EIG Submission on the Belém Mission to 1.5°C

The EIG is pleased to respond to the call for inputs on the Belém Mission to 1.5.

In Belém, Parties decided to launch, under the guidance of the Presidencies of the sixth, seventh and eighth sessions of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement "Belém Mission to 1.5" aimed at enabling ambition and implementation of nationally determined contributions and national adaptation plans, to reflect on accelerating implementation, international cooperation and investment in nationally determined contributions and national adaptation plans across mitigation and adaptation, and requested those Presidencies to produce a report summarizing the work as they conclude the work by the eighth session of the COP.

I. A Belém Mission to 1.5°C must be anchored in science

The Belém Mission to 1.5 should provide a blueprint for how to avoid and limit overshoot of 1.5°C. It should be anchored in the best available science, and draw from the IPCC scenarios and pathways, including the latest scenarios, namely where it identified actions with the highest Mitigation potential (see Chapter III) and Adaptation potential (see Chapter IV). Implementation pathways should remain nationally determined, taking into account national circumstances, development priorities, food security needs and domestic legal frameworks.

The world has not surpassed 1.5°C of global warming yet, but is getting close[1]. Returning to 1.5°C by 2100 is still possible, but has become more uncertain and challenging. Reversing global temperature overshoot requires countries to reduce and remove emissions to such a degree that global emissions become net negative. Every fraction of a degree of global warming matters.

II. Key expectations

The Belem Mission to 1.5 should:

1) **Deliver a roadmap** (written document) under the authority of the presidencies that:
    a. Drawing from the IPCC and other relevant reports, namely scenarios to maintain the 1.5° limit.
    b. Identifies concrete actions, that have the highest mitigation and highest adaptation potential, to inform the Second Global Stocktake and guide the consideration of possible as policy options.
    c. Draws on BTRs and FMCPs to inform discussions on implementation challenges without serving as a country-level assessment.

2) Use existing funds, facilities and tools such as the GCF readiness proramm, in a more systematic manner for **support and technical assistance** to countries implement their NDCs and NAPs, through bottom-up, self-determined efforts, namely by:
    a. Providing political space for countries to -identify their implementation challenges and formulating their needs (investment and climate finance challenges, technology access and transfer, peer learning, scientific and technical cooperation);
    b. Encouraging countries if possible to develop implementation plans, investment plans, or country platforms, support their development through technical assistance, e.g. NDC-Partnership.
    c. Enhanced coordination, strengthening political commitment and scaling support and resource mobilization to reinforce existing mechanisms and co-operation among relevant stakeholders that support countries in their efforts to design and implement NDCs and NAPs;

[1] UNEP Emissions Gap Report 2025, chapter 4.5.1: The remaining carbon budget for limiting warming to 1.5°C without overshoot is now 130 GtCO2 at 50 per cent probability, and only 80 GtCO2 at 66 per cent probability (Forster et al. 2025). At current CO2 emissions levels of about 40 GtCO2/year (chapter 2), this budget will be exhausted before 2030

d. Promoting peer-to-peer exchange and learning**:** provide dedicated space to Parties for peer-to-peer exchange and learning to allow effective implementation of mitigation and adaptation.

3) Work with the **Global Implementation Accelerator** to focus on a small number of high-impact systems:
   a. Support Parties, upon request and on a voluntary basis, in translating their own NDC and NAP priorities into policy and investment roadmaps
   b. Identify cooperation offers (finance, capacity building, scientific cooperation, access to technical knowledge and innovation, and knowledge transfer, regulatory models)

4) Identify opportunities for **multilateral or plurilateral action**, namely
   a. Identify actions that require further efforts
   b. Find ways to support and accelerate existing coalitions or action agenda initiatives
   c. Identify areas for collaboration through alliances and coalitions of the willing, where these do not yet exist

5) **Mobilize support** for climate actions
   a. Curate "ambition-ready actions" that could be scaled if support is available.
   b. Convene MDBs, philanthropy, climate funds, bilateral actors around country-owned pipelines.
   c. Crowd in private capital through de-risking frameworks.

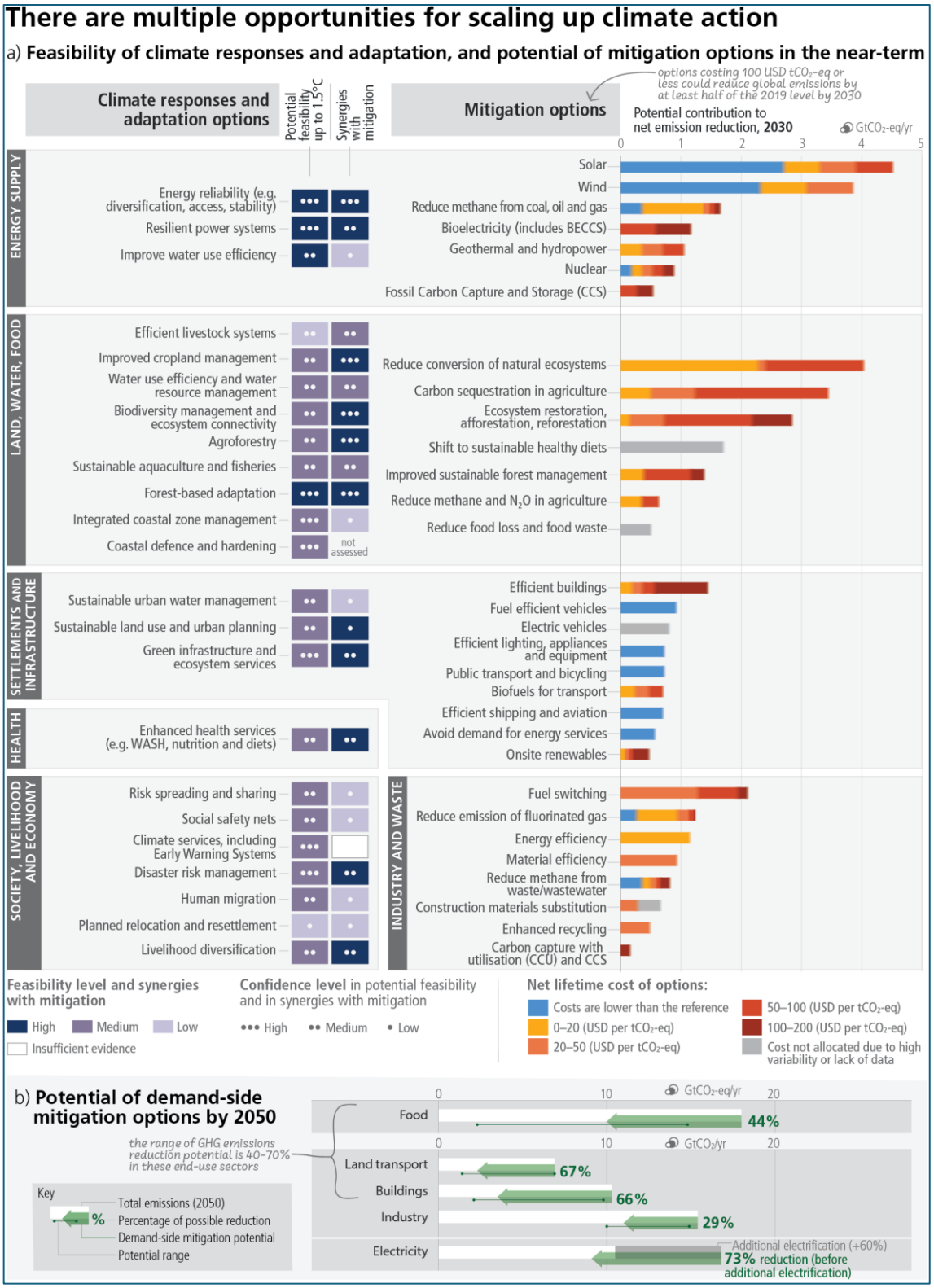
6) **Present measurable results:** as the Presidencies conclude their work, they could present the result of their efforts including, where feasible, quantified estimates of greenhouse gas emission reductions as well as measurable adaptation outcomes, while respecting the national circumstances of each Party

