Pan-European Commission on Climate and Health
Information Series

Realizing the health potential of climate action: adaptation and mitigation opportunities in the WHO European Region

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About this document

This document summarizes key evidence relevant to the opportunities and co-benefits of addressing climate change threats to human health in the WHO European Region through both adaptation and mitigation measures. It provides key messages about the multiple health benefits of thoughtfully designed and equitably implemented climate action.

It is the second of a series of three short thematic briefs developed for the Pan-European Commission on Climate and Health (PECCH), which has been convened by the WHO Regional Office for Europe to accelerate decisive climate action that protects and promotes health.

PECCH will convene for three hybrid hearings in 2025, engaging leading experts, people with lived experience and other key informants and stakeholders in specific areas of climate change and health, as well as social development and policy-making, to present current evidence and case examples, and identify gaps and opportunities for accelerated action. Drawing upon these hearings, PECCH will make recommendations for accelerated health and climate action.

Ahead of each hearing, the PECCH research team, in close collaboration with its Chief Scientific Advisor will prepare a short thematic brief for PECCH members to help inform – and contextualize the evidence from the WHO European Region related to the scope of – the hearing. Each thematic brief contains a set of key messages for consideration by the Chair and the Commissioners to guide their discussions at the hearings on areas that might be deliberated as input to the final "Call to action" of the Commission.

The three hearings of the Commission are intended to build on each other, addressing the broad themes of:

- **threats** to human health, well-being and ecosystems;
- **opportunities and co-benefits** of addressing these threats through both adaptation and mitigation measures; and
- possible entry points for **actions** to enhance mitigation, adaptation and resilience to climate change in terms of legislation, governance, capacity strengthening, technologies and economic frameworks, among others, applied at different levels of governance, for equitable health and well-being outcomes.

From crisis to opportunity across scales

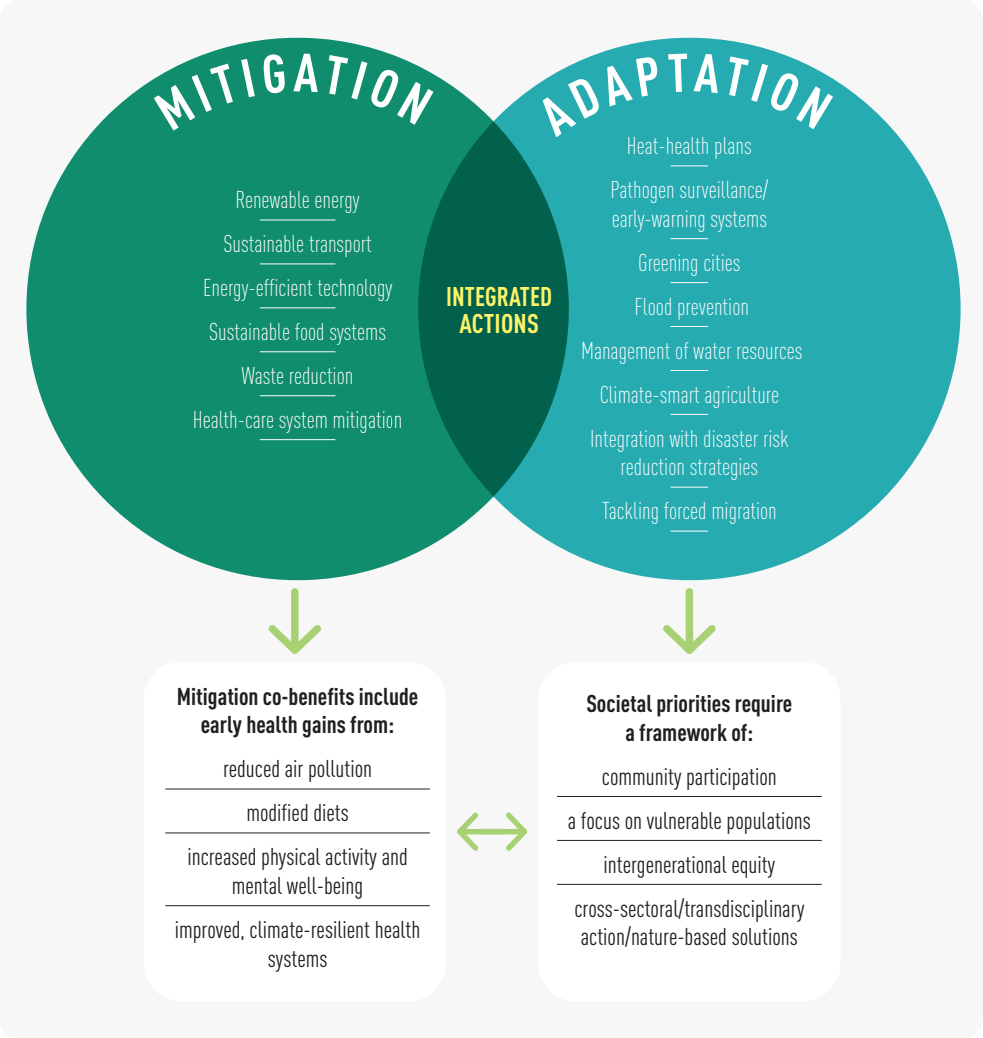
Many solutions to climate and health challenges are already known and being applied in some settings, often with encouraging results. However, their uptake remains uneven and implementation is frequently hampered by insufficient governance, financing, conflicting interests or capacity barriers. The task now is to accelerate action, address structural inequities and bring successful approaches to scale across diverse contexts.

