends beyond merely identifying hazards influenced by climate shifts. Not all changes in hazard result in material loss impacts, so we place a deliberate emphasis on the specific components of a hazard that drive loss. By focusing on components of the hazard that drive impact, we not only identify targets for deeper scientific research, but also prioritize specific sub-perils for action. For example, an emerging body of literature has found that wind-driven fire drives a disproportionate amount of wildfire losses, so assessing that subset of fire risk is particularly useful for portfolio management and accumulation control.

(4) Develop actionable metrics for the business

We recognize the imperative of translating climate risk assessments into tangible actions. One of the ways we do this is by integrating operational project outcomes into metrics used for gauging risk appetites within the business. For example, this year we updated our view of hurricane risk, incorporating the latest scientific insights on climate change. This will be integrated across the business through the Liberty View of Risk and our standardized catastrophe modeling process and metrics. Catastrophe model adjustments are incorporated into Liberty Mutual's routine internal financial reporting schedule at a minimum of twice annually.

To bolster our understanding of climate-related physical risks, we collaborate with expert organizations such as the National Oceanic and Atmospheric Administration (NOAA), Massachusetts Institute of Technology (MIT) and the National Center for Atmospheric Research (NCAR).

Chronic physical risk

To further understand chronic physical risks, we utilize advanced modelling tools following a variety of Shared Socioeconomic Pathways – Radiative Concentration Pathways (SSP-RCP) scenarios to analyse regional changes in temperature and precipitation. These models couple different policy and economic decisions with their downstream effects on chronic risks, allowing us to understand Liberty Mutual's exposure. Physical risk scenarios were selected to pair with transition risk modelling to understand possible drivers in GDP impacts in various NGFS scenarios within higher physical risk or higher transition risk stress scenarios. While the Integrated Assessment Models (IAMs) used to generate the NGFS pathways offer a more granular view of energy system and economic changes, the SSP-RCP scenarios based on CMIP6 data allows us to examine physical risk variables not directly included in the NGFS data set, such as precipitation. By pairing the observations from both analyses, we are better able to comprehend the totality of impacts that may be experienced under different climate conditions.

We expect that changes in chronic physical risks can directly affect acute physical risks. Rising global average temperatures can have considerable impacts on current weather patterns, presenting opportunities for us to assess the uncertainties associated with climate-related risks. As an example, the combination of altered rainfall patterns and escalating temperatures is transforming environments conducive to wildfires, amplifying the risk in regions already susceptible to such disasters. In particular, increases in temperature may drive increased burn areas in wildfires. While wildfires are challenging to directly model in global climate models due to their limited spatial and temporal extents, identifying chronic temperature changes can help us target where wildfire hazard may be sensitive to changes in the future.

Physical risks in our investments

In assessing climate-related physical risks within Liberty Mutual’s investment portfolio, we are working to combine our in-house natural catastrophe modeling expertise with our unique investment perspective and asset management goals.

This approach leverages our physical risk modeling expertise from the insurance side of the business to pilot guidance datasets encompassing Liberty Mutual's key perils which can be used to augment traditional data sources that are used within investment portfolio management. By incorporating a more comprehensive understanding of physical risks across our investment portfolio, we have taken an initial step toward ensuring that our investment portfolio is well-positioned for future physical climate impacts.

Approach to transition risk

Liberty Mutual's approach to identify and assess climate-related transition risks combines a systems and a portfolio level approach.

- **Systems-level approach:** We assess macroeconomic, policy and legal, reputational, and technological risks (with regional and sector insights) over five-, 10-, 15-, 20- and 30-plus-year time horizons, recognizing that quantitative approaches do not yield meaningful insights between 30- and 50-year time horizons. In 2023, we updated our enterprise climate scenario framework to reflect the updated NGFS scenarios.

- **Portfolio-level approach:** In 2023, Liberty began running pilot exercises to assess sectors exposed to transition risk in its insured books of business, utilizing a proprietary methodology, starting with business units in Europe, Bermuda, and Canada. These pilots allowed us to refine our underwriting portfolio approach to transition risk exposure mapping and scenario analysis, and to ask what types of risk and opportunity are spread across business units and within different lines of business. In addition to specific risk management efforts, this work has helped to inform our Climate Activation Program training with grounded, concrete examples of how the Liberty Mutual portfolio compares with the local economy, and how that local economy is positioned to face the upcoming energy transition. Our preliminary portfolio analysis reveals that the plausible magnitude of future risk and opportunity is dependent on the industry and regional exposure of a portfolio. Certain sectors are more sensitive to policy changes, therefore leading to higher uncertainty of the magnitude of risk or opportunity.