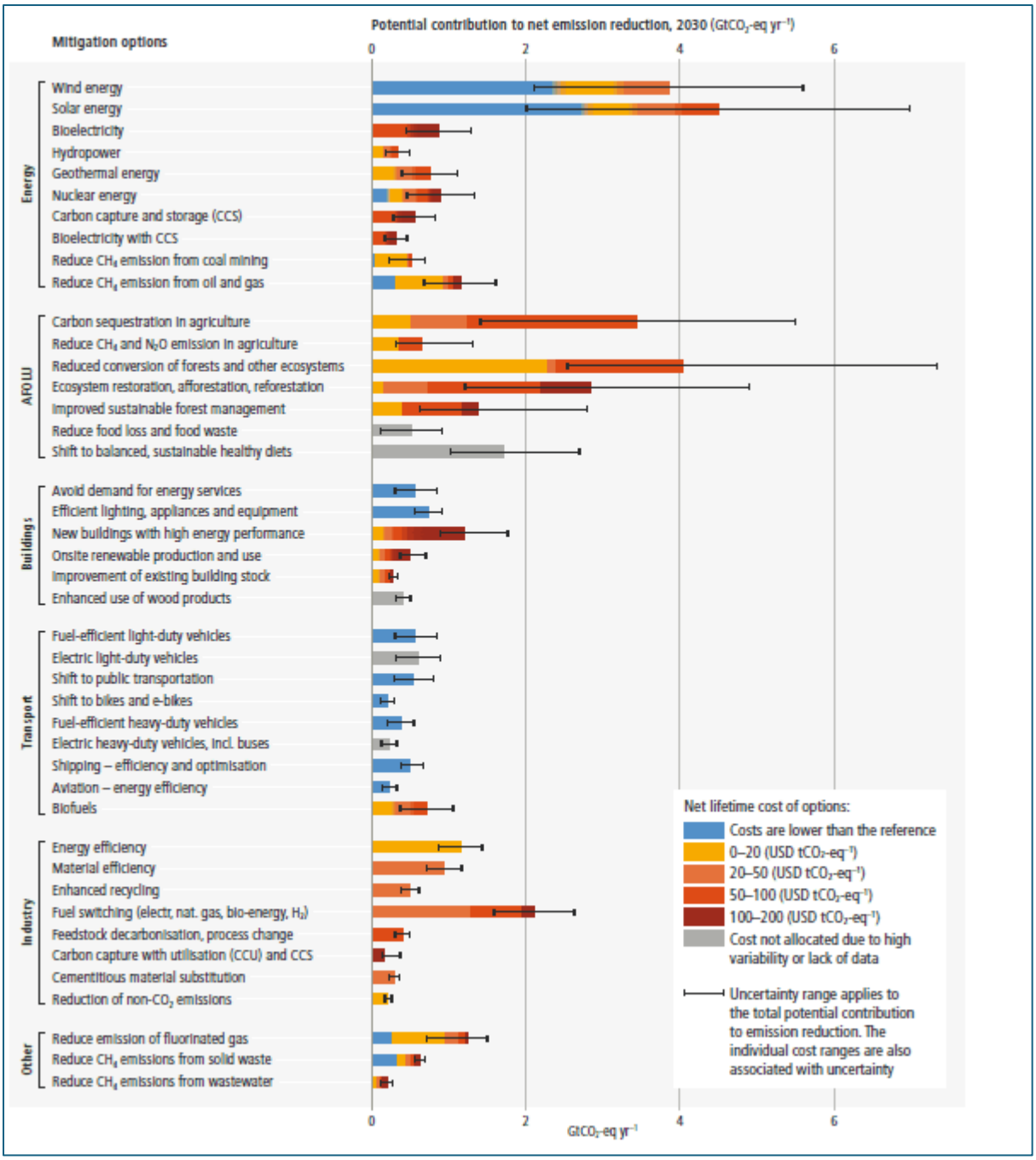
7) **Foresee concrete actionable next steps**. The Belém Mission to 1.5 cannot remain a report, it must be used and deliver concrete action. The COP32 and COP33 Presidencies may consider, within their respective mandates, how to maintain momentum on the implementation of relevant recommendations and include them as an input part of the second Global Stocktake.

III. Mitigation

According to the IPCC, there are multiple opportunities for scaling up climate action (see Figure 1 and 2 below[2]), with varying levels of feasibility, adaption co-benefits, and potential contribution to net emission reductions. Every fraction of a degree counts to keep 1.5 within reach, so that all actors and sectors should be explored. At the same time, priority actions should target those sectors and systems with the highest and most efficient (in terms of lifetime costs per tCO2 equivalent) mitigation potential (Figure 3). The IPCC assessment provides information on global potentials and costs. It does not prescribe national priorities, which remain nationally determined and depend on domestic circumstances, resource endowments and energy security considerations.

[2] https://www.ipcc.ch/report/ar6/syr/figures/figure-spm-7


There are multiple opportunities for scaling up climate action
a) Feasibility of climate responses and adaptation, and potential of mitigation options in the near-term
Climate responses and adaptation options
Potential feasibility up to 1.5°C
Synergies with mitigation
Mitigation options
options costing 100 USD tCO2-eq or less could reduce global emissions by at least half of the 2019 level by 2030
Potential contribution to net emission reduction, 2030
GtCO2-eq/yr
0
1
2
3
4
5
ENERGY SUPPLY
Energy reliability (e.g. diversification, access, stability)
Resilient power systems
Improve water use efficiency
Solar
Wind
Reduce methane from coal, oil and gas
Bioelectricity (includes BECCS)
Geothermal and hydropower
Nuclear
Fossil Carbon Capture and Storage (CCS)
LAND, WATER, FOOD
Efficient livestock systems
Improved cropland management
Water use efficiency and water resource management
Biodiversity management and ecosystem connectivity
Agroforestry
Sustainable aquaculture and fisheries
Forest-based adaptation
Integrated coastal zone management
Coastal defence and hardening
not assessed
Reduce conversion of natural ecosystems
Carbon sequestration in agriculture
Ecosystem restoration, afforestation, reforestation
Shift to sustainable healthy diets
Improved sustainable forest management
Reduce methane and N2O in agriculture
Reduce food loss and food waste
SETTLEMENTS AND INFRASTRUCTURE
Sustainable urban water management
Sustainable land use and urban planning
Green infrastructure and ecosystem services
Efficient buildings
Fuel efficient vehicles
Electric vehicles
Efficient lighting, appliances and equipment
Public transport and bicycling
Biofuels for transport
Efficient shipping and aviation
Avoid demand for energy services
Onsite renewables
HEALTH
Enhanced health services (e.g. WASH, nutrition and diets)
SOCIETY, LIVELIHOOD AND ECONOMY
Risk spreading and sharing
Social safety nets
Climate services, including Early Warning Systems
Disaster risk management
Human migration
Planned relocation and resettlement
Livelihood diversification
INDUSTRY AND WASTE
Fuel switching
Reduce emission of fluorinated gas
Energy efficiency
Material efficiency
Reduce methane from waste/wastewater
Construction materials substitution
Enhanced recycling
Carbon capture with utilisation (CCU) and CCS
Feasibility level and synergies with mitigation
High
Medium
Low
Insufficient evidence
Confidence level in potential feasibility and in synergies with mitigation
••• High
•• Medium
• Low
Net lifetime cost of options:
Costs are lower than the reference
0–20 (USD per tCO2-eq)
20–50 (USD per tCO2-eq)
50–100 (USD per tCO2-eq)
100–200 (USD per tCO2-eq)
Cost not allocated due to high variability or lack of data
b) Potential of demand-side mitigation options by 2050
the range of GHG emissions reduction potential is 40-70% in these end-use sectors
Key
Total emissions (2050)
%
Percentage of possible reduction
Demand-side mitigation potential
Potential range
0
10
20
GtCO2-eq/yr
Food
44%
GtCO2/yr
Land transport
67%
Buildings
66%
Industry
29%
Electricity
Additional electrification (+60%)
73% reduction (before additional electrification)


