



CLIMATE RESILIENCE DIALOGUE INTERIM REPORT

27 July 2023

CLIMATE RESILIENCE DIALOGUE

- Interim Report -

DISCLAIMER

The considerations in this report are compiled under the aegis of the members of the Climate Resilience Dialogue. This document is not an official European Commission document nor reflects an official European Commission position. Nothing in this document commits the European Commission nor does it preclude any policy outcomes.

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1. Background

Despite the global effort to limit temperature increase to 1.5°C, the devastating effects of climate change are evident and further impacts will be unavoidable. The financial cost of climate change is already high and keeps going up and yet, only around 30% of losses of in Europe were covered by insurance during the period 1980-2021.¹

In this context, the European Commission has set up the **Climate Resilience Dialogue**. It is one of the concrete actions to reduce the climate protection gap through facilitating exchanges between insurers, reinsurers, public authorities, and other stakeholders, such as real-estate developers and infrastructure operators, as set out in the 2021 EU Adaptation Strategy and in the Strategy for Financing the Transition to a Sustainable Economy. Both strategies are part of the European Green Deal and aim to increase and accelerate the EU's efforts to protect nature, biodiversity, people and livelihoods against the unavoidable impacts of climate change.

The Climate Resilience Dialogue was officially launched in November 2022. During the launch event members discussed and agreed on the objectives of the group, as well as the division of tasks between the thematic subgroups. Moreover, it was agreed that the Dialogue would produce an interim report by in the summer of 2023 and the Final Report by the end of June 2024. This Interim Report outlines the work done by the Dialogue since its inception in November 2022. It starts with a definition of climate protection gap agreed upon by the group and presents preliminary findings of the group on the identified gaps, the approach towards measuring and analysing the gaps, as well as the way forward until the publication of the Final Report in Q2 2024.

1.1 Organisational arrangements

The Climate Resilience Dialogue is a **special group** co-chaired by DG CLIMA and DG FISMA. Special groups are *sui generis* bodies that, based on their nature and the tasks they perform, do not qualify as “Commission expert groups” or “other similar entities” in the understanding of the framework of Commission Decision C(2016)3301.

DG CLIMA and DG FISMA invited the following organisations to participate in the Dialogue as members:

- European Federation of Insurance and Financial Intermediaries (BIPAR),
- Insurance Europe,
- World Bank,
- Bureau Européen des Consommateurs/The European Consumer Organisation (BEUC),
- Federation of European Risk Management Associations (FERMA),
- European Insurance and Occupational Pensions Authority (EIOPA),
- United Nations Environment Programme Finance Initiative (UNEP FI),
- EU Covenant of Mayors (EU-CoM),
- UN Office for Disaster Risk Reduction (UNDRR),

¹ European Environmental Agency, ‘Economic losses from climate-related extremes in Europe (8th EAP)’. 21 April 2023. <https://www.eea.europa.eu/ims/economic-losses-from-climate-related>

- Actuarial Association of Europe (AAE),
- SMEUnited,
- Union Internationale de la Propriété Immobilière/International Union of Property Owners (UIPI),
- Pan European Insurance Forum (PEIF),
- European Environment Agency (EEA),
- Chief Risk Officers Forum (CRO Forum),
- Reinsurance Advisory Board (RAB),
- Association des assureurs mutuels et coopératifs en Europe/ Association of Mutual Insurers and Insurance Cooperatives in Europe (AMICE).

The Dialogue is divided into **two subgroups**:

- Subgroup 1: '*Insurance underwriting and solutions*',
- Subgroup 2: '*Adaptation investment*'.

The European Commission provides the secretariat for the Dialogue and as such is hosting regular meetings of the Dialogue and set up its [website](#).

1.2 Objectives

The Dialogue has been set up as a forum for discussion that aims at strengthening the collective understanding of insurers, reinsurers, businesses, consumers and other stakeholders on the climate protection gap.

The main objectives of the Climate Resilience Dialogue are firstly, to identify ways to **narrow the climate protection gap**, and secondly, ways to **stimulate investments in good adaptation solutions**.

The initial and non-exhaustive work programme of the Climate Resilience Dialogue included: i) to exchange views on how to address the climate-related disaster losses; ii) to identify how the insurance industry can contribute more to climate change adaptation, by increasing the penetration of climate risk insurance for industry and all of society; and iii) to improve the conditions for more investments in adaptation solutions.

In order to have a common understanding on how to approach the work programme, the group decided to start their work by:

- Agreeing on a common understanding of the climate protection gap
- Identifying the key gaps and priority areas to address
- Pinpointing the main drivers of the key gaps and understand the why behind these.

In terms of output, the Climate Resilience Dialogue will conclude with a report that includes a set of possible for actions that can be implemented by relevant stakeholders so they contribute to narrowing the climate protection gap in the EU and stimulate investments in good adaptation solutions.

As regards subgroup 1 (SG1) more specifically, its main objectives are: i) to set out a common understanding of the climate protection gap for the work of the Dialogue, ii) to analyse specific

climate protection gaps, iii) to explore how the coverage of private insurance for climate/disaster risks can be increased, and iv) to define actions that improve awareness about means for climate change adaptation and to explore gaps in and applications for loss and risk data.

The specific objective of subgroup 2 (SG2) is to explore how risk management and building resilience can contribute to reduce economic losses from climate change. This is done with a focus on loss prevention and risk management measures, insurance underwriting, investments from insurers/financial institutions and knowledge- and data-sharing between insurers, insured and the public sector.

1.3 Summary of subgroups' meetings

Since the launch event in November 2022, the two subgroups have been regularly meeting in virtual format, both separately and jointly as shown in the table below:

Meetings	JAN	FEB	MAR	APR	MAY	JUN
SG1	26	9	2&30	/	11	
SG2	30	17	9	20	17	
Plenary/ Joint meetings	-	-	-	27	-	22

The first meeting of SG1 'Insurance underwriting and solutions' focused on the understanding and refining of the list of tasks attributed to the subgroup during the launch event. The subsequent two meetings served to exchange views among members on the outline of the Dialogue's final report as well as to define an approach for developing a joint understanding of the climate protection gap. This resulted in more detailed discussions on the definition of the climate protection gap and its quantification and specification to allow further analysis by the Dialogue during the most recent two meetings of SG1. The preliminary conclusions of SG1's work have informed the content of sections 2 and 3 of this report.

SG2 'Adaptation Investment' decided during its first meeting to divide in smaller working groups for the different topics in between the general SG2 meetings and inform/consult the subgroup about their findings and progress. During the subsequent meetings the working groups presented their findings, which was followed by the exchange of views with the subgroup. The results of these discussions are presented in sections 4 and 5 of this report.

1.4 Purpose of this document

The purpose of the interim report is twofold; it aims to take stock of the discussions held so far and prepares the ground for future work of the Dialogue, which will culminate in the publication of the final report. This report frames the problem statement of the group, which includes contextualizing and defining the climate protection gap, and provides preliminary list of the areas or gaps for future focus.

This report is the result of the contributions made by the Dialogue’s members and its content has been agreed by the Dialogue’s members.

While the Dialogue and the European Commission are not launching public consultation at this stage, readers of this interim report can send until 30 September 2023 observations, comments and input to the mailbox EC-CLIMATE-RESILIENCE-DIALOGUE@ec.europa.eu, in particular as regards sources of data on the climate protection gap that are not yet referenced in this interim report.

2. Definition of climate protection gap

The overarching and ultimate objective of the Climate Resilience Dialogue (hereafter “Dialogue”) is to identify concrete solutions to the climate protection gap. Before anything else, this objective requires being as specific as possible about exactly what such concrete solutions should address. This is a complex exercise, first and foremost because there is no straightforward way to define “the climate protection gap”. The fact alone that people across countries and regions are exposed to different hazards and risks, depending on their location (OECD, 2022), implies the need for an in-depth problem analysis and demonstrates that the search for concrete solutions requires a carefully calibrated and nuanced approach. However, all countries and regions are exposed to climate related risks and insurance protection gaps exist in all countries even if the magnitude and specificities of the gaps vary from country to country. Moreover, any climate protection gap in 2050 is likely to be inherently different to what it is today or what it was thirty years ago. Consequently, as a starting point, it is pivotal to establish, as much as possible, a clear and unambiguous definition of what the “climate protection gap” is and how it can be measured, estimated or qualitatively assessed.