Outputs from the first hearing of the PECCH supported and extended the background analysis presented in the related technical report *(1)* and hearing brief *(2)*: the climate crisis is a major threat to health across the WHO European Region and also threatens safety and security, social cohesion and human rights. Even in the short time elapsed since the first hearing, research is providing further evidence on these adverse health effects. For example, the assessment and modelling of the European heatwave occurring between 23 June and 2 July 2025 found that climate change nearly tripled heat-related deaths in certain cities across the Region *(3)*.

The first hearing concluded that the implementation of evidence-based solutions, both through mitigation and adaptation, is urgent, reinforcing messages from other recent strategic initiatives, in particular WHO's Draft Global Action Plan on Climate Change and Health (GAP) *(4)*. One of the key underlying principles in GAP is the commitment to integrating national and international scales for coherent action, including local and regionally led strategies and multisectoral and transdisciplinary partnerships. This integration of policy development and translation to practice across different levels of governance, will be strongly emphasized in the present briefing.

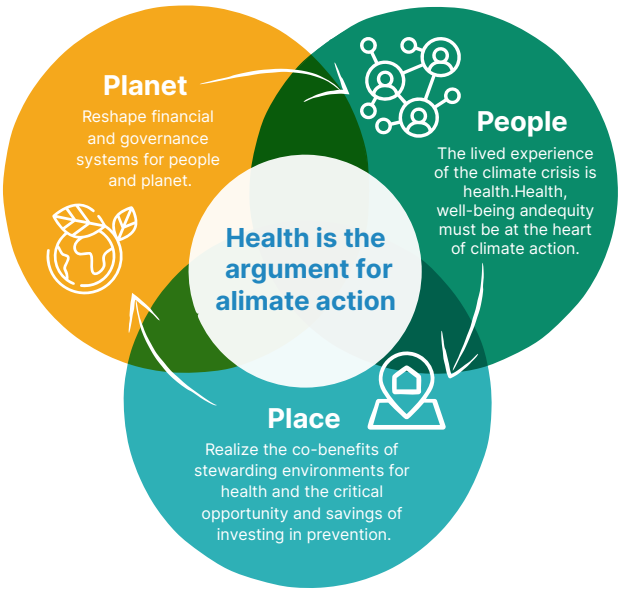
This second hearing marks a pivotal shift: from diagnosing the escalating risks to actively identifying and unlocking the opportunities for transformation. Climate action, if thoughtfully designed and equitably implemented, can be a powerful driver of population health *(5,6)*. The same policies that reduce emissions, such as replacing fossil fuel-derived energy by clean renewable energy sources, promoting active transport, ensuring food security, or enhancing thermal comfort, can also deliver immediate health gains. These benefits materialize not in a distant future, but here and now, and across a wide range of settings. Fig. 1 illustrates how mitigation and adaptation actions interact to yield health gains, particularly when embedded in equity-based and participatory frameworks. Although the most vulnerable groups are disproportionately affected by climate change, they are often overlooked in climate adaptation and mitigation planning and, especially, in implementation *(7)*.