Mitigation options
Potential contribution to net emission reduction, 2030 (GtCO2-eq yr-1)
0
2
4
6
Energy
Wind energy
Solar energy
Bioelectricity
Hydropower
Geothermal energy
Nuclear energy
Carbon capture and storage (CCS)
Bioelectricity with CCS
Reduce CH4 emission from coal mining
Reduce CH4 emission from oil and gas
AFOLU
Carbon sequestration in agriculture
Reduce CH4 and N2O emission in agriculture
Reduced conversion of forests and other ecosystems
Ecosystem restoration, afforestation, reforestation
Improved sustainable forest management
Reduce food loss and food waste
Shift to balanced, sustainable healthy diets
Buildings
Avoid demand for energy services
Efficient lighting, appliances and equipment
New buildings with high energy performance
Onsite renewable production and use
Improvement of existing building stock
Enhanced use of wood products
Transport
Fuel-efficient light-duty vehicles
Electric light-duty vehicles
Shift to public transportation
Shift to bikes and e-bikes
Fuel-efficient heavy-duty vehicles
Electric heavy-duty vehicles, incl. buses
Shipping – efficiency and optimisation
Aviation – energy efficiency
Biofuels
Industry
Energy efficiency
Material efficiency
Enhanced recycling
Fuel switching (electr, nat. gas, bio-energy, H2)
Feedstock decarbonisation, process change
Carbon capture with utilisation (CCU) and CCS
Cementitious material substitution
Reduction of non-CO2 emissions
Other
Reduce emission of fluorinated gas
Reduce CH4 emissions from solid waste
Reduce CH4 emissions from wastewater
Net lifetime cost of options:
Costs are lower than the reference
0–20 (USD tCO2-eq-1)
20–50 (USD tCO2-eq-1)
50–100 (USD tCO2-eq-1)
100–200 (USD tCO2-eq-1)
Cost not allocated due to high variability or lack of data
Uncertainty range applies to the total potential contribution to emission reduction. The individual cost ranges are also associated with uncertainty
0
2
4
6
GtCO2-eq yr-1

Key actions to prioritize

I.1. **Reform of economic and financial systems**

The UNEP Global Environmental Outlook (GEO-7) identifies reform of economic and financial systems as a prerequisite for all other transformations. We need systematic alignment of economic and financial systems with net-zero trajectories.

Article 2.1.c of the Paris Agreement calls for the alignment of all financial flows with low-emissions and climate resilient development.

Whilst this objective is broad and covers a range of possible actions, the following are of particular importance:

1. This requires, first, that all countries progressively align their national development plans and fiscal frameworks with their long-term low greenhouse gas emission development strategies, and their adaptation and resilience, in line with the national circumstances, including through analyses that support the integration of climate action into national budgeting processes, such as climate budget tagging, consistent with relevant COP and CMA decisions, to strengthen transparency and facilitate the mobilization and effective allocation of resources for the implementation of NDCs and NAPs.
2. Second, the progressive alignment of public and private financial flows with nationally determined climate and sustainable development priorities, consistent with Article 2.1(c), while recognizing national circumstances and development needs.
3. Third, phasing out inefficient fossil fuels subsidies that do not address energy poverty or just transitions as called for in paragraph 28(h) of decision 1/CMA.5, should be a priority. Progress in this area would be supported by a common understanding of definitions and methodologies, which currently vary widely across countries.
4. Fourth, while policy instruments should remain nationally determined, recognizing that countries may pursue different policy mixes according to their national circumstances and legal frameworks, countries may make greater use of carbon pricing mechanisms, including through Article 6 cooperative approaches that can unlock cross-border mitigation at scale as complementary policy tools to support the transition to low-emission and climate-resilient development.
5. Fifth, governments should promote coordinated technology access, transfer, research, development through cooperative international programmes and voluntary cooperation on energy efficiency standards, ensuring measures that allow for a just, widely accepted transition to low and zero carbon technologies. while scaling up adaptation and resilience-enhancing technologies and solutions".
6. Sixth, governments and financial actors should build a common understanding and transparency around the alignment of financial flows. In particular, efforts to enhance transparency in line with article 13 of the Paris Agreement, around financial flows should be supported and expanded, namely through the development of common methodologies or voluntary tests, as well as further policies and measures, such as transition plan, that best allow for a rapid alignment.
7. Seventh, the systemic barrier of investment risk must be addressed head-on: for example, de-risking mechanisms can be a tool for mobilizing the private capital that public budgets alone cannot deliver. Underpining this is a critical enabling environment: regulatory certainty, transparent governance, fair competition frameworks, and strong institutions are the conditions without which neither price signals nor technology incentives nor finance instruments can fully function. Scaled-up, predictable and accessible means of implementation remain essential for developing countries to implement ambitious NDCs and NAPs.
8. Finally, international cooperation to share experiences is key.

Concrete Action

➔ Explore introduction of economic incentive schemes to redirect financial flows towards low-emission and climate-resilient investments, such as further development of carbon pricing approaches, and the establishment of clear criteria and transparency in the field of sustainable finance:

- Encourage transparency, as well as discussions on definitions and methodologies for fossil fuel subsidies. Build capacity for Article 6 implementation, and support its development whilst building high integrity carbon markets, so that cooperative approaches can deliver higher ambition at lower cost.
- Encourage countries to use, on a voluntary basis, to promote the use of assessment tools by voluntary tests for private sector actors, in particular financial actors, to evaluate the Paris Agreement alignment of their investment portfolio.
- Encourage peer-to-peer exchanges among voluntary Parties, particularly around the development of carbon pricing schemes.
- Develop a common understanding of the alignment of financial flows with low emissions and climate resilient development, namely through the Veredas Dialogues.

I.2. **Energy systems transformation**

The UNEP Global Environment Outlook 7 (GEO-7) identifies energy system transformation as the most powerful lever for climate mitigation. Limiting warming to 1.5°C requires 74–82% of primary energy to come from low- or zero-carbon sources by 2050, with 97–99% of electricity demand met by clean sources.

One priority should be to scale up renewable energy, in particular solar and wind power, identified by the IPCC as one of the most cost-effective mitigation solution (Figure above). Global renewable power capacity is expected to double between now and 2030. According to the IEA[3], solar PV accounts for almost 80% of the global increase, followed by wind. In more than 80% of countries worldwide, renewable power capacity is set to grow faster between 2025 and 2030 than it did over the previous five-year period. However, challenges including grid integration, supply chain vulnerabilities and financing are also increasing.

Alongside the rapid scale-up of renewables, the deployment of the full range of zero- and low-emission technologies will be essential, particularly in hard-to-abate sectors and in systems where variable renewable generation alone cannot ensure security of supply. Technology choices reflecting national circumstances, energy security, affordability and reliability are enabling conditions for, not constraints on, an accelerated transition, consistent with paragraph 28(e) of decision 1/CMA.5,
Finally, widespread electrification has a high emission reduction potential. For its potential to be unlocked, all systems that can be electrified need to be electrified quickly, electricity generation from low- and zero- carbon sources need to be increased accordingly, and, above all, the capacity and intelligence of electrical systems - particularly grids - would need to be drastically increased.

Direct public transit electrification in cities, particularly in countries with lower capacity and emerging economies, offers high impact at lower per-vehicle cost than private EVs and immediate air quality benefits.