  In 2021 we conducted a climate scenario analysis which found that climate transition risk has low impacts on LMI's portfolio holdings over the near-term, and it increases moderately over a 15-year time horizon. Notably, these results assume that there is no active management of the portfolio over a 15-year period. LMI actively manages our portfolio and would seek to reposition it over time to address evolving climate risks. As our climate transition analytics capabilities continue to mature, we seek to continue to align our underwriting and investment level approaches with science-based approaches.

Since our seminal portfolio-level analysis in 2021, we have tailored the analysis to jurisdiction-specific portfolio-level climate stress tests to comply with local regulatory reporting requirements. Our approach computes climate stress profit and loss (P&L) annually based on updated NGFS scenarios. We utilize an external vendor's climate stress models and data in this exercise, covering public corporate bonds and equity, which focuses on scenario-conditioned carbon price to imply transition risk. We process illiquid investments' climate risk by proxying to public equivalents.

These more granular portfolio-level analyses have informed additional insights for identifying and assessing climate-related transition risks associated with our portfolio holdings. We also continue to research ways in which we can advance our climate risk analytics capabilities. We are aiming to fill a gap in existing research by looking at insurance portfolio impacts from the climate transition. We have developed a science-based methodology based on academic and industry sources to map and measure transition risk impact to our underwriting portfolios and are currently working to scale our pilot across the global enterprise.

B. Describe the insurer's processes for managing climate-related risks.

We believe that insurance is a force for good and serves a dual role as both a mechanism for risk transfer and risk signaling. We understand the dynamic environment and stay risk-aware rather than risk-averse. This belief shapes the way we proactively manage risks by using catastrophe models, integrating risk management into our business and monitoring emerging risks.

Managing physical risks through catastrophe models
We conduct assessments to evaluate the vulnerability of our portfolios, geographic locations, business divisions and product segments to natural disasters like hurricanes, earthquakes, and severe weather phenomena. To manage the potential adverse impact of catastrophes, whether natural or man-made, on our underwriting and financial results, we employ a strategy that incorporates diverse modeling techniques, stringent underwriting controls and strategic reinsurance placements. This involves analysis of historical weather data and an assessment of the vulnerability of our assets and operations to such events.

To manage climate-related physical risks, we implement disaster response plans and transfer risk through insurance and reinsurance. Our primary tool for assessing the potential financial impact of natural catastrophe-related risks is catastrophe modeling. We utilize the latest catastrophe loss simulation models from reputable third-party specialists like Verisk Extreme Event Solutions and Moody's Risk Management Solutions, in addition to internally developed modeling and analysis tools, supplementing them regularly with up-to-date scientific information on severe weather perils and our own loss experience.

For the acute risks that are captured in catastrophe models, we apply a flexible toolbox of strategies depending on the level of confidence in forward-looking impacts on the peril. Where confidence is highest, such as sea level, we run forward-looking scenarios. For example, a project examining the effects of sea level rise on storm surge in our portfolios used NOAA's Intermediate Sea level scenario to project coastal flood risk out to 2035 and 2050. However, for many of our hazards, uncertainty is higher within scenarios or time frames prior to 2050 than between those scenarios. In those cases, such as hurricane frequency, we leverage alternative approaches, such as reverse stress testing or sensitivity testing, that allow us to identify and monitor a wide range of impacts to our book of business, rather than relying on a single point estimate or range from a scenario.

Catastrophe loss simulation models play a crucial role in our underwriting process, aiding in the development of risk selection guidelines and contributing to the establishment of pricing differentials for individual risks and program rate structures. We integrate the output from these models into our ongoing risk management efforts, ensuring an effective management approach for our natural catastrophe exposure portfolio. As part of our ERM program, we can conduct stress testing to facilitate understanding of the capital or liquidity impacts of various deterministic stress scenarios or combinations thereof, ensuring that our current portfolio adheres to established tolerances.