Fig. 1. Health-focused adaptation and mitigation: a dual-track approach for benefits



In exploring how benefits can be realized, this briefing takes a multilevel approach, recognizing that solutions must be enabled and aligned across international, national, subnational and community scales. Actions taken at each level shape what is possible at the others. To guide this exploration, the "people–place–planet" framework (Fig. 2) continues to serve as a cross-cutting lens: centring systems transformation and mitigation efforts ("planet"), acknowledging the diversity of implementation contexts ("place") and grounding decisions in equity, participation and intergenerational justice ("people") *(8)*.

Fig. 2. The "people-place-planet" framework: key pillars of taking action for climate change and health



Source: (8).

These efforts do not occur in isolation. They build on – and contribute to – an evolving international policy landscape that increasingly positions health as both a motivator and beneficiary of climate action.

Unlocking health through climate action: international levers for transformation

Coordinated international action anchored in science, equity and cross-border solidarity can unlock powerful health gains by enabling local and national climate-health solutions across the WHO European Region.

Many of the most pressing climate-health risks in the WHO European Region transcend borders and therefore require coordinated international action. As highlighted in the first PECCH hearing and its first brief, fine particulate matter (known as PM2.5) reductions across sectors and countries from replacing fossil fuels with clean renewable energy sources can rapidly improve regional air quality and health as well as reduce the risks of climate change in the longer term *(6)*. The northward spread of diseases such as West Nile virus and dengue underscores the need for harmonized surveillance and early warning, particularly in central and eastern Europe to support climate change adaptation *(9)*. Climate change is also driving water stress, food and nutrition insecurity, and crop yield losses within and beyond the Region, with knock-on effects such as higher food prices and disproportionate impacts on vulnerable populations *(10)*. These interconnected threats illustrate why strong international frameworks and networks

are indispensable for protecting health in a changing climate, not just for developing international policy but also to bring more local actors together to share and upscale practice at the international level, for example through networks such as C40 Cities, Local Governments for Sustainability and the WHO Healthy Cities Network.

These and other cross-border mechanisms shape funding flows, foster cooperation and provide normative and technical guidance, particularly crucial for aligning national and subnational actions, supporting capacity-constrained countries and tackling transboundary health risks. When designed equitably, these mechanisms serve not only as backbones of global solidarity, but also as vehicles for delivering health co-benefits across scales.

The WHO European Region is strongly embedded in a growing international policy landscape that frames climate action as both a necessity and an opportunity for health (Box 1).

Box 1. Key WHO policy frameworks on climate and health

The ***Declaration of the Seventh Ministerial Conference on Environment and Health: Budapest, Hungary 5–7 July 2023*** **(Budapest Declaration)** *(11)* commits governments to urgently act on climate change, pollution and biodiversity loss. Pledges include protecting health through mitigation and adaptation measures, promoting just transitions, reducing environmental health inequalities and integrating environmental sustainability into health systems and policies.

The Seventy-seventh World Health Assembly Resolution *Climate change and health* *(12)* from 2024, calls on Member States to strengthen climate-resilient and sustainable health systems, integrate health in climate action and climate in health policy, reduce health sector emissions and mobilize finance. It also requests that WHO develop a results-based Global action plan aligned with the Paris Agreement *(13)*, embed climate across all technical work and support countries through capacity-building, technical guidance and advocacy.

The GAP *(4)* from 2025 is structured around three action areas: i) leadership, coordination and advocacy; ii) evidence and monitoring; and iii) country-level action and capacity-building. It sets global targets for integrating health into climate agendas, creating robust evidence and building climate-resilient, low-carbon health systems. The GAP emphasizes equity, One Health and multisectoral collaboration, with tailored actions for Member States, WHO and stakeholders.

