Be-Adapt: Adaptation measures in Belgium based on risk analyses

Final report

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Be-Adapt: Adaptation measures in Belgium based on risk analyses

Final report

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SUMMARY

The Be-Adapt study identified and examined potential measures to address a number of risks identified in the first Belgian Climate Risk Assessment (BCRA) [1]. Ten risks of particular relevance to the study were identified. These risks were selected in the first place because of their urgency, as highlighted in the BCRA. The 10 highest-priority risks for which federal competences are available were subsequently selected.
Of these ten risks, six were prioritised for Be-Adapt (Table 1). These key risks were analysed in detail based on available regional, national and international reports on adaptation to climate change, scientific literature, and discussions with key stakeholders. Preliminary results for shortlisted measures were refined using feedback from a broad range of stakeholders gathered through surveys.

Table 1: Key risks and shortlisted measures elaborated in the Be-Adapt study

Key risk prioritised for Be-Adapt	**Shortlisted measures**
Risk to property insurance due to flooding	• Issue federal guidelines defining minimum flood-related preparedness and response elements to be included in municipal emergency plans • Federal framework to recognise and certify flood risk reduction measures for insurance purposes
Risk to human health due to heat stress	• Stimulate the inclusion of climatological heat and ozone in occupational risk analysis • Targeted early warning and response system for protection of the working population • Guidance for technical and organisational measures for vulnerable occupations • Use of future climate scenarios in specifications for federal buildings
Risk to energy infrastructure due to extreme weather events	• Define resilience objectives for the energy sector • Build capacity to use climate risk data and tools in the energy sector • Harmonise and strengthen climate risk assessment methodologies
Risk to mental health from climate change	• Ensure continuity of mental health support during and after climate-related disasters • Active surveillance of people with pre-existing mental health conditions during extreme weather events
Risk of reduced social cohesion and increased inequalities from climate change	• Climate-adaptive social protection to anticipate climate crises • Climate displacement preparedness within social services • Inclusive risk and adaptation communication
Risk to continuity of healthcare systems due to heatwaves and flooding	• Develop targeted alert systems for hospitals • Provide guidance for hospitals to train their workers for heat and flood emergencies

Key risk prioritised for Be-Adapt	Shortlisted measures
	• Provide hospitals with guidance on protecting essential medical supply autonomy during heatwaves and floods

The shortlist of measures was established through a stepwise process consisting of:

- drafting an initial broad list of possible adaptation measures based on consulted reports and scientific literature;
- drafting a longlist of measures that are applicable at the federal level, i.e., those for which the federal level is (partially) competent. These measures were described to make further selection possible in the next step;
- selecting a shortlist of measures based on the significance of the role of the federal level in implementing each measure, and on the added value of the Be-Adapt study in elaborating the selected measures in more detail.

The shortlist of measures is not intended to be an exhaustive list of all measures considered relevant to addressing a risk. Rather, it is a pragmatic selection of measures that are considered promising, for which significant action can be taken at the federal level, and which were therefore investigated further in this study.

The selection and the description of the shortlisted measures do not constitute a formal policy decision or commitment regarding their implementation, nor do they imply any allocation of roles and responsibilities among the governmental or non-governmental actors involved. Political decisions will follow at a later stage.

The shortlisted measures were then submitted through a survey to a representative sample of stakeholders from federal and regional administrations, as well as participants from the relevant sectors, scientists, and sector organisations. This gave the stakeholders the opportunity to validate the measures and to correct, refine or complement them where deemed necessary. Chapters 3.1 to 3.6 of this report contain the results of the analysis of the shortlisted measures. Annex 1 to 7 provide further details on the initial lists and the longlists.

In addition to the prioritised risks, four additional risks were addressed less extensively. Information on ongoing actions and major needs to address these risks was provided by the Federal Public Service Health, Food Chain Safety and Environment (FPS Health), based on discussions with key stakeholders, and was reviewed and, in some cases, further elaborated by the Be-Adapt consortium (Table 2).

At three points during the study, interim results were submitted to the Steering Committee for input and feedback and were discussed during Steering Committee meetings.

Table 2: Additional risks

Additional risk	Shortlisted measures
Risk to transport infrastructure due to extreme weather	Conducting systematic climate stress tests for each critical site
Risk to food safety due to climate impacts on global supply chains	No measures were elaborated. A short note has been added to explain that the European Union is the primary and most effective governance level for addressing this risk.
Risk of internal displacement of people due to flooding	No measures were shortlisted. A longlist of possible measures has been drafted but not elaborated in detail in Be-Adapt.
Risk to human health from expansion and increased transmission of vector-borne diseases	The ongoing work in this field has been listed. Several measures are in full development within the federal and interfederal contexts. No additional federal adaptation measures were identified that are sufficiently mature to be developed by the consortium within Be-Adapt.

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1 CONTEXT

As emphasised in the first National Security Strategy for Belgium, climate change poses an ever-increasing threat to Belgian citizens, the economy, and nature [2]. The first Belgian Climate Risk Assessment (BCRA) [1] identified several risks related to climate change that require (additional) action. The identified risks cover several policy domains with competences spread over both the federal level and the federated entities.

A Belgian national adaptation strategy was adopted in 2010, which provided for the drafting of a National Adaptation Plan 2017–2020. It aimed to develop a coherent framework for an integrated policy, and to enable cooperation and synergy between federal and regional authorities. A new national strategy and plan have not yet been completed. On 26 January 2026, the National Climate Commission mandated the working group Adaptation to draft a work programme for a new National Adaptation Strategy, identifying scope, methodological options and possible timelines.

At the federal level, the document “Towards a Climate-Resilient Society by 2050 – Federal Adaptation Measures 2023–2026” [3] sets out 28 adaptation measures across eight policy domains, including public health, environment, mobility, infrastructure and risk management, forming a coherent package of actions to strengthen resilience to the impacts of climate change. Implementation is supported by an interim evaluation [4] that monitors progress, identifies challenges and good practices, and enables adjustments during the cycle. The results of this evaluation, in combination with the findings of this study, will feed into the preparation of a new federal adaptation plan scheduled to begin in 2027, ensuring continuity and further strengthening the federal contribution to a climate-resilient society by 2050.

Be-Adapt identifies and develops possible federal measures addressing ten risks identified in the BCRA. For most of these risks, a number of measures are selected and analysed in detail, including their objectives, federal competences, interfederal aspects, effectiveness, actors involved, costs, indicators and possible barriers for implementation.

The description and analysis of these measures is intended to help policymakers in the selection and further elaboration of measures to be included in the forthcoming federal adaptation plan.

The selection and the description of measures in this report do not constitute a formal policy decision or commitment regarding their implementation, nor do they imply any allocation of roles and responsibilities among the governmental or non-governmental actors involved. Political decisions will follow at a later stage.

2 METHOD

The following sections describe the method used to select and describe possible federal adaptation measures, and to analyse investment needs and financing, indicators for monitoring and possible barriers of the measures. The method was tested and fine-tuned in a pilot case on the risk to human health due to heat stress.

At three points during the study, interim results were subject to input and feedback from the Steering Committee and were discussed during Steering Committee meetings.

2.1 Pilot phase

The objective of the pilot was to:

- assess the number and type of key risks to be elaborated in detail in Be-Adapt;
- assess the level of detail of the sub-aspects (including scope, involved actors, intended effects, type of adaptation measures, financial needs, timeline aspects, competent authorities);
- refine the methodology regarding information collection/processing, online stakeholder surveys/interaction and reporting.

The pilot was carried out for the risk to human health due to heat stress. Based on its findings, the method was adapted on a few points, i.e., discussions with key stakeholders were included in an early phase of the definition and description of possible measures. The questions on costs and funding in the survey were also adapted (see Annex 8).
The description below reflects the method as used in the risks that were analysed subsequently in the following phase. Reporting on the pilot on heat stress may therefore diverge on some points from the methodology described below.

Based on the assessment of the time needed to properly assess the measures for a specific risk, and the available resources, the list of risks to be addressed was split into a list of key risks to be addressed in Be-Adapt, and a list of additional risks (see 2.2).

2.2 Selection of risks

The Belgian Climate Risk Assessment (BCRA) [1] identified 28 priority risks across five clusters: ecosystems, food, infrastructure and buildings, human health and population well-being, and economy and finance. It identified the most pressing risks related to climate change and ecosystem degradation, assessed their urgency and current policy readiness, and set out strategic priorities to build a resilient, fair and secure society. These 28 risks were rated according to their urgency level based on the risk severity, policy readiness and level of confidence.

- **Urgent action needed:** The combination of critical to catastrophic risks and insufficient policy readiness calls for urgent new, stronger or different action in the coming years to reduce climate and ecosystems degradation risks. Such actions include policymaking, implementation, capacity building or enabling the environment for adaptation, over and above those already planned.

- **More action needed:** The severity of risk and the limited level of policy readiness call for more action to be implemented. It is crucial to initiate processes that strengthen adaptation action to avoid critical impacts of climate change.
- **Precautionary action needed:** Precautionary actions and no-regret measures are needed due to the potential severity of the risk, even when knowledge is scarce. Additional evidence must be gathered regarding the severity of the risk as well as policy readiness, e.g., through dedicated research, monitoring or policy evaluation.
- **Enhance vigilance:** The evidence in these areas should be kept under review, with continuous monitoring of risk levels, so that further action can be taken if necessary.
- **Operationalise existing policies:** Current or planned actions are appropriate, but effective implementation of related policies and plans is needed to ensure that the risk is also managed in the future. A monitoring process should be in place to evaluate policy effectiveness, with a view to continuous improvement.

From these 28 risks, 10 risks were selected for Be-Adapt based on their level of urgency and their relevance for action at the federal level (Table 3). Following the pilot phase (2.1), and the assessment of the resources needed to study the measures for a specific risk, six 'key' risks were prioritised and have been studied in detail in this study according to the methodology described in sections 2.3 to 2.5. The other four, termed 'additional' risks, were treated less extensively in Be-Adapt as described in Table 4. Overall, these additional risks received a lower urgency score in the BCRA. Information on what is already ongoing and what the major needs are to address these risks, was provided by the Federal Public Service Health, Food Chain Safety and Environment (FPS Health) based on its discussions with responsible federal departments and key stakeholders, and reviewed by the study consortium.

Table 3: Selected risks for this study based on level of urgency and relevance for action at the federal level in order of priority from top to bottom

	Risk	Urgency score	Specific threat	Why federal?
	Key risks for Be-Adapt			
1	Risk to property insurance due to flooding	Urgent action needed	Repeated floods threaten insurability by increasing legal uncertainty and strain on insurance systems.	Insurance legislation, prudential supervision (NBB), macroprudential stability.
2	Risk to human health due to heat stress	Urgent action needed	Increase in mortality and morbidity through heatwaves; disproportionate impact on vulnerable groups and outdoor workers.	Labour legislation, social protection, federal health data and standards for federal building portfolio.
3	Risk to energy infrastructure due to extreme weather events	More action needed	Overloads, blackouts, transport interruptions and cascading effects in the event of heat, flood or storm.	Energy and transport legislation, Critical Entities Resilience (CER) Directive, national emergency planning. (Federal competence for energy supply, emergency planning and critical infrastructure)
4	Risk to mental health from climate change	Precautionary action needed	Federal PSIP (Psychosocial Intervention Plan) / crisis architecture, national helplines and protocols.	Transversal theme that can be considered within all federal competences and interfederal policy.
5	Risk of reduced social cohesion and increased inequalities from climate change	More action needed	Climate impact increases inequalities; risk of social unrest and vulnerability of low incomes.	Social protection, taxation, labour law, national crisis governance.
6	Risk to continuity of healthcare systems due to heatwaves and flooding	Precautionary action needed	Hospitals and healthcare institutions are at risk of failure in the event of heat or flooding.	Federal role in emergency planning, critical infrastructure, and health standards.
	Additional risks			
7	Risk to transport infrastructure due to extreme weather	More action needed	Damage and failure of transport networks (rail transport, airports, etc.) in the event of floods and storms.	Federal leverage through critical entities and national crisis logistics. Railways are federally managed. Skeyes is also federal.

8	Risk to food safety due to climate impacts on global supply chains	Precautionary action needed	Mycotoxins, cold chain failures and import problems threaten food and feed safety. Surveillance systems are insufficiently flexible for new climate risks. Bridging the gap between food safety and quality. Embedding food safety throughout the chain.	FASFC, border control, traceability and crisis communication.
9	Risk of internal displacement of people due to flooding	Precautionary action needed	Evacuation and long-term resettlement in the event of large-scale flooding.	Crisis management, social protection, emergency shelter financing.
10	Risk to human health from expansion and increased transmission of vector-borne diseases	Precautionary action needed	Increase in vector-borne diseases (e.g., ticks, mosquitoes) and infections due to changing climatic conditions.	Public health, surveillance and border control.

Table 4: Restricted elaboration of 'additional' risks

Additional risks	
Risk to transport infrastructure due to extreme weather	Adaptation measures for railway transport have already been studied extensively by NMBS/SNCB and Infrabel for their own adaptation plans. For aviation, FPS Health agreed with FPS Mobility and Skeyes and selected one measure for further elaboration in Be-Adapt. See chapter 3.7.
Risk to food safety due to climate impacts on global supply chains	A short note has been added to explain that the European Union is the primary and most effective governance level for addressing this risk. See chapter 3.8.
Risk of internal displacement of people due to flooding	For this risk, FPS Health provided a longlist of possible measures that have been reviewed but not elaborated in detail in Be-Adapt. See chapter 3.9.
Risk to human health from expansion and increased transmission of vector-borne diseases	Several measures are in full development within the federal and interfederal contexts (e.g., the national operational plan for West Nile fever). It is currently not opportune to identify additional federal adaptation measures that are sufficiently mature to be developed by the consortium within Be-Adapt. See chapter 3.10 for an overview for the ongoing work.

2.3 Selection and description of measures

The selection and description of measures was done in several steps.

2.3.1 Initial list of possible adaptation measures

For each priority risk, an **initial list** of possible adaptation measures was drawn up. This list started from information and recommendations from the Belgian Climate Risk Assessment (BCRA) [1]. Further, other relevant sources were screened for possible measures, including national and international reports, national adaptation plans from neighbouring countries, scientific reviews and web portals with climate adaptation information, and regional and sector-specific adaptation planning information. More details on the sources that were screened for each of the risks are provided at the beginning of the respective sections in chapter 3.

Although the BCRA also includes recommendations to address information gaps, measures that solely aim at addressing information gaps are not included in this study.

2.3.2 Longlist of possible measures with a federal component

Based on a governance analysis and discussion with the FPS Health, measures on this initial list were screened for their applicability at federal level, i.e., measures for which the federal level is (partially) competent (measures applicable at federal level) and those for which there is no specific competence at federal level. Measures with direct applicability at the federal level were kept in a **longlist**. Other measures were kept on the initial list but not further elaborated.

There is a drawback in focusing exclusively on federal measures. Potentially important measures for which the regions/communities are competent do not appear further in the analysis. Often the proposed federal measures only cover specific aspects of the risk that is addressed and should be integrated in an overall coordinated effort across the different governance levels. Lack of coordination and integration among different institutional levels is a recurrent issue for many of the risks identified in the BCRA. Many of the measures, even if an important competence lies at the federal level, require close interaction and collaboration with the federated entities for complementary competences, creating synergies, coordination, avoiding overlap and/or filling gaps for which competences are not clear-cut.
Therefore, the Be-Adapt study specifically addressed the interfederal aspects of each proposed measure and identified collaboration with federated entities wherever this may be relevant. Key relevant actors for the adaptation plans of the federated entities took part in the Steering Committee. Representatives of relevant federated departments were invited to participate in the survey.
In addition, measures that are already extensively studied, taken up or planned in other initiatives or working groups were not further addressed in Be-Adapt to prevent duplication.

The measures in this longlist were further elaborated. Qualitative information on the objective of the measures, their effectiveness in reducing vulnerability and increasing resilience, potential transversal aspects, possible co-benefits, social aspects (equity, gender) and risk of maladaptation was added where relevant (Table 5). The first results of this analysis were discussed bilaterally with key stakeholders, mainly from federal departments that would have a key role in implementing the measures, in order to cross-check the added value and feasibility of the measures and obtain inputs and suggestions from the main competent services or departments in an early stage. Based on these bilateral discussions, the descriptions of the measures were updated. The updated measures were presented to the Steering Committee, which provided further feedback.

2.3.3 Shortlist of possible measures

Based on this analysis, on selection criteria of FPS Health, on the priorities of the Steering Committee members, and on further exchanges between FPS Health and the project team, measures were selected for the **shortlist**.

Important criteria for FPS Health in selecting measures for the shortlist were the significance of the role of the federal level and the added value the study would have in elaborating selected measures. The latter is important as the resources available for the study had to be allocated in the most efficient way. More specifically, this was reflected in the following questions:

- Is the measure within federal competences and can it effectively be implemented at the federal level?
- For which measures are financial insights most important?
- Are data on the measure readily available or not (if yes, the measure is not considered a priority for Be-Adapt)?

Table 5: Description of measures on the longlist and on the shortlist

Elements that are included	Longlisted measures	Shortlisted measures
Context	Short	Updated, elaborated
Objective	Included	Updated, elaborated
Description	Included	Updated, elaborated
Federal competences	Included	Updated
Interfederal aspects	Included	Updated
Effectiveness (including co-benefits)	Included	Updated, elaborated
Responsible[1]		Added
Other actors involved / transversal aspects	Main actors	Updated, elaborated
Time horizon		Added
Need for transformative change[2]		Added
Points of attention: gender, equitability, risk of maladaptation ("Do No Significant Harm" (DNSH) [3])	Main points of attention	Updated, elaborated
Costs and funding		Added
Indicators		Added
Barriers and solutions		Added

As a result, the shortlist of measures is ***not intended to be an exhaustive list*** of all measures considered relevant to addressing a risk. Rather, it is a pragmatic selection of measures that are considered promising, and that require further investigation in this study.

[1] 'Responsible' describes which administration takes up the lead in the implementation of the measure. Other administrations that have a large role in the implementation and/or that lead important subtasks are also added here.

[2] Transformative or transformational change refers to large-scale, systemic changes that fundamentally alter existing structures, systems or paradigms. It involves a complete shift from one state to another and often requires overhauling deep-rooted patterns [5].

[3] The "Do No Significant Harm" (DNSH) principle aims to ensure that EU initiatives do not cause significant harm to the EU's climate and environmental objectives, namely climate change mitigation, climate change adaptation, sustainable use and protection of water and marine resources, circular economy, pollution prevention and control and protection and restoration of biodiversity and ecosystems.

The measures on the **shortlist** were then elaborated in further detail as indicated in Table 5. Readily available information on costs, on indicators for monitoring, and on possible barriers and solutions was added according to the methods described in 2.4, 2.5.1 and 2.5.2.
In the following step, feedback (validation, correction, refinement, amendment) and complementary information were collected on the shortlisted measures via an online stakeholder survey (see 2.6), and this was integrated in the information on the shortlisted measures.

The selection and the description of the shortlisted measures do not imply any decision or commitment to implementation of the measures as a whole nor to the allocation of roles and responsibilities among involved governmental or non-governmental actors. Political decisions will follow at a later stage.

2.4 Investment needs and financing

An investment needs and financing methodology was developed to derive an estimated overview of expected costs and plausible funding sources for shortlisted adaptation measures that require investment needs. It was developed to ensure results remain comparable across risks while staying feasible within project resources.

A distinction is to be made between direct costs, which relate to costs the federal administration may have to disburse relating to the implementation of the measures, and indirect costs, which are borne by other stakeholders such as companies. Such indirect costs occur downstream and could include, for example, the opportunity cost arising from allocating staff time to comply with new protocols, where, in the absence of the measure, the employee could be working on more value-producing tasks. Be-Adapt focuses on the consideration of direct costs, especially capital expenditure (CAPEX, upfront, long-term investment) at the federal level. It does not estimate personnel costs for tasks that are part of a staff member's regular responsibilities. However, the analyses can flag instances where further technical expertise is needed, leading to additional costs to enable the implementation of the measure (for example, hiring a consultant). Information on operational expenditure (OPEX, ongoing, recurring costs) can be flagged as a complement where possible but is not the main focus of Be-Adapt. Where information is readily available, the study acknowledges where measures are likely to trigger substantial downstream action (indirect costs), but these are not analysed in detail.

The methodological process was divided into several sequential steps:

1. A preliminary literature review was conducted based on a variety of documents, such as scientific articles, review reports, and case studies.
2. These preliminary findings were then incorporated into the survey for validation and further comments from participants.
3. In the survey, participants were also asked to provide additional insights or sources, and to motivate their reflections. However, this was not always consistently followed. While some participants indicated that certain estimates seemed unrealistic, a clear rationale was not always provided for such statements. In addition, some participants noted that they were not in a position to estimate costs.
4. Based on the combined findings from the literature review and the survey, the measure sections were subsequently updated to reflect the final cost estimates.

It is important to remain aware of the limitations of this method. The studied measures are often highly specific, refined with stakeholders, and adapted to the study context. Therefore, estimates of associated costs are not readily available and documented in the literature. This

required the project team to rely on assumptions, the availability and quality of information, as well as survey participants' knowledge to derive estimates, since conducting an in-depth economic assessment of the measures was not within the scope of this study.

In this report, the final cost results are presented in a table format per measure, in accordance with the formatting of the rest of the results. In the table, for each cost estimate, the following aspects are covered: type, lifetime, costs, and reflection on costs. An explanation of each output category is provided in Table 6.

Table 6: Costs output

Costs				
	Type	**Lifetime**	**Costs**	**Reflections on costs**
This column lists the individual cost items to which the next columns refer, such as regular employee costs for policy design, external expertise to gather technical input, any required IT infrastructure, etc.	This column indicates whether the cost relates primarily to a soft aspect of the measure (e.g., staff time or expertise) or to infrastructure-related investments.	This category specifies whether the cost is recurring over time or represents a one-off expenditure.	This column presents the final cost estimate.	In this column, additional explanations, assumptions, or considerations regarding the cost estimate are provided.

2.5 Monitoring and barriers

2.5.1 Identification and selection of monitoring indicators

2.5.1.1 Typology of indicators

Indicators may greatly vary in scope and nature. Given the diverse range of indicators found in the literature, we opted for the typology visualised as a logic chain in Figure 1.

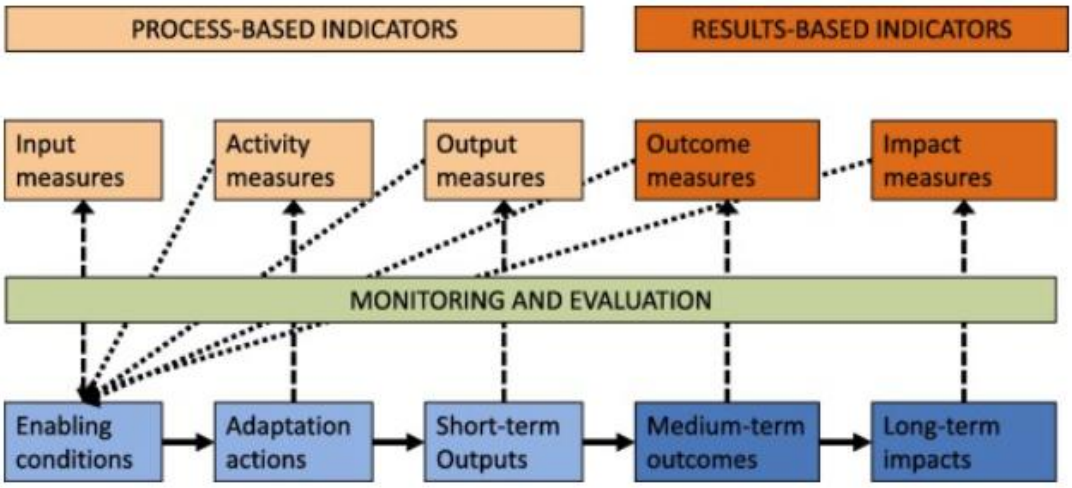


Figure 1: Typology of indicators visualised as a logic chain (developed by [6])

Given the limited added value of input indicators in monitoring effective implementation of measures, these were left out. Activity indicators were also excluded where a corresponding output indicator already captures the same information more directly. The table below describes the types of indicators retained, illustrated by an example for the measure *"Make existing federal buildings accessible as public cooling spaces"*.

Types of indicators	**Description**	**Examples**
Output	Actions undertaken, processes implemented, or direct tangible results produced (infrastructure, plans, tools)	Number of days per year cooling spaces are operational
Outcome	Short-to-medium-term effects (behavioural or systemic change)	Number of visitors to cooling spaces during heatwaves
Impact	Long-term environmental or societal effects	Number of excess deaths during heatwaves

2.5.1.2 Preliminary identification and selection of indicators

2.5.1.2.1 Existing international and European databases

The identification of indicators was first based on a review of existing databases covering a range of scales — from international frameworks to advanced national monitoring systems, including monitoring, evaluation and learning (MEL) systems. Sources were selected based on their documented focus on climate change adaptation indicators and their level of methodological development, with particular attention to countries considered advanced in adaptation monitoring.

Country/region	**Programme**	**Reason for selection**
International	Belém Programme [6]	UNFCCC framework
Europe	Climate-ADAPT [7]	EU reference
Germany	Monitoring report on the German Strategy for Adaptation (DAS) [8]	National adaptation plan includes a structured monitoring and evaluation system

Country/region	Programme	Reason for selection
France	PNACC 3 [9]	National adaptation plan includes a structured monitoring and evaluation system
UK	Progress in adapting to climate change [10] Research to develop indicators that monitor adaptation: APR25 [11]	National adaptation plan includes a structured monitoring and evaluation system
Ireland	National adaptation framework [12]	National adaptation plan includes a structured monitoring and evaluation system
Finland	National climate change adaptation plan until 2030 [13]	National adaptation plan includes a structured monitoring and evaluation system

Potentially relevant indicators were identified from these databases through keyword-based research relating to each risk and measure. Regional monitoring frameworks were also consulted — notably the Agence wallonne de l'Air et du Climat (AWAC) climate indicators portal for Wallonia and Klimaatportaal in Flanders — as a complement.

In practice, however, existing databases proved of limited direct applicability. International and European frameworks tend to focus on hazard and vulnerability indicators rather than on output, outcome and impact indicators directly linked to specific policy measures. Regional portals such as AWAC similarly provide climate trend, hazard and vulnerability indicators rather than measure-level monitoring tools. This gap reflects both the relatively novel nature of several measures proposed in Be-Adapt and the general scarcity of ready-made indicators for federal adaptation measures in the Belgian institutional context. The database review therefore served primarily to confirm the absence of directly applicable precedents and to inform the development of tailored indicators by the consortium.

2.5.1.2.2 Consortium's suggestions for indicators

Given the limited alignment between existing databases and the measures selected for Be-Adapt, the consortium developed indicators specifically tailored to monitor progress in the implementation of each measure, drawing on the consortium's expertise and on the specific objectives, outputs and expected outcomes as elaborated in this report.

2.5.1.3 Stakeholder survey

A concise online survey was sent to a broad set of stakeholders to refine the preliminary findings and identify key missing scientific and grey literature references.

For each measure, each recipient of the survey was asked to:

- Evaluate which types of indicators were needed to properly monitor the measure;
- Rate the relevance and feasibility of the suggested indicators[4][5];
- Formulate new indicators and suggest references to identify other potential ones;

[4] The indicator directly reflects what the measure tries to achieve (its core objective), rather than a side effect, a distant proxy or something only loosely connected.
[5] The indicator can be produced with existing data (or easily obtainable data), at a reasonable cost, within the mandate of federal actors responsible for monitoring.

- Provide open comments.

It should be noted that survey coverage was uneven across measures. For measures that were not processed through the survey — either because they were added at a later stage or treated as additional risks outside the main survey scope — indicators were developed solely on the basis of consortium expertise and the available literature.

2.5.2 Identification and selection of barriers and solutions

2.5.2.1 Typology of barriers and solutions

Barriers to adaptation and solutions to overcome them can be categorised in multiple ways in the literature. This study adopted the following typology as a reference grid to ensure comparability across measures and risks.

Category	Coverage
Financial / Economic	Availability and accessibility of funding; financial incentives or constraints; economic attractiveness of adaptation
Institutional / Governance	Clarity of mandates and coordination across levels; strength of policy frameworks; political commitment
Technical / Knowledge and Information	Availability, quality and accessibility of data; technical capacity; innovation and tools supporting decisions
Social / Cultural / Awareness	Public understanding, risk perception, social norms, inclusion, and stakeholder engagement
Organisational / Operational	Actors' internal capacities, human resources, interdepartmental collaboration, project management, and continuity
Policy / Regulatory	Existence and coherence of laws, standards, plans, and enforcement mechanisms; integration of adaptation into policy instruments

2.5.2.2 Preliminary identification and selection of barriers and solutions

Barriers and solutions were identified through two complementary approaches. Where possible, they were drawn from the literature review conducted during the measure selection phase — references discussing barriers and solutions were systematically recorded alongside those used to identify and justify the measures, avoiding the need for a separate search.

In practice, however, the literature did not always provide sufficiently specific or directly applicable barriers and solutions for the measures retained in Be-Adapt. In such cases, barriers and solutions were proposed directly by the consortium based on its expertise and knowledge of the Belgian context. These consortium-derived inputs were not systematically grounded in cited literature and should be read accordingly. The stakeholder survey served as the primary validation mechanism for both literature-based and consortium-proposed barriers, where survey coverage was available.

2.5.2.3 Stakeholder survey

The online survey (see 2.6) was then sent to stakeholders to refine the preliminary findings and identify key missing references. For each measure, each recipient was asked to: evaluate which barrier types would most influence implementation; rate the relevance of suggested barriers; propose solutions; and provide open comments.

As noted for indicators, survey coverage was uneven across measures. For measures not processed through the survey, barriers and solutions were developed solely on the basis of the literature review and consortium expertise and are presented as such in the relevant measure descriptions.

2.6 Stakeholder consultation

As part of the pilot on heat stress measures, a stakeholder consultation process was implemented to gather feedback and recommendations on the selected measures. This consultation aimed to ensure that the measures were appropriate to the needs and realities on the ground, while also ensuring their effectiveness and feasibility. The description of the measures reflected the consortium's interpretation of the information and data gathered from literature sources and the key stakeholders involved at that point. The aim of the survey was to validate this interpretation and provide stakeholders with the opportunity to correct, refine or complement the measures, where deemed necessary by them.

The stakeholder survey was conducted with a representative sample of stakeholders across federal and regional administrations, participants from the sector itself, scientists, and sector organisations. For the compilation of the stakeholder list, the team worked with the list of stakeholders identified for BCRA and complemented it with input from FPS Health. A period of three weeks was given for respondents to complete the survey.

The online survey (see Annex 8) was created using the Alchemer tool. The survey contained sections corresponding to the measures for which consultation was requested. The objective was to obtain detailed feedback on each measure.
For each measure, respondents were asked to give their advice on the following aspects:

- The general comprehension of the measure;
- The costs, funding, and financing involved;
- Relevant indicators for tracking the measure's effectiveness;
- Barriers and potential solutions for overcoming them.

They were also asked to give an overall rating for each measure.

Finally, respondents were asked to suggest additional measures that were not initially identified in the survey.

3 RISKS AND PROPOSED MEASURES

3.1 Risk to property insurance due to flooding

3.1.1 General

The BCRA indicates that increasing flood risk threatens the functioning of property insurance as the generation of highly concentrated and massive damages puts pressure on insurers (BCRA Technical paper - Risk to property insurance due to flooding). In fact, such events trigger sharp increases in claims which can lead to rising premiums, potentially resulting in the unaffordability of insurance or a risk of uninsurability altogether in some high-risk areas.

The identification of possible federally relevant measures to address this risk started from the BCRA technical paper on the risk to property insurance due to flooding, although several reports and scientific literature addressing climate change adaptation, flood risk management, and the functioning of insurance markets under increasing climate risks were also consulted, as well as national adaptation plans for selected European countries, as detailed below. The measures were adapted to the Belgian context and needs, and refined through stakeholder consultations, making relevant and tailored supporting evidence often scarce.

The following documents were screened for information concerning measures:

- Association of British Insurers, n.d., Climate Adaptation – Guidance on Insurance Issues for New Developments. https://www.abi.org.uk/globalassets/sitecore/files/documents/publications/public/migrated/flooding/climate-adaption-guidance-on-insurance-issues-for-new-developments.pdf [14]
- FPS Health, 2023, Closing the Climate Insurance Protection Gap in Belgium – Workshop Report. https://climat.be/doc/report-on-workshop-closing-the-climate-insurance-protection-gap-in-belgium.pdf [15]
- BCRA, 2025, Technical Report Risk to Property Insurance Due to Flooding. https://www.cerac.be/sites/default/files/media/files/2025-11/Economie/EN/TP/eco_property_insurance_flooding.pdf [16]
- Connecting Expertise, (n.d.), External consultants: Freelancers vs permanent employee cost comparison. https://www.connecting-expertise.com/nl/blog/external-consultant-freelancers-vs-permanent-employee-cost-comparison-explained [17]
- Consultport, (n.d.), Consulting pricing tool. https://consultport.com/pricing-tool/ [18]
- Climate-ADAPT, 2017, Insurance of Weather and Climate-related Disaster Risk. https://op.europa.eu/en/publication-detail/-/publication/4f366956-a19e-11e7-b92d-01aa75ed71a1/language-en [19]
- DailyRate.be, (n.d.), Belgian freelance daily rate benchmark. https://dailyrate.be/en/ [20]
- Development People, (n.d.), Expert guide to consulting fees and per diems. https://www.developmentpeople.com/post/expert-guide-to-consulting-fees-and-per-diems-from-devpeople-recruiters [21]
- Endendijk et al, 2025, Flood experience and access to insurance contribute to differences in homeowners' post-disaster adaptation in a cross-border region of Western Europe. https://www.nature.com/articles/s43247-025-02385-z [22]

- European Commission, (n.d.), Methodology for expert fees. https://ec.europa.eu/research/participants/data/ref/h2020/other/experts_manual/methodology-for-expert-fees_en.pdf [23]
- Beck et al (InsuResilience), 2019, Ecosystem-based Adaptation and Insurance: Success, Challenges and Opportunities. https://www.adaptationcommunity.net/wp-content/uploads/2019/11/EbA_insurance_publication_2019_web.pdf [24]
- Lietaer et al (UNU-CRIS), 2024, Blind Spots in Belgian Flood Risk Governance. https://cris.unu.edu/blindspotsinbelgianfloodriskgovernance [25]
- National Adaptation Strategies from EU countries: France, the Netherlands, Sweden, Germany [9], [26], [27], [28]
- Scholer and Schuermans, 2022, Climate Change Adaptation in Insurance. https://link.springer.com/chapter/10.1007/978-3-030-86211-4_22 [29]
- UNIZO, (2024), Freelancers Focus 2024. https://www.startbuddy.be/wp-content/uploads/2024/11/freelancers-focus-2024-101024.pdf [30]
- Wang et al, 2022, A Review of Flood Management: From Flood Control to Flood Resilience. https://www.sciencedirect.com/science/article/pii/S2405844022030511 [31]

3.1.2 Governance aspects

Governance of flood risk in Belgium is **intrinsically multi-level and fragmented**, involving prevention, preparedness, crisis coordination, insurance and recovery, with responsibilities distributed across federal, regional, provincial and local authorities.

3.1.2.1 Regional and local governance – flood prevention and spatial planning

Regional authorities have the main responsibility for the implementation of the EU Floods Directive.

3.1.2.1.1 Water management and flood protection

Flood prevention and river basin management are **exclusive regional competences**, implemented through distinct administrative structures:

- **Wallonia**
  - **Service Publique de Wallonie (SPW) Agriculture, Ressources Naturelles et Environnement (ARNE)** manages non-navigable waterways and monitors water levels.
  - **SPW Mobilité et Infrastructures (SPW MI)** is responsible for navigable watercourses and flood protection infrastructure.
  - Flood risk management plans are embedded in Walloon river basin plans.
  - Structural flood protection investments are financed through regional budgets and ad hoc programmes.
- **Flanders**
  - **De Vlaamse Waterweg** is the agency specifically responsible for **navigable** waterways and their dikes.
  - **Vlaamse Milieumaatschappij (VMM)** manages non-navigable waterways and dikes, flood risk mapping and flood forecasting.
  - **Agentschap voor Natuur en Bos (ANB)** contributes through nature-based flood mitigation.
  - Flanders has established **dedicated and structurally funded flood resilience programmes**, including a **large multi-annual budget envelope for flood prevention and water management**, providing a higher level of investment certainty than in other regions.
- **Brussels-Capital Region**

- **Bruxelles Environnement** is responsible for water management, flood prevention and stormwater policies.
- **Vivaqua** takes care of the construction of storm basins, renovation of the drainage network, monitoring of sensitive neighbourhoods.
- Given spatial constraints, flood governance focuses on runoff management, storage and urban adaptation rather than large-scale river works.

3.1.2.1.2 Spatial planning and building regulation

Land-use planning, zoning decisions and building permits are **regional and local competences**. Flood hazard and risk maps are produced at regional level and integrated into planning instruments by the **SPW Territoire, Logement, Patrimoine, Énergie (**Wallonia**)**, **Departement Omgeving** (Flanders) and **urban.brussels** (Brussels).

At **local level**, municipalities are responsible for:

- local land-use decisions,
- maintenance of minor watercourses,
- implementation of municipal flood prevention measures.

Municipal planning instruments (e.g., zoning plans, permit conditions) play a decisive role in exposure to flood risk.

This results in **uneven integration of flood risk into land-use decisions**, with significant variation between regions and municipalities in the strictness of building restrictions in flood-prone areas.

3.1.2.2 Federal governance – insurance, crisis coordination and systemic risk

While the federal level has no direct competence for spatial planning or water management, it plays a structuring role in flood risk governance through several key levers.

3.1.2.2.1 Insurance and compensation mechanisms

Flood insurance is a **federal competence**, regulated by the **Federal Public Service Economy (FPS Economy)**:

- Flood damage coverage is **mandatory within fire insurance policies**.
- Compensation conditions are explicitly linked to **officially designated flood risk zones**, which are defined at regional level but legally recognised at federal level.
- The **Natural Disasters Pricing Office** intervenes when private insurance is unavailable or unaffordable for properties in high-risk zones.
- The **National Bank of Belgium** (NBB) ensures prudential supervision and collects data from insurers (and forwards it to the European Insurance and Occupational Pensions Authority) while the Financial Services and Markets Authority (**FSMA)** manages market conduct aspects.

These federal rules determine the distribution of risk between private insurers, public authorities and citizens. As escalating flood risks strain **insurance affordability** and exhaust **reinsurance limits**, the federal government's regulatory mandate becomes a structural necessity to ensure the stability of Belgium's property insurance framework.

3.1.2.2.2 Crisis management and emergency response

Flood emergencies are governed through Belgium's **multi-level emergency planning system** (PLANU –Planification d'Urgence):

- **Local level**: Mayors coordinate first response via municipal emergency plans.
- **Provincial level**: Provincial governors coordinate when impacts exceed municipal capacity.

- **Federal level**: The **federal phase** is activated when events affect multiple provinces or exceed regional capacities.

At federal level, flooding is explicitly included in **national risk assessments coordinated by the NCCN**, linking flood risk governance to national security and resilience planning:

- The **National Crisis Center (NCCN)** (FPS Interior) coordinates national crisis management, situational awareness, information management and intergovernmental coordination.
- The **Directorate-General for Civil Security** (FPS Interior) mobilises civil protection resources.

Regions do not replace local, provincial or federal authority in crisis command. Instead, regional authorities intervene through coordination, expertise, resource mobilisation and **support**, within their own competences.
At regional level, risk analysis, preparedness, crisis support and recovery learning are coordinated by:

- **Centre de Coordination des Risques et de la Transmission de l'Expertise (CORTEX)** in Wallonia;
- **Crisiscentrum Vlaanderen**;
- **Brussels Crisis Centre (safe.brussels)**.

Disaster management training is also facilitated at the regional level: Rampenmanagement provides instruction in Flanders, while PlaniCrise delivers training in Wallonia.

Finally, the landscape of disaster response is shaped by the involvement of the Federation Active in Disasters (**BE-FAID**) that brings together volunteers from all three regions. BE-FAID's mission is to foster risk awareness among the Belgian population and support the establishment of citizen crisis response teams at the local level, integrating these initiatives within existing networks for crisis prevention and management.

3.1.2.3 Recovery and financing

Post-flood recovery is characterised by **shared responsibility.**

Regions and municipalities manage reconstruction of regional and local infrastructure. A pervasive **lack of capitalisation across all regional disaster funds** compromises the reliability of property insurance protections. Within this shared challenge, minor **asymmetries in governance and financial preparedness** exist:

- **Flanders** benefits from:
  - structurally organised funding mechanisms for disaster recovery and prevention (Vlaams Rampenfonds), backed by specific legislation and a dedicated 100 million EUR buffer;
  - a direct budgetary continuity between preventative investment (e.g., the Blue Deal for water management), emergency response, and long-term reconstruction.
- **Wallonia** relies more heavily on:
  - ad hoc budgetary decisions,
  - exceptional federal or interregional solidarity mechanisms after major disasters,
  - case-by-case arrangements with insurers, as observed after the 2021 floods.
- **Brussels** operates on a smaller scale:

  - Instead of a capitalised fund, Brussels utilises specific budgetary allocations (A.B.) within its **general budget** to compensate individuals, businesses, and local authorities.
  - While the geographic scale is small, the high urban density means that even minor events (like the July 2025 floods) create **concentrated financial shocks.**

While the **Disaster Fund** was regionalised in 2014, the federal level maintains leverage through **prudential supervision** of insurers to prevent a total "protection gap" from the **Solidarity** perspective. The federal level intervenes through:

- insurance regulation: governing insurance contracts and mandating minimum coverage standards. The federal level mandates that natural disaster coverage be automatically included in all fire insurance policies for "simple risks" (homes and small businesses). This prevents an "insurance gap" where only those in high-risk areas seek coverage.
- fiscal and social instruments to support affected households and businesses. The federal government can provide immediate liquidity to victims without waiting for insurance or regional fund processing, through federal channels:
  - VAT reduction: Through the programme law of December 2020, the federal government implemented a 6% VAT rate (instead of 21%) for the demolition and reconstruction of destroyed homes.
  - Temporary unemployment: The federal ONEM/RVA granted "force majeure" unemployment benefits to workers whose businesses were destroyed by floods, preventing mass layoffs.
- extraordinary compensation mechanisms. After the 2021 floods, the federal government negotiated an agreement with **Assuralia** (the insurance federation) to temporarily raise the legal compensation ceilings, ensuring victims received higher payouts than the strict legal minimums initially allowed.
- coordination of national solidarity when damages exceed regional or private capacities. After the July 2021 floods, the Walloon Region's Disaster Fund was insufficient to cover the billions in damages. The **federal government granted a 1.2 billion EUR loan** to the Walloon Region to ensure that compensation could actually be paid to victims.

3.1.3 Selection of measures

A detailed methodology regarding the process and associated criteria for the selection of the measures is available in section 2.3 of this report. Moreover, Annex 1 - Risk to property insurance due to flooding – Initial list and longlisted measures includes an overview of the initial list of measures considered, as well as a classification into longlisted measures and measures not taken up further in the study, supported by an explanation of the main points motivating their exclusion from further consideration in the study. In order to agree on which measures to include in the longlist, the initial list was further discussed with Assuralia, Cerac, and briefly consulted in writing with FPS Economy. More details on the survey are available in section 3.1.4. The annex also shows the information produced for the longlisted measures.

The following measures are described in detail in the following sections:

- Issue federal guidelines defining minimum flood-related preparedness and response elements to be included in municipal emergency plans
- Federal framework to recognise and certify flood risk reduction measures for insurance purposes (for example, to inform potential premium reduction)

As mentioned in section 2.3.3, ***the selection and the description of the shortlisted measures do not imply any decision or commitment to implementation of the measures***.

3.1.4 Survey results

The two shortlisted measures with their extended descriptions were submitted to the stakeholders for their feedback and input (see 2.6). The survey was sent to about 30 stakeholder representatives from a broad group of actors across levels. Responses were received from three stakeholder representatives for the first measure, including one via email. Four stakeholder representatives answered to the second measure, including one via email.

Table 7: Number of responses for each of the measures

Measures	**Number of responses**
Issue federal guidelines defining minimum flood-related preparedness and response elements to be included in municipal emergency plans	3
Federal framework to recognise and certify flood risk reduction measures for insurance purposes (for example, to inform potential premium reduction)	4

As a summary, below are the overall ratings of both measures as gathered in the survey.

Measures	**Overall rating votes**
Issue federal guidelines defining minimum flood-related preparedness and response elements to be included in municipal emergency plans	Highly useful/necessary 50.0% Useful/necessary 50.0%
Federal framework to recognise and certify flood risk reduction measures for insurance purposes (for example, to inform potential premium reduction)	Highly useful/necessary 50.0% Useful/necessary 25.0% Probably not useful/necessary 25.0%

Based on the responses, the measures were further fine-tuned. The **final results** of this process are shown in the following sections.

During the survey, stakeholders were asked whether they would like to propose additional federal adaptation measures. One suggested measure is reported below.

Currently, certification of flood risk mitigation is often approached at building level. However, there is still a lack of clear and harmonised certification at product/system level (e.g., flood barriers, seals, valves, pumps). Although certification framework for flood barriers is being created by UBAtc, and standardisation efforts are being done in cooperation with Buildwise and SECO, a lot of questions are raised by:

- homeowners and designers (which products are reliable?)
- insurers (difficulty in assessing actual performance and thus the actual risk reduction).

Without product-level validation, the overall effectiveness of certified solutions remains unknown.

Proposed measure:
Development of a framework for the evaluation and certification of flood mitigation products, based on performance testing and standardised criteria. A lot of efforts are already being done in PRN FLOOD II (in cooperation with Buildwise) and through UBAtc. Key elements:

- Definition of product categories
- Development of standardised testing protocols
- Use of independent third-party certification bodies
- Database of certified products
- Alignment with system-level certification

The objective is similar as for Measure 2 but expanding it towards the product/system level. This ensures the implemented measures are technically reliable and thus enable a better quality, reducing the failure risks.

This measure is necessary because:

- product performance is the foundation of effective implementation of certain measures,
- certification on building level alone cannot guarantee performance without reliable components,
- insurers require objective information to integrate mitigation measures into underwriting.

A product-level certification framework is thus essential to ensure that Measure 2 delivers actual risk reduction in practice.
https://www.buildwise.be/nl/onderzoek-innovatie/onderzoeksprojecten/bouwen-en-renoveren-in-overstromingsgevoelige-gebieden-flood/onderzoek/flood-onderzoeksproject/

3.1.5 Proposed measures

3.1.5.1 Issue federal guidelines defining minimum flood-related preparedness and response elements to be included in municipal emergency plans

Context	There already exists a well-established multi-level emergency planning system which mandates municipalities to prepare generic and risk-specific emergency plans. This framework defines responsibilities and coordination mechanisms, but it does not provide federal guidelines on flood-specific minimum requirements and response elements to include in the plans. Therefore, planning procedures are developed locally, resulting in geographic variation in municipalities' approach to flood risk. Overall, there is a lack of unified national standards. This creates a gap where important elements such as early-warning triggers, predefined response actions, or standardised coordination with Civil Protection services are unevenly addressed across the country. The proposed measure aims to fill this gap by issuing federal guidelines to municipalities so they can consider critical flood-related preparedness and response elements in their emergency plans. The application of these guidelines will ensure consistent quality of flood preparedness across all municipalities and improve municipalities' readiness in case of extreme flood events.
Objective	Ensure consistent and effective municipal flood preparedness across Belgium by strengthening the quality and operational readiness of local emergency plans.
Description	These guidelines do not replace local planning. It is crucial that the measure considers the work and initiatives already undertaken by the regions. An example is the Walloon P.A.R.I.S. framework (Programmes d'Actions sur les Rivières par une Approche Intégrée et Sectorisée, or River Action Programmes through an Integrated and Sector-Based Approach), which supports integrated flood risk management and preparedness. The proposed guidelines are additional resources for municipalities to ensure a baseline level of preparedness across the country. They provide actionable requirements covering coordination, decision-making and response. At least the following elements will be included in the guidelines: • Sending precise and timely early warnings to ensure citizens can take the necessary actions (such as safeguarding their belongings where possible). • Laying out clearly the responsibilities of the various actors expected to act in case of flooding. This includes clarifying when and how municipalities should request the support of the Civil Protection service. • Pre-defining response actions to be taken as soon as the risk and intensity of flooding are known, such as closing roads, preparing shelters or activating the crisis room.

	Where appropriate, this measure should consider the establishment of adapted communication strategies to reach people in precarious socio-economic conditions in collaboration with and following recommendations and guidelines of the Interfederal Combat Poverty Service.
Federal competences	Writing and issuing the guidelines as part of national emergency planning.
Interfederal aspects	The guidelines should be created in cooperation with regional representatives to ensure critical elements of regional policies are considered, and there is no overlap with already existing documentation. Implementation of the guidelines will require action by regional and municipal authorities as this falls within their competence (warning information, response mechanisms, etc.).
Effectiveness	• Municipalities are better prepared, and gaps and inconsistencies are reduced. • Quality of the response is improved. • Citizens are better protected.
Responsible	FPS Interior, through the National Crisis Center (NCCN), is proposed as the federal authority responsible for this measure, given its role in crisis management.
Other actors / stakeholders involved / transversal aspects	Regarding the implementation of the guidelines, the following actors are to be involved: • Municipal actors (mayor, responsible for emergency planning, crisis team) • Civil Protection • Hydrology services at regional scale for the detection of flooding events • Regional risk and crisis management bodies (such as Crisis Centre of the Flemish Government - CCVO, Centre for Risk Coordination and Expertise Transfer CORTEX, or safe.brussels) While NCCN is competent on crisis-related aspects, regions hold most of the relevant competences to implement actual adaptation measures. The Interfederal Combat Poverty Service should be involved in ensuring, where relevant, that strategies are in place to reach people in precarious socio-economic conditions.
Time horizon	Short term for the issuance of the guidelines: 0-1 year Medium term for guidelines to be implemented (integration within emergency plans): 1-3 years
Need for transformative change	No
Points of attention: gender, equitability, risk of maladaptation	• Smaller municipalities may lack the necessary resources to implement the guidelines. • The guidelines should complement the existing emergency planning frameworks. • The guidelines should allow municipalities to tailor their plans based on local conditions and exposure to risk.

	• While the guidelines are issued at the federal level, many aspects of risk management and prevention fall under regional competences. Since the guidelines are non-binding, this could create ambiguity in terms of enforceability and implementation.			
Costs				
	Type	**Lifetime**	**Costs**	**Reflections on costs**
Guidelines writing (design, institutional analysis, consultation with regions, etc.)	Soft measure	One-off	Personnel costs covered by regular responsibilities of federal staff, and federated entities personnel.	As part of this study, it was agreed to not estimate costs as part of staff regular responsibilities.
Technical and expert input	Soft measure	One-off	32,000 EUR	Limited technical expertise may be sought regarding the definition of the minimum requirements, estimated at 40 days. These can cover external methodological support, flood risk or hydrological expertise, emergency management and response design advice. While finding relevant evidence of expert rates proved challenging, various sources point to a range of 400-1000EUR/days for hiring a consultant depending on experience (European Commission, n.d.; Development People, n.d.; UNIZO, 2024; Consultport, n.d.; DailyRate.be, n.d.; Connecting Expertise, n.d.). The present calculation uses a figure of 800 EUR and an estimation of 40 days needed. The number of days to contract also depends on the expertise already available internally.

Downstream costs	Soft measure	One-off	Not estimated	The application of the guidelines will result in some costs for municipalities to integrate minimum requirements in their emergency plans.
Funding/Financing				
	Federal budget (such as NCCN or Royal Meteorological Institute) for the regular operational cost (employees working on the measure) and contracting external experts.			
Indicators				
Indicator #1	**Formal publication and availability of federal flood preparedness guidelines**		**Type:** Output	
Description	The federal flood preparedness guidelines are formally published and made accessible to regions and municipalities through official channels.			
Frequency	Once			
Owner	FPS Interior			
Data source	The guidelines are officially made accessible to regions and municipalities, either publicly or through other formal channels.			
Indicator #2	**Number of elements included**		**Type:** Output	
Description	This indicator relates to counting the number of minimum flood-related preparedness and response elements that are included in the guidelines.			
Frequency	Once, upon adoption of the guidelines			
Owner	FPS Interior			
Data source	Consulting the guidelines document will enable counting the number of elements included.			
Indicator #3	**Degree of integration of the defined elements in emergency plans**		**Type:** Outcome	
Description	This indicator relates to the share of municipal emergency plans covering all minimum flood response elements defined in the guidelines (as a percentage).			
Frequency	Every 2 years			
Owner	FPS Interior			
Data source	Reviewing municipal emergency plans will enable verifying whether they include all minimum flood response elements as defined in the guidelines.			
Indicator #4	**Adherence of municipal emergency response to predefined plans**		**Type:** Outcome	

Description	The share of flood events in which municipal emergency response followed predefined plans without major coordination failures should be monitored.	
Frequency	Assessed after each major flood event, with periodic aggregation (every 2 years).	
Owner	Municipalities reporting to FPS Interior	
Data source	Municipalities' post-event report	
Barriers and Solutions		
Barrier #1	**Resource constraints**	**Type:** Financial / Economic and Technical / Knowledge and Information
Description	Some municipalities will face financial and technical resource challenges to operationalise the guidelines.	
Solution	The guidelines should avoid creating expectations that imply new investments, and rely on existing flood warning systems and data, as opposed to new local tools. Municipalities facing technical resource challenges should seek expertise from relevant organisations. The guidelines should recognise that work is already ongoing or planned at a regional or municipal level. For example, there are already existing plans regarding floods in municipalities linked with the flood management plans of the regions. The barriers and difficulties municipalities face, for example, in terms of coordination, should be acknowledged.	
Barrier #2	**Ambiguity in competences**	**Type**: Institutional / Governance
Description	These federal guidelines on minimum flood-related preparedness and response elements across municipal emergency plans could be perceived as overlapping with regional or local autonomy.	
Solution	A potential solution is to clearly state that guidelines are non-binding and supportive rather than regulatory, and to co-develop the guidance with representatives of the regions and municipalities.	