At Liberty Mutual, we establish both gross and net tolerances for natural catastrophe risk, managing both direct underwriting exposure and group-wide retention of risk. Occurrence tolerances help manage exposure concentration related to a single large event, while aggregate tolerances manage the potential exposure to an accumulation of losses from various events throughout the year. Utilizing measures such as Probable Maximum Loss (PML) and Conditional Tail Expectation (CTE), which are Value-at-Risk (VaR) and Tail Value-at-Risk (TVaR) measures, respectively, we assess and model our natural catastrophe exposures. These assessments are conducted semi-annually, with modeled losses evaluated relative to respective tolerances. We monitor and evaluate the limits for specific exposures, such as regional-level exposures, and,

when necessary, develop mitigation plans to align with tolerance levels and address adverse trends.

Managing transition risk through integrating sustainability in the Underwriting Process

Insurance protects and prepares for the unexpected through keen risk awareness and mitigation. At Liberty Mutual, we've been entrusted to insure the most complex assets on the globe, and the most influential enterprises sustaining local communities. We are embedding sustainability into our decision-making processes and underwriting strategy to ensure that we remain a stable, adaptive insurer, always risk aware and looking ahead. Being proactive will keep us ahead of the evolving risk landscape, supports developing a robust portfolio with improved business performance, and better positions us to help our customers de-risk their business and build resilience.

Through our commercial insurance business, we:

- Apply a sustainable underwriting risk framework, a consistent set of material environmental, social, and governance considerations relevant across our portfolio, including climate. This year we bolstered this framework with insights from a line of business specific materiality assessment and built tools to bring relevant insights to our underwriters so that they can better assess risks and opportunities.
- Manage a set of enhanced and expanded sensitive topics that warrant additional guidance where we perceive elevated reputational, commercial and regulatory risks, including those linked to climate-related factors. We formed a council to oversee this work, which includes key underwriting, risk, sustainability, and legal leaders. Topics are identified through diverse sources including product boards, underwriting referrals, public affairs, legal, investments and our own proprietary analysis.

Managing risks in our investments

LMI integrates sustainability into the investment process to provide investors with an expanded information set to aid investment research, support portfolio returns and lessen volatility over time. Our sustainable integration efforts span both our global fixed income and private investments and utilize internal and external resources to supplement our robust investment process.

C. *Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the insurer's overall risk management.*

Through Liberty Mutual's Enterprise Risk Management (ERM) teams and the Climate Council, we consider the impact of climate-related risk at both the enterprise level and within individual business units.

Liberty Mutual's ERM approach emphasizes the identification and quantification of material exposures, effective communication and management of these exposures throughout the company, and the development and implementation of strategies to mitigate identified risks when

deemed necessary. Strong governance ensures that there is an open-line of communication with the highest levels of management for identifying, assessing and managing climate-related risks.

The ERM Executive Committee, chaired by the CEO, holds the responsibility for overseeing the development of processes to aggregate, evaluate, and manage group-wide exposures across the organization, and provides guidance on the implementation of ERM processes.

RISK MANAGEMENT – CLOSED ENDED QUESTIONS

- Does the insurer have a process for identifying climate-related risks? **YES**
  - If yes, are climate-related risks addressed through the insurer's general enterprise-risk management process? **YES**
- Does the insurer have a process for assessing climate-related risks? **YES**
  - If yes, does the process include an assessment of financial implications? **YES**
- Does the insurer have a process for managing climate-related risks? **YES**
- Has the insurer considered the impact of climate-related risks on its underwriting portfolio? **YES**
- Has the insurer taken steps to encourage policyholders to manage their potential climate-related risks? **YES**
- Has the insurer considered the impact of climate-related risks on its investment portfolio? **YES**
- Has the insurer utilized climate scenarios to analyze their underwriting risk? **YES**
- Has the insurer utilized climate scenarios to analyze their investment risk? **YES**

METRICS AND TARGETS – NARRATIVE

Disclose the metrics and targets used to assess and manage relevant collateralized risks and opportunities where such information is material.

A. ***Disclose the metrics used by the insurer to assess climate-related risks and opportunities in line with its strategy and risk management process.***

Energy transition investments

In 2023, Liberty Mutual Investments managed approximately $100 billion in capital across global fixed income and private investments, including asset classes such as private equity, venture capital, real estate and private credit.1 Liberty Mutual is a UNPRI signatory and maintains a responsible investment policy. Its overall asset allocation framework reflects multiple considerations including, but not limited to, compounding capital, maintaining adequate liquidity and minimizing risk. Within our overall investment approach, we have been making a more pronounced focus on supporting emerging investment opportunities and going beyond traditional renewable energy projects, as noted in Table 1 below.