This chapter will delve into the definitions already coined and the methodologies to measure protection gaps that have already been developed, also for climate. This will pave the way for establishing a common understanding of what a climate protection gap is, and which will serve as a basis for the Dialogue to continue work towards identifying actions for narrowing protection gaps where they exist. Within this framework, and before looking at definitions and methodologies, this chapter will sketch the broader trends and context in which the climate protection gap is in focus. Key trends and context are relevant for understanding the circumstances under which the climate protection gap is developing, as well as for understanding why, and ultimately how, the climate protection gap could be addressed. The chapter will then elaborate on the various definitions already presented, which will be followed by a section on how to measure and model the climate protection gap. On this basis, finally, the chapter will put forward the definition of the climate protection gap that will serve as the reference point for the Dialogue.

2.1 Contextualising the climate protection gap

In contextualising the climate protection gap, it is key to look at how climate change-related risks are materialising, evolving, and impacting people, businesses, economies, societies, ecosystems, and infrastructures. Here it is important to acknowledge that climate change-related events are increasingly difficult to separate from extreme events and natural

catastrophes that are not typically influenced by the effects of climate change. This is due to the fact that an increasing number of such events, including cyclones, tornados, thunderstorms, wildfires and heatwaves have been proven to be linked to climate change. Even in the case of earthquakes, some believe in a link with climate change.² The intention is for this report to pursue a pragmatic approach and focus on climate related risks (climate risks) and events, and, subsequently, the protection gaps in relation to these risks and events³.

Accounts of the impact of climate change abound. These accounts frequently include figures and projections that illustrate the likely consequences of a lack of adequate action to combat the effects of climate change (e.g. OECD). In one of the main records in this regard, the World Health Organisation (WHO) describes climate change as the “single biggest health threat facing humanity” and points out that, between 2030 and 2050, malnutrition, malaria, diarrhoea and heat stress resulting from the effects of climate change will lead to approximately 250 thousand additional deaths per year ([WHO, 2021](#)). Looking only at the direct damage to health, and excluding damage to health-determining sectors, such as agriculture, water and sanitation, the WHO estimates that climate change will lead to costs amounting USD 2-4 billion per year by 2030 (WHO, 2021; [JRC, 2022](#)). The IPCC has also highlighted that rapidly increasing climate change poses a rising threat to mental health and psychosocial well-being ([IPCC, 2022](#)). The SCOR study⁴ points out that there is also a relationship between increased temperatures and suicide numbers. According to the literature⁵, for every one person affected physically during a disaster, 40 people are affected psychologically.

Indeed, the consequences of climate change are materialising in many ways, be it through changes in frequency and severity of droughts, water scarcity, severe fires, rising sea levels, flooding, melting polar ice, catastrophic storms, or declining biodiversity, among others ([United Nations](#)). In turn, these events can have a range of consequences. An example are the record-setting heatwaves that occurred in Europe and the rest of the world over the past few years. It is expected that such heatwaves will continue to happen in the future and will directly affect people’s productivity and, consequently, business operations and supply chains. Intense heat moreover adversely impacts the functioning of public infrastructures, increasing further the possibility of business interruptions.⁶ As such, the materialisation of climate risk is directly affecting lives, livelihoods, (especially the more vulnerable people and population groups ([European Commission](#))) societies and economies across the globe. Existing projections imply that there is no sign of the impact abating, unless action is taken to both mitigate the impact of

² Attribution studies and scientists are still exploring the extent to which thunderstorms, cyclones, and (all) wildfires, earthquakes and other disasters can be attributed to climate change.

³ Specifically, the dialogue will not focus on earthquake or volcano risk, in light of the consideration that they are largely independent from climate change, even though climate change may have an influence on their frequency and severity (see e.g. “Can Climate Affect Earthquakes, Or Are the Connections Shaky?”, [NASA, 2019](#); “A volcano is erupting again in Iceland. Is climate change causing more eruptions?”, [The Conversation, 2022](#)). This is also notwithstanding the fact that there is a significant protection gap for those risks across Europe.

⁴ [The relevance of climate change for life insurance | SCOR](#)

⁵ [3343 Climate change and mental health BP36 v6.pdf \(imperial.ac.uk\)](#)

⁶ Scientists underscore that heatwaves are hotter and 100 times more likely to occur because of climate change ([Imperial College London, 2023](#)).

climate change and to adapt, as much as possible, to changing conditions. Mitigation and adaptation measures are thus increasingly urgent, especially considering the accelerating nature of climate change, which is resulting in intense climate change-related events becoming more frequent, as well as more extreme (Zhai, Zhou and Chen, 2018⁷, [OECD, 2022](#), [IPCC sixth assessment report](#), 2021). In consequence, the materialising impact of climate change-related events, which is already significant, is likely to further intensify in line with this development. This is particularly true when the resulting material losses and damage are not, no longer, or not yet absorbed by (private) insurance. In this regard, it is important to point out that the effects of climate change, notably in terms of losses, might still outpace the effects of prevention and adaptation measures taken to close the protection gap. Moreover, there needs to be strong emphasis that maladaptation, i.e. actions intended to reduce the impacts of climate change that actually create more risk and vulnerability (either elsewhere or in the future) should be avoided, as it could be counterproductive. It is however clear that the absence of good adaptation actions would lead to an even bigger protection gap.

Figures from the Organisation for Economic Co-operation and Development (OECD) corroborate that damages and losses from climate-related disasters are increasing. According to the OECD, this is likely to be explained by an increase in growth in both hazard and exposure ([OECD, 2023](#)). Hazard and exposure are key elements to look at when assessing the impact of climate change and climate-related risks. In its fifth Assessment Report (2014), the Intergovernmental Panel on Climate Change (IPCC) provides a theoretical framework to help grasp the risk of climate-related impacts. According to this framework, climate risk results from the “interaction of climate-related hazards (including hazardous events and trends) with the vulnerability and exposure of human and natural systems” ([IPCC, 2014](#)). Hazards, vulnerability, and exposure are thus core determinants of assessing climate risk and are therefore key in determining the extent to which people are protected or not protected from climate risk. These determinants will serve as a starting point for defining the protection gap.

2.2. Defining the climate protection gap – a literature review

Several attempts have been made to define the “climate protection gap”. This section provides an overview of and the Dialogue’s reflection on these existing definitions. Taking the commonly used three dimensions of climate risk - hazards, (physical) vulnerability and exposure - as the starting point (e.g. IPCC, 2014), the next step is to look at where the element of protection against climate risk, or lack thereof, fits in. In this regard, researchers involved in the European Commission’s Index for Risk Management ([INFORM](#)) model, have suggested to add a fourth dimension to the IPCC’s theoretical framework: lack of coping capacity ([INFORM Index for Risk Management: Concept and Methodology, Version 2017](#) and referenced by the [OECD, 2022](#)). This is an important suggestion in the search for an adequate definition of the climate protection gap.

⁷ Zhai, P., B. Zhou and Y. Chen (2018), “A Review of Climate Change Attribution Studies”, *Journal of Meteorological Research*, Vol. 32/5, pp. 671-692, <http://dx.doi.org/10.1007/s13351-018-8041-6>.

The INFORM model proposes to merge physical exposure and physical vulnerability into the “hazard and exposure dimension”, while, in this model, the “vulnerability dimension” encompasses the fragility of the socio-economic system. The additional “lack of coping capacity” dimension refers to the lack of resilience to cope and recover ([INFORM Model, 2017](#)). By adding “lack of coping capacity” as a dimension of climate risk, the researchers add the element “protection” to the theoretical framework, thereby contributing to an enhanced understanding and even definition of the climate protection gap. Furthermore, in doing so, they confirm the pivotal role of resilience. While “lack of coping capacity” constitutes a relatively broad term and reflects the need for increased resilience and protection – be it due to a lack of demand or due to a lack of supply- other definitions of the climate protection are narrower in their focus.

Some of these other definitions have the element of the discrepancy between risk and coping capacity in common, but they look at coping capacity from one angle in particular: insurance. One such definition was proposed by staff of the European Commission and describes the climate protection gap as “the term used in reference to the share of non-insured economic losses in total losses after a climate-related catastrophe event” ([European Commission, 2021⁸](#)). The Geneva Association refers to “insurance protection gaps” specifically, which it defines as the “difference between the amount of insurance that is economically beneficial and the amount of coverage actually purchased” ([Geneva Association](#)). The Geneva Association confirms that this is a more specific definition, compared to the broader risk protection gap, which describes the difference between total losses and insured losses” ([Geneva Association](#)). Stressing the subjective nature of the insurance protection gap and referring to challenges in measuring it, the Geneva Association explains that “insurance protection gap” is replaced by an indicator comparing covered loss to total economic loss, caveating that this “needs to be put into perspective as a certain level of risk retention makes economic sense” ([Geneva Association](#)). In this regard, it is worthwhile pointing out that the extent of the protection gap and, in particular, the economic losses that could be covered by insurance, depend on the type of peril and the severity of a given peril.