These are echoed in the *COP28 UAE Declaration on climate and health (14)*, signed at 28th annual United Nations Climate Change Conference by 144 countries, including many from the European Region, which recognizes the urgent need for climate-resilient and low-carbon health systems.

In the WHO European Region, other relevant initiatives from multiple actors, including European Union institutions, may also inform future PECCH recommendations. For example, the new European Union Climate Adaptation Plan (from 2026) will propose a

legal framework for climate resilience, deploying resilience by design across sectors and policies, and clarifying risk ownership at local and national levels *(15)*. Furthermore, the European Commission's recent communication (2 July 2025) on its life sciences strategy covering the climate and health agenda proposes a global research collaboration to foster alignment between funders and to support the development of solutions for climate adaptation and mitigation *(16)*. Regional dietary patterns also offer evidence for aligning health and sustainability objectives: a recent analysis of a Spanish cohort found that the Mediterranean diet is broadly consistent with the EAT–Lancet Commission's Planetary Health Diet in nutritional quality and environmental performance, with both associated with lower mortality risk and reduced dietary greenhouse gas emissions *(17)*.

WHO and partners have developed a suite of tools and platforms to support country action, ranging from proposing a set of the health arguments for climate action *(18)* and the Alliance for Transformative Action on Climate and Health, to health integration guidance in Nationally Determined Contributions *(19,20)*. In the WHO European Region, the country-led Environment and Health Process Partnership for Health Sector Climate Action, aligns with the Alliance for Transformative Action on Climate and Health and fosters peer exchange, mutual support and shared learning among countries facing similar challenges in building climate-resilient, low-carbon health systems, and represents an important regional platform for scaling action and encouraging wider participation *(21)*.

However, implementation gaps remain: a WHO analysis found that while health is increasingly reflected in national climate commitments, substantial deficits in financing and technical capacity persist *(22)*.

International discussions on loss and damage are increasingly acknowledging health as a central concern. Heatwaves, flooding, food insecurity and forced migration carry escalating direct and indirect health costs. The Resolution *Climate change and health* called for action to avert, minimize and address loss and damage, including through targeted financing mechanisms for the most vulnerable countries and regions *(12)*. However, scientific capacity to quantify and track health-related losses remains limited across contexts. Investment in data, attribution science *(23)* and regional capacity is essential to inform fair and effective responses. It is noteworthy that G77 countries recently requested that the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impact mandate include a global scientific assessment of Loss and Damage: this would be very helpful in the WHO European Region, as elsewhere.

Despite growing commitments, access to climate finance for health remains highly unequal. A key finding from the WHO Regional Office for Europe's *Zero regrets: scaling up action on climate change mitigation and adaptation for health in the WHO European Region* report is that the health sector is underrepresented in climate finance portfolios, particularly in lower-resource countries across eastern Europe, the Balkans and central Asia *(6)*. Targeted efforts to unlock global funds such as the Green Climate Fund for health-specific adaptation and mitigation are needed. Similarly, efforts must prioritize the people and places most affected.

International actors can catalyse national and subnational progress by making mitigation health co-benefits visible and measurable. Investments in clean energy, sustainable

food systems and active transport, if incentivized and supported by international frameworks, can accelerate climate action while reducing noncommunicable diseases, improving mental health and enhancing well-being *(24)*. The "people–place–planet" framing is instrumental here: while "planet" connects to global emissions reductions, "place" addresses locally relevant implementation, and "people" ensures that benefits are equitably shared, and health gains maximized.

National action: advancing climate–health integration through policy, planning and practice

National climate and health action is taken up across the WHO European Region, but persistent implementation and evaluation gaps highlight the need for stronger governance to provide direction and accountability, inclusive monitoring to capture diverse realities and equitable co-benefit delivery to ensure that gains reach those most at risk.

Across the WHO European Region, steps are increasingly taken to integrate health into national climate action. In Netherlands (Kingdom of the), policies promoting active travel have demonstrated measurable health benefits *(25)*.