3.1.5.2 Federal framework to recognise and certify flood risk reduction measures for insurance purposes (for example, to inform potential premium reduction)

Context	Households and businesses located in flood-prone areas are increasingly exposed to flood risk as climate change intensifies the frequency and severity of flooding events. While these are encouraged to adopt physical flood risk reduction measures, there is currently no harmonised framework to assess and certify their effectiveness at building level for insurance purposes. However, putting in place a nationally recognised system to document or certify these measures will bring benefits both to the person implementing the measure, and insurers. The absence of a common assessment approach creates uncertainty for both policyholders and insurers regarding the performance of applied flood risk reduction measures under different flooding scenarios. Existing technical approvals and product certifications provide information on individual components, but they do not systematically assess how measures perform once integrated into a specific building and its local context. This creates a gap between the implementation of flood adaptation measures and their recognition within insurance-related mechanisms.
Objective	Improve the insurability of flood risk by enabling households to reliably document verified flood risk reduction measures, and insurers to recognise them.
Description	The federal framework formally recognises and certifies household-level flood-risk-reduction measures, which will be used in insurance underwriting. It does not prescribe how to build (which is a regional competence) and applies to both the retrofitting of existing buildings and the integration of measures in new constructions. It relies on existing certified products, technical approvals or standards where they already exist, but does not aim to produce a full certification process at the level of individual products or materials. The added value lies in the certification of the measure as a whole as a flood risk reduction measure. The individual implementing the measure receives a proof (in the form of a certificate) of the effectiveness of the measure, tailored to the specific conditions of their installations, and including any limitations to their effectiveness. That is to say that the certificate clarifies the extent of protection provided by the measure (for example, up to a specific water level), based on various criteria including its integration at building level. For an individual-level measure, it is likely that it would mainly apply to flood events of low to moderate intensity. Insurers can refer to the certificate confirming that the property is protected which, in some cases, can enable a usually uninsurable property to be considered for flood insurance. In the case where the property was already insured, providing the insurer with a proof of having implemented a measure certified to reduce risk could enable the policyholder, after discussion and agreement with their insurer, to receive a premium reduction. This provides the opportunity for policyholders to reduce their insurance costs, helping preserve affordability and insurability. Overall, the certificate provides insurers with consistent and reliable information to integrate household-level risk reduction into their risk assessments.

	The measure focuses on ex ante verification of protective works at the building scale, for which households would otherwise have no predictable way to demonstrate the benefits to insurers. The framework provides the following elements: • Definition of categories of eligible flood risk reduction measures, including where relevant the use of certified products or systems • Setting of minimum criteria for certification • Development of an evaluation method, assessing the measures' effectiveness at building level, such as their integration within the property and interaction with other building components • Establishment of who is qualified to certify (such as engineers, architects), including mechanisms to ensure their neutrality and avoid conflicts of interest • Introduction of a standardised certificate template, including an indication of the level or extent of protection provided by the measure
Federal competences	Federal competences that are relevant for this measure include the creation of the basis for insurers to recognise certified measures in underwriting. The federal level is also responsible for the development (definition of the elements provided in the description section) and governance (oversight and updating) of the framework.
Interfederal aspects	To prepare the tools and certification criteria, the federal level will have to cooperate with the regions, who are responsible for specific building codes and technical standards, to gain access to technical data.
Effectiveness	• Increased visibility and credibility of adaptation measures • Increased incentive for households to invest in adaptation • Opportunity for individuals in uninsurable areas to get insurance (within limits and depending on the measures applied) • Reduced damages for low to moderate events
Responsible	Unclear. FPS Economy is proposed as the lead for the coordination and overall governance of the framework, but it is unclear whether the necessary competences exist within its departments, particularly since many of the required competences have a strong regional component.
Other actors / stakeholders involved / transversal aspects	• Regional governments (contribution to technical input, alignment with building standards) • Professional bodies/technical experts (for the development of criteria and assessment approach) • Assuralia (providing input on the usability for insurance underwriting and market uptake)

	• Belgian Union for Technical Approval in Construction and Buildwise (contributing via the existing technical knowledge and approvals that could be built upon)			
Time horizon	The design and establishment of the framework take place in the short term (1-2 years), while uptake occurs gradually over subsequent years.			
Need for transformative change	No			
Points of attention: gender, equitability, risk of maladaptation	• False sense of security: It should be clear that certified measures do not eliminate the risk but reduce it. • Individual property-level measures do not provide full protection against extreme flood events and are ineffective at very high water levels. • Certification is a paid service offered by architects or engineers, so a regulation of its cost should also be discussed so it is not a factor discouraging individuals from implementing risk reduction measures. • Property-level measures may influence water runoff on surrounding properties, potentially increasing flood risk downstream. • The framework should be accompanied by a communication campaign to incentivise early adaptation measures implementation (encourage proactive action and avoid reactive, post-disaster implementation). • A lack of standardised methodologies to assess and demonstrate the effectiveness of flood risk reduction measures at building level could lead to different results depending on the assessment methods used.			
Costs				
	Type	**Lifetime**	**Costs**	**Reflections on costs**
Framework content design and drafting	Soft measure	One-off	Personnel costs covered by regular responsibilities of federal staff	Includes defining eligible measures, certification criteria and who is qualified to certify, as well as the elaboration of the certificate template. As part of this study, it was agreed to not estimate costs as part of staff regular responsibilities.
Institutional coordination and consultation	Soft measure	One-off	Personnel costs covered by regular responsibilities of federal staff, and federated entities personnel	Includes meeting with insurers, regions, and potential certifiers to refine content.

Technical and expert input	Soft measure	One-off	80,000 EUR - 120,000 EUR	Includes the contracting of experts to understand local, condition-specific risk reduction via building-level measures, and/or discuss evaluation methodologies including where the use of specific or certified products should be envisaged for the measure to be considered effective. The estimate assumes that between 100 and 150 expert days are needed, depending on the number of categories and the measures studied, and the depth of technical expertise needed to develop the methodology. The number of days to contract also depends on the expertise already available internally. While finding relevant evidence of expert rates proved challenging, various sources point to a range of 400-1,000 EUR/days for hiring a consultant depending on experience (European Commission, n.d.; Development People, n.d.; UNIZO, 2024; Consultport, n.d.; DailyRate.be, n.d.; Connecting Expertise, n.d.). The present calculation uses a figure of 800 EUR.
Downstream costs	Soft measure	Ongoing	Not estimated	The individual wishing to certify a measure bears the certification fee. On the insurers' and certifiers' side, since they will be involved in the design of the framework, they will have to use some time to take part in meetings. Insurers also need to

				invest time to consider such certifications in underwriting processes.
Funding/Financing				
	Federal budget for both regular employee and technical experts' costs (FPS Economy budget in case competences are confirmed to belong to this service).			
Indicators				
Indicator #1	**Certification framework adopted**		**Type:** Output	
Description	This indicator monitors the adoption/publication of the framework and its components (eligible measure categories, minimum criteria, qualified certifiers, certificate template, etc.).			
Frequency	One-off			
Owner	FPS Economy			
Data source	Official publication record/website			
Indicator #2	**Insurer recognition rate (market adoption**)		**Type:** Outcome	
Description	This indicator relates to the percentage of insurers that formally recognise the risk reduction certificate in underwriting decisions or premium setting.			
Frequency	Annual			
Owner	The FPS Economy is responsible for collecting the data from Assuralia.			
Data source	Insurer survey			
Indicator #3	**Household awareness of certification scheme**		**Type:** Outcome	
Description	The indicator aims to assess the share of households in flood-prone areas that are aware of the certification framework and its purpose.			
Frequency	Every 2 years			
Owner	FPS Economy			
Data source	Public awareness survey			
Indicator #4	**Framework uptake**		**Type:** Outcome	
Description	This indicator monitors the share of insured properties which have implemented certified risk-reduction measures.			
Frequency	Annual			
Owner	The data is provided by Assuralia/insurers, coordinated at the federal level.			
Data source	Insurers' disclosure			
Indicator #5	**Claims reduction due to framework**		**Type:** Impact	
Description	The indicator monitors the reduction in damage claims for properties benefiting from a certified measure.			
Frequency	Annual			

Owner	The data is provided by Assuralia/insurers, coordinated at the federal level.	
Data source	Insurers disclosure	
Barriers and Solutions		
Barrier #1	**Certification costs for individuals or households**	**Type:** Financial / Economic
Description	For households that are considered as vulnerable, the extra certification expense, in addition to the cost of implementing the measures, may limit the use of the service. This could restrict their access to insurance-related benefits and create inequitable outcomes.	
Solution	Certification prices charged by experts should be monitored, with capped fees for basic certifications.	
Barrier #2	**Lack of insurer buy-in**	**Type**: Institutional and Governance
Description	There is a risk that insurers have limited confidence in the effectiveness of certified measures to reduce the risk to which their clients are exposed, or may struggle to price the effect of the measures.	
Solution	Insurers and/or Assuralia should be invited to participate in the design phase of the framework, to share concerns and elements they deem necessary for the certification.	
Barrier #3	**Uneven geographic availability of qualified certifiers**	**Type:** Organisational / Operational
Description	In some areas, such as rural areas, there may be insufficient qualified professionals to certify flood risk reduction measures. This creates barriers to accessing certification services.	
Solution	The definition of who can certify measures should be broad enough while remaining robust.	
Barrier #4	**Misalignment with local building regulations**	**Type:** Policy / Regulatory
Description	There is a risk of misalignment between the certification framework and regional/local building regulations.	
Solution	Alignment should be ensured through early coordination with regional authorities, and the integration of relevant regional technical standards and requirements in the assessment of the measures.	

3.2 Risk to human health due to heat stress

3.2.1 General

The Belgian Climate Risk Assessment (BCRA) indicates heat stress as the main health risk from climate change in Belgium (https://www.cerac.be/en/bcra/health-and-well-being). More than 1,000 heat-related deaths are expected every year, even in a future scenario with limited warming. Those most at risk are pregnant women, the elderly, individuals suffering from chronic physical and psychological disorders, and people in precarious housing situations. Further, also outdoor workers, such as those in agriculture and construction, may endure prolonged exposure without adequate protection. Considering the high level of confidence in the risk assessment and the moderate level of risk preparedness, the BCRA concludes that urgent action is needed to address the impacts of heat stress on human health. For a detailed assessment we refer to the BCRA Technical paper 'Risk to human health due to heat stress' [32].

Specific targets for federal adaptation that address the risk to human health due to heat stress are:

- reduce excess mortality and morbidity during heatwaves;
- reduce occupational risks during heatwaves;
- reduce disproportionate impact on vulnerable groups.

3.2.1.1 Identification of possible measures

Several sources were consulted for the identification of possible measures to address the impact of heat stress on human health, including the Belgian Climate Risk Assessment (BCRA) [1], several Belgian [33], European [34], [35] and international [36], [37] reports, scientific reviews [38], [39] and the EEA Climate-ADAPT resource catalogue [40].

Possible measures are spread across different population groups (general population, working population, personally and socio-economically vulnerable groups), and different domains, including urban design and planning, building design, construction and renovation, personal protection measures, (preventive) healthcare, and occupational health and safety.

An important starting point was the BCRA which provides a policy evaluation and recommendations. However, some recommendations are quite specific (e.g., monitor Wet-Bulb Globe temperature (WBGT) in real-time), and go in more detail than the level of the policy evaluation. In some cases, recommendations are given without a detailed policy evaluation for the specific domain. This is, e.g., the case for occupational health and safety measures. Some recommendations may already be included in legislation, but implementation and enforcement may be insufficient.

For existing measures, the first step is to evaluate their implementation and efficiency. However, if not yet available, such an evaluation is not possible in the timeframe of this study. Similar considerations apply to measures identified from the literature – some of them are partially or fully included in legislation or action plans. Literature at international or EU level provides generally applicable measures, guidelines and good practices. However, it does not take into consideration current implementation levels in Belgium.

3.2.1.2 Protection of workers against (climatological) heat stress

On top of the previously mentioned sources, additional reports from the World Health Organisation (WHO) [41], the International Labour Organisation (ILO) [42] and the European Agency for Safety and Health at Work (EU-OSHA) [43], and one report referenced in the

BCRA [44] were used to identify and describe measures for protection of workers against climatological heat stress. These were compared to the current legislation (Codex on Well-being at Work and information on the website of the FPS Employment, Labour and Social Dialogue[6]).

Measures to protect the working population from heat stress address both indoor and outdoor workplaces, where working conditions can be affected by the hazards which result from hot weather, including ozone for outdoor workplaces. Whereas outdoor work has a more direct relation to outdoor environmental conditions, indoor work can be either worse (including both indoor technical heat production and climatological heating) or better (e.g., due to indoor cooling) than outdoor conditions.
To protect workers against heat stress the BCRA recommends to formally recognise heat as an occupational hazard with mandatory workplace-specific heat action plans that adapt working conditions (e.g., schedules, rest breaks, cooling access) and strengthen protections for vulnerable workers through improved labour rights and social safeguards. When possible, it is advised to provide real-time (WBGT) monitoring of the thermal environment[7], to develop sector-specific guidelines for personal protective equipment to avoid overheating, and to adjust work schedules (e.g., siesta model) to reduce heat exposure during the hottest hours of the day.

Outdoor workers: The sectors in which workers are likely to do intense physical work in direct exposure to sunlight and heat include agriculture, forestry, public spaces and road repair and maintenance, fisheries, construction, mining and quarrying, transport, postal services, waste collection, and maintenance and utilities supplies. Emergency workers such as firefighters, police officers and military staff, emergency medical staff and rescue workers can also be affected, for example, when natural disasters or forest fires occur [43], as well as during their regular work.
During extreme weather events or natural disasters, emergency workers often must work at maximum capacity while wearing personal protective clothing or equipment, which can cause additional mental and physical strain.

Indoor workers: At risk are those who work in poorly cooled buildings, in cabin-operated machinery without cooling (e.g., cranes) and in settings with high industrial heat production, and those who carry out heavy physical work or must use personal protective equipment (PPE) in hot conditions. High humidity adds to the heat burden. For healthcare workers also, the use of PPE in hot conditions can contribute to heat stress. They may also face a massive influx of patients during heatwaves, leading to a high workload and stressful and physically strenuous conditions. [43]

It is to be noted that the relevance of heat stress extends well beyond direct exposure to climatological heat. According to data from IDEWE [45] a total of about 165,000 people in

[6] https://werk.belgie.be/nl/themas/welzijn-op-het-werk/algemene-beginselen/codex-over-het-welzijn-op-het-werk; https://werk.belgie.be/nl/themas/welzijn-op-het-werk/omgevingsfactoren-en-fysische-agentia/thermische-omgevingsfactoren; https://werk.belgie.be/nl/themas/welzijn-op-het-werk/omgevingsfactoren-en-fysische-agentia/thermische-omgevingsfactoren-0 ; https://beswic.be/nl/themas/fysische-agentia/thermische-omgeving/programma-van-technische-en-organisatorische-maatregelen

[7] WBGT, the Wet-Bulb Globe Temperature, is an indicator for thermal stress that better reflects actual heat stress than air temperature. The WBGT integrates multiple environmental factors — air temperature, humidity, wind speed, and solar radiation — to provide a more accurate assessment of thermal stress.

Belgium are exposed to heat[8]. For about 143,000 of them, this exposure is due to 'technical' or 'technical + climatological' heat[9], which is therefore present at least partially throughout the year. 22,000 people are exclusively exposed to (seasonal) natural heat.
No figures are available on disease incidence or accidents related to environmental heat.

Heat stress is considered by the FPS Employment, Labour and Social Dialogue as one among many occupational risks. Priorities for occupational hazards at this moment are psychosocial risks and musculoskeletal risks, which often cause long-term sick leave (respectively 37% and 30% of all long-term sick leave) (from discussion with FPS Employment, Labour and Social Dialogue).

3.2.1.3 Climate-proofing of buildings

On top of the previously mentioned sources additional Belgian, European and international sources were used to identify and analyse possible measures relating to climate-proofing of buildings ([46], [47], [48], [49], [50], [51]).

3.2.2 Governance aspects

In Belgium, mitigating risks of heat stress to human health is a shared responsibility between the federal government, regional governments, and local communities. Each level has its own role, but they must work closely together to protect the population, especially during extreme situations such as heatwaves.

At the federal level, the **Federal Public Service (FPS) Health, Food Chain Safety and Environment** and the **FPS Employment, Labour and Social Dialogue** are the main competent bodies for occupational health and safety, labour norms, and health surveillance systems. The FPS Employment, Labour and Social Dialogue remains responsible for the protection of workers during heat and ozone episodes. It issues guidelines for employers on including climatic risks (heat, ozone) in workplace risk assessments and prevention plans, and monitors compliance through the labour inspection services. The federal authority is also responsible for establishing an occupational warning system, using environmental data (temperature and ozone) provided by the **Royal Meteorological Institute (RMI)** and the **Interregional Environment Agency (IRCEL - CELINE)** to trigger preventive actions in the workplace.

During heatwaves, especially in the alert phase, the federal government shifts toward crisis management. It coordinates national crisis communication with the **National Crisis Center (NCCN).** The national health surveillance system operated by **Sciensano** tracks mortality almost in real-time (but not morbidity). The **NCCN** organises and coordinates the national response strategy and crisis communication and facilitates information flow to municipalities through the provincial governors. This is supported by the **Directorate-General for Civil Security (part of FPS Interior),** which mobilises civil security resources (Civil Protection, Fire Services) to support local authorities and vulnerable populations during emergencies.

Regions are primarily responsible for the vigilance phase and for the warning phase. The latter is initiated if the established temperature threshold is reached. Each region, through its competent health and environment administrations (**Departement Zorg, Departement Omgeving** and the **Vlaamse Milieumaatschappij (VMM)** in Flanders, the Agence pour une Vie de Qualité **(AVIQ)** in Wallonia, and **Brussels Environment**, **safe.brussels** and the

[8] Cooks are by far the most exposed to heat stress, followed by metalworkers, glassmakers and ceramists, bakers, rubber and plastic processors, and food processors. The heat in which these most exposed people (roughly 88,000) work, is produced by humans.
[9] The Code on Well-being at Work distinguishes between 'technical' and 'climatological' heat, which are equivalent to 'human' and 'natural' as used in the IDEWE study.

COCOM (Common Community Commission) in Brussels), is also in charge of issuing regional and local heat alerts and of developing and implementing their own heat-health action plans. They adapt federal guidelines to their local context and ensure local strategies (preventive and protective measures) are in place to protect vulnerable populations during heatwaves.

The federal government coordinates the **National Environment-Health Action Plan (NEHAP).** Among other things, the NEHAP Working Group on Ozone and Heat acts as the operational body, facilitating interfederal actions, data exchange, and consistency between federal and regional levels. This working group is responsible for developing the **Ozone and Heat Plan**. This plan is developed in cooperation with the **RMI** and **Sciensano**. The NEHAP Working Group reports its progress to the **National Environment-Health Cell**. This cell coordinates and oversees the work before informing the **Interministerial Conference on Environment and Health**, which takes the final decision.

The regions are in charge of building norms and energy performance standards for residential, public, commercial, and industrial buildings. They play a key role in urban planning to reduce the heat island effect through the creation of green spaces. Regions also manage the development of cooling networks, which fall outside federal competences. These networks are vital for protecting the public from the effects of extreme heat. Regions also ensure that necessary infrastructure is in place to provide cooling spaces and other protective measures.

The federal government retains competence over its own real estate portfolio (courts, prisons, museums, office buildings)[10]. The federal **Buildings Agency** (**Régie des Bâtiments/Regie der Gebouwen**) manages the federal government's real estate portfolio (courts, prisons, museums, office buildings) and implements energy efficiency and sustainable development policies in federal buildings.

The regions are primarily responsible for communicating and supporting vulnerable groups (elderly, children, homeless), and make sure local strategies are in place to protect them from extreme heat. However, at the federal level**,** the **Public Planning Service (PPS) Social Integration** and the **Interfederal Combat Poverty Service** ensure that national policies and social programmes are aligned with the needs of vulnerable groups, addressing the socio-economic factors that contribute to higher heat exposure.

The regions are responsible for environmental monitoring, including ozone and air quality measurements, through regional environment agencies such as the **VMM** (Flanders), **ISSeP** (Wallonia), and **Brussels Environment** (**Bruxelles Environnement/Leefmilieu Brussel)**.

Financing the health system

Belgium's healthcare system financing is shared among different levels of government. The federal government, via the National Institute for Health and Disability Insurance (RIZIV/INAMI), provides the primary funding through social security contributions and general taxation. This funds most healthcare services, the operational costs of hospitals, and national prevention programmes.

The regions and communities receive financial transfers from the federal level and use these resources to finance preventive health measures, health promotion, and environmental health policies, including those related to heatwave preparedness and response. They may also allocate their own regional budgets to support targeted initiatives for vulnerable groups or to improve local infrastructure that contributes to heat resilience.

[10] Defence manages its own buildings.

While the regions are responsible for the renovation and modernisation of hospitals, the federal government finances hospital operational costs (day-to-day functional expenses) and medical services. Both levels of government coordinate through intergovernmental bodies to ensure that infrastructure investments align with overall national health policy objectives.

3.2.3 Selection of measures

The initial list of possible measures to address the impacts of climate-induced heat stress on human health was compiled from several sources mentioned above. From this initial list, a longlist was selected following the steps described in sections 2.1 and 2.3. The longlisted measures were discussed in bilateral meetings with the FPS Employment, Labour and Social Dialogue to discuss measures related to protection of workers against heat stress, and with the Buildings Agency to discuss measures related to federal buildings. Based on these discussions, some measures on the longlist were adapted or removed from the list.

Annex 2 contains the measures on the initial list that were not further taken up in Be-Adapt. It also contains the motivation why some of the longlisted measures were not included in the shortlist below.

This resulted in the following shortlist of measures[11] that are described in detail in the following sections:

1) Stimulate the inclusion of climatological heat and ozone in occupational risk analysis
2) Targeted early warning and response system for protection of the working population
3) Guidance for technical and organisational measures for vulnerable occupations
4) Use of future climate scenarios in specifications for federal buildings

The measures on the shortlist were further elaborated (following the methodology described in 2.3).

As mentioned in section 2.3.1 measures that aim at addressing information gaps are not included in Be-Adapt. Nevertheless, it is worth mentioning here that surveillance of morbidity related to extreme weather is currently lacking. Putting in place a form of syndromic surveillance [52] and systematic follow-up of use of healthcare services (first-line, ambulance, emergency room visits) would allow following up the impact of extreme weather events and evaluating whether measures are sufficient or not. This would apply for heat, as well as for flooding, and would also include mental health impacts.

As mentioned in section 2.3.3 ***the selection and the description of the shortlisted measures do not imply any decision or commitment to implementation of the measures***.

3.2.4 Survey results

The resulting measures with their extended description were submitted to the stakeholders for their feedback and input (see 2.6). A total of 22 responses were received; however, they were unequally distributed over the different measures.

[11] Review of the access to temporary unemployment due to bad weather is included under 3.5.5.1 Climate-adaptive social protection to anticipate climate crises.

Table 8: Number of responses for each of the measures

Measure	**Number of responses**
Measure 1: National (Interfederal) Heat-Health Adaptation Plan (NHHAP)	10
Measure 2: Stimulate the inclusion of climatological heat and ozone in occupational risk analysis	2
Measure 3: Integrate protection of the working population in the national Ozone and Heat Plan	4
Measure 4: Develop guidance for technical and organisational measures for vulnerable occupations	2
Measure 5: Use future climate scenarios in specifications for federal buildings	4
Total	**22**

Based on the responses the measures were further fine-tuned. The results of this process are shown in the following sections.

The measure to elaborate a National (Interfederal) Heat and Health Adaptation Plan (NHHAP) was included in the survey. The Belgian Climate Risk Assessment (BCRA) stressed the need for more formal governance and a cross-sectoral approach including all stakeholders to coordinate efforts on heat stress. The institutional fragmentation of the Belgian governance system across federal, regional, community and local levels complicates coherent and timely responses [32]. However, this measure was conceived to focus on the elaboration of a consolidated plan, and not on the actual actions to be implemented. Although most respondents rated this measure as (highly) useful / necessary, measures that only have an interfederal coordination component are not at the core of this study. Moreover, after the survey it became clear that the Interfederal Action Plan on Extreme Weather Events intends to take up this interfederal coordination. Hence, this measure was not elaborated further in Be-Adapt.

3.2.5 Proposed measures

3.2.5.1 Stimulate the inclusion of climatological heat and ozone in occupational risk analysis

Context	The Belgian Climate Risk Assessment (BCRA) recommends mandatory workplace-specific heat action plans. The Belgian regulation on occupational health and safety does not formally impose 'heat action plans' (occupational heat action programmes (OHAP) [41]). However, it includes the obligation for employers to develop prevention plans and annual action plans. It requires employers to identify all relevant risks in their workplaces through risk analysis and to take preventive measures. The Code on Well-being at Work explicitly covers both technical and **climatological heat** as a hazard category. **Heatwaves** and number of **heat days** are increasing in future climate scenarios, and heatwaves are getting longer. As this is a relatively recent phenomenon, (increasing) climatological heat may not always be (sufficiently) considered in risk analyses, and prevention and action plans. Although, in principle, the cycle of the Dynamic Risk Management System (DRMS) ensures that the risk analysis is updated regularly, specific attention can be drawn to employers to explicitly take into account climatological heat in the identification of hazards, including impacts of hot weather on health, safety and well-being, i.e., in industries and activities in which working conditions can be severely affected by hot weather as well as in those sectors which employ the most vulnerable occupational groups. No separate provisions exist in the workplace regulations regarding protection against **ozone** of climatological origin. However, exposure to ozone of climatological origin should also be considered an occupational risk for which preventive measures must be taken. Because ozone concentrations indoors are significantly lower than outdoors, these measures should primarily focus on employees working outdoors. ***Outdoor*** The sectors where workers are likely to do intense physical work in direct exposure to sunlight and heat include agriculture, forestry, public spaces and road repair and maintenance, fisheries, construction, mining and quarrying, transport, postal services, waste collection, and maintenance and utilities supplies. Emergency workers such as firefighters, police officers and military staff, emergency medical staff and rescue workers can also be affected, for example, when natural disasters or forest fires occur. During extreme weather events or natural disasters, emergency workers often must work at maximum capacity while wearing personal protective clothing or equipment, which can cause additional mental and physical strain. ***Indoor*** At risk are those who work in poorly cooled buildings, in cabin-operated machinery without cooling (e.g., cranes) and in settings with high industrial heat production, and those who carry out heavy physical work or must

	use personal protective equipment (PPE) in hot conditions. High humidity adds to the heat burden. For healthcare workers also the use of PPE in hot conditions can contribute to heat stress. They may also face a massive influx of patients during heatwaves, leading to a high workload and stressful and physically strenuous conditions. [43] ***Vulnerability*** The Code states that the risk analysis should consider the *individual characteristics of the employees*, which may relate to age, sex, physical condition, medical sensitivity, pregnancy or acclimatisation. Vulnerability to heat during occupational activities depends on the job, personal characteristics or biological states (e.g., age, pregnancy, health disorders, …), and finally the socio-economic context. The risk of heat stress is high in low-skilled, low-paid physical work in hot environments, often done by vulnerable workers on precarious contracts or piece-rate pay [44]. Due to personal circumstances (such as poverty, immigration status) or professional circumstances (such as temporary work, seasonal work, low salary) some workers may not be able to demand their right to safe working conditions because they cannot afford to lose their job. Vulnerable occupations hence include occupations that are specifically vulnerable to climatological heat due to their high exposure and/or due to the socio-economic vulnerability of (most of) the workers. Several organisations/bodies such as FPS Employment, Labour and Social Dialogue (e.g., through the Beswic platform), external prevention services and sector organisations (e.g., Constructiv, Preventagri) already publish guidance for heat at work.
Objective	Stimulate inclusion of climatological heat in company prevention and action plans, with special emphasis on vulnerable occupations and sensitive workers

Description	A knowledge and awareness campaign on the risks of climatological heat will be launched, i.e., targeting vulnerable professional groups for which climatological heat may be relevant (outdoor workers, as well as indoor workers for which climatological heat adds to technological heat stress). A communication strategy will be set up to reach vulnerable workers through internal and external prevention services, sectoral organisations and workers' organisations.
	For outdoor workers specific attention will be drawn to ozone as a specific hazard.
	Specific actions:
	- Identification and prioritisation of vulnerable occupations at risk of heat stress caused by hot weather
	- Identification of available materials (Belgium, international, e.g., https://oshwiki.osha.europa.eu/en)
	  ○ Risk-oriented (climatological heat, ozone)
	  ○ Occupation- or sector-oriented
	- Disseminate available materials at all levels (management, team leaders, workers) through collaboration with prevention services, sector organisations and workers' organisations

	- Stress the need to include climatological heat and ozone in risk analysis, i.e., for vulnerable occupations and sensitive groups Each year in May the campaign will be repeated.
Type of measure	E1: Information and awareness raising □ Communication and dissemination E2: Capacity building, empowering and lifestyle practices □ Training and knowledge transfer
Federal competences	Labour norms and occupational health and safety
Interfederal aspects	Cross-sectoral co-ordination and exchange on communication efforts and expertise in the Ozone and Heat Plan.
Effectiveness	Effectiveness depends on targeted communication (and prior identification) of sectors at risk and vulnerable groups. However, knowledge and awareness do not guarantee that action will be taken. Co-benefits: decreased absence through sick leave; increased productivity
Responsible	FPS Employment, Labour and Social Dialogue
Other actors / stakeholders involved / transversal aspects	• FPS Health • Internal and external prevention services • Sectoral organisations, workers' organisations • PPS Social Integration (non-take-up of rights in precarious situations)
Time horizon	0 - 12 months
Need for transformative change	No
Points of attention: gender, equitability, risk of maladaptation	As mentioned above, the most vulnerable jobs are often low-skilled, low-paid, physically demanding jobs. Workers may be vulnerable due to personal circumstances (such as poverty, immigration status) or professional circumstances (such as temporary work, low salary). Specific communication and actions, e.g., awareness raising and training, may be needed for employees or self-employed workers in such working conditions. Sensitive workers include pregnant women and people with cardiovascular conditions.

Costs

	Type	**Costs**	**Reflections on costs**
Knowledge and awareness campaigns	Soft measure	Costs for the FPS Employment, Labour and Social Dialogue consist of personnel costs for identification of vulnerable groups and available materials, dissemination and coordination, and contracted services for campaign and communication design	

		Prevention services, sector organisations and workers' organisations: personnel costs to contribute to the identification, review and dissemination of available materials, to be involved in identification of vulnerable groups and in dissemination	
Funding/Financing			
	Not applicable (NA)		
Indicators			
Indicator #1	**List of vulnerable occupations available**	**Type:** Output	
Description	List of occupations that are specifically vulnerable to climatological heat due to their high exposure and/or to the intrinsic vulnerability of (most of) the workers (low-skilled, low-paid, physically demanding jobs often carried out by people in socio-economically precarious positions)		
Frequency	Once (afterwards list updated every five years)		
Owner	FPS Employment, Labour and Social Dialogue		
Data source	Report		
Indicator #2	**Number of employers and employees reached**	**Type:** Output	
Description	Estimation of the number of employers and workers in vulnerable occupations that are reached through the knowledge and awareness campaign		
Frequency	Yearly		
Owner	FPS Employment, Labour and Social Dialogue		
Data source	Based on the list of vulnerable occupations, estimates of the number of workers in these vulnerable occupations, and the number of employees (incl. seasonal workers) and self-employed people that have been reached among these.		
Indicator #3	**Number of visits to webpages related to climatological heat**	**Type:** Output	
Description	Number of visits to webpages related to climatological heat		
Frequency	Yearly		
Owner	FPS Employment, Labour and Social Dialogue		
Data source	Visit logs of dedicated websites hosted by FPS Employment, Labour and Social Dialogue and by other involved stakeholders (sector organisations, prevention services)		
Indicator #4	**Number of companies including concrete actions related to climatological heat in prevention and action plans**	**Type:** Outcome	
Description	Number of companies including concrete actions related to climatological heat in prevention and action plans		
Frequency	Yearly		

Owner	FPS Employment, Labour and Social Dialogue	
Data source	Verification of prevention and action plans	
Barriers and Solutions		
Barrier #1	**Not a priority hazard for FPS Employment, Labour and Social Dialogue**	**Type:** Institutional / Governance
Description	Psychosocial and musculoskeletal hazards are priorities for the FPS Employment, Labour and Social Dialogue as they often lead to long periods of sick leave. Heat stress is considered as one among many occupational risks. Therefore, limited resources may be available to address climatological heat hazards.	
Solution	Prepare a targeted list of priority sectors and vulnerable occupations for which climatological heat poses a serious risk (as acknowledged in international reports and scientific literature) and focus actions (and indicators) on these.	
Barrier #2	**Support from prevention services, sectoral organisations, workers' organisations**	**Type:** Social / Cultural / Awareness
Description	These stakeholders may not conceive climatological heat stress as a priority risk.	
Solution	Include these stakeholders from the start of the measure, set up a task force on climatological heat Provide targeted information on risks of climatological heat in specific sectors / occupations	
Barrier #3	**No systematic data available on the link between climatological heat and disease or accidents**	**Type:** Technical / Knowledge and Information
Description		
Solution	Increase knowledge base on (climatological) heat stress and diseases or accidents through a study and a targeted system for follow-up	
Barrier #4	**Employers may be reluctant to implement measures if they are costly**	**Type:** Financial / Economic
Description		
Solution	Targeted controls during hot periods	

3.2.5.2 Targeted early warning and response system for protection of the working population

<table>
<tr>
<td>Context</td>
<td>
In the occupational setting, workers can be exposed to heat for prolonged periods of the day – particularly those whose roles involve manual tasks (physical work) with elevated endogenous (metabolic) heat production. Workers thus experience negative effects of environmental heat stress at lower temperature levels than those eliciting public alerts. Furthermore, protective clothing and PPE required for work safety may hamper natural heat loss. For outdoor workplaces exposure to solar radiation may add to the environmental heat. For indoor workplaces climatological heat may add to already elevated levels of technological heat. [37]
The current regulation imposes measures when Wet-Bulb Globe Temperature (WBGT) thresholds are exceeded. WBGT is used in most countries, and is also the most well-known and commonly adopted indicator for heat stress used by scientists and OSH professionals [41], [42]. WBGT reflects heat stress better than air temperature alone by combining air temperature, humidity, wind, and shortwave/longwave radiation.
The thresholds adopted in legislation worldwide are typically 29-30°C for high-intensity work, 30-31°C for moderate-intensity work, and 31.5-32.5°C for low-intensity work [42]. In Belgium they are more conservative (see table below) which reflects the fact that people are less acclimatised to higher temperatures.
<table>
<tr><th>Fysieke werkbelasting</th><th>Maximale WBGT-index</th></tr>
<tr><td>Licht of zeer licht</td><td>29</td></tr>
<tr><td>Halfzwaar</td><td>26</td></tr>
<tr><td>Zwaar</td><td>22</td></tr>
<tr><td>Zeer zwaar</td><td>18</td></tr>
</table>
Currently, there is no targeted heat-health warning system for the working population. Measurements or predictions of WBGT are not readily available. Although WBGT limits are legally defined in Belgium, according to information from FPS Employment, Labour and Social Dialogue few companies use WBGT loggers. Early warnings (i.e., a few days in advance) may help employers to adapt their planning to the expected weather conditions.

The European Centre for Medium-Range Weather Forecasts (ECMWF) demonstrates the feasibility of a predictive heat stress approach through its production of global Universal Thermal Climate Index (UTCI) (both historical and forecast) and WBGT datasets, as well as other experimental heat-health indices developed within its forecasting system [53], [54], [55]. Such a forecasting system will target outdoor work as the relevance for indoor environments depends on the specific workplace.
</td>
</tr>
</table>

	No separate provisions exist in the workplace regulations regarding protection against **ozone** of climatological origin. Organisational measures are suggested that could be implemented based on the data on ozone concentrations in the air provided by Belgian Interregional Environment Agency (IRCEL – CELINE), and the communications on exceedance of the information and alarm thresholds [56].
Objective	Provide early warnings on WBGT and ozone threshold exceedances to employers, employees and self-employed persons in vulnerable occupations to allow them to take preventive action (e.g., rescheduling work)
Description	A warning system similar to the actual heat and ozone plan will be set up. Such an occupational heatwave warning system differs from the warning system for the general population by: • action thresholds (based on WBGT); • target groups and communication channels; • responsibilities, i.e., of the employer. The system will be based on the current WBGT thresholds in the Code on Well-being at Work. The RMI will develop an operational WBGT forecast method. RMI's existing reference stations already measure most of the required variables. Missing components, mainly radiation, will be obtained via additional measurement data. This will allow real-time WBGT forecasts and public map layers to be generated, showing conditions in full sun and shade, with a green/amber/red alert overlay based on Belgium's legal workload thresholds. Apart from the legal thresholds, a metric comparable to the one used in the national Ozone and Heat Plan will be used to allow early warnings for upcoming heat events a few days in advance. This allows employers (or self-employed people) to adapt work schedules and activities for outdoor work timely. Ozone thresholds will be provided by IRCEL. Messages will be developed including the mention of specific risks for vulnerable groups, i.e., people wearing protective clothing or PPE that may hamper natural heat loss, people with personal sensitivities, e.g., people with cardiovascular risks. Communication channels will be established for targeted communication, e.g., through internal and external prevention services, and sector organisations (e.g., Constructiv, Preventagri). The occupational heatwave warning system will also target self-employed workers (e.g., farmers, parcel delivery workers, ...) and seasonal workers for whom specific communication channels will be considered. Specific actions: • development of an operational WBGT forecast method • development of a cumulative threshold, if feasible and appropriate • identification of vulnerable jobs at risk of heat stress caused by hot weather (see also previous measure) • determining different phases of the plan and action thresholds, i.e., for warning phase and alarm phase • list of actions to be taken by stakeholders when thresholds are exceeded

	• communication campaigns to inform target groups on the warning system
Type of measure	A: Governance and Institutional A1: Policy instruments ○ Creation / revision of policies ○ Creation / revision of (implementing) regulations A2: Management and planning ○ Mainstreaming adaptation into other sectors ○ Creation / revision of technical rules, codes and standards A3: Coordination, cooperation and networks ○ Creation / revision of ministerial coordination formats ○ Creation / revision of stakeholder networks C2: Technological options ○ Early warning systems
Federal vs. regional competences	Federal: labour norms and occupational health and safety; weather predictions (RMI) Regional: providing ozone data
Interfederal aspects	Coordination and consistency with the Heat and Ozone Action plan
Effectiveness	In general heat-health warning systems are considered highly cost-effective in reducing heat-related health conditions [36]. No evidence is found in the analysed literature and data sources on specific occupational heat-health warning systems. It can be expected that effectiveness increases when targeting more specific groups of workers, or specific workplaces. The warnings and real-time maps also provide the Surveillance on Well-being at Work with a concrete tool to assess actual working conditions and organise targeted inspections. Co-benefits: decreasing absence through sick leave; maintaining productivity during heat days
Responsible	FPS Employment, Labour and Social Dialogue
Other actors / stakeholders involved / transversal aspects	• FPS Health • FPS Economy, • National Institute for the Social Security of the Self-employed (NISSE) • NEHAP • RMI, IRCEL • High Council for Prevention and Protection at Work • Services for Prevention and Protection at Work, sectoral organisations, workers' organisations

	• PPS Social Integration			
Time horizon	0 – 24 months			
Need for transformative change	No			
Points of attention: gender, equitability, risk of maladaptation	The most vulnerable jobs are low-skilled, low-paid, physically demanding jobs. Specific communication and actions are needed to reach these vulnerable employees or self-employed workers in such working conditions. Specific thresholds may be considered for sensitive people, e.g., pregnant women, people with pre-existing conditions (e.g., cardiovascular)			
Costs				
	Type	**Lifetime**	**Costs**	**Reflections on costs**
Setting up and operating WBGT prediction service	Soft measure		RMI: 3 person-months for development + 1 person-month yearly operational cost	
Radiation sensors	Infrastructure (dedicated)		1000-5000 EUR per weather station	
Operation and follow-up of early warning system	Soft measure		FPS Employment, Labour and Social Dialogue: recurrent personnel costs for setting up the warning system (messaging), coordination, evaluation Personnel costs for involved governmental and non-governmental organisations for input and advice during set-up of the warning system, and in the operational phase	No information is available on specific occupational heat-health warning systems. However, studies on general heat-health warning systems have estimated that heat–health warning systems are highly cost-effective [37]
Funding/Financing				
	Increase annual funding to RMI for the development and maintenance of the additional capacities			
National Climate Commission (NCC) funding	NCC funding seems a relevant instrument to coordinate the funding since this measure, while led by the federal government, would likely need to be highly integrated with different actors			

Indicators		
Indicator #1	**List of vulnerable occupations available**	**Type:** Output
Description	See previous measure	
Indicator #2	**Operational WBGT forecasting service**	**Type:** Output
Description	The WBGT forecasting service is operational and allows the detection of critical WBGT values two to three days in advance. Real-time and forecast maps are available on the website.	
Frequency	Yearly	
Owner	RMI	
Data source	Website, yearly report	
Indicator #3	**Number of warnings sent out**	**Type:** Output
Description	The number of early warnings sent out to relevant stakeholders based on the WBGT forecast.	
Frequency	Yearly	
Owner	FPS Employment, Labour and Social Dialogue	
Data source	Logging – Report	
Indicator #4	**Number of workers in vulnerable occupations reached**	**Type:** Output
Description	Estimation of the number of employers and workers in vulnerable occupations that are covered/reached by the warnings.	
Frequency	Yearly	
Owner	FPS Employment, Labour and Social Dialogue	
Data source	Based on the list of vulnerable occupations, estimates of the number of workers in these vulnerable occupations, and the number of employees and self-employed people that have been reached among these.	
Indicator #5	**Work adapted following warning**	**Type:** Outcome
Description	Part of the intention of the measure is to increase compliance with the regulation on occupational heat stress in cases of climatological heat. Through targeted inspections Surveillance on Well-being at Work can assess whether companies have taken the required measures according to the exceeded threshold.	
Frequency	Yearly	
Owner	FPS Employment, Labour and Social Dialogue; Surveillance on Well-being at Work	
Data source	Inspection reports	
Barriers and Solutions		
Barrier #1	**Not a priority hazard for FPS Employment, Labour and Social Dialogue**	**Type:** Institutional / Governance
Description	See previous measure	

Barrier #2	**No systematic data available on the link between climatological heat and disease or accidents**	**Type:** Technical / Knowledge and Information
Description	See previous measure	
Barrier #3	**Support from prevention services, sectoral organisations, workers' organisations**	**Type:** Social / Cultural / Awareness
Description	See previous measure	
Barrier #4	**Confusion with other warning systems**	**Type:** Organisational / Operational
Description	The existence of a system parallel to the existing Ozone and Heat Plan and the RMI warning system may lead to confusion and miscommunication. The use of WBGT (which is a composite indicator rather than an actual physical temperature) instead of actual temperatures may also lead to confusion.	
Solutions	The occupational early warning system will have its own dedicated occupational target groups, stakeholders and communication channels. This distinguishes it clearly from communication with the general population. Its implementation will be coordinated with the Ozone and Heat Plan.	

3.2.5.3 Guidance for technical and organisational measures for vulnerable occupations

Context	The current regulation contains a limited set of generally applicable actions to be taken when WBGT thresholds are exceeded, including providing protective equipment (sunscreen, headgear, etc.) to employees exposed to direct sunlight, providing appropriate refreshing drinks free of charge, installing a ventilation system in the workspaces within 48 hours, and, when the exceedance persists, allowing rest periods. In the latter case the employer may independently decide to implement temporary unemployment. More permanent measures such as climate control, i.e., ventilation, for indoor workplaces, default rest times and minimum breaks for specific workplaces, or guidelines for personal protective equipment depend on the risk analysis. Based on the risk analysis, the employer must take preventive measures. If – for technological or climatic reasons – the exposure action values could be exceeded, the employer shall first draw up a programme of technical and organisational measures to prevent or minimise exposure to heat and the resulting risks. The technical and organisational measures (which are generically listed in the regulation) are described in the programme per workstation or group of workstations, per function or group of functions. Several instances such as FPS Employment, Labour and Social Dialogue/Beswic, external prevention services and sector organisations (e.g., Constructiv, Preventagri) already publish general guidance for heat at work.
Objective	Provide concrete guidance on measures that can be taken to protect workers from heat stress with a focus on vulnerable occupations and sensitive workers
Description	This measure will take the risk assessment a level higher, and provide more specific guidelines at sector level or for professional groups, such as: • Real-time monitoring of WBGT • Climate control for indoor workplaces • Rest times and minimum breaks • Guidelines for personal protective equipment The measure will focus on vulnerable professional groups and sectors in which many vulnerable workers are employed, and that have no guidelines yet. Existing guidelines and materials (e.g., from sector organisations such as Constructiv) will be used. Sub-measures: • identification of occupations at risk of heat stress caused by hot weather • identification of existing guidance • review of existing guidance (Belgium, comparable countries) • development of additional guidance

	• publishing guidance through FPS Employment, Labour and Social Dialogue website, and through websites of sectoral and workers' organisations			
Type of measure	E2: Capacity building, empowering and lifestyle practices • Identification and sharing of good practices • Training and knowledge transfer			
Federal competences	Federal – labour norms and occupational health and safety			
Interfederal aspects	Exclusively federal competence			
Effectiveness	Effectiveness depends on prior identification of sectors at risk and vulnerable groups. However, availability of guidance does not guarantee that action will be taken. Co-benefits: decreased absence through sick leave; increased productivity			
Responsible	FPS Employment, Labour and Social Dialogue			
Other actors / stakeholders involved / transversal aspects	• FPS Health • Internal and external prevention services • Sectoral organisations, workers' organisations • PPS Social Integration (non-take-up of rights in precarious situations)			
Time horizon	12-36 months			
Need for transformative change	No			
Points of attention: gender, equitability, risk of maladaptation	Targeted towards vulnerable occupational groups and sensitive workers			
Costs				
	Type	**Lifetime**	**Costs**	**Reflections on costs**
Review and development of guidance	Soft measure		Costs for the FPS Employment, Labour and Social Dialogue consist of preparatory costs for identification of vulnerable groups and available materials, review and development of guidance,	

			communication and coordination. Prevention services, sector organisations and workers' organisations will be asked to contribute to review, development and communication of guidance.	
Implementation of guidance	Infrastructure (dedicated)		Implementation of the guidance may lead to costs for employers, e.g., costs for monitoring (roughly 200 EUR for a WBGT logger), for climate control, for protective equipment adapted to high temperatures.	
Funding/Financing				
	NA			
Indicators				
Indicator #1	**List of vulnerable occupations available**		**Type:** Output	
Description	See previous measure			
Indicator #2	**Number of sectoral / occupation-specific guidance documents produced**		**Type:** Output	
Description	Every year over a total of three years, specific sectors and/or vulnerable occupations will be selected for review and development of guidance			
Frequency	Yearly			
Owner	FPS Employment, Labour and Social Dialogue			
Data source	Guidance published			
Indicator #3	**Number of employers and employees covered**		**Type:** Output	
Description	Estimation of the number of employers and workers in vulnerable occupations that are covered by the new guidance			
Frequency	Yearly			
Owner	FPS Employment, Labour and Social Dialogue			

Data source	Based on the list of vulnerable occupations, estimates of the number of workers in these vulnerable occupations, and the number of employees and self-employed people that have been reached among these.	
Indicator #4	**Number of views of published guidance**	**Type:** Output
Description	The number of times the guidance has been viewed (and possibly downloaded) gives an indication of the use that is made of the guidance.	
Frequency	Yearly	
Owner	FPS Employment, Labour and Social Dialogue	
Data source	Logs of visits to dedicated websites hosted by FPS Employment, Labour and Social Dialogue and by other involved stakeholders	
Barriers and Solutions		
Barrier #1	**Not a priority hazard for FPS Employment, Labour and Social Dialogue**	**Type:** Institutional / Governance
Description	See previous measure	
Barrier #2	**Support from prevention services, sectoral organisations, workers' organisations**	**Type:** Social / Cultural / Awareness
Description	See previous measure	
Barrier #3	**No systematic data available on the link between climatological heat and disease or accidents**	**Type:** Technical / Knowledge and Information
Description	See previous measure	
Barrier #4	**Employers may be reluctant to implement measures if they are costly**	**Type:** Financial / Economic
Description	See previous measure	

3.2.5.4 Use of future climate scenarios in specifications for federal buildings

Context	Federal buildings include: • Office buildings • Prisons and internment buildings • Courthouses • Federal museums, historical buildings, ... • International institutions/schools • Scientific research institutes Federal buildings are subject to the National Energy and Climate Plan. Part of the strategy to attain the goals of the Plan is the renovation of existing buildings. Energy audits of federal buildings are ongoing. For the expected energy performance and thermal comfort for buildings (new as well as renovations) the Buildings Agency imposes outcome specifications rather than specific means to attain these specifications. Through its current specifications for construction works and for central heating, ventilation and climate control the Buildings Agency imposes comfort standards based on NBN ISO norms. These standards are checked using thermodynamic simulations. For these thermodynamic simulations an average meteorological year is used. The overheating simulation should contain at least one heatwave period according to the definition of the RMI. However, this average meteorological year is based on historical data (a 30-year period, 1991-2020). Due to climate warming these data are outdated. Moreover, they don't consider expected future warming.
Objective	Guarantee future thermal comfort of federal buildings in a changing climate Set an example of proactive consideration of future overheating risks
Description	A standard future meteorological year that considers future climate change will be developed for use in the thermodynamic simulations for overheating and comfort temperature. Assumptions will have to be made on the climate scenario to be used, the time frame to consider and how to deal with uncertainties. The standard future meteorological year will be included in the specifications of the Buildings Agency for construction works for federal buildings. It will be revised every five years. The impact on building technologies needed to attain thermal comfort norms under the standard future meteorological year will be assessed, i.e., to avoid resorting to additional investments in active cooling installations.
Type of measure	A2: Management and planning □ Creation / revision of technical rules, codes and standards
Federal competences	Management of federal buildings, including specifications for new federal buildings and renovation of federal buildings, climate data

Interfederal aspects	Building norms and energy standards for buildings are regional competences. The use of a standard future meteorological year may be relevant for future adaptations to building norms and energy standards. Therefore, concertation with the regions is necessary to avoid divergence on scenarios and assumptions.
Effectiveness	Important direct health effects of the adaptations to the federal buildings will be related to the working conditions for the employees working in the federal buildings. Further, an important sub-group of federal buildings are prisons or internment buildings for which thermal comfort is also a key requirement. The number of federal buildings (offices, residential, …) is limited compared to the total building stock. However, the use of a proactive standard meteorological year by the federal government can be an example for the regions and for private actors. Co-benefits: Considering the changing climate, proactive consideration of future overheating risks will avoid (future) increases in cooling demand, and hence energy demand and cost. As such this measure is also part of the aim to have climate-neutral buildings. Also, building insulation will have benefits both for avoiding overheating (i.e., in buildings that are mainly used during the day) and energy performance.
Responsible	The Buildings Agency is responsible for the specifications for new federal buildings and renovation of federal buildings. After agreement with the minister in charge of the Management of State Buildings, currently the Minister of Modernisation of the Government (Minister van Modernisering van de Overheid), the Buildings Agency can include the use of the standard future meteorological year for the simulations of the thermal comfort in its standard specifications.
Other actors / stakeholders involved / transversal aspects	• RMI: responsible for the development of the standard future meteorological year • FPS Health • Regions (Energy Performance of Buildings (EPB) legislation) • Buildwise
Time horizon	0-24 months
Need for transformative change	No
Points of attention: gender, equitability, risk of maladaptation	• Vulnerable groups: prisoners and interned people • Comfort temperatures in buildings are especially important for sensitive people (pregnant women, people with pre-existing conditions) • Risk of maladaptation: using a future-proof climate scenario may lead to additional investments in active cooling installations, requiring increased energy consumption, to guarantee the comfort temperature in the building.

Costs				
	Type	**Lifetime**	**Costs**	**Reflections on costs**
Building costs	Infrastructure (climate-proofing)	30 years	Attaining thermal comfort norms under a more stringent future climate scenario will entail additional costs compared to the use of a historical average year. In general, incremental costs for climate-proofing of existing buildings are estimated at 3% of the project's total investment cost (CAPEX) (see World Bank report "Lifelines: The Resilient Infrastructure Opportunity").	The scientific and grey literature primarily focuses on the costs and benefits of very specific measures (e.g., overhang, green roof, air conditioning, etc.), while the building specifications specify the overall energy and comfort performance of the building, and not the specific measures to attain this performance. [57] Investments to avoid overheating will contribute as well to attaining the objectives of the National Energy and Climate Plan.
Development of standard meteorological year	Soft measure		Estimated: 3 person-months of work for expert	
Adaptation of specifications			Personnel costs for the Buildings Agency	Considered to be minor
Funding/Financing				
Federal funding	The main external cost to be borne will be the development of the standard meteorological year. Downstream implementation of the actual adaptation measures will be a part of overall renovations of federal buildings, driven mainly by EPB requirements, or of new buildings. Costs for climate-proofing are incremental on the overall available budgets and can be integrated in the overall funding of the renovations of the buildings.			

Indicators		
Indicator #1	**Standard future meteorological year established**	**Type:** Output
Description	Standard future meteorological year established and integrated in specifications for federal buildings	
Frequency	Once (update every five years)	
Owner	RMI	
Data source	Report and data file available	
Indicator #2	**Number of new building or renovation projects in which the standard future meteorological year is used**	**Type:** Output
Description	Number of new federal building or renovation projects in which the standard future meteorological year is used for thermodynamic simulations.	
Frequency	Yearly	
Owner	Buildings Agency	
Data source	Data Buildings Agency - Annual report	
Indicator #3	**Number of new or renovated buildings that are resilient to overheating due to future climate change**	**Type:** Outcome
Description	New or renovated federal buildings will not be affected by overheating and attain thermal comfort norms in future climate scenarios while adhering to the ambitions of the National Energy and Climate Plan.	
Frequency	Yearly	
Owner	Buildings Agency	
Data source	Data Buildings Agency – based on simulations	
Barriers and Solutions		
Barrier #1	**Additional investment costs**	**Type:** Financial / Economic
Description	Attaining thermal comfort norms under a more stringent future climate scenario will entail additional costs compared to the use of a historical average year.	
Solution	Assess costs and benefits to justify additional costs	
Barrier #2	**Consistency with existing legislation**	**Type:** Policy / Regulatory
Description	Whereas the EPB legislation provides the framework for energy performance of buildings, it does not consider future climate scenarios. Also, there is no existing EU framework or guidelines.	
Solution	Co-ordination and consultation with the regional departments responsible for the EPB legislation.	

3.3 Risk to energy infrastructure due to extreme weather events

3.3.1 General

As highlighted by the Belgian Climate Risk Assessment (BCRA), extreme weather events represent a critical risk for Belgium's energy infrastructure, including power plants (nuclear, gas, oil), renewables, electricity and gas networks as well as the oil supply chain. These events can reduce generation efficiency, constrain cooling and water availability, damage key assets, and increase the risk of overloads and blackouts.

Due to the high degree of interdependence between energy and other critical systems, such disruptions may rapidly propagate to other sectors, notably transport, telecommunications and essential public services that depend on electricity and communication networks. These cascading effects may significantly amplify the socio-economic consequences of extreme weather events, while the full extent of these systemic impacts remains difficult to predict.

3.3.1.1 Analytical basis and sources

The selection of measures is primarily based on the BCRA, which provides a comprehensive and structured analysis of climate risks affecting energy infrastructure. The BCRA proposes a broad set of recommendations covering the full resilience cycle: governance, risk-based planning, financing frameworks, regulatory alignment, crisis preparedness, and the management of interdependencies.