[3] International Energy Agency, Renewables 2025: Analysis and forecasts to 2030
https://iea.blob.core.windows.net/assets/76ad6eac-2aa6-4c55-9a55-b8dc0dba9f9e/Renewables2025.pdf

Concrete Action

- ➔ Unlock renewable energy investments in regions where it is lagging behind.
- ➔ Scale up, modernize and decentralize grids, including grid interconnection, especially in regions where lack of interconnection is a primary barrier to renewable deployment at scale
- ➔ Interested Parties are encouraged to develop, on a voluntary basis, national or regional energy transition roadmaps and may consider including in their NDCs actions, such as transitioning away from fossil fuels in a just, orderly, and equitable manner, taking into account national circumstances, capacities and priorities.
- ➔ Private sector actors are encouraged to develop corporate roadmaps aligned with the Paris Agreement goals.
- ➔ Transparency in terms of fossil fuel demand and supply projections could be enhanced.
- ➔ Support countries, upon request, in deploying the full range of zero- and low-emission technologies they select for their energy systems,

I.3. **Reduce emissions from deforestation and forest degradation, unsustainable land-use and expand mitigation benefits through ecosystem, afforestation, and sustainable management**

Emissions from land-use change, driven by the loss of biomass and soil organic matter, contribute approximately 25% of atmospheric CO_2, second only to fossil fuels[4]. Global CO_2 emissions from land use, land-use change, and unsustainable forestry averaged 4.5 ± 2.6 $GtCO_2$ per year over the period 2012–2021 (Friedlingstein et al., 2022).

The IPCC identifies reducing conversion of forests and other ecosystems, carbon sequestration in agriculture, ecosystem restoration, afforestation, reforestation, and sustainable forest management as one of the actions with the highest mitigation potential (see Figures above).

The achievement of global climate, biodiversity, and sustainable development goals relies highly on maintaining and expanding global forest extend and quality, including carbon storage and sequestration. Forests absorb globally 7-10 gigatons of CO_2 per year, approx. 30% of global annual CO_2 emissions from fossil fuels and land-use change (IPCC, AR6 2021). While humankind depends on mitigation and many other vital forest services, the ecosystem is at existential risk from human-induced land-use changes and climate change. The result is decreased human well-being and loss of biodiversity, both exacerbated by wider damage to natural cycles and their regulation of the planet.

The first step in safeguarding forest ecosystems and the essential services they provide are secured is to protect and conserve them against deforestation and forest degradation. Yet, the majority of the world's forests are not isolated from human influence, and it is essential that management is sustainable and that we restore what has been lost and degraded. Reversing current trends requires the large-scale implementation of forest landscape restoration, sustainable forest management, agroforestry systems, and sustainable bioeconomy approaches that strengthen community-based productive systems, integrate biodiversity conservation, improve market access, and foster inclusive development to maximize their mitigation potential, with society's participation, particularly the most vulnerable groups to climate change, and complementary to and in coordination with forest protection and conservation.

[4] International Energy Agency, Renewables 2025: Analysis and forecasts to 2030 https://iea.blob.core.windows.net/assets/76ad6eac-2aa6-4c55-9a55-b8dc0dba9f9e/Renewables2025.pdf

Concrete Action

- ➔ Build political support for the COP30 Presidency Roadmap on Halting and Reversing Deforestation and Forest Degradation by 2030 for the Roadmap's implementation on national, regional, and global levels, while ensuring its continuation throughout 2030.
- ➔ Provide dedicated space for peer-to-peer exchange and learning on halting and reversing deforestation and forest degradation.
- ➔ Encourage Parties to implement the Global Stocktake paragraphs 33 and 34 (2/CMA.5) in accordance with the Paris Agreement Article 5 to inform decision makers on the gap in the objectives' achievement and implementation needed, including based on submitted NDCs and BTRs, reporting and performance tracking under the UNFCCC REDD+, and information from the Global Forest Resources Assessment (FAO).
- ➔ Encourage Parties to include specific forest objectives and effective governance (including community-led forest stewardship) in their planning tools including NDCs (UNFCCC), NBSAPs (UNCBD), and NAPs (UNCCD) or respective updates/annexes simultaneously harnessing synergies between multilateral agreements.
- ➔ Encourage Parties to support the enhancement of enabling factors (capacity, technology, finance) towards halting and reversing deforestation and forest degradation.
- ➔ Recognize the role of subnational governments and local actors, including Indigenous Peoples and local communities, and ensuring their effective participation in governance, planning, and implementation processes.

I.4. **Reduce food waste emissions and promote a circular economy approach**

Demand-side measures, such as supporting sustainable and healthy diets and reducing food loss and waste in conjunction with the promotion of sustainable agricultural practices, including agroecology and other innovative approaches can reduce ecosystem conversion, methane and nitrous oxide emissions[5]. At the same time, improving resource efficiency land for reducing material demand can help alleviate pressure on land, creating opportunities for reforestation and ecosystem restoration. Furthermore, advancing circular economy approaches is essential to minimize waste generation, keep materials and resources in productive use for longer, reintegrate them into value chains across economic sectors, and promote their integrated and sustainable management.

The IPCC AR6 and GEO-7 both place food systems among the top contributors to global GHG emissions, responsible for approximately 30 per cent of total anthropogenic emissions when the full supply chain. In addition, IPCC AR6 concludes that demand-side measures, including many circular economy approaches, could reduce greenhouse gas emissions in end-use sectors by 40 per cent to 70 per cent by 2050 compared with baseline scenario[6]. At the same time, food systems are highly affected by climate change and biodiversity loss impacts.

Following actions could also contribute to advancing the priorities identified by the COP31 Presidency which also could also contribute to methane emission reductions.

[5] IPCC_AR6_SYR_SPM.pdf, C3.5
[6] IPCC AR6 Figure SPM.6

Concrete Action

- ➔ Promote policies and their effective implementation that encourage sustainable and healthy diets.
- ➔ Promote policies and their implementation that reduce food waste and food loss.
- ➔ Encourage policies and infrastructure that support the transition to a circular economy in order to reduce pressure on natural resources and improve waste management.
- ➔ Promote peer-to-peer exchange and sharing of best practices on effective policies and measures to reduce food loss and food waste and promote circular economy approaches.

I.5. **Drastically reduce methane emissions**

Methane is the greenhouse gas with the most immediate leverage over near-term warming. Responsible for approximately 30 per cent of observed global warming since pre-industrial times, methane's 20-year global warming potential is roughly 80 times that of CO_2 — but its atmospheric lifetime is only around 12 years. This short lifetime makes methane a powerful near-term climate lever available: reductions achieved within this decade translate directly into measurable temperature benefits before 2035, unlike CO_2 reductions whose full thermal effect takes decades to manifest.

Informed by the UNEP Glboal Methane Assessment(2021), internatial initiatives such as the Global Methane Pledge sets a global goal of reducing methane by 30% by 2030. Meeting the 30 per cent target would, according to the Climate and Clean Air Coalition (CCAC), reduce warming by at least 0.2°C by 2050, and prevent annually 26 million tonnes of crop losses, 255,000 premature deaths, and 775,000 asthma-related hospitalizations.

