RESOLUTION TABLE

Methodological Paper

EIOPA-BOS-21/255
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European Insurance and
Occupational Pensions Authority

Question 1: Do you agree with the definition of the perils?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
1	AIR Worldwide	Public	Yes		
2	AMICE	Public	Yes	We generally agree on the definition of the perils; however, it would be useful if EIOPA provides a more granular list at sub-peril level (e.g. mud floods, flood debris, landslides) including those that are not to be considered. The list of sub-perils would help clarify if they need to be considered and in which category. It should also be defined whether “storm surge” is part of the "Windstorm" or "Hail" perils in the natural catastrophe risk sub-module of the Standard Formula.	Noted. The aim of the paper is to lay down what is basically covered in the SF. Storm surge is part of the windstorm peril.
3	Unipol Group S.p.A.	Public	Yes	We generally agree on the definition of the perils; however we think it would be better to have a more granular list by sub-perils (even those that are not to consider). Having a list with all the specific sub-perils (e.g. mud floods, flood debris, landslides), would be helpful to clarify if they effectively have to be considered and in which category. it should be clarified whether "storm surge" is part of "windstorm" or "hail".	Noted. The aim of the paper is to lay down what is basically covered in the SF. Storm surge is part of the windstorm peril.
4	PIU - Polish Chamber of Insurance	Public	Yes	Polish Chamber of Insurance appreciates EIOPA’s discussion paper on the methodology on potential inclusion of climate change in the natcat standard formula. PIU supports the continuous monitoring of changes to the risks included in a standard formula as well as the emerging risks. Thanks to such an approach Solvency II remains a truly risk-based system. In our opinion it is not only important to follow the changes in the risks nature, frequency and severity, but also include a real impact on the insurers business models. Nevertheless we need to be very careful and distinguish between the climate change and weather related damages which are subject to insurance products. PIU is also very supportive to the reassessments of the parameters in the standard formula every 3-5 years as proposed. However, such process should be done via open dialogue, in a transparent way and should be clearly documented. As to the first question, in general we agree with the definition of the perils	Noted.

				and over time we got used to them. Renaming perils in the SF could create additional confusion, therefore we suggest not to change it.	
5	Insurance Europe	Public	No	It is vital that the scope of each SF peril is clearly defined to ensure consistency and clarity for all stakeholders. Likewise, it is important that the methodology in the standard formula works well with the established actuarial practices and underwriting, for example with the risk definitions in the non-binding model terms and conditions.	Noted. The aim of the paper is to lay down what is basically covered in the SF.
6	Actuarial Association of Europe	Public	Yes	Yes, in general terms we agree. We understand the definition in table 1 as a more precise definition compared to Solvency II Delegated Act. From an actuarial point of view we welcome the intention of this approach which should align definitions considering various aspects: • One peril should not cover losses/events triggered by different meteorological root causes. This is important for forward-looking actuarial modelling based on climate scenarios. • One peril should not combine coverages that are typically handled in different (re)insurance contracting terms. • Granularity of data available in loss databases (relevant for modelling loss amounts based on meteorological events) This is further complicated through the fact that a single root cause (or Nat Cat event) may comprise losses from different perils which are potentially not covered completely. The climate driven definition makes sense in the context of climate change modelling. We basically agree to the definition but recommend further elaboration on the reasoning behind the definitions (especially regarding the consistency to the above mentioned aspects). The EIOPA definition of perils should be consistent to (vendor) models used to (re)calibrate the SF. It is not always easy to split/separate the specific peril or identify it in the claims data for back-testing purposes. It generally depends on the vendor models and their definition. It would be good to have more explicit definitions to ensure that all risks are captured, and none are double-counted. In	Noted. Amendments to what is included in the SF were made, also having discussed the coverage with EIOPA's Technical Expert Network on Catastrophe Risks again. The aim of the paper is to lay down what is basically covered in the SF. Storm surge is part of the windstorm peril.

				particular: • Coastal floods (storm surge) and ice-jam floods should be excluded from SF Peril Windstorm and be included in SF Peril Flood. • SF Peril Hail should only consist of Hail and should not include losses from tornadoes, lightning, strong wind, and heavy showers. • Same for convective storms. We are not sure whether convective storms are included within WS or not. We note additional issues: • Hail is characterized by hailstones whose diameter can vary from a few millimeters to about twenty centimeters in the most extreme cases. While this peril happens during wild storms, the effects are very storm specific. Windstorm currently covers a large number of perils which are not linked to the same underlying phenomena.] • One issue can be the differentiation of flash flood and heavy showers, which is unclear to us: Flash flood (part pluvial) is in the peril "flood" whereas heavy showers are in "hail".	
7	German Insurance Association	Public	Yes	Yes, we agree with the current effective definition of the perils. The definitions should not be changed. In principle, the previous approach has proven itself. It is important that the methodology in the standard formula works well with the established actuarial practices and underwriting, for example with the risk definitions in the non-binding model terms and conditions.	Noted.
8	INSTITUT DES ACTUAIRES (France)	Public	No	Hail is characterized by the fall of disjointed logs more or less round of ice (hailstones) whose diameter can vary from a few millimeters to about twenty centimeters in the most extreme cases. While this peril happens during wild storm, the effects are specifics. Windstorm currently covers a large number of perils which are not linked to the same underlying phenomena.	Noted. Amendments to what is included in the SF were made, also having discussed the coverage with EIOPA's Technical Expert Network on Catastrophe Risks again.
9	HDI International	Public	Yes		
10	FERMA: Federation of European Risk	Public	Yes		

	Management Associations				
11	Financial Guard	Public	Yes		

Question 2: Do you think that it should be clarified that the peril currently named "Hail" in the SF refers to "Convective Storm"?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
12	AIR Worldwide	Public	Yes	Hail is a sub-peril of convective storms	Noted. Having considered the comment and discussed the issue with EIOPA's Technical Expert Network on Catastrophe Risks again amendments were made to clarify that hail is the dominant sub-peril, but that other sub-perils of severe convective storms are also included.
13	AMICE	Public	Yes	We agree that such clarification would be useful. "Convective storm" conveys a broader meaning.	Noted. Having considered the comment and discussed the issue with EIOPA's Technical Expert Network on Catastrophe Risks again amendments were made to clarify that hail is the dominant sub-peril, but that other sub-perils of severe convective storms are also included.
14	Unipol Group S.p.A.	Public	Yes	Yes, it should be clarified because hail is a particular atmospheric event; Severe convective storms is a general and broader category of events. We think that Convective Storm (risk) conveys more meaning.	Noted. Having considered the comment and discussed the issue with EIOPA's Technical Expert Network on Catastrophe Risks again amendments were made to clarify that hail is the dominant sub-peril, but that other sub-perils of severe convective storms are also included.
15	PIU - Polish Chamber of Insurance	Public	No	Renaming perils in the SF could create additional confusion, therefore we suggest not to change it.	Agreed. Name will not be changed.
16	Insurance Europe	Public	No	Insurance Europe understands that currently the Hail peril refers to only hail and does not include losses from other events such as tornadoes, lightning etc. It does not support expanding the scope of this SF peril.	Noted. Having considered the comment and discussed the issue with EIOPA's Technical Expert Network on Catastrophe Risks again

				As noted by EIOPA, the term “convective events” can refer to very different phenomena such as hail, thunderstorm gusts, heavy rain, and lightning. These events result in very different types of damage and also differ in the meteorological observations and modelling.	amendments were made to clarify that hail is the dominant sub-peril, but that other sub-perils of severe convective storms are also included.
17	Actuarial Association of Europe	Public	Yes	We agree that undertakings would benefit from more clarity in the definitions of hail and all other Nat Cat perils to determine the correct treatment and the policies which would trigger losses for such perils. We also suggest that it would be sensible to align the peril names/definitions with commonly used terminology in policy wordings across the market. A mapping would be helpful to explain the differences between the SF and EM-DAT definitions that are not obvious.	Noted. The EM-DAT definitions were included as a reference for general definitions of the perils. In order to avoid potential misunderstandings they will be included as a new Annex A.
18	German Insurance Association	Public	No	See the response to Q3.	See answer to Q3.
19	INSTITUT DES ACTUAIRES (France)	Public	Yes	As stated in the previous comment, hail is a specific peril.	Noted. Having considered the comment and discussed the issue with EIOPA's Technical Expert Network on Catastrophe Risks again amendments were made to clarify that hail is the dominant sub-peril, but that other sub-perils of severe convective storms are also included.
20	HDI International	Public	Yes	Yes, clarification is required	Noted. Having considered the comment and discussed the issue with EIOPA's Technical Expert Network on Catastrophe Risks again amendments were made to clarify that hail is the dominant sub-peril, but that other sub-perils of severe convective storms are also included.
21	FERMA: Federation of European Risk Management Associations	Public			

22	Financial Guard	Public	Yes		

Question 3: Do you think that the peril currently named "Hail" in the SF should be renamed as "Convective Storm"?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
23	AIR Worldwide	Public	Yes	Hail is a sub-peril of convective storms	Noted. However, peril will not be renamed.
24	AMICE	Public	No	Renaming perils in the Standard Formula could create additional confusion. If the definition of each peril is clarified as per discussion in questions Q1 and Q2 then this should be sufficient. Moreover, only hail can really cause very costly damage and represent a major event (e.g. ELA in 2014). The rest can be considered as so-called attritional losses.	Noted. The aim of the paper is to lay down what is basically covered in the SF. The peril will not be renamed. Having considered the comment and discussed the issue with EIOPA's Technical Expert Network on Catastrophe Risks again amendments were made to clarify that hail is the dominant sub-peril, but that other sub-perils of severe convective storms are also included.
25	Unipol Group S.p.A.	Public	Yes	Yes, we agree. "Convective storm" conveys more meaning.	Noted. However, peril will not be renamed.
26	PIU - Polish Chamber of Insurance	Public	No	Renaming perils in the SF could create additional confusion, therefore we suggest not to change it.	Agreed.
27	Insurance Europe	Public	No	As noted in response to Q2, the SF Hail peril is not currently considered to reflect convective storms. Moreover, only hail causes very costly damage and represents a major event (eg ELA in 2014). The other events can be considered as so-called "attritional losses". In any case, renaming perils in the SF could create additional confusion.	Noted. The peril will not be renamed. Having considered the comment and discussed the issue with EIOPA's Technical Expert Network on Catastrophe Risks again amendments were made to clarify that hail is the dominant sub-peril, but that other sub-perils of severe convective storms are also included.
28	Actuarial Association of Europe	Public	Yes	Hail is a subcategory of convective storm. In some cases, strong winds follow hail and vice versa - it is often challenging to separate the effects of strong winds (e.g., Derecho) and hail. Also, hail has specific characteristics (i.e., hailstones) resulting in different original policy conditions affecting different types of insured objects and resulting in various losses.	Noted. Having considered the comment and discussed the issue with EIOPA's Technical Expert Network on Catastrophe Risks again amendments were made to clarify

				In addition, it would fit with the definition of the cat modelling agent making easier the potential comparisons See our response to Q2 where we referred to common terminology. It needs also to be considered that the term “hail” is commonly used in reinsurance contracts. In any case hail is the primary effect of convective storms in Europe.	that hail is the dominant sub-peril, but that other sub-perils of severe convective storms are also included. The peril will not be renamed.
29	German Insurance Association	Public	No	The term “convective events” can refer to very different phenomena such as hail, thunderstorm gusts, heavy rain, and lightning. These events result in very different types of damage and also differ in the meteorological observations and modelling. Therefore, renaming “hail” does not seem expedient.	Noted. The peril will not be renamed. Having considered the comment and discussed the issue with EIOPA's Technical Expert Network on Catastrophe Risks again amendments were made to clarify that hail is the dominant sub-peril, but that other sub-perils of severe convective storms are also included.
30	INSTITUT DES ACTUAIRES (France)	Public	Yes	When you have some hails, you have as well some tornadoes… In addition, it would fit with the definition of the cat modelling agent making easier the potential comparisons	Noted. The peril will not be renamed. Having considered the comment and discussed the issue with EIOPA's Technical Expert Network on Catastrophe Risks again amendments were made to clarify that hail is the dominant sub-peril, but that other sub-perils of severe convective storms are also included.
31	HDI International	Public	Yes	Yes, "Hail/Convective Storm" would be our suggestion	Noted, but the peril will not be renamed, also because hail is the dominant sub-peril.
32	FERMA: Federation of European Risk Management Associations	Public			
33	Financial Guard	Public	Yes		

Question 4: Do you think that it should be clarified that the peril currently named “Windstorm” in the SF refers to “Cyclonic storm”?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
34	AIR Worldwide	Public	Yes		
35	AMICE	Public	Yes	We agree that "Cyclon" is a general term that can embed tropical and extra-tropical cyclons. We think that the term "wind" is misleading because it points out at wind related phenomena which actually fall under the category of Convective storm (i.e. so called straight-line wind). As stated in Q1, it should be clarified whether "storm surge" is part of the "Windstorm" or "Hail" perils.	Noted. Storm surge is part of the windstorm peril.
36	Unipol Group S.p.A.	Public	Yes	Yes, it should be clarified.	Noted.
37	PIU - Polish Chamber of Insurance	Public	No	Renaming perils in the SF could create additional confusion, therefore we suggest not to change it. From the meteorological point of view not every Windstorm is a Cyclonic storm.	Noted. The name of the peril will not be changed.
38	Insurance Europe	Public	No	According to the usual definition in the insurance terms and conditions, only the wind speed on site is decisive for the insured event “storm”, regardless of the meteorological history. Major damaging winter and summer storm events, such as Ela 2014 or tornadoes, are part of the hazard “Storm” or are more of a “cyclonic nature”. This should be reflected by the standard formula. Thus, “windstorm” should not be renamed, and the current definition should be kept.	Noted. The name of the peril will not be changed. Having considered the comment and discussed the issue with EIOPA's Technical Expert Network on Catastrophe Risks again the coverage was kept as suggested.
39	Actuarial Association of Europe	Public	Yes	Yes, this is more aligned with the market standards. The perils windstorm/hail should be defined in a way that facilitates modelling. Cyclonic storms are more material for coastal countries; rather than inland, there should be a more precise definition of what is understood as a windstorm. The use of the standard formula is aligned with the calibration. (As inland countries are less exposed to cyclonic storms and more impacted by convective storms) however, their understanding of windstorms perils might be different. Thus a mapping is needed to explain the differences between the SF and EM-DAT definitions that are not obvious. The French Institut des actuaires believes that this peril could be split into two types of perils: cyclones and extra-tropical cyclones. The origin of those perils is different and therefore should not be part of the same definition. For cat modelers, there are two different models as well.	Noted. It is not the aim to change any coverage of the perils in the SF. Having considered the comment and discussed the issue with EIOPA's Technical Expert Network on Catastrophe Risks again amendments were made to the coverage of hail, but the coverage of windstorm was kept as suggested.