[1] As of 12/31/2023

Table 1. Energy Transition Investments	2021	2022	2023
Total investments in renewable energy[2]	$1,468 m	$1,274 m	$1,231 m
Total investments in energy transition solutions[3]	$287 m	$388 m	$810 m

Measuring progress against our 2019 Coal Policy

In 2019, Liberty Mutual established a global policy on coal underwriting and investing. We have met the investments goals for this policy and have nearly met those related to global underwriting.

As detailed throughout this report, we recognize that the energy mix and demands for every region and community may look different, including the continued need for traditional energy sources, and we are committed to making sure the climate transition includes everyone. We continue to take a pragmatic approach and believe that as new energy sources are developed at scale, demand for new and expanded traditional energy projects will decline based on market forces and the evolution of public policy.

Table 2. Coal Policy Progress

	Underwriting	Investments
Commitment	• No longer underwrite risk for companies that have >25% of exposure from coal extraction and/or produce energy from thermal coal.	• No longer make new investments in companies that generate more than 25% of their revenues from thermal coal mining or utility companies generating more than 25% of their electricity production from thermal coal. • Divest existing investments in companies that exceed this threshold by 2023.
Progress/ results	Since establishing our global coal policy, we have nearly met our goals related to global underwriting. For the remaining handful of insurance policies necessary to meet this goal, we are actively managing the non-renewals or the phase-out plans for multi-year contracts, which we are bound to uphold until their expiration dates.	LMI has successfully exited all positions that exceeded policy thresholds and established appropriate compliance and portfolio management practices to maintain continued adherence to the policy.

[2] In 2023, fixed maturities and public equities of US$383 million, LP, LLC and other equity method investments of US$583 million and unfunded commitments of US$265 million were included. In 2022, fixed maturities and public equities of US$461 million, LP, LLC and other equity method investments of US$446 million and unfunded commitments of US$368 million were included. In 2021, fixed maturities and public equities of US$506 million, LP, LLC and other equity method investments of US$406 million and unfunded commitments of US$556 million were included.

[3] Includes unfunded commitments of US$358 million (2023), US$247 million (2022), US$221 million (2021).

Environmental Risk Exposure Metrics

In the assessment of climate-related risks and opportunities, Liberty Mutual employs a comprehensive set of environmental risk exposure metrics. These metrics are crucial to understanding the exposure to potential climate-related losses.

Liberty Mutual closely monitors changes to the frequency and severity of weather-related natural catastrophes, as well as changes in exposure in our insured portfolio, in evaluating the company's exposure to climate risk. These factors along with a range of assumptions beyond those embedded in standard models (using Liberty Mutual's historical data, third party tools, new scientific research and technologies, and input from expert consultants) enables the company to build a custom modeled view of loss, the Liberty View of Risk.

One key aspect of this catastrophe management approach is the regular monitoring of catastrophe exposures through metrics such as Probable Maximum Loss (PML). This metric, among others, enables the company to assess vulnerability and exposure to climate related risks, allowing for the refinement of risk management strategies proactively. The table below provides the probabilities that estimated catastrophe losses from a single hurricane or earthquake event, occurring in a one-year timeframe, will equal or exceed the indicated loss amounts after reinsurance and net of tax based on the company's view of risk using proprietary and third-party catastrophe models as of December 31, 2023. Estimated losses comprise claims and allocated claim adjustment expenses (but exclude unallocated claim adjustment expenses), net of reinsurance recoveries and reinstatement premiums.

Table 3.
Probabilities that estimated catastrophe losses from a single hurricane or earthquake event, occurring in a one-year timeframe, will equal or exceed the indicated loss amounts after reinsurance and net of tax based on the company's view of risk using proprietary and third-party CAT model as of Dec. 31, 2023

Likelihood of Exceedance (Occurrence)[4]	Dollars (in millions) North America		Percentage of total policyholders equity as of 12/31/2023 North America[5]	
	Hurricane Net	Earthquake Net	Hurricane Net	Earthquake Net
1 in 50 Year PML (2.0%)	915	796	3.3%	2.8%
1 in 100 Year PML (1.0%)	1,009	938	3.6%	3.3%
1 in 250 Year PML (0.4%)	1,452	1,213	5.2%	4.3%

[4] The probabilities in the table represent the likelihood of losses from a single event equaling or exceeding the indicated loss amount in a one-year timeframe. The 1 in 100-year PML refers to a 1% chance of a loss equaling or exceeding the indicated amount. Also, the modeled loss represents the single event occurrence perspective and does not reflect the aggregation of multiple events that can occur in a single year timeframe.