In its “Global Protection gaps and recommendations for bridging them”, the Global Federation of Insurance Associations (GFIA) provides a more elaborate definition of the natural catastrophe protection gap: the “difference between total economic losses from natural catastrophes and the insured part of these losses (not including government relief efforts). Insured losses are gross of any reinsurance, be it provided by commercial or government schemes. Life insurance losses are not included. The natural catastrophe protection gap also does not reflect the (often severe) human suffering, which cannot be measured in financial terms” ([GFIA, Report extract: nat cat protection gap, chpt. 4, 2023](#)). This definition reflects that insured losses are not exclusively covered by (re)insurance companies, but, in some cases, also by public players, including through public-private partnerships and pools.

⁸An earlier EIOPA staff paper on the protection gap for natural catastrophes defined the insurance protection gap as the difference between the level of insurance (measured by insured losses) and the amount of economic losses ([EIOPA, 2019](#)).

Looking more closely at the definitions referenced above, it becomes necessary to qualify what is meant by “total economic loss”. The Swiss Re Institute provides a definition of “economic losses”, which it indicates as “all the financial losses directly attributable to a major event, i.e., damage to buildings, infrastructure, vehicles, etc. The term also includes losses due to business interruption as a direct consequence of the property damage. Total loss figures do not include indirect financial losses, i.e., loss of earnings by suppliers due to disabled businesses, estimated shortfalls in GDP and non-economic losses, such as loss of reputation or impaired quality of life” ([Swiss Re Institute, sigma n. 1/2021, Appendix 2, definition of terms, 2021](#)).

On the basis of these definitions and elaborations, it is clear that insurance is considered one of the key elements of the “coping capacity dimension” of climate risk, and that, as such, insurance is an important factor to look at in seeking to better understand and finding ways to address climate protection gaps. At the same time, the Dialogue’s discussions indicate that there is no “silver-bullet solution”, i.e., one solution that will significantly contribute to narrowing protection gaps where they exist, since they are caused by different factors, and that insurance is also not such silver-bullet solution. Also, a 100% insurance coverage is neither necessarily a desirable objective, nor one that can be achieved in all cases, in practice citizens, businesses, and public authorities may choose to not seek financial protection through insurance solutions and sometimes opt to self-insure their risks. Therefore, while insurance is pivotal in securing resilience and coping capacity, it is also critical to look at other factors, such as climate adaptation. With extreme weather events increasing in severity and frequency, the availability and affordability of insurance cover is under increasing pressure, thus the ability of insurers to cover for damage caused by climate-related events will increasingly depend on strong and effective adaptation measures that can improve insurability as well as on the capacity of the insurance market to innovate and to develop effective solutions.

BOX 1

The role of the insurance industry

The OECD identifies that insurance “can play a critical role in absorbing the costs of future climate damages and losses and supporting economic recovery in the aftermath of these disasters”([OECD, 2023](#)) and also staff of the European Central Bank (ECB) and the European Insurance and Occupational Pensions Authority (EIOPA) highlight the important role of the private insurance industry in a joint discussion paper ([ECB and EIOPA, 2023](#)). EIOPA staff and the OECD additionally point out that there is evidence demonstrating that societies with a higher insurance penetration rate tend to recover more swiftly from adverse climate change-related events than those with a relatively low penetration rate ([EIOPA, 2019](#) and [OECD, 2023](#)). It remains however important to acknowledge the limits of insurability⁹.

⁹ An example that may serve to demonstrate the impact of climate change on insurability are the developments in the property insurance market of California over the past years. After several severe wildfire seasons, some insurance companies decided to opt out from renewals or to stop accepting applications for new insurance coverage.

Principles of insurability

Insurance is the transfer of risk. It transfers the risk of financial losses as a result of specified but unpredictable events from an individual or entity to an insurer in return for a fee or premium. If a specified event occurs, the individual or entity can claim compensation or a service from the insurer.

Insurance is therefore a means of reducing unpredictability and the potential for financial hardship or insolvency. Buying an insurance policy for an affordable, and regular known premium, removes the graver consequences of having to pay a larger loss on one's own. By pooling premiums and insured events, between groups of policyholders and/or over time, the financial impact of an event that could be disastrous for one policyholder is spread among a wider group.

Similarly to insurance, reinsurance reduces an insurer's risk of loss by sharing the risk with one or more reinsurers. Reinsurance generally works by either transferring a portion of a particularly large risk that has been taken on by an insurance company (facultative reinsurance), or by transferring a portion of all the pool (or book) of risks (treaty reinsurance) to a reinsurer in return for a share of the original premium. In the event of a claim, the reinsurer compensates the insurer for its share of the risk ([Insurance Europe](#)).

For private insurance to work, a number of conditions need to be met, including:

- the risk is definable and financially measurable;
- the risk is random;
- it is possible to build a risk pool in which the risk can be shared and diversified at economically fair terms (mutualisation);
- the likelihood of the risk is calculable, and the premium is sufficient to cover future claims on its pool of risks and is affordable to policyholders,
- the exposure to catastrophically large losses is duly monitored and the financial impact of such losses are not so significant that an insurer/the insurance sector cannot afford to pay it.

The fact that one or several of these conditions are not met does not mean that insurance does not work, however, it may imply a need to adapt the insurance solutions to the specific risks being covered.

Based on the considerations outlined in this section, the participants of the Dialogue agree that the climate protection gap could be defined as the difference between economic losses and insured losses from the materialisation of climate related risks. Furthermore, in analysing different climate protection gaps, the Dialogue will consider certain contextual information, including:

- To what extent losses that are part of a climate protection gap are covered by means of financial protection other than private insurance (e.g. public-private re/insurance pool);

- Whether there is a wide consensus that parts of the climate protection gap are considered to be uninsurable by the private sector alone and where policy measures (e.g. to improve climate adaptation) are expected not to be sufficient for the risks to become insurable;
- The size of climate protection gaps in relation to other relevant metrics.

This agreement primarily covers the qualitative side of a definition of climate protection gap. It is however also important to reflect the quantitative aspects in a definition: how can the climate protection gap be measured and modelled, taking into account the evolving nature of climate protection gaps.

2.3 Measuring and modelling the climate protection gap

Consensus on a qualitative definition and understanding of the climate protection gap is an important steppingstone towards pinpointing concrete actions to narrow it. Equally important is to integrate a quantitative assessment into the problem analysis and definition, and, therefore, to reach consensus on how to measure and model the climate protection gap. In a similar vein to establishing a qualitative understanding of the climate protection gap, quantifying the protection gap is not a straightforward task. This is underlined by the Geneva Association, which confirms that the insurance protection gap is hard to measure and, moreover, subjective ([Geneva Association](#)). Especially challenging in this regard is the fact that the protection gap is constantly changing. For any given peril, the protection gap may be different from one year to the next. The situation is not static. This means that, if the purpose of the Dialogue is to identify concrete solutions and proposals for narrowing the climate protection gap, these will need to pay heed to the constantly evolving nature of the climate protection gap, in line with changing climate risk. It is consequently important to have an idea of what the climate protection gap was in the past, what it is currently, and what it is projected to be in the future. Therefore, the quantitative component of the definition of the climate protection gap should reflect that, depending on the context, the Dialogue will analyse and/or reference historical, current and/or forward-looking climate protection gaps.

Indeed, while the ultimate objective of the Dialogue is to identify ways to address current and future climate protection gaps, understanding historical climate protection gaps is also important, in that it helps in understanding the drivers of past protection gaps and, subsequently, may help in informing decisions on how to narrow the current and future protection gap. Data is pivotal for making any type of predictions and drawing material conclusions regarding climate risks and the climate protection gap ([OECD, 2022](#)). However, while data on past events and losses is more readily available, it is, on the basis of existing data, not possible to quantify the current protection gap precisely, even though much of the literature highlights that the availability of data is improving. In a similar vein, it is challenging to model and quantify the future climate protection gap. Nevertheless, several efforts have been undertaken and existing studies provide useful insights into the evolving nature of climate protection gap, as well as into the key parameters on the basis of which protection gaps can be measured and better understood. As the scientific measuring and modelling of the climate protection gap exceeds the scope of the Dialogue, this section will look at those existing efforts

and studies in greater detail, discerning efforts that focus on the historical, current, and future climate protection gap, respectively. The ultimate objective is thus to, rather than attempting to measure the protection gap, generate a clearer picture of how the protection gap may evolve in the future and pinpoint the key underlying parameters in this regard.