40	German Insurance Association	Public	No	See the response to Q5.	See answer to Q5.
41	INSTITUT DES ACTUAIRES (France)	Public	Yes	The French Institut des actuaires believes that this peril could be split into two types of perils: cyclones and extra-tropical cyclones. The origin of those perils are different and therefore should not be part of the same definition. For cat modelers, there are two different models as well.	Noted. It is not the aim to change any coverage of the perils in the SF. The coverage was also discussed with EIOPA's Technical Expert Network on Catastrophe Risks again.
42	HDI International	Public	Yes	Yes, clarification is required	Noted.
43	FERMA: Federation of European Risk Management Associations	Public			
44	Financial Guard	Public	Yes		

Question 5: Do you think that the peril currently named "Windstorm" in the SF should be renamed "Cyclonic storm"?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
45	AIR Worldwide	Public	Yes		
46	AMICE	Public	No	We believe it is key that the definition of each peril is clarified as per discussion in Q4.	Noted.
47	Unipol Group S.p.A.	Public	Yes	We agree that "cyclon" is a general term that can embed Tropical and extra-tropical cyclons. We think that the term "wind" is misleading, because it points out at wind related phenomena which actually fall under the category of Convective storm (i.e. so called straight-line wind). It should be clarified if "storm surge" is part of "windstorm" or "hail".	Noted. Storm surge is part of the windstorm peril.
48	PIU - Polish Chamber of Insurance	Public	No	Renaming perils in the SF could create additional confusion, therefore we suggest not to change it. From the meteorological point of view not every Windstorm is a Cyclonic storm.	Noted.
49	Insurance Europe	Public	No	Renaming perils in the SF could create additional confusion.	Noted.

				Moreover, windstorm defines all low-pressure systems/cyclones within medium latitude (EU) while cyclonic storm in meteorology refers to cyclones only formed in the Indian Ocean.	
50	Actuarial Association of Europe	Public	No	There is a clear distinction regarding cyclonic storms and convective storms, and inland countries are more exposed to convective storms than cyclonic storms. Both types of storms have different properties, impact, volatility, and severity. Most vendor models separate cyclonic storms and convective storms. Both should follow different calibration methods as convective storms are more localized, hence inherently having different risk characteristics. Another reason the terms should remain unchanged is that these are used in contracting.	Noted.
51	German Insurance Association	Public	No	According to the usual definition in the insurance terms and conditions, only the wind speed on site is decisive for the insured event “storm”, regardless of the meteorological history. The major, damaging storm events in Germany take place in winter, so they are more of a "cyclonic nature". In addition to winter storms, summer storms such as Ela 2014 or tornadoes are also part of the hazard “storm”. This should be reflected by the standard formula. Thus, “windstorm” should not be renamed, and the current definition should be kept.	Noted.
52	INSTITUT DES ACTUAIRES (France)	Public	No	To avoid confusion as most catastrophe modelling tools treat them separately.	Noted.
53	HDI International	Public	Yes		
54	FERMA: Federation of European Risk Management Associations	Public			
55	Financial Guard	Public	Yes		

Question 6: Do you agree with the risks identified where there is a high confidence level on the current and short-term impact of climate change in Europe?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
56	AIR Worldwide	Public	Yes	Overall, we have no concerns with the statements made but can provide two minor comments:	Noted. Areas listed as most affected by changes in river flooding and

				The areas listed as most affected by changes in river flooding and heavy precipitation differ. Maybe a comment on the reasons for this would be useful. Our own research indicates some evidence for a slight but steady increase in winter storm counts over the last 40 years over Northern America but also there is empirical evidence from the extreme winter storms, which do have a connection/explanation to the sudden stratospheric warming, polar vortex splitting, etc. The steady weakening and hence the tendency for the vortex to split has been documented and attributable to climate change. It remains to be seen to what extend these observations are valid for European winter storm activity as well.	heavy precipitation differ as this was the evidence from the EEA analysis.
57	AMICE	Public	Yes	As far as France is concerned, we agree with Table 3, specifying that - Floods and extreme rainfall are also projected to concern metropolitan France and its Mediterranean area. - The wildfire risk will increasingly concern France in terms of frequency, but not in terms of intensity. The scale of risks is not the same when comparing California or Australia. We observe an increase in heavy precipitation and hail in the Netherlands. The change in river flood risk is hard to assess as the effect of improvements in flood defenses and more space for rivers counterweighs the effects of increased river water discharge due to more precipitation in Western Europe. Wildfire and drought are not material risks for insurers in the Netherlands and subsidence is not covered in the Netherlands either.	Noted.
58	Unipol Group S.p.A.	Public	Yes	We generally agree that there is a significant consensus on the fact that mean temperatures may be rising in the next 5-10 years; however the time span is shorter than typical model projections (usually run at least 2050), so caution should be applied to whether model projections linked to climate change are of a greater magnitude and distinguishable from the typical natural climate variability.	Noted, most recent analysis suggest 1,5°C global warming will be reach by 2034. See https://cds.climate.copernicus.eu/cdsapp#!/software/app-c3s-global-temperature-trend-monitor?tab=app.
59	PIU - Polish Chamber of Insurance	Public	Yes	PIU appreciates the analysis which has been done based on widely acknowledged sources. Nevertheless that fact does not provide yet the sufficient basis for answering the question on whether new perils should be included in the standard formula, or to recalibrate existing ones.	Noted. It is key to ensure that the parameters are adequate for more than one year as the same parameters will be used during multiple years until a recalibration

				Even if we understand the aims of EIOPA, from the methodological point of view it is also hard to accept inclusion of 3-5 years horizon to standard formula which is based on 1 year horizon. However, as Poland is concerned changes to draughts, we don't observe for this moment any corelation between hot/dry periods and numbers of damages or indemnities. On the other hand for hail we didn't observe the catastrophic event but rather some minor, local events. However there are no models available for hail in Poland.	will be done. It is therefore important to introduce a forward-looking approach when performing a Nat Cat SF parameters recalibration to ensure that the parameters are valid over the next 5-10 years.
60	Insurance Europe	Public	Yes	The analysis has been performed using widely acknowledged sources and its conclusions are shared. However, this analysis is independent from the need to include new perils in the standard formula, or to recalibrate existing ones.	Noted.
61	Actuarial Association of Europe	Public	No	In general we agree. But, we do not agree with respect to hail or convective storms as a risk having a high confidence level on the current and short-term impact of climate change. As stated in the discussion paper in figure 3 on page 17 and in Annex B as well, there is reduced confidence about an increasing hail & tornado risk – although we agree that there are indicators for an increasing risk. It should also be considered, that based on local climate change scenarios published by local meteorological authorities, the confidence level may vary by member state and peril. We agree with observed trends but note that some risks need to be considered together: •Storms are more and more humid so that windstorm and heavy precipitations become one event. •Similarly, there is an increased correlation between storms and floods. As to Cyclonic Storm, there is no information on the wind speed to infer any trend. Subsidence insurability can be subject to debate and intensive discussions in some Member States. If, following a court decision, insurers have to cover this risk, this should be included in the Standard Formula taking into account the legal framework.	Noted.

62	German Insurance Association	Public		The climate project of the GDV with PIK, FU Berlin and University of Cologne shows a noticeable increase in claims expectations in Germany for storms, hail and floods for the middle to the end of the century. Conceptually, however, these model approaches are not suitable for making statements for the near future. In the claims history there are no trends in storms or floods if these are adjusted for portfolio and inflation. In the case of hail, there are indications that the average loss may have increased disproportionately. Attribution research has identified no significant influence of climate change for major natural events in Germany (see e.g. for storm event Friederike: https://www.worldweatherattribution.org/the-stormy-month-of-january-2018-over-western-europe/ , rainstorms in spring 2016: https://www.worldweatherattribution.org/european-rainstorms-may-2016/).	Noted.
63	INSTITUT DES ACTUAIRES (France)	Public	Yes	No comment	
64	HDI International	Public	Yes		
65	FERMA: Federation of European Risk Management Associations	Public			
66	Financial Guard	Public	Yes		

Question 7: Do you agree to refer to a 1.5°C warming scenario for short-term (5-10 years) projection of climate change?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution

67	AIR Worldwide	Public		We agree that 1.5° warming scenarios are those for which the likelihood is highest that they can be interpolated to “current” condition. We would assume that the effects over the next few years are still smaller in the short term than for a fully materialized 1.5° warming scenario in the long term.	Agreed.
68	AMICE	Public	No	The different scientific studies show that over longer time horizons, the greenhouse gas emissions are expected to have an increasing influence on predicted climate. They also show that by the 2050s, there is clear divergence in the climate change projections between alternative future greenhouse gas scenarios. However, the projections also show that the results of the modelling for different greenhouse gas scenarios practically do not differ over short term horizons.	Noted.
69	Unipol Group S.p.A.	Public	No	Considering the state of the art in the relevant literature, the 1.5° C warming scenario is more compatible with a time span ranging from now to 2050. So, this scenario, if applied to a time span of 5-10 years, should be treated more as a stress rather than an average outcome, given the available scientific evidence.	Disagreed, most recent analysis suggest 1,5°C global warming will be reach by 2034. See https://cds.climate.copernicus.eu/cdsapp#!/software/app-c3s-global-temperature-trend-monitor?tab=app.
70	PIU - Polish Chamber of Insurance	Public	No	In Poland we have already tried to define the short term and long term approach to climate change scenarios, however we found it very challenging. The simple reason for this is that for 1 - 3 years projections (namely the planning period) modelling of different greenhouse gas scenarios are very close to each other. For longer approaches it is difficult to recognise on which path we are and lack of possibility to recognise the changes to other than climate change risk over time, management action as well as natural changes of the portfolios make the long term scenarios unrealistic and difficult to interpret.	Noted.
71	Insurance Europe	Public	No	The climate projections are designed primarily for long-term developments (mid to end of the century). This is a problem for all climate projections, regardless of the assumptions (scenarios) for the development of greenhouse gases. In the "short-term" the results of the modelling for different greenhouse gas scenarios practically do not differ. In addition, the projections with 1.5 ° C have not been investigated as intensively as the other scenarios. Therefore, it might be advisable to also include the other scenarios in order to obtain a broader spectrum of the research results - if this is considered necessary.	Noted.
72	Actuarial Associatio	Public	Yes	According to IPCC SR1.5 the global average temperature level of 1.5°C is expected to be reached approx. in the year 2040. As a reference scenario the level of 1.5°C seems appropriate as it is probable in the next decades and well-known and much scientific	Disagreed, most recent analysis suggest 1,5°C global warming will be reach by 2034. See

	n of Europe			research is available. The respective recalibration should interpolate between “today” and this scenario. However, we would disagree about to refer to a 1.5°C warming scenario for the very short-term projection. As stated in 3.15, there is a 20% chance that the annual global temperature will exceed 1.5°C in at least one of the following five years. So the assumption, that the temperature will definitely rise to or above 1.5°C in the short-term projection, would lead to an overestimation of the short-term risks. We like to suggest to clarify, whether it is assumed that the temperature would rise above 1.5°C within the short-term projection, or whether the development of climate change would follow the RCP 1.9 (or the RCP 2.6) pathway. We note also that there may be some practical issues with converting a 1.5 degree temperature increase scenario to a 1-in-200 loss.	https://cds.climate.copernicus.eu/cdsapp#!/software/app-c3s-global-temperature-trend-monitor?tab=app.
73	German Insurance Association	Public	No	In our response to Q9ff we discuss how the consequences of climate change on the expected loss accumulation can be encountered in the modelling in the near future. Regarding the question of the selection of a possible scenario, we would like to point out the following: -The climate projections are designed primarily for long-term developments (mid to end of the century). This is a problem for all climate projections, regardless of the assumptions (scenarios) for the development of greenhouse gases. -For "short-term" the results of the modelling for different greenhouse gas scenarios practically do not differ. In addition, the projections with 1.5 ° C have not been investigated as intensively as the other scenarios. Therefore, it might be advisable to also include the other scenarios in order to obtain a broader spectrum of the research results - if this is considered necessary / expedient. -In addition, there are the so-called "climate predictions" e.g. provided by Germany's	Noted.