France has taken steps to align food systems with both health and sustainability goals and was one of the first countries to incorporate environmental considerations into its dietary guidelines, including increasing plant-based food in school meals and reducing food waste: measures with the potential to improve child nutrition and reduce food-related greenhouse gas emissions *(26)*.

In England, the United Kingdom, the National Health Service has adopted a net-zero emissions target, making it the first national health system to do so. The strategy includes mitigation actions across facilities, energy systems, transport, procurement and clinical care. It has been described as a model for integrating decarbonization into health system planning, while also promoting equity and patient well-being *(27)*. Several other European Region Member States, including Austria, Belgium, France, Ireland and Norway have developed national health sector strategies, some of which also integrate resilience components.

To strengthen the readiness of Member States for climate change related emergencies, the WHO Regional Office for Europe organized a regional simulation exercise, building on real life case studies on flooding in Armenia and wildfires in Portugal *(28)*. Such simulation exercises help health services to become better prepared for, and adapt to, extreme weather events and also emphasize the point that cross-border health threats may challenge country-level plans.

Despite these advances, evaluation gaps persist. Many national climate strategies do not include systematic measurement of the health co-benefits, such as the reduction of noncommunicable diseases due to air quality improvements. The *Health Effects of*

Climate Change in the UK: 2023 report emphasized that the absence of health indicators in climate monitoring frameworks limits accountability and underutilizes the potential of co-benefit framing for advancing action *(29)*. Sound evaluation is essential not only for measuring health and cross-sector impacts, but also for testing the scalability and transferability of interventions. Governance and the equitable delivery of co-benefits play a central role in closing these implementation and evaluation gaps *(30)*. Embedding accountability mechanisms, ensuring transparent monitoring and prioritizing benefits for the most affected populations can help translate climate–health strategies into sustained, system-wide gains.

Equity is another major blind spot. A growing body of research highlights that specific vulnerable populations face heightened exposure to climate-related health risks, yet national adaptation and mitigation strategies often fail to explicitly address their needs *(9)*.

Governance is a key driver of effective and sustained action, shaping how priorities are set, resources allocated and responsibilities coordinated across sectors and levels of government. While the detailed discussion of governance will be addressed in the third PECCH hearing, its role in closing current gaps is clear: without coherent leadership structures and clear mandates, even well-designed climate–health strategies, risk stalling. Inclusive monitoring, engaging communities, subnational authorities and vulnerable groups, can reveal inequities and implementation barriers that top-down data may miss. Ensuring equitable co-benefit delivery maximizes health gains while supporting public trust and legitimacy.

To close the gaps, national governments must move beyond isolated good practices and institutionalize mechanisms to evaluate health outcomes, address structural inequities and ensure health system readiness for both mitigation and adaptation. For example, as highlighted in the recent PECCH open letter on extreme heat *(31)*, only 21 of 53 countries in the WHO European Region have implemented heat-health action plans and this deficit should be addressed.

Subnational action: place-based innovation for health and climate

Subnational innovation rooted in local context and equity can drive measurable climate and health gains, but systematic evaluation and investment are essential to scale effective, place-based solutions across the Region.

Cities, rural areas and regions across the WHO European Region are well suited to implement place-based strategies that yield measurable climate and health benefits, grounding transformation in equity, adapting to diverse geographies and contributing to broader mitigation and resilience goals. Cities and other local authorities are often seen as better equipped than national governments to lead and implement climate action for different reasons, including proximity to their constituencies, greater flexibility and innovation, stronger cross-sectoral networks, and political will and leadership.

They are also often the first to respond to climate impacts and hold responsibilities for implementing adaptation and mitigation measures. However, they frequently face challenges such as limited resources, constrained mandates and dependence on higher levels of government for support *(32)*.

Many interventions originate outside the health sector yet provide significant health co-benefits. For example, the "Superblocks" in Barcelona, Spain, which reduce car traffic to reclaim public space, have been shown to substantially improve public health. A modelling study projected that full implementation could prevent up to 667 premature deaths annually through reductions in air pollution, noise and heat, alongside increased physical activity *(33)*. A health impact assessment conducted in the same city estimated that shifting from car to bicycle use would prevent 12 premature deaths annually and increase life expectancy by 3–14 months per person among regular cyclists, with the benefits far outweighing risks from air pollution and traffic injury *(34)*. These outcomes should be viewed in the broader context of cumulative benefits over time, potential cost savings for the health system, integration with urban planning and climate objectives, and alignment with priorities for equity and the protection of vulnerable groups.