2.3.1 Historical protection gap

Given the constantly evolving nature of the climate protection gap, today's current climate protection gap is tomorrow's historical protection gap. The fact that most existing effort to measure the climate protection gap by industry, academics, and institutional actors (e.g. EIOPA, EEA) alike, take a historical view or use historical data to make projections about any current or future protection gap is a reflection of this fact. While the studies highlighted in the section on the historical protection gap therefore also provide insights into the current protection gap and even into the protection gap in expected (future) terms, the Dialogue has tried to categorise these efforts according to their focus, notably for the sake of generating a better understanding of the key parameters to look at in different contexts.

In delving into the historical protection gap and existing efforts to quantify it, a useful starting point is Munich Re's NatCatSERVICE, an extensive database of events and loss information collected since 1980 ([Munich Re's NatCatSERVICE](#)). Munich Re's data indicates that the cumulative direct economic losses from climate-related events totalled at least EUR 419 billion across EU Member States between 1980 and 2019. Between 2010 and 2019, the average annual economic losses amounted to EUR 12 billion (Munich Re's NatCatSERVICE referenced in [European Commission, 2021](#)). While these amounts accounted for less than 0.1% of the EU's annual Gross Domestic Product (GDP), and while there is significant variation year-on-year, European Commission staff notes that the impact can be substantial when looking at the GDP of an individual EU Member State ([European Commission, 2021](#)). Of note is also the data pointing at the fact that over 60% of the economic losses were caused by less than 3% of all unique registered events ([European Commission, 2021](#)). Another database that can be used to quantify the historical protection gap is the open source emergency event database EM-DAT ([EM-DAT](#)).

Taking a more global perspective, Thomas Holzheu and Ginger Turner from Swiss Re provide a useful framework for defining the protection gap in historical and expected terms in their 2018 Geneva Paper on Risk and Insurance, "[The natural catastrophe protection gap: measurement, root causes and ways of addressing underinsurance for extreme events](#)". Based on Swiss Re data, as well as on models that combine geophysical vulnerability maps, economic exposure data and insurance market information, Holzheu and Turner determine that the global property protection gap has steadily widened over the past 40 years.¹⁰ In terms of losses, the authors indicate that, over the past 40 years, an estimated USD 4 trillion has been "lost to

¹⁰ Holzheu, T., Turner, G. (2018), "[The natural catastrophe protection gap: measurement, root causes and ways of addressing underinsurance for extreme events](#)", The Geneva Papers on Risk and Insurance—Issues and Practice, Vol 43, pp 37-71.

extreme natural disaster events, of which USD 2.9 trillion were caused by climate-related events, such as windstorm, flood, drought, hail and brushfire, and USD 1.1 trillion by other natural catastrophes such as earthquake and tsunami. Some USD 1.1 trillion were recovered through insurance, and about USD 2.9 trillion remained uninsured.”¹¹ They note that, between 1990 and 2015, weather-related uninsured losses grew at the same pace globally and at one (emerging economies) to two percentage points (mature economies) faster than GDP. The authors additionally modelled and compared each country’s expected (or optimal) property insurance penetration to actual penetration to derive a measure of property underinsurance. The scenario-based modelled protection gap for European countries in the study sample was in one case as high as 0.48% of GDP. Finally, they explored the factors influencing property insurance demand. It should be noted that these numbers may be an overestimation of the protection gap, notably because, according to the authors, the economic losses include “some public infrastructure and commercial property where partial self-insurance is preferred”.¹²

The data and studies referenced above already provide a useful indication of the type of parameters to look at in trying to understand (historical) protection gaps: losses in relation to a country’s GDP, vulnerability, economic exposure, in addition to insurance market information, such as property insurance demand and penetration rates. It is also important to look at the drivers behind insurance demand and supply.

Another key effort in quantifying the historical and current climate protection gap is EIOPA’s dashboard on the European natural catastrophe insurance protection gap ([EIOPA, 2022](#)). EIOPA’s dashboard constitutes an attempt to measure and understand the insurance protection gap, with the aim of identifying measures that may help reduce losses in the wake of an event. It presents a view on the historical protection gap using data on economic and insured losses, and in addition presents a view on the current protection gap which uses modelled risk estimations and insurance coverage from the 30 European Economic Area countries. It also provides information on the national specificities of the insurance markets in the scope of the dashboard. As such, it represents a unique initiative that provides useful insights about the historical and current climate protection gap across different European countries. As EIOPA intends to review the dashboard every five years, it may ultimately be possible to draw forward-looking conclusions as regards the way the protection gap is evolving. It should be noted, however, that EIOPA was also confronted with the same challenges in collecting and validating data that have been outlined above. EIOPA itself indicates that the data used for the dashboard has been complemented by expert judgement (from national insurance supervisors for example) to fill any gaps. Furthermore, in looking for ways to address climate protection gaps, it is crucial to give due consideration to regional or national risk exposure and circumstances. This is also confirmed by GFIA in its “Global protection gaps and recommendations for bridging them” ([GFIA, 2023](#)).

¹¹ Holzheu and Turner, “The natural catastrophe protection gap” (2018), 37.

¹² Holzheu and Turner, “The natural catastrophe protection gap” (2018), 49.

Based on the Dialogue’s discussions on the abovementioned efforts to measure and quantify the historical protection gap, the Dialogue will, for the historical protection gap, refer to estimations of the actual losses that occurred following climate related events. Within this framework, and depending on the context, the Dialogue will take into account relative losses in a country in proportion to an agreed upon metric, as well as a region’s risk exposure and circumstances, property insurance rates, property insurance demand, and the drivers of this demand. The next section 2.3.3. will dive deeper into the efforts undertaken in relation to current protection gaps and the key parameters to look at in this regard.

2.3.2 Current protection gap

GFIA indicates that the current natural catastrophe protection gap can be estimated at roughly US\$139bn per annum at global level, looking at the “economic losses from natcats currently not covered by insurance” ([GFIA, 2023](#)). The report furthermore provides a specification of how the protection gap is evolving, indicating that the amount of natural catastrophe losses has increased by an average of 5% per year over the last 50 years. Concretely, this means that average annual natural catastrophe losses increased from US\$126bn between 1990 and 1999 to US\$219bn between 2010 and 2020 ([GFIA, 2023](#)). In addition to providing a clear estimation of the current protection gap, GFIA’s report gives useful insights into the key parameters to look at. GFIA identifies the movement of populations and their valuable assets to high hazard areas as a key driver of protection gaps, noting that there are significant differences across regions in this regard, with the level of vulnerability and exposure of regions dependent on socioeconomic factors, including increasingly valuable assets, population growth and urbanisation. GFIA clarifies that these factors include decisions to build in particular (high-risk) areas.

EIOPA’s dashboard also provides a current view of the insurance protection gap for natural catastrophes for 30 European countries. The current view is based on a modelling approach that provides an estimation of today’s protection gap by taking into account information on the risk (composed of the type of hazard, degree of vulnerability and level of exposure) and the current level of insurance coverage.

Based on the discussions on the efforts to quantify the current protection gap detailed in this section and keeping in mind the conclusions on measuring the historical protection gap, the Dialogue will take into account the estimations of the losses that may occur in the event of a climate-related risk materialising. It is possible to make such estimates based on several key parameters, such as property valuation, property location, probability and severity of expected events, or insurance penetration rates. Taking a holistic approach, on the basis of a broad range of parameters, is important as this could enhance an understanding of the extent to which any losses could have been avoided, had there been prevention, resilience or protection measures in place. This is especially pertinent in measuring the future protection gap.

BOX 2

The demand-side perspective

Understanding the various perspectives on the demand-side of the protection gap is a crucial complement to the other side of the equation: the supply of insurance, which is based on the principles of insurability as outlined in Box 1.

According to the Geneva Association, there are six specific demand-side obstacles to the take-up of insurance generally, which would also have a bearing on the climate protection gap, namely: i) affordability, ii) awareness, iii) appeal and quality of product/service, iv) trust, v) cultural and social factors; and, vi) behavioural biases ([Geneva Association, 2018](#)). Further work has shown that, in addition, due to *complexity*, policyholders may not fully understand insurance coverage and expectation gaps might arise ([ECB-EIOPA, 2023](#)). In recent work, EIOPA explores demand-side *barriers*—such as income—and demand-side *drivers*, such as the premium ([EIOPA 2023](#)).