				National Meteorological Service DWD that cover exactly this time period of up to 10 years (see https://www.dwd.de/EN/climate_environment/climateresearch/climateprediction/climateprediction_node.html). Currently, however, these predictions do not yet appear to be suitable for the specific application for the extreme events considered here.	
74	INSTITUT DES ACTUAIRES (France)	Public	Yes	More 10 years horizon than 5 years.	Noted.
75	HDI International	Public	Yes	For the next 5-10 years, all future climate scenarios are very close to one another.	Noted, most recent analysis suggest 1,5°C global warming will be reach by 2034. See https://cds.climate.copernicus.eu/cdsapp#!/software/app-c3s-global-temperature-trend-monitor?tab=app.
76	FERMA: Federation of European Risk Management Associations	Public	No	The scenarios should not be 'prescriptive' in the sense that prescriptive scenarios may not be relevant to a specific undertakings' business model. For instance, most of captives' sustainability risks are addressed by their parent or sister companies. The sustainability exposure to physical and transition risks from climate change of the group they belong to is already included in the global risk management framework, the captive risk tolerance limits and pricing, and its investment policies of their parent company.	Noted.
77	Financial Guard	Public	Yes		

Question 8: Do you agree to take into account adaptation measures when assessing weather-related risks?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
78	AIR Worldwide	Public	Yes	Yes, if possible. However, collecting data and agreeing on scenarios of future adaptation measures may prove complicated. Simplified approaches should be considered.	Noted.
79	AMICE	Public	Yes	We fully agree. The longer the time span considered, the more likely is that adaptions measures are taken. The greater the technological/economic feasibility of such measures, the more plausible is that they are taken into	Noted.

				consideration. However, the adaptation scenario should depend on easy and verifiable assumptions applied uniformly across the affected markets/firms.	
80	Unipol Group S.p.A.	Public	Yes	The longer the time span considered, the more likely is that adaptions measures are taken. The greater the technogical/economical feasibility of such measures, the more plausible is that they should be taken into consideration. However, the adaptation scenario should depend on easy and verifiable assumptions applied uniformly across the affected markets/firms.	Noted.
81	PIU - Polish Chamber of Insurance	Public	Yes	In order to not to overestimate the risks, the adaptation and prevention measures should be taken into account as they are crucial components of the insurance business. Preventive actions significantly reduce the potential scale or cost of the phenomenon (e.g. retention, more resistant varieties of plants, changes to infrastructure, etc.). In our climate report (https://piu.org.pl/en/piu-climate-report/) we explain that prevention and insurance complement one with another and fulfil different functions in risk management. Investments in safety decrease the probability of damage or reduce its value. Therefore, insurance of a given risk is more economically efficient. In the case of insurance of highly probable risks with a significant value of damage caused, in order to ensure the security of their customers (who are also insured against other risks) insurance companies need to cover high exposure to potential losses with high equity. As a result, in certain cases, effective prevention is a necessary condition for a given risk to be insurable. Highly probable events, which may involve potentially significant losses, can be insured thanks to cooperation between the insurance sector and the state, e.g. in the form of a public-private partnership. Such cooperation may involve: prevention, which translates into the reduced probability of an extreme event, and mitigation, which reduces the impact of a negative event after its occurrence.	Noted.
82	Insurance Europe	Public	Yes	Adaptation and prevention measures are an essential component for insurance business and, thus, should be considered for assessing weather-related risks. These measures, which are often initiated by governments to ensure the safety of their citizens, help to mitigate exposure to certain risks; not considering them could bring to overestimation of risks. It is important to clarify that not taking prompt adaptation measures could bring impacts not only on the estimates, but on a broader economical and human level, with “snowball” effects that could be very significant.	Noted.

				More climate-resilient buildings and more climate-resilient economic activity are needed to adapt to the impact of climate change. Land use planning also has an important function, e.g. to keep particularly exposed areas free of buildings. The insurance industry is engaged in this area. So, insurers work in standardisation organisations and advise policyholders on preventive measures. Successful prevention can significantly reduce the loss and accumulation expectation. Therefore, it makes sense to appropriately consider the current average resilience.	
83	Actuarial Association of Europe	Public	Yes	When assessing weather-related risks regarding climate change, adaptation measures (e.g., public and private adaptation measures) should be excluded and included to measure the adaptation effect and to assess weather risks. Mitigation measures (objective of action on the factors of climate change despite a significant level of uncertainty) and measures to adapt to the consequences of change (objective of maintaining equivalent living conditions despite climate change) should be taken into account. Insurers and reinsurers should be more proactive on this front to help citizens, cities and states to invest in such these measures. Some adaptation measures may be easier to take into account (e.g. river flood risk managed by the State) while other measures are more difficult to quantify or too long term (e.g. building resilience). Public adaption measures as well as generally used private adaptation measures (i.e. building standards) are essential for assessing realistic claim amounts and therefore should be considered. It would make sense for the risk management to consider individual adaptation measures as well (i.e. contractual deductibles or the resilience of buildings actually insured) - however this could result in an overcomplicated SF. Our expectation is that current adaptation measures are implicitly included in the existing parameterisation so it would appear reasonable to follow a similar approach for any recalibration in the context of climate change.	Noted.

				[As an example, for Ireland it should be assessed whether it is likely that additional adaptation measures will be put in place before the next recalibration date which may render inappropriate a recalibration based on historical claims data only. Refer to question 22 for a data source to help make this decision on the basis that Flood is introduced as a peril for Ireland. A policy paper produced by Grantham Research Institute on Climate Change and the Environment titled "Fit for the Future?" provides some additional background to adaption measures from an Irish Flood perspective.]	
84	German Insurance Association	Public	Yes	Yes, adaptation and prevention measures are an essential component for insurance business and, thus, should be considered for assessing weather-related risks. More climate-resilient buildings and more climate-resilient economic activity are essential aspects of the German strategy to adapt to the impact of climate change. In addition, land use planning has an important function, e.g. to keep particularly exposed areas free of buildings. The insurance industry is engaged in this area. So, insurers work in standardisation organisations and advise policyholders on preventive measures. Successful prevention can significantly reduce the loss and accumulation expectation. Therefore, it makes sense to appropriately consider the current average resilience.	Noted.
85	INSTITUT DES ACTUAIRES (France)	Public	Yes	Mitigation measures (objective of action on the factors of climate change despite a significant level of uncertainty) and measures to adapt to the consequences of change (objective of maintaining equivalent living conditions despite climate change) should be taken into account. Insurers and reinsurers should be more proactive on this to motivate citizens, cities and states to invest in such these measures	Noted.
86	HDI International	Public	Yes	The adaptation measures are important part of the risk assessment. Based on the anticipated changes several governments/local authorities invest in the prevention (direct e.g. By a building a dam and indirect e.g. National programs of water retention)	Noted.
87	FERMA: Federation of European Risk Management Associations	Public			

88	Financial Guard	Public	Yes		

Question 9: Do you agree that in light of climate change, it is necessary to explicitly consider climate change in the recalibration of the Nat Cat SF for certain perils/regions as identified in Part 3?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
89	AIR Worldwide	Public	Yes	It makes sense to explicitly consider climate change in the recalibration process, be that as a trigger for regular recalibration/review of potentially affected peril regions or as a "loading" to present day risk. However, potential future trends and changes in the understanding of the risk should be treated equally no matter if they are related to climate change or not. E.g. general advancements of NatCat risk assessment/modelling should be a main driver of recalibrations	Noted.
90	AMICE	Public	No	As scientific advances in the area of catastrophe risk modelling are rapidly evolving, setting up a common process would help the reassessment of the new evidence available and the need to be incorporated in the Natural catastrophe risk sub-module of the Standard Formula. We agree that a more regular recalibration of the parameters will allow to capture climate related developments, including the impact of climate change, by incorporating the latest observed trends. However, the input data sources, models, parameters used, validation method and process of the recalibration exercise should be disclosed. The Solvency II calibration is based on the notion of 1:200 confidence level but past and current data do not necessarily translate into increases in the tail of the distribution. Naturally, based on certain actuarial or mathematical methods this would be an automatic outcome but it should be assessed whether such increase would still be appropriate.	Noted.
91	Unipol Group S.p.A.	Public	No	It should be considered if there is scientific evidence of more hazard attributable to climate change for the peril-country combination. Models that have to determine the impact of climate change need to distinguish effectively among the different factors that can compete in the explanation of increasing economic/insured losses (e.g urbanization). Moreover if model projections suggest more frequency, it should be taken into account in the SF an increase in number of events (in hail and flood there are currently 2 events) rather than an increase in the severity. Distinguishing the source of climate change risk (more frequency vs more severity) is key to not have distortions in the risk management especially with respect to the risk transfer strategies.	Noted.

92	PIU - Polish Chamber of Insurance	Public	No	PIU is supportive to the assessment of the appropriateness of the standard formula parameters, which should be driven not only by the climate change, but also by the assessment of impact of such a change on insurance companies. Not all the observed changes have an impact on insurance exposure. For example the fire of the Biebrza National Park in 2020 caused huge natural losses, with practically no impact on insurance companies. National Parks are not subject to insurance in Poland. Also the observed trends in frequency and severity are addressed by the companies via standard risk management processes and reflected in underwriting and pricing. Additionally inclusion of new perils in the standard formula requires proper data and modelling of those perils. For Poland those data and models are very hardly available, or even often unavailable. At the moment we collect this data, and we learn to do it in the sense of ensuring standardization, interoperability, but it is too early to draw conclusions and include such risks in the standard formula. It should also be emphasized that when the risk is too high, the insurance companies will either adjust their insurance premiums or give up providing the coverage. Estimating the standard formula in a 3-5-year perspective therefore will not accurately reflect the level of exposure or the level of own funds needed. Nevertheless the open dialogue and sharing available analyses and data would enhance the companies' ORSAs in the area of climate change consequences and would be very valuable.	Noted. The paper mentions that any changes would need to be material to the insurance sector to be considered in the standard formula.
93	Insurance Europe	Public	Yes	Insurance Europe partially agrees in so far that the standard formula should represent the best view of the climate risk (and all other parameters such as exposure growth, etc) at the time of recalibration, given its 1-year time horizon. To achieve this outcome, Insurance Europe supports the regular assessment of the standard formula to identify if there is a need for recalibration of any natcat parameters. Where a need is identified, a transparent process should be followed to recalibrate the parameter. See response to question 20 for comments on assessing the need for a recalibration and the design of the process.	Noted. The parameters should represent the best view of te climate risk but also ensure to be valid for the time companies will use these parameters to estimated the nat cat capital requirement. The point on transparency is also noted and is one reason why EIOPA explicitly mentioned the possibility to also include open source models in future calibrations.

				The need for recalibration is likely to be partially driven by climate change. However, there are other factors including changes in exposure and/or vulnerability and model development which could also contribute to the need for recalibration (paragraphs 4.44 and 4.45 cover these factors in more detail). Implicitly capturing the impact of climate change within the regular recalibrations should be sufficient to capture the evolution of these risks within the standard formula due to their long-term development. Besides a regular recalibration, transparency is another component for adequate consideration of climate change. Disclosure of the handling of climate change for any model used in this context would be very useful for industry as well as supervisors. Undertakings could use this information to assess possible deviations of risks that are not reflected in the calculation of the Solvency Capital Requirement. To do so, the industry is asked to build further knowledge on that topic. Thus, transparency and expertise will enable undertakings to better reflect risks enhanced by climate change in their risk management and governance, eg by recognising any issues with their risk profile when climate change has an impact and addressing this in their ORSA. In case of a sudden rise of climate risks due to eg reaching a tipping point, an immediate recalibration should take place. As a last resort and only if these exceptional circumstances based on an objective base require additional measures, supervisors may set a capital add-on for an undertaking if the risk profile deviates significantly from the assumptions underlying the Solvency Capital Requirement (Art. 37, SII-Directive).	
94	Actuarial Association of Europe	Public	Yes	This seems reasonable, subject to whether this would have a material impact. We also note the comment in the discussion paper regarding the delay between the data used in any recalibration exercise and its implementation. This is important to consider in the context of the framework for recalibration as discussed in Q20.	Agreed.