Energy infrastructure is clearly recognised as a strategic backbone of societal functioning, with explicit attention to cascading effects between energy and other critical systems such as transport, telecom, water and urban systems. The approach therefore shifts from reactive infrastructure protection towards a more systemic approach based on risk-informed governance, long-term planning and coordinated operational management.

At the same time, the BCRA highlights important gaps in Belgium's current framework. The issue is not a lack of awareness or technical solutions, but rather fragmentation in governance, an increasing need for coordination between actors, the absence of harmonised risk assessment methodologies, and the lack of a structured process to translate risk assessments into clear resilience planning decisions.

In addition to the BCRA, several national adaptation plans were screened (Netherlands, France, Germany, Austria, the UK, Ireland, Sweden, and Luxembourg). Most confirm the direction set by the BCRA without adding fundamentally new (categories of) measures. However, some provide useful operational angles: Ireland stands out for its emphasis on governance, implementation structures and cross-sector coordination; the UK intends to use price-control frameworks to enable and incentivise operator investment in resilience; France highlights the need to cover both power systems and oil supply chains; and Austria and Luxembourg stress the importance of flexibility and balancing between generation and consumption under climate stress. EU Climate-ADAPT (European Environment Agency, EEA) also reinforced the relevance of early warning systems as an operational resilience measure.

Further international references were also reviewed (IRENA, JASPERS, International Energy Agency (IEA), and UK grid operators). These sources largely confirm the scope of the measures already identified. In particular, National Grid's electricity and gas adaptation reporting illustrates how climate resilience can be embedded into enterprise risk management, monitoring, and structured reporting, offering practical examples of implementation mechanisms.

The following reports and research papers were screened for actions or measures:

- BCRA Technical Report - Risk to energy and transport infrastructure [58]
- Belgian National Risk Assessment [59]
- France - Plan National d'Adaptation au Changement Climatique (PNACC3) [9]
- The Netherlands – National Climate Adaptation Implementation Programme [28]
- Luxembourg - Project of strategy and adaptation plan [60]
- Austria - Strategy for Adaptation to Climate Change [61]
- UK - Third National Adaptation Programme (NAP3) and the Fourth Strategy for Climate Adaptation Reporting [62]
- Ireland - Electricity and Gas Networks Climate Change Sectoral Adaptation Plan [63]
- Sweden - National strategy and government action plan for climate adaptation [26]
- IRENA – Enhancing resilience: climate-proofing power infrastructure [64]
- JASPERS - Practical sectoral guidance on climate resilience proofing [65]
- IEA - Climate Resilience - Electricity Security 2021 [66]
- National Grid - Climate Change Adaptation Report - Round 4 (ARP4) [67]
- National Gas Transmission plc - Adapting to change, fit for the future - Our Climate Change Adaptation Report 2024 [68]

3.3.1.2 Role and scope of the CER Directive

In December 2025, the Belgian Parliament adopted the transposition of the European Critical Entities Resilience (CER) Directive (EU 2022/2557) into Belgian law. The directive aims to strengthen the resilience of entities providing essential services against a wide range of risks, including natural hazards, accidents and malicious acts.

Under the directive, critical entities are defined as public or private entities designated by Member States because their disruption would have significant effects on the provision of essential services. The energy sector is explicitly covered by the directive, including electricity generation, transmission and distribution, gas infrastructure, and oil supply chains (as detailed in the Annex to the Directive).

The CER Directive establishes a governance framework requiring Member States to identify critical entities, conduct national risk assessments, and ensure that these entities implement resilience measures such as risk assessments, continuity planning and incident reporting. However, the directive does not define sector-specific technical standards nor prescribe concrete investment requirements for infrastructure adaptation.

While the CER framework focuses on officially designated critical entities, the climate resilience of the energy system also depends on a broader range of actors, including decentralised energy producers, suppliers and service providers that may not fall within the formal scope of the directive. Consequently, a federal adaptation plan must address systemic vulnerabilities that extend beyond the strict regulatory perimeter of CER, while remaining within the competences of federal authorities.

3.3.2 Governance aspects

Governance of energy infrastructure resilience in Belgium is a complex interplay of federal and regional competences, combining **federal responsibility for security of supply and systemic risk**, **regional competences for planning and network regulation**, and **operator responsibility for asset-level resilience**.

3.3.2.1 Planning, regulation and operational preparedness

In the preparedness phase, **energy operators** play the central role. Transmission system operators (TSOs) and distribution system operators (DSOs) are responsible for:

- monitoring meteorological forecasts and early warnings (including those from the **Royal Meteorological Institute**);
- identifying vulnerable assets (e.g., flood-prone substations, overheated equipment, cooling-dependent facilities);
- implementing preventive operational measures (load management, redundancy, physical protection, undergrounded critical lines, adjusted maintenance schedules, ...);
- activating internal business-continuity and emergency procedures when thresholds are approached.

While the Commission for Electricity and Gas Regulation (**CREG**) acts as the federal regulator for transmission and approves TSOs' investment plans, regional regulators like the Vlaamse Nutsregulator (VNR) in Flanders, Commission Wallonne pour l'Énergie (CWaPE) in Wallonia, and BRUGEL in Brussels set the tariff structures that allow DSOs to recover costs for resilience investments.

Besides the regulation of distribution networks, the regions (Flanders, Wallonia, and Brussels-Capital Region) hold **core competences over onshore energy infrastructure**, including:

- spatial planning and permitting of energy assets;
- onshore renewable energy and rational energy use (renovations);
- integration of climate and extreme-weather risks into regional infrastructure planning.

The federal level takes a **supervisory and coordinative** role (not operational) insofar as extreme weather may threaten national strategic interests:
The **FPS Economy** oversees the overall energy policy – with a focus on **security of energy supply –** and is responsible for nuclear energy and offshore wind. It monitors supply risks to national electricity, gas and fuel supply, coordinates information exchange with TSOs and DSOs and ensures that **critical energy entities** have conducted risk assessments and resilience planning, as required under the EU **Critical Entities Resilience (CER) Directive** framework. It also coordinates sector-specific resilience exercises and audits.
Under the **FPS Interior**, the National Crisis Center is responsible for the national emergency planning (including national risk assessment scenarios involving large-scale energy disruptions) and acts as the EU contact point for resilience reporting under the CER framework.
National Bank of Belgium (NBB): While primarily financial, the NBB monitors the systemic risks that large-scale energy failures (blackouts) pose to the Belgian economy.

3.3.2.2 Multilevel crisis response

When extreme weather causes **localised or regional disruptions** (e.g., damaged distribution infrastructure, temporary outages):

- **energy operators** implement emergency procedures (e.g., decentralised energy production during weather stress) and restoration actions to ensure continuity of service;
- **municipal and provincial authorities** manage local impacts on populations and services;

- **regional crisis coordination centres** (Crisiscentrum Vlaanderen, CORTEX, safe.brussels) coordinate operational response on their territory, including liaison with network operators and support the federal phase during energy disruptions.

When impacts **exceed regional capacity**, affect **multiple regions**, or threaten **continuity of essential energy supply**:

- coordination escalates to **federal level**;
- the **National Crisis Center (NCCN)** leads overall crisis coordination, focusing on **cross-sector impacts** and national situational awareness, particularly where energy disruption risks cascading failures (transport, digital networks, healthcare);
- the **FPS Economy** remains responsible for **energy-specific decisions** related to security of supply and coordination with energy operators.

3.3.2.3 Interfederal coordination and recovery

The **National Climate Commission (NCC)** ensures consistency of Belgium's climate policy commitments and reporting obligations across federal and regional levels, while the Interministerial Committee for Energy (CONCERE) coordinates energy policy between the federal government and the regions, ensuring coherence of measures across competence levels. In the context of energy infrastructure resilience, both bodies contribute to interfederal alignment notably through the joint CONCERE-NCC steering group, which monitors and coordinates the implementation of the National Energy and Climate Plan (NECP) — connecting energy infrastructure planning and climate objectives at federal and regional level.

After major extreme-weather events affecting energy infrastructure:

- operators and authorities assess damages, restoration timelines, and performance of emergency measures;
- incident data and lessons learned feed into **national risk assessments** and sectoral resilience evaluations;
- identified weaknesses inform updates to energy-sector risk scenarios, planning assumptions and resilience requirements.

3.3.3 Selection of measures

The initial list of possible measures to address the risk to energy infrastructure due to extreme weather was compiled from several sources mentioned in 3.3.1.1. From this initial list, a longlist was selected following the steps described in sections 2.1 and 2.3. The longlisted measures were discussed in bilateral meetings with FPS Economy – Directorate-General for Energy (DG Energy), NCCN and CREG to ensure relevance, federal and institutional competences as well as their operational feasibility. Based on these discussions, some measures on the longlist were adapted or removed from the list.

Annex 3 contains the measures on the initial list that were not further taken up in Be-Adapt. It also contains the motivation why some of the longlisted measures were not included in the shortlist below.

This resulted in the following shortlist of measures that are described in detail in the following sections:

1) Define resilience objectives for the energy sector
2) Build capacity to use climate risk data and tools in the energy sector
3) Harmonise and strengthen climate risk assessment methodologies

The measures on the shortlist were further elaborated (following the methodology described in 2.3).

As mentioned in section 2.3.3, the selection ***and the description of the shortlisted measures do not imply any decision or commitment to implementation of the measures***.

3.3.4 Survey results

The three shortlisted measures with their extended description were submitted to the stakeholders for their feedback and input (see 2.6). The survey was sent to about 40 stakeholder representatives representing a broad group of federal and regional authorities/administrations, energy operators, and academics. Responses were received from three stakeholder representatives for each measure. In addition, further feedback was provided by email by Cerac. The Royal Meteorological Institute (RMI) and the Belgian Climate Centre (BCC) were also contacted, although they were not able to provide feedback.

Table 9: Number of responses for each of the measures

Measure	**Number of responses**
Define resilience objectives for the energy sector	3
Build capacity to use climate risk data and tools in the energy sector	3
Harmonise and strengthen climate risk assessment methodologies	3

Based on the responses, the measures were further fine-tuned. The **final results** of this process are shown in the following sections.

3.3.5 Proposed measures

3.3.5.1 Define resilience objectives for the energy sector

Context	Current frameworks in Belgium (BNRA[12], BCRA, operator-level assessments) identify and assess risks, but do not define what level of risk is acceptable or what level of resilience infrastructure must be achieved. These assessments rely on existing coordination platforms – including the BNRP[13] working groups, CER Connect, and sectoral regulatory processes – that bring together key stakeholders involved in resilience policy. However, Belgium currently lacks a structured process to translate risk analyses into clear policy decisions regarding the level of resilience expected from energy services and infrastructure. In particular, no authority is tasked with defining acceptable risk levels, return periods or climate scenarios, nor with arbitrating trade-offs between resilience levels and associated costs. Individual operators manage climate risks against their own internal thresholds — however robust — but these are not calibrated against a shared national reference, and do not address risks that are more efficiently managed through collective solutions. As a result, it is unclear whether collective system resilience, across operators, sectors and regions, is adequate, creating uncertainty and limiting the ability to arbitrate trade-offs between costs and resilience across the sector.
Objective	Enable informed and coordinated policy decisions on acceptable risk levels, resilience targets and infrastructure adaptation priorities across the energy sector.
Description	This measure establishes an interfederal process led by the federal level to define resilience objectives for the energy sector, based on national risk assessments, climate projections and system interdependencies. It involves defining reference parameters such as acceptable risk levels, return periods and expected performance levels (e.g., recovery times, service continuity thresholds), and engaging with operators to assess the feasibility and costs of meeting these targets. These elements would then be translated into policy guidance or minimum expectations to inform risk assessments and investment planning across the sector. A key element of this process is determining, for each risk type, whether resilience objectives are to be met through individual operator-level measures or through collective solutions (e.g., shared flood protection, coordinated grid reinforcement) given the direct implications for cost-sharing and governance.

[12] Belgian National Risk Assessment
[13] Belgian National Resilience Plan

	It draws on available risk and planning documentation, including national risk assessments (BNRA, BCRA), network development plans submitted by TSOs and DSOs to competent regulators (CREG, VNR, CWaPE, BRUGEL), CER risk assessments where accessible and subject to applicable confidentiality constraints, and relevant sectoral and regional climate adaptation plans. The outputs of this measure would provide a clear national reference for operators when conducting risk assessments and elaborating resilience plans. While the CER Directive already requires designated critical entities to conduct climate risk assessments, this measure intentionally goes beyond the CER perimeter — covering energy infrastructure and operators not formally designated under the Directive. At the same time, the resilience objectives defined under this measure are to be aligned with the requirements of the CER framework, ensuring coherence and avoiding duplication for entities falling within both scopes. This measure differs from risk assessment methodology (measure 3) by defining the expected level of resilience, rather than how to assess risks or how to implement obligations.
Federal competences	Security of energy supply, energy infrastructure regulation, CER implementation and oversight, crisis management and national risk assessment, North Sea and offshore infrastructure, federal climate adaptation policy.
Interfederal aspects	• Distribution network resilience and DSO oversight: regional regulators are responsible for setting tariff structures that enable DSOs to recover costs for resilience investments. Their involvement is required to ensure that resilience objectives for distribution networks are operationally feasible and financially recoverable. • Regional climate adaptation frameworks and spatial planning: regions hold competence over spatial planning and onshore energy infrastructure. The integration of resilience objectives into regional adaptation plans requires active coordination between DG Energy and regional authorities. In addition, decisions on the siting, protection and permitting of energy assets involve regional spatial planning authorities, whose involvement is necessary for the implementation of collective resilience solutions.
Effectiveness	Dependent on: • The availability and quality of risk and climate data across the sector. • The capacity and political mandate of federal authorities to arbitrate trade-offs between resilience levels and economic constraints. • The willingness of operators to engage constructively in feasibility and cost assessments. • Strong coordination between federal and regional levels, given the split competences over transmission and distribution networks.

	• Clear political endorsement to give the resulting guidance sufficient weight for operators to integrate it into investment planning. • Clarity on the allocation of resilience responsibilities between individual operators and collective solutions.
Responsible	FPS Economy - DG Energy
Other actors / stakeholders involved / transversal aspects	• Energy operators, including TSOs and operators across the sector • DSOs and Synergrid • CREG • VNR, CWaPE, BRUGEL • RMI • BCC • Cerac • NCCN

Time horizon	36 months — indicative only, not subject to formal reporting obligations.
	• Year 1:
	  ○ Scoping and consolidation of existing risk analyses and current practices (thresholds used by operators, applicable standards), mapping of relevant actors and coordination mechanisms across the sector, competence mapping across federal and regional levels, identification of priority risks and data gaps, preliminary mapping of risks suited to collective rather than individual operator-level solutions
	  ○ Define draft resilience parameters (return periods, performance targets) based on available inputs from RMI and Cerac
	• Year 2:
	  ○ Stakeholder consultation and feasibility assessment (technical, financial, data availability), including DSOs and regional regulators;
	  ○ Formalisation into policy guidance or minimum expectations
	• Year 3: integration into relevant frameworks (development plans, regulatory review processes, regional adaptation plans, CER resilience plans where applicable) and first iterative update based on operator feedback

Need for transformative change	No

Points of attention: gender, equitability, risk of maladaptation	• Resilience targets may increase costs for operators, with potential pass-through to consumers. • Targets are to account for continuity of essential services for vulnerable groups, who can be disproportionately affected by service disruptions. • Overly conservative targets (e.g., very high return periods) risk inefficient investment in specific hazards. • Long-term infrastructure choices made under current targets may prove suboptimal under future climate uncertainty.

Costs

Shared analytical and technical costs (e.g., climate data translation and scenario definition) are pooled under the capacity-building measure to avoid duplication, while measure-specific costs are defined separately to reflect distinct coordination, alignment and policy decision efforts required for each objective.

	Type	Lifetime	Costs	Reflections on costs
Coordination and governance	Soft measure	NA	To be determined through internal negotiation	Staffing costs to be determined through internal resource negotiation. Key cost drivers to consider (non-exhaustive): coordination and governance across federal authorities, facilitation of stakeholder consultation with operators and regions, drafting of policy guidance and resilience parameters, legal/institutional review of framework, possible short-term workload peak during design and consultation phases. Additional dedicated FTEs (full-time equivalents) are essential and cannot be sourced through internal reallocation.
Technical/scientific support (pooled)	Soft measure	NA	Not separately costed; included under Measure 2	Targeted analytical support is required to translate climate projections and risk assessments into infrastructure-relevant parameters (e.g., thresholds, return periods). Considered to be covered by measure “Build capacity to use climate risk data”.
Consultancy support	Soft measure	NA	50,000–100,000 EUR	External support must be mobilised to structure the process, benchmark international practices, and support policy design and trade-off analysis (e.g., cost vs resilience levels). This is required to ensure sufficient technical expertise,

				accelerate delivery and ensure methodological consistency.
Funding/Financing				
	Federal budget			
Indicators				
Indicator #1	**Formal publication of resilience objectives**			**Type:** Output
Description	Formal adoption and publication of national resilience objectives for the energy sector, including defined parameters such as acceptable risk levels, return periods and performance targets and guidance on individual versus collective approaches by risk type			
Frequency	Once (with updates aligned with risk assessment cycles)			
Owner	FPS Economy (DG Energy)			
Data source	Official policy documents / guidance published by federal authorities			
Indicator #2	**Integration of resilience objectives into risk assessments and resilience plans**			**Type:** Outcome
Description	Share (%) of energy operators across the sector that explicitly integrate national resilience objectives into their risk assessments and resilience plans. Where formal reporting obligations exist, based on submitted assessments; otherwise based on voluntary assessments and available regulatory documentation.			
Frequency	Every 4 years, where aligned with formal reporting cycles; ad hoc for other operators based on available documentation.			
Owner	FPS Economy (DG Energy)			
Data source	Risk assessments and resilience plans submitted by operators under applicable frameworks, voluntary assessments and regulatory documentation for other operators, audit and review reports			
Indicator #3	**Use of resilience objectives in infrastructure planning and investment decisions**			**Type:** Outcome
Description	Evidence of resilience objectives being applied in infrastructure planning documents including justification of investments based on defined resilience targets.			
Frequency	Every 2 years (aligned with update of development plans)			
Owner	CREG (review) and FPS Economy (oversight)			
Data source	Elia and Fluxys development plans; CREG and FPS Economy opinions and evaluation reports. Extending monitoring to distribution networks is subject to interfederal arrangements to be defined as part of the coordination process with regional regulators.			
Barriers and Solutions				
Barrier #1	**Fragmented governance and unclear mandate for defining resilience objectives**			**Type:** Institutional / Governance

Description	Responsibilities for energy resilience are fragmented across federal and regional authorities, with no authority currently mandated to define national resilience targets, arbitrate trade-offs, or determine where collective solutions are more appropriate than individual operator-level measures.	
Solution	Establish a federal-led coordination mechanism with a clear mandate to define national reference parameters, building on existing platforms (CER Connect, BNRP working groups) and supported by a formal competence mapping across federal and regional levels.	
Barrier #2	**Diverging priorities and risk perceptions across actors**	**Type:** Institutional / Governance
Description	Diverging priorities, risk tolerances and methodologies across federal authorities, regions and operators hinder agreement on common resilience objectives and delay decision-making.	
Solution	Establish a structured alignment process to agree on common principles (risk levels, scenarios, performance targets), supported by a shared reference framework that ensures comparability while allowing adaptation to operator- and region-specific contexts.	
Barrier #3	**Lack of translation of climate data into operational infrastructure parameters**	**Type**: Technical / Knowledge and Information
Description	Climate projections are not systematically translated into infrastructure-relevant parameters (return periods, performance thresholds), making it difficult to define concrete and actionable resilience targets applicable across the energy sector.	
Solution	Develop targeted technical guidance translating climate projections into usable thresholds and performance benchmarks, with support from RMI, BCC and Cerac, and validated with sector experts including TSOs, DSOs and relevant regulators.	
Barrier #4	**Uncertainty on costs and economic implications of resilience targets**	**Type:** Financial / Economic
Description	Uncertainty regarding the costs of achieving different resilience levels — both for individual operators and for potential collective solutions — limits the ability to define realistic and acceptable targets and may discourage engagement from operators and authorities alike.	
Solution	Conduct cost–benefit and feasibility assessments with operators across the sector, covering both individual and collective approaches, to support informed trade-offs between resilience ambition and economic constraints.	
Barrier #5	**Absence of regulatory anchoring for resilience objectives**	**Type:** Policy / Regulatory
Description	Without a formal requirement to apply national resilience objectives in planning and risk assessments, uptake will depend on voluntary compliance. This is particularly acute for operators without existing formal resilience obligations, for whom no equivalent regulatory anchor currently exists.	
Solution	Integrate resilience objectives into applicable regulatory review processes (e.g., development plans) and explore dedicated mechanisms for operators currently without formal resilience obligations.	

3.3.5.2 Build capacity to use climate risk data and tools in the energy sector

Context	Belgium benefits from a wide range of climate data and analytical tools (e.g., CORDEX projections, RMI data, BCRA outputs), yet their use within the energy sector remains uneven. These datasets are complex, evolving and not always directly translatable into operational decision-making. Authorities and operators face difficulties in selecting appropriate scenarios, interpreting climate projections and deriving operational thresholds — and may lack the internal expertise to do so consistently. While some actors, such as Elia, already use advanced datasets for adequacy modelling, this does not systematically extend to infrastructure vulnerability assessments across the sector. This results in inconsistent integration of climate risks across the sector, creating a gap between available knowledge and its effective use in resilience planning.
Objective	Ensure that climate data and tools are effectively translated into actionable inputs for resilience planning across the energy sector — including support for the definition and implementation of resilience objectives as defined under Measure 1.
Description	This measure aims to strengthen the capacity of authorities, regulators and operators to interpret and operationalise climate data in risk assessments, planning and operational decisions. It includes: Development of practical guidance on selecting and applying climate scenarios (time horizons, warming levels), interpreting key variables (temperature, precipitation, wind, sea level) and translating them into impact thresholds relevant for infrastructure (e.g., temperature limits for equipment, flood levels for substations, wind load thresholds for overhead lines). Provision of shared tools and pre-processed datasets tailored to energy sector needs, developed in coordination with RMI and BCC. Training programmes and facilitated exchanges between scientific institutions (RMI, BCC, Cerac, universities), authorities and operators. Guidance and tools are designed to be usable by any operator independently, without presupposing access to individual operator risk assessments or resilience plans. For example, this will support regulators in assessing climate assumptions used in development plans or help operators define consistent thresholds for heat stress on grid components. This measure differs from harmonisation of methodologies (measure 3) by focusing on enabling actors to use data effectively in practice, rather than defining common methodological requirements.
Federal competences	Security of energy supply, energy infrastructure regulation, CER implementation and oversight, national risk assessment (BNRA) and civil emergency planning, North Sea and offshore energy infrastructure, federal climate adaptation policy.

Interfederal aspects	• Climate policy coordination through the National Climate Commission: the NCC serves as the platform for aligning federal and regional positions on climate scenarios and data assumptions used across the sector. • Regional climate data and adaptation scenarios: regions develop their own climate projections and adaptation data. Coordination is required to ensure consistency between regional datasets and the federal guidance produced under this measure. • Alignment on climate scenarios, assumptions and thresholds: federated entities are invited to align on the reference scenarios and thresholds used in their own planning documents, to ensure coherence with the federal methodological framework. • Consistency between federal risk frameworks and regional adaptation plans: regional authorities are expected to use guidance produced under this measure as a reference when developing or updating their adaptation plans for energy-related infrastructure.
Effectiveness	Dependent on: • The availability of sufficiently translated, accessible, and regularly updated climate data and tools across the sector. • Continuous updates of guidance to reflect evolving climate knowledge and new datasets. • Sufficient dedicated resources and staff within DG Energy and contributing institutions (RMI, BCC) to develop, maintain and deliver guidance and training. • Uptake by operators across the sector, whose engagement is voluntary. • Coordination with regional authorities on climate data and scenarios to ensure consistency of inputs.
Responsible	FPS Economy - DG Energy
Other actors / stakeholders involved / transversal aspects	• RMI • BCC • Cerac • Universities and research institutions • Energy operators, including TSOs and operators across the sector • DSOs and Synergrid • CREG • VNR, CWaPE, BRUGEL

	• Regional authorities • National Climate Commission • NCCN

Time horizon	24 months — indicative only, not subject to formal reporting obligations.
	• Year 1:
	  ○ Mapping of needs and use cases across key actors (DG Energy, CREG, operators, TSOs, DSOs, regional regulators)
	  ○ Compilation and translation of available climate data into usable formats for the energy sector, in coordination with RMI and BCC
	  ○ Develop practical guidance and shared tools
	  ○ Alignment with regional authorities and National Climate Commission on scenarios and assumptions
	• Year 2:
	  ○ Delivery of targeted training sessions across the sector
	  ○ Continuous support and refinement of tools based on operator and regulator feedback

Need for transformative change	No
Points of attention: gender, equitability, risk of maladaptation	• Over-standardisation of climate scenarios and thresholds risks reducing flexibility for operators with specific asset types or local exposure conditions — guidance is to allow for operator- and context-specific adaptation. • Guidance and tools risk becoming outdated as climate projections evolve — without a dedicated update mechanism, actors may rely on obsolete data, leading to underestimation of future risks. • The voluntary nature of operator engagement limits the reach of the measure — without embedding guidance use into regulatory review processes, uptake may remain uneven across the sector.

Costs				
Shared analytical and technical costs (e.g., climate data translation and scenario definition) are pooled under the capacity-building measure to avoid duplication, while measure-specific costs are defined separately to reflect distinct coordination, alignment and policy decision efforts required for each objective.				
	Type	**Lifetime**	**Costs**	**Reflections on costs**
Technical/scientific support (shared backbone)	Soft measure	NA	To be determined through internal negotiation	Covers translation of climate data (CORDEX, RMI datasets, BCRA outputs) into usable outputs for the energy sector (thresholds, indicators, simplified datasets). Work to be performed by RMI, BCC and/or Cerac — this is applied data formatting and interpretation work, not new research. This analytical work also supports the definition of resilience objectives (measure 1) and methodological harmonisation (measure 3) and must therefore be **accounted for only once for all three measures of the energy infrastructure risk**. Staffing costs to be determined through internal resource negotiation with RMI and BCC. Key cost drivers to consider (non-exhaustive): translation of climate projections into sector-relevant thresholds and indicators; development of practical guidance materials; design and delivery of training programmes; iterative updates as climate knowledge evolves.
Coordination and targeted workshops	Soft measure	NA	To be determined through internal negotiation	Key cost drivers to consider (non-exhaustive): facilitation of stakeholder workshops; development and maintenance of practical guidance materials; training coordination; iterative updates based on feedback.
Funding/Financing				
	Federal budget Technical/scientific support to be funded by the budget of RMI and/or BCC – to be confirmed through consultation with these institutions			

Indicators		
Indicator #1	**Development of practical guidance and training material**	**Type:** Output
Description	Production of concise guidance and training materials enabling authorities and operators across the sector to select climate scenarios, interpret data and define operational thresholds.	
Frequency	Once (updated as needed)	
Owner	FPS Economy (DG Energy), with RMI and Cerac support	
Data source	Published guidance documents and training materials	
Indicator #2	**Share of actors applying climate data in risk assessments and planning**	**Type:** Outcome
Description	Share of actors across the sector demonstrating use of climate data and defined thresholds in risk assessments, planning documents or regulatory reviews.	
Frequency	Every 2 to 4 years, where aligned with formal reporting cycles; ad hoc for other operators based on available documentation	
Owner	FPS Economy (DG Energy)	
Data source	Risk assessments and resilience plans submitted by operators under applicable frameworks, voluntary assessments and regulatory documentation for other operators, development plans and regulatory review documents.	
Indicator #3	**Stakeholder satisfaction with the usability of climate data**	**Type:** Outcome
Description	Qualitative assessment of how effectively actors can interpret and use climate data in their decision-making (e.g., via targeted surveys).	
Frequency	Once per guidance cycle (aligned with updates to guidance materials)	
Owner	FPS Economy (DG Energy)	
Data source	Stakeholder surveys, feedback	
Barriers and Solutions		
Barrier #1	**Misalignment between scientific outputs and operational needs**	**Type:** Technical / Knowledge and Information
Description	Climate datasets are not directly usable for infrastructure planning. Energy companies often lack the internal processes, expertise or tools to interpret climate projections and translate them into operational thresholds and investment decisions. This creates uncertainty about how to act on available data, even when it is accessible.	
Solution	Develop targeted translation of climate data into sector-specific indicators and thresholds, co-designed with users (operators, regulators) and scientific institutions (RMI, BCC, Cerac).	

Barrier #2	**Low integration of climate data into existing decision processes**	**Type**: Policy / Regulatory
Description	Climate data is available but not systematically integrated into planning, risk assessment or regulatory review processes across the sector. Long-term climate risks are structurally at risk of being underestimated or deprioritised relative to short-term operational concerns, limiting their practical impact on resilience decisions.	
Solution	Embed the use of climate data and guidance into existing planning and regulatory processes across the sector — including development plans, risk assessments and regulatory reviews — building on the reference framework established under measure 1. Formalising climate data use within regulatory expectations helps counteract the structural tendency to deprioritise long-term risks.	
Barrier #3	**Sustainability of guidance and tools over time**	**Type**: Financial / Economic
Description	Guidance and tools require regular updating as climate projections, scientific understanding and sector needs evolve. Without a dedicated maintenance mechanism and assigned resources, outputs risk becoming outdated and losing credibility.	
Solution	Define a clear update cycle and assign responsibility for maintenance to DG Energy in coordination with RMI and BCC, with dedicated budget lines to be confirmed through resource negotiation.	

3.3.5.3 Harmonise and strengthen climate risk assessment methodologies

Context	Climate risk assessments are conducted across the energy sector, but no common methodological baseline exists. As a result, operators rely on different scenarios, hazards, thresholds and levels of analysis, limiting comparability, transparency and the ability to prioritise resilience investments consistently at national level. Several frameworks and planning tools already integrate climate risks to varying extents: **Belgian National Risk Assessment** (BNRA - NCCN): national multi-risk assessment covering natural, technological and societal risks. The methodology is not publicly disclosed but is conducted in collaboration with TSOs **Belgian Climate Risk Assessment** (BCRA - Cerac): climate-focused assessment (28 risks) aligned with EUCRA, using scenario-based, multi-hazard analysis with qualitative evaluation of risk severity, urgency and time horizons **ENTSO-E/ENTSOG TYNDP scenarios**[14,15]: EU-level energy system scenarios (2030–2050) including decarbonisation pathways and weather-dependent modelling, but without explicit climate hazard scenarios, return periods or asset-level vulnerability assessment **Elia and Fluxys development plans**: 10-year network investment plans integrating climate objectives and, in Elia's case, qualitative consideration of climate risks but without specifying the methodologies used, including climate scenarios, thresholds, risk prioritisation criteria — limiting transparency and comparability. Fluxys solely indicates alignment with climate-neutral objectives **Elia's adequacy and flexibility study**[16] : advanced climate-based modelling using historical and synthetic climate data, focused on system adequacy rather than infrastructure vulnerability. **Elia's risk-preparedness plans**[17] integrate climate hazards as crisis scenarios and define emergency response measures, but do not address long-term infrastructure adaptation. While some operators document climate risk considerations in their planning, methodological transparency remains insufficient — with limited specification of scenarios, thresholds or prioritisation criteria, limiting comparability and the ability to prioritise investments consistently at national level.

[14] European Network of Transmission System Operators for Electricity (ENTSO-E) and for Gas (ENTSOG). They support European TSOs' Ten-Year Network Development Plans required by the Regulation 2022/869 on guidelines for trans-European energy infrastructure.
[15] https://www.entsos-tyndp-scenarios.eu/
[16] Elia Adequacy and flexibility study for Belgium. https://issuu.com/eliagroup/docs/adequacy_and_flexibility_study_for_belgium_2026-2?fr=sZGQ5Njg2NjM5NTg
[17] https://energy.ec.europa.eu/document/download/4e705874-3225-46cb-8c92-b2975b5e06ff_en?filename=BE_RPP_electricity_0.pdf

	This multiplicity of frameworks leads to fragmented approaches across operators and authorities. Without a common methodological baseline, results are not comparable, investment prioritisation at national level is inconsistent, and long-term climate risks may be systematically underweighted relative to short-term operational concerns. Beyond the energy sector, the absence of common reference scenarios is a broader challenge across all sectors exposed to climate risks. While this measure focuses on the energy sector, the methodological baseline developed here — including agreed climate scenarios, time horizons and hazard sets — has the potential to serve as a reference for other sectors, and its development must be coordinated with broader national efforts to harmonise climate risk assessment approaches across sectors.
Objective	Establish a common methodological baseline for climate risk assessments across the energy sector, enabling consistent prioritisation of resilience investments at national level.
Description	This measure establishes a harmonised methodological baseline for climate risk assessments in the energy sector by defining common reference elements — climate scenarios, time horizons, hazard sets and indicative thresholds — while allowing adaptation to operator- and context-specific needs. It introduces minimum requirements for climate vulnerability analysis of assets and services, based on extreme-event scenarios and identification of operational limits (e.g., overloads, outages, failure points). It builds on existing frameworks (BNRA, BCRA, ENTSO scenarios) and ensures their consistent application across the sector. The objective is to improve comparability, transparency and usefulness of risk analyses for decision-making to support national prioritisation of resilience investments. The measure applies to operators across the energy sector — including TSOs, DSOs and other relevant operators. Given the regional competence over distribution networks, DSOs' participation involves coordination with regional governments and regulators (VNR, CWaPE, BRUGEL). Guidance and tools are designed to be applicable independently by any operator, without presupposing access to individual risk assessments or resilience plans.
Federal competences	Security of energy supply, energy infrastructure regulation, CER implementation and oversight, national risk assessment (BNRA), federal climate adaptation policy.
Interfederal aspects	• National Climate Commission (NCC) and CONCERE: the NCC ensures consistency of the methodological baseline with Belgium's national climate policy commitments and reporting obligations, while CONCERE ensures coherence with the interfederal energy policy framework and the National Energy and Climate Plan (NECP). Both bodies facilitate coordination between federal and regional authorities on climate and energy policy issues relevant to this measure.

	• Alignment with regional authorities on climate data, scenarios and projections: regional authorities are expected to align their own risk assessment approaches with the federal methodological baseline, particularly for distribution networks and decentralised assets under regional competence. • Risk assessment approaches for distribution networks and decentralised assets: DSOs operate under regional regulatory oversight. Regional regulators would need to facilitate DSO participation in the methodological alignment process. • Spatial planning and local exposure to hazards: regional spatial planning authorities hold competence over land use decisions affecting infrastructure siting and exposure — their input is required for the hazard mapping components of the baseline. • Consistency between the federal methodological baseline and regional climate adaptation strategies: regions are expected to reference the federal baseline in their own adaptation planning where relevant.
Effectiveness	Dependent on: • The availability and quality of climate and risk data across the sector. • The development of practical, sector-adapted methodological guidance that operators can apply independently. • The willingness of operators and regulators to align on common scenarios, thresholds and assumptions, including across federal and regional levels. • Sufficient dedicated resources and staff within DG Energy and contributing institutions to develop and maintain the methodological baseline. • Regular updates to reflect evolving climate science and operator feedback. • A baseline that avoids excessive complexity — guidance is to be usable in practice. • Active counteraction of the structural tendency to deprioritise long-term climate risks relative to short-term operational concerns.
Responsible	FPS Economy - DG Energy
Other actors / stakeholders involved / transversal aspects	• RMI • BCC • Cerac • Universities and research institutions • Energy operators, including TSOs and operators across the sector

	• DSOs and Synergrid • CREG • VNR, CWaPE, BRUGEL • Regional authorities • National Climate Commission / CONCERE • NCCN

Time horizon	36 months — indicative only, not subject to formal reporting obligations.
	• Year 1
	  ○ Mapping and comparison of existing methodologies across the sector
	  ○ Identification of priority risks, use cases and data gaps
	  ○ Definition of draft methodological baseline (scenarios, hazards, thresholds)
	  ○ Competence mapping across federal and regional levels
	• Year 2:
	  ○ Stakeholder alignment across federal authorities, regions, operators, and regulators
	  ○ Testing of baseline on real cases with selected operators
	  ○ Refinement and formalisation of methodological framework
	• Year 3:
	  ○ Integrate into relevant planning and regulatory frameworks (development plans, regulatory review processes)
	  ○ Integration into CER risk assessments and resilience plans where applicable
	  ○ Establish iterative update mechanism

Need for transformative change	No
Points of attention: gender, equitability, risk of maladaptation	• Over-reliance on fixed scenarios or single datasets may obscure uncertainty and lead to misrepresentation of actual risk levels. • Over-standardisation may reduce flexibility to account for local conditions and operator-specific realities. • Conservative assumptions risk driving overinvestment and not reflecting realistic system behaviour.

Costs				
Shared analytical and technical costs (e.g., climate data translation and scenario definition) are pooled under the capacity-building measure to avoid duplication, while measure-specific costs are defined separately to reflect distinct coordination, alignment and policy decision efforts required for each objective.				
	Type	**Lifetime**	**Costs**	**Reflections on costs**
Coordination and governance	Soft measure	NA	To be determined through internal negotiation	Staffing costs to be determined through internal resource negotiation. Key cost drivers to consider (non-exhaustive): multi-stakeholder alignment across federal, regional authorities, scientific bodies, operators and regulators; facilitation of workshops and consultations; drafting and validation of methodological baseline; possible short-term workload peak during alignment and formalisation phases; integration into relevant planning and regulatory frameworks.
Technical/scientific support (pooled)	Soft measure	NA	Not separately costed; included under Measure 2	Relies on analytical work covered under the capacity-building measure (scenarios, hazards, thresholds).
Consultancy support	Soft measure	NA	50,000–100,000 EUR (optional)	External support may be mobilised to support facilitation and structuring of the alignment process. This is not strictly required but can accelerate delivery and ensure methodological consistency. Can be avoided if internal expertise is sufficient.
Funding/Financing				
	Federal budget			
Indicators				
Indicator #1	**Formal adoption of a common methodological baseline**			**Type:** Output
Description	Publication and formal validation of a harmonised methodological baseline (including scenarios, hazards, time horizons and indicative thresholds) for climate risk assessments in the energy sector.			
Frequency	Once			
Owner	FPS Economy (DG Energy)			
Data source	Official guidance documents / methodological framework			
Indicator #2	**Application of the methodological baseline by energy sector operators**			**Type:** Outcome

Description	Share (%) of energy sector operators applying the common methodological baseline in their climate risk assessments.	
Frequency	Every 4 years, where aligned with formal reporting cycles; ad hoc for other operators based on available documentation.	
Owner	FPS Economy (DG Energy)	
Data source	Risk assessments and resilience plans submitted by operators under applicable frameworks; voluntary assessments and regulatory documentation for other operators; methodological review reports.	
Indicator #3	**Quality and usability of the methodological baseline**	**Type:** Outcome
Description	Qualitative assessment by operators and regulators of whether the methodological baseline is practical, sufficiently adapted to sector needs and regularly updated.	
Frequency	Once per update cycle	
Owner	FPS Economy (DG Energy)	
Data source	Stakeholder surveys and feedback collected during update process	
Barriers and Solutions		
Barrier #1	**Fragmentation of competences and need for interfederal alignment**	**Type:** Institutional / Governance
Description	Differences in mandates and approaches between federal and regional authorities, combined with varying methodological practices across operators, complicate the definition of a common methodological baseline and slow alignment. Limiting methodological harmonisation to TSO level while leaving DSO practices unstandardised would produce an incomplete picture of system-wide resilience, given that risks and vulnerabilities cascade across the full network. Cross-sector resilience prioritisation falls outside the scope of this measure and would require a broader national coordination mechanism such as the BNRP framework.	
Solution	Establish a coordination process to define a common methodological baseline applicable across the energy sector, developed jointly with regional authorities and regulators, building on existing mechanisms (CER Connect, BNRP working groups) and allowing operator- and region-specific adaptation. Cross-sector prioritisation is acknowledged as a broader exercise to be addressed through separate interfederal mechanisms.	
Barrier #2	**Complexity of alignment with European frameworks (ENTSO-E/ENTSOG)**	**Type**: Policy / Regulatory
Description	Existing European frameworks (ENTSO scenarios) may follow different logics and levels of detail, making alignment with national methodologies complex and potentially inconsistent.	
Solution	Define a national interpretation layer that ensures consistency with EU frameworks while adapting them to infrastructure-level risk assessments.	

Barrier #3	**Limited incentives or obligation to converge methodologies**	**Type:** Policy / Regulatory
Description	Operators and authorities are not currently required to use a common methodology, reducing incentives to change existing practices. Long-term methodological alignment may be deprioritised relative to short-term operational concerns, particularly in the absence of regulatory expectations.	
Solution	Anchor the methodological baseline into relevant regulatory review processes across the sector — including development plans and investment oversight — to create systematic expectations for its use, reducing dependence on voluntary uptake.	
Barrier #4	**Sustainability and maintenance of the methodological baseline**	**Type:** Financial / Economic
Description	A methodological baseline requires regular updating as climate science, EU frameworks and sector needs evolve. Without a clear maintenance mandate and dedicated resources, the baseline risks becoming outdated and losing relevance.	
Solution	Define a formal update cycle as part of the baseline's governance framework, with assigned responsibility and dedicated resources confirmed through internal negotiation with DG Energy and contributing scientific institutions.	

3.4 Risk to mental health from climate change

3.4.1 General

Climate change affects mental health through direct and indirect pathways. The BCRA distinguishes heat-related mental health outcomes, mental health outcomes due to other extreme weather events (i.e., flooding, wildfires, drought) and climate change concerns and anxiety. Heatwaves can worsen existing psychological conditions, increase hospitalisations and even raise suicide risk or increase violent behaviour. Extreme events such as floods or wildfires trigger trauma, anxiety and depression that may persist for years. Indirectly, awareness of climate threats fuels climate anxiety, which can impair daily life for some. While mental health is often overshadowed by physical risks, evidence shows that psychological consequences are significant and will likely intensify as warming continues.

The following reports and research papers were screened for actions or measures:

- BCRA Technical Report Mental Health [69]
- Psychosociaal Interventieplan, PSIP, 2017, *https://www.health.belgium.be/nl/themas/gezondheid/dringende-geneeskundige-hulpverlening/noodplannen/psychosociaal-interventieplan-psip* [70]
- NEHAP3 [71]
- Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a comprehensive approach to mental health [72]
- WHO, 2023, Declaration of the Seventh Ministerial Conference on Environment and Health [73]
- National Adaptation Plans for France, Sweden, Germany, the Netherlands, the UK and Austria [9], [26], [27], [28], [62], [74]
- De Maeyer et al, 2025, The Medium-Term Psychosocial Impact of the 2021 Floods in Belgium: A Survey-Based Study [75]
- Lawrance, 2021, The impact of climate change on mental health and emotional well-being: current evidence and implications for policy and practice [76]
- Brandt, 2024, Climate change and mental health: Position paper of the European Psychiatric Association [77]
- Sutter, 2025, Eco-anxiété en France [78]
- Wu, 2020, Climate anxiety in young people: a call to action [79]
- Mouton et al, 2025, Eco-Emois: Etude exploratoire sur l'éco-anxiété chez l'enfant et l'adolescent en Belgique francophone [80]

The National Adaptation Plans for the Netherlands, France, Germany, Austria, the UK and Sweden were screened. Except for the UK all of them acknowledge mental health as a relevant issue. However, actions are mostly focused on research (often as a part of a larger research endeavour on climate change and health) or on indirect actions, such as protecting people from heat (France).

Also, other literature on climate change and mental health often stresses indirect actions that would mitigate or reduce climate change impacts that may impact people's mental health and well-being, such as the importance of *proactively building resilience of individuals, communities and support systems* to climate-related events and *invest in mitigation, prevention, and preparedness*. Increased preparedness will reduce negative impacts of a

crisis and as such benefit people's mental health and well-being. This applies more generally to all possible measures to effectively prepare for and address a crisis, whether it is climate-related or not. In principle all measures that reduce the impacts of extreme weather events (heat, flooding, wildfires, drought, …) will also reduce the mental health impacts. These measures are *not included* here.

More specifically, *secondary impacts* of a (climate-related) crisis / disaster such as financial problems or damaged housing (including persisting dampness or moulds) are known to have a serious impact on people's mental health and well-being [69]. Mitigating these secondary impacts is obviously the best way to maintain people's mental health and well-being. These secondary impacts are especially relevant for flooding, droughts and wildfires, but less for heatwaves. However, the actual measures to address *post-disaster financial or accommodation problems* are *out of scope* for this analysis.

Reports also recommend *prioritising climate mitigation and adaptation policies that include mental health and equity benefits*, for example, the use of nature-based solutions, such as urban greening, green and blue spaces, active urban transport (walking, cycling), access to nature [69], [81], [82]. These measures are also *out of scope* for this analysis.

Adaptation measures addressing the mental health impacts of climate change build upon existing mental health policies, systems, and action plans targeting the general population or specific groups. Many recommended actions (e.g., [82]) are broadly applicable to strengthening mental resilience and improving mental healthcare. Preventive measures focus on enhancing resilience among the general population and vulnerable groups. In addition, efforts aim to strengthen mental health support systems. The resilience of these systems needs to be increased both to withstand disruptions caused by climate-related events and to respond to a growing number of people experiencing climate-related mental health challenges, such as eco-anxiety. For example, during a heatwave, existing mental health services such as community centres and helplines are complemented by adaptation measures such as proactive outreach to vulnerable individuals, expanded helpline capacity, and integration of mental health support into heatwave response plans to address increased climate-related distress.

The Swedish national adaptation plan acknowledges the increased need for this in the light of the consequences of climate change. It explicitly includes an agreement with the Swedish Municipalities and Regions to strengthen mental health and suicide prevention work, extended/strengthened investment in mental health and suicide prevention and increased funding to improve access to child/adolescent psychiatry. Also other sources are stressing the need for preventive and proactive mental health strategies (e.g., [77]).

Finally, several reports and plans stress the need for long-term mental support after climate disasters [69], [75].

3.4.2 Governance aspects

3.4.2.1 General governance aspects

Mental healthcare, including climate-related mental health problems, falls under the responsibility of both the **federated entities** and the **federal state**. The federal level primarily steers compulsory health insurance, hospital budgets, health-professional regulation, and patients' rights, while the federated entities have the main responsibility for mental healthcare delivery organisation, primary care organisations, and health promotion and prevention.

The federal level, through the **FPS Health,** regulates and defines national policy frameworks for mental health, including the accreditation of mental health professions (accreditation and visa delivered by FPS Health), and the development of policy reforms such as the Belgian mental healthcare reform. The latter introduced community-based **mental health networks** integrating hospital and outpatient services.

Sciensano monitors the well-being and mental health of the general population and of a number of vulnerable groups in Belgium. It evaluates the burden and determinants of mental illness to formulate a health policy based on the best scientific evidence.

Federated entities, through **regional healthcare agencies** (e.g., SPW Santé et Environnement in Wallonia, the Departement Zorg in Flanders), are responsible for providing mental health services in non-hospital settings, including outpatient care and consultations with psychiatrists and psychologists, and ensuring local-level psychosocial support.

Following the reform of the mental healthcare, the **mental health networks** coordinate provision of primary and specialised psychological care. This is carried out under the responsibility of the federal interadministrative Service for Integrated Care and Mental Healthcare (RIZIV/INAMI and FPS Health). The mental health networks (for adults and for children) provide:

- Mental health promotion, prevention, early detection and intervention
- Mobile treatment teams
- Psychosocial rehabilitation
- Intensive specialised residential mental health units
- Specific living arrangements and residence formulas

The **Interministerial Conference on Public Health** ensures alignment across federal and regional/community levels, facilitating the development and implementation of joint measures for mental health.

3.4.2.2 Funding and reimbursement of psychological care

Psychological care is reimbursed through agreements organised by RIZIV/INAMI. Mental health practitioners participate in the agreement through recognised mental health networks, which coordinate provision of first-line and specialised psychological care.

The activities of the mental health networks are funded by RIZIV/INAMI through an agreement between RIZIV/INAMI and the mental health network.

Specialised ambulatory mental health services (Centra Geestelijke Gezondheidszorg (CGG) / Services de Santé Mentale (SSM)) are primarily funded by the communities and by patient contributions. However, the ‘Protocolakkoord betreffende gecoördineerde aanpak voor de versterking van het psychisch zorgaanbod’ (2020) also provides funding to strengthen these services of the federated entities.

3.4.2.3 Mental health services during and after collective emergencies (including climate-related emergencies)

Federal and regional authorities have to work together to ensure psychosocial support is effective across all phases of a disaster (acute, post-acute, and recovery), with national-level preparedness exercises and information-sharing frameworks in place to align efforts.

During collective emergencies, federal authorities will take the coordination and set up initiatives (including e.g. online psychological support and adaptation of reimbursement

protocols during the COVID-19 crisis). The **NCCN** organises and coordinates the national response strategy and crisis communication and facilitates the information flow to municipalities through the provincial governors. **DG Preparedness and Response** of the **FPS Health** is responsible for activating and coordinating the provision of psychosocial support, including psychological first aid and psychiatric services, during collective emergencies (including climate-related disasters) and in the start-up of the post-emergency phase through the **Psychosocial Intervention Plan (PSIP)**. The PSIP distinguishes between federal responsibilities during the emergency phase (e.g., setting up reception centres), the start-up of the post-emergency phase and the regional and community responsibilities in the post-emergency phase (e.g., providing long-term care and psychosocial support). The federal health insurance system (through **RIZIV/INAMI**) ensures that funding for mental healthcare during and after climate-related events is available.

Finally, the federal level is responsible for raising literacy and awareness of climate change's mental health impacts. National campaigns and initiatives like training for healthcare workers to identify and manage eco-anxiety and other climate-related mental health issues will be coordinated by **FPS Health.**

3.4.3 Selection of measures

An initial list of possible measures to address the impacts of climate change on mental health was compiled from the sources mentioned in 3.4.1. From this initial list, a longlist was selected following the steps described in section 2.3. The longlisted measures were discussed in bilateral meetings with DG Preparedness and Response of the FPS Health, with the Integrated Care Service/Mental Healthcare of the FPS Health, and with the Interfederal Combat Poverty Service. Two measures suggested during the stakeholder consultation were added to the longlist but without elaborated description. The longlisted measures (not included in the shortlist below), and their descriptions, as well as the measures from the initial list that were not further taken up in Be-Adapt, are included in Annex 4.

Following the procedure and criteria described in section 2.3.3 the following measures were shortlisted:

1) Ensure continuity of mental health support during and after climate-related disasters
2) Active surveillance of people with pre-existing mental health conditions during extreme weather events (i.e., flooding, wildfires)

The measures on the shortlist were further elaborated following the methodology described in sections 2.3 to 2.5. ***As mentioned before in section 2.3.3 the selection and the description of the shortlisted measures do not imply any decision or commitment to implementation of the measures.***

As already mentioned in section 3.2.3 putting in place a form of syndromic surveillance [52] would allow following up the impact of extreme weather events and evaluating whether measures are sufficient or not. This would also include mental health impacts. However, this is out of scope for this study.

Further, several stakeholders mentioned risks for the mental health of healthcare staff during and after an emergency, e.g., due to overburdening of the healthcare system. One respondent suggested an additional measure: 'mental health support for healthcare staff / supervision and prevention of burnout'. The measure would include proactive measures to increase resilience. Although the issue may be quite relevant, it was not taken up further in Be-Adapt, mainly due to time constraints (see also Annex 4).

3.4.4 Survey results

The two shortlisted measures with their extended description were submitted to the stakeholders for their feedback and input (see 2.6). The survey was sent to about 40 stakeholder representatives representing a broad group of federal, regional/community and local stakeholders. Responses were received from three people for the first measure. No responses were received for the second measure. One person commented more in general on both measures by email.

Table 10: Number of responses for each of the measures

Measure	**Number of responses**
Ensure continuity of mental health support during and after climate-related disasters	3 + 1 by email
Active surveillance of people with pre-existing mental health conditions during extreme weather events	1 by email

Based on the responses, the measures were further fine-tuned. The **final results** of this process are shown in the following sections.

3.4.5 Proposed measures

3.4.5.1 Ensure continuity of mental health support during and after climate-related disasters

Context	The impact of flooding on mental health has been relatively well investigated in the global context: reviews of studies confirmed a strong link between flooding and cases of post-traumatic stress disorder (PTSD), anxiety and depression which can last for several years after the event. However, long-term mental health consequences are not just a product of the initial disaster experience but also of persistent financial and housing problems. [69] People in precarious socio-economic conditions are especially vulnerable. A survey-based study on the medium-term psychosocial impact of the 2021 floods in Belgium concluded that there is need for better coordination between emergency and psychosocial services [75]. According to the starting note of the Interfederal Action Plan on Extreme Weather Events the transversal working group on psychosocial dimension and mental health will consider the harmonisation and strengthening of psychosocial support in the Belgian crisis management, including: • continuity of care, long-term follow-up and clear responsibilities; • development of interfederal guidelines that systematically incorporate mental health and social recovery into flood-related policy responses; • development of interfederal protocols for structural collaboration between crisis actors and care and well-being actors to ensure continuity of psychosocial support after flooding. The PSIP activates and coordinates psychosocial support in collective emergency situations during the acute phase and in the start-up of the post-phase of the disaster. The PSIP mentions the municipality's local psychosocial support network (PSH), and the possibility to include services such as the Centre for Crisis Psychology of the Ministry of Defence, victim support services of the Centres for General Welfare Work (Centra voor Algemeen Welzijnswerk (CAW)), and of the police, the Centres for Mental Healthcare; for large-scale emergency situations "a more thorough psychological first-aid" is envisaged [70]. At the end of the urgency phase psychosocial support is handed over to the federated authorities for long-term psychological support. However, the interfederal mental health networks can play an important role in assuring continuity of mental healthcare from the crisis phase to the post-phase, sufficient and adapted provision of easily accessible primary psychological support and treatment in the post-phase and continuity of care for moderate to severe mental health problems. The mental health networks coordinate primary psychological care, focusing on prevention, early detection and intervention. They focus on working in community settings ("vindplaatsgericht werken") which is especially useful

	for a collective emergency situation where a whole community is affected by the same crisis, and for actively reaching out to people in difficult socio-economic conditions and other vulnerable groups (immigrants/refugees, youth, elderly, …). Primary psychological care can be organised through: • Community-targeted interventions: organisations in the community can take the initiative for community-targeted interventions in collaboration with the mental health network. The mental health network decides on the organisation of the community-targeted intervention. These interventions are aimed at self-care, resilience and psychoeducation. The community organisation takes care of practical and organisational aspects. • Primary psychological support: aimed at clarification of needs, resilience-supporting and psycho-educational interventions for the prevention and/or (early) detection of (suspected) mental health problems that are still in an early stage, preventing symptoms from occurring or worsening and strengthening the individual and/or their context in their resilience, referral to further psychological treatment. • Primary psychological treatment: assessment of the need and short-term treatment The latter two can be organised as group sessions (strongly recommended) or individual sessions. The mental health networks collaborate locally with primary care partners and basic services such as: the Public Centres for Social Welfare (OCMWs), general practitioners and neighbourhood health centres (wijkgezondheidscentra), but also other primary care and support providers such as pharmacists and home nurses, social services as well as Centres for Pupil Guidance (CLBs), schools, Child and Family consultations, external and internal services for prevention and protection at work (EDPW), the advisory physicians of insurance institutions and their social services, organisations for students, families, ..., local service centres, social work services, neighbourhood centres, street corner work, youth centres of the CAW, the Centre for Enterprises in Difficulty (COM) and home care, ... [83] The Belgian Incident Tracking System (BITS)[18] of the FPS Health allows all people involved in an emergency to be registered and could be used to register people in need for continued psychological support. Currently, FPS Health develops a system for self-registration through a website where those involved can indicate if they wish further support.
Objective	Ensure sufficient and adapted provision of easily accessible mental health support and treatment during and after climate-related disasters, i.e., assuring continuity of care between the emergency and post-emergency phase, with a special focus on people in precarious socio-economic conditions and other vulnerable groups.