Concrete Action

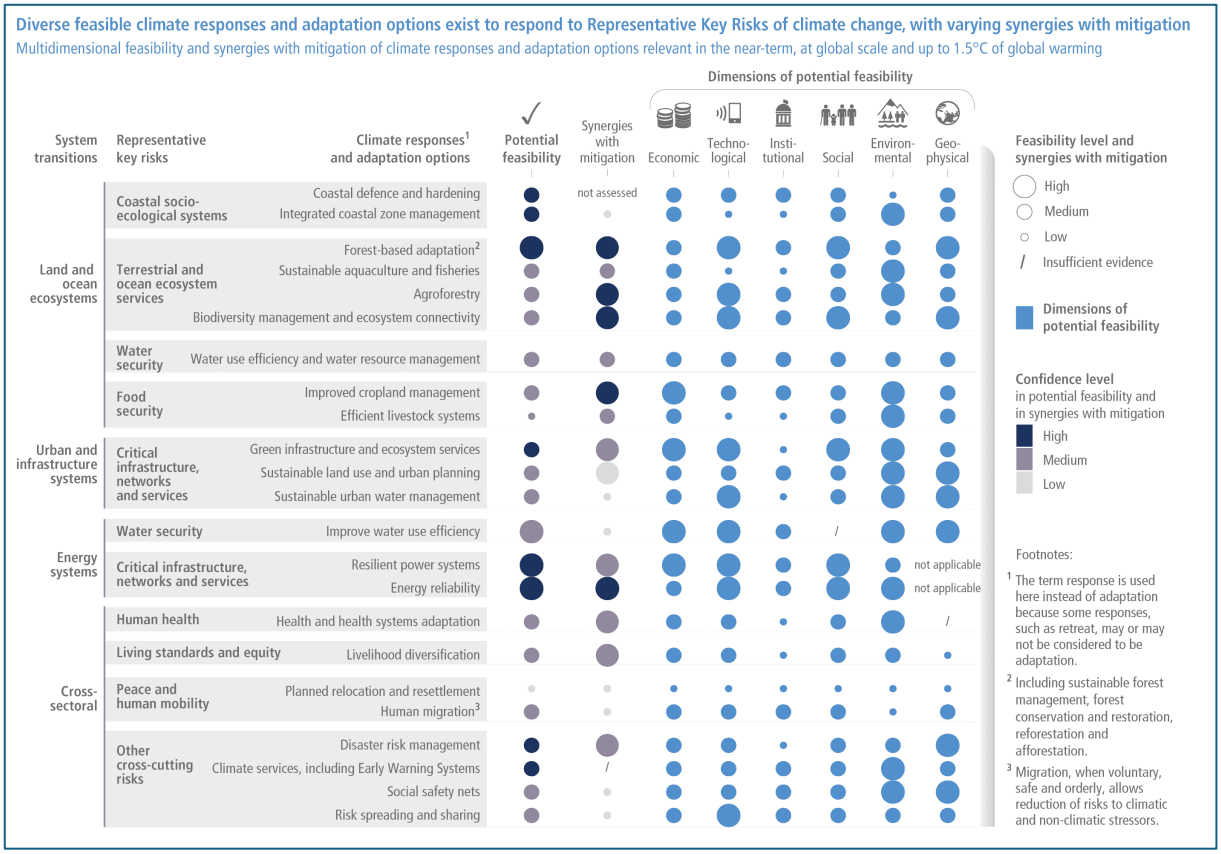
- ➔ Build on IMEO's satellite monitoring infrastructure to enhance transparency on global methane emission reductions.
- ➔ Encourage the implementation of the Global Methane Pledge's collective global methane reduction goal of at least 30 percent below 2020 levels by 2030.
- ➔ Invite Parties, on a voluntary basis, to identify opportunities and consider how methane-abatement can be reflected in their national planning and implementation, in a manner consistent with the nationally determined nature of their contributions.
- ➔ Promote peer-to-peer learning and expand capacity building around methane emission reductions in developing countries
- ➔

III. Adaptation

According to the IPCC AR6, WG II report, "the effectiveness of adaptation to reduce climate risk is documented for specific contexts, sectors and regions and will decrease with increasing warming. Integrated, multi-sectoral solutions that address social inequities, differentiate responses based on climate risk and cut across systems, increase the feasibility and effectiveness of adaptation in multiple sectors".

No single criteria can successfully guide adaptation action. Nevertheless, the Belém Mission to 1.5 should start by prioritizing actions, including ecosystem-based adaptation, community-based adaptation and locally led adaptation approaches, that have the highest adaptation potential, high feasibility, replicability, and that take into consideration equity, namely for particularly vulnerable populations. In parallel, adaptation efforts should reinforce the conservation and sustainable management of natural ecosystems, recognizing their vital contribution to resilience, climate risk reduction, and the provision of essential ecosystem services.

IPCC findings can provide a helpful guide in this context. The below figures provide a useful overview of diverse feasible climate responses and adaptation options[7], benefits to humans and ecosystems[8], as well as identification of potential actions according to their level of success, including taking through equity considerations[9], as well as examples of regional key risks[10].



[7] Figure AR6 WG2 | Climate Change 2022: Impacts, Adaptation and Vulnerability, Figure SPM.4
[8] Figure AR6 WG2 | Climate Change 2022: Impacts, Adaptation and Vulnerability, Figure 17.3
[9] Figure AR6 WG2 | Climate Change 2022: Impacts, Adaptation and Vulnerability, Figure 17.11
[10] Figure AR6 WG2 | Climate Change 2022: Impacts, Adaptation and Vulnerability, Figure TS.4

