

## INFORMATION DOCUMENT Glossary

## A

- **Adaptation:** Climate change adaptation refers to the process of adjusting and responding to actual or expected physical impacts of climate change, rather than tackling the causes of these impacts (Intergovernmental Panel on Climate Change [IPCC], 2015).
- **Agroforestry:** This is the process of growing trees and shrubs alongside agricultural crops on the same land. This serves to sustain the production of crops and trees as well as diversifying and improving the social, environmental and economic benefits for land users (Agroforestry Research Trust, n.d.).
- **Anthropogenic emissions:** These are the emissions of greenhouse gases into the atmosphere as a result of human activities (IPCC, 2015).
- **Anthropogenic removals:** Greenhouse gases are removed from the atmosphere through deliberate human action such as improving natural carbon sinks, using chemical engineering methods or adopting carbon capture and storage technologies (IPCC, 2015).

## B

- **Biomass:** This refers to organic material, excluding that which is fossilised or embedded in geological formations. Biomass can be used for the following:
  - **Bioenergy:** This is energy derived from biomass (eg plants, agricultural and food waste or by-products from the paper industry generating electricity, heat or gas).
  - **Biofuel:** This is fuel produced from biomass (eg biodiesel from canola or bioethanol from sugarcane or maize).
- **Biosphere:** The biosphere is a global ecosystem composed of all living organisms and the non-living elements from which they derive energy and nutrients (Thompson, 2007).

(IPCC, 2015)

## C

- **Carbon capture and storage (CCS):** These technologies are designed to capture the CO<sub>2</sub> emissions released from industrial processes such as material production, in order to use or store these emissions in ways that permanently prevent them from being released into the atmosphere. Currently, most CCS technologies are prohibitively expensive or difficult to scale up safely at the speed required (Material Economics, 2019).

- **Carbon dioxide (CO<sub>2</sub>):** CO<sub>2</sub> is a naturally occurring gas in the Earth's atmosphere. It is the main greenhouse gas released by human activities such as burning fossil fuels and biomass, industrial processes and land-use change (IPCC, 2015).
- **Carbon footprint:** This is defined as the total amount of carbon dioxide, methane, and other greenhouse gases produced by individuals, events, organisations, services, places, and products (The Nature Conservancy, n.d.).
- **Carbon offset:** This is defined as the reduction of carbon dioxide or other greenhouse gas emissions to compensate for emissions produced elsewhere. (IPCC, 2018)
- **Climate change:** This is defined as a significant and measurable change in the state of the climate, persisting over an extended period of time, typically decades or longer. Climate change may be due to natural climate variability (such as solar cycles, volcanic eruptions or internal processes) or human activity that changes the composition of the atmosphere (IPCC, 2015).

## D

- **Decarbonisation:** This is the process of reducing the amount of carbon dioxide released into the atmosphere, with the aim of ultimately reaching net zero emissions (RSSB, 2019).

## E

- **Ecosystem:** An ecosystem is a unit of all the living organisms in a specific area and their non-living environment (ie weather, sun, soil, climate, atmosphere), as well as the interactions between them. Each organism has a role to play and contributes to the functioning of the ecosystem as a whole (UN Environment Programme, n.d.a.).

## F

- **Feedback loops:** It refers to the acceleration or deceleration of a warming trend. Negative feedback decreases the rate of temperature rise, while positive feedback increases it (The Climate Reality Project, n.d.).

## G

- **Global carbon budget:** It refers to the maximum amount of carbon dioxide emissions that can be released into the atmosphere without compromising the goal of restricting global warming to less than 1.5°C or 2°C (Sussams, 2018).

- **Global warming:** This is the gradual increase, observed or projected, in global surface temperature, caused by anthropogenic greenhouse gas emissions (NASA, n.d.).
- **Green economy:** A green economy is one that is low carbon, resource efficient and socially inclusive (UN Environment Programme, n.d.b.).
- **Greenhouse gases (GHGs):** A greenhouse gas is any gaseous compound that absorbs infrared radiation from the Earth's surface and traps heat in the atmosphere, thus contributing to the greenhouse effect (Mann, 2019). The main GHGs in the atmosphere are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), ozone (O<sub>3</sub>) and water vapour (H<sub>2</sub>O) (IPCC, 2015).

## I

- **Impact:** It refers to effects on lives; livelihoods; health and well-being; ecosystems and species; economic, social and cultural assets; services (including ecosystem services); and infrastructure (IPCC, 2018).
- **Integrated land use:** This is a cross-sectoral approach to the use of land and resources that brings together stakeholders and interested parties with the aim of balancing the economic, social and environmental opportunities in a specific area, while minimising the human or industrial footprint on the land (Government of Alberta, n.d.).