[18] https://www.health.belgium.be/nl/themas/gezondheid/dringende-geneeskundige-hulpverlening/belgian-incident-tracking-system-bits

Description	This measure tasks the local mental health networks to coordinate and ensure sufficient and adapted provision of easily accessible mental health support and treatment during and after climate-related disasters. The mental health networks will be involved from the start in the acute phase of the emergency to ensure continuity of mental healthcare over the different phases of a collective emergency in their area of operation and to extend interfederal coordination in the post-emergency phase. The focus of this measure is on prevention, early detection and early treatment for people without pre-existing mental health problems, through community- or group-oriented interventions, as much as possible making use of the existing networks and instruments. This requires: • adaptation of the existing agreements on the role and tasks of the mental health networks to include organisation of mental healthcare that responds to the needs of (climate-related) collective emergencies; • inclusion of the role of the mental health networks in the PSIP • guidelines for specific (climate-related) collective emergencies - list possible needs and interventions (in both primary and specialised care) to be coordinated and/or taken up by the mental health network up to two years after the collective emergency – list new collaborations to be established, i.e., with emergency agencies (fire departments, police, …) • ad hoc funding in case of a collective emergency for the mental health network(s) in the affected areas to carry out these interventions over a period of two years after the emergency. The following actions will be part of the guidelines for climate-related collective emergencies: *Preparedness* • Integration of mental healthcare in provincial and municipal emergency- and intervention plans (nood- en interventieplannen) • Presence of mental health networks in meetings on emergency management and response, and in emergency management exercises • Creation of easily accessible emergency support points in each mental health network; create a dedicated information number (17xx) and a chat service for emergency-related mental health support, in all phases of a collective emergency • Training of mental health staff in emergency management, training of emergency staff in mental health aspects

	Acute phase: • Presence of (the coordinator of) the local mental health network in the municipality's local psychosocial support network (PSH); • Deployment of mobile teams and psychologists of the mental health network to coordinate and provide 'first aid', and to register people in need of continued psychological support using the BITS (the mental health networks will coordinate with existing services for crisis-related mental support such as the Centre for Crisis Psychology of the Ministry of Defence and victim support services of the Centres for General Welfare Work, and of the police to ensure efficiency and complementarity). *Post-phase*: • Organisation of local exchange and concertation with regular (mental) healthcare partners and with social welfare organisations and professionals. • Active set up of community-targeted interventions and group sessions for people affected by the disaster with the aim of prevention, early detection and early treatment; assess whether other locally embedded organisations ['vindplaatsen'] have to be included than those already mentioned in the Protocolakkoord (i.e., local community organisations, local organisations working with vulnerable groups including elderly, people in precarious socio-economic conditions, immigrants/refugees, youth organisations, …. • Active dissemination of possibilities of (initiating) first-line psychological support among local organisations ['vindplaatsen'], e.g.: o through the municipalities; o through the mental health networks and the associated existing structures; o through the health insurance funds. • Broad communication of possibilities of mental health support among the population through various online and real-life communication channels (including posters and displays in public spaces and among local organisations, GPs, …) with a specific focus on vulnerable groups including elderly, people in precarious socio-economic conditions, immigrants/refugees, youth organisations, ….

	○ Establishment of adapted communication strategies to reach people in precarious socio-economic conditions in collaboration with and following recommendations and guidelines of the Interfederal Combat Poverty Service, i.e., special attention for easily accessible contact points, non-digital communication (on paper), plain language, translation, pictorials, posters (pharmacies, waiting rooms, public transport, …), with involvement of organisations that are in direct contact with specific population groups [84], [85]. ○ Coordination with the measure 'Inclusive risk and adaptation communication' (section 3.5.5.3). Stakeholders suggested long-term monitoring and evaluation of mental health in the area affected by the emergency. This would contribute to the understanding of the long-term mental health effects and healthcare needs, and of the effectiveness of the measure. However, as this measure focuses specifically on continuity and provision of accessible care, this is not included here.
Federal competences	Applicability: high at federal level. **FPS Health** is responsible for provision of national-level frameworks for long-term psychological care. The interadministrative **Service for Integrated Care and Mental Healthcare (FPS Health and RIZIV/INAMI)** is responsible for implementation of federal measures regarding mental healthcare, including primary psychological care. **FPS Social Security** and **RIZIV/INAMI** are responsible for funding the mental health sector through the national health insurance systems, including primary psychological care through mental health networks. The **Directorate-General Preparedness and Response (DGP-R)** of **FPS Health** and **the Federal Health Inspector (GI**) are responsible for psychosocial support during the acute phase and the start-up of the post-phase of a collective emergency.
Interfederal aspects	As **interfederal structures** the **mental health networks** can take up coordination of long-term psychological support after the urgency phase through the existing coordination mechanisms and services. Important elements, which are already now embedded in the task of the mental health networks, are integration with housing and social welfare services, and collaboration with locally embedded community organisations. Additionally, coordination with regional crisis centres and municipalities, and shared operational protocols between emergency services and mental health actors require interfederal coordination. Amendments to the role of the mental health networks have to be agreed upon at interfederal level.
Effectiveness	This measure maximises effectiveness by using the existing (interfederal) networks in mental healthcare. It follows the vision on and reforms in the mental healthcare in Belgium, i.e., anchoring mental healthcare in networks, and in primary psychological care (focus on group interventions, on working in community settings ("vindplaatsgericht werken") and on the provision of resilience and self-care, early detection and intervention). The EPCAP study of

	2023 stresses the use of working in community settings and group interventions to increase uptake of vulnerable groups and organise accessible care [86]. Psychosocial support will progressively become structurally integrated into emergency preparedness and public mental health policies rather than relying only on temporary crisis mechanisms. Co-benefits: • the same measure may apply for collective emergencies which are not climate-related • increased social acceptance of and improved access to mental health support
Responsible	FPS Health - DGP-R and interadministrative Service for Integrated Care and Mental Healthcare
Other actors / stakeholders involved / transversal aspects	• RIZIV/INAMI • Regional/community level health administrations • Interfederal Combat Poverty Service For operational implementation: • Mental health networks • Primary care actors • Municipalities • Locally embedded community organisations (including those working with vulnerable groups) Through the operation of the mental health networks a broad range of stakeholders will be involved: conventioned first-line psychologists; general practitioners' associations; peer-support and expert-by-experience organisations; schools and youth organisations; organisations working with migrants, homeless persons and vulnerable populations; community and cultural organisations acting as trusted local entry points
Time horizon	• 2 years for developing protocols and guidelines; strengthening coordination mechanisms; initiating pilot implementations • 3–5 years for full structural integration and sustainable implementation, particularly regarding territorial coordination; integration into emergency preparedness systems; workforce training; sustainable funding
Need for transformative change	The measure builds further on the important shift taken towards prevention, resilience-building and community-based mental healthcare.
Points of attention: gender, equitability, risk of maladaptation	Equitability: Reaching people in precarious socio-economic conditions. Poverty is a recognised risk factor for development of psychiatric disorders. People living in poverty experience an accumulation of difficulties and permanent stress [87]. On top of these pre-existing differences, people in precarious socio-economic conditions will face most financial and housing problems due to climate-related emergencies, i.e., in case of flooding. Hence,

	targeted efforts to reach these groups are necessary. Vulnerable populations may be difficult to reach without proactive outreach strategies; territorial inequalities in psychosocial resources may create unequal access to care.		
Costs			
	Type	**Costs**	**Reflections on costs**
Concrete elaboration of role and agreements, guidelines and funding	Soft measure	Personnel costs included in regular responsibilities of federal staff Personnel costs for regular staff of involved federated entities	Not included here (not assessed): interoperable communication systems, digital infrastructure, secure data sharing
Recurrent funding of mental health networks for tasks related to preparedness for emergency	Soft measure	Estimated at 0.25 to 0.50 FTE per network, for 31 networks, giving rise to a total estimated budget of 1.25 to 2.5 million EUR per year	Including training costs for mental health staff and (local) emergency actors; preparing communication campaigns and targeted outreach strategies
Ad hoc funding of mental health network(s) in case of collective emergency	Soft measure	Very roughly estimated at 1 million EUR per 10,000 affected persons, using literature-based assumptions on the number of people requiring primary psychological care, the type of care they may need and the unit costs indicated in the RIZIV agreements with the mental health networks.	Few data are available on the percentage of people affected by flooding that need mental health support, the intensity and duration of care needs, and differences between mild psychosocial distress and more severe mental health conditions [88], [89], [90], [91]. Data are not always consistently defined and comparable.
		Additional indirect costs which are not covered by the unit costs for healthcare delivery may be related to: operation of mobile psychosocial teams; practical organisation of group interventions and community-based activities; costs linked to accessibility for vulnerable groups (translation, mobility, adapted communication tools). These additional indirect costs may be low compared to the actual care provision, but they should not be overlooked. Costs arising from supervision and prevention of burnout among professionals, and of monitoring and evaluation of the impact of emergencies on mental health (care needs) are not included here.	

Long-term (> 2 years) increased demand for primary psychological care and specialised mental healthcare	Soft measure	Additional support is conceived for two years after emergency; however, after two years still increased support may be needed (to be verified through evaluation and monitoring whether long-term needs are significantly higher than average).
Funding/Financing		
Federal Social Security budget	Funding of the recurrent costs for tasks related to preparedness for emergency through RIZIV/INAMI agreements with the mental health networks Ad hoc funding in case of collective emergency: funding of direct psychological and mental healthcare costs and indirect costs through temporary allocation of additional resources (staff, operational costs) to affected mental health networks	
Federal and regional emergency preparedness budgets	Funding of actions related to preparedness	
Indicators		
Indicator #1	**Guidelines disseminated**	**Type:** Output
Description	Guidelines for mental health networks for (climate-related) collective emergencies have been drafted and disseminated among the mental health networks	
Frequency	Once, then updated every [x] year	
Owner	FPS Health (Service for Integrated Care and Mental healthcare)	
Data source	Documented and disseminated guidelines	
Indicator #2	**Mental health networks ready**	**Type:** Output
Description	Number of mental health networks organised to take up their role in (climate-related) collective emergencies in the different phases (preparedness – acute phase – post-phase)	
Frequency	Once, then updated every [x] year	
Owner	Mental health networks	
Data source	Annual activity report	
Indicator #3	**Adapted communication strategies**	**Type:** Output
Description	Number of mental health networks that have an elaborated communication strategy, including targeted actions and methods to reach vulnerable population groups	
Frequency	Once, then updated every [x] year	
Owner	Mental health networks	
Data source	Communication strategy made available	
Indicator #4	**Community-targeted interventions and group sessions**	**Type:** Output

Description	Percentage of people affected by (climate-related) emergencies, participating in community-targeted interventions and group sessions	
Frequency	Yearly	
Owner	FPS Health (Service for Integrated Care and Mental healthcare and DGP-R)	
Data source	Registrations of participation by mental health networks affected by emergencies (reported in annual activity report) + estimates of number of people affected by the emergency (including severity)	
Indicator #5	**Continuity towards specialised mental healthcare**	**Type:** Outcome
Description	Percentage of people oriented towards specialised mental healthcare (during acute phase or post-phase), that are receiving this care within [x] weeks after orientation	
Frequency	Yearly	
Owner	Mental health networks	
Data source	Registrations by mental health networks affected by emergencies (reported in annual reports)	
Barriers and Solutions		
Barrier #1	**Insufficient capacity available in the network**	**Type:** Organisational / Operational
Description	In case of large emergencies, the needs may exceed the capacity for mental health support of the mental health network. Climate-related emergencies may increase pressure on already strained mental healthcare systems; sustainable funding and workforce support will be essential. There may also be territorial differences in available resources and accessibility.	
Solution	Clear funding mechanism that allows the network to attract additional workforce. Source additional capacity from neighbouring networks.	
Barrier #2	**Differing views on roles and responsibilities**	**Type**: Institutional / Governance
Description	According to the current PSIP psychosocial support is organised by the federal authorities during the acute phase and handed over to the federated authorities in the post-phase for long-term psychosocial support. This measure will change this by delegating responsibility for psychological (mental health) support to the interfederally coordinated mental health networks in both phases. Federal and federated entities may have diverging views on this.	
Solution	Shared analysis of the different roles and tasks to be taken up, and of the most efficient way to allocate, organise and coordinate them as part of the adaptation of the existing agreements on the role and tasks of the mental health networks	

Barrier #3	**Vulnerable populations may be difficult to reach**	**Type:** Organisational / Operational
Description	The Interfederal Combat Poverty Service points to the difficulties of reaching people in precarious socio-economic conditions. Difficulties are related to feelings of fear and distrust towards public services, administrative burden, insufficient mastering of (written) language, mobility and digitalisation [84]	
Solution	Establish adapted communication strategies to reach people in precarious socio-economic conditions, i.e., special attention for easily accessible contact points, non-digital communication (on paper), plain language, translation, pictorials, posters (pharmacies, waiting rooms, public transport, …), with involvement of organisations that are in direct contact with specific population groups [84], [85] Coordinate with measure ‘Inclusive risk and adaptation communication’ (section 3.5.5.3).	

3.4.5.2 Active surveillance of people with pre-existing mental health conditions during extreme weather events (i.e., flooding, wildfires)

Context	Whereas people with mental health conditions (especially those taking medication) are recognised as a specific target group for heat stress (see 3.2 Risk to human health due to heat stress), this is not explicitly the case for other extreme weather events (i.e., flooding, wildfires). People with existing mental health conditions are specifically vulnerable to the effects of crisis situations, during as well as after the acute phase. Psychosocial support during a collective emergency is taken up in the PSIP. Hence, assuring that vulnerable people in general, and more specifically people with mental health conditions, receive psychological 'first aid' is part of the PSIP. I.e., the PSIP has the possibility to include services such as the Centre for Crisis Psychology of Ministry of Defence, victim support services of the Centres for General Welfare Work, and of the police, the Centres for Mental Healthcare. However, there is no specific surveillance to actively identify and support people with mental health conditions. Moreover, for privacy reasons it is not straightforward to identify people in ambulatory mental healthcare (or not receiving any formal care). A good balance between proactive actions to reach people with mental health conditions and their privacy should be maintained. The Belgian Incident Tracking System (BITS) of the FPS Health focuses on locating, tracking and identifying people involved in a large-scale emergency but doesn't have a proactive component.
Objective	Ensure that people with mental health conditions (not including people in residential mental healthcare) receive appropriate psychological support ('first aid') during extreme weather events.
Description	This measure tasks the mental health networks to proactively set up and coordinate a system to identify, actively contact (through an established network of contacts) and provide psychological 'first aid' for people with mental health conditions. The system can be invoked in the acute phase of a collective emergency related to extreme weather events. A procedure and guidelines will be established that integrate and coordinate with existing (or planned) surveillance systems and communication lines to reach vulnerable people, including at regional level. Actions: • Development of procedure and guidelines to identify and actively reach out to people with mental health conditions and integrate this in crisis management planning and PSIP. ○ Make use of the mobile teams set up by the networks.

	○ Involve local actors, such as the Centra Geestelijke Gezondheidszorg (CGG) / Service de Santé Mentale (SSM), GPs, local multidisciplinary collaboration networks, local 'service centres' (for elderly people), local care networks, local volunteer organisations, …, most of which are already embedded in the mental health networks. Identify additional relevant local actors by the municipalities as part of the General emergency and intervention plan (Algemeen nood- en interventieplan ANIP). ○ Ensure a good balance between proactive provisions to reach people with mental health conditions and their privacy. ○ People will be contacted through trusted persons, such as GPs/care professionals, CGG/SSM, local care organisations, … • Integration and coordination with other surveillance systems and communication lines set up to reach vulnerable people during extreme weather events, e.g., systems set up at regional level in the context of the Ozone and Heat Plan (through NEHAP3); collaboration and integration with existing initiatives such as the Flemish initiative 'Zorgzame buurten' that targets connection between informal and formal care, and intersectoral collaboration • Development and implementation of adapted (proactive) communication strategies for people in precarious socio-economic conditions in collaboration with and following recommendations and guidelines of the Interfederal Combat Poverty Service, i.e., special attention for easily accessible contact points, non-digital communication (on paper), plain language, translation, pictorials, posters and displays in public places (pharmacies, waiting rooms, public transport, …), with involvement of organisations that are in direct contact with specific population groups. [84], [85] ○ Coordination with the measure 'Inclusive risk and adaptation communication' (section 3.5.5.3). • Establishment of clear communication lines and responsibilities between the different federal, federated, municipal and other local actors
Federal competences	High **FPS Health – DGP-R** is responsible for psychosocial support during the acute phase of an emergency, which is taken up in the PSIP. Hence, assuring that vulnerable people in general, and more specifically people with mental health conditions, receive psychological 'first aid' is part of that responsibility. The interadministrative **Service for Integrated Care and Mental healthcare (FPS Health and RIZIV/INAMI)** is responsible for implementation of federal measures regarding mental healthcare. **FPS Social Security** and **RIZIV/INAMI** are responsible for funding the mental health sector through the national health insurance systems.

Interfederal aspects	Amendments to the role of the **mental health networks** have to be agreed upon at interfederal level. Interfederal coordination with regions/communities for integration and coordination with existing and planned initiatives for local communication and care networks, neighbourhood networks Coordination with **NEHAP** on surveillance systems set up to reach vulnerable people during heatwaves.
Effectiveness	Due to privacy concerns actively registering people with mental health conditions is not possible. However, an indirect system in which people are contacted through trusted caretakers and organisations can be effective to reach the people in most urgent need for assistance. This measure maximises effectiveness by using the existing (interfederal) networks in mental healthcare. To increase effectiveness the system for surveillance of people with mental health conditions should be embedded in a broader system of identification, surveillance and adapted support for vulnerable groups. Co-benefits: the same measure may apply for disasters which are not climate-related
Responsible	FPS Health - DGP-R and Service for Integrated Care and Mental healthcare
Other actors / stakeholders involved / transversal aspects	• Regional/community health administrations • Municipalities • Mental health networks, and their networked organisations and services at regional and local level • NEHAP Working Group Climate resilient health systems • Interfederal Combat Poverty Service
Time horizon	2 years
Need for transformative change	NA
Points of attention: gender, equitability, risk of maladaptation	Equitability: Poverty is recognised as a risk factor for development of psychiatric disorders. People living in poverty experience an accumulation of difficulties and permanent stress. On the other hand mental health problems may be associated with causes of poverty [87]. Hence, targeted efforts to reach people living in poverty are necessary.

Costs			
	Type	**Costs**	**Reflections on costs**
Concrete elaboration of role and agreements, guidelines and funding	Soft measure	personnel costs included in regular responsibilities of federal staff; personnel costs for regular staff of involved federated entities;	
Recurrent funding of mental health networks for tasks related to preparedness for emergency	Soft measure	included in cost range previous measure	
Ad hoc funding of mental health network(s) in case of collective emergency	Soft measure	included in cost range previous measure	
Funding/Financing			
Federal Social Security budget	Funding of the recurrent costs for tasks related to preparedness for emergency through RIZIV/INAMI agreements with the mental health networks Ad hoc funding in case of collective emergency: funding of direct psychological and mental healthcare costs and indirect costs through temporary allocation of additional resources (staff, operational costs) to affected mental health networks		
Federal and regional emergency preparedness budgets	Funding of actions related to preparedness		
Indicators			
Indicator #1	**Procedures and guidelines disseminated**	**Type:** Output	
Description	Procedure and guidelines on how to set up and coordinate the identification and surveillance system have been drafted and disseminated among the mental health networks		
Frequency	Once, then updated every [x] year		
Owner	FPS Health (Service for Integrated Care and Mental healthcare)		
Data source	Documented and disseminated guidelines		
Indicator #2	**Mental health networks organised for this task**	**Type:** Output	
Description	Number of mental health networks that have set up the identification and surveillance system, and established the network of contacts to reach out to people with mental health conditions, with specific attention for vulnerable groups		

Frequency	Once, then updated every [x] year	
Owner	Mental health networks	
Data source	Annual activity report	
Indicator #3	**'First aid' for people with mental health conditions**	**Type:** Outcome
Description	Number of people with pre-existing mental health conditions that received 'first aid' psychological support during extreme weather events (collective emergencies)	
Frequency	Yearly	
Owner	FPS Health - (Service for Integrated Care and Mental healthcare)	
Data source	Registrations by mental health networks affected by emergencies (reported in annual reports)	
Barriers and Solutions		
Barrier #1	**Insufficient capacity available in the network**	**Type:** Organisational / Operational
Description	See previous measure 3.4.5.1	
Solution	See previous measure 3.4.5.1	
Barrier #2	**Differing views on roles and responsibilities**	**Type**: Institutional / Governance
Description	See previous measure 3.4.5.1	
Solution	See previous measure 3.4.5.1	
Barrier #3	**Vulnerable populations may be difficult to reach**	**Type:** Organisational / Operational
Description	See previous measure 3.4.5.1	
Solution	See previous measure 3.4.5.1	

3.5 Risk of reduced social cohesion and increased inequalities from climate change

3.5.1 General

Belgium's first Belgian Climate Risk Assessment (BCRA) identifies climate change as an immediate and growing threat to multiple facets of Belgian society. Among 28 priority risks, the risk to **social cohesion and inequalities** emerges as a significant concern. The technical analysis stresses that vulnerability is cumulative (e.g., age/health, housing quality, neighbourhood environment, income/education, language and social networks), and that climate hazards such as heat and flooding tend to concentrate impacts in dense urban areas and deprived zones, where exposure is higher and coping options are fewer. Climate impacts also influence perceptions of fairness and trust in institutions when responses are uneven or perceived as insufficient. Declining trust and perceptions of unfair treatment can erode social cohesion and diminish cooperative capacities needed for community adaptation and recovery. The risk is assessed as already substantial and worsening with higher warming; despite uncertainty at higher warming levels, Cerac maintains a high urgency rating because severity is expected to increase and current "policy readiness" is judged medium-low, with measures often too general, partially implemented, and insufficiently financed for vulnerable groups. Without targeted adaptation strategies that address these multidimensional vulnerabilities, climate change risks reinforcing social fragmentation, undermining solidarity, and reducing the overall resilience of Belgian society.

A central finding is the challenge of governance fragmentation: climate adaptation and social policy remain siloed, monitoring does not capture compounded vulnerabilities, and vulnerable groups are underrepresented in decision-making—raising the likelihood of maladaptation and legitimacy loss.

The main references that were consulted to evaluate this risk are:

- Vielle P., et al. (2025). Construire une protection sociale-écologique pour la Belgique. [92]
- KU Leuven et Universiteit Antwerpen. (2025). Indicatoren voor het meten van impact van crisissen in armoedesituaties. [93]
- Cauberghe, V. et al. (2024). "Stay Tuned" - Naar een optimale ontwikkeling van betekenisvolle klimaatcommunicatie in Vlaanderen. [94]
- Interfederal Combat Poverty Service webpages on:
    - COVID-19 key messages: https://luttepauvrete.be/themes/covid-19/ [95]
    - Communication guidelines: https://luttepauvrete.be/themes/covid-19/communication-vaccination-covid-19/ [96]
    - Webinar on guidelines for inclusive communication applied to climate change adaptation: https://luttepauvrete.be/themes/transition-juste/seminaire-la-communication-sur-ladaptation-climatique/ [97]
- Steunpunt tot bestrijding van armoede, bestaansonzekerheid en sociale uitsluiting (2025). Impact van crisissen in situaties van armoede en bestaansonzekerheid. Deliverables 1.2.1.[19] and 1.4.1[20] voor het onderzoeksproject BE-FAST.[93], [98]

[19] https://armoedebestrijding.be/wp-content/uploads/2025/06/250228-D.1.2.1-Be-Fast-Steunpunt-tot-bestrijding-van-armoede.pdf

[20] https://armoedebestrijding.be/wp-content/uploads/2025/08/250719-D.1.4.1.-Be-Fast-Steunpunt-tot-bestrijding-van-armoede.pdf

- Service de lutte contre la pauvreté, la précarité et l'exclusion sociale (2023). La dimension financière de la pauvreté. Contribution au débat et à l'action politiques. Rapport bi-annuel 2022–2023[21] [99]

3.5.1.1 Specific targets

Specific targets for the federal adaptation plan are to:

- **Strengthen Social Safety Nets:** Increase resilience of vulnerable groups and reduce environmental inequalities.
- **Equity-Focused Adaptation:** Vulnerable groups benefit from adaptation measures and adaptation measures are specifically designed to protect vulnerable groups.
- **Enhance Community Resilience and Social Capital:** Develop programmes that build trust, cooperation, and local capacity for collective action and community response before, during, and after climate impacts.
- **Integrate Climate Risk into Social Policy Frameworks:** Embed climate risk assessment and adaptation into broader social policies (health, housing, employment) to ensure cohesive and inclusive responses.
- **Improve Access to Climate-Adaptive Services and Infrastructure:** Ensure equitable access to cooling centres, flood protection, emergency assistance, essential services that anticipate shocks (e.g., price spikes) and stabilise households before crises escalate.
- **Promote Transparent, Inclusive Governance and Participation:** Foster participatory decision-making processes that ensure effective benefits for vulnerable groups, legitimacy, trust, and accountability in adaptation planning and implementation.
- **Build interoperable monitoring of climate vulnerability and social cohesion** outcomes (shared indicators, open dashboards) to guide targeted financing and accountability.

3.5.1.2 Specific vulnerable groups

Key groups requiring differentiated approaches include:

3.5.1.2.1 Low-income groups

People on low incomes and precarious employment. Limited savings, higher debt, and constrained housing choices reduce their ability to invest in cooling, insurance, repairs, or relocation. Climate shocks can therefore translate quickly into rent arrears, energy poverty, health deterioration, and institutional mistrust—fuel for distributional conflict. Vulnerability assessments have also shown that this group faces higher exposure to climate hazards (more likely to live in urban heat islands and flood zones).

3.5.1.2.2 Poor-quality housing

Residents of poor-quality housing and deprived neighbourhoods. BCRA points to exposure amplification via housing quality and local environment (e.g., limited green space, urban heat islands, flood-prone areas). This affects renters and informal or unstable housing situations particularly strongly because they have less control over building upgrades and often weaker representation in planning processes.

[21] https://luttepauvrete.be/wp-content/uploads/sites/2/2024/01/Rapport-bisannuel-2022-2023-La-dimension-financiere-de-la-pauvrete-FR-.pdf

3.5.1.2.3 Health vulnerability

Older adults, young children, pregnant people, and people with chronic conditions or disabilities. These factors increase sensitivity to heat and disaster disruption (mobility constraints, medical dependence, social isolation). Adaptation must therefore combine infrastructure (cooling/accessible shelters) with outreach, transport, and continuity of care.

3.5.1.2.4 Exposed work

The vulnerability may also increase due to the type of work. Outdoor activities such as agriculture and construction work, or industries operating at high temperatures increase the heat-related risks. See chapter 3.2 on risk to human health due to heat stress highlighting that: *"the risk of heat stress is high in low-skilled, low-paid physical work in hot environments, often done by vulnerable workers on precarious contracts or piece-rate pay [4]"*

3.5.1.2.5 Migrants

Migrants and people facing language barriers or administrative exclusion. BCRA explicitly cites language and social network support as adaptive capacity factors; risk communication, access to assistance, and participation are weaker if services are not culturally/linguistically accessible or if people fear administrative consequences.

3.5.1.2.6 Social isolation

People in social isolation and communities with low institutional trust. Cohesion is itself a resilience resource; where trust is low, early warnings, evacuation orders, recovery programmes, and behavioural heat protection are less likely to be followed or perceived as legitimate.

3.5.1.2.7 Urban versus rural

Urban versus rural differentiation matters. Urban areas concentrate heat risk, dense housing, and social polarisation dynamics; priorities include cooling equity, greening, tenant protections, and neighbourhood-based preparedness. Rural areas face access challenges (longer response times, fewer services), livelihood exposure (agriculture), and spatial isolation; priorities include service continuity, mobility solutions, rural flood/drought preparedness, and place-based investment that prevents "territorial resentment" and perceived neglect.

3.5.2 Governance aspects

Belgium's adaptation challenge for social cohesion is as much institutional as it is technical. The BCRA underlines "shared risk ownership" across governance levels and diagnoses medium-low readiness partly due to siloed policymaking, partial implementation, fragmented indicators, and underrepresentation of vulnerable groups. Belgium's federal structure reinforces both risks and opportunities: competences relevant to "cohesion-sensitive adaptation" (social protection, health, housing, spatial planning, environment, emergency management) are distributed across the federal state, regions, communities, provinces, and municipalities. The practical implication is that effective action depends on aligning mandates, budgets, data, and accountability across levels, while ensuring that equity goals do not "fall between" competences.

An institutional coordination architecture exists but needs to be leveraged for equity outcomes. Belgium has a National Climate Commission and a Working Group on Adaptation tasked with national strategy and planning coordination. The National Adaptation Strategy and National Adaptation Plan were designed to increase cooperation and synergies across entities, but real-world delivery for cohesion outcomes requires that joint frameworks translate into binding operational practices: shared minimum standards, joint financing for cross-cutting measures,

and common monitoring that captures compounded vulnerability rather than sector-by-sector outputs.

For social cohesion, the key governance question is how the federal level uses its levers (social security, aspects of public health, civil protection, parts of taxation and regulation, national infrastructure and procurement) to set “equity rules of the game” that regional and local actors can implement in territorially appropriate ways. This is consistent with BCRA’s emphasis that vulnerabilities must be proactively reduced at all levels, and that climate and social policy must be integrated rather than parallel. This translates into several principles:

1. Social cohesion must be treated as a condition for resilience and security, not merely as an add-on to social policy. The BCRA is clear on this point: weak social cohesion increases societal vulnerability, while reinforcing it in advance improves how crises are managed and how society recovers. In practice, this means giving cohesion-sensitive adaptation a clear place within federal risk management, emergency planning and budget prioritisation — including systematic attention in national risk registers and civil protection planning.
2. Belgium must move from general strategies to targeted action and financing for vulnerable groups. Cerac observes that current policies are often broad, only partially implemented, and underfinanced, with few of them systematically prioritising vulnerable populations. To address this, Belgium must create ring-fenced funding windows — federal or interfederal — for place-based vulnerability reduction, for example, targeting heat and flood vulnerability in deprived neighbourhoods. Co-financing conditions must require municipalities and regions to demonstrate measurable inclusion and distributional impact.
3. The silo problem needs to be addressed through mandatory cross-sectoral processes. The BCRA highlights that adaptation and social cohesion are currently treated separately, so synergies are missed and monitoring frameworks fail to capture how the two intersect. Belgium can respond in two ways: by requiring federal adaptation measures to undergo a “social cohesion and inequality impact” screening, and conversely, by requiring major social reforms to consider climate vulnerability. Both requirements can be embedded into federal regulatory impact assessments, public procurement criteria and programme guidelines. In parallel, interfederal working arrangements must define a shared vocabulary and a minimum dataset for vulnerability — covering exposure, sensitivity and adaptive capacity — aligned with privacy and statistical rules, so that targeting remains evidence-based and comparable across levels.
4. Inclusive participation needs to be strengthened to protect legitimacy and trust. The BCRA stresses that vulnerable groups are underrepresented in decision-making, which raises the risk of maladaptation and erodes trust in institutions. Given Belgium’s governance context, representative democracy must be combined with structured deliberation. This will include funded local “adaptation and cohesion councils” in high-risk areas, accessibility requirements covering language and disability, and feedback loops that show participants how their input shaped decisions. This approach is consistent with the European “just resilience” framing, which treats justice as integral to effective adaptation.
5. Shared indicators and accountability need to be built across governance levels. The BCRA notes that indicators already exist but remain indirect, fragmented, and disconnected from climate risks, so evaluation fails to capture compounded vulnerabilities. The way forward is for the National Climate Commission/Adaptation

Working Group to agree on a small set of mandatory core indicators — for example, heat vulnerability, housing quality, service access, recovery speed after floods, and participation metrics — while allowing regions to add context-specific indicators of their own.

6. Manage urban–rural equity explicitly. Regional and local autonomy is an asset, but cohesion risks emerge when people perceive uneven protection and investment. A federal plan must therefore articulate a transparent "territorial fairness" approach: why resources are targeted, which criteria are used, how rural service continuity is protected, and how urban hotspot investments avoid displacement/gentrification.

3.5.3 Selection of measures

In a nutshell, the BCRA diagnosis sheds light on (i) cumulative social vulnerability, (ii) urgency and medium-low readiness, and (iii) siloed governance and weak inclusion/monitoring.
An initial list of possible measures to address the impacts of climate change on social cohesion was compiled from the following reports and sources that operationalise equity and "just resilience" within adaptation:

- European policy framing on "just resilience";
- UNICEF framework; for social protection and climate risk management (anticipatory/shock-responsive approaches), and on the role of social protection in buffering inequality and instability under climate stress
- United Nations Office for Disaster Risk Reduction (UNDRR) guidance on inclusive disaster risk reduction (DRR) and social development linkages informed measures on participation, targeted preparedness, and protection of marginalised groups (gender, disability, age, poverty); and
- Climate-ADAPT and weADAPT knowledge portals for practical examples and locally led approaches that help define typologies of vulnerable groups and good practices for inclusion;

From this initial list, a longlist was selected following the steps described in section 2.3. The longlisted measures were discussed in bilateral meetings with:

- FPS Health
- FPS Employment
- PPS Social Integration
- FPS Social Security
- Social Services Federation (FdSS)
- RVA-ONEM
- Interfederal Combat Poverty Service

Annex 5 contains the measures from the initial list that were not further taken up in Be-Adapt, as well as the longlisted measures (not included in the shortlist below), and their descriptions.

Following the procedure and criteria described in section 2.3.3 the following measures were shortlisted:

1) Climate-adaptive social protection to anticipate climate crises
2) Climate displacement preparedness within social services
3) Inclusive risk and adaptation communication

The measures on the shortlist were further elaborated following the methodology described in sections 2.3 to 2.5.

As mentioned in section 2.3.3, the selection ***and the description of the shortlisted measures do not imply any decision or commitment to implementation of the measures***.

3.5.4 Survey results

The three shortlisted measures with their extended description were submitted to the stakeholders for their feedback and input (see 2.6). The survey was sent to about 40 stakeholder representatives representing a broad group of federal, regional/community and local stakeholders. Responses were received from four stakeholder representatives for the first measure. One response was received for the second measure. Two stakeholder representatives responded for the third measure.

Table 11: Number of responses for each of the measures

Measure	**Number of responses**
Climate-adaptive social protection to anticipate climate crisis	4
Climate displacement preparedness within social services	1
Inclusive risk and adaptation communication	2

Based on the responses, the measures were further fine-tuned. The **final results** of this process are shown in the following sections.

3.5.5 Proposed measures

3.5.5.1 Climate-adaptive social protection to anticipate climate crises

Context	Climate change is expected to increase the frequency of shocks (heatwaves, floods, health crises), placing sudden and uneven pressure on social care systems and social protection mechanisms. The PRETS report[22] highlights the need for systems capable of scaling up rapidly ("surge capacity") while maintaining continuity of care and support for vulnerable populations. Current systems are often designed for stable conditions, with limited flexibility to absorb sudden increases in demand or to anticipate climate-related risks. Experiences from COVID-19 and extreme weather events demonstrate that temporary adaptations—such as benefit top-ups, relaxed eligibility criteria, and rapid mobilisation of care resources—are effective but insufficiently institutionalised. Without structural reform, climate shocks risk overwhelming services, exacerbating inequalities, and undermining resilience. A transition towards anticipatory and shock-responsive social protection is therefore required.
Objective	Develop a flexible social protection and care system capable of anticipating, absorbing, and responding rapidly to climate shocks while protecting vulnerable populations.
Description	This measure proposes several adaptations to strengthen the social protection and care systems to better integrate climate responsiveness. It involves establishing clearly defined trigger mechanisms—either forecast-based or impact-based—that automatically activate temporary measures such as benefit top-ups, expanded eligibility, and accelerated disbursement procedures. Social care systems, including healthcare, elderly care, and disability services, would develop surge capacity plans covering staffing reinforcement, mobile care teams, and prioritisation protocols. Integration with early warning systems would enable anticipatory action, such as pre-emptive support for at-risk populations during heatwaves. A comprehensive review of all components of the social protection system relevant to climate adaptation will have to be undertaken as a first step. Several mechanisms have already been identified as particularly relevant: • **Reform of temporary unemployment support mechanisms** ○ This mechanism is already applicable in certain heatwave situations based on temperature thresholds. It must be reviewed to incorporate more refined indicators, such as wet-bulb temperature or broader "thermal comfort" thresholds, given the expected rise in extreme heat.

[22] P. Vielle et al 2025 Rapport pour le SPF Sécurité Sociale – Construire une protection sociale-écologique pour la Belgique. https://sonya.sciences.ulb.be/navigation/projets-de-recherche/prets

	○ It was also activated during the 2021 floods through derogation measures. Lessons from this experience must inform the development of a standardised activation protocol for future flood events. ○ Heatwaves disproportionately affect outdoor workers (e.g., construction, agriculture), sectors where self-employment and freelance work are common. Lessons from the “bridging right” (droit passerelle) used during the COVID-19 crisis must be applied to define activation protocols for self-employed workers during future climate-related events. ○ The possibility of increasing replacement income or lowering eligibility thresholds must be explored for individuals with additional vulnerabilities (e.g., respiratory conditions or other health sensitivities). ○ Given the expected increase in frequency and intensity of climate events, the financial sustainability of these mechanisms must be assessed. Budgeting, funding sources, and employer contributions must be adapted accordingly. The feasibility of linking employer contributions to workplace adaptation measures (e.g., shading, cooling) must also be examined. • **Strengthening the resilience of first-line social services (e.g., CPAS/OCMW)** ○ The role of the Board of Social Welfare (BCSD/RMW) within the CPAS/OCMW governance structure must be explicitly addressed, as this body's inability to convene during crises represents a potential bottleneck for rapid decision-making, even within the administrative framework. ○ Administrative requirements and rigid performance frameworks (e.g., excessive key performance indicators (KPIs)) must be streamlined to allow more flexible crisis response. ○ Lessons from past crises, where social services innovated under constrained resources, must be systematically analysed and scaled up where appropriate. ○ Requirements to formally demonstrate precariousness must be relaxed during crises. For example, during the COVID-19 crisis, proof of “state of necessity” was temporarily waived for access to food aid. These elements must be discussed in a dedicated working group bringing together legal experts from FPS Employment (including occupational safety), FPS Social Security, ONEM, climate and poverty experts. This would allow for the identification of the specific legal, regulatory, and policy changes required, and the development of a clear implementation roadmap. Energy security measures are covered by the Social Climate Plan. Synergies and coherence between the mechanisms of the Climate Social Plan and this measure must be ensured. In case of major crisis, a clear procedure must be identified to set up a structure in charge of relaying signals from stakeholders on the ground to policymakers regarding the impact of the crisis (see work of the Interfederal Combat Poverty Service during the COVID-19 crisis).

	Additional social protection reforms identified in the PRETS study could also be considered: • Improve monitoring of non-take-up of social rights and enhance the automation of access to benefits. Population registries could facilitate rapid identification and targeted support for vulnerable individuals affected by climate events. • Integrate climate-related variables into the COR pension simulation model, which currently relies primarily on demographic and financial parameters. • Extend leave schemes (e.g., parental leave) to support participation in ecological and transition-related activities. The rationale for extending leave schemes to ecological transition activities must be made explicit, including a clear definition of eligible activities and the justification for their inclusion. Similarly, the focus on the agricultural sector must be explained with reference to the specific exposure risks and gaps in existing social protection coverage for outdoor and self-employed agricultural workers. • Introduce a transition income for individuals moving into jobs that support the energy, ecological, and adaptation transition. As an initial step, regions could include such jobs in shortage occupation lists, allowing beneficiaries to retrain while retaining unemployment benefits. • Improve working conditions and job security in the care sector by establishing clear prioritisation of these sectors—based on essential human needs—during sectoral collective bargaining negotiations. • Strengthen social protection mechanisms for farmers, in coordination with agricultural insurance schemes where relevant. • Explore the development of food-related social security initiatives. Attention must be paid to the operational dimension of the measure. Monitoring and evaluation capacity must be positioned as an essential enabler rather than a bureaucratic burden; the COVID-19 experience showed that insufficient monitoring and evaluation hampered adaptive management during the crisis.
Federal competences	Federal competence in occupational health and safety (FPS Employment) must lead the aspects related to temporary unemployment mechanisms, given the direct relevance to worker protection during climate-related events. FPS Social Security must lead the aspects related to first-line social services. Coordination must be ensured with other FPS directorates/services responsible for healthcare financing and for coordinating national crisis and adaptation frameworks.
Interfederal aspects	Regions and communities are responsible for organising healthcare delivery and social services on the ground, and for adapting surge-capacity arrangements to local needs, while the federal level retains decision-making authority over social security benefits and temporary unemployment mechanisms. A clear distinction will be required between

	formal decision-making competences (federal) and advisory or implementing competences (regions/communities), to clarify the respective role of each level of governance in triggering and delivering the measure.
Effectiveness	Reduced poverty spikes during crises, improved continuity of care, enhanced system resilience, and more equitable protection of vulnerable populations under climate stress.
Responsible	Joint responsibility between FPS Employment and FPS Social Security with support of FPS Health – DG Environment
Other actors / stakeholders involved / transversal aspects	• Payment bodies (mutuality funds, ONEM payment bodies, insurance bodies/insurers) — necessary operational actors for unemployment benefit delivery • Interfederal Combat Poverty Service • Health and care providers • Regional health and social services authorities • Social concertation bodies, to be systematically consulted in the decision-making process • Social partners (employers' organisations and trade unions, at national and sectoral levels) must play an explicit role beyond collective bargaining, including in the design and governance of the measures. • Scientific institutions • NGOs and community organisations • Regional training providers (VDAB, Actiris, Forem) — essential if retraining components are developed
Time horizon	• 2027: System assessment and design of triggers and tools. • 2028–2033: Gradual reform of social security mechanisms. • Beyond: Continuous evaluation and adjustment. Note: the political feasibility of initiating structural social reforms during the current government's second half-term has been flagged by consulted experts as uncertain. The planning could realistically be reframed as a momentum-building and memorandum-preparation phase ahead of the next federal elections, rather than the start of formal legislative reform.
Need for transformative change	No need for transformative change for the “basic” measures described here. The PRETS report, however, highlights the need for future transformative change at two levels to ensure a sustainable social-ecological protection: • More research is required to explore scenarios for emancipation of the financing of social security from the need for economic growth. • Transition from a welfare state to an “enabling state” with the participation of academia and civil society in the definition of the social-ecological protection policies.

Points of attention: gender, equitability, risk of maladaptation	Ensure equitable access across socio-economic groups; avoid digital exclusion; prevent over-targeting that misses vulnerable individuals; ensure gender-sensitive care provision; avoid system overload in repeated shocks.			
Costs				
	Type	**Lifetime**	**Costs**	**Reflections on costs**
Administrative capacity (staff and coordination)	Soft measure	Short-term (0–5 years)	OPEX: 10–20 FTE/year (~1–3 million EUR/year)	Management, monitoring, coordination with regions and services.
IT system adaptation and interoperability	Soft measure	Short-term (0–5 years)	CAPEX: 10–20 million EUR	Development of trigger-based systems, integration with early warning data, automation of benefit adjustments.
Policy design, modelling and pilot testing	Soft measure	Mid-term (5–10 years)	CAPEX: 0.5–1 million EUR	Studies, simulations, pilot implementation in selected regions.
Stakeholders' participation process	Soft measure	Short-term (0–5 years)	OPEX: highly variable (1–2 FTE/year ~0.1-0.3 million EUR/year depending on events)	Management, coordination with stakeholders, regions and services.
Contingency financing for benefit top-ups	Soft measure	Mid- to Long-term (5–20 years)	OPEX: highly variable (10–100+ million EUR/year depending on events)	Temporary increase in benefits, expanded coverage during crises. It must be noted that anticipating climate change and adjusting the threshold for social security support can help support the sustainability of this budget.
Funding/Financing				
	Federal social security budget; contingency reserves; EU Social Climate Fund; ESF+; potential insurance/risk-pooling mechanisms; employer contributions (conditionality linked to adaptation measures). The Social Climate Fund is a potential source for the 2026–2032 window, but given its temporary nature, structural funding from the federal social security budget must be planned from the outset.			

Indicators		
Indicator #1	**Activation of shock-responsive mechanisms**	**Type:** Output
Description	Number of times trigger-based mechanisms are activated	
Frequency	Annual	
Owner	FPS Social Security	
Data source	Administrative data	
Indicator #2	**Coverage of vulnerable population**	**Type:** Outcome
Description	% of at-risk population receiving support during climate events	
Frequency	Annual	
Owner	FPS Social Security	
Data source	Social security databases	
Indicator #3	**Delay in benefit disbursement**	**Type:** Outcome
Description	Average time between trigger and payment	
Frequency	Annual	
Owner	FPS Social Security	
Data source	Administrative data	
Indicator #4	**Poverty variation after climate events**	**Type:** Impact
Description	Change in poverty rates after shocks	
Frequency	Event-based	
Owner	Statbel	
Data source	Survey/statistics, only available with delay. During the event rely on administrative data such as payment difficulties (see BE-FAST research project[23])	
Indicator #5	**Transition support uptake**	**Type:** Output
Description	Number of persons receiving a transition income or retraining support for jobs relevant to the ecological/adaptation transition	
Frequency	Annual	
Owner	FPS Social Security	
Data source	VDAB, Forem, Actiris reporting	
Barriers and Solutions		
Barrier #1	**Fragmented competences between federal and regional levels**	**Type:** Institutional / Governance

[23] *Indicatoren voor het meten van impact van crisissen in armoedesituaties – Deliverable 1.4.1. voor het onderzoeksproject BE-FAST*. Brussel, juli 2025.

Description	Social cohesion measures cut across competences split between the federal level (e.g., social security, BITS) and the Regions/Communities (e.g., social housing, CPAS/OCMW oversight), with no single body mandated to coordinate action across a crisis. This makes it difficult to trigger a coherent, joined-up response when social vulnerability spikes during a climate event.	
Solution	Establish a standing interfederal protocol (e.g., via an Interministerial Conference) that pre-defines roles, escalation triggers, and data-sharing obligations between federal and regional actors before a crisis occurs. This converts ad hoc, case-by-case coordination into a repeatable process that can be activated quickly when needed.	
Barrier #2	**Uncertainty on long-term funding needs**	**Type**: Financial / Economic
Description	Funding for social cohesion measures is currently allocated on a project-by-project or emergency basis, making it hard to plan for recurring or escalating needs as climate risks intensify. This exposes vulnerable groups to service gaps whenever ad hoc budgets run out or are reallocated elsewhere.	
Solution	Create dedicated contingency funds and risk-financing mechanisms (e.g., ring-fenced reserves, insurance-linked instruments) sized against projected climate-related social costs rather than historical spend. This gives implementing bodies predictable access to resources without waiting for exceptional budget approval each time.	
Barrier #3	**Lack of trigger definition and data integration**	**Type:** Technical / Knowledge and Information
Description	There is no shared, pre-agreed definition of the thresholds (e.g., heat index, flood extent) that should trigger social support measures, and the data needed to assess vulnerability is scattered across federal, regional, and local systems. This delays activation of support and can leave the most at-risk groups identified too late. Solution:	
Solution	Define common trigger thresholds and integrate early-warning systems with shared, interoperable datasets on social vulnerability (e.g., age, isolation, housing quality) across administrative levels. This allows support measures to activate automatically once agreed conditions are met, rather than relying on manual, after-the-fact assessment.	
Barrier #4	**Administrative rigidity of social services**	**Type:** Organisational / Operational
Description	Standard eligibility rules and procedures for social services are designed for normal operating conditions and are too slow or inflexible to adapt during a fast-moving climate crisis. This can prevent affected people from receiving timely support even when funds and services are technically available.	
Solution	Put in place pre-approved derogation mechanisms that allow eligibility and procedural rules to be temporarily relaxed once a crisis is declared, with simplified application processes for affected populations. This shortens the time between a person's need arising and support being delivered, without requiring new legal approval mid-crisis.	

3.5.5.2 Climate displacement preparedness within social services

Context	Climate-related disasters such as floods increasingly generate internal displacement within Belgium, as observed during the 2021 floods. This event revealed both strengths and gaps in the capacity of social services to respond rapidly and equitably. Emergency measures adopted during the 2021 floods—such as administrative simplifications, temporary extensions of rights, and flexible funding—demonstrated that faster, less bureaucratic responses are feasible in crisis contexts. However, these responses were often ad hoc, uneven across territories, and not structurally embedded in social protection systems. Climate change is expected to increase the frequency of such disruptions, including temporary or longer-term displacement due to housing loss or uninhabitable conditions. Without anticipatory planning, displaced populations risk falling into administrative gaps, delayed assistance, and unequal treatment. Strengthening preparedness within social services is therefore essential to ensure continuity of rights, rapid support, and preservation of social cohesion.
Objective	Ensure rapid, coordinated and barrier-free access to social services for populations internally displaced by climate events, guaranteeing continuity of rights and support.
Description	This measure establishes a predefined protocol for internal climate displacement within Belgium. It includes the creation of a clear legal and operational status for climate-displaced persons, enabling immediate and uninterrupted access to social rights, regardless of administrative domicile. Social services (CPAS/OCMW, housing, health) would activate simplified procedures, including automatic continuity of benefits, temporary suspension of administrative requirements, and the deployment of mobile service units. A national coordination mechanism would ensure interoperability between municipalities and regions, including shared registries (with appropriate data protection safeguards) and structured referral pathways. The measure would also provide for pre-identified emergency housing capacity and formalised partnerships with civil society organisations. Additional elements to be further developed include minimum standards for temporary accommodation, rapid rehousing pathways, labour protections (such as specific paid leave arrangements linked to displacement), access to legal support, and continuity of schooling for displaced children. Coordination with municipalities and housing providers will be essential to ensure operational effectiveness. Lessons from past crises (see notes written by the Interfederal Combat Poverty Service), such as the 2021 floods, must be translated into permanent contingency protocols. Regular training and simulation exercises would ensure preparedness across administrations. A key lesson concerns the derogation applied to the Relocation Support Allowance, which is normally granted only once in a lifetime to individuals exiting homelessness. During the floods, this support was exceptionally granted a second time in certain cases. The possibility of generalising this exception must be assessed. In addition, extending eligibility to situations where housing is not destroyed but essential household goods are lost must be considered, as well as broadening access to very low-income households who have not previously held homeless status.

	Further attention must be given to administrative continuity and residence status management. This includes possible derogations from cohabitation rules (which may reduce social benefits), the use of reference postal addresses, and ensuring seamless coordination between the CPAS/OCMW of usual residence and that of temporary accommodation. Teams should be set up to proactively contact affected households, including by going into the field and collaborating with local organisations. In the event of a major crisis, a clear procedure must be identified to set up a structure in charge of relaying signals from stakeholders on the ground to policymakers regarding the impact of the crisis. While the provision of safe public spaces and buildings as refuges depends largely on ownership and local competences, federal-level agreements and guidelines would help ensure that adequate, accessible, and inclusive refuge options are available across all territories and for different types of risks. Finally, monitoring systems must enable both the rapid identification of vulnerable populations affected by climate events and the systematic evaluation of the effectiveness and equity of the support provided.
Federal competences	Social security frameworks, civil protection coordination, crisis management, legal status definitions, and interoperability of administrative systems.
Interfederal aspects	Regions and municipalities are responsible for housing allocation, social assistance delivery and territorial crisis response on the ground, while the federal level defines the legal and operational status of climate-displaced persons and coordinates cross-regional relocation where needed. Links must also be made with the Interministerial Conference (IMC) “Major Cities Policy, Integration and Poverty Reduction” to ensure coherence with existing urban and integration policies.
Effectiveness	Faster assistance, reduced administrative exclusion, improved equity in crisis response, and strengthened trust in institutions during climate-related displacement events.
Responsible	FPS Social Security, in coordination with FPS Interior (crisis management), PPS Social Integration and the Federal Climate Change Department.
Other actors / stakeholders involved / transversal aspects	• CPAS/OCMW and municipalities • Regional housing and social services administrations • Civil Protection and Emergency services • NGOs (Red Cross, social support organisations) • Health services and mutualities • Interfederal Combat Poverty Service
Time horizon	• 2027: Legal analysis and protocol design • 2030: Pilot in high-risk regions and system interoperability

	• 2033: National rollout and integration into crisis planning • Beyond: Regular updates and exercises			
Need for transformative change	No			
Points of attention: gender, equitability, risk of maladaptation	Avoid exclusion of undocumented or mobile populations; ensure gender-sensitive and family-based support; prevent administrative overreach; ensure data protection; avoid unequal territorial access to assistance.			
Costs				
	Type	**Lifetime**	**Costs**	**Reflections on costs**
Administrative coordination and training	Soft measure	Short-term (0–5 years)	OPEX: 2–3 FTE/year (~0.2–0.4 million EUR/year)	Management, monitoring, coordination with regions and services.
Development of displacement protocols and legal framework	Soft measure	Short-term (0–5 years)	CAPEX: 0.3–1 million EUR	Legal drafting, interfederal agreements, operational guidelines.
Shared data systems and registries	Soft measure	Mid-term (5–10 years)	CAPEX: 0.5–2 million EUR	Tracking displaced persons, ensuring continuity of rights.
Training	Soft measure	Medium- to long-term (5–15 years)	OPEX: 4–5 FTE/year (~0.4–0.6 million EUR/year)	Training of CPAS/OCMW, crisis exercises, coordination staff.
Emergency housing preparedness	Soft measure	Medium- to long-term (5–15 years)	CAPEX: 2–10 million EUR (depending on scale)	Pre-identification, refurbishment or agreements with housing providers.
Stakeholders' participation process	Soft measure	Short-term (0–5 years)	OPEX: highly variable (1–2 FTE/year ~0.1-0.3 million EUR/year depending on events)	Management, coordination with stakeholders, regions and services.
Crisis response costs (housing, support services and outreach to the affected households)	Soft measure	Medium- to long-term (5–15 years)	OPEX: variable (5–50+ million EUR/event)	Temporary housing, social assistance, relocation support

Funding/Financing		
	Federal crisis management budget; EU Solidarity Fund; ERDF; regional housing funds; insurance mechanisms.	
Indicators		
Indicator #1	**Activation time of displacement protocol**	**Type:** Output
Description	Time between event and activation	
Frequency	Event-based	
Owner	FPS Interior	
Data source	Crisis reports	
Indicator #2	**Access to social rights for displaced persons**	**Type:** Outcome
Description	% of displaced persons receiving support within a defined timeframe	
Frequency	Event-based	
Owner	FPS Social Security	
Data source	Administrative data	
Indicator #3	**Availability of emergency housing**	**Type:** Output
Description	Number of available emergency housing units	
Frequency	Annual	
Owner	Regions	
Data source	Housing registries	
Indicator #4	**User satisfaction and perceived fairness**	**Type:** Outcome
Description	Survey of affected populations	
Frequency	Event-based	
Owner	Regions/NGOs	
Data source	Surveys	
Barriers and Solutions		
Barrier #1	**Lack of legal status for climate-displaced persons**	**Type:** Institutional / Governance
Description	Belgium currently has no dedicated legal status for persons internally displaced by climate events (e.g., recurring floods, extreme heat), leaving them to fall back on general social assistance frameworks not designed for displacement situations. This creates uncertainty over which rights, housing guarantees, and support duration apply, and can leave displaced people without a clear administrative anchor.	
Solution	Establish a specific legal status for climate-displaced persons, clarifying eligibility criteria, entitlements (housing, income support, return/relocation rights), and the competent authority responsible at each stage. This gives displaced people a predictable, enforceable basis for support rather than relying on discretionary or emergency-only measures.	