				Models are not calibrated each and every year, it is important to include the potential impact of climate change in the next 5 to 10 years. It is important to explicitly point out the quantum in the parameters' calibration attributed to climate change. However a cost / benefit analysis must be run to check the feasibility of the inclusion of such explicit variables. It is generally accepted that – when it comes to climate change – historical data is not representative for future development. Climate change has had a material effect on the global temperature only in the last 50 years – with continuous increase of temperature. These 50 years are the typical period of historical data used for calibration of vendor models. Obviously, climate has changed during these 50 years and the average climate of this period is not the climate to expect in the future. Therefore, the statement “Any current climate change will be implicitly included in the recent data (historical data about the events or the losses)” (par. 4.6 on page 24) has its limitations: as Nat Cat events are quite rare, many years of historical data are needed for calibrating – but only very few years of the current climate change are included in the historical data. Consequently, the statement “climate change is implicitly considered in current vendor models” (see par. 1.8 and 4.3) should be reasoned. Especially, as climate change is expected to have non-linear effects, an explicit consideration of future climate change in the recalibration is necessary. That said, it will also be useful to investigate the extent to which climate change is implicitly captured in the existing parameterisation process. Many initiatives are currently taken on climate change and there is a risk of adding climate change to climate change. So we need to consider whether Best Estimate already includes climate change resulting in a shifted distribution. SCR CAT Review should then be complementary to reflect increased uncertainty. Stress tests are an important tool to assess climate change risk. Firstly, we would have to define the "baseline” and then define the impact of climate change. Then, the Nat Cat SF's calibration should be based on the time horizon of implementing the next recalibration.	

				It may be essential to limit the risk of unjustified penalization of certain Member States from a competitive advantage and competitiveness perspective. Besides, the premium volume, Lines of Business characteristics, and sums insured will allow the risk of climate change to be considered. Indeed, the insured goods' materials will change due to climate change, which will lead to price and valuation changes. Hence, adaptation measures need to be taken into account for the calibration as well.	
95	German Insurance Association	Public	No	It is essential to observe, study and consider climate change. Thus, climate change must be reflected properly by the parameters of the Nat Cat SF. However, we are of the opinion that explicit consideration adds complexity to the recalibration without ensuring an adequate realisation of the effects due the uncertain development. A high frequency of recalibration, i.e. 3 to 5 years, does ensure to capture climate change to a high degree. First, this can be achieved because climate change is expected to evolve slowly and gradually over the next decades. Second, as stated by EIOPA, using historical data for the recalibration leads to inclusion of climate change effects such as trends in the parameters of the Nat Cat SF. The usage of validated data and models provides high reliability. (See also Q20-Q22 for further details on the recalibration.) Besides a regular recalibration, transparency is another component for adequate consideration of climate change. Disclosure of the handling of climate change for any model used in this context would be very useful for industry as well as supervisors. Undertakings could use this information to assess possible deviations of risks that are not reflected in the calculation of the Solvency Capital Requirement. To do so, the industry is asked to build further knowledge on that topic. Thus, transparency and expertise will enable undertakings to profoundly reflect risks enhanced by climate change in their risk management and governance, e.g. in ORSA. In case of a sudden rise of climate risks due to e.g. reaching a tipping point, in immediate recalibration should take place. As a last resort and only if these exceptional circumstances based on an objective base require additional measures, supervisors may set a capital add-on for an undertaking if the risk	Partially agreed. The gradual and slowly increase is not valid for all perils. The issue with historical data is that they can potentially miss new trends (see example on wildfire California). The point on transparency is also noted and is one reason why EIOPA explicitly mentioned the possibility to also include open source models in future calibrations.

				profile deviates significantly from the assumptions underlying the Solvency Capital Requirement (Art. 37, SII-Directive).	
96	INSTITUT DES ACTUAIRES (France)	Public	Yes	Models are not calibrated each and every year, it is important to include the potential impact of climate change in the next 5 to 10 years. It is important to explicitly point out the quantum in the parameters' calibration attributed to climate change. Since these factors involve country granularity and cross impacts it is more transparent and flexible to mention explicitly as explained in Part 3 the country and the peril impacted by climate change. However a cost / benefit analysis must be run with FCA and undertakings in this consultation to check the feasibility of the inclusion of such explicit variable.	Noted. The change needs to be material to the insurance sector to be reflected in the standard formula. EIOPA expects many changes not to be sufficiently material to be reflected in the standard formula but a clear monitoring is necessary.
97	HDI International	Public		The explicitly consideration of climate change seems to be challenging from a various reasons: the separation of the climate change from a "normal" volatility of the NatCat events seems to be difficult for the majority of peril regions. There is no clear scenario to what extend the climate could be changed in a given time horizon, the complexity of the change cannot be clearly captured and therefore cannot be explicitly considered. Maybe for the peril regions with highest evidence, it would make sense to consider climate change in the recalibration.	Partially agreed.
98	FERMA: Federation of European Risk Management Associations	Public			
99	Financial Guard	Public	Yes		

Question 10: Do you agree that for relevant perils/regions where climate change is expected to have an impact, Nat Cat models explicitly considering climate change should be used if available?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
100	AIR Worldwide	Public		Models that allow to explicitly consider the impact of the temporal evolution of a CC effect could be used to determine a loading factor for results that may stem from other models that have a less forward looking approach. However, given the large uncertainties in cat modelling (i.e. spread of model results) even	Noted. Model vendors will need to provide the information to what extent climate change is considered in their model.

				without considering climate change, it does not make sense to exclude models that do not explicitly consider CC. Model providers should be able to state if/how climate change is considered in their model and for what time frame their model results are valid. Expert judgement will still be necessary to reconcile the different model results – including those with and without explicit treatment of CC.	
101	AMICE	Public	Yes	Where models are available which consider the impact of climate change, these should be included within the recalibration process. Climate change trends may be implicitly built into catastrophe models, given the use of historical data in constructing them; however, these trends are not necessarily explicitly incorporated into the modelling output. Uncertainties in the estimation of the extent and frequency of the most extreme events means that the climate change impact can be difficult to account for in risk models. On the other hand, if a model correctly captures current climate change, even if implicitly, we see no reason why it should not be considered.	Agreed. EIOPA will consider all models available.
102	Unipol Group S.p.A.	Public	Yes	There must be scientific evidence that ensures that the variability in climate related risk is attributable to climate change. Given that the unfolding of climate change takes decades, great attention should be given to the time span considered. If the time span is not uniform across the adopted models, results are not comparable.	Noted.
103	PIU - Polish Chamber of Insurance	Public	No	Currently the available academic studies, models and expert analyses often lead to different results. Therefore sometimes it is difficult to use them even for the companies ORSAs. Reassessment of the parameters of the standard formula requires sound process based on solid analyses and data, which is currently often missing. Nevertheless EIOPA, NCAs as well as insurance association should continue the efforts to increase the availability of data with that regard as well as increasing the capacity in translating the existing analyses into insurance terms.	Noted.
104	Insurance Europe	Public	No	Where models are available which consider the impact of climate change, these should be included within the recalibration process. However, the extent to which these models should be solely relied on is questionable as it may result in overreliance on a single model vendor and/or restricted view of the peril. On the other hand, if a model correctly captures current climate change, even if implicitly, we see no reason why it should not be considered. All natcat	Agreed. EIOPA will consider all models available.

				models should be valid for usage. Models can be chosen properly for recalibration and for individual application by undertakings. Additionally, a large variety of models ensures better choices for individual modelling emphasis.	
105	Actuarial Association of Europe	Public	Yes	This appears reasonable; generally, any relevant data sources should be considered to some extent in any recalibration exercise. It may also be useful to consider in the context of a formalised framework to determine thresholds for materiality with respect to specific perils in different regions. Given the expected non-linear effect of future climate change, Nat Cat models using explicitly climate change models as a basis, should be used for recalibration of the standard formula by EIOPA. Generally, any relevant data sources should be considered to some extent in any recalibration exercise. Vendor models should implement forward-looking (local) climate change scenarios (based on various time horizons) that can be selected to model the impact of climate change on physical risks. Note that, while we welcome international platforms, local expertise should not be disregarded. This is especially the case for smaller countries where their specificities would not be properly captured. The models used can lead to significant different outputs.	Noted.
106	German Insurance Association	Public	No	Available, reliable Nat Cat models that explicitly consider climate change can certainly be used. However, there are many limitations of and challenges for these models (temporal/geographical scales, variability of weather, attribution etc.) as mentioned by EIOPA and stated in several scientific studies (see [1] and references therein). Therefore, all Nat Cat models should be valid for usage. As stated in our response to Q9, transparency of Nat Cat models with respect to the handling of climate change is imperative. Thus, models can be chosen properly for recalibration and for individual application by undertakings. Additionally, a large variety of models avoids overreliance on a single model	Agreed. EIOPA will not rely on one model to the extent possible.

				and ensures better choices for individual modelling emphases. [1] Fiedler T, Pitman AJ, Mackenzie K, et al (2021) Business risk and the emergence of climate analytics. Nature Climate Change 11:87–94. https://doi.org/10.1038/s41558-020-00984-6 / https://www.nature.com/articles/s41558-020-00984-6.epdf?sharing_token=KA_3fz0ShR9hqtb0XjVimdRgN0jAjWel9jnR3ZoTv0OSOZnKsSGMjP8867r_gOdtNaRkMlMK7aivZ2uhHDtFpU8uzvrzZHEujYqrZlJ5sTGgeE_X9odvXU60-2GY_AVrWtbp9ssBRiWWgCHv-o_hX-pTL0UJNJnCFyYVojc8eCl%3D	
107	INSTITUT DES ACTUAIRES (France)	Public	Yes	Indeed if the vendors models already include the potential impact of climate change, these models should be used however (and this is the next question), we are not aware of any modules trying to integrate it at the moment.	Noted.
108	HDI International	Public	Yes	For peril regions that are affected the strongest by climate change, models that explicitly considering climate change scenarios, if available, should be used.	Agreed.
109	FERMA: Federation of European Risk Management Associations	Public			
110	Financial Guard	Public	Yes		

Question 11: Are you aware of models, which would explicitly consider climate change which could be used to perform the Nat Cat SF parameters' calibration?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
111	AIR Worldwide	Public			
112	AMICE	Public	No	Most catastrophe models used today to consider most perils do not explicitly model the impact of future climate change. However, we expect that methods to quantify climate change in catastrophe modelling will develop as soon as the effects of climate change become more apparent over the coming decades.	Agreed.

113	Unipol Group S.p.A.	Public	No	For the best of our knowledge currently the main vendor models do not explicitly account for climate change. In our opinion these models are to be the pillars of the Nat Cat SF calibration process: anyway they can be informed by other climate models that are much more sophisticated with respect to the hazard modelling and can discriminate between what is attributable to natural climate variability and to climate change. In particular we suggest the following reference: - European Extreme Events Climate Index (https://www.ifabfoundation.org/e3ci/); - Models based on the ERA5/ERA5 Land reanalysis products developed by ECMWF.	Noted. Thank you for the references.
114	PIU - Polish Chamber of Insurance	Public	No		
115	Insurance Europe	Public	No		
116	Actuarial Association of Europe	Public	No	It is crucial to use widely used market available vendor models supported by scientific evidence and validation. It is essential to preserve predictability and stability regarding the standard formula to allow insurers to plan and take appropriate actions regarding the risks in their portfolio. However, there are some promising initiatives at a local level like "Climate Adaptation Services" in the Netherlands. In France, ARPEGE (a tool from the company Météo France) deals with climate change. The larger cat model vendors are starting to adjust their existing tools to deal with the climate change demand. This is peril dependent. Adjusting the model parameters to current climate state is a first step. Then allowing for sensitivity analyses/stress tests for future climate will follow. Reinsurance brokers have also developed proprietary cat models and are following the same approach. On the perils most sensitive to climate change, like European flood, smaller niche vendors (e.g. JBA) are starting to appear and can share their models on new open access platform like OASIS/Nasdaq Risk Modelling for Catastrophes. Existing vendors are also starting to share their models on such platforms. This is developing a new offer in the market. Data privacy and cloud management	Noted. Thank you for the references.

				is a potential hurdle for this new development. Other: • In top of models, robust datasets of future scenarios are starting to be used in the market. EURO-CORDEX and PESETA IV is an example for flood and has been sponsored by the European Commission. • We are aware of vendor models used in asset management which are based on explicit climate change models (e.g. 427 "four-twentyseven"). • The ECMWF Copernicus Climate Change Service may also be useful in in respect of Flood Risk in Ireland. • There are some regularly used models by Meteologists such as CMIP 5 but is not fully available and require meteo knowledge hence a price to pay to handle properly.	
117	German Insurance Association	Public	No		
118	INSTITUT DES ACTUAIRES (France)	Public	No	There are some regularly used models by Meteorologists such as CMIP 5 but is not fully available and require meteorology knowledge hence a price to pay to handle properly.	Noted. Thank you for the references.
119	HDI International	Public	No		
120	FERMA: Federation of European Risk Management Associations	Public			
121	Financial Guard	Public	No		

Question 12: Do you think that new countries should be considered in the SF in light of climate change?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
122	AIR Worldwide	Public			

123	AMICE	Public	No	EIOPA had stated a materiality threshold so that a peril would be material for a particular country when compared to other perils if a complete scenario for this particular peril and country had been developed. Where the factor did not fail the significance test (greater than 1/15th of the largest country-wide factor), a factor had to be provided. This materiality threshold has been applied in the consecutive recalibration exercises and should be the basis to add new countries in the standard formula. Regarding EIOPA´s proposals: • France: coastal flood risk exists but is not considered as a material risk especially since storm Xynthia (2010) led to preventive measures in order to limit the exposure at a non-catastrophic level. • Netherlands: the inclusion of Flood risk could be considered. A number of consultants/reinsurance brokers have developed flood models for the Netherlands that can be used for the assessment. • Finland: Hail is not material. Convective storms causing Hail are not material in Finland due to the Nordic climate. • Sweden: Windstorm is the main risk. Regarding Flood, there are other causes for the flooding and the existing data is inconclusive as to whether climatic change will in fact increase / decrease the occurrence in the Nordic countries.	Noted. The matrix of potential countries to consider has been revised.
124	Unipol Group S.p.A.	Public			
125	PIU - Polish Chamber of Insurance	Public	No	Additional perils for Poland should not be included as they are not material. We are not aware of any refined models for hail, so it will be difficult to properly evaluate this risk. As a first step, we could consider to do some stress tests in this area to check the materiality and possible impact of the event on the market. Polish insures with a large share in agricultural insurance do not observe any significant catastrophic losses due to this risk.	Noted. A materiality assessment is needed.
126	Insurance Europe	Public		Any consideration of additional countries to be included in the standard formula must first consider the materiality of the given peril in that country. Where the chosen materiality threshold is met for a given peril/country, it should be considered for inclusion, regardless of the driver of the risk.	Noted. The matrix of potential countries to consider has been revised.