## J

- **Just transition:** This refers to the need to ensure that the costs and benefits of the net zero transition and future low carbon economy are distributed in a more socially equitable manner (Climate Justice Alliance, n.d.).

## L

- **Land degradation:** Land degradation is a negative trend in the condition of land as a result of human action. It can be recognised by the long-term reduction or loss of land productivity, ecological integrity or value to humans (Olsson et al., 2019).
- **Land-use change:** Land use refers to the human activities and actions undertaken in a certain type of land cover. The term is also used to denote the social and economic purposes for which land is managed (eg grazing, timber extraction and conservation). Land-use change is when the use or management of land by humans alters, potentially leading to a change in land cover as well as a range of impacts on the climate system (IPCC, 2015).

- **Lock-in:** This occurs when historic developments, such as infrastructure, technology and behavioural norms, determine or constrain the future development of a system (IPCC, 2015).
- **Low carbon:** This is the minimal output of greenhouse gas emissions (Linnenluecke, 2019).

## M

- **Market capitalisation:** This refers to the total value of a company's shares on a stock market (Cambridge Dictionary, n.d.a.).
- **Mitigation:** In the context of climate change, mitigation is defined as "a human intervention to reduce the sources or enhance the sinks of greenhouse gases" (IPCC, 2015). In other words, it refers to the measures that governments, businesses or other actors take to proactively combat the causes of climate change, by reducing or preventing further greenhouse gas emissions.

## N

- **Nature-based solutions:** These are actions that simultaneously protect, manage and restore ecosystems and effectively respond to societal challenges, such as climate change and natural resource security (International Union for Conservation of Nature, n.d.).
- **Network effect:** This refers to an increase in the value of a product or service that is linked to the number of users or subscribers (ie the more users, the higher the value). It is thought that the number of users has to reach a specific level, or critical mass, in order to trigger significant network effects (Banton, 2019).
- **Net zero emissions:** The IPCC (2015) defines net zero emissions as when anthropogenic greenhouse gas emissions are balanced globally by the intentional removal of greenhouse gases through human activity. Some sources modify this slightly by accounting for the offset of residual emissions generated by sectors that are more difficult to abate, such as aviation, energy and heavy industry (Burns, 2019).

## O

- **Ocean acidification:** This is the lowering of the pH level (the measurement of a solution's acidity) in the ocean that occurs as a result of carbon dioxide uptake from the atmosphere and leads to an increase in the acidity of sea water (IPCC, 2015).

## R

- **Reforestation:** This is the process of replanting trees in areas where trees previously existed but have been cleared for alternative land use (IPCC, n.d.).
- **Risk:** This is the potential for adverse consequences directed toward humans and ecological systems (Reisinger et al., 2020).

## S

- **Soil carbon sequestration (SCS):** This refers to the various ways of managing land that increase the ability of the soil to capture and store organic carbon, resulting in a net removal of atmospheric CO<sub>2</sub> (IPCC, 2015). This can be achieved through **carbon farming** or **regenerative agriculture** practices such as reducing soil disturbance, changing planting rotations, managed grazing of livestock and applying compost or crop residues to fields (Regeneration International, n.d.).
- **Stranded assets:** This is the devaluation of assets as a result of changes associated with the net zero transition. These changes could include changes in regulation, market demand or prices (Carbon Tracker Initiative, 2017).
- **Strategic complementarities:** In game theory, the network effect is often related to the concept of strategic complementarities (Bulow, Geanakoplos & Klemperer, 1985). Here, the net benefit of taking an action (eg investing in low carbon technologies) is a function of how many others do the same. If you are a lone mover, costs are likely to be high and risks may also be high. If everyone acts, then opportunities related to the network and other effects, such as shared learning, will rise. What makes this concept interesting is the role of expectations: If enough people believe others will act, then they will act, helping make the prediction self-fulfilling.

## T

- **Tipping point:** This refers to the moment in time when widespread, critical change occurs in terms of the adoption of an idea, trend or belief, or the substantial change in an environment (Cambridge Dictionary, n.d.b.). On this course, the focus will be on the following:
  - **Environmental tipping point:** This is the critical threshold where the properties of the global or regional climate changes – often abruptly, from one stable state to another – and does not return to the initial state even if the drivers of the change are abated (IPCC, 2015).
  - **Social tipping point:** This refers to the point in time when a sufficiently large number of people in a group, community or society change their behaviours or beliefs, causing the remaining majority to do the same. This

creates a momentum that cannot be stopped as it generates reinforcing feedback mechanisms such as falling technology costs, more favourable politics, new institutions and greater civil acceptance of change (Milkoreit et al., 2018).

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