Barrier #2	**Poor coordination between municipalities**	**Type**: Organisational / Operational
Description	Municipalities affected by the same climate event often manage displacement responses independently, with no shared system to track who has been displaced, where, or for how long. This can lead to duplicated efforts in some areas, gaps in others, and people falling through the cracks when they move between municipalities.	
Solution	Set up a shared registry and coordination platform accessible to all affected municipalities (and relevant regional/federal actors) to track displaced persons' status and needs in real time. This enables consistent follow-up as people move across municipal boundaries and allows resources to be allocated where they are actually needed.	
Barrier #3	**High unpredictable crisis costs**	**Type:** Financial / Economic
Description	The costs of housing, supporting, and eventually relocating climate-displaced persons are highly variable and difficult to predict, since they depend on the scale and duration of each crisis. Without pre-arranged financing, municipalities and regions must scramble for emergency budgets each time, delaying support.	
Solution	Put in place pre-arranged emergency funding mechanisms (e.g., a standing displacement fund or rapid-disbursement agreement) that can be triggered as soon as a displacement event is declared. This removes the need to negotiate funding mid-crisis and ensures municipalities can act immediately rather than waiting on budget approval.	

Barrier #4	**Risk of exclusion of vulnerable groups**	**Type:** Social / Cultural / Awareness
Description	Climate-displaced persons who are already vulnerable — due to age, income, disability, or migration status — face a higher risk of being overlooked or excluded from support, particularly if they are not registered with existing social services. This can compound their vulnerability during an already disruptive event.	
Solution	Develop targeted outreach protocols (e.g., proactive contact by social workers, multilingual communication, partnerships with organisations already trusted by vulnerable groups) to identify and reach people who might otherwise be missed. Inclusive intake procedures should then ensure that support is accessible regardless of administrative status or prior registration.	

3.5.5.3 Inclusive risk and adaptation communication

Context	Recent crises in Belgium, including the COVID-19 pandemic and the 2021 floods, have demonstrated that communication is a critical determinant of effective response and social equity. While significant efforts were made to adapt communication (multilingual materials, simplified messaging, use of local intermediaries), gaps remained in reaching vulnerable populations such as migrants, elderly people, low-literacy groups, and socially isolated individuals. The starting note of the Interfederal Action Plan on Extreme Weather Events has also identified the need to improve clarity, coordination, accessibility and trustworthiness of emergency communication, including better use of multiple channels and local relays. Climate adaptation communication, however, remains less systematically structured than emergency communication and is often technical, fragmented, or not tailored to diverse audiences. As climate risks intensify, ensuring that all communities can understand and act upon adaptation guidance becomes essential not only for risk reduction but also for social cohesion and trust in institutions.
Objective	Ensure climate adaptation communication is accessible, understandable, and actionable for all population groups, particularly vulnerable and hard-to-reach communities.
Description	This measure extends inclusive communication practices developed in emergency contexts to all climate adaptation communication. It establishes a federal framework for inclusive communication standards, including the use of plain language, multilingual dissemination, visual formats, non-digital formats, and full accessibility for persons with disabilities. Communication strategies must systematically rely on trusted local intermediaries—such as municipalities, NGOs, community leaders, and health professionals—and combine digital and non-digital channels to ensure broad and equitable reach. The Interfederal Combat Poverty Service has compiled lessons learned on inclusive communication during the COVID-19 crisis and translated them into key recommendations for climate adaptation communication, which were presented during a dedicated seminar. This measure must build on these findings and mainstream these guidelines across all communication activities under the National Adaptation Plan. Building on improvements identified in interfederal emergency planning, the measure would strengthen coordination between federal, regional, and local messaging to ensure consistency and avoid contradictory information. It would also promote action-oriented communication by linking information to clear behavioural guidance, for example, during heatwaves or flood events. A testing phase involving target groups—through co-creation processes and behavioural insights—must be included to improve effectiveness. A relevant reference for the design of effective climate messages is the Flemish study on climate frames and narratives[24], which tested various frames with a broad target audience using focus groups.

[24] “Onderzoek naar motiverende klimaatboodschappen, klimaatframes en klimaatnarratieven” Research Portal Belgium - https://www.researchportal.be/nl/project/onderzoek-naar-motiverende-klimaatboodschappen-klimaatframes-en-klimaatnarratieven-0

	Communication strategies must be explicitly differentiated by target audience, ensuring that inclusivity goes beyond accessibility to encompass content relevance, cultural appropriateness, and behavioural resonance for each specific group. Organise an interfederal exchange and cooperation cell – within the Interfederal Combat Poverty Service – regarding communication to vulnerable groups, with the involvement of the various communication services and stakeholders. Monitoring mechanisms would assess reach, comprehension, and impact across different social groups. This approach must be systematically embedded across all adaptation policies rather than implemented as isolated campaigns. For particularly sensitive communication topics, the Public Planning Service (PPS) Social Integration already draws on a network of "experts by experience". This resource must be mobilised to ensure that adaptation messages are understandable, relevant, and appropriate for vulnerable populations.
Federal competences	Federal level coordinates national communication standards, crisis messaging, multilingual materials, and ensures coherence across federal adaptation and risk communication strategies.
Interfederal aspects	Effective implementation requires strong coordination with regions, communities and municipalities for local adaptation, dissemination channels, and trusted intermediaries. It is important to set up an exchange network between communication services from the different levels of authority and to establish a permanent structure for this.
Effectiveness	Effective implementation requires strong coordination with regions, communities and municipalities, which are responsible for adapting messages to the local context, selecting appropriate dissemination channels, and mobilising trusted intermediaries, while the federal level sets the overarching framework and standards for inclusive communication. It is important to set up a permanent exchange network between communication services from the different levels of authority, rather than relying on ad hoc coordination during crises.
Responsible	National Crisis Center and National Climate Commission, with support from FPS Health (risk communication expertise) and Interfederal Combat Poverty Service.
Other actors / stakeholders involved / transversal aspects	• Regional bodies in charge of adaptation and crisis management • Local authorities • Public health institutions (e.g., Sciensano for health-related content and surveys) • NGOs and community organisations • Social services (CPAS/OCMW) • Media and public broadcasters • Migrant and inclusion organisations • Disability advocacy groups

	• Interfederal Combat Poverty Service • PPS Social Integration – “experts by experience” service
Time horizon	• 2027: Development of inclusive communication standards and mapping of existing practices. • 2029: Pilot campaigns and co-creation with target groups. • 2033: Integration into all adaptation communication. • Beyond: Continuous evaluation and improvement.
Need for transformative change	No
Points of attention: gender, equitability, risk of maladaptation	Ensure gender-sensitive messaging, avoid digital-only communication, address language and literacy barriers, and prevent unequal access to information that reinforces existing vulnerabilities or exclusion.

Costs

	Type	**Lifetime**	**Costs**	**Reflections on costs**
Development of communication standards and tools	Soft measure	Continuous (review every 5 years)	CAPEX: 0.2–0.8 million EUR	Guidelines, templates, multilingual and accessible formats.
Permanent exchange and cooperation cell between communication services	Soft measure	Continuous (review every 5 years)	OPEX: 1 FTE/year (~0.1 million EUR/year)	Meetings, networking and dissemination of best practices
National communication campaigns	Soft measure	Continuous (review every 5 years)	OPEX: 1–5 million EUR/year	Media campaigns, seasonal messaging (heatwaves, floods).
Translation and accessibility services	Soft measure	Continuous (review every 5 years)	OPEX: 0.3–1 million EUR/year	Multilingual materials, sign language, easy-to-read formats.
Local outreach and partnerships	Soft measure	Continuous (review every 5 years)	OPEX: 0.5–2 million EUR/year	NGOs, community organisations, local intermediaries.
Monitoring and behavioural research	Soft measure	Continuous (review every 5 years)	OPEX: 0.2–0.5 million EUR/year	Surveys, testing, impact evaluation.

Funding/Financing		
	Federal communication budgets; Social Climate Fund; regional co-financing.	
Indicators		
Indicator #1	**Reach of communication campaigns**	**Type:** Output
Description	% population exposed to messages	
Frequency	Annual	
Owner	National Crisis Center (NCCN)	
Data source	Media analytics	
Indicator #2	**Comprehension of messages**	**Type:** Outcome
Description	% population understanding key messages	
Frequency	Periodic (3–5 years)	
Owner	Statbel	
Data source	Feasibility rated as limited by consulted experts. Consider periodic deep-dive surveys (every 3–5 years) rather than annual tracking or develop lighter proxies.	
Indicator #3	**Engagement of vulnerable groups**	**Type:** Outcome
Description	Participation rates of target groups	
Frequency	Annual	
Owner	NGOs	
Data source	Reports	
Indicator #4	**Behavioural change**	**Type:** Impact
Description	Adoption of recommended behaviours	
Frequency	Periodic (3–5 years)	
Owner	Federal/Regional authorities	
Data source	Feasibility rated as limited by consulted experts. Consider periodic deep-dive surveys (every 3–5 years) rather than annual tracking or develop lighter proxies.	
Barriers and Solutions		
Barrier #1	**Low trust in institutions**	**Type:** Social / Cultural / Awareness
Description	In some communities, low or eroded trust in public authorities means official risk communication and adaptation messaging is met with scepticism or simply ignored, especially where past interventions were seen as slow, unclear, or unfair. This significantly reduces the reach and effectiveness of otherwise well-designed communication campaigns.	
Solution	Channel messaging through trusted local intermediaries (community leaders, local associations, frontline social workers) who already have credibility with the target audience, rather than relying solely on top-down institutional	

	communication. Co-creating messages and formats with these communities also increases relevance and buy-in, making people more likely to act on the information received.	
Barrier #2	**Digital divide**	**Type**: Technical / Knowledge and Information
Description	Reliance on digital channels (apps, websites, SMS alerts) to communicate climate risks excludes people without reliable internet access, digital literacy, or a smartphone — often the same groups most vulnerable to climate impacts, such as older or low-income residents. This creates a gap where those most at risk are least likely to receive timely warnings or guidance.	
Solution	Pair digital tools with offline channels — printed materials, door-to-door outreach, community boards, local radio, and in-person briefings — to ensure critical information reaches people regardless of their digital access. Maintaining both channels in parallel, rather than treating offline methods as a fallback, ensures consistent coverage across the whole population.	

Barrier #3	**Fragmented messaging**	**Type:** Organisational / Operational
Description	Federal, regional, and local authorities currently issue risk and adaptation communications independently, sometimes using different terminology, timing, or risk thresholds for the same event. This can produce conflicting or duplicated messages that confuse the public and undermine confidence in official guidance.	
Solution	Establish a central coordination framework that aligns the content, timing, and channels of risk communication across administrative levels before messages are released. This ensures the public receives one consistent narrative, even when multiple authorities are involved in the response.	
Barrier #4	**Lack of standard guidelines**	**Type:** Policy / Regulatory
Description	There are currently no shared guidelines defining what good risk communication should look like (tone, format, accessibility, language requirements), leaving each authority or service to develop its own approach. This inconsistency makes it harder to ensure messaging is clear, inclusive, and reliably understood across the population.	
Solution	Develop federal communication standards setting minimum requirements for clarity, accessibility (including plain language and multilingual versions), and timing of risk communications. Adopting these standards across all levels of government would raise the baseline quality and consistency of messaging, regardless of which authority issues it.	

3.6 Risk to continuity of healthcare systems due to heatwaves and flooding

3.6.1 General

The BCRA identifies heatwaves and flooding as a critical risk to Belgium's health system, impairing access to and the functioning of healthcare facilities through disruptions such as power, cooling, water and transport failures, while driving increases in demand (Technical paper on the risk to human health systems and social care delivery due to climate change).

After a scoping process to determine which aspects of this broad risk should be addressed, it was agreed that the study would focus on hospital continuity. Indeed, the BCRA notes that federated entities have the main responsibility for care for the elderly and people with disabilities, primary healthcare, home care and rehabilitation care. A natural choice is therefore to focus on hospitals, where the federal role is stronger.
Scoping was also performed to identify the continuity dimensions to assess. In fact, various dimensions were identified, which are listed below:

- Infrastructure vulnerability (for example, due to electricity or water cuts, dependence on community infrastructure such as telecoms)
- Service disruption (reduced accessibility of facilities, impacts on patient transport and logistics)
- Workforce impacts (such as absence or reduced availability of staff during heatwaves or floods)
- Supply chain issues (for example, lack of medicines supply)
- Governance and preparedness gaps (fragmented competences, gaps in emergency planning)
- Surges in healthcare demand (e.g., more patients with signs of dehydration in case of heatwave)

After consulting key actors, it was agreed to base the analysis on the following dimensions: workforce impacts, service disruption, supply chain issues.

The identification of possible measures started from the BCRA technical paper, although several reports and scientific literature addressing climate change adaptation of health systems were consulted, as well as national adaptation plans for selected European countries. The measures were adapted to the Belgian context and needs, and refined by stakeholder consultations, making relevant and tailored supporting evidence often scarce.

The following documents were screened for information concerning measures:

- Alfano, Serini and Scaletti, 2024, Addressing heatwave impacts on hospital admissions in an Italian region. https://www.nature.com/articles/s41598-024-79652-0 [100]
- Alho, Oliveira, Viegas and Nogueira, 2024, Effect of heatwaves on daily hospital admissions in Portugal. https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(24)00046-9/fulltext [101]
- BCRA, 2025, Technical Paper Risk to human health systems and social care delivery due to climate change. https://www.cerac.be/sites/default/files/media/files/2025-11/Gezondheid/EN/TP/health_human_health_health_system.pdf [102]
- Borst et al, 2025, Keeping healthcare afloat: protocol for a 5-year multi-site research project into preparedness of healthcare for floods in the Netherlands. https://link.springer.com/article/10.1186/s12961-025-01338-4 [103]

- Connecting Expertise, (n.d.), External consultants: Freelancers vs permanent employee cost comparison. https://www.connecting-expertise.com/nl/blog/external-consultant-freelancers-vs-permanent-employee-cost-comparison-explained [17]
- Consultport, (n.d.), Consulting pricing tool. https://consultport.com/pricing-tool/ [18]
- DailyRate.be. (n.d.). Belgian freelance daily rate benchmark. https://dailyrate.be/en/ [20]
- Development People, (n.d.), Expert guide to consulting fees and per diems. https://www.developmentpeople.com/post/expert-guide-to-consulting-fees-and-per-diems-from-devpeople-recruiters [21]
- European Commission, (n.d.), Methodology for expert fees. https://ec.europa.eu/research/participants/data/ref/h2020/other/experts_manual/methodology-for-expert-fees_en.pdf [23]
- FPS Health, 2019, Plan Forte Chaleur et Pics d'Ozone. https://www.health.belgium.be/fr/themes/sante/aide-medicale-urgente/plans-durgence/plan-fortes-chaleurs-pics-dozone [104]
- German adaptation strategy, 2023 [27]
- NEHAP3, 2023 Plan National d'Action Environnement-Santé 2023–2029. https://www.environnementsante.be/sites/default/files/public/NEHAP3_FR.pdf [71]
- PoshtMashhadi, Ijadi Maghsoodi and Wood, 2025, The impact of extreme temperatures on emergency department visits: a systematic review. https://www.sciencedirect.com/science/article/pii/S0048969725005042?via%3Dihub [105]
- UNIZO, (2024), Freelancers Focus 2024. https://www.startbuddy.be/wp-content/uploads/2024/11/freelancers-focus-2024-101024.pdf [30]
- VITO, Möbius, Sciensano for FPS Health Belgium, 2021, Impact of Climate Change on the Healthcare System in Belgium – Final Report. https://www.atachcommunity.com/fileadmin/uploads/atach/Documents/Country_documents/Belgium_VA_2021_fhs-climate-healthcare-final-report-final.pdf [33]
- WHO Regional Office for Europe, 2021 – Heat and health in the WHO European Region: updated evidence for effective prevention. https://www.who.int/europe/publications/i/item/9789289055406 [37]

3.6.2 Governance aspects

3.6.2.1 Risk prevention and system readiness

3.6.2.1.1 Operational preparedness

Healthcare institutions (hospitals, residential care facilities, emergency services, primary care) are responsible for:

- maintaining continuity of essential medical services during disruptions;
- internal emergency and continuity planning (including staffing, triage, and service prioritisation);
- securing critical dependencies such as **backup power, cooling systems, water supply and medical stock**;
- protecting critical installations, often located in basements, against risks such as flooding.

3.6.2.1.2 Health system standards and surveillance

At federal level, the **Federal Public Service Health, Food Chain Safety and Environment (FPS Health)** provides the **regulatory and coordinating framework** for healthcare preparedness by:

- defining hospital standards and accreditation requirements;
- coordinating national preparedness policies for the healthcare system and ensuring it is integrated into hospital governance;
- ensuring alignment between health-sector preparedness and national risk assessments.

Sciensano, as the federal public health institute, supports preparedness through national health surveillance during extreme events.

3.6.2.1.3 Care organisation and prevention

Preparedness for healthcare continuity is largely implemented by federated authorities responsible for care organisation and prevention:

- **Flanders**: Department Zorg oversees prevention policy, organisation of care and preparedness of healthcare and residential care facilities.
- **Wallonia**: AVIQ (Agence pour une Vie de Qualité) is responsible for prevention, health promotion, organisation and supervision of healthcare and care institutions.
- **Brussels-Capital Region**: responsibilities are exercised by Iriscare and the COCOM for bi-community competences.

Federated authorities also coordinate infrastructure investments and renovation programmes. For climate adaptation (e.g., retrofitting cooling systems), a "dual-key" governance logic applies: regional permits and building subsidies meet federal operational funding (via **RIZIV/INAMI**).

3.6.2.2 Crisis response

3.6.2.2.1 Local and regional disruptions

When extreme weather causes **localised healthcare disruptions**:

- Hospitals activate internal emergency plans (heat protocols, evacuation or relocation, surge management, cancellation of elective care);
- municipalities and provinces manage immediate impacts on access (roads, ambulances...), mobility, emergency logistics (water supply, temporary generators...), coordination with fire services and civil protection and vulnerable populations;
- regional crisis coordination structures support operational response and liaise with healthcare authorities.

3.6.2.2.2 Federal escalation and cross-sector coordination

Healthcare disruptions during extreme weather are rarely isolated and often coincide with **energy, transport, or communication failures**, making federal-level coordination indispensable to manage cascading effects.

When impacts exceed regional capacity, affect multiple regions (or hospitals) or threaten **continuity of essential healthcare services at scale**, coordination escalates to **federal level**:

- the **National Crisis Center (NCCN)** coordinates the overall crisis response, ensuring coherence across sectors (health, energy, transport, civil protection);
- **FPS Health** coordinates healthcare-specific response elements, including capacity monitoring, redistribution of patients if needed, and crisis communication;

- the **Federal Health Inspector** ensures that medical assistance is provided smoothly during disasters and major incidents at the provincial and local level. They supervise hospitals and medical services, coordinates assistance in emergency situations and advises local and provincial authorities such that patients in crisis situations are treated quickly, efficiently and safely. The Federal Health Inspector works with an Incident and Crisis Management (ICM) expert and a Psychosocial Manager (PSM).
- The Risk Management Group (https://www.health.belgium.be/nl/themas/gezondheid/bestrijding-infectieziekten/gezondheidsautoriteiten-crisisbeheer) supports coordinated decision-making between health authorities and relevant stakeholders, facilitating information exchange and assessing risks to public health.

As already mentioned, federal authorities are also responsible for national safety, energy security and civil protection.

3.6.2.3 Recovery and adaptation

After extreme-weather events affecting healthcare continuity:

- damages to healthcare infrastructure and service disruptions are assessed by competent health authorities;
- impacts on access to care and service delivery are analysed;
- lessons learned are fed back into national risk assessments and health-sector preparedness frameworks.

3.6.3 Selection of measures

A detailed methodology regarding the process and associated criteria for the selection of the measures is available in section 2.3 of this report. Moreover, Annex 6 - Risk to continuity of healthcare systems due to heatwaves and flooding includes an overview of the initial list of measures considered, as well as a classification into longlisted measures and measures not taken up further in the study, supported by an explanation of the main points motivating their exclusion from further consideration in the study. In order to agree on which measures to include in the longlist, the initial list was discussed with DG Preparedness and Response (DGP-R). More details on the survey are available in section 3.6.4. The annex also shows the information produced for the longlisted measures.

The following measures are described in detail in subsequent sections:

- Develop targeted alert systems for hospitals
- Provide guidance for hospitals to train their workers for heat and flood emergencies
- Provide hospitals with guidance on protecting essential medical supply autonomy during heatwaves and floods

The measures on the shortlist were further elaborated following the methodology described in sections 2.3 to 2.5.

As mentioned in section 2.3.3 ***the selection and the description of the shortlisted measures do not imply any decision or commitment to implementation of the measures***.

3.6.4 Survey results

The three shortlisted measures with their extended descriptions were submitted to the stakeholders for their feedback and input (see 2.6). The survey was sent to about 30 stakeholder representatives from a broad group of actors across levels. Responses were received from four stakeholder representatives for both the first and the second measure. One

stakeholder representative started filling in the survey for the third measure but did not complete it, resulting in limited insights.

Table 12: Number of responses for each of the measures

Measures	Number of responses
Develop targeted alert systems for hospitals	4
Provide guidance for hospitals to train their workers for heat and flood emergencies	4
Provide hospitals with guidance on protecting essential medical supply autonomy during heatwaves and floods	1

As a summary, below are the overall ratings of measures as gathered in the survey.

Measures	Overall rating votes
Develop targeted alert systems for hospitals	Highly useful/necessary 50.0% Useful/necessary 25.0% Potentially useful/necessary 25.0%
Provide guidance for hospitals to train their workers for heat and flood emergencies	Highly useful/necessary 75.0% Useful/necessary 25.0%
Provide hospitals with guidance on protecting essential medical supply autonomy during heatwaves and floods	No overall rating provided

Based on the responses, the measures were further fine-tuned. The **final results** of this process are shown in the following sections.

During the survey, stakeholders were asked whether they would like to propose additional federal adaptation measures. One suggested measure is reported below.

Specialty-specific training programmes should be developed to address the health impacts of climate change. For example, gynaecologists could receive training on how climate change affects maternal [health], or dermatologists and infectious disease specialists could be trained on conditions such as vector-borne diseases. There should be an emphasis on secondary prevention (early detection and identification of new health issues).

3.6.5 Proposed measures

3.6.5.1 Develop targeted alert systems for hospitals

Context	Several alert systems are already in place for weather and civil protection emergencies. For example, BE-Alert is designed to notify the general population and municipalities during urgent situations. However, it does not provide sector-specific operational guidance for hospitals. Meteorological warnings issued through the Royal Meteorological Institute (RMI) provide important hazard information, but do not translate it into operational implications for hospitals. In parallel, the National Ozone and Heat Plan includes an alert phase, during which healthcare institutions can be requested to put in place protective measures. The presence of this tool means the proposed measure should not start from scratch but rather build on this existing alert system. It will develop a more operational layer for hospitals, providing targeted guidance based on the type and intensity of the hazard, not only focusing on health risks but also infrastructure-level vulnerabilities such as cooling system failure, internal logistics disruptions or access constraints. Moreover, the measure suggests adding a flooding component to the alerting system. While this component is not to be integrated within the scope of the Ozone and Heat Plan, it seems relevant to extend the alerting system developed for heatwaves into a multi-hazard tool comprising flooding. In practice, the proposed elaboration of the heat-related component can be explored during the next revision of the Ozone and Heat Plan, while the flooding component is to be developed as a complementary alert stream. As climate change exacerbates, and heatwaves and flooding become more frequent and intense, there is a growing need to better protect hospitals against these events which may disrupt their operations, when possible, by strengthening and complementing existing systems. While the measure focuses on hospitals due to the federal nature of the present study, other healthcare facilities under regional competence such as nursing homes or primary care structures face similar vulnerabilities. These would therefore benefit from being integrated into the proposed system.
Objective	Provide hospitals with earlier, more precise warnings about imminent heatwave or flooding events to enable timely protective and operational measures.
Description	This measure strengthens existing alerts by adding a more operational layer and extending the scope to include flooding hazards. It is operated at the federal level and provides hospitals with earlier and more detailed warnings for heatwaves and floods compared to generic population alerts. The alert system builds on existing national alert infrastructures such as meteorological warnings and the alerting system developed as part of the National Ozone and Heat Plan. It is crucial that it is anchored within existing governance frameworks, encompassing both general

	crisis management and health crisis coordination mechanisms. It should therefore be aligned with structures under the authority of the NCCN, provincial governors, the 112 emergency call centres, as well as with health sector governance arrangements. It targets designated hospital contact points and warns of expected impacts on critical functions like cooling capacity, emergency care pressure, staff availability, and continuity of essential services. Moreover, the alert indicates the types of measures that the hospitals should take in order to protect their operations (for example, displacing medicines to upper floors). To make the alert operational, the federal authorities work with health, civil protection, and meteorological services to define hospital-specific thresholds, set standardised alert formats, and align the tool's use with existing hospital emergency preparedness procedures. It would be unrealistic to claim that the proposed measure will provide personalised recommendations for individual hospitals, since climate impacts, especially with regards to floods, are highly context and location specific. They depend on the local infrastructure, hospitals' exposure and their previous preparedness efforts. Instead, the alert system focuses on translating hazard levels into standardised associated response options. Hospitals are responsible for taking appropriate actions in line with their risk assessment and emergency plans. The DG Preparedness and Response of FPS Health is exploring potential solutions for establishing a direct communication channel with hospitals in crisis situations, within the context of the CER legislation and the designation of hospitals as critical entities. This channel could complement the proposed measure, as it would aim to facilitate information exchange and coordination, without constituting a formal alerting mechanism based on predefined thresholds or standardised operational recommendations.
Federal competences	• Emergency communication systems and civil security • Hospital standards and emergency preparedness obligations • Coordination of health crisis management • Meteorological warnings
Interfederal aspects	Interfederal coordination is required for the revision of the alert in the National Ozone and Heat Plan, as well as the alignment with regional environmental and health agencies (such as Vivalis, Department Zorg or AVIQ) on thresholds and operational triggers. The involvement of the Risk Assessment Group (RAG) and Risk Management Group (RMG) is also required to ensure consistency with existing health crisis governance mechanisms. Moreover, regions can provide knowledge and relevant studies or risk analysis results.
Effectiveness	High, if the alert is sent at a relevant time and contains actionable recommendations in line with the expected impacts. A limitation to consider is that no fully tailored, hospital-specific recommendations are to be sent. Co-benefits include

	improved crisis coordination within the hospital resulting in increased trust and reduced stress among both workers and patients.
Responsible	FPS Health – DGP-R, with strong interfederal component (involvement of CIMES and regional health agencies).
Other actors / stakeholders involved / transversal aspects	• Interministerial Conference on Environment and Health (CIMES), in particular the CIMES Working Group on Ozone and Heatwaves, for alignment with the National Ozone and Heat Plan and its future revisions • Vivalis, Department Zorg, AVIQ • Risk Assessment Group (RAG) and Risk Management Group (RMG) • National Crisis Center if the hospital-specific alert is to be integrated with Be-Alert • Royal Meteorological Institute for the weather-related threshold setting • Sciensano for the health-risk interpretation of the RMI data • NEHAP working group The Ozone and Heat Working Group serves as a coordination platform bringing together relevant stakeholders involved in the management of ozone and heat-related risks in Belgium and operates as a project management structure. However, the Ozone and Heat Working Group, the NEHAP, and the CIMES are not crisis management bodies and are not mandated to issue alerts. The issuance of alerts remains the responsibility of the competent authorities, depending on the phase of the crisis. These authorities are responsible for disseminating alerts, communication, and recommendations through their respective channels.
Time horizon	Short term development (2-3 years), followed by ongoing operation.
Need for transformative change	No
Points of attention: gender, equitability, risk of maladaptation	• Beware of not ‘over-alerting’ (repeatedly sending alerts for events that do not result in a tangible impact on hospital operations), as hospitals may not pay attention to the alerts anymore. • Hospital workers should be trained to respond to these alerts and know how to operationalise the recommendations. • Resilience plans need to be in place irrespective of alerts. Hospitals should have critical infrastructure already safeguarded against extreme events.

Costs				
	Type	**Lifetime**	**Costs**	**Reflections on costs**
Policy design	Soft measure	One-off	Personnel costs covered by regular responsibilities of federal staff.	Includes policy scoping, coordination across various federal services (such as FPS Health and RMI), meetings with hospital representatives. As part of this study, it was agreed to not estimate costs incurred as part of staff regular responsibilities.
Development of thresholds	Soft measure	One-off, requires periodic update	32,000 EUR	Development of hospital-relevant weather-related thresholds (heat, rain, river levels, etc.) and translation into operational risk (cooling failure, access issues etc). It is assumed this task is undertaken by external experts. The number of days required depends on the expertise available at the federal level but is estimated to be 40 days. While finding relevant evidence of expert rates proved challenging, various sources point to a range of 400-1,000 EUR/days for hiring a consultant depending on experience (European Commission, n.d.; Development People, n.d.; UNIZO, 2024; Consultport, n.d.; DailyRate.be, n.d.; Connecting

				Expertise, n.d.). The present calculation uses a figure of 800 EUR.
Adaptation of existing alert infrastructure	IT measure	One-off and ongoing maintenance	Cost could not be estimated	Adaptation of the Ozone and Heat Plan alert infrastructure
Funding/Financing				
	Federal budget to be used for the regular employees' costs, as well as any external technical input costs and the update of the alerting infrastructure.			
Indicators				
Indicator #1	**Hospital-specific alert system operational**		**Type**: Output	
Description	Existence of an alert stream specifically designed for hospitals that translates meteorological and civil protection warnings into hospital-relevant operational information.			
Frequency	Once (with ad hoc updates if the system is modified)			
Owner	FPS Health in coordination with civil protection and meteorological services			
Data source	Administrative records, system deployment			
Indicator #2	**Share of hospitals activating internal preparedness measures following an alert**		**Type**: Outcome	
Description	Percentage of hospitals that report activating predefined preparedness or protective measures (e.g., equipment relocation, staff adjustments) after receiving a targeted alert. This indicator enables to monitor hospital responsiveness following an alert, rather than evaluating the functioning of the alerting system itself.			
Frequency	Annual			
Owner	Hospitals			
Data source	Emergency plan activation logs			
Indicator #3	**Hospital satisfaction with relevance and usability of alerts**		**Type**: Outcome	
Description	Degree to which hospitals consider the targeted alerts clear, timely, and operationally useful for decision-making during heatwave or flooding events.			
Frequency	Annual			
Owner	FPS Health			
Data source	Hospital survey			

Barriers and Solutions		
Barrier #1	**Alert fatigue due to excessive or poorly targeted warnings**	**Type**: Organisational / Operational
Description	Receiving too many alerts, or alerts that are not sufficiently targeted and relevant, means there is a risk of alert fatigue. As a result, staff may pay less attention to warnings over time, therefore reducing the system's effectiveness.	
Solution	It is important that hospital-specific thresholds are carefully studied, to ensure alerts are issued only when they have a clear operational relevance. Moreover, alerts should be concise and actionable. There is a need for alignment with successful alert systems, building on good practices in terms of threshold and process controls used in the Ozone and Heat alert system.	
Barrier #2	**Insufficient integration into existing emergency planning frameworks**	**Type**: Organisational / Operational
Description	Even though alerts provide earlier and more operationally relevant information, hospitals should be adequately prepared to take action, in order to maximise the system's impact.	
Solution	Parallel actions need to take place at the hospital level as part of emergency plans, such as pre-defining procedures following alerts, training staff, and allocating responsibilities, so that the early warnings can translate into timely protective actions.	

3.6.5.2 Provide guidance for hospitals to train their workers for heat and flood emergencies

Context	Hospitals are required to maintain emergency plans. These require staff to undergo regular training related to safety, evacuation, and crisis response. However, heatwaves, floods, and climate-induced disruptions such as mobility problems, equipment overheating or temporary staffing shortages are not systematically integrated into current training practices. The growing impact of extreme weather on the health sector is acknowledged. However, no detailed guidance on how hospitals should translate these risks into staff training is available nationally. This means hospitals develop their own approach based on their resources, priorities, and level of awareness. This can lead to uneven levels of preparedness across the country. Therefore, this measure fills that gap by ensuring that all hospital workers receive structured, sector- and climate-specific emergency training that prepares them for heatwaves, floods, and any associated operational disruptions.
Objective	Ensure hospital staff can effectively respond to heatwaves, floods, and related disruptions, including situations where the team is reduced due to colleagues being unable to (come to) work.
Description	The measure consists of developing federal guidance supporting hospitals in the design and delivery of heatwave- and flood- related training for their staff. This guidance provides a common reference for all Belgian hospitals, and is intended to be incorporated in their emergency plans. It serves as a baseline that hospitals can adapt to their infrastructure, risk profile, and available resources. This ensures that climate-related risks are systematically integrated into existing emergency preparedness and continuity training. The guidance outlines the core competences hospital staff should acquire for responding to a flood or heatwave-related crisis. It also sets the minimum elements to be covered in training sessions. The content should include, for example: • protocols for protecting vulnerable patients or critical elements (such as pharmacy stocks), • contingency plans for staff shortages due to access or mobility problems, • internal communication management during climate-related incidents. Moreover, the measure should strengthen staff preparedness and awareness regarding their access to the workplace during flooding events. This is done by including clear behavioural and organisational procedures outlining how staff should act if their usual access route is disrupted, as well as anticipatory planning to ensure adequate staffing levels during such emergencies.

	The guidance further recommends that hospitals communicate with the competent regional authority responsible for waterways, to better understand potential water levels and their impact on hospitals, including consequences for access routes and staff mobilisation.
Federal competences	The federal level cannot mandate hospitals to organise these trainings. However, it can issue guidance to hospitals, as it has competence for aspects of the crisis preparedness framework and related tools used by hospitals.
Interfederal aspects	The implementation of the training is the responsibility of hospitals. In addition, federated entities are also relevant for the territorial and operational aspects of the measure. Indeed, hospitals operate under federated recognition, and the training relies on regional input in terms of data (flood risk management, regional mobility, spatial planning and hospital exposure data). The use of this regional data enables the training to be adapted to local conditions.
Effectiveness	• Increased workforce readiness and reduced stress during events • Improved patient safety and quality of care
Responsible	FPS Health – DG Preparedness and Response
Other actors / stakeholders involved / transversal aspects	Other members of the Hospital Emergency Plan Working Group, on top of FPS Health – DG Preparedness and Response, should be involved in the development of this measure. They include representatives of the federated entities (AVIQ, Vivalis, Department Zorg), whose involvement is essential to ensure alignment. Expertise is also required from NCCN on crisis management, FPS Mobility and Transport regarding staff access, as well as regional authorities, including regional waterways or mobility authorities, which are responsible for providing relevant data for the training.
Time horizon	Short term development of the guidance (0-2 years), with integration by hospitals in the medium term, and an ongoing use and periodic updates on the longer term.
Need for transformative change	No
Points of attention: gender, equitability, risk of maladaptation	This training will need to be integrated within existing programmes to reduce training overload and avoid adding to staff workload. It should be delivered to all staff categories, not only to clinical staff, since other employees, such as cleaning or security staff play a critical role in maintaining operations. This is particularly relevant as the high workload faced by healthcare staff limits their ability to participate in additional training. Moreover, introducing additional training can impose a cost for hospital, both in financial terms and because it temporarily leads to fewer staff members being available to work on the days the training takes place.

Costs				
	Type	**Lifetime**	**Costs**	**Reflections on costs**
Policy development	Soft measure	One-off	Personnel costs covered by regular responsibilities of federal staff. As part of this study, it was agreed to not estimate costs incurred as part of staff regular responsibilities.	Includes researching content and drafting the guidance, as well as coordinating between various federal and non-federal institutions (hospitals, regional authorities).
Technical and expert input	Soft measure	One-off	48,000 EUR	Includes mobilising external expertise, if necessary, for example, on hospital continuity planning, workforce resilience or emergency training specificities. The number of days depends on the expertise already available internally but is estimated at 60 days. While finding relevant evidence of expert rates proved challenging, various sources point to a range of 400-1,000 EUR/days for hiring a consultant depending on experience (European Commission, n.d.; Development People, n.d.; UNIZO, 2024; Consultport, n.d.; DailyRate.be, n.d.; Connecting Expertise, n.d.). The present calculation uses a figure of 800 EUR.

Downstream costs	Soft measure	Recurrent	Not estimated	As a result of the measure, hospitals will have to allocate human resources to adapt their processes and deliver the associated training, as well as coordinate with regional authorities. Regional authorities will also be contacted for input by the federal services for the policy development.
Funding/Financing				
	Primarily federal budget (FPS Health), for both the regular operations (employee costs) and external technical input. The measure could be discussed within CIMES to explore shared responsibilities and possible cost-sharing with federated entities.			
Indicators				
Indicator #1	**Guidance document completion**		**Type**: Output	
Description	Guidance published with core modules: heatwave response, flood response, staff shortage/mobility disruption, vulnerable patient protection, critical supplies/equipment protection, internal communications.			
Frequency	Once, with periodic updates			
Owner	FPS Health			
Data source	Federal system records/link to the guidance			
Indicator #2	**Waterway authority liaison established**		**Type**: Output	
Description	Share (%) of hospitals in flood-exposed areas with a named contact point and procedure for obtaining water level forecasts and access-route implications from the competent regional waterway authority.			
Frequency	Annual			
Owner	Hospitals and regional authorities, aggregated federally			
Data source	Hospital surveys			
Indicator #3	**Coverage of climate-specific training**		**Type**: Outcome	
Description	Share (%) of hospital staff who completed climate-emergency-related training within the last 12 months.			
Frequency	Annual			
Owner	Hospital training department			
Data source	Training registers			

Barriers and Solutions		
Barrier #1	**Fragmented knowledge availability across authorities**	**Type**: Organisational / Operational
Description	The knowledge needed to develop the guidance is distributed across various entities, such as federal health authorities, crisis management centres or regional authorities responsible for flood risk, waterways or mobility. Therefore, producing the guidance requires coordination and agreement.	
Solution	Establish a coordination arrangement to consolidate the available knowledge. This can be done via designating a lead federal authority responsible for drafting the guidance while setting up a targeted inter-authority working group. The CIMES, as well as regional health authorities should be consulted for input.	

3.6.5.3 Provide hospitals with guidance on protecting essential medical supply autonomy during heatwaves and floods

Context	A number of emergency planning requirements are already in place, however, current guidance in Belgium does not sufficiently address the specific risks that heatwaves and flooding pose to the continuity of essential medical supplies in hospitals. Extreme events can compromise sensitive medicines, medical gases, and blood products, either due to temperature sensitivity or storage issues. Despite individual hospitals' preparedness efforts, there is no harmonised national guidance tailored to vulnerabilities related to medical supply autonomy during climate-related disruptions. This leaves a gap in ensuring consistent minimum protection of essential materials across the hospital system, which can be addressed by the present measure.
Objective	Secure uninterrupted care by ensuring hospitals can protect essential supplies such as temperature-sensitive products.
Description	This measure focuses on increasing the capacity of hospitals to maintain autonomy over essential medical supplies. It consists of developing clear, practical guidance that supports hospitals in identifying, safeguarding, and managing the supplies that are essential for the continuity of care. This enables hospitals to be more resilient when external supply chains are disrupted or when on-site infrastructure is compromised. The guidance outlines recommended approaches for ensuring several days of operational autonomy. This includes: • Advising on the maintenance of backup stocks of drinking water, medical gases, and essential medicines. • Providing criteria for the safe and compliant storage of essential materials (e.g., advising against storing life-saving supplies in flood-prone areas such as basements). • Clarifying requirements and good practices for protecting products that can degrade under high temperatures, such as vaccines or blood derivatives. • Providing recommendations on temperature monitoring or emergency power supply considerations. The guidance further recommends the use of national or regional flood risk maps to identify hospitals and storage areas exposed to flooding. Based on these maps, priority prevention measures can be defined for the most vulnerable hospitals, such as relocating critical storage, reinforcing infrastructure, or ensuring additional backup capacity, in alignment with the federal-level guidance.

	As a result, the measure helps hospitals prepare for potential delivery interruptions during extreme events or establish internal procedures to activate emergency stocks when thresholds are reached.
Federal competences	The development and issuance of the guidance build on existing federal responsibilities in public health preparedness, emergency planning, and coordination of medical supply security.
Interfederal aspects	Interfederal cooperation is needed, in particular with regional crisis management authorities and hospital pharmacy networks, to ensure that the guidance reflects existing arrangements for emergency logistics. Coordination is necessary to identify any regional vulnerabilities and align the use of climate risk information to ensure consistency with regional preparedness and response frameworks.
Effectiveness	• Provides a harmonised baseline of practical recommendations for hospitals. • Reduces fragmentation in preparedness practices, supporting risk-based prioritisation of resilience investments by identifying hospitals most vulnerable to flooding and heatwaves. • Improves consistency in how essential medical supplies are protected during heatwaves and floods.
Responsible	FPS Health – DG Preparedness and Response
Other actors / stakeholders involved / transversal aspects	• National Crisis Center for consistency on emergency response coordination and crisis preparedness. • Federal Agency for Medicines and Health Products (FAMHP) for technical recommendations on storage, handling, and temperature sensitivity of specific medicines and medical products. • Federated healthcare authorities (AVIQ, Departement Zorg, Vivalis) to align with regional healthcare preparedness policies. • Hospital pharmacy networks to understand supply chain vulnerabilities and mutual support mechanisms between hospitals. • Regional crisis centres, for integration with regional emergency logistics.
Time horizon	The development and issuance of the guidance take place in the short term (within the first two years), with impacts materialising in the short to medium term, while remaining relevant over the long term through periodic updates as climate and supply risks evolve.
Need for transformative change	No
Points of attention: gender, equitability, risk of maladaptation	• Risk of supplies expiring if hospitals build large emergency stocks without stock rotation. • Potential need for new infrastructure to ensure the safe storage and protection of essential medical supplies. • Need to recognise that the present measure reduces disruptions at the hospital level but does not replace the need for resilience in the overall supply chain.

Costs				
	Type	**Lifetime**	**Costs**	**Reflections on costs**
Policy drafting and development	Soft measure	One-off per review cycle	Personnel costs covered by regular responsibilities of federal staff. As part of this study, it was agreed to not estimate costs as part of staff regular responsibilities.	Includes drafting the guidance, coordinating internally across the various actors involved (FPS Health, NCCN, FAMHP), and consulting stakeholders (e.g. hospital federations).
External technical expertise	Soft measure	One-off per review cycle	48,000 EUR	Includes contracting the expertise needed to ensure the guidance is practical and grounded in both climate change and hospital realities. It can involve contracting climate risk, medical, or pharmaceutical experts to derive actionable insights on relevant risks and associated recommended actions. This is estimated at 60 days of work. While finding relevant evidence of expert rates proved challenging, various sources point to a range of 400-1,000 EUR/days for hiring a consultant depending on experience (European Commission, n.d.; Development People, n.d.; UNIZO, 2024; Consultport, n.d.; DailyRate.be, n.d.; Connecting Expertise, n.d.).

				The present calculation uses a figure of 800 EUR.
Downstream costs	Soft measure	One-off per review cycle	Not estimated	Includes the time non-federal stakeholders (hospital representatives or federations) spend in the consultation process. As a result of the guidance, hospitals will also update their processes and may need to purchase additional material, resulting in both staff time and capital costs.
Funding/Financing				
	Federal budget, for both the regular employee costs and external technical input.			
Indicators				
Indicator #1	**Federal guidance on medical supply autonomy published**		**Type**: Output	
Description	Existence and official publication of federal guidance addressing hospital autonomy for essential medical supplies under heatwaves and flood conditions.			
Frequency	One-off			
Owner	FPS Health			
Data source	Official records/website			
Indicator #2	**Hospitals applying climate-resilient storage practices**		**Type**: Outcome	
Description	Share (%) of hospitals that have adjusted storage locations or conditions for essential supplies to reduce flood or heat exposure (e.g., avoiding storing in basements, monitoring temperature in storage rooms).			
Frequency	Annual			
Owner	Data from hospitals, aggregated by FPS Health			
Data source	Surveys			

Barriers and Solutions		
Barrier #1	**Ambiguity of federal steering role**	**Type**: Institutional and Governance
Description	The federal level may have limited authority beyond issuing non-binding guidance, reducing its ability to steer consistently.	
Solution	Position the guidance as a reference document for hospital emergency plans, rather than a stand-alone document. Clarify the federal role as coordinating and setting minimum expectations, without creating binding obligations.	
Barrier #2	**Uneven technical capacity across hospitals**	**Type**: Organisational / operational
Description	Smaller hospitals may find it harder to dedicate human and financial resources to applying the guidance, leading to variable levels of implementation among hospitals.	
Solution	Ensure the guidance is highly operational, focusing on clear recommended practices that hospitals can apply directly, while remaining flexible to adapt to hospitals' local conditions.	

3.7 Risk to transport infrastructure due to extreme weather

3.7.1 General

Belgium's transport infrastructure — encompassing roads, railways, inland waterways, ports, and air transport — is increasingly exposed to climate-related hazards, including extreme heat, drought, and flooding. The BCRA identifies these as compounding risks with cascading consequences: heatwaves cause thermal expansion in rail tracks and airport runways and reduce the load-bearing capacity of underground structures; prolonged drought lowers river levels, restricting inland navigation; flooding damages infrastructure, disrupts operations across interconnected networks, and generates recovery costs extending over months or years. The 2021 floods in Belgium caused an estimated 30–62 million EUR in railway damage alone — illustrating both the severity of direct impacts and the potential for rapid propagation across dependent systems and sectors.

Vulnerability is spatially concentrated and varies significantly by mode and location, with infrastructure siting playing a central role in exposure. Despite growing operator awareness, the systematic assessment of climate risks at individual critical sites remains uneven across the transport sector, limiting the ability to prioritise and plan targeted adaptation measures.

3.7.2 Selection of measures

Federal competences regarding transport cover national airports and railways. Given that climate adaptation measures for railway transport have been studied extensively by SNCB/NMBS and Infrabel in the context of their own adaptation plans, it was agreed with FPS Health to focus this risk on aviation infrastructure.

In consultation with FPS Mobility and Skeyes, one measure has been identified for further elaboration in this study: Conducting systematic climate stress tests for each critical site.

As this risk is treated as an additional risk within the scope of this study (see section 2.2), it was not processed through the stakeholder survey. However, the proposed measure was discussed specifically with Skeyes to verify its technical accuracy, relevance, feasibility, and consistency with current operational practices. **As mentioned in section 2.3.3, the selection and the description of shortlisted measures do not imply any decision or commitment to implementation** — Skeyes' participation and input served solely to inform and refine the assessment and should not be interpreted as an endorsement or commitment to implement the proposed measure.

3.7.3 Proposed measures

3.7.3.1 Conducting systematic climate stress tests for each critical site

Context	Aviation infrastructure is exposed to a range of climate hazards — including extreme heat, flooding, lightning strikes, and power instability — that can affect operational continuity. Skeyes, responsible for air navigation services in Belgium, operates business continuity plans and redundant infrastructure. Current known vulnerabilities include cooling system stress during heatwaves and isolated exposure of navigation beacons to flooding. While existing measures address these risks reactively, no formal climate adaptation analysis or systematic site-level vulnerability assessment is currently in place across Skeyes' critical operational infrastructure.
Objective	Develop and apply a repeatable internal methodology for assessing the climate sensitivity of Skeyes' critical sites, enabling systematic monitoring, prioritisation of vulnerabilities, and evidence-based investment planning.
Description	This measure consists of conducting systematic climate stress tests across Skeyes' critical sites. For each site, the assessment covers exposure to relevant climate hazards (extreme heat, flooding, drought, lightning, storm events) and evaluates the sensitivity of critical systems — cooling infrastructure, power supply, navigation beacons, data connections, and physical structures. Results are used to prioritise vulnerabilities, inform adaptation investments, and strengthen integration of climate risks into existing business continuity plans. The methodology is designed for internal use, avoiding the need to share confidential infrastructure data with external parties. Once established, the framework enables periodic reassessment as climate projections evolve. The approach can draw on existing sectoral guidance, notably EUROCONTROL's guidelines on climate change adaptation for air navigation service providers [106], which provide a practical framework for site-level climate risk assessment applicable to the Belgian context.
Federal competences	National airports and air navigation services.
Interfederal aspects	/
Effectiveness	Dependent on: • Availability of sufficiently granular climate projections for site-level assessment. • internal capacity within Skeyes to develop and apply the methodology. • effective integration of results into investment planning and business continuity processes.
Responsible	Skeyes
Other actors / stakeholders involved / transversal aspects	• RMI • FPS Mobility and Transport

Time horizon	24 months: • Year 1: Development of internal stress test methodology; baseline assessment of all critical sites • Year 2: Prioritisation of vulnerabilities; integration into business continuity plans; definition of investment roadmap			
Need for transformative change	N/A			
Points of attention: gender, equitability, risk of maladaptation	*Risk of maladaptation: Over-investment in individual* site hardening without accounting for evolving climate projections — the methodology should be designed for periodic update to avoid locking in assumptions based on current climate data only.			
Costs				
	Type	**Lifetime**	**Costs**	**Reflections on costs**
Methodology development	Soft measure	Short-term (0–2 years)	OPEX: 0.1–0.4 million EUR	External consultancy required given specialised nature of climate stress testing for aviation infrastructure. Key cost drivers: scoping and framing of the methodology; selection and downscaling of relevant climate scenarios in coordination with RMI; definition of hazard parameters per infrastructure type (heat thresholds for cooling systems, flood return periods, wind and lightning loads); documentation and internal validation. Assumes 80–150 consultant-days at 1,500–2,500 EUR/day.
Site-level assessments	Soft measure	Short-term, then recurring (0–2 years, updated every 4–6 years)	OPEX: 0.1–0.3 million EUR (initial round)	Assumes 3 core sites under federal scope (Brussels Airport main site, Bertem radar station, Saint-Hubert radar station). Per-site assessment estimated at 20–40 consultant-days including on-site data collection, exposure mapping, hazard analysis and vulnerability ranking. At 1,500–2,500 EUR/day, this yields

				approximately 30,000–100,000 EUR per site. If extended to regional airport towers, costs would increase proportionally (up to 8 sites, estimated 0.2–0.8 million EUR in total). Update cycles are expected to be significantly cheaper once the methodology is established.
Integration into business continuity plans	Soft measure	Short-term (1–2 years)	OPEX: <10,000 EUR	Internal exercise requiring limited dedicated staff time. Key cost drivers: facilitation of internal workshops to translate stress test outputs into continuity plan revisions; drafting of updated procedures; staff briefing. Estimated at 10–20 person-days of internal A2-level staff time (fully loaded daily rate ~210–310 EUR/day based on 2026 Belgian public pay scales), yielding a total of approximately 2,000–6,000 EUR in internal staff costs. Marginal external costs possible if a formal legal or procedural review of the updated continuity framework is required.
Funding/Financing				
	Internal Skeyes budget (operational and investment planning). EU funding may be relevant via the Connecting Europe Facility (CEF) transport strand.			
Indicators				
Indicator #1	**Climate stress test methodology developed and adopted** | **Type:** Output			
Description	Formal adoption of a documented, repeatable climate stress test methodology applicable to all Skeyes operational sites, covering relevant hazards (heat, flooding, lightning, wind) and infrastructure types.			
Frequency	Once (updated as needed following significant changes in climate projections or infrastructure)			
Owner	Skeyes, under oversight of FPS Mobility and Transport			
Data source	Internal Skeyes documentation; management contract reporting, subject to the integration of climate adaptation requirements into the management contract as proposed under Barrier #3.			

Indicator #2	**Share of operational sites assessed**	**Type:** Output
Description	Share (%) of Skeyes operational sites for which a climate stress test has been completed and documented.	
Frequency	Once for initial round; then aligned with update cycle (every 4–6 years)	
Owner	Skeyes	
Data source	Internal Skeyes assessment reports	
Indicator #3	**Integration of stress test results into business continuity plans**	**Type:** Outcome
Description	Evidence that climate stress test findings have been translated into updated business continuity plans, including identification of priority vulnerabilities and associated adaptation measures.	
Frequency	Once following completion of initial site assessments; then per update cycle	
Owner	Skeyes, under oversight of FPS Mobility and Transport	
Data source	Updated business continuity plans; internal audit or management contract reporting	
Barriers and Solutions		
Barrier #1	**Limited internal climate expertise**	**Type:** Technical / Knowledge and Information
Description	Skeyes does not currently have dedicated climate adaptation expertise internally. Developing and applying a rigorous stress test methodology requires specialised knowledge of climate projections, hazard assessment and infrastructure vulnerability analysis that is unlikely to be available in-house.	
Solution	Commission external consultancy support for methodology development and initial site assessments, while building internal capacity progressively. Draw on EUROCONTROL's guidance on climate adaptation for air navigation service providers [106] as a methodological reference.	
Barrier #2	**Confidentiality constraints on infrastructure data**	**Type:** Institutional / Governance
Description	Skeyes' operational sites contain sensitive infrastructure whose detailed vulnerability data cannot be shared externally. This limits the ability to involve external parties in the assessment process beyond a tightly controlled scope.	
Solution	Design the stress test methodology for internal use from the outset, with clearly defined protocols for handling sensitive data. External consultants involved in methodology development or site assessments should operate under strict confidentiality agreements.	
Barrier #3	**Absence of regulatory obligation**	**Type:** Policy / Regulatory
Description	No formal regulatory requirement currently obliges Skeyes to conduct systematic climate stress tests or to integrate climate adaptation into its business continuity plans. Without a regulatory driver, the measure depends entirely on internal prioritisation, which risks being deprioritised against operational demands.	
Solution	Integrate a requirement for systematic climate vulnerability assessment into Skeyes' management contract with the federal government, providing a formal mandate and accountability mechanism without requiring new legislation.	