Within the- different actors on the demand side there is a variety of competences with respect to insurance. The Dialogue also identified some important concerns about climate protection gaps common across these actors.

Among the core issues for actors on the demand-side are:

- There are persistent difficulties in the identification and quantification of risks. This is exacerbated by a limited supply of good quality data.
- Once the risks can be quantified, (potential) buyers of insurance look for a product adapted/suited to their needs that will perform as expected at the time of purchase in terms of indemnification of damages.
- There are issues surrounding affordability of insurance products.
- In some communities on the demand-side there is a skills/knowledge gap about insurance and risk, particularly notable in some segments of SMEs.
- There are issues related to contractual exemptions and complexity of the product.
- In addition, there is also a view that the right/specific coverage is not available.

There is also concern about the inevitable widening of the climate protection gaps as a result of unmitigated climate change. Mitigation efforts should therefore be part-and-parcel of any discussion about how to close the gaps.

2.3.3 Future protection gap

In addition to Holzheu and Turner's attempt at providing an indication of the protection gap in expected (future) terms, France Assureurs provided a study that appears currently to move the

furthest towards forward-looking perspective on the protection gap. In “*Impact du changement climatique sur l’assurance à l’horizon 2050*”, France Assureurs provides a forward-looking perspective on the evolution of the impact of climate change-related events on the French insurance industry ([France Assureurs, 2022](#)). In doing so, France Assureurs focuses on a limited number of perils (drought, flood, storm, and storm-induced marine flooding), and explicitly excludes others. The French insurance association indicates that the claim amounts in the wake of climate-related events could reach EUR 143 billion cumulatively between 2020 and 2050, which implies an increase of 93% (EUR 69 billion more) compared to the 1989-2019 period. It is relevant to note that this amount also takes into account expected demographic and economic developments considerations, besides the impact of climate change on certain identified perils.

This exercise shows the difficulty of forecasting the evolution of the protection gap, as this requires taking account of a wide range of parameters, all of which will evolve depending on many decisions and actions being taken, having an influence on, for instance: the extent to which the climate will continue to change and how quickly and efficiently adaptation measures will be taken. Moreover, given that climate change impacts are non-linear the potential of physical tipping points being passed may lead to a dramatic widening of the climate protection gap through the combined effect of increased losses and withdrawal of insurers and reinsurers.

Providing a quantitative assessment of the evolution of the protection gap, similar to the exercise conducted by France Assureurs, falls outside the mandate of the Dialogue. However, as such information would help identifying the most efficient measures to be taken to increase resilience, the Dialogue wishes to encourage studies and surveys pursuing this objective.

Furthermore, while the Dialogue will not venture into measuring and modelling protection gaps, it will integrate existing quantitative estimations, where available, into a qualitative assessment of historical, current, and future protection gaps. The qualitative assessment will also look at the parameters that have been identified as key factors and drivers of protection gaps within existing quantitative efforts, but from a qualitative perspective. The following section 2.4. provides the Dialogue’s definition of the climate protection gap that emerged from the considerations set out above.

2.4 Definition of the Climate Protection Gap for the purpose of the Dialogue’s work

The definition of the climate protection gap that will subsequently serve as the basis for the work of the Dialogue is outlined in Box 3.

BOX 3

Definition of the climate protection gap

The definition of “the climate protection gap” that will serve as a basis for the Dialogue’s continued work on finding solutions to narrowing protection gaps where they exist is as follows: the climate protection gap could be defined as **the difference between economic losses and insured losses from the materialisation of climate related risks.**

In analysing different climate protection gaps, the Dialogue will consider certain contextual information, including but not limited to:

- To what extent losses that are part of a climate protection gap are covered by means of financial protection other than private insurance (e.g. public-private re/insurance pool);
- Whether there is a wide consensus that parts of the climate protection gap are considered to be uninsurable by the private sector alone and where policy measures (e.g. to improve climate adaptation) are expected not to be sufficient for the risks to become insurable;
- The size of climate protection gaps in relation to other relevant metrics.

Furthermore, the Dialogue will integrate existing quantitative estimations, where available, into a qualitative assessment of historical, current, and future protection gaps:

- For the historical protection gap, refer to estimates of actual losses that occurred in the past following climate related events, and the extent to which these losses were covered by insurance;
- For the current protection gap, refer to estimates of expected losses, should climate related events occur today, and to the extent to which such losses would be covered by insurance, where such information is available. This will be accompanied by a more qualitative analysis of this current protection gap, covering what are considered to be the key areas in which a climate protection gap exists as well as its main drivers;
- For the future protection gap, provide quantitative estimates to the extent available and a qualitative assessment of how the current protection gap is expected to evolve in a number of key areas, as well as of the main drivers of such future protection gap.

3. Outlook on future work

In addition to establishing the definition of the climate protection gap that will serve as the basis for the Dialogue's work moving forward, the discussions that have so far taken place within the context of the Dialogue have centred around identifying the best approach to selecting the priority areas of focus. A challenging exercise, given the wide range of possible areas to look into, but a prioritisation and selection of specific climate protection gaps is a necessary step towards developing specific recommendations to address protection gaps.

Various approaches have been proposed and considered, always with the objective of finding concrete solutions in mind. In order to ensure an effective approach to finding solutions, the Dialogue has opted for an approach that is focused first on "the why" there are protection gaps, keeping in mind that the situation varies sometimes significantly from country to country. Such a focus implies a specific emphasis on analysing the drivers and impact of protection gaps.

On the basis of this approach, at the 22 June Plenary Session of the Climate Resilience Dialogue, participants held a structured discussion on the various areas that could be analysed moving forward.

The next subsections provide a summary of focus areas and gaps that the Dialogue is considering analysing for the preparations of the Dialogue's final report. The following list has been compiled on the basis of the discussions at meetings of the Dialogue as well as with the written input from Dialogue members. The order does not indicate a view of the Dialogue as regards the prioritisation of the focus areas and gaps.

A list of the specific focus areas and gaps considered by the Dialogue is provided in Annex II.

For some of the focus areas and gaps, the subsequent sections 4 and 5 provide preliminary observations of Dialogue members.

3.1 Risk awareness

A first focus area concerns **risk awareness**, which is a pre-condition for any actions to address the climate protection gap. Risk awareness allows individuals, communities, businesses, and policymakers to identify and assess the potential risks associated with climate change. This enables preparedness and enhanced resilience and provides the necessary information for decision-making and long-term planning. Therefore, it is crucial to continue exploring explanations for shortcomings in risk awareness as well as possible solutions to the risk awareness gap. Challenges around risk awareness differ across the relevant actors and the Dialogue may analyse separately, for instance, risk awareness for higher-level decision-makers and of the general population. Closely related to risk awareness is also risk perception, which can be influenced by the selection of data and its presentation.

Sections 4.3 and 5.3 provide some preliminary observations of Dialogue members on risk awareness as well as on risk mitigation.

3.2 Risk assessment

Risk assessments are needed, among others, to measure climate protection gaps. These include large-scale risk assessments at national/societal level and “risk assessment” in a more traditional insurance sense of risk engineering to support and advise customers in risk reduction (see also section 3.3 on Risk reduction). At micro-level, risk assessments carried out by risk managers on behalf of their companies using Enterprise Risk Management (ERM) frameworks also contribute to a broader understanding of the risks facing society.

Risk assessments require the availability of risk data and modelling and analytics capacities. Risk data should ideally cover the three components of risk – hazard, exposure and vulnerability – separately, in particular in the context of estimates on future climate protection gaps. Another challenge in the use of data is the comparability of data sources in terms of methodologies. Notably, there are several publications that reference estimates of economic losses attributed to climate disasters, although there does not appear to be a common understanding of “economic losses” in that context.

Collaboration and knowledge sharing have the potential to enhance risk assessment practices.

Sections 4.1 and 5.1 provide some preliminary observations of Dialogue members on the topic of data.