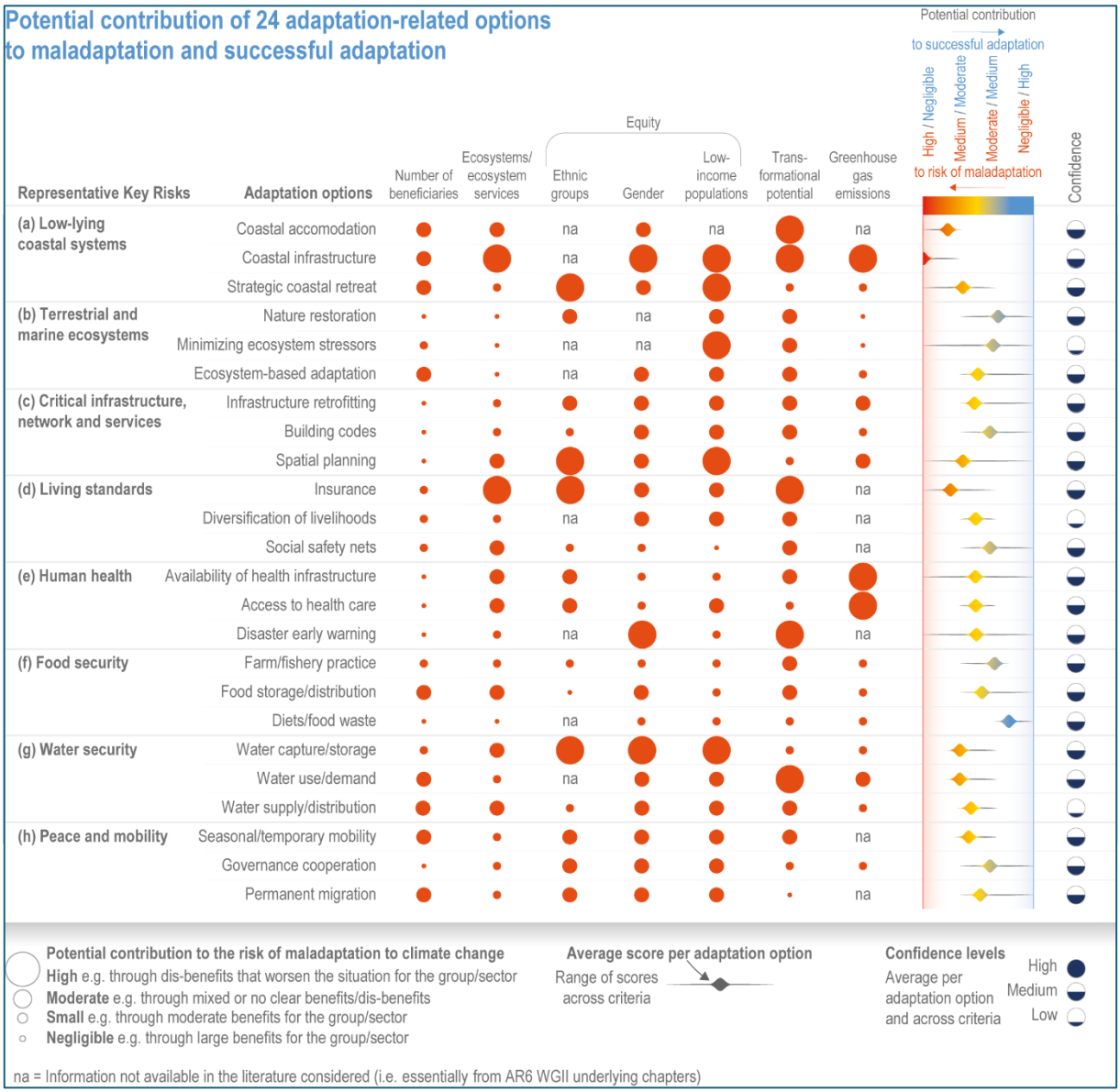
Benefit to humans and ecosystems

from representative adaptation options

Confidence level

• Low •• Medium ••• High

Benefits of each adaptation option for ecosystems and ecosystem services	Breadth of applicability of each adaptation option benefiting humans: Can reduce the exposure or vulnerability **of specific groups of people** i.e. <1 billion people	Can reduce the exposure or vulnerability **of many people** i.e. between 1–5 billion people	Can reduce the exposure or vulnerability **for most people in the world** i.e. >5 billion people
Highly beneficial	- Ecosystem-based adaptation (•••)	- Minimizing ecosystem stressors (••)	- Nature restoration (•••) - Diets/food waste (•••)
Moderately beneficial	- Strategic coastal retreat (•••) - Efficient water use/demand (••) - Seasonal/temporary mobility (••) - Permanent migration (••)	- Diversification of livelihoods (••) - Farm/fishery practice (•••)	- Infrastructure retrofitting (•••) - Building codes (••) - Disaster early warning (•••) - Governance cooperation (••)
No clear and different benefits / harms	- Coastal accommodation (••) - Food storage/distribution (••) - Water supply/distribution (•)	- Social safety nets (•) - Water capture/storage (•)	- Spatial planning (•) - Availability of health infrastructure (••) - Access to health care (••)
Worsens the situation	- Coastal infrastructure (•••)	- Insurance (••)	


Potential contribution of 24 adaptation-related options to maladaptation and successful adaptation
Potential contribution
to successful adaptation
High / Negligible
Medium / Moderate
Moderate / Medium
Negligible / High
to risk of maladaptation
Equity
Representative Key Risks
Adaptation options
Number of beneficiaries
Ecosystems/ ecosystem services
Ethnic groups
Gender
Low-income populations
Trans-formational potential
Greenhouse gas emissions
Confidence
(a) Low-lying coastal systems
Coastal accomodation
Coastal infrastructure
Strategic coastal retreat
(b) Terrestrial and marine ecosystems
Nature restoration
Minimizing ecosystem stressors
Ecosystem-based adaptation
(c) Critical infrastructure, network and services
Infrastructure retrofitting
Building codes
Spatial planning
(d) Living standards
Insurance
Diversification of livelihoods
Social safety nets
(e) Human health
Availability of health infrastructure
Access to health care
Disaster early warning
(f) Food security
Farm/fishery practice
Food storage/distribution
Diets/food waste
(g) Water security
Water capture/storage
Water use/demand
Water supply/distribution
(h) Peace and mobility
Seasonal/temporary mobility
Governance cooperation
Permanent migration
Potential contribution to the risk of maladaptation to climate change
High e.g. through dis-benefits that worsen the situation for the group/sector
Moderate e.g. through mixed or no clear benefits/dis-benefits
Small e.g. through moderate benefits for the group/sector
Negligible e.g. through large benefits for the group/sector
Average score per adaptation option
Range of scores across criteria
Confidence levels
Average per adaptation option and across criteria
High
Medium
Low
na = Information not available in the literature considered (i.e. essentially from AR6 WGII underlying chapters)

(f) Examples of regional key risks

Absence of risk diagrams does not imply absence of risks within a region. The development of synthetic diagrams for Small Islands, Asia and Central and South America was limited due to the paucity of adequately downscaled climate projections, with uncertainty in the direction of change, the diversity of climatologies and socioeconomic contexts across countries within a region, and the resulting few numbers of impact and risk projections for different warming levels.

The risks listed are of at least *medium confidence* level:

Small Islands
- Loss of terrestrial, marine and coastal biodiversity and ecosystem services
- Loss of lives and assets, risk to food security and economic disruption due to destruction of settlements and infrastructure
- Economic decline and livelihood failure of fisheries, agriculture, tourism and from biodiversity loss from traditional agroecosystems
- Reduced habitability of reef and non-reef islands leading to increased displacement
- Risk to water security in almost every small island

North America
- Climate-sensitive mental health outcomes, human mortality and morbidity due to increasing average temperature, weather and climate extremes, and compound climate hazards
- Risk of degradation of marine, coastal and terrestrial ecosystems, including loss of biodiversity, function, and protective services
- Risk to freshwater resources with consequences for ecosystems, reduced surface water availability for irrigated agriculture, other human uses, and degraded water quality
- Risk to food and nutritional security through changes in agriculture, livestock, hunting, fisheries, and aquaculture productivity and access
- Risks to well-being, livelihoods and economic activities from cascading and compounding climate hazards, including risks to coastal cities, settlements and infrastructure from sea level rise

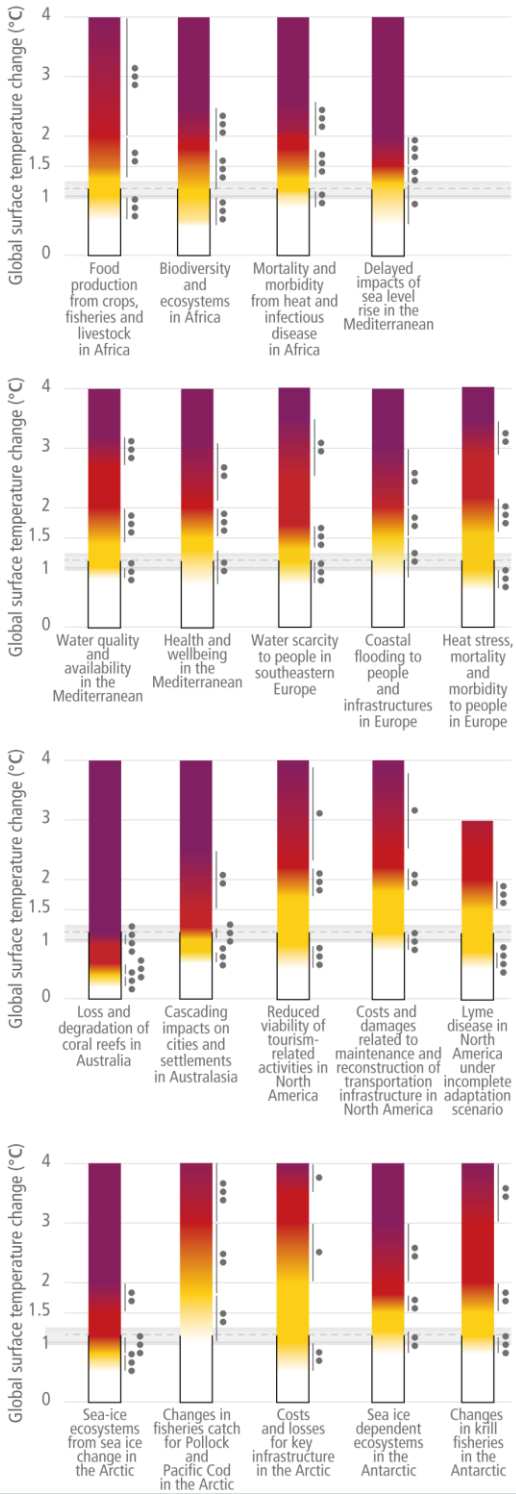
Europe
- Risks to people, economies and infrastructures due to coastal and inland flooding
- Stress and mortality to people due to increasing temperatures and heat extremes
- Marine and terrestrial ecosystems disruptions
- Water scarcity to multiple interconnected sectors
- Losses in crop production, due to compound heat and dry conditions, and extreme weather

Central and South America
- Risk to water security
- Severe health effects due to increasing epidemics, in particular vector-borne diseases
- Coral reef ecosystems degradation due to coral bleaching
- Risk to food security due to frequent/extreme droughts
- Damages to life and infrastructure due to floods, landslides, sea level rise, storm surges and coastal erosion

Australasia
- Degradation of tropical shallow coral reefs and associated biodiversity and ecosystem service values
- Loss of human and natural systems in low-lying coastal areas due to sea level rise
- Impact on livelihoods and incomes due to decline in agricultural production
- Increase in heat-related mortality and morbidity for people and wildlife
- Loss of alpine biodiversity in Australia due to less snow