3.8 Risk to food safety due to climate impacts on global supply chains

Climate-driven food safety risks linked to disruptions in global agricultural production are, by their very nature, transboundary and supply-chain driven, which makes the European Union the primary and most effective governance level for addressing them. The BCRA stresses that the mechanisms through which climate change affects food safety, such as increased pathogen proliferation, mycotoxin contamination, chemical residues, cold chain failures during heatwaves, and degraded water quality in exporting regions, originate largely outside Belgium's borders and propagate through international trade flows over which Member States have limited unilateral influence. These hazards fall squarely within the scope of EU-level instruments such as the General Food Law, European Food Safety Authority's (EFSA) scientific risk assessments, and the Rapid Alert System for Food and Feed (RASFF), which collectively form a harmonised regulatory and surveillance architecture designed to govern the safety of imported products across the single market. The BCRA explicitly notes that while this EU framework is strong, it is not yet fully adapted to emerging climate-driven hazards, particularly concerning incomplete monitoring of new pathogens, global contaminant patterns, and climate sensitive supply chain vulnerabilities, highlighting the structural need for EU wide reform and enhanced anticipatory capabilities.

Because these challenges exceed the regulatory reach and diplomatic leverage of any single Member State, it is appropriate that **Be-Adapt does not analyse this risk in depth**, as Belgium cannot independently redesign monitoring systems, impose climate conditional import requirements, or expand surveillance of third country production environments. These tasks require EU scale coordination, legislative adaptation, and shared surveillance infrastructure. Nevertheless, it remains useful for Belgium to explore complementary strengthening measures, such as enhancing national surveillance for climate-sensitive hazards, reinforcing domestic cold chain resilience during heatwaves, and refining risk-based import controls, to ensure that national preparedness evolves in parallel with EU level reforms. These measures do not replace European action, but they can significantly increase Belgium's resilience while the core of this risk continues to be governed at the EU level.

3.9 Risk of internal displacement of people due to flooding

3.9.1 General

Climate change is increasingly causing temporary internal displacement in Belgium, primarily due to flooding, and may in the longer term necessitate planned internal relocation in areas that become structurally uninhabitable.

The 2021 floods demonstrated that Belgium has strong reactive systems — crisis management, social assistance, insurance — but also revealed the absence of an anticipatory policy framework that structurally integrates human mobility into climate adaptation.

Based on our analysis, drawn on the BCRA and the International Dialogue on Migration (IOM) event of 25 December 2025 in Brussels, the main gaps are:

- fragmented governance across policy levels;
- absence of explicit integration of internal displacement and relocation in adaptation plans;
- lack of data, indicators and risk trigger points;
- insufficient coordination between emergency planning, housing and social services.

The challenge is not a lack of capacity, but a lack of anticipatory planning and coordination.

International sources on climate-related migration further underscore the need for:

- international development cooperation, regional and local policy focus — given that current cycles of displacement-and-return migration take place locally;
- investment in knowledge and data, as current projections of climate migration flows vary widely, making policy planning difficult.

In summary:

- Belgium has strong reactive systems but lacks anticipatory planning around internal displacement;
- Human mobility must be recognised as a structural adaptation theme, not merely a crisis phenomenon.
- Investing in data, planning and inclusive guidelines will increase protection of citizens, efficiency of crisis management, and social equity.

3.9.2 Governance aspects

Governance of climate-related displacement in Belgium is a complex interplay of federal and regional competences, combining federal responsibility for framework-setting and crisis coordination, regional competences over housing, spatial planning and local emergency response, and municipal responsibility for direct population support.

The federal government has an indispensable framework-setting and coordinating role across the following policy domains: climate adaptation; crisis management; social protection; mobility; housing; and equal opportunities.

Its core responsibilities include:

- Integrating human mobility — temporary displacement, evacuation and planned internal relocation — into national climate adaptation and risk management frameworks
- Preventing forced and harmful displacement

- Ensuring better protection of vulnerable groups
- Improving the efficiency of crisis response and accelerating recovery and rehousing

3.9.3 Selection of measures

As agreed with FPS Health, no measure was shortlisted for complete detailing. However, FPS Health identified a longlist of measures which are further described in Annex 6.

3.10 Risk to human health from expansion and increased transmission of vector-borne diseases

3.10.1 Context

Due to ongoing climate change, Belgium is becoming increasingly vulnerable to mosquito-borne diseases such as West Nile fever, dengue, chikungunya, and Zika. Warmer summers and milder winters allow exotic species, including the tiger mosquito, to establish and overwinter more easily. This increases the risk of local transmission. The common house mosquito, Culex pipiens, also benefits from the changing climate, which can lead to a longer active period and potentially higher population densities. This species is the primary vector of West Nile virus in Europe.

3.10.2 Ongoing work

3.10.2.1 National response plan for West Nile fever

By the summer of 2026, a national operational plan for West Nile fever will be finalised under the leadership of Sciensano, in collaboration with the federal government, the regions and communities, and various experts. The plan describes the measures to be taken for each risk level, ranging from no circulation of the virus to a large-scale outbreak, and clarifies the specific responsibilities of the relevant authorities. The plan is structured in such a way that it can later be applied to other vector-borne diseases. This forms an important building block for stronger governance and better coordination between all relevant policy levels.

3.10.2.2 Interfederal collaboration through NEHAP

The National Environment-Health Action Plan (NEHAP) 2023-2029 is an important instrument for federal and interfederal coordination regarding climate-related health risks. NEHAP brings together the federal government, the regions, and the communities around themes where cooperation offers clear added value. This includes, among other things, limiting the spread of exotic mosquitoes and other vectors.

Within NEHAP3, there are separate action sheets that focus specifically on the monitoring and follow-up of exotic mosquitoes and other vectors. For example, action sheet 7 contains a national section on monitoring exotic mosquitoes, and action sheet 8 a section on ticks. These sheets describe joint actions for monitoring, data sharing, risk assessment, and public information provision.

3.10.2.3 Vector-borne diseases within the Summer Plan

The possibility of including additional measures regarding vector-borne diseases in the future Summer Plan is currently being investigated.

3.10.2.4 Scientific support and climate data via the Belgian Climate Centre

As part of the “Climate Service for Belgian Vector-Borne Disease Management” project, VITO, in collaboration with the Belgian Climate Centre and funded by the ECMWF – Copernicus Climate Change Service (C3S) National Collaboration Programme, developed a custom-made climate service for the Vector-borne Diseases and Zoonoses unit at Sciensano. The service combines AI modelling with climate data from the Copernicus Climate Change Service (C3S) (ERA5) and observations from the RMI’s Automated Weather Stations to generate near real-time and spatially detailed climate data (up to 100 m resolution). The resulting daily indicators for temperature, precipitation, and humidity are then automatically linked to Sciensano’s epidemiological workflows. This results in detailed maps that help to better identify climate conditions favourable for the presence and activity of vectors (such as ticks and exotic mosquitoes), thereby supporting the surveillance and risk assessment of vector-borne

diseases. The climate service was developed in close collaboration with Sciensano to ensure that the indicators align with the needs of epidemiological monitoring. At the start of the project in December 2024, an initial stakeholder workshop took place at the Belgian Climate Centre with more than 15 participating organisations, including Sciensano, the FPS Health, Flemish administrations, the Institute of Tropical Medicine, the Spatial Epidemiology Lab, Cerac, and Vivalis. During this workshop, the technical approach, the data and methodology used, and the expected results were presented.

The climate service is now operational within Sciensano's infrastructure. In late February 2026, a training session took place during which researchers and epidemiologists from the relevant Sciensano unit were trained in the use of the indicators and maps. In a final stakeholder meeting the results and further implementation possibilities were discussed.

3.10.3 Current status and implications for Be-Adapt

Although there are clearly many ongoing activities within the federal and interfederal contexts, these tracks are still in full development. Due to the timing of the national operational plan for West Nile fever and other ongoing initiatives, it is **currently not opportune to identify additional federal adaptation measures that are sufficiently mature to be developed by the consortium within Be-Adapt**. As soon as the operational plan is further advanced, it will be reviewed again whether measures can be added or supported within the federal adaptation policy.

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ANNEX 1 - RISK TO PROPERTY INSURANCE DUE TO FLOODING – INITIAL LIST AND LONGLISTED MEASURES

Overview of longlisted measures and measures not taken up further in Be-Adapt

Measures	Applicability at federal level
Longlisted measures	
Issue federal guidelines defining minimum flood-related preparedness and response elements to be included in municipal emergency plans	**High** *Shared responsibility* - While municipalities are responsible for the implementation, the federal level retains a structuring role through standard-setting, coherence and oversight of the emergency planning system.
Establish a federal annual Flood Readiness Week aimed at improving citizens' flood preparedness and self-protection	**High** Federal crisis communication
Create a federal investment platform to mobilise long-term private capital for climate adaptation infrastructure	**High** *Shared* The federal level can provide the financing framework and platform, but the project selection and implementation are regional competences.
Fund for adaptation akin to the French "fonds Barnier"	**High** *Federal competence* – National solidarity mechanisms, insurance-based levies and large-scale compensation funds fall under federal authority.
Federal framework to recognise and certify flood risk reduction measures for insurance purposes	**High**

	Regulates how flood-mitigation information is recognised and used within the insurance sector, without imposing any construction or urban-planning requirements, which is a regional competence.
Measures not taken up further in this study	**Applicability at federal level**
Unified database with comprehensive flood data **Objective**: Facilitate risk comparison, improve risk assessment and mapping. **Description**: Develop a single national database that compiles granular flood data to improve flood-risk assessment by centralizing detailed, high-resolution flood information. **Reason for excluding**: Data will come from the regions, so it is not a fully federal measure. Moreover, it is included in the discussions concerning the Interfederal Action Plan on Extreme Weather Events as the 'Water data hub'.	**Medium** *Shared responsibility* - Regions produce flood data; the federal level has a coordination role to ensure national consistency for insurance, crisis management and financial monitoring.
Update flood risk maps to improve zoning and building codes **Objective**: Strengthen land-use, construction and insurance decisions with more accurate, up-to-date flood information. **Description**: Regularly update flood-risk maps, supporting better zoning rules and building standards, ensuring that developments reflect real and evolving flood risks. **Reason for excluding**: Updating the map is a regional competence and the legal mandate to update them comes from EU law, not the federal level. It is unclear which actions at the federal level could require the regions to update their maps. Moreover, this is included in the discussions concerning the Interfederal Action Plan on Extreme Weather Events with a workgroup on 'Modernisation des zones à haut risque'.	**Limited** *Primarily regional* – Mapping is regional; federal relevance lies in enabling data exchange and aligning insurance and risk governance.
Collaborative workgroup with the government and the insurance sector **Objective**: Involve insurance companies in policy-making discussions and decisions, and enable cooperation to encourage prevention, awareness, and funding for adaptation measures.	**High** *Federal competence* – Insurance regulation and sectoral governance/coordination are federal responsibilities.

Description: Set up a permanent joint workgroup bringing together government authorities and the insurance sector to harmonise data, align policies, and co-develop solutions on prevention, coverage, and climate-risk adaptation. **Reason for excluding**: This working group is already in place; the question is rather whether it should become permanent.	
Creation of a public reinsurance system **Objective**: Guarantee insurance market stability by providing a backstop for extreme flood losses. **Description**: Set up a government-backed reinsurance layer that steps in when private insurers and reinsurers reach their capacity limits. This protects affordability, prevents insurer withdrawal from high-risk areas, and ensures continuous coverage in the face of escalating climate-driven floods. **Reason for excluding**: Regions are responsible for managing their own disaster funds; this is no longer a federal competence. Responsibility was transferred to the regions, and there is little scope to reverse it. While the French or Spanish models are interesting, implementing them would require federal competence. The only potential option would be to require the regions to allocate funding to their disaster funds, but this is not a federal competence. Moreover, a working group is already in place to discuss these topics. This does not undermine the fact that the existence of a sufficiently funded public backstop (whether regional or federal) on top of private insurance, private reinsurance and the European-level solidarity mechanism remains essential to ensure resilience.	**Medium** Reinsurance, financial stability and market backstopping are federal competences, but the measure relies heavily on regional competences.
Restrict building permits **Objective**: Reduce future flood losses by avoiding new construction in high-risk zones. **Description**: New developments should be located in areas which are not at risk of flooding from any source, both now and in the future. **Reason for excluding**: Raised as important by a stakeholder representative, but it falls under regional competence.	**Limited** *Primarily regional/local competence* – Spatial planning and building permits fall under regional and municipal authority. Federal leverage: indirect, via insurance rules linked to officially designated flood risk zones.
Use of next generation catastrophe modelling by insurers	**Medium** Insurance regulation and prudential supervision are federal responsibilities.

Objective: Improve flood-risk assessment by incorporating climate-driven changes into insurance models. **Description**: Adopt advanced catastrophe models that integrate future climate scenarios, evolving hazard patterns, and high-resolution data. It allows insurers to better anticipate extreme flood events and set more accurate premiums and risk limits. **Reason for excluding**: Stakeholder representatives mentioned insurers already have very good models, and it is not seen positively that the government mandates the type of modelling companies should use.	The federal level can regulate transparency but not mandate specific models.
Incentives to policyholders (premium reduction) for implementing flood risk reduction measures **Objective**: Encourage policyholders to invest in measures to keep floodwater away from their property. **Description**: Use risk-based pricing, based on insured people's location and the adaptation measures they took. Solutions could include grey or ecosystem-based measures (e.g., nature-based solutions, dams, dikes, retention reservoirs) to reduce flood risk around a property. **Reason for excluding**: A stakeholder representative mentioned that larger scale infrastructure projects are more efficient, and at the individual level, the main action would be to secure belongings during the flooding event. Regarding individual measures, insurers would need to assess the effectiveness of the measure (a 50 cm wall will not be efficient in case of a 1 m high water level). Companies should be allowed to decide if they apply a discount or not, in order to respect the commercial freedom of insurers, since premium setting is free. This measure was excluded from the analysis in its present form, but this idea was integrated in the shortlisted measure 'Federal framework to recognise and certify flood risk reduction measures for insurance purposes (for example, to inform potential premium reduction)'.	**Limited** *Shared responsibility* – Insurance pricing frameworks and incentive mechanisms fall under federal competences, but many risk-reduction measures are territorial investments.
Funding more research on prevention effectiveness **Objective**: Identify which flood-prevention measures deliver the greatest risk-reduction impact. **Description**: Invest in research assessing how well different mitigation and adaptation measures reduce flood damage, to help prioritise the most effective actions and improve future risk-pricing and planning. **Reason for excluding**: It was agreed not to include research measures in the study.	**Limited** *Shared responsibility* – The research funding can be federal or regional; but the federal relevance lies in informing insurance, national risk assessment and financial resilience.

Description of longlisted measures (except shortlisted measures)

Establish a federal annual Flood Readiness Week aimed at improving citizens' flood preparedness and self-protection

This measure was not selected in the shortlist following the feedback received in the second steering committee process. The feedback highlighted that for this measure to be effective it must be implemented locally, at the regional, provincial, or even local level. It seems there are already prevention initiatives underway, at least in Wallonia, motivating the conclusion that the measure is not relevant to the scope of Be-Adapt.

Context	The July 2021 floods showed a lack of public preparedness and risk communication, with information gaps and a limited understanding among residents of what actions to take. In fact, according to Murdock et al[25], one third of affected residents in the Walloon Region did not receive any warning and more than half did not know how to respond effectively. Following the event, some municipalities organised awareness raising events such as training sessions to inform residents of good practice when facing floods. However, these initiatives remain fragmented as there is no consistent national framework for citizen-level preparedness. At the federal level, broader crisis-readiness campaigns were created with the aim of building general emergency awareness among the population. However, these are not primarily focused on flood preparedness, and do not provide a standardised, nationwide package of information aimed at increasing flood awareness and readiness among the population. Therefore, this measure proposes to put in place a national annual Flood Readiness Week. It aims to educate citizens by providing guidance before flooding risks materialise to improve their ability to protect themselves and their property.
Objective	To improve citizens' preparedness and self-protection in case of flooding by providing clear, practical guidance well before flood risks become imminent, thereby reducing avoidable harm to people and property.
Description	During this Flood Readiness Week, the federal government distributes to every household a standardised Flood Preparedness Pack/Protocol, in one of the three national languages based on individual preference. The information can be delivered in a digital or paper format, or key information can be disseminated via the radio to enable more vulnerable people such as the elderly to have access to the recommendations. It will be distributed in cooperation with key actors and institutional levels such as regions, municipalities or schools. This pack includes step-by-step advice on how to prepare before a flood (especially regarding storing important belongings, or implementing specific structural measures to protect houses), but also what to do when floodwaters begin to rise.

[25] H. J. Murdock, D. Rodriguez Castro, B. Dewals, A. Heidenreich and A. H. Thieken, Learning from the past to inform flood risk management: Analysis of public survey data in Belgium on flood early warning and response during the July 2021 flood, 2026. Available: https://egusphere.copernicus.org/preprints/2026/egusphere-2025-6376/egusphere-2025-6376.pdf.

	Post-flooding guidance is also included. It also includes recommendations on how to claim insurance compensation. A checklist is also included, providing a visual summary of the main points and helping citizens identify the actions they need to take. This information is covered in the media (television, radio, social media, government website) during the week to ensure it reaches as many people as possible. Tailored activities with municipalities or schools can be considered, for example, in the form of flood response exercises.
Federal competences	National crisis communication and population warning.
Interfederal aspects	Regions and municipalities might wish to update the standardised guidance to include more targeted insights on local risk. This would require them to take part in the drafting of the pack, providing relevant flood risk information. The implementation of the measure, via the delivery of the packs and any local dissemination activities in the media is regional/municipal competence, while the dissemination in schools is a community competence.
Effectiveness	• Improves national consistency in flood risk awareness. • Reduces avoidable material damage by enabling residents to move valuable objects or put in place adaptation measures at their property. • Encourages early action and reduces panic-driven actions. • Enhances social cohesion.
Responsible	FPS Interior – National Crisis Center
Other actors / stakeholders involved / transversal aspects	Regional authorities and municipalities for organising the dissemination of the pack's content. The media for disseminating the content.
Points of attention: gender, equitability, risk of maladaptation	The risk of not reaching the whole population is always present, for example, older people, or people with low literacy. Some recommendations on the pack require funding (e.g., adaptation measures) which not everyone will be able to implement for financial reasons. It is important to be aware of the perception issue and first communicate on the improvements made by the government in terms of preparedness and response systems to avoid a potential perception that people will need to save themselves.

Create a federal investment platform to mobilise long-term private capital for climate adaptation infrastructure

This measure was not shortlisted partly due to the strong critique it received from a knowledgeable stakeholder representative who highlighted that the issue with mobilising private capital on adaptation projects would not be solved by the creation of a platform but lies in the nature of the benefits received (mainly collective) and the lack of opportunity for private return on investment. The comments are integrated where relevant in the below table, but the measure's structure is deemed too weak to be taken on as a shortlisted measure.

Context	Belgium does not have a dedicated federal framework to allocate long-term private capital to climate adaptation infrastructure projects. Most large-scale adaptation projects such as flood protection or river basin management would benefit from receiving financing from private investors like insurers and pension funds. While these actors themselves are looking to invest their capital in such stable investment opportunities, there currently exists no structured pipeline or matchmaking mechanism connecting them to adaptation projects. There is a growing recognition that adaptation requires long-term, predictable financing that does not only come from public funds. A federal level investment framework would address this issue by increasing the visibility of projects needing financing, for investors to invest their capital and contribute to improved national climate resilience. However, it is to be acknowledged that for most flood adaptation projects, returns are not fully monetisable and primarily offer collective benefits, while private capital seeks private return on investment. The platform is not designed to create returns in itself, but to improve visibility to make such projects investable for private actors, limiting its usefulness in solving the problem at the core.
Objective	To facilitate long-term, stable investment by insurers and other institutional investors in large-scale climate adaptation projects in Belgium.
Description	The federal government creates a national investment platform aiming to mobilise long-term private capital on national flood-adaptation infrastructure projects. It works as a pipeline builder helping insurers identify projects in need of financing. In particular, the measure requires interfederal cooperation between the federal government and regions or local authorities to identify investable projects. These can include nature-based water retention solutions, flood protection works or other flood resilience building projects. Once identified and verified, they are published in a matchmaking platform to be consulted by insurers. The platform provides at least the following information: location, promoter, stage, timeline, expected rate of return, expected risk reduction potential and for which risk.
Federal competences	Creating and running the investment platform.
Interfederal aspects	Identifying largescale investable projects is a regional competence. Interfederal alignment is required to ensure that listed projects comply with regional permitting, land-use plans and hydrological priorities.
Effectiveness	The proposed measure gives visibility to adaptation projects with a flood risk reduction potential.

	Ideally, the measure enables insurers to invest their capital in projects with stable rates of return, while generating a positive impact on their activity (risk reduction). However, an apparent issue negatively affecting the effectiveness of the measure is that the returns on investment relating to flood risk reduction projects are more collective than private.
Responsible	FPS Finance - Treasury
Other actors / stakeholders involved / transversal aspects	• Regions, local authorities, regarding project identification and data coordination. • Financial Services and Markets Authority, regarding the decision of which information to disclose on the platform to inform investors.
Points of attention: gender, equitability, risk of maladaptation	Identified projects should have a clear business model to create return on investment. However, a strong point of attention, which undermines the credibility of this measure and is part of the reason why it is not taken up further in the study, is that based on stakeholder feedback, investment in adaptation usually does not create monetised returns on investment that can be distributed to a private investor. Creating a federal platform is therefore not helping in solving the problem at the core and could be considered again if further evidence emerges of viable business models or financing structures that allow private investors to capture a share of the value generated by flood risk reduction investments.

Fund for adaptation akin to the French "fonds Barnier"

Context	The current flood-related compensation framework in Belgium relies on the compulsory inclusion of flood coverage within fire insurance policies. This mechanism provides compensation for damages after an event, but it does not systematically proactively finance adaptation measures to reduce potential future damages. In parallel, the former federal calamities fund was transferred to the regions, which are required to allocate money to the fund in order to cover for damages beyond insurer's involvement. This leaves the country with no federal mechanism dedicated specifically to funding prevention measures related to climate-exacerbated flood risks. Past flooding events highlighted the need for stronger, upstream prevention financing, which could be effective in reducing future flood-related losses. As a way of investing in such adaptation and vulnerability reduction measures, France's fonds Barnier provides structured national funding. Historically, it was funded via a surcharge on home insurance policies, but it is now an integral part of the state budget.
Objective	Support preventive and adaptive measures that reduce future flood losses.
Description	This measure creates a dedicated federal fund to finance preventive and adaptive actions. The fund supports measures of different types, for example, structural adaptations such as elevating essential equipment, and promotes a proactive approach to risk reduction, as opposed to the more post-disaster-based compensation currently applied. The fund is federally managed and financed either through a levy on natural-disaster insurance premiums or through an annual budget voted at the federal level. Funding is allocated through a structured grant scheme where applicants are required to provide specific information, such as demonstrating the risk level of their property, or showing insurance coverage. The amount that can be claimed depends on the type of applicant (for example, 80% for individuals but less for local authorities).
Federal competences	• Creating and managing the fund. • Introducing a small surcharge on insurance premiums to fund the initiative, if this is the chosen option. • Setting eligibility and cost-sharing rules for the funding.
Interfederal aspects	The measure requires close cooperation between the federal authority and the regions regarding eligibility criteria or project selection, as many of the flood protection measures financed through the fund will fall within regional competences. While this measure is proposed as federal, it will need to remain aligned with regional disaster-risk reduction policies.
Effectiveness	Reduction in vulnerability and future loss by incentivising the implementation of prevention actions. Potential for shifting certain properties from an uninsurable to an insurable status. A link can be made with the certification of the implemented measures as described in the shortlisted measure in section 3.1.5.2.
Responsible	FPS Economy

Other actors / stakeholders involved / transversal aspects	• Regional authorities, to ensure consistency with the policies in place. • Insurance companies, in case the chosen financing option for the fund is to collect a surcharge on premiums.
Points of attention: gender, equitability, risk of maladaptation	A risk could be the inability to fund measures of regional competence with federal money. The creation of this fund should not be seen as an incentive to keep building in flood risk areas. If the funding does not reach 100% of the total adaptation measure's cost, more financially vulnerable households or entities may refrain from implementing such measures due to the inability to cover the remaining cost.

ANNEX 2 - RISK TO HUMAN HEALTH DUE TO HEAT STRESS – INITIAL LIST AND LONGLISTED MEASURES

Overview of longlisted measures with indication of applicability at federal level

Measures	Applicability at federal level
Overall	
Elaborate a National (Interfederal) Heat and Health Adaptation Plan (NHHAP)	High
Heatwave response – general population	
Revise/Improve the Ozone and Heat Plan	High
Make existing federal buildings accessible as public cooling spaces	High
Targeted communication for vulnerable people	*Limited*
Heatwave response – occupational – protection of workers	
Establish an environmental heat and ozone warning system specifically intended to protect the working population	High
Include diseases caused by heat stress on the list of occupational diseases	High
Increase knowledge and awareness among employers on the inclusion of climatological heat and ozone in prevention and action plans, and possibly increase supervision	High
Develop sectoral guides for minimum mandatory technical and work organisation provisions	High
Elaborate specific health-impact thresholds for hazardous work conditions	High
Impose real-time WBGT monitoring	High
Evaluation of the measures to adjust work schedules	High
Monitor the impact of environmental heat on occupational health and safety	High
Urban and landscape	
Urban design	*Limited*
Urban greening	*Limited*[26]

[26] Even though the federal applicability is limited, urban greening is interesting because of its co-benefits (mental health, air pollution, stimulating physical activity, …). The federal BiodiversiScape programme aims to set an example of how biodiversity can be integrated into landscapes and buildings by greening locations that are under federal control (including the Ministry of Defence, SNCB-NMBS, Infrabel and the Belgian Buildings Agency) (https://www.health.belgium.be/en/themes/animals-plants/biodiversiteit/play-your-part-help-maintain-biodiversity)

Blue infrastructure	*Limited*
Water facilities for cooling	*Limited*
Other urban 'grey' measures	*Limited*
Buildings	
Adapt building norms – introduce cooling standards for new and existing buildings	*Limited*
Adapt building norms and financing for health and care infrastructure to protect vulnerable groups (BCRA)	*Limited*
Adopt cooling standards for federal buildings	High
Climate-proofing / retrofitting existing federal buildings	High
District (heating and) cooling	*Limited*
Dynamic thermal environments and personalised cooling options in federal offices	High
Include thermal stress in training curricula of professionals in building/construction	*Limited*
Personal	
Advice on protective measures to be taken at personal level (excluding occupational context)	High[27]

The following measures from the longlist were adapted and/or not further selected for the shortlist:

- Revision/Improvement of the Ozone and Heat Plan: the current Ozone and Heat Plan is essentially an early warning and response system. The National Environment-Health Action Plan 2023-2029 (NEHAP 3) [107] includes actions to improve the current Ozone and Heat Plan (i.e., the early warning and response system), as well as actions aiming at structural prevention and adaptation:
    - Involving additional partners during the alarm phase, such as civil security, the police, defence, FPS Mobility, FPS Economy, the Belgian governors

    (mid-term)
    - Monitoring/evaluation of mortality, use of services (consultations, hospital admissions, ambulances, etc.)
    - Exchange of good practices; workshop, information, education, community of practice, ...
    - Harmonisation of coordination between federal, regional, and local powers in all phases

    (long-term)
    - Regular monitoring/assessment of behavioural changes (surveys)
    - Impacts on competences other than health (working time management, lowering building temperatures, increasing green spaces, urban planning to reduce heat islands, access to cooler areas, access to water, etc.)

    Recommendations made in the Study on the effects of climate change on healthcare in Belgium (2021) [33] will be followed up as possible activities during NEHAP3:

[27] Jointly with the regional and local authorities who run campaigns and provide advice on this.

  - Assessment of heat-related vulnerability using mortality and morbidity data
  - Research into other activation criteria for ozone and heat plans
  - Including specific actions for vulnerable people: continuous updating of the RAG measures, specific messages for vulnerable groups
  - Intensive surveillance of vulnerable populations staying at home during extreme weather
  - Possible research into available Belgian data on the effects of heat on mental health.
  - Possible research into the impact of heat on the effectiveness of medications that affect the nervous system.

  These (sub-)measures/actions that are taken up in NEHAP3 are not taken up separately in this study.
- The proposed measure to make existing federal buildings accessible as public cooling spaces was excluded from this study as it is taken up already by the Cabinet of the Minister of Mobility, Climate, Ecological Transition and Sustainable Development.
- Measures on well-being at work were reconsidered and rephrased to be in line with the general logic and philosophy of the Code on Well-being at Work.

Rather than adopting (separate) cooling standards for federal buildings, a more important gap in the actual climate-proofing of buildings is the absence of a reference meteorological year that is consistent with future climate change scenarios, to be used by contractors in thermal comfort and overheating simulations. Apart from punctual adaptations to existing buildings following complaints on overheating, climate-proofing / retrofitting of federal buildings is a logical and integrated part of the efforts to attain the objectives of the National Energy and Climate Plan. Measures to avoid overheating while avoiding the use of energy-intensive active cooling installations, are driven by EPB requirements.

ANNEX 3 - RISK TO ENERGY INFRASTRUCTURE DUE TO EXTREME WEATHER EVENTS

Overview of longlisted measures and measures not taken up further in Be-Adapt

Measures	Applicability at federal level
Longlisted measures	
Ensure monitoring and effectiveness of CER implementation by critical energy entities	**High** *Federal competence* NCCN for implementation of CER Directive and FPS Economy (DG Energy) as sectoral supervising authority monitoring CER compliance
Operationalise CER obligations by critical energy entities	**High** *Federal competence* NCCN for implementation of CER Directive + FPS Economy (DG Energy) as sectoral supervising authority
Define resilience objectives for the energy sector	**Medium** Federal level (NCCN and FPS Economy) coordinates systemwide resilience but resilience objectives must also align with regional competences (DSOs, spatial planning)
Integrate lessons from crisis simulations into infrastructure resilience planning	**Medium** *Shared* NCCN competent for risk preparedness and crisis management

	Highly depends on operators and regional and local crisis actors
Build capacity to use climate risk data and tools in the energy sector	**Medium** *Shared*
Harmonise and strengthen climate risk assessment methodologies	**Medium** *Shared*
Measures not taken up further in this study	
Transpose and operationalise the CER Directive for the energy sector • Description: Ensure full transposition and effective implementation of the CER Directive for the energy sector. • Objective: Establish a clear and harmonised legal framework for resilience obligations of critical energy entities. **Reason to exclude**: The CER Directive was transposed in Belgian law in December 2025. Competent authorities have yet to be officially designated but this is an ongoing process. Regarding the operationalisation, DG Energy is currently defining criteria to designate critical entities, which will be identified by July 2026.	**High** *Federal competence*. Extreme weather can disrupt national energy supply and trigger cascading cross-sector impacts, requiring federal designation and oversight of critical energy entities.
Streamline reporting obligations for key energy infrastructure operators • Description: Simplify and align reporting obligations across legal frameworks for key energy infrastructure operators • Objective: Reduce administrative burden while ensuring consistent evidence of resilience and preparedness **Reason to exclude**: Most reporting obligations stem from EU legislation even though federal authorities can still improve how these requirements are implemented nationally. The objective should be to streamline their national implementation, avoid duplication between frameworks and facilitate information sharing between competent authorities. This objective is considered a guiding transversal principle when implementing resilience measures rather than as a standalone policy measure in this adaptation plan. It is therefore considered out of scope.	**Medium** *Shared*. Mostly EU-driven. Federal coordination is needed to ensure timely, comparable information during extreme-weather-related energy disruptions. Interfederal alignment needed.

Create a federal steering mechanism for energy infrastructure resilience • Description: establish a federally led structure responsible for steering energy resilience policy by overseeing implementation, monitoring progress of actions, and ensuring alignment of sectoral resilience obligations for critical energy infrastructure. • Objective: Provide clear federal leadership, accountability and oversight for energy infrastructure resilience. **Reason to exclude**: CER Connect (NCCN) and BNRP working groups already gather key stakeholders to oversee resilience policies (for critical entities). In addition, the mid-term evaluation by DG Energy of Measure 20 of the current federal adaptation plan explicitly states that it was decided not to create additional working groups as existing working groups already included key stakeholders (Elia, NCCN…).	**High** *Federal competence*.
Strengthen public–private coordination for energy infrastructure • Description: Strengthen structured coordination between public authorities and critical energy operators for both crisis response and resilience planning • Objective: Ensure rapid, coordinated decisions and operational actions during extreme events, and improve joint preparedness for disruptions affecting energy supply and critical services. **Reason to exclude**: Coordination mechanisms between public authorities and energy operators exist, particularly for crisis management. Emergency plans involve various governance levels, with clearly identified contact points within energy operators and established reporting channels. As for the Belgian electricity risk-preparedness plan, involving Elia, indicates some level of collaboration for risk preparedness. The key gap therefore does not lie in a lack of coordination, but in the absence of a definition of resilience objectives to be met. This is suggested as another measure.	**Medium** *Shared*. Both rapid federal-level coordination with operators and other public authorities.
Integrate climate risk and cost–benefit prioritisation into energy infrastructure planning • Description: Ensure climate risks are systematically integrated into energy infrastructure planning and asset management processes, using risk-based prioritisation and cost–benefit logic when full protection is not feasible. Relies on structured dialogue between diverse actors. • Objective: Direct investments toward the most exposed and critical assets, maximising resilience value under budget constraints and avoiding fragmented interventions.	**Medium** *Shared*. CREG for federally regulated network segments + other authorities depending on asset type.

Reason to exclude: the existence of multiple risk assessments and plans (see context of measure 3.3.5.3) by energy operators.	
Develop integrated and shared databases • Description: functional linkage of meteorological, hydrological, health and vulnerability data, with a clear distinction between use in prevention/adaptation and crisis management (real time). • Objective: provide consistent data to all relevant stakeholders and ensure homogeneity of use **Reason to exclude**: already being explored during the discussions concerning the Interfederal Action Plan on Extreme Weather Events.	**Low** *Shared* Strongly interfederal (regional data)
Develop climate reference scenarios • Description: Development of national climate scenarios (2°C, 3°C, 4°C) as a common basis for infrastructure planning, land use planning and risk assessment. • Objective: provide a consistent framework and commonly shared narratives **Reason to exclude**: already being explored during the discussions concerning the Interfederal Action Plan on Extreme Weather Events.	**Medium** *Shared* Highly dependent on regions and EU frameworks. Strong reliance on Belgian Climate Centre and interfederal scientific bodies.
Set up permanent cross-sector coordination channels for critical infrastructure resilience • Description: Establish structured coordination mechanisms between energy, transport, telecom, water and relevant regional and local authorities to manage interdependencies and crisis interfaces • Objective: Prevent cascading failures and improve coordinated response across interconnected systems. **Reason to exclude:** already being explored during the discussions concerning the Interfederal Action Plan on Extreme Weather Events.	**High** *Federal competence*. Federal coordination of interfederal mechanisms.
Integrate climate risks into national preparedness simulations for energy disruption • Description: Embed climate risks into disaster preparedness simulations across local, provincial, and national levels. • Objective: Improve operational readiness for extreme weather impacts on energy infrastructure.	**Medium** *Shared*. Federal preparedness planning but with multilevel execution spanning provinces, regions and municipalities

Reason to exclude: NCCN conducts crisis simulation exercises based on extreme climatic events, also under changing climate.	
Integrate operational early warning system into national emergency planning • Description: Connect national meteorological and multi-hazard warning systems to energy operators and emergency planning structures, with predefined operational trigger thresholds (e.g., heat, flood, storm alerts). • Objective: Enable preventive operational actions before extreme events cause overload, blackout or supply disruption. **Reason to exclude**: already being explored during the discussions concerning the Interfederal Action Plan on Extreme Weather Events.	**High** *Federal competence*. Integration into national emergency coordination, with operator integration
Institutionalise regular multi-hazard crisis exercises with energy operators • Description: Run regular crisis exercises including combined hazards (e.g., heatwaves + blackout, flood + infrastructure failure). • Objective: Test and strengthen response capacity under realistic extreme-weather scenarios. **Reason to exclude:** already being explored during the discussions concerning the Interfederal Action Plan on Extreme Weather Events.	**Medium** *Shared*. Joint exercises with multi-level organisation (federal, regions, provinces, municipalities).
Integrate interdependency and cascading risk analysis into energy resilience policy • Description: Require that resilience analyses and planning explicitly account for interdependencies between energy, transport, communication and other critical systems. • Objective: Reduce cascading failures and systemic disruption during extreme events. **Reason to exclude:** already being explored during the discussions concerning the Interfederal Action Plan on Extreme Weather Events.	**High** *Federal competence*. Federal mandate to mitigate systemic cross-sector risks
Map and prioritise critical infrastructure nodes exposed to multi-hazard risks • Description: Cross-reference hazard maps with key energy infrastructure to identify and prioritise nodes where failure would trigger cascading effects. • Objective: Target adaptation investments on systemically critical and highly exposed assets.	**Medium** *Shared*. Federal coordination role (with regions and operators' input) as prioritisation requires national

Reason to exclude: critical infrastructures have been identified under the Law of 1 July 2011, while the CER Directive further requires the identification of critical entities. This process already considers interdependencies, including nodes and cascading effects. In parallel, NCCN is exploring the development of an additional module within Pentagon to model and visualise cascading impacts resulting from asset disruptions. Besides, as a (multi-)hazard assessment method is addressed under a separate measure, this measure is left out.	oversight. Implementation is shared.
Benchmark and share best practices on climate resilience across energy operators and sectors • Description: Establish a structured benchmarking process to compare climate resilience practices across energy operators, sectors and European counterparts, focusing on risk assessment approaches, resilience measures and investment strategies. • Objective: Enable continuous improvement of resilience practices by comparing approaches, identifying best practices and fostering convergence across operators and sectors. **Reason to exclude**: while benchmarking can support knowledge sharing and convergence of practices, it does not in itself address the core gaps identified at this stage—namely the absence of common methodological frameworks and defined resilience objectives. Priority is therefore given to measures that establish these foundations, which are prerequisites for benchmarking to generate actionable and comparable insights.	**Low** *Shared* Federal role for coordination and facilitation but no clear regulatory/policy leverage
Align financing and regulatory frameworks to enable climate-resilient investment • Description: Ensure climate adaptation investments in energy infrastructure are embedded in regulated development plans, financed through appropriate tariff mechanisms, and assessed using long-term cost and affordability considerations. • Objective: Enable sustainable and equitable financing of resilience investments while internalising long-term climate-related costs. **Reason to exclude**: Integrating climate resilience into existing development plans, investment processes and tariff frameworks is expected, with no intention to create dedicated regulatory or financing mechanisms; introducing a standalone measure would add complexity without clear added value.	**Medium** *Shared*. Federal steering role (via CREG), but regions regulate DSOs
Update technical standards and procurement rules for climate resilience • Description: Update regulatory and procurement frameworks to ensure compliance with climate-resilient technical standards and prioritise lifecycle resilience over lowest upfront cost.	**Low** *Shared*. EU-driven

• Objective: Avoid locking in vulnerable infrastructure and ensure new and renewed assets meet future climate conditions. **Reason to exclude**: mostly coordinated at European level through network codes (binding EU regulations specific to energy system operation like grid connection rules, system balancing…) and EU standards (Technical specifications for design, equipment, construction).	Federal and regional alignment is required
Ensure continuity of energy supply chains • Description: Ensure resilience planning covers energy supplies (gas and oil) as part of critical infrastructure continuity. • Objective: Prevent cascading disruptions affecting heating, industry and power generation during extreme events. **Reason to exclude:** strategic reserves are established by law for electricity, gas and oil. For electricity, adequacy is assessed by Elia; if needed, capacity mechanisms (CRM) and, as a last resort, load shedding plans can be activated. For gas, the REPowerEU framework introduced mandatory EU-level storage targets (90% filling before winter), complemented by joint purchasing and solidarity mechanisms between Member States. Belgium also benefits from a diversified gas supply and a federal emergency plan that can restrict consumption and trigger additional procurement depending on alert levels. For oil, a minimum stock equivalent to 90 days of consumption is required. Overall, multiple mechanisms are already in place to ensure security of supply. However, further efforts are needed at federal level to strengthen electricity interconnections and support the development of offshore energy to enhance resilience.	**High** *Federal competence*. Federal for national security-of-supply framing; shared in execution
Strengthen electricity grid resilience • Description: Reduce the risk of overloads, outages and blackouts during extreme events by increasing the physical robustness and operational controllability of the electricity grid. • Objective: Promote and require targeted grid hardening in critical areas (e.g., undergrounding, elevating/insulating exposed equipment, improving cooling/ventilation) and accelerate smart grid capabilities (detection, load balancing, targeted intervention) to manage extreme-weather stress in real time. **Reason to exclude**: Operators' responsibility. Therefore, not within the scope of the study.	**Low** *Shared*. Federal influence via oversight (CREG, DG Energy) Regional alignment is required for DSOs. Largely dependent on operators.

Strengthen gas network resilience • Description: Protect and climate-proof critical gas infrastructure (compressor stations, terminals, storage, above-ground equipment) and ensure continuity procedures during extreme weather. • Objective: Prevent gas supply disruption during heat, flooding and storms. **Reason to exclude**: Operators' responsibility. Therefore, not within the scope of the study.	**Low** *Shared*. Federal influence via oversight (CREG, DG Energy) Regional alignment is required for DSOs. Largely dependent on operators.
Diversify the energy mix for climate resilience • Description: Diversify the energy mix to reduce dependence on any single source vulnerable to specific hazards. • Objective: Reduce systemic vulnerability to climate-related disruptions affecting specific generation technologies. **Reason to exclude**: further efforts remain needed at federal level to strengthen electricity interconnections and support the development of offshore energy to enhance resilience. However, recent suspension of part of project of Princess Elisabeth Energy Island indicates political slowdown[28].	**Medium** *Shared*. Federal role in offshore, nuclear, interconnections. Other diversification means lie at regional level

[28] https://www.rtbf.be/article/le-gouvernement-federal-suspend-une-partie-du-chantier-de-l-ile-energetique-princesse-elisabeth-11558849, retrieved on 9th of June 9th 2026.

Description of longlisted measures (except shortlisted measures)

Ensure monitoring and effectiveness of CER implementation by critical energy entities

Context	The CER Directive, transposed into Belgian law in December 2025, establishes obligations for critical energy entities, including risk assessments and resilience plans. As the framework is recent, its practical implementation remains to be clarified, particularly given the complexity of the energy system, interdependencies between sectors, and the need to translate legal requirements into operational practices. While critical entities will have nine months to conduct their risk assessment from the official notification, no deadline was set for submission of resilience plans. At minimum, this means that the federal administration must be ready to assess compliance by the time risk assessments are ready.
Objective	Ensure that CER obligations are implemented in a consistent, high-quality and operational manner across the energy sector.
Description	This measure focuses on assessing implementation of the CER Directive. Yet it aims to go beyond formal compliance by strengthening monitoring, evaluation and continuous improvement mechanisms. It includes defining evaluation criteria, reinforcing audit and inspection practices, and integrating lessons learned from incidents and exercises. In this way, authorities can assess the quality, completeness and effectiveness of risk assessments and resilience measures implemented by critical entities. It also promotes information sharing and benchmarking across operators to progressively enhance resilience at system level.
Federal competences	Supervision of critical entities (CER law) Crisis management and national risk assessment (evaluation frameworks)
Interfederal aspects	Align with regions for distribution networks, spatial planning, risk data and infrastructure realities Avoid divergence in evaluation practices across levels Alignment with CONCERE and the National Climate Commission to ensure consistency between CER evaluations and regional adaptation frameworks
Effectiveness	The effectiveness of this measure depends on the establishment of robust monitoring and feedback mechanisms, as well as the capacity of authorities to ensure consistent application across operators.
Main actors	• FPS Economy - DG Energy • NCCN • Energy operators (TSOs and other critical energy entities/operators) • CREG - alignment with regulatory frameworks

Points of attention: gender, equitability, risk of maladaptation	Monitoring requirements may increase administrative and compliance costs, potentially passed on to consumers Avoid disproportionate administrative workload, specifically for small operators Avoid duplication with other existing administrative frameworks (e.g., NIS2) Overly rigid evaluation criteria may incentivise “tick-box” approaches rather than meaningful resilience improvements Effectiveness depends on sufficient resources and expertise within supervisory bodies

Operationalise CER obligations by critical energy entities

Context	The CER Directive requires critical energy entities to conduct risk assessments and establish resilience plans but remains largely principle-based and does not provide sector-specific guidance. In Belgium, FPS Economy (DG Energy) is expected to rely on existing frameworks such as the BNRA and sectoral inputs, yet no detailed operational guidance has been formalised for the energy sector. In practice, operators such as Elia and Fluxys already perform various risk analyses (e.g., development plans, adequacy studies, internal risk management), but these are developed for different purposes and are not explicitly aligned with CER requirements. As a result, operators interpret CER obligations individually, leading to potential differences in scope, level of detail and structure of risk assessments and resilience plans. This limits the ability of authorities to review, compare and ensure consistency across actors.
Objective	Provide practical guidance and tools to enable consistent and actionable implementation of CER obligations by critical energy entities.
Description	This measure aims to translate CER obligations into clear, practical and consistent implementation practices for the energy sector. It entails the development of sector-specific guidance defining the expected structure and content of risk assessments and resilience plans, including the integration of climate risks, interdependencies and cascading effects. It also includes the provision of templates, reporting formats and minimum expectations, as well as the organisation of structured exchanges between authorities (FPS Economy – DG Energy, CREG) and operators to clarify expectations and progressively align practices. Practical support (e.g., guidance notes, feedback on submissions) would accompany initial implementation cycles. For example, this could clarify how Elia's existing analyses (adequacy studies, development plans) should be consolidated within CER risk assessments. This measure differs from the harmonisation of methodologies by focusing on translating existing legal obligations into operational practices, rather than defining the technical content of risk assessments.
Federal competences	Implementation of CER framework: guidance, tools, interpretation of obligations Translation of legal requirements into operational practices
Interfederal aspects	Dependence on regional inputs: climate data and risk maps, infrastructure constraints Need for coordination on scenarios, assumptions and methodologies Avoid inconsistent approaches across regions and operators
Effectiveness	Depends on clear, practical and sector-adapted guidance, as well as active engagement with operators.
Other actors / stakeholders involved / transversal aspects	• FPS Economy - DG Energy • NCCN • Energy operators (TSOs and other critical energy entities/operators)

	• CREG
Points of attention: gender, equitability, risk of maladaptation	Ensure usability and practicability of guidance and tools. Over-standardisation may lead to rigid approaches not adapted to local contexts or evolving risks. Avoid disproportionate administrative workload, specifically for small operators Avoid duplication with other existing administrative frameworks (e.g., NIS2)

Integrate lessons from crisis simulations into infrastructure resilience planning

Context	Crisis simulations and exercises are regularly conducted at national and sectoral levels (e.g., under NCCN coordination), including scenarios involving energy disruptions and extreme events. These exercises provide valuable insights into system vulnerabilities, interdependencies and operational weaknesses. However, the translation of these lessons into long-term infrastructure planning, regulatory updates and investment decisions remains limited and insufficiently structured, leading to missed opportunities to strengthen resilience.
Objective	Ensure that vulnerabilities identified during crisis simulations inform long-term resilience investments, regulatory updates, and infrastructure adaptation strategies.
Description	Establish a formal mechanism to systematically translate findings from national and sectoral crisis exercises into infrastructure resilience planning. This includes identifying and consolidating key lessons learned, integrating them into risk assessments, investment planning and regulatory frameworks, and ensuring feedback loops between crisis management and long-term planning. The measure also promotes coordination between authorities and operators to ensure that identified vulnerabilities are addressed through concrete actions and reflected in infrastructure design, operation and adaptation strategies.
Federal competences	Crisis management and organisation of national exercises (NCCN) Critical infrastructure protection and CER implementation Security of energy supply (integration into planning frameworks)
Interfederal aspects	Crisis exercises involve multiple levels of governance and sectors Need alignment between federal crisis management outputs and sectoral/regional planning processes
Effectiveness	Depends on the existence of structured mechanisms to capture and translate lessons learned, followed by concrete actions Depends on coordination between crisis management and infrastructure planning actors Depends on the willingness and capacity of authorities and operators to cooperate
Other actors / stakeholders involved / transversal aspects	• FPS Economy - DG Energy • NCCN • Energy operators • TSOs and DSOs • CREG • Regional authorities • Emergency services and crisis actors

Points of attention: gender, equitability, risk of maladaptation	Crisis scenarios may not fully capture impacts on vulnerable populations Risk of focusing on short-term operational fixes rather than long-term systemic resilience Need to ensure lessons are generalised and adapted to future risks, including climate change

ANNEX 4 - RISK TO MENTAL HEALTH FROM CLIMATE CHANGE – INITIAL LIST AND LONGLISTED MEASURES

Overview of longlisted measures and measures not taken up further in Be-Adapt

Longlisted measures
Heat-related mental health outcomes
• See 3.2 Risk to human health due to heat stress and 'Measures not taken up further in this study' further down in this table
Climate-related disasters / emergencies
Continuity of psychological support during and after climate-related disasters • Ad hoc addendum to agreements between mental health networks affected by climate-related disasters and RIZIV/INAMI to allow for adapted first-line psychological support and provide additional funding
Active surveillance of people with mental health conditions during extreme weather events (i.e., flooding, wildfires) [69], [71] • Proactively set up a system of surveillance for people with mental health conditions during extreme weather events that can be invoked in the acute phase of a collective emergency related to extreme weather events. (see chapter 3.2 for heat in NEHAP3)
Climate anxiety
Raise awareness and resilience on climate anxiety • Workshops for schools on climate risks, climate mitigation and climate resilience, including aspects of climate anxiety • Promote and encourage the possibility of organising community-targeted interventions and group sessions on climate anxiety offered by the mental health networks
Improve general communication and narratives on climate mitigation and climate resilience, in a proactive, realistic and solution-oriented way, focusing on positive actions, in ways that reduce fear and helplessness and support hope and action, with consideration for individuals' psychological and emotional responses.
Measures suggested during stakeholder consultation but not further elaborated
Mental health support for healthcare staff / supervision and prevention of burnout • Several stakeholders mentioned risks for the mental health of healthcare staff during and after an emergency, e.g., due to overburdening of the healthcare system. The measure would include proactive measures to increase resilience. • Occupational health actors have a role and responsibility in this
Long-term monitoring and evaluation of mental health in the area affected by the emergency

• Such a monitoring effort will contribute to the understanding of the long-term mental health effects and healthcare needs, and of the effectiveness of measures. • This may be highly relevant as few such data are available.	
Measures not taken up further in this study	**Applicability at federal level**
'Train healthcare workers to understand, identify, manage, and speak out about the impacts of climate change on mental health' [69], [77], [82], [108] A planned e-learning course on the relation between environment and mental well-being will be launched probably in early 2027 as a part of NEHAP3. Although not yet fully planned, the current focus is set on eco-anxiety. • Not a priority for this study as this is already taken up by the NEHAP Working group Climate resilient health systems • Suggestion: information on this could be disseminated through the mental health networks.	*High* *Shared* ***FPS Health** coordinates national training efforts and defines national strategy* *The actual implementation of training programmes for healthcare professionals (including psychiatrists, psychologists, and others) is carried out by **regional healthcare agencies***
'*Advising patients on psychotropic medication during heatwaves*', '*Surveillance of vulnerable population (i.e., mental health conditions) during heatwaves*' [69], [71] Specific actions in NEHAP3 relating to heat stress are already mentioned in 3.2 Risk to human health due to heat stress: • Including specific actions for vulnerable people: continuous updating of the RAG measures, specific messages for vulnerable groups • Intensive surveillance of vulnerable populations staying at home during extreme weather • Possible research into available Belgian data on the effects of heat on mental health. • Possible research into the impact of heat on the effectiveness of medications that affect the nervous system. People with mental health conditions are not explicitly mentioned in 'vulnerable population'. However, '*People who take certain medications such as medicines for (…) mental illnesses (…)*' are mentioned. Neither are people with mental health conditions mentioned in 'specific actions' (incl. communication) unless as 'other vulnerable groups that need to be identified'	Limited This measure is already included in NEHAP3 and is mainly under regional authorities' jurisdiction

The NEHAP WG will evaluate the available Belgian data on the effects of heat on mental health. Based on these data, the working group will decide whether additional measures will be included in the RAG's decisions, or the competent authorities will decide whether additional measures will be included during the warning or alarm phase.	
'*Raise literacy and awareness of the possible mental health impacts of heat stress among the general public, emergency workers, high-risk groups'* [75], [76], [82], [108]' See previous measure. This would be a possible measure resulting from the evaluation of the NEHAP WG.	High National coordination
'*Provide a comprehensive overview of available mental health support services'* In general, this seems sufficiently covered in Belgium (e.g., https://spreekerover.be/, https://www.centrageestelijkegezondheidszorg.be/, websites of mental health networks[29]). However, specific actions related to emergencies, including actions to reach vulnerable groups are addressed in the shortlisted measures below.	High *Shared*
'*Digital approaches, e.g., both face-to-face and online consultations in case of disasters*' [77] → *(https://vvkp.be/online-consultaties-veelgestelde-vragen*: *"In België worden videoconsultaties bij een geconventioneerd klinisch psycholoog terugbetaald voor wie daar ook al in de conventionele variant voor in aanmerking kwam."*	Limited *Shared*
'*Effective insurance schemes for rapid coverage of climate-related costs crucial for socio-economically disadvantaged groups*' [75] → out of scope	Out of scope
'*Timely provision of quality accommodation*' [76] → out of scope	Out of scope

[29] https://www.inami.fgov.be/SiteCollectionDocuments/psy_netwerken_volwassenen_psy_reseaux_adultes_citizen.pdf

Description of longlisted measures (except shortlisted measures)

Climate anxiety

Context	Climate anxiety, and eco-anxiety more in general, is not inherently pathological. It can represent an appropriate emotional response to real environmental threats, and a driver towards adaptation and change. Direct and indirect effects of the climate crisis manifest in a spectrum of psychological stress and disorders [78], [109], [110]. A recent study in France, based on the Hogg Eco-Anxiety Scale (HEAS) [111], categorised people from “eco-indifferent” to “eco-terrified”. People in the categories “eco-frightened” and “eco-terrified” are in need of psychotherapeutic support, whereas for the less severe categories of eco-anxiety prevention is needed to avoid they would evolve to higher categories [78]. The French version (HEAS-FR) has been validated further [112]. HEAS was also used and validated in a recent German study [109]. Groups that are specifically vulnerable are youth [80], people with pre-existing mental disorders, and people with low socio-economic status [109], [110], [113]. However, the French study suggests that people of all ages can be affected with people from 25-34 years old scoring highest [78]. Training of health professionals on eco-anxiety seems a necessary action [78]. However, a new e-learning module for health professionals on the relation between environment and mental well-being will be launched (probably early 2027) as a part of NEHAP3. This module will probably focus on eco-anxiety. Therefore, this action is not included here.
Objective	Prevent mild eco-anxiety from developing into severe (pathological) climate anxiety disorder Provide necessary psychological support for people scoring high on the eco-anxiety scale
Description	Climate anxiety, and eco-anxiety more in general, will be addressed without ‘psychologising’ as an appropriate emotional response to real environmental threats, and considered as a possible driver towards adaptation and change. • Develop and provide workshops for schools (facilitated by climate coaches) on climate risks, climate mitigation and climate resilience, in a proactive, realistic and solution-oriented way, focusing on positive actions, in ways that reduce fear and helplessness and support action. ○ The workshops will acknowledge moderate levels of climate anxiety as a normal reaction to uncertain threats of climate change and as a positive driver of action but also point at the need for professional psychological support for severe (pathological) climate anxiety. • Promote and encourage the possibility of organising community-targeted interventions and group sessions on climate anxiety offered by the mental health networks (respectively the children and youth networks and the adult networks)

	○ communication with mental health networks on climate anxiety ○ communication to schools, youth organisations, student organisations as well as organisations working with people in precarious socio-economic conditions to encourage them to organise community-targeted interventions or group sessions on eco-anxiety • [*to be decided if this should be part of this measure or a separate measure*] Improve general communication and narratives on climate mitigation and climate resilience, in a proactive, realistic and solution-oriented way, focusing on positive actions, in ways that reduce fear and helplessness and support action, with consideration for individuals' psychological and emotional responses. ○ develop and implement adapted strategies to reach people in precarious socio-economic conditions in collaboration with and following recommendations and guidelines of the Interfederal Combat Poverty Service
Federal competences	High **FPS Social Security** and **RIZIV/INAMI** are responsible for funding the mental health sector through national health insurance systems → primary psychological care through mental health networks (resilience, self-care, psychoeducation, early detection) **FPS Health** coordinates national training efforts. The federal level is responsible for raising literacy and awareness on mental health impacts of climate change.
Interfederal aspects	Interfederal coordination with regions/communities, e.g., the Flemish policy plan mental health promotion in which climate change as a cause of mental health problems is mentioned in the strategic and operational objectives.
Effectiveness	Research on and acknowledgment of eco-anxiety is quite recent. Whereas the actions included in this measure are based on recommendations in the scientific literature and dedicated reports (i.e., [79], [110], [114]), no concrete examples have been found where they have been put into practice and evaluated. The proposed measure follows the vision on and reforms in the mental healthcare in Belgium, i.e., anchoring mental healthcare in networks, and in primary psychological care (focus on group interventions, on working in community settings ("vindplaatsgericht werken") and on the provision of resilience and self-care, early detection and intervention). The EPCAP study of 2023 stresses the use of working in community settings and group interventions to increase uptake of vulnerable groups and organise accessible care [86]. Co-benefits: More general increased understanding, openness to discussion and social acceptance ("normalisation") of mental health problems, support and treatment; increased support and action for climate mitigation and climate adaptation
Responsible	FPS Health

Other actors / stakeholders involved / transversal aspects	• RIZIV/INAMI • Regional/community level health administrations, education administrations • Mental health networks • Secondary / higher education institutions • Local organisations working with people in precarious socio-economic conditions • Interfederal Combat Poverty Service
Points of attention: gender, equitability, risk of maladaptation	Equitability: Reaching people in precarious socio-economic conditions. Poverty is recognised as a risk factor for development of psychiatric disorders. People living in poverty experience an accumulation of difficulties and permanent stress [87].