3.3. Risk reduction

As described earlier in this report, the Dialogue works on the basis of the climate protection gap understood as the difference between economic losses and insured losses from the materialisation of climate related risks. The climate protection gap can therefore be reduced by increasing insurance coverage and/or by reducing economic losses. The latter can be achieved by **risk reduction**. This is particularly relevant as economic losses are expected to increase due to climate change. There is a wide range of measures that could reduce risks. Notably, asset owners can seek risk transfers other than private insurance (i.e. to investors) or invest in adaptation measures. Nature-based solutions represent a possible adaptation measure, and they can have multiple additional benefits (e.g., public health, biodiversity). Where private insurance is used as a risk-mitigation tool, the insurer can encourage policyholders to take preventive actions and to promote resilience. Public authorities can also play a crucial role in risk reduction by adopting fit for purpose legislation on building codes and land use planning as well as by effectively enforcing such legislation. Examples of good practice for disaster risk reduction have been documented in the joint report by the International Cooperative and Mutual Insurance Federation (ICMIF) and the United Nations Office for Disaster Risk Reduction (UNDRR) “From protection to prevention: The role of cooperative and mutual insurance in disaster risk reduction”.¹³

¹³ <https://www.icmif.org/united-nations-office-for-disaster-risk-reduction-undrr/>

More examples of risk reduction measures, this time put in place by risk managers can be found in the report from AMRAE (French Risk Management Association) entitled "*Risques et opportunités liés au changement climatique: panorama et bonnes pratiques*".¹⁴

Sections 4.2 and 5.2 provide some preliminary observations of Dialogue members on investments in adaptation.

3.4 Public private collaboration

Another area that Dialogue will analyse further is **public private collaboration**. Such collaboration can take various forms and some countries have formal public-private partnerships (PPPs) in place. The Dialogue will explore under which conditions and for which purpose formal PPPs could make sense in other Member States. Collaboration between public and private sectors may also be useful to inform decisions on public policy. For instance, public authorities could consider actions like insurance mandates to increase the demand for insurance. However, such mandates may require subsidies or public backstops to ensure supply of insurance coverage and/or the stability of the insurance sector. The lack of mandates can result in insurers withdrawing from commercial activities in those lines of business when climate losses increase, as seen for example in California¹⁵. Less invasive actions could be requirements on or encouragement of bundling of insurance coverage for multiple hazards. Exchanges between the insurance sector and public authorities can also be useful to inform mechanisms to increase resilience (e.g. via climate adaptation certificates).

3.5 Perils

Many of the focus areas mentioned in this section will deal with the perils that appear most pertinent in the European context. However, the Dialogue will also conduct dedicated analyses of some specific **perils**. This will include the more traditional perils flood and storm, but also drought, heatwave and wildfire, which have attracted more public attention in recent years.

3.6 Assets and activities

As a next area, the Dialogue will seek to analyse various **assets and activities**. Property and casualty insurance for corporates and private households has probably been most widely covered in past work on the climate protection gap and it will be covered under other focus areas mentioned in this section. The Dialogue aims to go beyond this ‘traditional’ business line to also explore life and health risk insurance, and agricultural insurance, as well as private insurance coverage of public assets.

3.7 Drivers of climate protection gaps

The development of solutions to climate protection gaps requires an understanding of the drivers of climate protection gaps and many potential drivers are covered in the other areas listed in this section. A possible starting point in the analysis of drivers of climate protection

¹⁴ <https://www.amrae.fr/bibliotheque-de-amrae/risques-et-opportunites-lies-au-changement-climatique-panorama-et-bonnes-pratiques>

¹⁵ [Allstate and State Farm Stop New Home Insurance in California \(businessinsider.com\)](https://www.businessinsider.com/allstate-and-state-farm-stop-new-home-insurance-in-california)

gaps is to understand whether there is a **mismatch of the supply and the demand** of private insurance for climate risks. The strategies to address climate protection gaps may be very different in situations where the supply falls short of demand and where gaps are caused by a lack of or low demand. There would be real value-added to conduct a thorough analysis of the supply and demand factors behind protection gaps, which would help highlight cases where insurance coverage is either not available, or prohibitively expensive; and, importantly, to underline those cases where insurance is available but it is not taken up with an unpacking of the reasons why.

A frequently referenced driver of the climate protection gap is **affordability**. The unaffordability of insurance can be caused by many factors including misunderstanding of the product's exclusions and/or their pricing. The customers may also have limited trust if they are not able to compare the products, or because of previous bad experiences. Sometimes the insurance purchasing process can demand an effort. Affordability issues may be addressed by financial support, but this may also reduce the adaptation incentives from the price signal of insurance premiums. The Dialogue will therefore analyse this area further with a view to understanding affordability as a driver and to shedding light on the trade-offs between higher insurance penetration and adaptation incentives. The Dialogue will look further into other drivers of the climate protection gap, including the ones described in the recent paper from EIOPA on demand side aspects of the natural catastrophe protection gap ([EIOPA, 2023](#)).

The drivers of the protection gap will differ across stakeholders. In addition to affordability issues, and especially for large enterprises, there are also issues about the level of capacity in the market, or even availability of coverage. In particular, there might be a lack of coverage (or none at all) available for specific technologies or materials, or even exclusions of specific risks ([FERMA, 2022](#)).

3.8 Other

Finally, there is a range of **other areas** that the Dialogue is considering exploring further, namely the research on and the use of AI solutions, parametric insurance, multi-year insurance and the case for a potential EU-level scheme (as proposed e.g. by EIOPA and ECB staff in their discussion paper from April 2023, ([ECB-EIOPA, 2023](#))).

4. Preliminary observations on selected gaps

While section 3 summarises a more comprehensive list of focus areas and gaps that the Dialogue intends to analyse further, this section and the next section already provide preliminary observations on some of those focus areas and gaps. The Dialogue will continue to reflect on the areas covered in the next two sections.

4.1 Data

The Climate Resilience Dialogue was tasked, among others, to:

- Explore the challenges of gathering harmonised data on losses from climate -related disasters.

- Explore the creation of a common harmonised standard for reporting loss data, as well as potential obstacles to such a standard and approaches to overcome them.
- Develop a set of voluntary actions and collaboration arrangements for the collection and processing of comparable loss data (both insured and non-insured) which can be made accessible to as wide a range of interested parties as possible and in as flexible, disaggregated and customised manner.

A dedicated working group was formed within SG2 to discuss the topics above. The working group agreed that data are not ‘the’ solution to close the climate protection gap, but rather that availability of the right data is a ‘commodity’ or ‘enabling activity’ supporting the real solutions. Therefore, iterative interaction with the other working groups of SG2 and SG1 will be necessary to explore the subject and indicate how and which data are necessary to better understand the climate insurance protection gap and which would be needed to support the proposed solutions.

The role of data in addressing the climate protection gap will be examined in the following sequence: first, by getting a good understanding of the climate protection gap and its underlying reasons and then proceeding to developing solutions. Only when those two stages are completed will it be possible to determine gaps in the data to be filled to support the proposed solutions. However, it has to be noted that more accurate and comprehensive sets of climate-related data will not necessarily lead to closing the protection gap, as it may also lead to the exclusion of ‘bad risks’ and, in turn, widen the gap due to a lack of supply of insurance cover for those risks.

4.2 Adaptation investment

The Dialogue was also invited to explore how to foster the role of insurance in building resilience (including by building back better) and facilitating climate adaptation, by:

- Investment in adaptation.
- Offering expertise in assessing and quantifying risks as an important part of promoting build back better or build forward better principles.

The working group discussed the adaptation financing gap ([UNEP, 2022](#)) and the role that various financial sector stakeholders could play in scaling finance for adaptation measures, in particular the role of insurers and policymakers.

In general terms, insurers could increase the attractiveness of adaptation investments through adaptation-linked cost of insurance. There are, broadly speaking, three clusters where insurance may provide such products:

- Adaptation investments/General risk reduction: offer wider insurance coverage or on better terms where adaptation measures are included. This will incentivise the demand for adaptive measures and products, stimulating the investments.
- Adaptation investments/Insuring adaptation projects: offer more insurance coverage for adaptation-related projects, e.g. construction to install flood barriers. Insurance coverage can make the investment more attractive to lenders or investors, by recusing

financial risks, thus stabilizing profit margins of projects. Additionally, insurance might support ecosystem-based adaptation projects through covering the time until ecosystems fully grow their risk protection benefits.

- Adaptation-enabling investments/Insuring companies with core business in adaptation: offer of insurance coverage for companies that operate in adaptation products and in adaptation technological innovation.

However, it has to be pointed out that these are all examples of micro-adaptation, i.e. adaptation that occurs at a structure (individual / firm / asset) level. Macro-adaptation (at a society level) also needs to occur to ensure that disruption does not affect societies or economies, which can, in turn, have impacts at the micro-level. Understanding the impact of such macro-level investments (e.g. community flood defences) can be much more difficult to quantify, as this depends on the hazard modelled, the specific geographical location, the degree of insurance penetration and the overall benefit to a particular community or area. Where macro-adaptation measures are financed by public budgets, reductions in future disaster relief payments may offset the costs and this may also benefit public finances more than insurance premium reductions, i.e. ex-ante financing.