				The existing materiality threshold of the country factor being 1/15th of the largest peril-specific factor for the given country is easy to understand and should continue to be used as a basic reference point for materiality. On the specific country proposals put forward by EIOPA: Germany and Italy: Subsidence is not material. Considering coastal flood, there is some risk given, however, the exposure is not material. Barely any products insuring against coastal flood are offered in the German and Italian market. Spain: The risk of subsidence is not material in Spain as it is located in areas that are not populated/urbanized and where the possible risks are controlled. Subsidence is either implicitly covered by other perils (flood). In addition, the Consorcio de Compensación de Seguros partly covers this risk. Hail risk: there is no evidence of the need for its recalibration in Spain. Denmark: No, we do not believe that flood risks are sufficiently material for inclusion. The 2011 Copenhagen flooding was severe but in the following years both companies and authorities have worked on a variety of adaption strategies. We therefore consider most of this risk mitigated. Not due to “risk mitigating techniques”, but rather due to responsible infrastructure planning. River, EIOPA dido not show any cases of “river” cases for Denmark. The reason for this is that all “river” cases haves been covered by the national “stormflods ordning” and therefore have not been a major risk to a single company. The purpose of the “stormflods ordning” is to mitigate risk from a	

				single market company or region to the community. Netherlands: Inclusion of flood risk for the Netherlands could be considered, however only for those LoB's business lines where there is an insured risk with respect to flood: e.g. motor. A number of consultants/reinsurance brokers have developed flood models for the Netherlands that can be used for the assessment. Finland: Hail is not material. Convective storms causing hail risk is not material in Finland due to the Nordic climate. Croatia: Flood, hail, subsidence and wildifire are not likely to be material for the time being, due to low to moderate exposure. Flood risk has low exposure due to low insurance penetration. Another obstacle for consideration of these perils in SF for Croatia would be the fact that there are no relevant models available at the moment for some of these perils. Sweden: Flood should not be considered for Sweden. Windstorm is the dominant peril in the Nordics. Flooding as a peril in the Nordics would also be dependent on seasonal snow melting and not only rain fall; currently there is no clear consensus that there would be a decrease or increase in snowfall or increased occurrences of colder winters in a warming climate overall. France Coastal floods risk exists but it is not considered a material risk, especially since the Xynthia storm in 2010 which led to preventive measures in order to limit the exposure at a non-catastrophic level.	

				Bulgaria: Hail risk is considered to be relevant for the Bulgarian market. There is a historical precedent for its manifestation, and it is necessary for it to be analyszed. However, a study for the inclusion of hail risk in the sStandard fFormula must be based on clear criteria and include the whole region without exception. EIOPA's assessment of countries with similar climate conditions in sSouth - eEastern Europe appears to be inconsistent and we do not find a connection of this proposal with the data on which it is based in Annex B of the dDiscussion pPaper (Climate in Europe under Gglobal Wwarming) and in particular the EIOPA's comment in items 6.38 and 6.39, as well as with the data in fFigure 17 (Observed annual median and trend of the Mean Potential Hail Index (PHI) over the period 1951-2010), where Romania, Bulgaria and Greece are completely absent. Greece: Wildfire risk exists in Greece and constitutes an increasing concern since the Mati incident in 2018 which led to an increase of the levels of state readiness towards the phenomenon to mitigate the exposure. Therefore, we do not agree to add the specific peril to the standard formula. Poland: Additional perils for Poland should not be included as they are not material. We are not aware of any refined models for hail, so it will be difficult to properly evaluate this risk. Polish insurers with a large share in agricultural insurance do not observe any significant catastrophic losses due to this risk.	
127	Actuarial Association of Europe	Public	Yes	European insurers are looking for growth relays in North America, Africa, and the Middle East. It could be interesting to include them. In order to be prudent all countries that have been impacted in the last decade with a high severity and penetration should consider being included. It might be useful to adopt some threshold system when a new risk/territory should be added to allow greater transparency.	Noted. The matrix of potential countries to consider has been revised.

				Specifically, • the Netherlands should be included for flood to create awareness about and more insight into the protection gap and its impact on society and economic losses. To be considered: Currently the coverage in general is usually limited to flash flooding, while all floods related to the overflow or failure of primary watersystems (sea and big rivers) cannot be insured. • • For Germany it should be evaluated to include subsidence. For the Netherlands flood might be valuable to be included. • Flood risk in Ireland is increasingly prevalent and should be considered in any future recalibration exercises. • Coastal flood should be added in France and Spain since there have been many occurrences in the last 3 years. [Sample data sources and discussion papers available on Irish Flood Risk: - Grantham Research Institute on Climate Change and the Environment "Fit for the Future - an assessment of Flood Risk" - Department of Finance Public Consultation on Climate Change and Insurance in the context of the 'Climate Action Plan 2019 to Tackle Climate Breakdown - The Office of Public Works have a national flood information portal, providing location specific access to flood risk and flood management information.]	
128	German Insurance Association	Public	No	The given answer "no" refers to Germany. Generally, the risk subsidence is not material in Germany. Thus, the exposure to the risk isn't material either. Considering coastal flood, there is some risk given, however, with respect to the exposure coastal flood is not material in	Noted. The matrix of potential countries to consider has been revised.

				Germany. Barely any products insuring against coastal flood are offered in the German market.	
129	INSTITUT DES ACTUAIRES (France)	Public	Yes	In order to be prudent all countries that have been impacted in the last decade with a high severity and penetration should consider being included - Coastal flood should be added in France since there have been many occurrences in the last 3 years.	Noted. The matrix of potential countries to consider has been revised.
130	HDI International	Public	Yes	But it should be focused on the non-included peril-country combinations with the highest evidence for climate change impact. For example the expansion of coastal flood would be one reasonable focus.	Noted.
131	FERMA: Federation of European Risk Management Associations	Public			
132	Financial Guard	Public	No	All countries should be considered, partly because risk exposures for insurers extend outside of the insurer's domicile and even outside of EIOPA's regulatory regime, and partly because a full global model has the best opportunity for meaningful results for even regional insurers.	Noted.

Question 13: For new perils, EIOPA has focused on wildfire. Do you see additional "new" perils which could be of relevance for the SF?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
133	AIR Worldwide	Public			
134	AMICE	Public	No	The evidence provided by EIOPA is not conclusive. Further work is needed to investigate whether additional climate change-related perils such as droughts and wildfire could be better captured in the natural catastrophe risk sub-module.	Noted.
135	Unipol Group S.p.A.	Public			
136	PIU - Polish Chamber of Insurance	Public	No	Any consideration of additional perils to be included in the standard formula must consider the part already captured in the calibration of the non-life premium and reserve risk sub-module and in the calibration of the "other non-life catastrophe risk" sub-module to avoid potential double-counting on the SCR.	Noted.
137	Insurance Europe	Public	No	As noted in respone to Q12, the inclusion of a new peril in the standard formula should be driven by its relevance in terms of materiality. Drought and wildfire events have generated substantial economic and sometimes insured	Noted.

				losses, in Europe and elsewhere, and appear to occur with increased frequency. These two perils are so far not part of the standard formula (apart from a drought related peril, subsidence, which is modelled for France), but should be captured, if material. Any consideration of additional perils to be included in the standard formula must consider the part already captured in the calibration of the non-life premium and reserve risk sub-module and in the calibration of the "other non-life catastrophe risk" sub-module to avoid potential double-counting on the SCR.	
138	Actuarial Association of Europe	Public	Yes	First of all, in respect of wildfire, the exposure is different in the different EU countries. In most countries, the insured risk associated to wildfire is limited to properties and vehicles. Only a few countries have the forest insured by the private insurance sector. So the scenarios should be different based on the insured exposure. The exposure might depend on the share of forests in total land use. This differs a lot from country to country and the effects of climate change on temperature and precipitation levels will differ as well. Also illnesses and plagues (the state of the forests) are important. Other potential perils to be considered • Drought could also be of relevance for the SF for various regions. It might create additional risks to crops, buildings, and industrial sectors. It could also be relevant to assess the transition risks. • In addition to drought the agro sector is exposed to different climate developments like illness associated to climate impact, precipitation and spring freeze. • We could also consider heatwave. There has been an increase in frequency and severity, however there are currently no vendors models. • We would recommend clarifying coastal flood: this should not be considered as a new peril but be associated to the Windstorm peril as it is the case in the	Noted.

				UK but not in Belgium and other European countries. • Severe Convective storms can also be impacted by climate change and could have damaging impact depending on possible high concentration of exposures. • Subsidence is another peril which is very sensitive to climate change and a scenario should consider the soil nature. • Landslide could be considered for Alpine regions. However, yet it doesn't seem to be significant. • It may be interesting to analyze the extent to which volcanoes and marine submersions can be taken into account. Consideration could also be given to secondary perils (i.e. which of the perils that occur following significant events). It would be necessary to check whether considering new perils within CAT NAT sub-module creates any overlap with other submodules as premium and reserves risk, and if so, to select where best to capture such a capital requirement.	
139	German Insurance Association	Public	No	The given answer "no" refers to Germany. The hazard "drought" might occur more frequently in Germany. However, the exposure for the German market is currently very low, and it is not expected to change any time soon (see also Q17).	Noted.
140	INSTITUT DES ACTUAIRES (France)	Public	Yes	In addition to wildfire and drought we should also take into account heatwave increase in frequency and severity, however there is currently no vendors models.	Noted.
141	HDI International	Public	No		
142	FERMA: Federation of European Risk	Public			

	Management Associations				
143	Financial Guard	Public	No		

Question 14: Do you think that wildfire could potentially be material enough for the insurance sector to be considered in the SF?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
144	AIR Worldwide	Public			
145	AMICE	Public	No	With respect to wild fires, EIOPA should not disregard the fact that the wild fires occur in the "wild" and does not necessarily result in insurance losses. That would only be possible if a city would be impact by an uncontrolled wild fire.	Noted.
146	Unipol Group S.p.A.	Public			
147	PIU - Polish Chamber of Insurance	Public	No	Following the wild fires in California and Australia everybody was analysing the wildfires. Nevertheless it is worth to mention the difference in the size of natural areas of California and Australia. As mentioned earlier the fire of the Biebrza National Park in 2020 caused huge natural losses, with practically no impact on insurance companies. In the last 20 years, even during the hot and dry summers the insurance market didn't noticed any negative impact of this weather condition for general amount of indemnities for damages caused by fire.	Noted.
148	Insurance Europe	Public	No	See comments on materiality of perils in Q12. Italy: Currently, wildfire is not considered to be material. Spain: Currently wildfire is already covered on forestry farms by a pool (Agroseguro). Most wildfires are caused by people. The risk of climate-driven increase would be partially or totally offset by adaptation strategies (eg traditional fire prevention or land use management). Finland: wildfire is not material and it should not be included as a new peril. Croatia: wildfire is not likely to be material due to low to moderate exposure.	Noted. Points have been considered in the paper.

				Sweden: No. Wildfire is not considered to be a material peril in Sweden. Windstorm is the dominant peril in the Nordics also for forest exposure. Any new perils in the standard formula from a long-term climate change perspective should be clearly derived from empirical evidence of materiality in connection with a clear consensus from the scientific community of an increased risk compared to the historical data. France: even if the wildfire risk is an increasing concern in France in terms of frequency, the intensity will be limited at a non-catastrophic level. The scale of risks is not the same when comparing California or Australia. Consequently, we do not agree with the inclusion of this new peril in the SF for France. Poland: wildfires have been observed and are considered to be the consequence of drought which have become uninsurable in parts of Poland. However, the scale of our forests is not the same in California or Australia and we do not consider it necessary to add this peril to the standard formula. Austria: wildfire is not considered to be a material peril in the CEE region.	
149	Actuarial Association of Europe	Public	Yes	Yes, it appears reasonable that this should be considered, particularly as events which have already happened are captured in pricing data and therefore covered under Premium Risk – it would therefore be consistent to also consider this in the Nat Cat module. Depending on various aspects like regional area and likelihood to affect insured objects and lives. Besides, there should be tighter co-operation between national regulators and EIOPA where national regulators can analyse insurers' ORSA and Risk registers and notify EIOPA regarding potential new risks (emerging risks). [Note from Germany: So far, an accumulation event of several building destroyed by wildfire has only occurred once: Siegburg 2018 (eight houses on fire along an ICE railway due to heat). The awareness of such events should be created nevertheless. And further research would be appreciated. As a first step it should be elaborated how large a 1:200 event as of 2018 could have looked like.]	Noted.