Asia
- Urban infrastructure damage and impacts on human well-being and health due to flooding, especially in coastal cities and settlements
- Biodiversity loss and habitat shifts as well as associated disruptions in dependent human systems across freshwater, land, and ocean ecosystems
- More frequent, extensive coral bleaching and subsequent coral mortality induced by ocean warming and acidification, sea level rise, marine heat waves and resource extraction
- Decline in coastal fishery resources due to sea level rise, decrease in precipitation in some parts and increase in temperature
- Risk to food and water security due to increased temperature extremes, rainfall variability and drought

Africa
- Species extinction and reduction or irreversible loss of ecosystems and their services, including freshwater, land and ocean ecosystems
- Risk to food security, risk of malnutrition (micronutrient deficiency), and loss of livelihood due to reduced food production from crops, livestock and fisheries
- Risks to marine ecosystem health and to livelihoods in coastal communities
- Increased human mortality and morbidity due to increased heat and infectious diseases (including vector-borne and diarrhoeal diseases)
- Reduced economic output and growth, and increased inequality and poverty rates
- Increased risk to water and energy security due to drought and heat



Key actions to prioritize

II.1. **Agri-food resilience and food security**

For many developing countries, strengthening resilience of food systems constitutes an immediate priority given increasing climate impacts on food production and rural livelihoods. Rising temperatures, shifting rainfall patterns, more frequent droughts and floods, the migration of pests and pathogens, and the degradation of soils and freshwater resources are together undermining the productive capacity of agricultural systems precisely when demand is increasing. The IPCC AR6 projects yield declines of 2 to 6 per cent per decade for major staple crops in tropical and subtropical regions under current warming trajectories, while the most climate-vulnerable farming populations are disproportionately exposed and least equipped to adapt. The stakes of inaction are not simply agricultural: food systems act as the entry point for simultaneously addressing climate vulnerability, biodiversity loss, land degradation, human health, and gender inequality

Adaptation is especially important for agriculture, livestock production, fisheries, and agro-industry as it is essential for ensuring long-term global food security, safeguarding livehoods, reducing vulnerability and strengthening resilience of vulnerable communities while promoting sustainable development. Climate action in agriculture should contribute simultaneously to food security, sustainable rural development, adaptation, mitigation and biodiversity conservation.

For food systems, adaptation and mitigation need to go hand in hand. To create resilient food systems that help ensure global food security requires moving to more sustainable and resilient agrifood systems as otherwise impacts from climate change will exceed systems' capacity to adapt. Adapting agriculture and food systems to changing conditions has to include switching to low-emissions practices and improving carbon sinks. Thus, adaptation needs to contribute to mitigation and vice versa.

The transition towards resilient and low-emission agrifood systems should not impose disproportionate costs or risks on small-scale, family, Indigenous or medium-sized producers. Climate finance should facilitate producers' access to technologies, infrastructure, technical assistance and risk management instruments necessary for implementing resilient agricultural practices. The transition towards resilient and low-emission agrifood systems should be supported through adequate finance, technology transfer and capacity-building, ensuring that small-scale and medium-scale producers do not bear a disproportionate share of transition costs and risks.

One of the key responses to climate change adaptation is diversification: diversifying agricultural production reduces risk by spreading climate impacts across multiple crops and livestock systems. It enhances ecosystem resilience, strengthens farmers' capacities to adapt to changing weather patterns and often draws on indigenous knowledge and the use of traditional, climate-resilient crops that are well acclimatised to local conditions. Furthermore, it improves dietary diversity and nutrition by increasing the availability of a wider range of nutrient-rich foods.

Climate action in agriculture should strengthen food security, nutrition, rural livelihoods and sustainable productivity while enhancing resilience and reducing emissions. In this regard, it is crucial to promote resilient, sustainable and inclusive agrifood systems through integrated water management, soil restoration, agroecological approaches, sustainable livestock systems, biodiversity conservation and nature-positive production, particularly benefiting small-scale producers.

Concrete Action

- ➔ Switching to agroecological practices for enhancing food systems resilience.
- ➔ Diversifying agricultural production systems and reducing climate risk by engaging in multiple crops, livestock, fisheries, and agro-industrial activities.
- ➔ Promote peer-to-peer exchanges on effective policies and measures related to agri-food resilience and food security.

II.2 **Advance sustainable water resources management**

Climate change has altered the global hydrological cycle, generating impacts that are manifested in both the scarcity and the overabundance of water resources. Adaptation to water-related risks and impacts make up the majority of all documented adaptation[11]. Adaptation options include early warming systems, levees, restoring wetlands and rivers, land-use planning or upstream forest management, and increasing wastewater treatment, and improving water infrastructure. Meanwhile, irrigation requires appropriate management to avoid potential adverse outcomes. Importantly, the effectiveness of most water-related adaptation options declines with increasing warming.

Integrated water resources management, watershed restoration and water security should be recognized as cross-cutting priorities supporting both adaptation and mitigation objectives.

Concrete Action

- ➔ Scale up investments and access to technologies for integrated water management, including water capture and storage, irrigation efficiency, water harvesting, efficient distribution systems, treatment and reuse and resilient infrastructure.
- ➔ Scale up cooperation on international water management.

II.3. **Adaptation of forests to climate change**

In the face of climate change, sustainable forest management (SFM) must evolve to address the accelerating, more extensive, and severe forest disturbances and damages, for example, the recent extensive forest degradation from droughts and resulting camalities, in all of the world's biomes, whether boreal, temperate, tropical, savanna, or dryland. Adaptation of forests to climate change - through adaptive management in the context of SFM and broader landscape approaches (including e.g., agroforestry, bioeconomy), - is needed to enhance adaptive capacity, strengthen resilience, and reduce vulnerability of forest ecosystems and the communities that depend on them. This leads to secured and strengthened well-being of humans and nature.

Cooperation, and inclusive decision making, with local communities and Indigenous Peoples and environmental defenders, as well as recognition of inherent rights of Indigenous Peoples, is integral to successful forest adaptation in many areas.

Examples of adaptive management practices include risk- and long-term planning-based diversification of tree species, genetics, and stand structure, soil protection and regeneration as well as individual trees' and stands' resistance to disturbances. Biodiversity conservation and the consideration of the various forest ecosystem

[11] IPCC_AR6_WGII_FullReport.pdf, C.2.1.

services together with adaptation are the prerequisites for long-term ecosystem service provisioning and thus must be reflected in adaptive management. On a national level, Switzerland fosters enhanced close-to-nature and adaptive management practices including biodiversity conservation as key tool to adapt forests to climate change.

In México adaptation policies focuses on restoring degraded landscapes and enhancing ecological connectivity across natural areas to reduce the vulnerability of forest ecosystems and forest-dependent communities to climate change. Key actions include strengthening forest biodiversity management, improving forest health and resilience, enhancing wildfire management systems, promoting adaptive forest management practices, and building the adaptive capacity of forest-dependent communities.

Through the implementation of adaptive management, multiple synergies with global, regional, and local efforts are created, including mitigation and biodiversity co-benefits. Reduced climatic forest-risks such as proneness to fires decrease loss and damage. Incorporated into broader landscape approaches, adaptive management contributes to deforestation- and forest degradation-free supply chains and fosters community management and livelihoods including food security.

Concrete Action

- ➔ At COP31, Parties should commit to prioritize adaptation of forests to climate change as a key element of sustainable forest management practices, complementary to forest protection, conservation and restoration.
- ➔ Encourage Parties to strengthen national framework conditions (legal, policy, technical) to incentivize action towards adaptation of forests to climate change on domestic level contributing to national efforts in strengthening forest ecosystem service provisioning.
- ➔ Build political support for the COP30 Presidency Roadmap on Halting and Reversing Deforestation and Forest Degradation by 2030 for the Roadmap's implementation on national, regional, and global levels, while ensuring its continuation throughout 2030.