ANNEX 5 - RISK OF REDUCED SOCIAL COHESION AND INCREASED INEQUALITIES FROM CLIMATE CHANGE – INITIAL LIST AND LONGLISTED MEASURES

Overview of longlisted measures and measures not taken up further in Be-Adapt

Measures	Direct competences at federal level
Longlisted measures	
Climate vulnerability mapping and shared indicator dashboard • Objective: Target investments and identify most vulnerable zones where adaptation should be prioritised. • Description: Agree a core set of vulnerability indicators (exposure/sensitivity/capacity) across entities; publish open dashboards with privacy-preserving aggregation. Require that major programmes report outcomes by vulnerability quintiles and territories. Create an interfederal unit under existing coordination structures to manage shared indicators, co-financing rules, and evaluation, with formal representation of social actors and municipalities.	High *Shared* The f**ederal government** is responsible for coordinating national climate risk assessments **Regions** provide data
Climate-adaptive social care surge and shock-responsive social protection • Objective: Enhance and adapt Belgium's social protection schemes to be "shock-responsive" to climate events – automatically assisting affected vulnerable populations (financially or in-kind) when extreme weather or climate-related crises occur, thereby preventing climate shocks from driving up poverty or social exclusion. • Description: Define triggers (forecast-based or impact-based) that activate temporary supports: emergency top-ups, simplified claims, labour protections, rapid housing assistance, and targeted outreach. Coordinate with regions/municipalities for referral pathways and with health services for at-risk registries under strong privacy rules. Fund surge staffing pools, telehealth protocols, backup power, and continuity plans for care homes and home-care providers. Integrate with local warning systems and outreach teams.	High *Shared* Social protection policies fall under the **federal government.** If federally funded, it would be implemented by municipalities
Climate displacement preparedness within social services • Objective: Prevent displacement (both within Belgium and from outside) from escalating into social conflict and exclusion. • Description: Plan temporary accommodation standards, rapid rehousing pathways, legal support, and school continuity for displaced families; coordinate with municipalities and housing providers.	High *Shared* **The federal government** oversees policies related to migration and displacement

Link this measure to, and check for overlap with, the measure on flooding displacements.	preparedness, which includes coordinating with **regional and local authorities**
Water affordability and service protection during drought/heat periods • Objective: Ensure basic water access regardless of income or location. • Description: Strengthen protections against service cut-offs; targeted subsidies for vulnerable households; public hydration points and refill networks; rural contingency planning for small water systems. **Feedback from interviews**: to be extended to insist on trade-offs between essential needs and leisure use (e.g., not filling swimming pools during droughts) and between sectors: e.g., households vs. industry vs. agricultural needs	Medium *Shared* The **federal government** has significant responsibility for ensuring consumer protections against service cut-offs during extreme weather events **Regions** have specific responsibility for local water services, pricing and infrastructure
Establish a federal "Just Resilience" standard for adaptation spending • Objective: Ensure all federally funded adaptation measures demonstrably reduce vulnerability for those most at risk and avoid maladaptation. • Description: Create a standard requiring distributional impact assessment, minimum inclusion requirements, and anti-displacement safeguards for projects receiving federal adaptation funds. Require reporting on beneficiaries, accessibility, and vulnerability reduction outcomes; align with "leave no one behind" criteria. Conduct social-cohesion audits of relevant expenditure. **Reason for not shortlisting**: partly covered. Standards defined by High Committee for a Just Transition. Ex ante evaluation conducted by CNTR for all relevant expenditure and projects. Just resilience standards included in the Social Climate Plan, although focused more on mitigation than adaptation. It was not clear from stakeholder interviews how it could translate into a specific measure that would not be "just another checklist".	High *Shared* The **federal government** would establish this standard to ensure all adaptation projects reduce vulnerability in high-risk populations **Regions' authorities** implement the programmes
Integrate adaptation into anti-poverty and social inclusion programmes • Objective: Mainstream climate vulnerability reduction into social policy delivery.	High *Shared* The **federal government** has control over social

• Description: Require social inclusion programmes to include climate risk screening, referral pathways (housing upgrades, cooling support), and partnerships with municipalities and NGOs. **Reason for not shortlisting**: generic mainstreaming covered within the Social Climate Plan. Integration into specific social plans has led to more specific measures (mainstreaming into social protection plan, into health plan, housing plan, …). The stakeholder interviews did not clarify whether more specific measures should be elaborated, and which social plans should be addressed as a priority.	protection, poverty alleviation, and inclusion programmes **Regional governments** would manage local adaptations of these programmes and partnerships with municipalities and NGOs
National Campaign for Climate Solidarity and Behaviour Change • Objective: Roll out a national awareness and engagement campaign that promotes the values of solidarity and mutual aid in the context of climate change • Description: educates the public on how to protect themselves and support vulnerable others during climate events and celebrates examples of communities coming together – thereby fostering a resilient national identity in facing climate adversity. **Reason for not shortlisting**: no specific reason for excluding but not considered a priority by any of the stakeholders interviewed.	High While the federal level can coordinate, behaviour changes and education are largely **community** competences. This requires strong interfederal coordination
Public-Private Partnerships for Resilient Critical Services • **Objective**: Develop **partnership agreements with utility and infrastructure companies** to harden critical systems against climate impacts (grid upgrades, flood-proof telecom facilities, etc.) and to provide priority service and assistance to vulnerable populations during outages or disruptions – ensuring continuity of essential services and preventing social breakdown during climate crises. • **Description**: regulation of key service providers: electricity grid operators, water companies, public transport agencies, telecom firms, etc. with: - climate resilience standards (e.g., power substations in flood zones must have flood defences or quick shut-off to avoid long downtime) - emergency protocols focusing on vulnerable customers (e.g., No disconnection during heatwaves). - deploy mobile generators to support shelters or cooling centres as part of their corporate social responsibility (CSR) or emergency obligation. - Transport services (like SNCB/NMBS for trains) ensure stations are equipped as refuges if passengers are stranded (with water, cooling or heating, information) and vehicles used for evacuation.	Medium The **federal government,** through ministries such as the Ministry of Environment and FPS Health, will coordinate public-private partnerships to ensure that critical infrastructure is resilient to climate risks. Federal leverage for federal utilities (SNCB/NMBS, energy grid via CREG), but low influence on local transport and water which are regional

- open up networks (like free public Wi-Fi or not counting data usage for certain emergency sites/apps during crises). - Incentivise resilience investments by allowing cost recovery for grid upgrades that specifically address climate risk. Update licence conditions to prevent failure to climate threats. - Encourage these companies to engage in community preparedness outreach – e.g., a water company may educate on water saving. - Monitoring: track metrics like duration of service outages in poor vs affluent areas. **Reason for not shortlisting**: specific measure for water prioritisation. Other public services: include the social clauses within a global measure of adjusting network management contracts to integrate climate change aspects.	
Local volunteer and mutual aid formalisation (training, insurance, logistics) • **Objective**: Turn informal solidarity into reliable capacity without burnout. • **Description**: Provide training, protective equipment, micro-grants, and insurance coverage for volunteer networks; establish protocols for deployment during heat/flood events; ensure inclusion of migrant/community organisations. **Reason for not shortlisting**: This measure was not shortlisted because it addresses water prioritisation specifically, rather than public services more broadly. For other public services, the same concern is better addressed by incorporating social clauses into a broader measure on adjusting network management contracts to integrate climate change aspects.	Medium Volunteering and mutual aid are coordinated locally. The status of volunteers is defined at federal level
Measures that are already taken up or out of federal competency	
Municipal "cohesion hubs" for preparedness and recovery • **Objective**: Build trusted, local infrastructure for mutual aid and risk communication. • **Description**: Support neighbourhood centres (existing or new) that coordinate volunteers, multilingual outreach, check-ins for isolated residents, and distribution of cooling kits or cleanup materials after floods. Formalise links with municipal emergency plans and social services. See also pilot project led by Walloon Regional Crisis Centre (Cortex) on flash-flood resilience communities in the framework of the Interreg project "Flash Flood Breakers". **Reason for excluding**: considered a regional competence. Stakeholders interviewed, however, highlight that there may be a role for the federal level regarding the status of volunteers to support such measures. The work of Bea Cantillon was also highlighted on the need to translate the recommendations in the report of the High Committee for a Just Transition into operational measures tailored to each territorial context. For this, suggestions were made on how to develop democratic and inclusive mechanisms at local level. A pilot testing	Low

phase could be led by the federal level to improve lessons learnt in the various Belgian contexts before upscaling at national level through the federated entities.	
Evaluation framework focused on cohesion outcomes (trust, fairness, recovery equity) • **Objective**: Demonstrate whether adaptation strengthens cohesion, not only infrastructure. • **Description**: Add outcome indicators (perceived fairness, trust, participation quality, differential recovery times) to programme evaluation; commission periodic independent reviews and publish results. **Reason for excluding**: partly covered in the measure to establish a federal "Just Resilience" standard for adaptation spending (see longlisted measures, first part of this table). Stakeholders consider that it will be too difficult to identify the contribution of adaptation measures to these indirect cohesion outcomes. Would require too much effort for low impact.	High *Shared* Federal government coordinates national climate risk assessments
Inclusive early warning and risk communication reform • **Objective**: Ensure warnings are received, understood, and acted upon across all communities. • **Description**: Standardise multi-channel alerts (SMS, apps, radio, community mediators) with clear behavioural guidance. Co-produce messages with community organisations; ensure accessibility (plain language, multiple languages, disability formats). Track reach and comprehension. **Reason for excluding**: Included in the discussions concerning the Interfederal Action Plan on Extreme Weather Events	High Early warning system is led by the federal government
Disaster recovery equity protocol (fast, fair, transparent compensation) • **Objective**: Preserve legitimacy and cohesion after disasters. • **Description**: Coordinate across insurers, regions, and social services to prevent gaps. Define service standards for claims processing, advance payments, and appeals; publish timelines and criteria. Provide legal aid and navigators for vulnerable households. Train mediators and community leaders; deploy "conflict-sensitive" service delivery during emergencies; establish transparent grievance channels for adaptation projects and disaster recovery. **Reason for excluding**: covered in inter-federal starting note on extreme events.	High *Shared* **The federal government** can establish protocols for equitable disaster recovery, though local and regional authorities would handle implementation
Training for frontline staff (social workers, police, health staff) on climate equity • **Objective**: Improve fairness and consistency in service delivery during extremes. • **Description**: Develop curricula on vulnerability, non-discrimination, trauma-informed approaches, and referral pathways; include scenario exercises for heat/flood events.	High Shared Federal government coordinates national training efforts

Annex 5 - Risk of reduced social cohesion and increased inequalities from climate change – Initial list and longlisted measures

Reason for excluding: covered in inter-federal starting note on extreme events.	
Insurance accessibility and risk-sharing reforms for vulnerable households • **Objective**: Prevent "protection gaps" from becoming cohesion fractures. • **Description**: Explore targeted premium support, public-private risk pools for high-risk zones, and requirements for transparent pricing and advice; link with household-level risk reduction to avoid lock-in. **Reason for excluding**: Part of it is covered by calamity fund (regional). Ongoing discussion of federal input in 3 working groups (starting note on the Interfederal Action Plan on Extreme Weather Events) + ongoing Cerac analysis	High *Shared* Insurance regulation is under federal, with involvement from regional actors for implementation
Climate-resilient social housing renovation with cooling-first standards • **Objective**: Cut heat and flood vulnerability among low-income households without increasing energy poverty. • **Description**: Set minimum adaptation specs for publicly supported renovations: passive cooling, ventilation, shading, moisture/flood resilience where relevant, and summer comfort metrics. Pair with rent regulation/anti-eviction conditions and targeted grants for private landlords hosting vulnerable tenants. **Reason for excluding**: regional competence.	Low Regional competence
Tenant protection and anti-displacement safeguards in greening projects • **Objective**: Deliver cooling benefits without pushing out intended beneficiaries. • **Description**: Pair greening with rent stabilisation tools, right-to-return policies, social housing quotas, and monitoring of displacement indicators. Include community benefit agreements in major projects. **Reason for excluding**: regional competence. The federal level has levers through financing mechanisms with rules of financing/procurement that could include adaptation criteria. Ongoing work at more general level. Suggestion from interview that one good way to mainstream good practices, greening and ecological improvement without increasing the rents is to have a high share of public housing. In Vienna, for example,, 60% of rental housing are publicly owned (not necessarily social housing).	Low Regional competence
Climate-resilient public transport and "safe mobility" during extremes • **Objective**: Maintain equitable access to work, care, and cooling centres. • **Description**: Hardening of critical lines, shaded stops, heat protocols, flood diversion plans, and priority transport for medically vulnerable people; rural on-demand options during alerts. **Reason for excluding**: FPS already working on this in a specific working group.	Medium *Shared* Federal level manages the SNCB/NMBS, while local routes and stops are regional

Food security support and community food resilience initiatives • **Objective**: Buffer vulnerable households and maintain solidarity during shocks. • **Description**: Expand targeted food assistance during events; support community kitchens and food hubs; link with local producers; ensure dignified access and culturally appropriate options. **Reason for excluding**: regional competence. FdSS (interview) mentioned however that the federal level has a budget for food assistance. This budget had been increased three times with EU recovery plan budgets. It is now back to its previous budget level which causes severe pressure on the sector. Availability of food for food assistance is also threatened by environmental strategies working on waste reduction. This is however outside the scope of the adaptation strategy. FdSS also pointed out that the first priority regarding food security and quality for vulnerable people would be to ensure access to quality and free food in schools. Possible federal competence regarding food quality: regulate and ban commercial communications on poor quality food contributing to health sensitivity. This would, however, be more closely related to the health axis measures.	Low Regions are the first line actors
Rural service continuity and "last mile" resilience package • **Objective**: Maintain equal access to essential services under climate disruption. • **Description**: Fund mobile health/social service units, backup power for rural clinics, and community transport during heat/flood events. Integrate with local volunteer networks and civil protection planning; ensure multilingual risk communication for seasonal workers. **Reason for excluding**: regional competence.	*Low*
Targeted Support for Rural and Farming Communities • **Objective**: Implement an adaptation support package for rural areas and farmers. • **Description**: financial tools (like crop insurance or diversification grants), advisory services for climate-smart agriculture, and community resilience initiatives (like cooperative water management), so that rural and farming communities can adapt effectively without social or economic breakdown. **Reason for excluding**: regional competence. The federal level has levers through financing mechanisms, but this would only be a specific dimension of a more comprehensive measure. It should however be checked that the working group on insurance also encompasses agricultural/crop-insurance aspects.	High The **federal government** has responsibility only for providing financial tools
Climate-proofed school and childcare environments • **Objective**: Protect children and provide visible, shared resilience assets.	Low

• **Description**: Retrofit schools with passive cooling, shading, and safe ventilation; green schoolyards; heat protocols for schedules. Use schools as cooling/relief hubs after hours with staffing plans. **Reason for excluding**: regional competence.	
Climate Education and "Just Resilience" Awareness in Schools and Communities • **Objective:** Promote widespread climate adaptation literacy and solidarity • **Description: Incorporate climate justice and adaptation** topics in school education at all levels, and host regular community dialogues/workshops that raise awareness of local climate risks and the importance of inclusive, fair adaptation – thereby building an informed and cohesive public that supports equitable resilience measures **Reason for excluding**: regional competence.	Low
Climate Migration and Integration Support • **Objective**: Proactively develop strategies to **welcome and integrate climate-displaced persons** – both international climate refugees and internally displaced families • **Description**: provide housing, language and job support, and community-building programmes that ease their transition and foster positive relationships with host communities, thereby maintaining social harmony. **Reason for excluding**: internally displaced persons are covered within the specific measure of addressing displacement preparedness within social services and the overlap with flooding displacement. Anticipation of future climate migrations within migration plan was highlighted as important during interviews, but they also pointed out that there is no real "migration plan" except the idea that at some point migrations would stop. It is therefore difficult to mainstream climate aspects in this topic.	Low
Heat-health outreach teams for isolated and medically vulnerable people • **Objective**: Reduce morbidity, mortality, and perceived abandonment during heatwaves. • **Description**: Deploy trained outreach (nurses, social workers, volunteers) for proactive check-ins, hydration/cooling support, transport to cooling centres, and medication continuity. Align with privacy rules and primary care networks. **Reason for excluding**: regional competence.	Low
"Cool home" grants and no-interest loans for low-income households • **Objective**: Increase household-level heat resilience fairly.	Low

• **Description**: Subsidise shading, ventilation, window treatments, and efficient cooling where necessary, prioritising passive measures. Provide installation support and consumer protection to prevent predatory sales. **Reason for excluding**: regional competence.	
Climate-ready cultural and public spaces as "shared resilience assets" • **Objective**: Provide inclusive, non-stigmatising places for relief and community building. • **Description**: Retrofit libraries, community centres, and sports halls for cooling and emergency use; extend opening hours during heat; programme inclusive activities to maintain social ties. **Reason for excluding**: regional competence.	Low
National heat equity programme for deprived urban neighbourhoods • **Objective**: Reduce heat-related harm and visible inequities in cooling access. • **Description**: Co-finance municipal packages: cool roofs, street shade, pocket parks, schoolyard greening, fountains/misters where appropriate, and "cool routes" to services. Require tenant protections and affordability measures to avoid green gentrification. **Reason for excluding**: regional competence.	Low

Description of longlisted measures (except shortlisted measures)

Climate vulnerability mapping and shared indicator dashboard

Context	Vulnerability is one of the three core components of risk. When considering exposed populations, each social dimension of vulnerability therefore represents a potential lever for adaptation and resilience. However, there are currently limited guidelines and quantified targets addressing these social dimensions at both international and national levels. In order to define clear objectives, a necessary first step is to identify and operationalise these social dimensions of vulnerability through robust and measurable indicators. Belgium already has several advanced but fragmented initiatives to measure social vulnerability. In Wallonia, the ISADF provides a broad, rights-based multidimensional framework with 13 rights and over 100 indicators, combining administrative and survey data at local level[30]. The AWAC social vulnerability indicator further operationalises climate vulnerability using demographic, socio-economic, health and environmental variables at statistical sector level[31]. At national level, the ELLIS project and the Belgian Index of Multiple Deprivation (BIMD) introduce harmonised, small-area composite indicators across domains such as income, employment, housing and health, enabling spatial targeting [32]. However, these approaches use different methodologies, datasets and update cycles, limiting comparability and policy coherence. The ELLIS analysis explicitly highlights challenges of data harmonisation and the need for shared tools across regions. Without coordination, this fragmentation risks duplications, inconsistent targeting and reduced policy effectiveness. Consider integrating a specific subset of indicators into this overall dashboard for displacement issues: numbers, thresholds, re-entry rates, social vulnerability in the event of flooding
Objective	Establish a harmonised, validated and regularly updated national framework of social climate vulnerability indicators, enabling coherent, comparable and policy-relevant mapping across Belgium.
Description	The measure consists of creating a federal coordination mechanism to define a core set of shared indicators for climate-related social vulnerability, building on existing initiatives (ISADF, AWAC indicator, BIMD, Flemish work).

[30] IWEPS 2025, Rapport de recherche 64 – Mise en place d'une enquête citoyenne et construction de l'indice synthétique d'accès aux droits fondamentaux https://ediwall.wallonie.be/iweps-rapport-de-recherche-64-rapport-methodologique-de-lisadf-2025-mise-en-place-dune-enquete-citoyenne-et-construction-de-lindice-synthetique-2025-137784

[31] Loozen, Y., Habran, S., Harchies, M. (2025). Risques climatiques en Wallonie. Indicateur de vulnérabilité sociale de la population face aux aléas climatiques. Service Public de Wallonie (SPW) – Agence wallonne de l'Air et du Climat (AwAC). https://rapport-methodo.s3.eu-west-1.amazonaws.com/Rapport+me%CC%81thodo+-+06+-+Social.pdf

[32] Martina Otavova, Bruno Masquelier, Christel Faes, Laura Van den Borre, Catherine Bouland, Eva De Clercq, Bram Vandeninden, Andreas De Bleser, Brecht Devleesschauwer, 2023. "Measuring small-area level deprivation in Belgium: The Belgian Index of Multiple Deprivation" https://www.sciencedirect.com/science/article/pii/S1877584523000242

	A technical working group (federal, regional, scientific actors) would identify a minimum common framework (e.g., demographic sensitivity, socio-economic conditions, health, housing, social isolation, exposure proxies), while allowing regional extensions. The federal level would facilitate data access and standardisation, notably through administrative datasets (Statbel, health, social security), ensuring interoperability and GDPR compliance. A shared dashboard platform would visualise indicators at relevant spatial scales (statistical sector, municipality), updated regularly. The approach would explicitly integrate climate hazard overlays (heat, floods) and enable cross-sectoral use (health, crisis management, social policy). Once validated, the shared indicator set would act as a reference tool, encouraging all levels of governance to align policies and monitor inequalities.
Federal competences	Statistical coordination, national datasets (Statbel, health, social security), climate policy coordination (NCC), and support to National Adaptation Plan and NEHAP.
Interfederal aspects	Strong interfederal coordination required for indicator definition, data harmonisation, and alignment with regional methodologies and policy uses.
Effectiveness	Improved targeting of vulnerable populations, coherent policy design, enhanced trust through transparency, and increased integration of social vulnerability into climate adaptation decisions. Quantified commitments at multiple governance levels targeting each dimension of social vulnerability.
Main actors	• Federal Climate Change Department (FPS Health - DG Environment), in collaboration with Statbel and Sciensano. • Regional administrations: AWAC (Wallonia), VMM (Flanders), Bruxelles Environnement • Scientific institutions: ISSeP, IWEPS, IBSA, Vivalis, Sciensano, universities • Federal services: Statbel, Social Security, RIZIV/INAMI • Local authorities and CPAS/OCMW • NGOs working on poverty, health and social cohesion, Inter-Mutualist Agency • Data protection authorities (GDPR compliance)
Time horizon	• 2027: Mapping existing indicators, governance setup, agreement on core framework • 2028: Indicator harmonisation, pilot dashboard, data-sharing agreements • 2030: Full deployment, integration into NAP and sectoral policies • Beyond: Regular updates (e.g., annual/biennial) and methodological refinement
Points of attention: gender, equitability, risk of maladaptation	Ensure indicators capture gendered vulnerabilities and intersectionality; avoid reinforcing territorial stigma; guarantee inclusive data (e.g., migrants, homeless); prevent maladaptation through mis-targeting or over-reliance on composite indices without contextual interpretation.

Annex 5 - Risk of reduced social cohesion and increased inequalities from climate change – Initial list and longlisted measures

Water affordability and service protection during drought/heat periods

Context	Climate change is increasing the frequency and intensity of droughts and heatwaves, placing growing pressure on water resources in Belgium. These situations raise complex trade-offs between competing water uses (households, agriculture, industry, ecosystems), often requiring restrictions or prioritisation. Vulnerable populations are disproportionately affected, as water affordability and access to essential services can be compromised during crises. Existing frameworks for water management and pricing do not always sufficiently account for social equity and basic needs under stress conditions. Moreover, decision-making processes for water allocation are often sectoral and lack transparent prioritisation criteria. Ensuring access to water as a basic need, while managing scarcity across sectors, is therefore a critical adaptation challenge. A more integrated approach combining social protection, water governance and crisis management is required.
Objective	Guarantee equitable access to essential water services during drought and heat periods while establishing transparent and socially just prioritisation of water uses.
Description	This measure establishes a national framework for water prioritisation and social protection during scarcity events. It defines clear hierarchies of water use, prioritising basic human needs and vulnerable populations, followed by essential services and economic uses. Social measures would include water affordability protections, such as temporary tariffs, moratoria on disconnections, and targeted support for low-income households. The framework would integrate early warning systems and trigger-based restrictions, coordinated across regions. Data sharing and monitoring systems would support real-time decision-making. The measure would also promote local resilience solutions, such as decentralised water access points and community-level preparedness. Public communication strategies would ensure transparency and public acceptance of allocation decisions. Stakeholders interviewed suggested the need to have a democratic mechanism at local level to discuss how to agree on the distribution of resources in periods of scarcity (not necessarily only water). So far, access is largely determined by ability to pay. The democratic mechanism could be inspired by community preparedness and resilience experiences (see Interreg project Flash Flood Breakers) and recommendations from the Just Transition report to the High Committee. Such mechanisms are strengthened and are better able to reach vulnerable people when combined with social, cultural and safe and accessible public spaces such as youth centres and cultural centres with free or cheap quality food and drinks.
Federal competences	Coordination of crisis management, social protection measures, and support to national frameworks for resource prioritisation and public health.
Interfederal aspects	Strong coordination with regions responsible for water management, pricing policies, and infrastructure, ensuring coherent and equitable implementation.
Effectiveness	Maintained access to essential water for vulnerable groups, improved legitimacy of allocation decisions, and reduced social tensions during drought and heat crises.

Annex 5 - Risk of reduced social cohesion and increased inequalities from climate change – Initial list and longlisted measures

Main actors	• Federal Climate Change Department, FPS Health, and FPS Economy (consumer protection aspects). • Regional water authorities and utilities • Municipalities • Social services (CPAS/OCMW) • Environmental agencies • Civil society organisations
Time horizon	• 2027: Definition of prioritisation principles and stakeholder consultation • 2028: Legal and operational framework development • 2030: Integration into drought and heat plans • Beyond: Monitoring and iterative refinement
Points of attention: gender, equitability, risk of maladaptation	Ensure affordability measures reach informal or marginalised users; avoid disproportionate restrictions on vulnerable groups; integrate gender and household dynamics; prevent maladaptation through inequitable allocation or long-term resource degradation.

Annex 5 - Risk of reduced social cohesion and increased inequalities from climate change – Initial list and longlisted measures

Establish a federal “just resilience” standard for adaptation spending

Context	Belgium’s just transition work already points toward the need to embed social and participatory safeguards into environmental policy rather than treat them as an add-on. The High Committee defines just transition as placing social and participatory rights at the heart of environmental policy and stresses four dimensions: guaranteeing social and environmental rights within planetary boundaries, fair distribution of efforts and benefits, resilience to natural and transition risks for all, and meaningful participation in decision-making. It also notes that just-transition imperatives have not yet been translated into sufficiently concrete objectives and measures in Belgian climate plans. The 2025 Just Transition blueprint likewise emphasises social legitimacy, vulnerable groups, and democratic inclusion. In parallel, the Belgian Social Climate Plan is being prepared through the National Climate Commission, with a federal-regional working group assessing support measures for vulnerable households, transport users and micro-enterprises. Together, these elements justify a common federal “just resilience” standard for adaptation expenditure.
Objective	Ensure that publicly funded adaptation measures systematically meet minimum social fairness, participation, and vulnerability-reduction requirements before approval and during implementation.
Description	The measure would create a federal just-resilience standard applying to federal adaptation spending and to co-financed national measures under the future National Adaptation Plan. The standard should include at least five tests: distributional effects, protection of vulnerable groups, affordability impacts, participation quality, and maladaptation risk. This would translate the High Committee’s justice principles into an operational spending filter and align adaptation with the Social Climate Plan’s concern for vulnerable households and users. In practice, the standard could be integrated into project fiches, budget notes, and ex ante evaluation templates, with a proportionate approach for small versus large measures. A pilot phase should be launched in a few local territories to test last-mile democratic mechanisms—for example, territorial assemblies or co-design panels—so that national standards are not only defined centrally but also appropriated locally.
Federal competences	Federal government can set conditions for federal spending, procurement, ex ante policy appraisal, and national adaptation coordination.
Interfederal aspects	Territorial application, co-financing, and local democratic testing require coordination with regions, communities, and municipalities.
Effectiveness	More adaptation spending reaches vulnerable groups, fewer inequitable side effects occur, and project documentation systematically demonstrates fairness, participation, and affordability safeguards.
Main actors	• Federal Climate Change Department (FPS Health, Food Chain Safety and Environment), with support from the Federal Institute for Sustainable Development and FPS BOSA for appraisal/procurement methods. • National Climate Commission; • Regional climate administrations;

	• Federal Planning Bureau; • Anti-poverty bodies; • Social partners; • Local authorities; • Civil society; • Citizen panels; • Researchers.
Time horizon	• T0 (at inception): include just transition standards as a transversal aspect across all adaptation axes within the NAP • 2027: pilot of a last-mile democratic mechanism to appropriate adaptation and social issues at local level • 2030: embed in the federal budget guidance and scale up the pilot project at national level. • Beyond: annual reporting and refinement.
Points of attention: gender, equitability, risk of maladaptation	The standard should require sex-disaggregated and socio-economic analysis, avoid place-based stigma, assess tenant impacts and accessibility, and guard against green gentrification or disproportionate burdens on already vulnerable groups.

Local volunteer and mutual aid formalisation (training, insurance, logistics)

Context	Belgium's recent crises showed the value of local solidarity but also the fragility of informal mobilisation. During COVID-19, the federal government repeatedly adopted temporary support measures for volunteering, including extensions of the volunteering framework to commercial elderly-care settings and temporary changes related to reimbursement ceilings and support mechanisms. These ad hoc changes indicate that the standard framework under the Law of 3 July 2005 on the rights of volunteers is not fully adapted to prolonged, high-intensity crisis mobilisation across care and emergency support functions. In the 2021 floods, local volunteer mobilisation was considerable, but the main bottlenecks reported across crises have generally concerned legal clarity, insurance, reimbursement, compatibility with benefits, and coordination rather than willingness to help. Most operational aspects of volunteer mobilisation—training, local logistics, neighbourhood coordination, emergency planning—fall to the regional and local levels. The key federal lever is therefore the status of volunteers, which should better support regional crisis and mutual-aid systems.
Objective	Provide a crisis-ready volunteer framework that removes legal and insurance obstacles and enables regional and local authorities to mobilise mutual aid quickly and safely.
Description	This measure should focus on a federal reform of volunteer status, while leaving training, logistics, deployment models and local coordination mainly to regions and municipalities. The federal reform should update the Law of 3 July 2005 and related implementing decrees so that, in officially recognised crisis periods, volunteers can be activated under a simplified emergency regime with clear insurance coverage, compatible reimbursement rules, and explicit safeguards for people receiving unemployment or social benefits. COVID-era temporary measures demonstrate that Belgium can derogate from ordinary rules when needed; the lesson is to predefine these derogations instead of improvising them. Regions would then build their own operational systems: local registers, modular training, stock management, neighbourhood deployment, and interfaces with civil protection and social services.
Federal competences	Volunteer status, reimbursement ceilings, social-security compatibility, and legal insurance framework are predominantly federal matters.
Interfederal aspects	Regional emergency planning, training systems, and local volunteer deployment models should be co-developed across governance levels.
Effectiveness	Faster mobilisation, fewer legal uncertainties, wider participation of volunteers, and fewer interruptions caused by insurance, reimbursement or benefits-related barriers.
Main actors	• The lead federal administration should be FPS Social Security, in close cooperation with FPS Employment and the Higher Council for Volunteers, because the main issues concern status, benefit compatibility, and insurance architecture rather than operational deployment. • Regions and municipalities;

	• Civil protection; • Red Cross; • Volunteer platforms; • CPAS/OCMW; • Health and care institutions; • Insurers; • Unemployment and benefit agencies.
Time horizon	• 2027: legal review and crisis-after-action analysis. • 2028: amend law/decrees and issue model protocols. • 2030: regional operational rollout and exercises. • Beyond: periodic review after real events or simulations.
Need for transformative change	N/A
Points of attention: gender, equitability, risk of maladaptation	Avoid shifting essential public responsibilities onto unpaid labour; ensure inclusive access for women, migrants, older adults and low-income volunteers; reimburse costs fairly; and prevent unsafe deployment without training or psychosocial support.

Integrate adaptation into anti-poverty and social inclusion programmes

Context	Climate risks interact directly with poverty and social exclusion, but not every social policy instrument needs to be climate-proofed in the same way. Employment-related dimensions are already closely linked to social-security reform and labour-market adaptation measures, particularly where climate transition and climate shocks reshape income stability, working conditions and retraining needs. By contrast, health and housing are better handled in dedicated adaptation measures under the relevant axes, especially heat-health planning and housing/renovation resilience. That leaves a broad range of social inclusion and anti-poverty programmes where climate risks are still insufficiently anticipated: debt prevention, minimum income support pathways, digital inclusion, food aid, homelessness strategies, local social action plans, and social accompaniment for people with complex vulnerabilities. A targeted integration of climate adaptation into these programmes would improve early identification of climate-related hardship, strengthen referral mechanisms, and avoid treating climate shocks as purely exceptional events rather than foreseeable drivers of deprivation.
Objective	Systematically integrate climate-risk anticipation into anti-poverty and social inclusion programmes that are not already covered by dedicated health, housing, or labour-market adaptation measures.
Description	This measure should focus on the non-sectoral social-policy layer. Employment-related adaptation should remain tied to the broader social-security and employment reform track (see measure 3.5.5.1climate-adaptive social care surge and shock-responsive social protection), where climate shocks and transition effects on work, skills and income are already central policy concerns. Health and housing should be dealt with under dedicated adaptation measures in those sectors, to avoid overlap and fragmentation. The added value here is elsewhere: climate-sensitive debt support, crisis-proof social assistance pathways, homelessness services prepared for heat and flooding, food-security and school-support programmes, social inclusion plans, and digital inclusion initiatives capable of functioning during shocks. Climate screening should be added to programme design, local action plans, and referral tools used by CPAS/OCMW and social-inclusion services. The measure should also encourage “anticipatory social work” by identifying households likely to be destabilised by recurring heat, flooding, price shocks or service disruptions before they fall into deeper poverty.
Federal competences	Federal level shapes anti-poverty coordination, minimum-income frameworks, social-security architecture, and national social-inclusion priorities.
Interfederal aspects	Delivery is shared with regions, communities, and municipalities, especially through local social services and inclusion programmes.
Effectiveness	More anti-poverty programmes systematically assess climate risks, referrals improve, and fewer vulnerable households experience repeated climate shocks as chronic social decline.

Annex 5 - Risk of reduced social cohesion and increased inequalities from climate change – Initial list and longlisted measures

Main actors	• PPS Social Integration, in coordination with FPS Social Security and the Federal Climate Change Department. • CPAS/OCMW; • Anti-poverty networks; • Social inclusion NGOs; • Food-aid organisations; • Local authorities; • Digital inclusion actors; • Employment services
Time horizon	• 2027: mapping of relevant plans and screening tools. • 2028: climate-risk module in guidance and local plans. • Beyond: evaluation and refinement.
Points of attention: gender, equitability, risk of maladaptation	Climate screening should not create new administrative burdens or conditionalities; it should identify needs earlier, remain accessible, and reflect gendered and intersectional pathways into poverty.

Annex 5 - Risk of reduced social cohesion and increased inequalities from climate change – Initial list and longlisted measures

National campaign for climate solidarity and behaviour change

Context	Public communication on preparedness often focuses on self-protection, but some international best practice shows that solidarity can also be framed as part of resilience. Sweden's official brochure *In case of crisis or war* explicitly tells residents that they are part of the country's overall preparedness and that resilience is built every day together with relatives, neighbours, colleagues and friends. This offers a useful reference for a Belgian campaign that would combine practical preparedness with neighbourly support and attention to vulnerable people. Such a campaign could promote small acts of solidarity—checking on isolated people during heatwaves, sharing trusted information, supporting local cooling or relief points, and joining trained volunteer networks. However, communication campaigns have limits: they are only effective when paired with material support, trusted institutions, and accessible services. On their own, they rarely correct structural inequalities. For that reason, this measure is useful but should probably not be considered a top adaptation priority compared with more structural social-protection and service-delivery reforms.
Objective	Promote practical preparedness and social solidarity behaviours that help communities protect vulnerable people during climate-related crises and everyday climate stress.
Description	A Belgian campaign could combine three strands: household preparedness, mutual aid, and trusted public guidance. Like the Swedish brochure, it should use simple language, paper and digital formats, and multilingual distribution. It should not only say "prepare yourself" but also "know who around you may need help," thereby linking resilience to social cohesion. Materials could include seasonal flyers for heat and drought, advice on checking on neighbours, local helplines, cooling-point information, and prompts to join structured volunteer systems. International good practice suggests that repetitive, standardised messaging works best when it is linked to concrete actions and visible institutions. The campaign should therefore be tied to municipal plans, schools, public-health messaging and local organisations rather than run as a one-off media operation. Its limits should be acknowledged clearly: communication cannot substitute for housing, health, social protection or crisis-response capacity. It is therefore a supporting measure, not a core structural one.
Federal competences	Federal level can coordinate national messaging, preparedness standards, multilingual materials, and links with crisis-management and climate communication.
Interfederal aspects	Local tailoring, trusted messengers, and distribution through schools, municipalities, communities and regions are necessarily shared responsibilities.
Effectiveness	Higher awareness of solidarity behaviours, better uptake of local preparedness services, and stronger recognition of vulnerable groups in public crisis behaviour.
Other actors / stakeholders involved / transversal aspects	• National Crisis Center and Federal Climate Change Department, with public-health communication support. • Regions; • Municipalities;

	• Schools; • Public broadcasters; • NGOs; • Volunteer organisations; • Public-health services; • Community leaders; • Migrant support organisations
Time horizon	• 2027: concept and testing with target groups. • 2028: national rollout linked to heat season. • Beyond: periodic updates and integration into crisis communication cycles.
Points of attention: gender, equitability, risk of maladaptation	Avoid moralising messages that shift responsibility onto households; ensure accessibility for low-literacy and multilingual audiences; and avoid implying that solidarity can compensate for inadequate public services.

Public-private partnerships and network management contracts for resilient critical services

Context	Critical services such as water, energy, transport and communications are essential to climate resilience, but their social dimension is often underdeveloped in technical resilience planning. Belgium already has the general framework of public procurement and service contracting, while sectoral drought initiatives such as Flanders' Blue Deal illustrate the growing importance of scarcity planning and water governance. The challenge is not only to harden networks physically, but also to define social service obligations under stress: who must be protected first, which minimum services are non-negotiable, how vulnerable users are identified, and how communication and compensation work during disruption. For this reason, the strongest argument is that this issue should be addressed primarily within the infrastructure axis, but with explicit social requirements embedded in network management contracts and service standards. A dedicated social sub-measure may still be useful to ensure that equity is not lost inside a predominantly technical infrastructure agenda.
Objective	Embed social-protection and equity obligations into critical-service network contracts so resilience planning protects vulnerable users during climate-related disruptions and scarcity episodes.
Description	This measure should require that service-management contracts and public-private partnership frameworks for critical networks include explicit social resilience clauses. These should cover continuity of minimum service, priority restoration criteria, affordability safeguards during crises, support for medically or socially vulnerable users, accessible communication, and transparency on outage management. This measure would possibly be best placed in the infrastructure axis, because it is fundamentally about network governance and service obligations; the social dimension should be mainstreamed there rather than treated as an entirely separate policy family. A particularly useful pilot would be in water services, where scarcity management is becoming unavoidable (see the Annex 5 water-affordability measure). The pilot should test a social-equity stress test for drought and heat conditions, including water-service continuity, priority uses, support for precarious households, and a local democratic arbitration mechanism to discuss trade-offs before crisis periods. This would connect technical scarcity planning with public legitimacy and social fairness.
Federal competences	Federal levers exist through general public-contracting rules, consumer protection, crisis coordination, national transport systems (SNCB) and national resilience standards for essential services.
Interfederal aspects	Sector regulation, utility governance, local transport and water policy are substantially regional and require strong interfederal coordination.
Effectiveness	Service contracts explicitly include social safeguards, crisis protocols protect vulnerable users, and pilot water-arbitration processes improve legitimacy and preparedness.
Main actors	• FPS Economy and FPS BOSA for contract/governance frameworks, with the Federal Climate Change Department and National Crisis Center. • Regional utility regulators;

	• Water and energy operators; • Municipalities; • Consumer bodies; • Anti-poverty organisations; • Health actors; • Civil protection; • Local citizen panels.
Time horizon	• 2027: define model social clauses and select sectors. • 2028: pilot in water services. • 2030: evaluate and extend to other critical-service contracts. • Beyond: embed in standard network-governance practice.
Points of attention: gender, equitability, risk of maladaptation	Social clauses should protect households with care burdens, medical needs and low incomes; avoid opaque prioritisation; and ensure crisis trade-offs do not systematically disadvantage precarious territories or users.

ANNEX 6 - RISK TO CONTINUITY OF HEALTHCARE SYSTEMS DUE TO HEATWAVES AND FLOODING – INITIAL LIST AND LONGLISTED MEASURES

Overview of longlisted measures and measures not taken up further in Be-Adapt

Measures	Applicability at federal level
Longlisted measures	
Include the pre-establishment of protocols for staff access to hospital sites during flooding in hospital emergency plans	**High** Defining key themes to include in hospital emergency plans is a federal competence, but implementation is not.
Develop targeted alert systems for hospitals	**High** *Shared responsibility* National crisis and health-surveillance systems to anticipate system-wide stress + regional responsibility for local alerting.
Provide guidance for hospitals to train their workers for heat and flood emergencies	**Medium** *Shared responsibility* Federal authorities define health-system preparedness principles and set standards, while federated authorities and hospitals implement training.
Establish a healthcare workforce reserve database for climate-related emergencies	**Medium** *Shared responsibility* Establishment of the list is federal (workforce organisation and contingency staffing), deployment of workers to hospitals is regional.
Issue national recommendations on protecting hospital staff during heatwaves	**High** *Shared responsibility* Federal level can issue minimum requirements/guidance (within the labour framework) for safety norms and health

	standards, but implementation is at the hospital level.
Provide hospitals with guidance on protecting essential medical supply autonomy during heatwaves and floods	**High** Recommendations are federal.
Pre-contract drone services to deliver critical medicines/blood	**High** Airspace regulation, medicines logistics and emergency medical supply chain are federal. The drone operating company might be a private entity. Federal involvement would be justified in the context of crisis preparedness. Any arrangement would require a public procurement process.
Measures not taken up further in Be-Adapt	
Develop hospital heatwave protocols **Objective**: Ensure continuous and safe healthcare delivery during heatwaves. **Description**: Introduce a national obligation for hospitals to implement heatwave management plans. The plan can include deferring non-urgent elective care, relocating at-risk patients to cooled wards, and increasing seasonal bed availability. **Reason for excluding**: Stakeholder representatives mentioned that the service disruption topic is already covered in the hospital emergency plans.	**High** *Shared responsibility* Hospital responsibility, with federal standards (FPS Health + RIZIV/INAMI).
Identify critical medical supplies and ensure multi-sourcing **Objective**: Reduce supply disruptions by securing reliable access to essential medical products. **Description**: Identify the hospital's critical medical supplies and establish multi-sourcing arrangements to avoid dependence on a single supplier. **Reason for excluding**: Stakeholder representatives mentioned the Federal Agency for Medicines and Health Products (FAMHP) already has response mechanisms.	**Limited** *Shared responsibility* Federal coordination only if national supply chains are affected.
Conduct awareness-raising and behavioural adaptation campaigns	**High** *Shared responsibility* National communication campaigns possible when linked to national

Objective: Reduce preventable injuries and unnecessary hospital visits during heatwaves and floods by informing the population (especially vulnerable groups) with clear guidance on protective behaviours. **Description**: Implement targeted awareness campaigns through the media and official channels to inform the public about safe actions during heatwaves and flooding, such as moving to or remaining on upper floors, avoiding driving through floodwaters, ensuring adequate hydration, staying in shaded and cool areas, and adapting daily routines. **Reason for excluding**: The governance analysis showed that behavioural guidance is federated, and the topic of managing the additional influx of patients is not seen as a priority to focus on in this study.	emergency management, but behavioural guidance mostly falls under prevention/health education (federated).
Set up a phone helpline **Objective**: Reduce unnecessary hospital visits during heatwaves and floods by providing accessible tailored advice. **Description**: Establish a dedicated helpline that allows people to call for guidance on minor or non-urgent situations, helping prevent avoidable emergency department visits. **Reason for excluding**: This is seen by stakeholder representatives as a more general problem of first-line healthcare practitioners being difficult to reach, which should be tackled with other issues at a more general level. Moreover, the theme of managing the additional influx of patients is not seen as a priority to focus on in this study.	**High** *Shared responsibility* Federal coordination of regional helplines if integrated with emergency response (112). If advice-only line, more likely to be federated.
Implement green and blue infrastructure in the direct vicinity of hospitals **Objective**: Enhance hospital resilience to heatwaves and flooding through measures like nature-based solutions. **Description**: Introduce green and blue infrastructure around hospital sites to improve soil water retention during floods and offer cooling recreational areas during heatwaves. This also supports patient and staff well-being. **Reason for excluding**: Local and federated competence.	**Limited** *Local and federated competence*
Develop a national “climate surge module” in the Belgian Incident Tracking System (BITS) **Objective**: Enable real-time visibility of climate-related pressures on hospitals by tracking heat- and flood-driven patient surges and staffing shortfalls.	**High** *Federal competence* Nationally coordinated data system.

Description: Add a dedicated “climate surge” module to BITS to monitor indicators such as heat-related patient surges or staff shortages linked to heat or flood. **Reason for excluding**: The feedback received indicated that there are already statistics about this, therefore there is little value in analysing this measure further.	

Description of longlisted measures (except shortlisted measures)

Include the pre-establishment of protocols for staff access to hospital sites during flooding in hospital emergency plans

Context	Hospital Emergency Plans are mandatory in Belgium. They aim to provide hospitals with the necessary tools and preparedness levels to face crises, while maintaining a high quality of care for their patients. Such plans consider both internal and external disruptive events, including flooding. However, these plans primarily focus on topics such as the management of patient surges and internal continuity of care. They do not include a protocol to ensure that staff working in areas affected by extreme weather events are enabled to reach their work site. This measure aims to build a structured national approach to anticipating staff mobility challenges during floods and pre-establishing protocols to address this gap and reduce staff absence during these events, therefore promoting continuity of care within hospitals. Paragon is an online platform developed by the National Crisis Center. It allows information exchange during emergencies, such as the sharing of maps, and is a proposed tool to operationalise part of this measure. In particular, it can enable the visualisation of non-floodable routes and alternative access options for staff.
Objective	Ensure the continuity of hospital operations during flooding by guaranteeing that healthcare staff can access hospital sites in case of flooding.
Description	The measure establishes a federal toolbox to support the identification and organisation of alternative access arrangements for staff whose commute to hospital sites is affected by floods. It provides a variety of tools and proposed approaches that can be applied to identify staff-mobility challenges in advance and think of safe access routes from the personnel's home to the hospital. The toolbox includes federally standardised methods, templates and digital resources, including: • Methodology for identifying critical staff categories whose presence is essential on-site, with guidance on estimating the minimum number of staff from each category to enable continuity of care services; • Recommendation to map the personnel's home addresses against areas at risk of flooding to know who may need support in case of flood; • Guidance for hospitals to map alternative access routes using Paragon, based on maps identifying roads susceptible to flooding (to be delivered by the regional authorities); • Recommendation for hospitals to make sure that concerned staff is aware of alternative routes and knows where to find real-time information on floodable areas or alternative transport options (likely to be accessed via a regionally governed tool);

	• Procedures to request federal support when staff cannot reach the hospital safely by their own means, including predefined triggers and channels to ask for federal emergency assistance (e.g., Civil Protection, specialised high-clearance vehicles, or boats).
Federal competences	• Ability to introduce or recommend new components in the hospital emergency plans, as well as setting the associated guidance and recommendations. • Competence for the activation of Civil Protection and federal emergency assistance services that help people reach their workplace. • Paragon is a federal tool.
Interfederal aspects	The federated entities will be responsible for sharing maps of flood-prone areas as well as associated real-time information, which can support the identification of alternative transport routes. A close coordination with regional crisis centres and hospital-infrastructure regulators is required to ensure alignment between federal protocols and local implementation capacities.
Effectiveness	• Increases continuity of care for patients. • Provides employees with organisational support, helping them feel better prepared. • Reduces anxiety on the day of the disruption, both for employees affected by flooding, who have clear guidance on how to reach the workplace, and for their colleagues, who are less likely to face increased workloads resulting from staff shortages. • Possibility for the toolbox to be adapted to include other climate-related risks in the future.
Responsible	FPS Health (DG Health Care)
Other actors / stakeholders involved / transversal aspects	• FPS Interior - Civil protection • Regional authorities • National Crisis Center – Paragon development
Points of attention: gender, equitability, risk of maladaptation	Flood patterns may evolve and the pre-identified routes may become obsolete. This exercise should be done regularly to update the processes. It is important to stress that staff should not put themselves in danger and travel only if the overall situation does not pose a risk to their safety. The mapping of staff home addresses may raise General Data Protection Regulation (GDPR) and privacy concerns. These should be carefully assessed, and appropriate privacy-preserving measures should be implemented before any such mapping exercise is undertaken.

Establish a healthcare workforce reserve database for climate-related emergencies

Context	Hospitals are likely to face recurring staffing pressures during climate-related events such as heatwaves and floods. In fact, such events can increase patient load while simultaneously reducing staff availability due to illness, caregiving responsibilities, or transport disruptions. Despite this, there is currently no central system that maintains up-to-date, structured information on potential reserve workers with medical training (e.g., recently retired staff, part-time professionals, civil servants with medical qualifications) or that defines clear criteria for their mobilisation during climate-related emergencies. This gap increases the risk of staff shortages, creating an intense workload on the personnel present on site, and potentially reducing the quality of care given to patients. A structured healthcare workforce reserve database would address this by providing visibility on additional personnel capacity and enabling a faster and coordinated mobilisation during climate-related emergencies.
Objective	Ensure continuity of hospital services by enabling coordinated activation of healthcare workforce reserves when minimum staffing thresholds are at risk.
Description	This measure involves the establishment of a national healthcare workforce reserve database designed specifically for activation during heatwaves and flooding. This registry would contain: • The verified identity and proven qualifications of reserve healthcare professionals; • Their availability, contact information and location; • Any conditions and limits of mobilisation (e.g., which role they can be considered for). Clear eligibility criteria will be determined to enable deciding the types of profiles to be included in the reserve. These can be based on the reserve professional's age (particularly in the case of retired people), their last professional healthcare contribution, or other criteria to be defined. Activation protocols should also be determined, including specifying how and when reserve personnel can be mobilised or how hospitals can request support.
Federal competences	• Creating and maintaining the database as a contingency mechanism. • Defining the eligibility criteria and required qualifications for inclusion on the list.
Interfederal aspects	• Identifying reserve professionals from primary care or regional services. • Operationally activating the protocols within hospitals, making sure the activation is aligned with regional health services and local emergency plans.
Effectiveness	The measure enables early activation of support mechanisms when several hospitals in the same area are affected by a climate-related event, which contributes to reducing the workload on permanent staff. The list could be used for other, non-climate related instances, for example, in the case of epidemics.