In London, United Kingdom, the implementation of the Ultra Low Emission Zone significantly improved local air quality. Research found a 49% reduction in roadside nitrogen dioxide concentrations in central London between 2017 and 2020, with expected health gains from reduced cardiovascular and respiratory disease burden *(35)*. A systematic review found that low emission zones generally have positive effects on air quality and potential health benefits, although more research is needed to fully assess long-term impacts *(36)*.

Although still under evaluation, the 15-minute city approach adopted in Paris, France, which fosters local access to services and active transport, is expected to be associated with increased walkability and reduced car use, contributing to lower emissions and improved well-being *(37)*. However, various concerns for designing compact cities, such as impact on equity and infectious disease transmission, remain to be clarified in practice.

Green and blue infrastructure such as urban trees, parks and water features are increasingly integrated into local planning to mitigate urban heat and support mental health. While these show effectiveness in reducing daytime temperatures, trade-offs such as unintended nighttime warming and the risk of green gentrification underscore the need for equity-centred and context-specific design *(38)*. "Place" may be an important factor: for example, a recent modelling of urban cooling strategies (e.g. increasing vegetation fraction and modifying surface albedo) shows that in most mid- and high-latitude cities (including some within WHO European Region) these typical cooling strategies weaken the beneficial role of urban heat islands during cold spells (i.e. cold-related mortality is amplified) *(39)*. There are, of course, other benefits of greening on mental and physical well-being but one solution to the cooling dilemma is to use seasonal-adjusted strategies such as deciduous, not evergreen, trees to avoid winter cooling.

Subnational action also extends beyond urban areas. Rural communities can play an important role in advancing climate-smart agriculture, renewable energy projects and nature-based solutions (e.g. afforestation, wetland restoration) that provide both mitigation and adaptation benefits, while coastal and mountain regions can pioneer

resilient infrastructure, early warning systems and disaster preparedness measures.

There are also health sector-led initiatives at subnational level. In Galicia, Spain, the Life Resystal project supported the Galician Health Service in developing a climate resilience plan, integrating adaptation actions into hospital infrastructure and operations *(40)*. In Norway, the New Førde Hospital, located in a flood-prone delta area, has been protected through a concrete embankment and large pump station to prevent damage from snowmelt and heavy rain *(41)*. These examples underline the importance of local health authorities and facilities as key actors in resilience-building, and the need for frameworks to facilitate the sharing and upscaling of such practices nationally and internationally.

Despite promising practices, evaluation remains limited. Most urban heat plans lack data on mortality impacts, and rural innovations, such as clean mobility projects, are rarely assessed for health outcomes. Greater investment in monitoring and cross-sectoral metrics is needed to avoid maladaptation and to scale-up effective strategies *(5,22)*. Potentially, evaluation, implementation and scale-up can also be advanced by collective commitment to adhering to best practice guidance for evaluation *(28)* and sharing effective implementation strategies for mutual learning (e.g. how to avoid maladaptation): although not health specific, the European Climate Adaptation Platform Climate-ADAPT case study explorer *(42)* might be a useful model to extend across the WHO European Region. Also more generally, the Covenant of Mayors has recently updated its guidance to local authorities *(43)* on how to reduce greenhouse gas emissions, adapt to climate impacts and address energy poverty at the community level but this report is essentially limited to the European Union in scope and the guidance would benefit from being extended across the Region.

Community action and social participation: empowering people to drive transformational change

Community-led action is essential to accelerate climate and health solutions. Empowered participation fosters behavioural change, builds resilience and enhances legitimacy, yet it must be supported by structural enablers to avoid inequitable burdens or maladaptation.