While the discussion is often focused on insurance, it needs to be emphasised that in case of adaptation investment, the banking and asset management sectors are also relevant, particularly since it can benefit both from additional investment opportunities (e.g. lending to asset owners related to adaptation upgrades) and from lower losses (e.g. on mortgages) and costs on investments that are more resilient.

It is worth mentioning that adaptation measures mitigate the losses from climate-related events, thus address the issue of increased loss volatility and make asset prices more stable and hence make the investments more appealing. The insurance sector can help create awareness of the benefits of climate adaptation to customers through data-driven risk assessments, across different perils and real or financial assets, which would provide ex-ante price signals.

However, there is a limit above which coverage becomes un-economical or financially unviable for insurance and reinsurance companies. Therefore, risks might not be fully insurable above a certain level of potential losses, which can lead to market failures and make certain types of insurance products unavailable or simply unaffordable for some individuals or businesses.

Public entities or public-private partnerships (PPP) can play a complementary role by providing insurance or reinsurance for low-risk high-impact events that private insurers may be unwilling or unable to cover. Public entities can also invest in risk reduction measures and provide funding for disaster recovery efforts.

Overall, a mix of private and public involvement is likely to be most effective in fostering resilience. Private insurers can offer a wide range of insurance products and invest in risk reduction measures, while public entities can decide to provide insurance for high-risk events and invest in different risk reduction measures.

Among the considerations to be taken into account when designing a PPP in this context are:

- Sharing similar views on risk (by peril / by asset) – information asymmetries can be problematic in this case;
- Consider compulsory / semi-compulsory insurance mechanisms with adequate risk management to avoid moral hazard and anti-selection effects;
- Have the insurance as well as reinsurance market participate to these initiatives. Cat bonds and/or securitisation of risk can help to pool risk.

There are multiple examples of PPP. Flood Re in the UK is an example of a scheme that promotes risk-based pricing whilst encouraging adaptation (micro/macro level), as well as rebuilding after events in a more resilient manner ('build forward better'). This approach is part of Flood Re's exit strategy as it, at least in theory, allows resilience to be enhanced and the need for high-risk coverage to be phased out over time. Another example is the Natural Catastrophe scheme of the CRR in France, which provides for ex-post risk mitigation plans. Public-private schemes like these could be considered in other jurisdictions not only for flood risk but also for other hazards. Yet another example is '*Consortio de Compensación de Seguros*'¹⁶ in Spain which among its functions provides coverage of extraordinary catastrophic risks. However, schemes where the public sector is fully covering potential natural catastrophes losses can discourage uptake of private insurance solutions. Against this background, it is necessary to find a good balance of private and public sector solutions against climate-related risks. Looking at the micro- vs. macro-adaptation, it needs to be pointed out that it may be difficult to monetise returns on macro-adaptation investments. While ideally, such investments should result in lower premiums for the insured due to reduced risks, as well as reduced potential claims, the benefits may accrue to many stakeholders – not just the insured (free-rider issue).

Another approach would be to focus on micro-level investments, such as companies with a core business in adaptation. This would target companies that develop adaptation-enabling products and in technological innovation for adaptation, crowding in other investors.

The adaptation investment should be looked at in combination with insurance affordability, which varies across Member States and is often low in areas where there is both a high need for insurance and low levels of insurability. Moving forward, that highlights the need for improved risk reduction policy, however the issue of pre-existing risk cannot be ignored.

4.3 Risk awareness & risk mitigation

The Dialogue had been asked also to identify new solutions to foster the involvement of consumers, SMEs and other stakeholders that would help them better assess their vulnerability to climate change-related risks and their financial consequences. The group has begun with exploring the so-called shortcomings in the areas of risk awareness and risk mitigation in the context of climate change.

The group started by identifying the areas where there are gaps and making a link to a simplified risk management process:

¹⁶ <https://www.consorseguros.es/web/la-entidad/acerca-de-ccs>



The preliminary discussion identified the following possible gaps:

- **An awareness gap** where there are low levels of **awareness of risks** faced by enterprises, public authorities and consumers / households. This may result from not having access to a sufficient amount or level of information or data. However, it may also be to fewer concrete factors such as cultural norms, attitudes and behaviours.
- A **data gap**, which worsens the awareness, or even means it is practically not possible to know risks and exposures.
- A **skills gap** when facing up to the climate risks or trying to find the right solutions has been signalled by the SME community.
- A **demand gap** (non-emerging need), where insufficient awareness of climate-related risks by potential policyholders is one factor that prevents insurance uptake. An EIOPA study ([EIOPA, 2023](#)) has found that consumers mis-evaluate their actual exposure to natural catastrophe risks by underestimating the losses and/or probability of a disaster, and therefore, might find the benefits of insurance protection as unattractive relative to the premium/cost of the policy. Reasons include e.g. perceptions that there is no or low risk (this is linked to the **awareness gap**); the right product is **not available** for a variety of reasons, or that it might be **unaffordable** (felt strongly by SMEs); insurance products made complicated by **exemptions**, or **high deductibles**, which undermine the attractiveness of the insurance solution.
- Another demand-side factor attributed to low insurance uptake concerns trust, whereby potential consumers may decide to not purchase insurance because of negative past experiences, or a misunderstanding of the inclusions and exemptions of the insurance contracts offered. This is what EIOPA has identified as a **trust gap**.
- **Accessibility issue** in some cases, due to costs, guarantees, and bureaucratic burdens signalled by the SMEs.

Generally, while there are clearly information asymmetries or gaps on the demand side, there is also a reality that suitable solutions are not always available on the supply side. The Dialogue will continue to explore the drivers and include in the discussion EIOPA's study "Measures to address the demand side aspects of the nat cat protection gap" ([EIOPA, 2023](#)).

5. Approach towards the analysis of the identified gaps

5.1 Data

Data availability and accessibility are crucial in developing and implementing solutions designed to address the adaptation investment.

Better available, specific and harmonised data and information can make investments more appealing, as investors preferably rely on quantitative data (even when being proxies) to evaluate a potential investment in adaptation solutions, to monitor the project and finally to assess its effectiveness in limiting the climate-related losses, risks and return on investment.

The Climate Resilience Dialogue is an opportunity to make progress on the assessment of data gaps and needs. The analysis should cover both insurance and investment activities, since taking measures to increase climate resilience and preparedness are complementary to risk transfer and insurance mechanisms. Being too cautious and limiting expectations too quickly is a missed opportunity and so is being too generic and not defining data needs related to solutions.

The potential to harmonise loss and exposure data will have to be discussed, while it is not a solution as such, but rather a guiding principle. Different stakeholders (e.g., insurers, investors) have different data needs, but this does not have to result in different data sets. The physical event and loss data remain the same and while the use of the data, the preferred parameters and level of detail might differ, the data sets could be normalised in a simple and applicable way. A divergence of data sets for different users would lead to new issues, therefore normalisation should be simple and applicable.

The past does not provide sufficient information for the future. Loss data have limitations due to the fact that the frequency and intensity of perils are increasing, therefore access to risk data (using multiple scenarios) can be more relevant. Nevertheless, starting from the available loss information (for a limited past period) would provide an anchoring point.

Improving historic loss data is not a goal in itself. The data task should start from the data needs for the future, not automatically limiting itself to what was collected in the past. For instance, for the case of climate scenario analyses, relying on loss data alone is not suitable to inform forward-looking scenarios where modelling of climate risks is necessary given the emerging, accelerating and non-linear nature of climate change¹⁷.

Efforts such as the Global Resilience Index Initiative¹⁸ aim to create global public goods that will enable enhanced access to the next generation of analytics and enable modelling the impacts of climate change across systems and supply chains. This can allow consistent assessment of macro-level and systemic physical climate risks, and drill down to the asset level required for climate disclosure and risk management for the first time. Another modelling and management tool is the open source CLIMADA-App which uses a user interface built by EIOPA and the open-source cat model [CLIMADA](https://www.cgfi.ac.uk/global-resilience-index-initiative/).¹⁹ Such tools can help policy makers, financial markets and exposed communities better understand their climate risks to make, communicate and implement better decisions for a transition.

The discussion on the data needs will focus on the next years/decade and iteratively evaluate how changing needs and solutions lead to new data requirements.