[5] The percentage of total policyholders' equity is calculated by dividing the indicated loss amounts by the total policyholders' equity less unrealized gains and losses on certain investments in debt securities, net of tax and related deferred acquisition costs, as of December 31, 2023.

Table 4 below details estimated ultimate catastrophe losses, net of reinsurance and inclusive of reinstatement premium, incurred in accident years 2021, 2022 and 2023 as of December 31, 2023. Table 5 shows the estimated ultimate catastrophe losses as initially reported for those accident years in Liberty Mutual's MD&A. Additionally, subsequent favorable development, which represents the difference between the initial reported loss and the current estimated ultimate, is displayed. Table 6 details the estimated ultimate catastrophe losses by major geographic region.

Liberty Mutual defines a catastrophe as natural events, civil unrest or terror events exceeding $25 million in estimated ultimate losses, including loss adjustment expenses, net of reinsurance, and before taxes, aggregated across the business for both U.S. and international events. Catastrophe losses, where applicable, include the impact of accelerated earned catastrophe premiums and earned reinstatement premiums.

Liberty Mutual recognizes that catastrophe modeling continues to evolve, and available models reflect varying levels of maturity and sophistication. As a result, Liberty Mutual regularly evaluates and incorporates the most up to date scientific advances in the estimation of the Company's natural catastrophe loss exposure.

Table 4. Estimated Ultimate Catastrophe Losses, Net of Reinsurance and inclusive of reinstatement premium, by Accident Year evaluated as of December 31, 2023. (in $ millions)

Peril Category	Accident Year 2023	Accident Year 2022	Accident Year 2021
Tornado, Hail and Wind	3,982	1,646	1,259
Winter Storm	195	699	843
Tropical Storms/Hurricanes	131	457	767
Typhoons/Europe Floods	85	103	309
Wildfires	129	9	124
Earthquake	129	–	–
Other[6]	34	481	–
Net Catastrophe Losses[7]	**4,685**	**3,389**	**3,046**

Table 5. Estimated Ultimate Catastrophe Losses, Net of Reinsurance and inclusive of reinstatement premium, by Accident Year evaluated as initially reported. (in $ millions)

Peril Category	Accident Year 2023	Accident Year 2022	Accident Year 2021
Net Catastrophe losses as originally reported at the end of each accident year	4,685	3,552	3,057
Favorable development in subsequent calendar years	–	(163)	(11)

[6] Other Category includes losses for Ukraine Invasion in AY 2022 and Sudan conflict in AY 2023.
[7] Net Catastrophe Losses include recoveries on cat aggregate covers in AY 2021 and AY 2022.

Table 6. Estimated Ultimate Catastrophe Losses by Region, Net of Reinsurance and inclusive of reinstatement premium, by Accident Year evaluated as of December 31, 2023. (in $ millions)

Region	Accident Year 2023	Accident Year 2022	Accident Year 2021
North America	4,327	2,652	2,993
Europe	101	640	309
Latin America	-	-	-
Asia Pacific	93	103	-
Other[8]	163	-	-
Net Catastrophe Losses[9]	**4,685**	**3,389**	**3,046**

Operational Footprint

We have continued to reduce our operational carbon footprint and expand our waste and water management efforts, while office occupancy and business travel increased in 2023. To reduce our operational emissions, we leverage efficiency and a data-driven approach to real estate portfolios, fleet usage and business travel.

Table 7. Energy Consumption

	2023	2022	2021
Electricity (MWh)	104,914	126,027	149,975

Building operations

We are making our buildings more efficient by focusing on reducing energy consumption and optimizing operations. Our Boston headquarters was awarded the First Place 2024 American Society of Heating, Refrigerating and Air-Conditioning Engineers Technology Award in recognition of outstanding achievement in the design and operation of energy efficient buildings. The campus also won the 2023 Massachusetts Save Climate Leader Award for efforts to increase energy efficiency and reduce emissions. Additionally:

- In the U.S., three of our owned buildings have LEED certifications and two have Energy Star certifications.
- Our Plano, Texas building has reduced its energy consumption by 8% by installing an energy-efficient cooling system and making continuous energy efficiency improvements. It also sources a majority of its electricity from renewable power generation.
- In Singapore, our team conducted a detailed workplace scenario analysis to optimize and reduce space. As a result, we shifted from a six-story building to a single floorplan.
- Our Asia Pacific region selects high-efficiency buildings for its operations that have a National Australian Built Environment Ratings System (NABERS) rating for sustainability performance.
- In China, we lowered emissions significantly by reducing our office space footprint while simultaneously redesigning the spaces to enhance the employee experience.