II.4. **Expand coverage of early-warning systems**

In the face of climate change, the frequency and intensity of extreme weather events are increasing across all regions, exposing a growing share of the world's population to hazards. Multi-hazard early warning systems (MHEWS) are among the most cost-effective adaptation measures: countries with limited coverage record disaster mortality rates up to six times higher. Yet EWS reduce risk only as part of a broader disaster risk reduction effort, they do not substitute for addressing risk creation itself, including through risk-informed land-use planning and development choices. The Early Warnings for All (EW4All) initiative aims to protect every person on earth by 2027. While more than 60 per cent of countries now report having a MHEWS, fewer than one third report local plans to act on warnings. Closing this warning-action gap requires co-development with local authorities, civil society, communities and Indigenous Peoples, whose trust and agency determine whether warnings translate into protective action.

Effective early warning requires a shift from delivering warnings to enabling action. This means people-centred, end-to-end system design; impact-based forecasting translated into locally understandable and actionable alerts; community feedback mechanisms that demonstrably inform system improvement; and trusted local messengers embedded in the communities they serve, with particular attention to the most vulnerable populations and to fragile and conflict-affected contexts. It also requires structural changes in how the international system operates for the effective early warning: strengthening coordination among existing international climate finance institutions; promoting harmonised results frameworks and greater transparency in tracking EWS finance; and layered, sustainable financing, combining domestic, ODA, climate, private, insurance and humanitarian sources that covers operations and maintenance, not only capital investment, and is complemented by legal and regulatory

mechanisms enabling anticipatory financing before disasters strike. Strengthened support for voluntary initiatives and partnerships that support early warning systems and anticipatory action can further enhance implementation. The strong return on investment of EWS should be embedded systematically into project design and appraisal. Investment in early warning advances the UAE Framework for Global Climate Resilience target on MHEWS, contributes to multiple Sendai Framework targets — on mortality, people affected and economic losses, not only Target G — and reduces avoidable losses and damages, thereby linking adaptation, disaster risk reduction and loss and damage action.

Concrete Action

- ➔ Build political support for achieving the Early Warnings for All target by 2027 and for sustaining the initiative beyond 2027, shifting emphasis from warning coverage towards communities' capacity to act, and consolidating institutional support around existing structures rather than new coordination mechanisms.
- ➔ At COP31, Parties should commit to prioritize people-centred multi-hazard early warning systems as a key element of adaptation and disaster risk reduction action, complementary to risk-informed planning, preparedness and resilience building.
- ➔ Encourage Parties and financing institutions (GCF, MDBs, GEF) to strengthen national framework conditions (legal, policy, technical, financial) — including legal mechanisms for anticipatory action financing — and to mainstream sustainable, layered EWS financing covering full operational costs, with improved transparency and tracking of investments, including community co-design, feedback mechanisms and monitoring of whether warnings result in protective action.
- ➔ Support the development of harmonised results frameworks and a shared EWS project/finance repository, and embed a learning and evidence function within existing mechanisms (e.g. REAP) to capture good practice and track effectiveness, not only coverage.

II.5. **Resilience to extreme heat, in particular in urban settings**

Extreme heat is already the deadliest consequence of climate change, and cities are its most dangerous amplifier. GEO-7 documents that approximately 489,000 heat-related deaths occurred annually over the period 2000–2019, with annual heat-related mortality among people over 65 increasing by roughly 85 per cent in the decade to 2022 compared with the 1990s. This trend will worsen substantially without adaptation. GEO-7 is explicit that "the adverse effects of heat are amplified in urban areas, particularly in those lacking shade trees, parks or green spaces": the urban heat island effect, driven by heat-absorbing built materials, reduced vegetation, and anthropogenic heat sources, generates night-time warming significantly above the global average, compounding daytime extremes and denying urban populations the physiological recovery periods that prevent heat stroke and cardiovascular collapse.

The IPCC AR6 WGII confirms that cities are simultaneously the primary sites of climate risk and the primary sites of adaptation opportunity: urban planning, building codes, and green infrastructure investments made now will determine heat exposure for hundreds of millions of people for the next fifty years. Women, the elderly, outdoor workers, residents of informal settlements, and low-income urban and rural households often cannot afford air conditioning and often live in heat-trapping concrete environments without access to green space, and therefore bear a disproportionate share of this burden. Without deliberate, large-scale investment in urban heat resilience, rising temperatures will not be distributed equally.

Concrete Action

- ➔ Expand spatial planning that supports adaptation to climate change.
- ➔ Scale up urban greening, cool roofs, and blue-green infrastructure as mandatory elements of climate-resilient urban planning.
- ➔ Institutionalize heat action plans and multi-hazard early warning systems with specific heat alert protocols across all urban centres
- ➔ Promote climate-responsive building codes.
- ➔ Expand investments in cooling, avoiding emissions from the expansion of cooling systems.

II.6. Conservation, restoration, and sustainable use of biodiversity and ecosystem services

The IPCC AR6 establishes that maintaining planetary health is essential for human and societal health and a pre-condition for climate resilient development. Effective ecosystem conservation on approximately 30% to 50% of Earth's land, freshwater and ocean areas, including all remaining areas with a high degree of naturalness and ecosystem integrity, will help protect biodiversity, build ecosystem resilience and ensure essential ecosystem services12.

IPCC also recognized that Climate change has altered marine, terrestrial and freshwater ecosystems all around the world and caused local species losses, increases in disease and mass mortality events of plants, animals and ecosystems have caused measurable economic and livelihood losses and altered cultural practices and recreational activities around the world. Similarly, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) identifies in its global assessment report on Biodiversity and Ecosystem Services climate change as a major direct driver of biodiversity loss, increasingly intensifying the impacts of other environmental pressures on ecosystems and human well-being. These changes have had far-reaching consequences for biodiversity, affecting species distribution patterns, phenology, population dynamics, community composition, and ecosystem functions.

Concrete Action

- ➔ Support the achievement of the Kunming-Montreal Global Biodiversity Framework's 30x30 target by expanding and effectively managing protected and conserved areas, ensuring ecological connectivity and long-term biodiversity conservation.
- ➔ Promote the design and implementation of ecological corridors that facilitate species migration and adaptation to climate change, while strictly protecting areas with low thermal vulnerability that can serve as future biodiversity strongholds
- ➔ Prioritize the restoration and sustainable management of carbon- and water-rich ecosystems, including ocean, mangroves, wetlands, peatlands, and native forests, NbS that enhance climate resilience and reduce the impacts of floods, droughts, and heatwaves.
- ➔ Integrate the traditional knowledge and cosmovisions of Indigenous Peoples and local communities, recognizing their critical role in biodiversity conservation, climate adaptation, and the maintenance of territories with lower deforestation rates and greater ecological resilience.

[12] IPCC_AR6_WGII_FullReport.pdf TS.E.4

IV. Conclusion and next steps

The scientific evidence assembled in this submission points unambiguously toward a narrow but real window of opportunity. The technologies required for rapid decarbonization exist and are cost-competitive. The adaptation measures needed to protect the most vulnerable exist and are cost-effective.

Identifying critical actions will not be enough: by the end of this year, we should have a workable global blueprint for how to maintain and realize the 1.5°C objective. The Belém Mission to 1.5°C should provide suggestions about which actions, in which contexts, can meaningfully reduce emissions and build resilience, even incrementally. The Belem Mission 1.5 report should include facilitative and non-prescriptive menu of recommendations, which includes possible milestones milestones and to provide the international community with confidence and reassurance that we are fully committed and, more importantly, actively working to deliver just climate action that leaves no one behind.

COP31 in Antalya, framed as an 'implementation COP' under the joint Turkey-Australia Presidency, provides an opportunity to accelerate work on the critical priority actions. We call on the presidencies to highlight clearly how the identified actions will be promoted, and to develop measurable results: as they conclude their work, the Presidencies should present the result of their efforts.

We call on all parties and non stakeholders to support the priority actions identified in this submission, to to consider and engage constructively with the proposed COP31 initiatives, and to engage constructively on their follow-up in coming years.

Finally, we invite the COP32 Presidency to join the COP30 and COP31 Presidencies in carrying forward this work.