

Glossary

Abatement / see mitigation

Adaptation: Adjustment in natural or human systems, in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory and reactive, autonomous and planned, public and private.

Adaptation Fund: The Adaptation Fund was established to finance concrete adaptation projects and programs in developing countries that are Parties to the Kyoto Protocol. The Fund is financed with a share of proceeds from the Clean Development Mechanism (CDM) and receives funds from other sources.

Adaptive capacity: The ability of a system to adjust to climate change (including climate variability and extremes) in order to take advantage of opportunities, moderate potential damages, or cope with the consequences.

Adaptive management: A systematic process for continually improving management policies and practices by learning from the outcomes of previously employed policies and practices, through an explicitly experimental approach.

Additionality: In the CDM context this refers to whether the carbon offsets generated by a project are backed up by emission reductions additional to those that otherwise would occur without the financial and technical incentive of the CDM mechanism. An activity's emissions as they would have been in the absence of the CDM project constitute the baseline against which additionality is measured. The creation and

sale of offsets from a CDM project lacking additionality may lead to an increase in emissions to the atmosphere, relative to the emissions released if the potential purchaser of the offset instead directly reduced their own emissions at home.

Afforestation: Planting a new forest on land that has either never or not recently been forested.

Annex I parties: Annex I parties include the industrial countries that were members of the OECD (Organization for Economic Co-operation and Development) in 1992, plus countries with economies in transition (the EIT Parties), including the Russian Federation, the Baltic states, and several Central and Eastern European states. They have committed to limit their greenhouse gas emissions. *Non-Annex-I parties:* The group of primarily developing countries without such commitments, which instead have acknowledged general obligations to formulate and implement national programs on mitigation and adaptation.

Anthropogenic: Directly caused by human actions. For example, burning fossil fuels to supply energy leads to anthropogenic GHG emissions, whereas natural decay of vegetation leads to non-anthropogenic emissions.

Assigned amount units (AAUs): The total volume greenhouse gases—measured in tons CO₂e—that each Annex I country is allowed to emit during the first phase of the Kyoto Protocol.

Bali Action Plan: The two year plan launched at the 2007 United Nations Climate Change Conference in Bali, Indonesia to negotiate long-term cooperative action

on climate change beyond 2010 and to reach an agreed outcome in Denmark in late 2009. The plan has four pillars: mitigation, adaptation, finance, and technology.

Biodiversity: Biodiversity is the variety of all forms of life, including genes, populations, species, and ecosystems.

Biofuel: A fuel produced from organic matter or combustible oils produced by plants. Examples of biofuel include alcohol, black liquor from the paper-manufacturing process, wood, and soybean oil. *Second-generation biofuels:* Products such as ethanol and biodiesel derived from woody material by chemical or biological processes.

Cap and trade: An approach to controlling pollution emissions that combines market and regulation. An overall emissions limit (cap) is set for a specific time period and individual parties receive permits (either through grant or auction) giving them the legal right to emit pollution up to the quantity of permits they hold. Parties are free to trade emission permits, and there will be gains from trade if different parties have different marginal pollution abatement costs.

Carbon capture and storage (CCS): A process consisting of separation of CO₂ from industrial and energy-related sources, transport to a storage location, and long-term isolation from the atmosphere.

Carbon dioxide (CO₂): A naturally occurring gas that is also a by-product of burning fossil fuels (fossil carbon deposits such as oil, gas, and coal), of burning biomass, of land-use changes, and of several industrial processes. It is the principal anthropogenic greenhouse gas that affects the Earth's radiative balance. It is the reference gas against which other greenhouse gases are measured and therefore has a Global Warming Potential of 1.

Carbon dioxide equivalent (CO₂e): A way of expressing the quantity of a mixture of different greenhouse gases. Equal amounts of the different greenhouse gases produce different contributions to global warming; for example, an emission of methane to the atmosphere has about 20 times the warming effect as the same emission of carbon

dioxide. CO₂e expresses the quantity of a mixture of greenhouse gases in terms of the quantity of CO₂ that would produce the same amount of warming as would the mixture of gases. Both emissions (flows) and concentrations (stocks) of greenhouse gases can be expressed in CO₂e. A quantity of greenhouse gases can also be expressed in terms of its carbon equivalent, by multiplying the quantity of CO₂e by 12/44.

Carbon fertilization: The enhancement of the growth of plants as a result of increased atmospheric carbon dioxide (CO₂) concentration. Depending on their mechanism of photosynthesis, certain types of plants are more sensitive to changes in atmospheric CO₂ concentration.