¹⁷ <https://actuaries.org.uk/emperors-new-climate-scenarios>

¹⁸ <https://www.cgfi.ac.uk/global-resilience-index-initiative/>

¹⁹ [Open-source tools for the modelling and management of climate change risks \(europa.eu\)](https://open-source-tools-for-the-modelling-and-management-of-climate-change-risks.europa.eu)

5.2 Investment in adaptation

- i) Offering expertise in assessing and quantifying risks as an important part of promoting build back better or build forward better principles*

A basic principle is that insurance does not provide greater finance than damages. Therefore, the ‘build forward better’ idea will be further explored. Contrary to the definition of ‘build back better’, the ‘build forward better’ principle integrates the idea that historic or existing approaches to reconstruction may not adequately account for future climate impacts, market changes or technological developments in response to climate change.

The group will explore the required expertise and how it could be offered for the promotion of these two principles.

- ii) Possible channels to leverage insurance industry risk expertise for the benefit of other stakeholders*

The insurance industry has a strong understanding of risk, but more importantly it also understands very well how the risks impact the insurability of possible future losses. However, the knowledge of certain technical aspects might not be part of core insurance culture, e.g. civil engineers, hydrologists or urban planners and architects. Having interdisciplinary groups, e.g. consisting of civil engineers, hydrologists or urban planners and architects, could support quicker and more effective transfer of risk expertise, and it should among other things, clearly facilitate conditions to make insurance products more affordable.

There are two distinct approaches to leveraging insurance industry expertise and other expertise:

- **Industry driven approaches for information sharing** such as the data platforms on loss data, such as [Oasis LMF](#), climate data platforms such as [OS-Climate](#), [the Global Resilience Index Initiative](#), [the Global Risk Modelling Alliance](#) and the [Global Risk Alliance](#) for developing tools and training programmes on risk identification and management. There is also ongoing work to scale insurance-backed investments such as the [V20 Sustainable Insurance Facility](#). Aggregation platforms such as UNDRR’s Risk Information Exchange can improve access to hazard, loss and exposure data, (<https://rix.undrr.org/>). Tools like Desinventar support the systematic collection, documentation and analysis of data about losses caused by disasters associated with natural hazards. (<https://www.desinventar.net/whatisdesinventar.html>).
- **Centralized pooling of resources organised by governments and other public institutions** to share the knowledge and the needs of stakeholders involved and at the same time ensure a full coverage of knowledge. For example, the Dutch central bank (DNB) has established an adaptation finance working group to pool resources from different elements of the finance sector, academia and other technical specialists. Governments are also able to (co-)finance research into resilience and resilient assets.

iii) Public-private partnerships

Public-private partnerships can bring together expertise from the private sector and public research institutions on topics that do not necessarily bring immediate financial returns. An example of such a public-private research partnership on risk prevention is the [IBHS \(Insurance Institute for Business and Home Safety\)](#), which is driving norm/standard-setting in the United States in response to accelerating climate related risks. Research by IBHS showed that structures post-Hurricane Ian in Florida were more resilient to wind damage as these structures were built after previous storms with improved building codes.

It is important that prevention measures, such as early warning systems and risk mitigation advice reach the whole population and not only insured persons, for example through cooperation between the private and public sectors.

iv) The role of government in subsidising insurance premiums and their impact the perception of risk for investors.

There remain questions about financial allocations: is it more beneficial for governments to subsidise premiums or to make investments in macro-level adaptation? How can investors monetise returns from investments in risk adaptation aside from reduced future losses? How can the adaptation investment be priced and valued? How to evaluate the effectiveness of nature-based solutions?

5.3 Risk awareness & risk mitigation

In order to identify solutions that would raise risk awareness and facilitate mitigation²⁰ of climate-related risks, the group will take the following approach:

- **Literature review** on what's available already in terms of both articulating and even attempts at addressing the gaps (such as tools helping SMEs evaluate their risks).
- **Devote work on a more thorough understanding of the gaps by segment** (consumer/household, SME, large enterprise) **and insurance market**, by means of discussions led by the various parties in follow-up meetings.
- Collect **best practices** or tried-and-tested schemes/solutions. At same time, **new frameworks** are needed for this analysis.

²⁰ “Mitigation of risks” or “risk mitigation” as referred to in this sub-section should not be confused with climate change mitigation which focuses on the reduction of green-house gas emission. Although the Dialogue does not aim to provide a precise definition, the term ‘risk mitigation’ is intended to refer to actions and/or strategies that aim to prepare for and/or lessen the effects from the potential materialisation of risks or achieve similar objectives.

Annex I: Draft outline of the Dialogue's final report

The members have provisionally agreed on a structure of the Dialogue's final report. While the draft outline is intended to facilitate the further work of the Dialogue, the structure of the final report may deviate from the tentative structure set out below.

Executive summary

- 1. Introduction of the problem and objective of the Climate Resilience Dialogue**
- 2. Background: Role of adaptation in lowering climate-related risks**
 - 2.1. Overview of main categories of adaptation measures (per peril and geographical area)
 - 2.2. Main challenges to implementing climate adaption measures (including risk of maladaptation)
- 3. The Climate Protection Gap: problem analysis**
 - 3.1. Defining the climate protection gap, including background on insurability
 - 3.2. Mapping of climate protection gap (based primarily on historical losses) for relevant exposures against climate-related risks at several geographical levels.
 - 3.3. Impact of the climate change [and climate policies] on the climate protection gap
 - 3.4. Identification of the main drivers of the current protection gap
 - 3.4.1. Supply factors
 - 3.4.2. Demand factors
 - 3.4.3. Other factors, including lack of knowledge, lack of data, lack of risk, etc.
- 4. Analysis of gaps**
 - 4.1. [Gap 1]
 - 4.2. [Gap 2]
 - ...
- 5. Possible solutions**
 - 5.1. [Gap 1]
 - 5.2. [Gap 2]
 - ...
- 6. Selected areas for improvement**
 - 6.1. Identification of effective and efficient solutions based on preliminary cost-benefit analysis, including Nature-Based Solutions (NBS)
 - 6.1.1. [Solution 1]
 - 6.1.2. [Solution 2]
 - ...
 - 6.2. Prioritization
 - 6.3. The role of stakeholders: public authorities, insurers, policyholders
- 7. Conclusion**

Case studies, real life examples of good practices and lessons learned from real life examples could also be added in the final report, for instance in an annex.

Annex II - List of gaps and areas that the Dialogue is considering for further analysis (Referenced in Section 3)

Risk awareness

1. Risk awareness
 - Risk awareness of decision-makers and accompanying actions
 - Risk awareness of corporates and the general population
2. Risk perception

Risk assessment

3. Data availability and quality
4. Risk modelling and analytics
5. Risk assessment and adaptation
6. Climate scenario analysis
7. Collaboration and knowledge sharing

Risk reduction

8. Investment in adaptation measures
9. Risk transfer mechanisms
10. Prevention measures, quantification and documentation
11. Effective enforcement and fitness for purpose of the legislation on building codes and land use planning
12. Nature-based solutions

Public-private collaboration

13. Public-Private Partnerships
14. Lack of insurance mandates
15. Mechanisms to increase resilience
16. Bundling hazard-specific insurance offerings into a multi-hazard elemental insurance product

Perils

17. Floods
18. Storms
19. Droughts
20. Wildfires

Assets/activities

21. Life & health
22. Agriculture
23. Public assets

Drivers

- 24. Mismatch between supply and demand
- 25. Affordability

Other demand and supply side drivers

- 26. Research in AI solutions
- 27. Parametric insurance
- 28. EU-level scheme
- 29. Transitional risks (e.g. insuring renewable energy)
- 30. Multi-year insurance

Ideas for case studies and examples

AMICE members are working with the farming community on risk management in a structured way, ie. by making investments now, future losses can be prevented. It is a variation on building back better (BBB) with a focus not only on property and infrastructure but also on societal/community BBB or insurance partnerships.

The European Commission Joint Research Centre has a disaster loss and damage working group ([Disaster Loss and Damage Working Group - European Commission \(europa.eu\)](https://ec.europa.eu/jrc/en/dlwg)) with experts and practitioners since 2013. They prepared several publications, including:

- recording disaster losses (recommendations for a European approach), 2013.
- best Practices for disaster loss data recording in EU Member States (overview of current practices), 2014.
- recording and sharing disaster damage and loss data (development of operational indicators to translate the Sendai Framework into action), 2015.
- Loss Database Architecture for Disaster Risk Management, 2018.

As part of the Zurich Flood Resilience Alliance, insurers are engaged in community work both in the UK and Germany, collaborating closely with city and local authorities to implement a comprehensive flood resilience program (refer to <https://floodresilience.net/countries/?DE> for further information). This initiative serves as a valuable example to explore in terms of how the public sector can effectively collaborate with insurance providers on risk awareness, resilience advice, and protection guidance beyond the scope of individual properties.