Communities are not passive recipients of climate impacts; they are active agents in shaping solutions. Across the WHO European Region, local citizens are implementing and co-producing interventions that directly affect adaptation, mitigation and health outcomes. Community gardens, neighbourhood cooling initiatives and heat-health early warning systems have been shown to reduce exposure to heat and support food security and mental health improvements when designed inclusively and contextually *(44–46)*.

Participatory mechanisms like citizen assemblies, youth forums and community-based monitoring could enhance trust and ensure that interventions reflect lived experience. Further, social connectedness itself improves resilience. Evidence from responses to

extreme weather events suggests that communities with high social capital experience lower mortality and recover faster *(47)*. Mental health dimensions are increasingly recognized in this context. Eco-anxiety, particularly among youth, is growing, but may also be a mobilizing force. Participatory climate action could potentially increase psychological resilience and agency *(48)*. Health professionals are also key enablers of community engagement. "Green prescribing" – encouraging time in nature for mental health – demonstrates the potential of health services to link individuals with community-based adaptation strategies *(49)*. More generally, a recent WHO Regional Office for Europe report *(50)*, highlights the potential of nature-based solutions to address both human health and environmental sustainability (and underpins the planetary health link with biodiversity). Many of these nature-based examples are relevant to climate action but well-planned design and management are essential to avoid unintended health risks.

Care must be taken not to shift responsibility to individuals without adequate institutional support. Behavioural interventions only succeed when embedded within enabling environments: accessible public transport, safe green spaces, affordable and accessible healthy food and housing security. Without these, individual actions may be constrained or exacerbate inequities *(51)*.

Risks of maladaptation must also be addressed. Community-led projects can inadvertently displace vulnerable groups (e.g. via green gentrification) or be captured by more powerful actors if participatory processes are not safeguarded. Inclusive design and continuous evaluation are essential to avoid unintended harms and ensure benefits are equitably distributed *(52)*.

Communities hold vital knowledge and energy for transformative change. Unlocking this potential requires investment in participation mechanisms, the recognition of diverse voices – especially youth, and Indigenous and marginalized populations – and sustained support from institutions to scale what works, safely and justly.

Final reflections ahead of the second PECCH hearing

Commissioners have previously emphasized the importance of providing distinctive, evidence-based, recommendations that align with, reinforce and extend the outputs of the other major international bodies previously noted, including the recent GAP from WHO. In terms of adding value to GAP, there is much to be done at the regional level by tackling evidence and implementation gaps, and there are also joint strategic opportunities for advancing at both global and regional scales, for example, through further work on clarifying indicators for measuring progress, including integration with metrics of progress for the Sustainable Development Goals (SDGs) (a continuing objective for GAP). The United Nations latest *Global Report on Climate and SDGs Synergies*, forthcoming in September 2025, is likely to provide further impetus for the integration of objectives.

Across the WHO European Region, good practices in climate and health across sectors, ranging from city-level mitigation to community-led adaptation, are demonstrating

measurable benefits. Yet many remain siloed, underfunded or unevenly implemented. The PECCH can play a catalytic role by outlining processes for evaluating interventions, including their co-benefits for health and equity, scalability and transferability, and by advising on how to communicate these effectively to decision-makers, drawing on insights into governance, funding, mandates and institutional arrangements to enable transformative change.

Strategic support – technical, financial and political – is essential to enable action at scale. Equally important is robust evaluation, building on the evidence base outlined in the first PECCH hearing, to ensure that commitments translate into measurable results. Linking evidence, evaluation and action is critical to distinguish impact from intention, prevent greenwashing or health-washing and guide adaptive implementation. The PECCH could recommend embedding economic metrics and co-designed evaluation tools in climate–health strategies, to strengthen accountability and accelerate uptake of effective solutions.

Scaling what works means fostering enabling conditions (e.g. intersectoral governance, inclusive participation, capacity-building) while recognizing context-specificity. The PECCH's leadership can help shift from scattered innovation to systemic change. The recent statement from the United Nations Secretary-General, introducing a new note of optimism, "We are on the cusp of a new era. Fossil fuels are running out of road. The sun is rising on a clean energy age*" (53),* sets the stage for transformative change for health, integrating mitigation and adaptation.

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