Carbon footprint: The amount of carbon emissions associated with a particular activity or all the activities of a person or organization. The carbon footprint can be measured in many ways, and may include indirect emissions generated in the whole chain of production of inputs into an activity.

Carbon intensity: Typically, the amount of economywide emissions of carbon or CO₂e per unit of GDP, that is, the carbon intensity of GDP. May also refer to the carbon emitted per dollar of gross production or dollar of value added by a given firm or sector. Also used to describe the amount of carbon emitted per unit of energy or fuels consumed, that is, the carbon intensity of energy, which depends on the energy sources, fuel mix, and efficiency of technologies. The carbon intensity of GDP is simply the product of the economywide average carbon-intensity of energy and energy-intensity of GDP.

Carbon lock-in: Actions which perpetuate a given level of carbon emissions. For example, expansion of roads and highways will tend to lock in carbon emissions from fossil fuels for decades unless there are countervailing policies to limit fuel use or control vehicle use.

Carbon sink: Any process, activity or mechanism which removes carbon dioxide from the atmosphere. Forests and other vegetation are considered sinks because

they remove carbon dioxide through photosynthesis.

Clean Development Mechanism (CDM):

A mechanism under the Kyoto Protocol through which developed countries may finance greenhouse-gas emission reduction or removal projects in developing countries, and thereby receive credits for doing so which they may apply towards meeting mandatory limits on their own emissions. The CDM allows greenhouse gas emission reduction projects to take place in countries that are signatories but have no emission targets under the Kyoto Protocol.

Climate sensitivity: The change in global mean surface temperature in response to a doubling of the atmospheric CO₂e concentration. A key parameter for translating projected emissions into projections of warming and thus impacts.

Consumptive use of water: Water removed from available supplies without return to a water resources system (for example, water used in manufacturing, agriculture, and food preparation that is not returned to a stream, river, or water treatment plant).

Coping capacity: The ability of people, organizations and systems, using available skills and resources, to face and manage adverse conditions, emergencies or disasters. Refers to short-term capacity in response to an event, whereas adaptive capacity refers to the long-term ability to make systematic changes to reduce the impact of climate change.

Damage function: In the climate change context, the relation between changes in the climate and reductions in production or consumption, or losses of assets (potentially including ecosystems or human health).

Deadweight loss: A cost that generates no benefit.

Discount rate: The rate at which individuals or enterprises trade off present versus future consumption or wellbeing, usually expressed as a percentage.

Downscaling: A method that derives local- to regional-scale (10 to 100 km) information from larger-scale (200+ km)

climate-projection models or data analyses. Dynamic downscaling uses high resolution models for a particular region run within a large-scale global model; statistical downscaling uses statistical relationships that link the large-scale atmospheric variables with local or regional climate variables.

Early warning system: A mechanism to generate and disseminate timely and meaningful warning information to enable individuals, communities and organizations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss.

Ecosystem services: The ecosystem processes or functions that have value to individuals or society, for example, the provision of food, water purification, and recreational opportunities.

Evapotranspiration: An important part of the water cycle, it is the combined process of evaporation from the Earth's surface (from sources such as the soil and bodies of water) and transpiration from vegetation (loss of water as vapor from plants, primarily through their leaves).

Forest degradation: The reduction in forest biomass through unsustainable harvest or land-use practices including logging, fire, and other anthropogenic disturbances.

Geoengineering: Geoengineering is the large-scale engineering of our environment to combat or to counteract the effects of climate change. Proposed measures include injecting particles into the upper atmosphere to reflect sunlight and the fertilization of the oceans with iron to increase uptake of CO₂ by algae.

Gini coefficient: A commonly used measure of inequality of income or wealth distribution, varying between 0 (perfect equality) and 1.

Green tax: A tax that aims to increase environmental quality by taxing actions which harm the environment.

Greenhouse gas (GHG): Any of the atmospheric gases that cause climate change by trapping heat from the sun in Earth's atmosphere—producing the greenhouse

effect. The most common greenhouse gases are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), ozone (O₃), and water vapor (H₂O).

Innovation: The creation, assimilation, or exploitation of a new or significantly improved good or service, process, or method.

Institutions: Structures and mechanisms of social order and cooperation governing the behavior of a set of individuals.

Integrated assessment: A method of analysis that combines results and models from the physical, biological, economic and social sciences, and the interactions between these components, in a consistent framework, to project the consequences of climate change and the policy responses to it.