Responsible	FPS Health (DG Health Care) is responsible for creating the database.
Other actors / stakeholders involved / transversal aspects	• eHealth or the Health Data Agency (HDA) provides the technical infrastructure. • Regional or community actors provide data on, for example, primary care professionals. • Red Cross acts as a supporting entity in case of emergencies and periods of high surge.
Points of attention: gender, equitability, risk of maladaptation	• Risk of potential legal issues for replacing clinical staff with people with different or more limited clinical qualifications (e.g., care assistants), unless it can be argued as an exceptional circumstance. • Uneven availability of reserve staff across geographic areas. • Risk of insufficient enrolment of professionals in the database (e.g., retired staff unwilling to return to practice, even temporarily). • Regular maintenance of the database is necessary, which can create a burden on the administration responsible for it. • Need for a dedicated coordination structure and staff to manage the database and coordinate with reserve staff.

Issue national recommendations on protecting hospital staff during heatwaves

Context	Existing guidance at federal or interfederal level focuses mainly on patient safety, public health alerts (for example, with the Ozone and Heat Plan), or general occupational health rules. However, there is currently no consolidated national guidance specifically tackling how hospitals should protect their own staff during extreme heat. Hospitals themselves can develop ad hoc internal protocols targeting the protection and well-being of their staff at work. While this is a positive initiative, it may lead to significant variability in measures across hospitals and therefore varying working conditions for staff. Occupational health services provide support, but the absence of harmonised recommendations means that worker protection can depend heavily on local resources and interpretation. Issuing national recommendations aims to build on existing heatwave plans and workplace health legislation. It provides a consistent framework that hospitals can apply during high heat, ensuring that staff members are protected and benefit from a more adapted working environment thereby supporting their well-being, safety, and availability to work.
Objective	Protect staff health through clear protocols that adapt working conditions and support worker well-being.
Description	The national recommendations set out a coherent set of measures that hospitals can apply to protect their staff during heatwaves. They build on existing occupational health principles and heat health alerts. The recommendations lay out optional measures to help hospitals prepare staff protection protocols when temperatures exceed predefined thresholds. The recommendations include: • Adjusting working conditions such as limiting prolonged Personal Protective Equipment (PPE) use when possible, or providing staff with lighter or cooling PPE equipment; • Promoting working from home where possible for non-clinical roles; • Ensuring there are enough hydration points across hospital sites; • Providing access to cooled rest areas, shaded outdoor spaces, or rooms with portable cooling; • Reinforcing staff psychosocial support and fatigue-management resources such as giving access to an app with meditation sessions, tips on staying healthy in a heatwave, therapy sessions, etc. Overall, the recommendations provide a harmonised and practical framework that hospitals can adapt to their context. They ensure that staff health protection is integrated into heatwave response planning of hospitals that choose to implement them. From a workforce perspective, this may help staff feel more valued and supported, contributing to higher job satisfaction and engagement.
Federal competences	The federal level is responsible for the worker protection legislation, so adapting working conditions is a federal competence. Therefore, the federal authorities have a role in developing and issuing the recommendations,

	defining the minimum recommended measures and protection principles, or coordinating with occupational health experts where expertise is lacking.
Interfederal aspects	The implementation of this guidance takes place at the hospital level, and some aspects of these measures may require regional competences (for example, should infrastructure work be necessary to enable staff to have cooled rooms). The recommendations should also take into consideration relevant heatwave action plans, whether at the regional, community or hospital level.
Effectiveness	• Improved occupational well-being may contribute to reduced absenteeism or staff turnover, strengthening the workforce's resilience to heatwaves and ensuring continuity of care. • Reduced risk of heat-related illness, fatigue, and exhaustion among healthcare workers.
Responsible	FPS Employment, Labour and Social Dialogue - DG Control on well-being at work
Other actors / stakeholders involved / transversal aspects	FPS Health
Points of attention: gender, equitability, risk of maladaptation	• Vulnerable workers might need extra adjustments (e.g., pregnant women or older staff). • The implementation of this guidance will depend on factors such as the resources available to individual hospitals. Therefore, disparities in working conditions and staff well-being may persist across hospitals.

Pre-contract drone services to deliver critical medicines/blood

Context	Belgium has been actively testing medical drone deliveries in recent years, with initiatives showing that drones can safely transport urgent medical items such as pathology samples, medications, and other critical supplies between hospital sites. While these trials show the potential of drones to complement existing medical logistics, they are primarily designed for routine or planned inter-hospital transport and have not yet been integrated into Belgium's emergency response mechanisms for extreme weather events. In case of flooding, road networks may become inaccessible, restricting access to vehicles delivering essential medical supplies. There are currently no pre-contracted federal agreements guaranteeing the immediate deployment of drones for urgent deliveries during extreme events that result in road inaccessibility, such as floods. Establishing such agreements would build on existing technological capabilities while addressing the lack of emergency-specific, nationally coordinated aerial logistical support.
Objective	Guarantee access to life-saving medical supplies during floods or road blockages by securing aerial support in advance.
Description	This measure involves establishing formal, pre-arranged contracts between federal authorities and one or more certified drone operators. It aims to ensure that, during floods or other climate-related infrastructure disruptions, drones can be rapidly deployed to deliver critical medical supplies (critical medicines, blood products, and other essential items). In concrete terms, the measure includes pre-contracting the drone service, stipulating the capacity and distance the drone should be able to cover, as well as defining other logistical issues such as establishing drone landing zones for all hospitals.
Federal competences	Airspace regulation and drone authorisation are federal competences, as well as national emergency response and the regulation of certain specific medical products such as blood.
Interfederal aspects	Interfederal coordination with regional mobility authorities and local safety services is required to ensure effective operational integration, including flight routing and landing-site approval.
Effectiveness	• Reduced transport time, ensuring rapid, direct delivery. • Possibility to be scaled beyond climate-related emergencies.
Responsible	FPS Mobility and Transport
Other actors / stakeholders involved / transversal aspects	• FPS Health • Civil Protection, relating to the activation of triggers (e.g. flooded roads) • Drone traffic management providers • Drone operators

Points of attention: gender, equitability, risk of maladaptation	• Limited transport capacity, since drones can carry smaller quantities of supplies compared to road vehicles. • Reduced operational reliability during extreme weather conditions, such as strong winds or heavy rainfall.

ANNEX 7 - RISK OF INTERNAL DISPLACEMENT OF PEOPLE DUE TO FLOODING

Overview of longlisted measures and measures not taken up further in Be-Adapt

Measures	Direct competences at federal level
Federal measures	
Guidelines for inclusive evacuation and temporary shelter (including a "firewall") • Description: Create binding/guiding protocols on inclusive evacuation (e.g., homeless people, migrants and undocumented persons), non-discriminatory access to shelter (incl. undocumented persons), multilingual communication, accessibility standards, and BE-Alert improvements.	**Medium–High**
Flexible Federal Emergency Fund for Transitional Housing • Description: Ensure rapid mobilisation of federal funds for transitional housing, installation premiums (*installatiepremies*) and requisition of buildings/hotels during major floods.	**High**
Interfederal Task Force "Planned Relocation" • Description: Develop frameworks for voluntary buyouts, long-term relocation strategies in high-risk zones, and financial/legal procedures for "managed retreat".	**High** (Requires strong regional lead but federal coordination crucial)
Federal crisis data protocol – Use of Belgian Incident Tracking System (BITS) and self-registration for displaced persons • Description: Ensure that in every major flood, displaced persons are systematically registered (BITS, QR self-registration, Red Cross bracelets) to avoid data losses as during 2021.	**High** (fits NCCN, DGP-R and PPS Social Integration roles)
Federal minimum standards for heat-resilient temporary shelters for flood-displaced persons • Description: Ensure vulnerable displaced persons sheltered in flood crises also receive cooling support during heat episodes (increasingly correlated crises).	**Medium (FOD MI, FOD BOSA (Regie) and FPS Health)**
Interfederal measures (federal, regional and local levels)	
Development of flood mobility risk maps and trigger points • Description: Jointly develop hazard × vulnerability × infrastructure risk maps for floods; define common triggers for evacuation, emergency shelter scaling, and long-term uninhabitability; define best location of shelter (maximum acceptable distance from affected populations, no risk of	**Medium**

isolation due to transport network being flooded, reduced risk of heat stress, …); ensure harmonisation across regions.	
Structural coordination between crisis management, housing and social services • Description: Institutionalise permanent coordination between NCCN, regional housing agencies, CPAS/OCMW, insurers and local governments to accelerate the pathway from crisis shelter → transitional housing → sustainable solutions.	**Medium**
Social vulnerability "Buddy System" for flood evacuation • Description: Create local registries or buddy networks to support people unable to evacuate alone (older people, socially isolated people and people with disabilities). Federal role: guidelines (+use of social networks – cf. the Interfederal Combat Poverty Service), regions/local: implementation.	**Low–Medium**

Description of longlisted measures

In agreement with FPS Health, the measures identified for this risk were retained at longlist level and are not elaborated in the same detail as measures covered by the consortium. The content of this section was provided directly by FPS Health and reflects its assessment of relevant measures and priorities.

Guidelines for inclusive evacuation and temporary shelter (incl. “Firewall”)

Context	Belgium has strong reactive systems for crisis management, social assistance and emergency shelter, but lacks an anticipatory policy framework that structurally integrates human mobility into climate adaptation. Current emergency systems do not systematically account for vulnerable groups — including undocumented persons — nor for language barriers, social isolation or the need for interoperability with neighbouring countries.
Objective	Develop federal guidelines ensuring inclusive evacuation and temporary shelter, with particular attention to vulnerable and hard-to-reach groups.
Description	The federal government develops binding requirements or non-binding guidelines covering inclusive evacuation procedures and temporary shelter arrangements. These include: accessible information (multilingual, easy to access); explicit separation between emergency assistance and migration enforcement through a formal "firewall" — undocumented persons must be able to access federal emergency shelter and medical care without fear of deportation (via Dokters van de Wereld or CPAS/OCMW); development/improvement of the federal BE-Alert emergency alert system that is low-threshold and multilingual, specifically targeting socially isolated groups. The approach advocates an intersectional, non-stigmatising understanding of vulnerability, including migrants where demonstrable barriers exist.
Federal competences	Risk communication; national emergency planning (NCCN); social integration policy (PPS Social Integration and Fedasil); coordination of federal emergency response.
Interfederal aspects	Preventive communication is primarily a regional competence. Operational emergency response involves municipalities (mayors) and provinces (governors) as primary decision-makers for evacuation orders. Alignment required with regional crisis coordination centres (Crisiscentrum Vlaanderen, CORTEX, safe.brussels).
Effectiveness	Depends on political willingness to establish binding rather than merely advisory protocols; effective reach to undocumented and populations who do not speak French, Dutch or German; and operational integration into existing municipal emergency plans.
Responsible	FPS Interior (NCCN); PPS Social Integration
Other actors / stakeholders involved / transversal aspects	• NCCN • FPS Interior; PPS Social Integration • Fedasil

	• Red Cross • IOM • NGOs
Points of attention: gender, equitability, risk of maladaptation	*Gender / equitability*: Intersectional and non-stigmatising approach to vulnerability explicitly required, including migrants, elderly, people with limited mobility and socially isolated groups. Risk of exclusion if multilingual and accessible communication is not systematically implemented. *Risk of maladaptation*: Risk that generic guidelines fail to reach the most vulnerable if not co-designed with field actors (NGOs, CPAS/OCMW, IOM).

Flexible Federal Emergency Fund for Transitional Housing

Context	Current social protection systems are designed for individual homelessness and are not adapted to absorb collective displacement following climate disasters. No permanent budgetary mechanism exists at federal level for rapid mobilisation of transitional housing at scale. Germany has a comparable permanent mechanism — the Soforthilfen und Aufbauhilfefonds[33] — activated after the 2021 floods, providing rapid liquidity through an interfederal (Bund-Länder) fund.
Objective	Create a permanent budgetary framework within PPS Social Integration for the immediate activation of additional transitional housing and installation grants following climate disasters.
Description	A permanent federal emergency housing fund is established within PPS Social Integration. This enables: rapid mobilisation of transitional housing (via requisition of private hotels or vacant federal buildings through the Buildings Agency); activation of installation grants for displaced persons. The fund is specifically designed to address collective displacement — distinct from individual homelessness — and can be activated immediately following a declared climate disaster.
Federal competences	Social integration policy and federal funding flows to CPAS/OCMW (PPS Social Integration); management of federal buildings (Buildings Agency).
Interfederal aspects	Housing policy is primarily a regional competence. Coordination required with regions and municipalities for transitional housing solutions beyond federal building stock. CPAS/OCMW operate at local level under regional frameworks.
Effectiveness	Depends on pre-agreed activation criteria and procedures to avoid delays during acute crises; sufficient and predictable budget allocation; and coordination with regional housing authorities for rapid identification of available stock.
Main actors	• PPS Social Integration • CPAS/OCMW • Buildings Agency
Points of attention: gender, equitability, risk of maladaptation	*Gender / equitability:* Fund design must ensure equitable access for all displaced persons, including undocumented residents and those without formal housing contracts. *Risk of maladaptation:* Risk of fund being too narrowly defined to cover climate displacement if eligibility criteria are not explicitly adapted.

[33] https://www.bundesfinanzministerium.de/Monatsberichte/2021/08/Inhalte/Kapitel-2b-Schlaglicht/2b-gemeinsam-gegen-die-flutkatastrophe.html, retrieved on 10th of May 2026.

Interfederal Task Force "Planned Relocation"

Context	Belgium currently has no legal or financial framework for planned relocation (managed retreat) of residents from zones that are becoming structurally uninhabitable due to repeated flooding or extreme heat. The current approach relies on repeated insurance payouts rather than structural solutions. France has advanced legislation on managed retreat (Loi Climat et Résilience, 2021), requiring municipalities threatened by coastal erosion to map uninhabitability over 30 and 100 years, with financial mechanisms for government buyout of properties in structurally unsafe zones. Germany has introduced strict spatial prohibitions (Bauverbot) in risk zones and buyout mechanisms (Hochwasserschutzfonds and Baugesetzbuch).
Objective	Anticipate areas becoming structurally uninhabitable by developing legal and financial frameworks for voluntary property buyout schemes in zones with unmanageable flooding or heat risk, rather than repeatedly compensating damages through insurance.
Description	An expertise centre is established to develop: • legal frameworks for voluntary buyout schemes in zones with unmanageable climate risk; • financial mechanisms to support planned relocation; • criteria for identifying zones eligible for managed retreat.
Federal competences	National risk assessment; crisis management framework; federal coordination role for interfederal mechanisms.
Interfederal aspects	Spatial planning and property rights are regional competences. Buyout schemes require active regional involvement (the regions hold competence over land use and housing). Insurance regulation involves federal and sector actors. Full interfederal coordination is essential for this measure to be operational.
Effectiveness	Depends on political acceptance of managed retreat as a legitimate policy option; willingness of regions to participate given their competence over spatial planning and housing; and availability of sufficient financial mechanisms to make voluntary buyouts genuinely attractive.
Main actors	• Cerac • NCCN • Insurance sector (Assuralia) • Regions • International Organisation for Migration
Points of attention: gender, equitability, risk of maladaptation	*Gender / equitability*: Buyout schemes must ensure fair compensation and voluntary participation, with particular attention to lower-income households who may have fewer relocation options. Risk of socially regressive outcomes if wealthier households relocate while vulnerable residents remain in high-risk zones.

	Risk of maladaptation: Risk of premature or coercive relocation if trigger criteria are not carefully defined and transparently governed. Risk of concentrating displaced populations in areas with insufficient services or social infrastructure.

Federal crisis data protocol – Use of Belgian Incident Tracking System (BITS) and self-registration for displaced persons

Context	The 2021 floods exposed significant gaps in the systematic registration of displaced persons, leading to data losses that hampered crisis management and recovery. No standardised federal protocol currently ensures consistent tracking of displaced persons across events and regions.
Objective	Ensure systematic registration of displaced persons during major flood events through standardised federal protocols and tools.
Description	The measure establishes a federal protocol for registering displaced persons during major flood events, drawing on existing tools including the Belgian Incident Tracking System (BITS), QR-based self-registration, and Red Cross identification bracelets. The protocol defines minimum data requirements, responsibilities across actors, and interoperability standards to ensure that data are captured consistently and can be shared across relevant authorities.
Federal competences	National crisis data management, federal emergency planning framework.
Interfederal aspects	Regional crisis coordination centres and municipalities are the operational actors during flood events. Protocol must be compatible with regional emergency management systems.
Effectiveness	Depends on pre-crisis testing and training across all relevant actors; simplicity and accessibility of registration tools for all displaced persons regardless of language or digital literacy; and interoperability with regional emergency management systems.
Main actors	• FPS Interior • NCCN • Regional crisis coordination centres • Municipalities and CPAS/OCMW • Red Cross
Points of attention: gender, equitability, risk of maladaptation	*Gender / equitability:* Registration tools must be accessible to all displaced persons regardless of language, literacy or digital access. *Risk of maladaptation:* Risk of data protocol becoming a bureaucratic burden during acute crisis if not sufficiently pre-tested and simplified.

Federal minimum standards for heat-resilient temporary shelters for flood-displaced persons

Context	Flood displacement and extreme heat are increasingly correlated events. Persons sheltered in temporary accommodation during flood crises may simultaneously face heat stress, particularly vulnerable groups such as older people and persons with medical conditions. No federal minimum standards currently ensure that temporary flood shelters provide adequate cooling conditions.
Objective	Ensure that vulnerable persons displaced by flooding also receive adequate cooling support when temporary shelter coincides with heat episodes.
Description	The measure establishes federal minimum standards for temporary flood shelters covering cooling requirements — including ventilation, temperature thresholds, access to drinking water and shade. Standards are developed at federal level and apply as a baseline across all temporary shelter arrangements, with implementation resting with regions and local authorities.
Federal competences	Public health and emergency planning standards
Interfederal aspects	The provision and operation of shelters are regional and local responsibilities. Standards must be integrated into regional emergency planning frameworks and shelter management protocols.
Effectiveness	Depends on integration into regional and local shelter management protocols before a crisis occurs; and practical feasibility of meeting cooling standards in rapidly mobilised temporary accommodation.
Main actors	• FPS Health, FPS Interior • NCCN • Red Cross • Regional crisis coordination centres • Municipalities and CPAS/OCMW
Points of attention: gender, equitability, risk of maladaptation	*Gender / equitability:* Standards must be calibrated to the needs of the most heat-vulnerable groups — elderly, infants, persons with chronic illness. *Risk of maladaptation:* Risk of energy-intensive cooling solutions increasing carbon footprint; preference should be given to passive cooling approaches where feasible.

Development of flood mobility risk maps and trigger points

Context	Belgium currently lacks centrally defined trigger points for evacuation or emergency shelter activation. Decisions rest with local authorities and are made ad hoc at the moment of crisis, without pre-defined thresholds combining hazard exposure, population vulnerability and infrastructure capacity. This fragmentation limits the ability to anticipate displacement needs, coordinate shelter responses and identify zones at risk of becoming structurally uninhabitable. Germany's Klimaanpassungsgesetz (2024, Climate Adaptation Act) requires the adoption of a national adaptation strategy, and the resulting Klimaanpassungsstrategie (2024, Climate Adaptation Strategy) offers an example of standardised triggers, with 33 measurable targets (comprising 45 sub-goals) based on the national Climate Risk and Impact Analysis (Klimawirkungs- und Risikoanalyse, KWRA).
Objective	Jointly develop hazard × vulnerability × infrastructure risk maps for floods; define common trigger points for evacuation, emergency shelter scaling and long-term uninhabitability; define optimal shelter locations; and ensure harmonisation across regions.
Description	Federal and regional authorities jointly develop risk maps combining flood and heat hazards with socio-economic vulnerability and infrastructure exposure. Based on these maps, common trigger points are defined for three types of situations: temporary evacuation, upscaling of emergency shelter capacity, and potential long-term uninhabitability leading to planned relocation. Trigger points are structured in a layered Social Risk Level framework (from early warning to mandatory evacuation) combining physical thresholds with social vulnerability indicators. The measure also defines criteria for optimal shelter locations, including maximum distance from affected populations, accessibility via non-flooded transport routes, and reduced heat stress exposure. Results are harmonised across the three regions to ensure consistent thresholds and comparable decision-making. Managed retreat criteria are also defined for zones experiencing repeated severe flood events or becoming uninsurable under normal market conditions. In high-diversity zones, activation of emergency plans triggers mandatory multilingual communication via BE-Alert.
Federal competences	National risk assessment (BNRA); national emergency planning and alerting (NCCN, BE-Alert); federal coordination of interfederal risk mapping.
Interfederal aspects	Regional climate and water services hold primary competence over hazard monitoring and threshold definition. Provinces and municipalities are the operational decision-makers for evacuation. Spatial planning and housing competences are regional. Full interfederal co-development is required with coordination from the federal level.
Effectiveness	Depends on data quality and interoperability across federal and regional levels; political acceptance of pre-defined thresholds constraining local discretion; and sustained interfederal commitment to harmonisation across regions.
Main actors	• Cerac • NCCN • Regional climate and water services

	• RMI, BCC • Universities
Points of attention: gender, equitability, risk of maladaptation	*Gender / equitability:* Trigger frameworks and shelter siting criteria must account for vulnerable populations — elderly, persons with reduced mobility, households without private transport. Distance criteria for shelter location must reflect the mobility constraints of the most vulnerable, not average populations. Multilingual communication triggers directly address language and accessibility barriers. *Risk of maladaptation:* Over-standardisation may reduce local flexibility in complex situations. Managed retreat triggers must be designed as tools for voluntary, supported relocation rather than coercive instruments. Siting criteria require regular updating to reflect evolving exposure patterns.

Structural coordination between crisis management, housing and social services

Context	The transition from emergency shelter to durable housing solutions following climate displacement is currently slow and poorly coordinated. No structural consultation mechanism exists between crisis management authorities, regional housing bodies, municipalities, CPAS/OCMW and the insurance sector to manage this transition systematically.
Objective	Institutionalise structural consultation and agreements between crisis management, regional housing authorities, municipalities, CPAS/OCMW and the insurance sector to accelerate the transition from emergency shelter to transitional housing and then to durable solutions.
Description	A permanent interfederal coordination structure is established to institutionalise dialogue and agreements between: crisis management authorities (NCCN, provinces); regional housing agencies; municipalities and CPAS/OCMW; the insurance sector. The structure aims to systematise the transition from emergency shelter to durable housing solutions following climate displacement events, by pre-defining roles, responsibilities and handover protocols across levels.
Federal competences	National crisis management coordination
Interfederal aspects	Housing policy is a regional competence. Municipalities and CPAS/OCMW are the operational interface with displaced persons. Insurance regulation involves both federal and sector actors.
Effectiveness	Depends on institutionalisation of coordination structures with defined mandates and resources rather than informal arrangements, and alignment of timelines and responsibilities across actors with very different operational rhythms.
Main actors	• NCCN • Regional authorities • Municipalities and CPAS/OCMW • Assuralia and insurers • Red Cross
Points of attention: gender, equitability, risk of maladaptation	*Gender / equitability:* Coordination structures must explicitly include actors working with the most vulnerable displaced persons (CPAS/OCMW, NGOs). *Risk of maladaptation:* Risk of coordination structures remaining formal without operational follow-through if no dedicated resources or mandates are assigned.

Social vulnerability "Buddy System" for flood evacuation

Context	During flood events, older people, people with disabilities and socially isolated people face significant difficulties evacuating without assistance. Current emergency planning does not systematically identify or reach these groups in advance, leaving them disproportionately exposed.
Objective	Establish local vulnerability registries and buddy networks to identify and support people unable to evacuate alone during climate-related displacement events.
Description	Local vulnerability registries identify residents requiring evacuation assistance, drawing on existing data sources (CPAS/OCMW, social services) and voluntary registration. Buddy networks pair vulnerable individuals with a designated support person for alerting and assistance during emergencies. The federal role is limited to developing guidelines for registry design, data protection compliance and buddy network organisation, and promoting use of social networks as outreach channels in coordination with the Interfederal Combat Poverty Service. Implementation rests with regions and local authorities.
Federal competences	GDPR compliance framework; coordination with Interfederal Combat Poverty Service; national emergency planning (NCCN).
Interfederal aspects	Implementation is regional and local. Coordination with CPAS/OCMW, local social services and civil society.
Effectiveness	Depends on local uptake and resourcing; completeness and regular maintenance of vulnerability registries; and sufficient institutional backing to avoid over-reliance on volunteers.
Main actors	• FPS Interior • Regional authorities • NCCN • Interfederal Combat Poverty Service • CPAS/OCMW • Red Cross
Points of attention: gender, equitability, risk of maladaptation	*Gender / equitability:* Outreach must reach non-native speakers and avoid stigmatisation. Voluntary registration should be accessible to all. *Risk of maladaptation:* Registries require regular updating. Buddy networks need institutional backing to avoid over-reliance on volunteers.

ANNEX 8 - HEAT STRESS SURVEY

This annex contains the survey as it was carried out in the pilot study on heat stress. After the pilot the following questions replaced the questions on costs and funding in the heat stress survey:

- The study aims to evaluate primarily the initial direct costs incurred by the federal government for the implementation of the measure, although where relevant other costs (such as significant downstream costs) might be identified. Do you agree with the cost estimates currently presented for this measure? If not, please rectify it, explaining your reasoning and providing the associated sources.
- Are there any additional cost estimates missing for this measure? Please explain your reasoning and provide the associated sources.
- Do you agree with the proposed funding mechanisms for this measure? If not, please rectify it, explaining your reasoning and providing the associated sources.
- Can you identify any additional sources of funding, investment strategies, or financing models for this measure? Please explain your reasoning and provide the associated sources.

Be Adapt survey: identification of federal adaptation measures related to climate change risks.

Below are the 5 measures for which we would appreciate your input. Kindly select the ones you feel most qualified to provide feedback on, based on your area of expertise. After submitting feedback on one measure, you can return to this page to choose another one.

( ) Measure 1: National (Interfederal) Heat-Health Adaptation Plan (NHHAP)
( ) Measure 2: Stimulate the inclusion of climatological heat and ozone in occupational risk analysis
( ) Measure 3: Integrate protection of the working population in the national Ozone and Heat Plan
( ) Measure 4: Develop guidance for technical and organisational measures for vulnerable occupations
( ) Measure 5: Use future climate scenarios in specifications for federal buildings

Measure 1: National (Interfederal) Heat-Health Adaptation Plan (NHHAP)
General comprehension and clarity of the measure

	Do you agree?		**Open feedback**
	Yes	**No**	
Is the objective clear and unequivocal? If not, how would you formulate it?	[ ]	[ ]	___
Is the description clear and unequivocal? If not, please indicate how you would adapt it. If you want to add elements, please refer to the source(s) motivating these additional elements.	[ ]	[ ]	___
Are the competences relating to the measure clearly and correctly defined? If no, please refer to relevant source.	[ ]	[ ]	___
Are the interfederal aspects clearly and correctly defined? If not, please indicate why not, i.e., please add any other interfederal aspects to this measure. Please refer to the source of information.	[ ]	[ ]	___
Do you have further concrete information on the effectiveness of this measure? If yes, please add it here, and refer to the source of the information.	[ ]	[ ]	___
Do you agree with the responsible for this measure? If not, please indicate who should be responsible for the measure?	[ ]	[ ]	___
Do you agree with the other actors identified? If not, do you see (other) stakeholders that should (or shouldn't) be involved in the implementation of the measure? Please motivate.	[ ]	[ ]	___

Do you agree with this timeframe? If no, please indicate what is according to you a realistic timeframe. Please motivate.	[ ]	[ ]	___
Do you have any further comments on need for transformative change, social aspects or risk of maladaptation. If yes, please indicate and refer to the source of information.	[ ]	[ ]	___

Are there any additional costs that should be considered when evaluating this climate adaptation measure?
If so, please refer to relevant sources or literature that outline these costs.

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Do you have any suggestions or insights regarding the funding or financing of this measure?
Please provide any potential sources of funding, investment strategies, or financing models that could support its implementation. If applicable, please refer to relevant sources or literature that outline these costs.

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Which types of indicators do you think we need to properly monitor for this measure?
( ) Input
( ) Output
( ) Outcome
( ) Impact
List of relevant indicators
Relevance = it directly reflects *what the measure tries to achieve* (its core objective), rather than a side effect, a distant proxy or something only loosely connected
Feasibility = it can be produced with existing data (or easily obtainable data), at a reasonable cost, within the mandate of federal actors responsible for monitoring

	Rate how relevant this indicator is					**Rate how feasible this indicator is**					**Open feedback**
	Not relevant	**Slightly relevant**	**Relevant**	**Very relevant**	**Highly relevant**	**Not feasible**	**Slightly feasible**	**Feasible**	**Very feasible**	**Highly feasible**	
Indicator 1: Number of meetings dedicated to the National HHAP **Data source:** Meeting minutes	___	___	___	___	___	___	___	___	___	___	___
Indicator 2: Decisions taken to improve consistency, create synergies and stimulate collaboration **Data source:** Meeting minutes	___	___	___	___	___	___	___	___	___	___	___
Indicator 3: Mortality / morbidity related to heat stress ***Data source:*** Yearly analysis of excess mortality / morbidity related to heat stress	___	___	___	___	___	___	___	___	___	___	___

For each indicator type (see above), do you have suggestions of indicators not captured that would be relevant and feasible?

	Name of the indicators	**Where to collect the data**
Input	___	___
Output	___	___
Outcome	___	___
Impact	___	___

Would you know of key references from the (academic and grey) literature to identify other relevant monitoring indicators?
Be as precise as possible (name of article/report, authors, country, URL...)
_____
Which types of barriers would most influence the implementation of this measure?
( ) Financial / Economic
( ) Institutional / Governance
( ) Technical / Knowledge and Information
( ) Social / Cultural / Awareness
( ) Organisational / Operational
( ) Policy / Regulatory

Would you think of barriers that block the implementation of the measure?
If applicable, please reference real examples or literature as well.
If possible, please also mention direct solutions to these barriers.
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Would you know of key references from the (academic and grey) literature to identify other relevant barriers and levers?
Be as precise as possible (name of article/report, authors, country, URL...)
_____

Overall rating of this measure
( ) Highly useful/necessary ( ) Useful/necessary ( ) Potentially useful/necessary ( ) Probably not useful/necessary ( ) Not useful/necessary
Comments:

What would you like to do next?
( ) Give feedback on another measure
( ) Provide a suggestion for an additional measure and/or finalise the survey

Measure 2 : Stimulate the inclusion of climatological heat and ozone in occupational risk analysis
General comprehension and clarity of the measure

	Do you agree?		Open feedback
	Yes	**No**	
Is the objective clear and unequivocal? If not, how would you formulate it?	[ ]	[ ]	___
Is the description clear and unequivocal? If not, please indicate how you would adapt it. If you want to add elements, please refer to the source(s) motivating these additional elements.	[ ]	[ ]	___
Are the competences relating to the measure clearly and correctly defined? If no, please refer to relevant source.	[ ]	[ ]	___
Are the interfederal aspects clearly and correctly defined? If not, please indicate why not, i.e., please add any other interfederal aspects to this measure. Please refer to the source of information.	[ ]	[ ]	___
Do you have further concrete information on the effectiveness of this measure? If yes, please add it here, and refer to the source of the information.	[ ]	[ ]	___
Do you agree with the responsible for this measure? If not, please indicate who should be responsible for the measure?	[ ]	[ ]	___
Do you agree with the other actors identified? If not, do you see (other) stakeholders that should (or shouldn't) be involved in the implementation of the measure? Please motivate.	[ ]	[ ]	___
Do you agree with this timeframe? If no, please indicate what is according to you a realistic timeframe. Please motivate.	[ ]	[ ]	___
Do you have any further comments on need for transformative change, social aspects or risk of maladaptation. If yes, please indicate and refer to the source of information.	[ ]	[ ]	___

Are there any additional costs that should be considered when evaluating this climate adaptation measure?
If so, please refer to relevant sources or literature that outline these costs.

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Do you have any suggestions or insights regarding the funding or financing of this measure?
Please provide any potential sources of funding, investment strategies, or financing models that could support its implementation. If applicable, please refer to relevant sources or literature that outline these costs.

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Which types of indicators do you think we need to properly monitor for this measure?
( ) Input
( ) Output
( ) Outcome
( ) Impact

List of relevant indicators
Relevance = it directly reflects *what the measure tries to achieve* (its core objective), rather than a side effect, a distant proxy or something only loosely connected
Feasibility = it can be produced with existing data (or easily obtainable data), at a reasonable cost, within the mandate of federal actors responsible for monitoring

	Rate how relevant this indicator is					Rate how feasible this indicator is					Open feedback
	Not relevant	Slightly relevant	Relevant	Very relevant	Highly relevant	Not feasible	Slightly feasible	Feasible	Very feasible	Highly feasible	
Indicator 1: List of vulnerable occupations available ***Description:*** *List of occupations that are specifically vulnerable to climatological heat due to their high exposure and/or to the intrinsic vulnerability of (most of) the workers (low-skilled, low-paid, physically demanding jobs often carried out by people in socio-economically precarious positions)* ***Data source:*** Report	___	___	___	___	___	___	___	___	___	___	___
Indicator 2: Number of employers and employees reached ***Description:*** *Estimation of the number of employers and workers in vulnerable occupations that are reached through the knowledge and awareness campaign* ***Data source:*** Based on the list of vulnerable occupations, estimates of the number of workers in these vulnerable occupations, and the number of employees and self-employed people that have been reached among these.	___	___	___	___	___	___	___	___	___	___	___
Indicator 3: Number of visits to webpages related to climatological heat ***Data source:*** *Loggings of visits to dedicated websites hosted by FPS Employment etc and by other involved stakeholders*	___	___	___	___	___	___	___	___	___	___	___
Indicator 4: Number of companies including climatological heat in prevention and action plans ***Data source****: Verification of prevention and action plans*											

For each indicator type (see above), do you have suggestions of indicators not captured that would be relevant and feasible?

	Name of the indicators	Where to collect the data
Input	___	___
Output	___	___
Outcome	___	___
Impact	___	___

Would you know of key references from the (academic and grey) literature to identify other relevant monitoring indicators? Be as precise as possible (name of article/report, authors, country, URL...)

_____

Which types of barriers would most influence the implementation of this measure?
( ) Financial / Economic
( ) Institutional / Governance
( ) Technical / Knowledge and Information
( ) Social / Cultural / Awareness
( ) Organisational / Operational
( ) Policy / Regulatory

List of potential barriers

	How relevant is this barrier ?					Are you aware of other direct solutions to overcome this barrier?
	Not relevant	Slightly relevant	Relevant	Very relevant	Highly relevant	
Barrier 1: Not a priority hazard for FPS Employment, Labour and Social Dialogue ***Type:*** *Institutional / Governance* ***Description:*** Psychosocial and musculoskeletal hazards are priorities for the FPS Employment, Labour and Social Dialogue as they often lead to long periods of sick leave. Therefore, limited resources may be available to address climatological heat hazards. ***Solution:*** Prepare a targeted list of sectors and vulnerable occupations for which climatological heat poses a serious risk (as acknowledged in international reports and scientific lit	___	___	___	___	___	___
Barrier 2: Support from prevention services, sectoral organisations, workers' organisations **Type:** Social / Cultural / Awareness **Description: T**hese stakeholders may not conceive climatological heat stress as a priority risk. **Solution: In**clude these stakeholders from the start of the measure, set up a task force on climatological heat Provide targeted information on risks of climatological heat in specific sectors / occupations	___	___	___	___	___	___
Barrier 3: No systematic data available on the link between climatological heat and disease or accidents **Type:** Technical / Knowledge and Information **Solution:** Increase knowledge base on (climatological) heat stress and diseases or accidents through a study and a targeted system for follow-up	___	___	___	___	___	___

Would you think of other barriers that block the implementation of the measure?
If applicable, please reference real examples or literature as well.
If possible, please also mention direct solutions to these barriers.

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Would you know of key references from the (academic and grey) literature to identify other relevant barriers and levers?
Be as precise as possible (name of article/report, authors, country, URL...)

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Overall rating of this measure
( ) Highly useful/necessary ( ) Useful/necessary ( ) Potentially useful/necessary ( ) Probably not useful/necessary ( ) Not useful/necessary
Comments:

What would you like to do next?
( ) Give feedback on another measure
( ) Provide a suggestion for an additional measure and/or finalise the survey.

Measure 3: Integrate protection of the working population in the national Ozone and Heat Plan
General comprehension and clarity of the measure

	Do you agree?		Open feedback
	Yes	**No**	
Is the objective clear and unequivocal? If not, how would you formulate it?	[ ]	[ ]	___
Is the description clear and unequivocal? If not, please indicate how you would adapt it. If you want to add elements, please refer to the source(s) motivating these additional elements.	[ ]	[ ]	___
Are the competences relating to the measure clearly and correctly defined? If no, please refer to relevant source.	[ ]	[ ]	___
Are the interfederal aspects clearly and correctly defined? If not, please indicate why not, i.e., please add any other interfederal aspects to this measure. Please refer to the source of information.	[ ]	[ ]	___
Do you have further concrete information on the effectiveness of this measure? If yes, please add it here, and refer to the source of the information.	[ ]	[ ]	___
Do you agree with the responsible for this measure? If not, please indicate who should be responsible for the measure?	[ ]	[ ]	___
Do you agree with the other actors identified? If not, do you see (other) stakeholders that should (or shouldn't) be involved in the implementation of the measure? Please motivate.	[ ]	[ ]	___
Do you agree with this timeframe? If no, please indicate what is according to you a realistic timeframe. Please motivate.	[ ]	[ ]	___
Do you have any further comments on need for transformative change, social aspects or risk of maladaptation. If yes, please indicate and refer to the source of information.	[ ]	[ ]	___

Are there any additional costs that should be considered when evaluating this climate adaptation measure?
If so, please refer to relevant sources or literature that outline these costs.

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Do you have any suggestions or insights regarding the funding or financing of this measure?
Please provide any potential sources of funding, investment strategies, or financing models that could support its implementation. If applicable, please refer to relevant sources or literature that outline these costs.

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Which types of indicators do you think we need to properly monitor for this measure?
( ) Input
( ) Output
( ) Outcome
( ) Impact
List of relevant indicators
Relevance = it directly reflects *what the measure tries to achieve* (its core objective), rather than a side effect, a distant proxy or something only loosely connected
Feasibility = it can be produced with existing data (or easily obtainable data), at a reasonable cost, within the mandate of federal actors responsible for monitoring

	Rate how relevant this indicator is	**Rate how feasible this indicator is**	**Open feedback**

	Not relevant	Slightly relevant	Relevant	Very relevant	Highly relevant	Not feasible	Slightly feasible	Feasible	Very feasible	Highly feasible	
Indicator 1: List of vulnerable occupations available ***Description:*** *List of occupations that are specifically vulnerable to climatological heat due to their high exposure and/or to the intrinsic vulnerability of (most of) the workers (low-skilled, low-paid, physically demanding jobs often carried out by people in socio-economically precarious positions)* ***Data source:*** Report	___	___	___	___	___	___	___	___	___	___	___
Indicator 2: Operational WBGT forecasting service ***Description:*** *The WBGT forecasting service is operational and allows to detect critical WBGT values two to three days in advance. Real-time and forecast maps are available on the website.* ***Data source****: Website, yearly report*	___	___	___	___	___	___	___	___	___	___	___
Indicator 3: Number of warnings sent out ***Description:*** The number of early warnings sent out to relevant stakeholders based on the WBGT forecast. ***Data source:*** Logging – Report	___	___	___	___	___	___	___	___	___	___	___
Indicator 4: Number of companies including climatological heat in prevention and action plans ***Data source****: Verification of prevention and action plans*	___	___	___	___	___	___	___	___	___	___	___
Indicator 4: Number of workers in vulnerable occupations reached ***Description:*** Estimation of the number of employers and workers in vulnerable occupations that are covered/reached by the warnings. ***Data source****:* Based on the list of vulnerable occupations, estimates of the number of workers in these vulnerable occupations, and the number of employees and self-employed people that have been reached among these.	___	___	___	___	___	___	___	___	___	___	___

For each indicator type (see above), do you have suggestions of indicators not captured that would be relevant and feasible?

	Name of the indicators	**Where to collect the data**
Input	___	___
Output	___	___
Outcome	___	___
Impact	___	___

Would you know of key references from the (academic and grey) literature to identify other relevant monitoring indicators? Be as precise as possible (name of article/report, authors, country, URL...)

_____

Which types of barriers would most influence the implementation of this measure?

( ) Financial / Economic
( ) Institutional / Governance
( ) Technical / Knowledge and Information
( ) Social / Cultural / Awareness
( ) Organisational / Operational
( ) Policy / Regulatory

List of potential barriers

	How relevant is this barrier?					Are you aware of other direct solutions to overcome this barrier?
	Not relevant	Slightly relevant	Relevant	Very relevant	Highly relevant	
Barrier 1: Not a priority hazard for FPS Employment, Labour and Social Dialogue ***Type:*** *Institutional / Governance* ***Description:*** Psychosocial and musculoskeletal hazards are priorities for the FPS Employment, Labour and Social Dialogue as they often lead to long periods of sick leave. Therefore, limited resources may be available to address climatological heat hazards. ***Solution:*** Prepare a targeted list of sectors and vulnerable occupations for which climatological heat poses a serious risk (as acknowledged in international reports and scientific lit	___	___	___	___	___	___
Barrier 2: Support from prevention services, sectoral organisations, workers' organisations **Type:** Social / Cultural / Awareness **Description: t**hese stakeholders may not conceive climatological heat stress as a priority risk. **Solution:** Include these stakeholders from the start of the measure, set up a task force on climatological heat. Provide targeted information on risks of climatological heat in specific sectors / occupations	___	___	___	___	___	___
Barrier 3: No systematic data available on the link between climatological heat and disease or accidents **Type:** Technical / Knowledge and Information **Solution:** Increase knowledge base on (climatological) heat stress and diseases or accidents through a study and a targeted system for follow-up	___	___	___	___	___	___

Would you think of other barriers that block the implementation of the measure?
If applicable, please reference real examples or literature as well.
If possible, please also mention direct solutions to these barriers.

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Would you know of key references from the (academic and grey) literature to identify other relevant barriers and levers?
Be as precise as possible (name of article/report, authors, country, URL...)

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Overall rating of this measure
( ) Highly useful/necessary ( ) Useful/necessary ( ) Potentially useful/necessary ( ) Probably not useful/necessary ( ) Not useful/necessary

Comments:
What would you like to do next?
( ) Give feedback on another measure
( ) Provide a suggestion for an additional measure and/or finalise the survey.

Measure 4 : Develop guidance for technical and organisational measures for vulnerable occupations
General comprehension and clarity of the measure

	Do you agree?		Open feedback
	Yes	**No**	
Is the objective clear and unequivocal? If not, how would you formulate it?	[ ]	[ ]	___
Is the description clear and unequivocal? If not, please indicate how you would adapt it. If you want to add elements, please refer to the source(s) motivating these additional elements.	[ ]	[ ]	___
Are the competences relating to the measure clearly and correctly defined? If no, please refer to relevant source.	[ ]	[ ]	___
Are the interfederal aspects clearly and correctly defined? If not, please indicate why not, i.e., please add any other interfederal aspects to this measure. Please refer to the source of information.	[ ]	[ ]	___
Do you have further concrete information on the effectiveness of this measure? If yes, please add it here, and refer to the source of the information.	[ ]	[ ]	___
Do you agree with the responsible for this measure? If not, please indicate who should be responsible for the measure?	[ ]	[ ]	___
Do you agree with the other actors identified? If not, do you see (other) stakeholders that should (or shouldn't) be involved in the implementation of the measure? Please motivate.	[ ]	[ ]	___
Do you agree with this timeframe? If no, please indicate what is according to you a realistic timeframe. Please motivate.	[ ]	[ ]	___
Do you have any further comments on need for transformative change, social aspects or risk of maladaptation. If yes, please indicate and refer to the source of information.	[ ]	[ ]	___

Are there any additional costs that should be considered when evaluating this climate adaptation measure?
If so, please refer to relevant sources or literature that outline these costs.

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Do you have any suggestions or insights regarding the funding or financing of this measure?
Please provide any potential sources of funding, investment strategies, or financing models that could support its implementation. If applicable, please refer to relevant sources or literature that outline these costs.

_____
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_____

Which types of indicators do you think we need to properly monitor for this measure?
( ) Input
( ) Output
( ) Outcome
( ) Impact
List of relevant indicators
Relevance = it directly reflects *what the measure tries to achieve* (its core objective), rather than a side effect, a distant proxy or something only loosely connected
Feasibility = it can be produced with existing data (or easily obtainable data), at a reasonable cost, within the mandate of federal actors responsible for monitoring

	Rate how relevant this indicator is	**Rate how feasible this indicator is**	**Open feedback**

	Not relevant	Slightly relevant	Relevant	Very relevant	Highly relevant	Not feasible	Slightly feasible	Feasible	Very feasible	Highly feasible	
Indicator 1: List of vulnerable occupations available ***Description:*** *List of occupations that are specifically vulnerable to climatological heat due to their high exposure and/or to the intrinsic vulnerability of (most of) the workers (low-skilled, low-paid, physically demanding jobs often carried out by people in socio-economically precarious positions)* ***Data source****:* Report	___	___	___	___	___	__	___	___	___	___	___
Indicator 2: Number of sectoral / occupation-specific guidances produced ***Description:*** Every year over a total of three years specific sectors and/or vulnerable occupations will be selected for review and development of guidance ***Data source****:* Guidance published	___	___	___	___	___	___	___	___	___	___	___
Indicator 3: Number of employers and employees covered ***Description:*** Estimation of the number of employers and workers in vulnerable occupations that are covered by the new guidance ***Data source:*** Based on the list of vulnerable occupations, estimates of the number of workers in these vulnerable occupations, and the number of employees and self-employed people that have been reached among these.	___	___	___	___	___	___	___	___	___	___	___
Indicator 4: Number of companies including climatological heat in prevention and action plans ***Data source****: Verification of prevention and action plans*	___	___	___	___	___	___	___	___	___	___	___
Indicator 4: Number of views of published guidance ***Description:*** The number of times the guidance has been viewed (and possibly downloaded) gives an indication of the use that is made of the guidance. ***Data source****:* Loggings of visits to dedicated websites hosted by FPS Employment, Labour and Social Dialogue and by other involved stakeholders	___	___	___	___	___	___	___	___	___	___	___

For each indicator type (see above), do you have suggestions of indicators not captured that would be relevant and feasible?

	Name of the indicators	**Where to collect the data**
Input	___	___
Output	___	___

Outcome	___	___
Impact	___	___

Would you know of key references from the (academic and grey) literature to identify other relevant monitoring indicators? Be as precise as possible (name of article/report, authors, country, URL...)

_____

Which types of barriers would most influence the implementation of this measure?
( ) Financial / Economic
( ) Institutional / Governance
( ) Technical / Knowledge and Information
( ) Social / Cultural / Awareness
( ) Organisational / Operational
( ) Policy / Regulatory

List of potential barriers

	How relevant is this barrier?					**Are you aware of other direct solutions to overcome this barrier?**
	Not relevant	**Slightly relevant**	**Relevant**	**Very relevant**	**Highly relevant**	
Barrier 1: Not a priority hazard for FPS Employment, Labour and Social Dialogue ***Type:*** *Institutional / Governance* ***Description****:* Psychosocial and musculoskeletal hazards are priorities for the FPS Employment, Labour and Social Dialogue as they often lead to long periods of sick leave. Therefore, limited resources may be available to address climatological heat hazards. ***Solution:*** Prepare a targeted list of sectors and vulnerable occupations for which climatological heat poses a serious risk (as acknowledged in international reports and scientific lit	___	___	___	___	___	___
Barrier 2: Support from prevention services, sectoral organisations, workers' organisations **Type:** Social / Cultural / Awareness **Description:** These stakeholders may not conceive climatological heat stress as a priority risk. **Solution:** Include these stakeholders from the start of the measure, set up a task force on climatological heat. Provide targeted information on risks of climatological heat in specific sectors / occupations	___	___	___	___	___	___
Barrier 3: No systematic data available on the link between climatological heat and disease or accidents **Type:** Technical / Knowledge and Information **Solution:** Increase knowledge base	___	___	___	___	___	___

on (climatological) heat stress and diseases or accidents through a study and a targeted system for follow-up						

Would you think of other barriers that block the implementation of the measure?
If applicable, please reference real examples or literature as well.
If possible, please also mention direct solutions to these barriers.

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Would you know of key references from the (academic and grey) literature to identify other relevant barriers and levers?
Be as precise as possible (name of article/report, authors, country, URL...)

_____

Overall rating of this measure
( ) Highly useful/necessary ( ) Useful/necessary ( ) Potentially useful/necessary ( ) Probably not useful/necessary ( ) Not useful/necessary
Comments:
What would you like to do next?
( ) Give feedback on another measure
( ) Provide a suggestion for an additional measure and/or finalise the survey.

Measure 5: Use future climate scenarios in specifications for federal buildings
General comprehension and clarity of the measure

	Do you agree?		Open feedback
	Yes	**No**	
Is the objective clear and unequivocal? If not, how would you formulate it?	[ ]	[ ]	___
Is the description clear and unequivocal? If not, please indicate how you would adapt it. If you want to add elements, please refer to the source(s) motivating these additional elements.	[ ]	[ ]	___
Are the competences relating to the measure clearly and correctly defined? If no, please refer to relevant source.	[ ]	[ ]	___
Are the interfederal aspects clearly and correctly defined? If not, please indicate why not, i.e., please add any other interfederal aspects to this measure. Please refer to the source of information.	[ ]	[ ]	___
Do you have further concrete information on the effectiveness of this measure? If yes, please add it here, and refer to the source of the information.	[ ]	[ ]	___
Do you agree with the responsible for this measure? If not, please indicate who should be responsible for the measure?	[ ]	[ ]	___
Do you agree with the other actors identified? If not, do you see (other) stakeholders that should (or shouldn't) be involved in the implementation of the measure? Please motivate.	[ ]	[ ]	___
Do you agree with this timeframe? If no, please indicate what is according to you a realistic timeframe. Please motivate.	[ ]	[ ]	___
Do you have any further comments on need for transformative change, social aspects or risk of maladaptation. If yes, please indicate and refer to the source of information.	[ ]	[ ]	___

Are there any additional costs that should be considered when evaluating this climate adaptation measure?
If so, please refer to relevant sources or literature that outline these costs.

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Do you have any suggestions or insights regarding the funding or financing of this measure?
Please provide any potential sources of funding, investment strategies, or financing models that could support its implementation. If applicable, please refer to relevant sources or literature that outline these costs.

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Which types of indicators do you think we need to properly monitor for this measure?
( ) Input
( ) Output
( ) Outcome
( ) Impact

List of relevant indicators
Relevance = it directly reflects *what the measure tries to achieve* (its core objective), rather than a side effect, a distant proxy or something only loosely connected
Feasibility = it can be produced with existing data (or easily obtainable data), at a reasonable cost, within the mandate of federal actors responsible for monitoring

	Rate how relevant this indicator is					Rate how feasible this indicator is					Open feedback
	Not relevant	Slightly relevant	Relevant	Very relevant	Highly relevant	Not feasible	Slightly feasible	Feasible	Very feasible	Highly feasible	
Indicator 1: Standard future meteorological year established and integrated in specifications for federal buildings ***Description:*** Standard future meteorological year established and integrated in specifications for federal buildings ***Data source****:* Report	___	___	___	___	___	___	___	___	___	___	___
Indicator 2: Number of invitations to tender imposing standard future meteorological year ***Description:*** *Number of* invitations to tender that require the use of the standard future meteorological year for thermodynamic simulations ***Data source****:* Annual report	___	___	___	___	___	___	___	___	___	___	___
Indicator 3: Number of employers and employees covered ***Description:*** Estimation of the number of employers and workers in vulnerable occupations that are covered by the new guidance ***Data source:*** Based on the list of vulnerable occupations, estimates of the number of workers in these vulnerable occupations, and the number of employees and self-employed people that have been reached among these.	___	___	___	___	___	___	___	___	___	___	___
Indicator 4: Number of views of published guidance ***Description:*** The number of times the guidance has been viewed (and possibly downloaded) gives an indication of the use that is made of the guidance. ***Data source****:* Loggings of visits to dedicated websites hosted by FPS Employment, Labour and Social Dialogue and by other involved stakeholders	___	___	___	___	___	___	___	___	___	___	___

For each indicator type (see above), do you have suggestions of indicators not captured that would be relevant and feasible?

	Name of the indicators	Where to collect the data
Input	___	___
Output	___	___
Outcome	___	___

Impact	___	___

Would you know of key references from the (academic and grey) literature to identify other relevant monitoring indicators?
Be as precise as possible (name of article/report, authors, country, URL...)

_____

Which types of barriers would most influence the implementation of this measure?
( ) Financial / Economic
( ) Institutional / Governance
( ) Technical / Knowledge and Information
( ) Social / Cultural / Awareness
( ) Organisational / Operational
( ) Policy / Regulatory

List of potential barriers

	How relevant is this barrier?					**Are you aware of other direct solutions to overcome this barrier?**
	Not relevant	**Slightly relevant**	**Relevant**	**Very relevant**	**Highly relevant**	
Barrier 1: Additional investment costs ***Type: Fi***nancial / economic ***Description:*** Attaining thermal comfort norms under a more stringent future climate scenario will entail additional costs compared to the use of a historical average year. ***Solution:*** Assess costs and benefits to justify additional costs	___	___	___	___	___	___
Barrier 2: Consistency with existing legislation **Type:** policy / regulatory **Description:** Existing legislation does not consider future climate scenarios – no EU framework or guidelines	___	___	___	___	___	___
Barrier 3: No systematic data available on the link between climatological heat and disease or accidents **Type:** Technical / Knowledge and Information **Solution:** Increase knowledge base on (climatological) heat stress and diseases or accidents through a study and a targeted system for follow-up	___	___	___	___	___	___
Barrier 4:	___	___	___	___	___	___

Would you think of other barriers that block the implementation of the measure?
If applicable, please reference real examples or literature as well.
If possible, please also mention direct solutions to these barriers.

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Would you know of key references from the (academic and grey) literature to identify other relevant barriers and levers?
Be as precise as possible (name of article/report, authors, country, URL...)

_____
Overall rating of this measure
( ) Highly useful/necessary ( ) Useful/necessary ( ) Potentially useful/necessary ( ) Probably not useful/necessary ( ) Not useful/necessary
Comments:
What would you like to do next?
( ) Give feedback on another measure
( ) Provide a suggestion for an additional measure and/or finalise the survey.

Additional federal adaptation measure(s)
Would you like to propose an additional federal adaptation measure?

	Comments
Context Why do you consider this measure important?	___
Objective of the measure What is the intended outcome or benefit of implementing this measure? How does it contribute to reducing climate-related risks?	___
Description of the measure Provide a clear and concise description of the measure. Include any technical, operational, or policy aspects that are relevant.	___
Supporting argumentation and background Explain why this measure is necessary and how it complements or improves upon existing measures. If possible, provide references, examples, or evidence that support its effectiveness.	___

Would you like to provide overall feedback on the survey itself (e.g., length, clarity, ease of understanding, question types, accessibility)?
We plan to send additional surveys on other federal measures related to priority risks, so we are eager to improve the consultation process.
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What is your email address? *
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