150	German Insurance Association	Public	No	The given answer “no” refers to Germany. Insurance products for wildfire are only offered by a couple of insurance companies and, thus, makes up a very small segment only. Therefore, wildfire shouldn’t be included in the standard formula for Germany.	Noted.
151	INSTITUT DES ACTUAIRES (France)	Public	Yes	The example given is Portugal with a few major events but some events took place in Greece and in northern Europe countries (Finland...) as well. Drought is one of the driver of such potential issue as well as building of houses nearby forests.	Agreed.
152	HDI International	Public		For most of the countries, this is not the case. However, for some countries there is at least some potetial for materiality.	Agreed.
153	FERMA: Federation of European Risk Management Associations	Public			
154	Financial Guard	Public	Yes		

Question 15: Are you aware of models or data which could be used for the calibration of parameters for wildfire risk in Europe?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
155	AIR Worldwide	Public			
156	AMICE	Public	No	N/A	
157	Unipol Group S.p.A.	Public			
158	PIU - Polish Chamber of Insurance	Public	No		
159	Insurance Europe	Public	No		
160	Actuarial Association of Europe	Public	No	Concerning wildfire we are not aware of any specific models. One could check whether the data from Copernicus and its databases can be used to start such a model calibration. Also Eurostat registers information on	Noted.

				forest exploitation. [We note the examples of Portugal with a few major events, and also Greece and in northern Europe countries (Finland) as well. Drought is one of the drivers of such potential issues as well as building of houses near forests.]	
161	German Insurance Association	Public	No		
162	INSTITUT DES ACTUAIRES (France)	Public	No	Some models exist in the US but to our knowledge not in Europe. We have identified a few data sources : - https://www.preventionweb.net/news/view/73721 - http://www.drias-climat.fr/ - https://cerfacs.fr/en/wildland-fire-propagation/?cn-reloaded=1	Noted. EIOPA will consider the referred sources.
163	HDI International	Public	No		
164	FERMA: Federation of European Risk Management Associations	Public			
165	Financial Guard	Public	No		

Question 16: For new lobs, EIOPA has focused on agricultural insurance and NDBI. Do see additional lobs, which could be of relevance for the SF?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
166	AIR Worldwide	Public			
167	AMICE	Public	No	EIOPA had stated a materiality threshold so that a peril would be material for a particular country when compared to other perils if a complete scenario for this particular peril and country had been developed. Where the factor did not fail the significance test (greater than 1/15th of the largest country-wide factor), a factor had to be provided. This materiality threshold has been	Agreed.

				applied in the consecutive recalibration exercises and should be the basis to add new lobs in the Standard Formula.	
168	Unipol Group S.p.A.	Public			
169	PIU - Polish Chamber of Insurance	Public	No	We do not observe material changes to the risks in this area.	Noted.
170	Insurance Europe	Public		See comments on materiality of perils in Q12.	Noted.
171	Actuarial Association of Europe	Public	No	Non-Damage Business Interruption • NDBI is a relatively "new" emerged risk in light of the covid-19 pandemic. Many insurers have either explicitly excluded NDBI from their ongoing policies due to a lack of appetite for such risk. It could be added as a form of a specific scenario. However, one would be hesitant to include this in the Catastrophic exposure's calibration due to the newly implemented exclusions. It is probably out of the scope of this consultation paper. In the context of NDBI, our view is that it would be difficult to assess materiality; furthermore, calibration may prove difficult if there are varying levels and types of cover available in different markets. Other • Some other lines of business which may be considered include travel and event cancellation. However, these are already captured in the Miscellaneous Financial Loss module and it is difficult to envisage how this could be calibrated for Nat Cat without requiring changes to the other areas of the Catastrophe Risk module for these classes, which already implicitly allow for Nat Cat losses among other sources of loss. • Cyber risk (man-made scenario) in the light of the covid19 and change of the traditional operational model) could potentially be added to the SF with many insurers exposed due to "silent" covers.	Noted.
172	German Insurance Association	Public	No	No, we do not see additional lobs because of materiality considerations (see Q17).	Noted.
173	INSTITUT DES ACTUAIRES (France)	Public	No		

174	HDI International	Public	No		
175	FERMA: Federation of European Risk Management Associations	Public			
176	Financial Guard	Public	No		

Question 17: Do you think that crop insurance could potentially be material enough for the insurance sector to be considered in the SF?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
177	AIR Worldwide	Public			
178	AMICE	Public	No	Crop insurance should have been taken already into account in the exposure measurement given that the Solvency II Delegated Acts account for general Fire and other damage to property exposure where crop insurance is generally embedded. Nonetheless, the current Standard Formula framework does not represent an acceptable proxy of the catastrophe risk associated to crops; indeed, this business is associated with significantly different damage factors. Moreover, the frequency of relevant events for insurance losses is higher than for the other LoBs. In the Netherlands, crop insurance is offered by a few companies only. Hail as component of crop insurance is taken account for in the Hail risk category.	Noted.
179	Unipol Group S.p.A.	Public	No	In the present structure of regulation, crop insurance should be already taken into account in the exposures measurement since the Delegated Acts account for general Fire and other damage to property exposure where crop insurance is generally embedded. Nonetheless, the current framework of the Standard Formula does not represent an acceptable proxy of the catastrophe risk associated to crops: indeed this business is associated with significantly different damage factors; moreover the frequency of relevant events for insurance losses is higher than for the other LoBs.	Noted.
180	PIU - Polish Chamber of Insurance	Public	No	In Poland, this is a risk specific to several companies on the Polish market. It is not such a large sector of insurance that would require special treatment.	Noted.

181	Insurance Europe	Public		See comments on materiality of perils in Q12. Comments on specific countries In Germany and the Netherlands, crop insurance is offered by only a few companies. Hail as component of crop insurance is taken account for in the risk category hail. The hazard "drought" might occur more frequently in Germany. However, the exposure for the German market is currently very low, and it is not expected to change any time soon. In Spain, the Spanish Agricultural Insurance System, managed by Agroseguro, aims to establish technically and financially viable coverage that allows the agricultural sector to deal with the serious damages caused to crops by uncontrolled and unforeseen risks of catastrophic consequences. Agroseguro's premiums and capital are being included in the Hail and Storm risks. Hail and Storms component of crop insurance is taken account for in the risk category hail and Storm. In Poland, this is a risk specific to several companies on the Polish market. It is not such a large sector of insurance that would require special treatment.	Noted.
182	Actuarial Association of Europe	Public	Yes	We agree that crop insurance may potentially be material for some insurers. Whilst it may not be material for the entire insurance sector at the moment, it is likely that it may become material in the future. This will increasingly be covered by parametric insurance. Crops can be impacted by several natural disasters like drought and hail and therefore should be included in the scope of the SF Nat Cat Risk especially because some insurance companies are heavily exposed to this specific LoB in limited territories. We note that the paper mentions a lack of models available in Europe; also, we expect that crop insurance is likely more material in non-EEA markets. Analyses indicate an increasing demand for crop insurance as frequency and severity of almost all events / risks covered by crop insurance increase driven by climate-change (e.g. flood, hail, fire/wildfire, drought). Therefore, we would like to encourage EIOPA to analyse the outlook for and impact of	Noted. EIOPA added the need to make further study on crop insurance.

				climate change on crop insurance in more detail. For its activities and discussions EIOPA should take into account that it takes a few years to effectively integrate new risks and LoBs (along with the risk factors needed) into the SF as already elaborated by EIOPA. With regard to a particular insurer, proportionality and materiality of the risk should be considered. However, in the current set-up of the SF Nat Cat SCR, country factors would to be recalibrated for the remaining kind of risks (e.g. civil risks, commercial risks, industrial risks) if agriculture risks are to be calibrated separately.	
183	German Insurance Association	Public	No	As mentioned in the response to Q13, droughts might occur more often in Germany. Particularly, because this hazard correlates strongly to rising temperatures. However, in Germany crop insurance is offered by a few companies only. Hail as component of crop insurance is taken account for in the risk category hail. Therefore, crop insurance is not material in Germany. The materiality of crop insurance is not likely to change unless public support becomes available. Similar considerations hold for NDBI. This segment is very small and therefore non-material. Nevertheless, the development of NDBI should be studied in the future since not only climate risks, but also transitional risk might enhance an increase of claims in NDBI.	Noted.
184	INSTITUT DES ACTUAIRES (France)	Public	Yes	Crops can be impacted by several natural disasters like drought and hail and therefore should be included in the scope especially because some insurance companies are heavily exposed to this specific LoB in limited territories. This will increasingly be covered by parametric insurance.	Noted.
185	HDI International	Public	No	The subsidiaries of HDI International have no crop insurance exposure	Noted.
186	FERMA: Federation of European Risk Management Associations	Public			
187	Financial Guard	Public	Yes		

Question 18: Do you think that adding a loading factor is the right approach to capture climate change?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
188	AIR Worldwide	Public	Yes		
189	AMICE	Public	No	The occurrence of events cannot necessarily be extrapolated to a 1:200 event. We do not agree that additional prudence should be introduced especially for scenarios where there is significant data, modelling exposure and expertise. Moreover, EIOPA would have to consider whether the outcome of applying loading factors is still reflective of the actual scenario.	Noted. In view of its limitations, EIOPA will not pursue this option.
190	Unipol Group S.p.A.	Public	No	Change in climate risk should be distinguished from natural climate variability. The time span considered in the models should be explicitly taken into account: the variability of climate projections depends heavily on the assumptions of the models and on the time span. We recommend to average models results given the high variability in projections and to consider climate change only if there is conclusive evidence that the variability attributable to climate change is greater than the variability due to model error and natural climate variability. The adoption of a loading factor may be inappropriate for a variety of reasons: if models predict more frequency of events, it should be more recommendable to increase the events; it should be added a loading factor if there is enough scientific evidence that climate change affects severity in a greater magnitude than frequency. Moreover a loading factor approach could be inappropriate to capture non-linear effects due to climate change. However the time span over which climate change unfolds, in almost all models, is of several decades. There could be time inconsistency between the current framework of Standard Formula and the projections of the scientific community.	Noted. In view of its limitations, EIOPA will not pursue this option.
191	PIU - Polish Chamber of Insurance	Public	No	It is already noted in the discussion paper itself that, there is a significant number of complexities and drawbacks to the use of an explicit loading factor. PIU shares this view. It should first be justified that the annual change in risk associated with climate change has a significant impact on the risk taken.	Noted. In view of its limitations, EIOPA will not pursue this option.
192	Insurance Europe	Public	No	As noted in the discussion paper, there is a significant number of complexities and drawbacks to the use of an explicit loading factor. This type of approach should therefore be avoided. It would also not be necessary if regular and transparent assessment of the parameters was undertaken to identify those which were in need of recalibration.	Noted. In view of its limitations, EIOPA will not pursue this option.

				Insurance Europe agrees with EIOPA that this approach would Add complexity Be very challenging to implement due to the difficulties in attributing/isolating the impact of climate change on the perils. Potentially create double counting. The occurrence of events cannot necessarily be extrapolated to a 1 in 200 year event. EIOPA should also consider whether the use of a loading factor would still constitute a 1 in 200 year event.	
193	Actuarial Association of Europe	Public	No	In principle, such an approach would avoid excessive volatility from frequent recalibrations and may be appropriate given the uncertainty inherent in the recalibration process. Historical data already included in the parameterisation should be excluded to avoid double-counting. In this context it is important to note the source of such a factor - care should also be taken as there are likely differences between a hypothetical loading factor in the tail compared to the mean of the distribution. It should also be considered that using a global loading factor will reduce the Nat Cat SF SCR's appropriateness if the composition of the underwriting portfolio is not in line with the reference portfolio used to determine a global loading factor. On the one hand, introducing a climate change-related weight factor per type of risk (i.e., civil risks, commercial risks, industrial risks, and agriculture risks) is more appropriate to determine the SF Nat Cat SCR because it takes into account the change in vulnerability of the hazard for each type of risk due to climate change. On the other hand, such a more advanced approach of disaggregating and integrating separately the effects induced by climate	Noted. In view of its limitations, EIOPA will not pursue this option.