Intellectual property rights (IPRs): Legal property rights over artistic and commercial creations of the mind, including patents on new technologies, and the corresponding fields of law.

Intergovernmental Panel on Climate Change (IPCC): Established in 1988 by the World Meteorological Organization and the United Nations Environment Program, the IPCC surveys worldwide scientific and technical literature and publishes assessment reports that are widely recognized as the most credible existing sources of information on climate change. The IPCC also prepares methodologies and responds to specific requests from the subsidiary bodies of the United Nations Framework Convention on Climate Change (UNFCCC). The IPCC is independent of the UNFCCC.

Kyoto Protocol: An agreement under the United Nations Framework Convention on Climate Change (UNFCCC) that was adopted in 1997 in Kyoto, Japan, by the parties to the UNFCCC. It contains legally binding commitments to reduce greenhouse gas emissions by developed countries.

Leakage: In the climate change context, the process whereby emissions outside of a mitigation project area increase as a result of emission reduction activities inside the project area, thus reducing the effectiveness of the project.

Land use, land-use change, and forestry (LULUCF): A set of activities including human-induced land use, land-use change, and forestry activities which lead to both emissions and removals of greenhouse gases from the atmosphere. A category used in reporting greenhouse gas inventories.

Maladaptation: Activities or actions that increase vulnerability to climate change.

Market-pull: The allocation of research and development (R&D) resources based on market demand for products and services, rather than scientific interest or top-down government policies.

Mitigation: A human intervention to reduce the emissions or enhance the sinks of greenhouse gases.

National Adaptation Programs of Action (NAPAs): Documents prepared by least developed countries (LDCs) identifying the activities to address urgent and immediate needs for adapting to climate change.

No regrets project: In the climate change context, a project that would generate net social and/or economic benefits irrespective of whether the project affects the climate or whether the climate affects the project.

Polluter pays principle: A principle in environmental law whereby the polluter must bear the cost of the pollution. Thus the polluter is responsible for the cost of measures to prevent and control pollution.

Positive feedback: When one variable in a system triggers changes in a second variable that in turn affect the original variable; a positive feedback intensifies the initial effect, and a negative feedback reduces the effect.

Precautionary principle: A principle that holds that, in the absence of scientific certainty that serious or irreversible harm would not occur as a result of an action or policy, the burden of proof lies with those that favor the action or policy. In the United Nations Framework on Climate Change (UNFCCC), it is a provision under Article 3 stipulating that the parties should take precautionary measures to anticipate, prevent, or minimize the causes of climate

change and mitigate its adverse effects, and that a lack of full scientific certainty about possibly serious or irreversible damages should not be used as a reason to postpone such measures—taking into account that policies and measures to deal with climate change should be cost-effective in order to ensure global benefits at the lowest possible cost.

Public good: A good whose consumption is non-exclusive (so that it is impossible to prevent anyone from enjoying the benefit) and non-rival (so that the enjoyment of the benefit by one individual does not diminish the quantity of benefits available to others). Climate change mitigation is an example of a public good as it would be impossible to prevent any one individual or state from enjoying the benefit of a stabilized climate, and the enjoyment of this stabilized climate by one individual or state would not diminish the ability of others to benefit from it.

RDD&D: Research, development, demonstration, and deployment of new methods, technologies, equipment, and products.

Reduced Emissions from Deforestation and forest Degradation (REDD): REDD refers to a suite of actions aimed at reducing greenhouse gas emissions from forested land. Financial incentives for REDD are potentially a part of the policy response to climate change.

Reforestation: Planting of forests on lands that were previously forested but that have been converted to another use.

Reinsurance: The transfer of a portion of primary insurance risks to a secondary tier of insurers (reinsurers); essentially “insurance for insurers.”

Resilience: The ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change.

Return period: The average time between occurrences of a defined event.

Risk assessment: A standardized methodology consisting of risk identification,

risk quantification, risk reduction, and risk mitigation.

Robust decision making: In the face of uncertainty, choosing not the measure or policy that would be optimal under the most likely future world, but the one that would be acceptable across a range of possible futures. The process involves evaluating options to minimize expected regret across a variety of models, assumptions, and loss functions, rather than to maximize returns under a unique likely future.

Safety net: Mechanisms that aim to protect people from the impact of shocks such as flood, drought, unemployment, illness, or the death of a household’s primary income earner.