[8] Other Location includes the Sudan Conflict and Turkey/Syria Earthquake for AY 2023.

[9] Net Catastrophe Losses include recoveries on the cat aggregate covers in AY 2021 and AY 2022.

- Our London office is BREEAM-certified complete with life cycle assessment and green energy supply.

Waste reduction and recycling

We are taking action to lessen our environmental footprint by reducing the waste generated across our operations. Specific actions include:

- **Printing conservation:** Through Liberty Mutual's Print$mart initiative (which captures printing activities both in-office and through remote work), total printed page volume in 2023 was 68% lower than 2019 levels. As a result, employees conserved 23 million gallons of water, saved 27,457 trees, and reduced GHG emissions by 1,144 tons.
- **Furniture reuse:** We donated 74,722 pounds of office furniture, which had a fair market value of $220,815, to local social service agencies, nonprofits and schools.
- **Landfill diversion:** With most employees back in an office, our centralized waste programs in U.S.-owned buildings have diverted significant waste from landfills. As employees are asked to sort waste into bins for recycling, compost and landfill, we're fostering a conscious disposal culture. In 2023, we diverted 65 tons of compost and 191 tons of mixed-recycling from our U.S.-owned facilities as well as 190 tons of electronics and 593 tons of office paper from our global operations.

Fleet highlights

Around the world we work to ensure claims adjusters and other employees are mindful of their carbon emission by using fuel efficient vehicles. Our impact in 2023 over 2019 baseline levels includes:

- 47% reduction in miles driven
- 14% decrease in gallons consumed
- 9% reduction in CO2 emissions

B. Disclose Scope 1, Scope 2, and if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.

At present, we systematically measure and disclose data on both Scope 1 and Scope 2 GHG emissions. Additionally, we track two distinct categories of Scope 3 emissions, namely waste generated from operations (pertaining to U.S. owned and operated facilities) and emissions resulting from business travel.

	2023	2022	2021
Scope 1 CO2e emissions ($MTCO_2e$)	30,162	29,236	29,699
Scope 2 CO2e emissions ($MTCO_2e$) location based	36,474	40,530	48,358
Scope 2 CO2e emissions ($MTCO_2e$) market based	31,731	36,791	44,760
Scope 3 CO2e emissions ($MTCO_2e$)[10]	46,240	29,518	8,638

[10] In 2023, Scope 3 emissions is limited to Category 5 – Waste Generated in Operations for US owned and operated facilities, and Category 6 – Business Travel for global commercial air and ground travel, and employee mileage reimbursement for US and Canada based employees.

C. Describe the targets used by the insurer to manage climate-related risks and opportunities and performance against targets.

We continue to work towards meeting our Scope 1 and 2 global greenhouse gas (GHG) reduction target of 50% by 2030 from 2019 levels. In 2023, we achieved a 4.5% reduction from 2022 levels, resulting in a cumulative 46% reduction from the 2019 baseline, contributing toward a low-carbon future.

To fulfill our GHG reduction objectives, we are actively reducing our operational carbon footprint. This includes enhancing operational efficiencies, identifying renewable energy opportunities across our real estate portfolio and leveraging key learnings from 2020 to increase emission reduction rates during the return-to-office transition. Furthermore, we are adapting to changing work dynamics, with a continued focus on the reimagination of the workplace as employees globally connect and collaborate in hybrid, in-office or work-from-home formats. This adaptability plays a crucial role in our overall reduction of GHG emissions. Our commitment to sustainability remains steadfast as we work towards a resilient and environmentally responsible future.

METRICS & TARGETS – CLOSED ENDED QUESTIONS

- Does the insurer use catastrophe modeling to manage your climate-related risks? **YES**
- Does the insurer use metrics to assess and monitor climate-related risks? **YES**
- Does the insurer have targets to manage climate-related risks and opportunities? **YES**
- Does the insurer have targets to manage climate-related performance? **NO**