				change and those driven by natural catastrophe events net of climate change into the SF may not lead to better results if this is being done based on sparse data. Thus a loading factor approach may be a reasonable proxy depending on the costs and benefits of the two potential approaches. We would expect a recalibrated multiplicative loading factor by peril but not by country. A difference should be made between perils where models exists and stress testing is possible, (like extra tropical cyclones, flood, Severe convective storms) and perils where such models do not exist in all countries (like subsidence, drought impact on agro). For the first list of perils, the scenario should consider a modelling approach to climate change, e.g. referring to the Peseta IV/Euro Cordex database for flooding. A loading estimated from these models is then an acceptable approach. Climate change is not all about severity. Climate change will have an impact on the frequency of some perils. A review of the number of events to consider for a specific year could sometimes be more appropriate than adding a severity loading. In this context, EIOPA could consider reassessing the current scenario based SF SCR Cat approach as it limits the number of storm/hail/flooding events to 2 per scenario. For other perils where no model currently exists, the loading factor could be an option which should be replaced in any further review if robust models have appeared in the meantime. We would like to add that the management of loadings should be made in a reasonable way. Climate change will not have a negative impact on all perils. For Extra-Tropical cyclones, there is currently no signal confirming a worsening of the hazard. Any loading factor should also take into account the impact of possible resilience measure. Flood is again a good example where infrastructure work or new technologies (eg the Prague mobile defences) can help in mitigate the impact of climate change. A loading will also depend on	

				the portfolio profile and more specifically on possible high concentration of exposure (e.g. hail). We understand that the current calibration implicitly takes into account climate change but only to some extent and, thus does not fully reflect the effect of climate change. The loading factor would then be added to the risk factor to seeking for a full reflection of the effect of climate change. The loading factor could also be a time dependent vector allowing for an increasing effect of climate change. When applying such an approach EIOPA should provide transparency on the derivation of the factors and the factors itself. We note also that entities with sufficient knowledge about this risk could use an internal estimated capital approved by the regulator, and therefore not be hit by a loading factor.	
194	German Insurance Association	Public	No	A loading factor is one option of explicitly modelling climate change. As states in our response to Q9, we do not see the need for explicit inclusion. The problems arising with the usage of a loading factor are named by EIOPA: attribution is very difficult, complexity would be added without a certain benefit and "double inclusion" of climate change effects could lead to too conservative Nat Cat parameters. If the application of a loading factor is chosen, transparency is key for the same reasons as stated in the response to Q9. If such a loading factor is determined, it should be clearly disclosed what it is based on (data, methods, assumptions). It seems questionable whether the scientific calculation of a loading factor is easier than a regular recalibration.	Noted. In view of its limitations, EIOPA will not pursue this option.
195	INSTITUT DES ACTUAIRES (France)	Public	No	Entities with sufficient knowledge about this risk could use an internal estimated capital approved by the regulator, and therefore not be hit by a loading factor.	Noted. In view of its limitations, EIOPA will not pursue this option.
196	HDI International	Public	No	The explicitly consideration of climate change seems to be challenging from a various reasons: the separation of the climate change from a "normal" volatility of the NatCat events seems to be difficult, there is no clear scenario to what extend the climate could be change in a given time horizon, the	Noted. In view of its limitations, EIOPA will not pursue this option.

				complexity of the change cannot be clearly capture and therefore cannot be explicitly considered. Eventually the loading factors should be only applied in those countries in which the risk associated with the climate change is the highest.	
197	FERMA: Federation of European Risk Management Associations	Public			
198	Financial Guard	Public	No		

Question 19: Do you think that revaluating the correlation matrices is the right approach to capture climate change?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
199	AIR Worldwide	Public	No	Re-evaluating the correlation matrices should be part of a regular re-calibration exercise that should be driven by the general progress in understanding weather related risks. However, reassessing the correlations only under a short term climate change lens seems like an over-complication in light of the associated uncertainties.	Noted. In view of its limitations, EIOPA will not pursue this option.
200	AMICE	Public	No	The existing correlation matrices were derived using a high degree of expert judgement. A revaluation every 5 to 10 years should ensure that the latest trends are being captured. If the available data, models and expert judgement show that climate change has altered the current spatial and peril dependencies in the tail of the distribution, the different values affected would have to be updated.	Noted. In view of its limitations, EIOPA will not pursue this option.
201	Unipol Group S.p.A.	Public	No	Climate change has not the same effects in all territories; this is borne out also by current measurement in temperatures (the poles register faster rising temperatures than other places); so it should be sensible to consider the impact on the correlations. However current climate models are characterized by a great uncertainty in risks to which insurance industry is exposed (hail and flood risks). This uncertainty is also of a geographical nature; climate models should have a higher resolution and less variability in order to be an input to correlation matrices. An error in single risk might be mitigated by errors in other risks; directly modifying matrices should be carried out only if scientific evidence is accurate enough because errors could be magnified.	Noted. In view of its limitations, EIOPA will not pursue this option.

202	PIU - Polish Chamber of Insurance	Public	No	This approach should be avoided as it will only lead to significantly increased complexity. This would be the similar to performing the standard formula recalibration process.	Noted. In view of its limitations, EIOPA will not pursue this option.
203	Insurance Europe	Public	No	This approach should be avoided as it will only lead to significantly increased complexity and spurious accuracy. Insurance Europe understands that the calibration of the correlation matrices has been undertaken using an iterative process to combine and refine input from multiple vendor models and relies heavily on expert judgement. Introducing an additional consideration of accounting for the potential impact of climate change is very unlikely to result in increased risk sensitivity or increasing the resilience of insurers against climate change.	Noted. In view of its limitations, EIOPA will not pursue this option.
204	Actuarial Association of Europe	Public	Yes	Yes, with reservations: • It appears a reasonable approach given that climate change will likely have an impact on the diversification between countries/perils. • However, this approach is complicated because, in order to take into account all climate change-related uncertainties, it may be too granular. While correlations are very important, we could end up with an over parametrisation if the correlation matrix has a too fine resolution (LoB, Cresta level) We note also that • It could be a reasonable approach for some perils but not for the majority. Extra tropical cyclones and flood could see more correlation with climate change in view of the increased humidity in the air. • Correlations between atmospheric perils may be unclear, unless the approach is an improvement on the current expert-judgement based correlation factors and supported by science.	Noted. In view of its limitations, EIOPA will not pursue this option.

				[Other comments • Correlation between different lines of business could also be reviewed for climate change impact, e.g. property and motor own damage for flood and severe convective storms. • Correlation between wildfire and subsidence may be worth considering.]	
205	German Insurance Association	Public	No	The initial evaluation process of the correlation matrices has been highly complex. Including another complex, uncertain component as explicit consideration of climate change should be avoided as accuracy is not necessarily increasing as a result. Calibration traceability might even decrease. A transparent revaluation of the correlation matrices should take place if EIOPA and/or stakeholders conclude that the parameters are not representative any longer. The effects of climate change will then be included implicitly.	Noted. In view of its limitations, EIOPA will not pursue this option.
206	INSTITUT DES ACTUAIRES (France)	Public	No	Correlations are very important but we could end up with an over parametrisation if the correlation matrix has a too fine resolution (LoB, Cresta level).	Agreed. In view of its limitations, EIOPA will not pursue this option.
207	HDI International	Public	No	The uncertainty in the calibration process is huge therefore this would be a very challenging to incorporate a climate change in the calibration process. Consequently, reevaluating the correlation matrices to account for climate change seems rather inconvenient	Agreed. In view of its limitations, EIOPA will not pursue this option.
208	FERMA: Federation of European Risk Management Associations	Public			
209	Financial Guard	Public	No	Correlations, and the implied reliance on statistics of historical data, is a paradigm for insurance only if the future is likely to be like the past. For climate, a new approach is necessary, one in which trends deduced from science are extrapolated to forecast insurance risks.	Noted. In view of its limitations, EIOPA will not pursue this option.

Question 20: Do you agree that there is a need to formalise an approach to re-assess current Nat Cat SCR parameters on a regular basis?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
210	AIR Worldwide	Public	Yes	The understanding of NatCat risk is evolving over time. Changes in the understanding of risk are in fact not only related to climate change This shows for example in updated vendor models EIOPA should revisit country factors in a 5-8 yr interval to ensure that the standard formula reflects the state of the art.	Noted.
211	AMICE	Public	Yes	We agree that it is necessary to formalise the approach used to assess the Nat Cat SCR parameters on a regular basis especially for Hail and Flood as these perils are sensitive to climate risk. We support a regular recalibration of these risks but they should be evaluated not more frequently than every 5-10 years. Need for Transparency The approach to set up a regular recalibration exercise would have to ensure that the details of the analysis carried out (i.e input data sources, models, parameters used, validation method and reasoning) for deriving each country and correlation factor are published.	Noted.
212	Unipol Group S.p.A.	Public	Yes	A reassessment procedure is welcome, but it should be carried out only if there is new scientific evidence carrying not much model error. The recalibration process should be driven by the evidence of signals (something is changing in the nature of the underlying process) rather than noises (variability due to the actual nature of the process). The science of attributing particular events to climate change is developing; if new evidence is produced, it should be taken into account. If models are robust, there should not be the need to frequently adjust parameters; frequent recalibrations could be a sign that something in the models is not functioning properly. We also think that frequent recalibrations due to updates in observations are more meaningful to track the drift of the stochastic process rather than re-estimate extreme percentiles; extreme-percentiles should be explored only if there is vast scientific consensus on how to reduce the epistemological uncertainty. The time length of the reassessment process should be linked with a robust scientific time span where the signals can be significantly discriminated from noises.	Noted.

213	PIU - Polish Chamber of Insurance	Public	Yes	PIU fully agrees that there is a need to formalise the approach used to assess the natcat parameters in the future as it would increase the transparency, open dialogue about those changes and at the end enhance the quality of the review. Reasonable recalibration should be done every 5 years. Any recalibration should avoid any double-counting with the other sub-modules of the “non-life underwriting risk module”. Valuable insights to may be provided by representatives of model vendors, academics, insurance and reinsurance companies, insurance associations and scientists.	Noted.
214	Insurance Europe	Public	Yes	Insurance Europe fully agrees that it is necessary to formalise the approach used to assess the natcat parameters in the future. It is imperative that the process is consistent, comprehensible, documented and transparent. It should be unambiguous on what data the current calibration is based and how the process of recalibration is performed. - The factor used in the calculation should be confirmed, and if necessary, updated in a fixed and well-defined time horizon by a standard process. - A reasonable recalibration assessment could be between 3-5 years. The assessment should ensure that recalibrations are only undertaken where material changes have occurred to avoid unjustified volatility in the parameters. - The time horizon needed for each individual parameter could therefore be different in order to reflect the differences, peculiarities and evolution of the specific risks. Moreover, recalibration should be only triggered if there is a change that lasts for a time sufficient to assess the recalibration. - Any recalibration should avoid any double-counting with the other sub-modules of the “non-life underwriting risk module”. - The recalibration process should be transparent with respect to the data used and the methods applied.	Noted.

				- Where expert judgement is applied, appropriate documentation should be made of the expert judgement, in particular where recommendations are made which deviate significantly from the input data. Quality documentation is of utmost importance. - Representatives of model vendors, academics, insurance and reinsurance companies as well as scientists can all provide valuable insights into the process.	
215	Actuarial Association of Europe	Public	Yes	We are of the opinion that insurers will need to discuss with climate change scientists, model vendors, FCA in order to reassess current Nat Cat SCR parameter on a regular basis. The frequency of reassessment of the Nat Cat SCR parameters should not be too high to have sufficient hindsight and avoid undue volatility. Reinsurers tend to review their parameters every 3 years. Regular recalibration balanced against avoiding excessive volatility appears to be a reasonable aim; therefore, the 3-5 year horizon mentioned appears sensible to allow for various changing conditions regarding climate change, insured objects, policy conditions, building constructions, etc. In this context, a formal approach for recalibrations is appropriate, in particular in establishing the process for determining materiality thresholds for adding/removing/amending parameters, the data sources to be used, stakeholders involved, etc. Some examples of stakeholders include: • Catastrophe Modelling Specialists • Insurance groups using internal models • Government bodies which may provide details on future adaptation measures and any relevant legislative changes, state insurance pools, etc. • Meteorological agencies such as national Met departments and	Noted.

				intergovernmental agencies such as ECMWF It may also be necessary to consider expert judgement to supplement historical data given the inherent uncertainty (this should also be addressed in any formal framework implemented). Given the significant impacts, it is important to be able to justify and explain the changes. It would help if the process and calculations of this recalibration were accessible to everyone to understand the logic behind it.	
216	German Insurance Association	Public	Yes	Yes, we agree that there is a need to formalise an approach to re-assess current Nat Cat SCR parameters on a regular basis. A formal process can be comprehensible and transparent which both is of high importance. The recalibration process should be transparent with respect to the data used and the methods applied. As we expect changes due to climate developments to be slow and gradually, this can be captured by a regular recalibration of three to five years.	Noted.
217	INSTITUT DES ACTUAIRES (France)	Public	Yes	Insurers will need to discuss with climate change scientists, model vendors, FCA in order to reassess current Nat Cat SCR parameter on a regular basis.	Noted.
218	HDI International	Public	Yes	Regular reassessment of parameters seems to be the most suitable way how to deal with the climate change. This kind of analysis should take place every 3-5 years in order not to put too much focus on single events, but focus on trends and the adaptation measures. 3-5 years seems reasonable.	Noted.
219	FERMA: Federation of European Risk Management Associations	Public			
220	Financial Guard	Public	Yes		