Sequestration: In the climate context, the process of removing carbon from the atmosphere and storing it in reservoirs such as new forests, soil carbon or underground storage. *Biological sequestration:* The removal of CO₂ from the atmosphere and storing it in organic matter through land-use change, afforestation, reforestation, carbon storage in landfills, and practices that enhance soil carbon in agriculture.

Social learning: Social learning is the process by which people learn new behavior through overt reinforcement or punishment, or via observing other social actors in their environment. If people observe positive, desired outcomes for others exhibiting a particular behavior, they are more likely to model, imitate, and adopt the behavior themselves.

Social norms: Implicit or explicit values, beliefs, and rules adopted by a group to self-regulate behavior through peer pressure; the yardstick individuals use to assess what is acceptable or unacceptable behavior.

Social protection: The set of public interventions aimed at supporting the poorer and more vulnerable members of society, as well as helping individuals, families, and communities manage risk—for example, unemployment insurance programs, income support, and social services.

Solar photovoltaics (PV): The field of technology and research related to the

conversion of sunlight, including ultra violet radiation, directly into electricity; the technology applied in the creation and use of solar cells, which make up solar panels.

SRES scenarios: A set of descriptions or storylines of possible futures used in climate change related modeling developed for the IPCC. The scenarios are used to project future emissions based on assumptions about changes in population, technology, and societal development. Four scenario families comprise the SRES scenario set: A1, A2, B1 and B2. A1 represents a future world of very rapid economic growth, global population that peaks in mid-century and declines thereafter, and rapid introduction of new and more efficient technologies. A2 represents a very heterogeneous world with continuously increasing global population and regionally oriented economic growth that is more fragmented and slower than in other storylines. B1 represents a convergent world with the same global population as in the A1 storyline but with rapid changes in economic structures toward a service and information economy, reductions in material intensity, and the introduction of clean and resource-efficient technologies. Finally, B2 represents a world in which the emphasis is on local solutions to economic, social, and environmental sustainability, with continuously increasing population (lower than A2) and intermediate economic development.

Stationarity: The idea that natural systems fluctuate within an unchanging envelope of variability, delimited by the range of past experiences.

Supplementarity: The Kyoto Protocol states that emissions trading and Joint Implementation activities are to be supplemental to domestic policies (e.g. energy taxes, fuel efficiency standards) taken by developed countries to reduce their GHG emissions. Under some proposed definitions of supplementarity, developed countries could be required to achieve a given share of their reduction targets domestically. This is a subject for further negotiation and clarification by the parties.

Technology transfer: The process of sharing of skills, knowledge, technologies, and

methods of manufacture to ensure that scientific and technological developments are accessible to a wider range of users.

Technology-push: The allocation of R&D resources motivated largely by inherent scientific interest, rather than market demand.

Threshold: In the climate change context, the level above which sudden or rapid change occurs.

Transaction costs: Costs associated with the exchange of goods or services that are additional to the monetary cost or price of the good or service. Examples include search and information costs or policing and enforcement costs.

Uncertainty: An expression of the degree to which a value (such as the future state of the climate system) is unknown. Uncertainty can result from lack of information or from disagreement about what is known or even knowable. It may have many types of sources, from quantifiable errors in the data to uncertain projections of human behavior. Uncertainty can therefore be represented by quantitative measures, for example, a range of values calculated by various models, or by qualitative statements, for example, reflecting expert judgment. However, in economics, uncertainty refers to Knightian uncertainty, which is immeasurable. This is in contrast to risk, wherein the occurrence of certain events is associated with a knowable probability distribution.

United Nations Framework Convention on Climate Change (UNFCCC): A convention adopted in May 1992 with the ultimate objective of the “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.”

Virtual water: The amount of water that is directly or indirectly consumed in the production of a good or service.

Vulnerability (also climate vulnerability): The degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate

variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variability to which a system is exposed, as well as the system's sensitivity and adaptive capacity.

Weather derivatives: Financial instruments to reduce risk associated with adverse weather conditions by, for example, providing for payments associated with a specified weather event (such as an unusually cool or hot month of August).

Weather-index insurance: Insurance where the indemnity (or payout) is based

on the realization of pre-agreed values of an index of a specific weather parameter, measured over a pre-specified period of time, at a particular weather station. The insurance can be structured to protect against index realizations that are either so high or so low that they are expected to cause crop losses. The indemnity is calculated based on a pre-agreed sum insured per unit of the index (e.g. US\$/millimeter of rainfall).

Win-win-(win): In the Report, this refers to measures that are beneficial for adaptation and mitigation (and development).