Question 21: Do you agree that regular recalibration is needed but under the condition that the changes are material in order to not include artificial volatility?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
221	AIR Worldwide	Public	Yes		
222	AMICE	Public	Yes	A regular recalibration is needed if the previous ones relied heavily on expert judgment; expert judgment should be scrutinized more frequently, because it could be modified by new evidence or new scientific findings. However, the more the models are reliable and incorporate all scientific knowledge, the less is the need to frequently change the parameters.	Noted.
223	Unipol Group S.p.A.	Public	Yes	Regular recalibration is needed if the previous ones relied heavily on expert judgment; expert judgment should be scrutinized more frequently, because it could be modified by new evidence or new scientific findings. However the more the models are reliable and incorporate all scientific knowledge, the less is the need to frequently change parameters.	Noted.
224	PIU - Polish Chamber of Insurance	Public	Yes	Definitely adding artificial volatility should be avoided and the approach based on materiality would limit it. Changes should not be made if the observations indicate that the actual changes in the scale and frequency of events are not significant. Therefore materiality threshold should be defined.	Noted.
225	Insurance Europe	Public	Yes	See comments to Q20. Care must be taken care to avoid unstable predictions and artificial high volatility. However, this does not mean that a regular assessment of the parameters is not necessary. If high quality data and methods are used for recalibration purposes in a transparent manner, even small changes to the parameters could be appropriate.	Noted.
226	Actuarial Association of Europe	Public	Yes	It makes sense to not introduce non-significant changes to the standard formular through recalibration. With a re-assessment interval of 5 years relevant changes would come without a huge delay anyway. The recalibration time frame of the standard parameters for the NAT CAT risk module of every 5 years seems reasonable and will help to avoid artificial volatility. We welcome the criteria on materiality and artificial volatility but ask for further clarification on their definition and related methodology. The framework referred to in Q20 should also consider how materiality thresholds are established. Changes needs to take into account the return period of high severity claims. However this should be monitored since frequency may also	Noted.

				increase so the materiality threshold will require a big scrutiny. Recalibration should only be executed if the changes at a predefined level (e.g., country-level) are material. It might be beneficial to implement some corridor system. If the change is within a specific corridor, then no recalibration is necessary. It is critical to maintain the stability of the standard formula. There is a need for documentation to explain how the parameters have been derived /calibrated. This documentation will help companies to understand the difference between their models and SF. Besides, there could be Ad-Hoc consideration for recalibration following a significant event/new emerging risk. It would be helpful if EIOPA were to release revised versions of the NAT CAT helper tab with each recalibration.	
227	German Insurance Association	Public	Yes	A regular recalibration of the standard parameters is a reasonable measure to reflect the effect of climate change. In the process it needs to be guaranteed that only validated data is used for the recalibration. It must be taken care to avoid unstable predictions and artificial high volatility. Only if trends in the claims history are evident or can be scientifically proven, risk factors should accordingly be adapted. Nevertheless, there shouldn't be any explicit thresholds. If data and methods of high quality are used for recalibration purposes in a transparent manner, even small changes to the parameters should be approved.	Noted.
228	INSTITUT DES ACTUAIRES (France)	Public	Yes	Changes needs to take into account the period of return of high severity claims. However this should be monitored since frequency may also increase so the materiality threshold will require a big scrutiny.	Noted.
229	HDI International	Public	Yes	This seems to be a good approach, especially that the volatility could be materially impacted by a single event. The adjustments should be in line with the expected long-term changes from climate change.	Noted.
230	FERMA: Federation of European Risk	Public			

	Management Associations				
231	Financial Guard	Public	Yes		

Question 22: Do you agree that any recalibration should take in account adaptation measures in a future calibration?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
232	AIR Worldwide	Public	No	No In principle, if the country factors are intended to represent the risk for up to 10 yrs into the future, all information that can inform the risk during that time should be considered. However, we feel that currently the data basis for future adaptation measures is to uncertain and would overly complicate the process	Noted.
233	AMICE	Public		Yes, they should be taken into account in an easy and verifiable way. In our opinion within the reassessment process the expert group should assess the likelihood of different pathways and consider the underlying assumptions with respect to adaptation measures. Two criteria may be adopted to assess the need to incorporate adaptation measures: the time span of the analysis and the likelihood of technological/engineer solutions to be deployed on an enough wide scale to affect risks.	Noted.
234	Unipol Group S.p.A.	Public	Yes	Yes, they should be taken into account in a easy and verifiable way. In our opinion within the reassessment process the working group should assess the likelihood of different pathways and consider the underlying assumptions with respect to adaptation measures. Two criteria may be adopted to assess the need to incorporate adaptation measures: the time span of the analysis and the likelihood of technological/ingegneristic solutions to be deployed on a enough wide scale to affect risks.	Noted.
235	PIU - Polish Chamber of Insurance	Public	Yes	Adaptation and prevention measures should be taken into account as they have a direct impact on the insurance business models.	Noted.
236	Insurance Europe	Public	Yes	Adaptation and prevention measures are an essential component for insurance business and should be taken into account for future calibrations, as long as that is practically feasible from a modelling perspective.	Noted.

				The adaptation measures reduce the losses and the calibration of the parameters should consider the real effects of the catastrophic event. It is important to clarify, as previously stated, that not taking prompt adaptation measures could bring impacts not only on the estimates, but on a broader economical and human level, with “snowball” effect that could be very significant.	
237	Actuarial Association of Europe	Public	Yes	When assessing weather-related risks regarding climate change, adaptation measures should be both excluded and included to measure the adaptation effect. We consider it would be too complex to anticipate future adaptation measures as part of the review process. However, those that are observed over the 3-5 last years, should indeed be included in the recalibration. Adaptation measures should be taken into account by the vendor models. However, it is nearly impossible for them to take this into account every year like building of roads, parkings etc. Recalibration should reflect risk as much as possible without any overestimation. [Some examples from Ireland • The Office of Public Works (OPW) is an Irish government office whose primary function is to support the implementation of government policy. They have made available a national flood information portal, providing location specific access to flood risk and flood management information. e.g. Flood plans are available which set out the roadmap for both investment and policy decisions for the coming 5-10 years. This information can be used take into account to adaptation measures in a future calibration. Office of Public Works (www.gov.ie) • Another company, Ambiental Risk Analytics, combine advanced flood modelling, predictive analytics and machine learning to give (re)insurance organisations the critical insight they need into flooding and flood risk. They	Noted.

				have also helped customers such as Zurich, Hastings, QBE and FloodRE to better understand the future impact of changing rainfall patterns on flood risk so as to assist. They may have some insight regarding how to allow for adaption measures as they discuss the following on their website "The Irish government, and other governments around the world, are developing strategies on climate change adaptation. Understanding the potential impact of climate change on flood risk is essential in prioritising natural flood management measures and guiding local flood management schemes. Climate change risk assessments are also fast becoming a critical and mandatory requirement for developing and maintaining any type of national or regional infrastructure. Transport and communication networks, energy and water supplies are all facing an increased risk of flooding."]	
238	German Insurance Association	Public	Yes	Yes, observations of the impact of adaptation and prevention measures are an essential component for insurance business. Thus, measurable effects of these actions should be taken into account for future calibrations. (See also Q8.)	Noted.
239	INSTITUT DES ACTUAIRES (France)	Public	Yes	Adaptation measures should be taken into account by the vendor models. However, it is nearly impossible for them to take this into account every year like building of roads, parkings… Recalibration should reflect risk as much as possible without any overestimation.	Noted.
240	HDI International	Public	Yes	The adaptation measures seems to be a important part of the resilience and therefore should be taken in the calibration process	Noted.
241	FERMA: Federation of European Risk Management Associations	Public			
242	Financial Guard	Public	Yes	While there is a modelling danger by allowing adaptation measurers, specifically over-estimating risk mitigating impacts of adaptation measures, we nonetheless feel this is an important inclusion because it can encourage investment in such measures.	Noted.

Question 23: Do you have any other comments on the draft Opinion?

Number	Name Stakeholder	Public/Confidential	Response	Comment	Proposed Resolution
243	AIR Worldwide	Public	No		
244	AMICE	Public	No		

245	Unipol Group S.p.A.	Public	No		
246	PIU - Polish Chamber of Insurance	Public	Yes	In general it is worth to highlight that we need to clearly distinguish between the climate change and the weather-related damages that are subject to insurance. Not all the observed changes have a direct impact on insurance business models.	Noted.
247	Insurance Europe	Public	Yes	The standard formula should use the best information available at the time of calibration, eg in terms of climate exposure, etc. forward-looking aspects such as mid-term climate trends are best implemented via ORSA, which can then inform the future calibration of the standard formula.	Noted.
248	Actuarial Association of Europe	Public	Yes	We welcome this discussion paper on Nat Cat perils (general insurance). • We suggest extending this work to health insurance, to disability and life insurance and to liability insurance. Current analyses in context of climate change focus very much on transition and physical risks, whereas there is a low level of activity on litigation risk and other risks to people. Even though, other LoBs e.g. environmental liability insurance might not be material for most insurers applying the standard formula, it may become relevant in the future. • Where a forward-looking approach regarding the impact of climate change is in scope, there should also be a consensus about the selected climate change scenario(s) and time horizon(s). Besides, it is critical to improve the calibration documentation and how the SF parameters were derived and selected. This documentation will improve insurers' understanding of the SF. They will be in a much better position to assess the potential gaps and appropriateness of the SF.	Noted. The possibility to also include open source models in future calibrations is now explicitly mentioned in the paper.
249	German Insurance Association	Public	No		
250	INSTITUT DES ACTUAIRES (France)	Public	Yes	Generally speaking, it could be interesting to investigate topics related to ecological transition from the perspective of the insurer's place as an economic selector of polluting or green companies.	Noted.
251	HDI International	Public	No		
252	FERMA: Federation of European Risk	Public	Yes	FERMA is very supportive of EIOPA's work in this area, and that, overall, insurance undertakings' need to consider climate scenarios. Furthermore, sustainability should certainly be considered as part of the risk management framework and business planning.	Noted.

	Management Associations			However, enforcing a prescriptive and inflexible requirement to take on board highly standardised scenarios within the ORSA is likely not the best approach to do this. We also urge the recognition of the principle of proportionality in this domain. Solvency II already allows insurers to efficiently deal with the sustainability risks be it through the market or catastrophic risk sub-modules for instance. Capturing these risks should not require additional complex methodologies beyond balanced and specific adjustments.	
253	Financial Guard	Public	No		
254	EIOPA Insurance and Reinsurance Stakeholder Group	Public		The IRSG supports EIOPA's work to assess the impact of climate change and reflect this in the natural catastrophe risk submodule. The group backs more explicit definitions of perils to ensure that all risks are captured, and none are double-counted. Specific perils should be mapped to terms used to avoid confusion. It is also vital to be aware of different side effects, like consequences of droughts for business lines other than agricultural insurance. Secondary perils, occurring following significant events, and other specific risks, such as volcanic eruption and marine submersion, should also be on monitored in case of increased importance. The calibration of the standard formula must remain up to date, and its scope should reflect the material risks to which European insurers could be exposed. However, it is worth recognising the limitations of the standard model and materiality of the risks. In our opinion, subject to a materiality assessment, the standard formula could and should be expanded by including new perils or wider scope of existing perils only where scientific data supports it. To this end, EIOPA should develop materiality thresholds which are applied consistently across all markets. EIOPA's proposal to undertake regular assessment of the nat cat parameters, e.g. every 3-5 years, should ensure that the future evolution of nat cat risks including the impact of climate change is appropriately captured in the nat cat submodule. The assessment should ensure that recalibrations are only undertaken where material changes have occurred to avoid unjustified volatility in the parameters. If the reassessment process identifies the need for recalibration, this should be undertaken through a standardised, transparent, and documented process concerning the data used and the methods applied. If changes are proposed to be made to SF parameters,	On the definition of perils: noted. Amendments were made to clarify the coverage of the perils, benefitting from discussions with EIOPA's Technical Expert Network on Catastrophe Risks. On the need to recognize the materiality of the risks: noted. In the paper it is explicitly mentioned that any changes would need to be material to the insurance sector to be considered in the standard formula. On the need of increasing transparency: noted. In the paper is now explicitly mentioned the possibility to also include open source models in future calibrations. On the addition of a loading factor and on the revaluation of the correlation matrices: noted. In view of the limitations of these two approaches, EIOPA will not pursue these options.

				supporting calibration documentation, covering derivation and selecting parameters should be made publicly available. This will enable improved insurer understanding of the parameters and put insurers in a better position to assess the SF's potential gaps and appropriateness. Also, in case of expert judgement, appropriate documentation should be made, particularly where recommendations deviate significantly from the input data. Representatives of model vendors, academics, and insurance and reinsurance companies can all provide valuable insights into the process. We fully agree that nat cat models should employ forward-looking climate change scenarios. However, there is no need to limit the scope of models to be used for nat cat risk management at this stage. Regarding the impact of climate change, a consensus about the selected climate change scenario(s) and time horizon(s) is vital where it is to be included in the forward-looking models. Our knowledge of potential climate changes and their outcome for the insurance industry is limited. That is why insurance regulators and supervisors should avoid any parameters in SF that lower transparency. The IRSG does not support adding a loading factor to the parameters that capture climate change at this level. This type of approach should be avoided since it increases complexity; it is very challenging to implement, and potentially creates double counting. This argumentation can be echoed in the case of revaluating the correlation matrices to include climate change. In the opinion of the IRSG, this will only lead to significantly increased complexity and spurious accuracy. Finally, the IRSG considers that EIOPA should take adaptation and prevention measures into account when assessing weather-related risks. However, at the same time, it is essential to differentiate the impact of those measures (i.e., wildfires and droughts).	On adaptation and prevention measures: noted.

EIOPA

Westhafen Tower, Westhafenplatz 1
60327 Frankfurt – Germany
Tel. + 49 69-951119-20
info@eiopa.europa.eu
https://www.eiopa.europa.eu