

UNDERSTANDING THE URGENCY OF ADDRESSING CLIMATE CHANGE - A LEXICON FOR BUSINESS LEADERS

Any number of recent developments, from warnings of likely increases in frequency and severity of extreme heatwaves, droughts and flooding set out in the [Sixth Assessment Report](#) issued this summer by the [IPCC](#) to the drumbeat of warnings from [COP26](#) attendees, underscore the urgency of addressing the effects of climate change. UN Secretary-General António Guterres [called](#) the IPCC report a “code red for humanity.” He called on the international community to keep the [1.5°C threshold](#) alive, noting that the “viability of society” depends on leaders in government, business and civil society “uniting behind policies, actions and investments” to meet the 1.5°C threshold.

In prior postings, I have highlighted the urgency of action (<https://bit.ly/3bt4Iib>) and the role of public company boards in addressing the effects of climate change on their businesses (<https://bit.ly/3CtvdTi>). There are myriad efforts to galvanize action – from the global [UNFCCC Race to Zero](#) and [Race to Resilience](#) campaigns to individual shareholder activist campaigns.

For corporate directors and senior management teams embarking on the journey of navigating the uncharted waters of adaptation and mitigation, and digesting the countless other concepts critical to setting out, and communicating, effective transition strategies to address the effects of climate change, I set out below key concepts in the form of a lexicon. This list is by no means exhaustive.

A note about context. I have chosen to focus on climate, but readers should recognize that climate is but one element of a broader focus by asset owners, asset managers, other institutional investors, lenders and insurers, policymakers, shareholders and other stakeholders. That broader focus is measured against ESG metrics, with “E” having both climate and broader sustainability elements, but there are equally important “S” and “G” considerations. The ESG overlay adds to the complexity of navigating the evolving landscape because of the proliferation (in the absence of a single body imposing mandatory concepts) of different (voluntary) ESG standards, inconsistencies in the level and quality of ESG data, the lack of comparability of ESG criteria and ratings methodologies, and inconsistent (and significantly evolving) corporate disclosure requirements, though trending toward mandatory disclosure requirements. Each of these challenges affects not only the more encompassing ESG world, but affects the “E” world just as much. In any event, in part to present a more manageable set of considerations and, in part, due to the likely target of upcoming mandatory corporate disclosure, the focus below is on climate.

Climate-Related Terminology

Adaptation: Actions and solutions to respond to the actual and potential adverse effects of climate change and to benefit from opportunities associated with climate change. These changes encompass the full range of human behavior, from adjustments to social, economic and ecological systems, to changes in processes and practices. Adaptation is distinguished from [mitigation](#), as the former encompasses adapting life in a changing climate (and thereby reduce vulnerability to the effects of climate change (such as food insecurity, extreme weather events or

sea-level rise)), while the latter encompasses actions to reduce climate change (either by reducing the source of [GHGs](#) or enhancing the [sinks](#) that store GHGs).

The IPCC (quoting the UNFCCC) [set out](#) the goals of mitigation, together with adaptation, as “stabilizing GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.”

Anthropogenic: Originating in human activity, as in anthropogenic emissions.

Carbon cycle: The flow of carbon (whether as [CO₂](#), carbon in biomass or carbon dissolved in the oceans) through the atmosphere.

Carbon dioxide or CO₂: A byproduct of burning fossil fuels, burning biomass, land-use changes or industrial processes (such as cement production). CO₂ is the principal anthropogenic GHG that affects the Earth’s radiative balance.

Carbon dioxide capture: A process to separate CO₂ from industrial and energy-related sources, and then compress and transport it for long-term storage. When CO₂ is captured and used to produce a new product, that process is known as ***carbon dioxide capture and utilization***. If the CO₂ is stored in a product for a climate-relevant period, the process is known as ***carbon dioxide capture, utilization and storage***. The process of storing carbon in a [carbon pool](#) is known as ***carbon sequestration***.

Carbon dioxide removal: The anthropogenic capture, compression, transportation and long-term storage of atmospheric CO₂ in geological, terrestrial or ocean reservoirs, or in products. The term generally encompasses direct air capture and storage, as well as existing and potential enhancements of biological or geochemical sinks. It does not include natural CO₂ uptake not caused by human activities.

Carbon equivalent: A metric measure used to compare the emission of different GHGs based on their global warming potential (GWP), which equates to the total energy that a gas absorbs over a specified period (usually 100 years), compared to CO₂. ***GWP*** represents the combined effect of the differing times GHGs remain in the atmosphere and their relative effectiveness in absorbing outgoing thermal infrared radiation (*i.e.*, the radiation emitted by the surface of the Earth, the atmosphere and clouds).

Carbon footprint: A measure of GHG emissions in a specified period of time, or the amount of GHG emissions associated with the manufacture of a product.

Carbon intensity: The relative amount of carbon emitted per unit of a selected variable such as gross domestic product, transportation or output energy use.

Carbon neutral: The state of making no net release of carbon dioxide to the atmosphere, especially through offsetting emissions, such as by planting trees.

Carbon offset: An emissions unit representing reduction or removal of GHG emissions.

Carbon pool: A reservoir of carbon that has the capacity to accumulate or release carbon. The categories are: above-ground biomass, below-ground biomass, dead wood, litter (non-living biomass lying dead in various states of decomposition above mineral or organic soil) and soil carbon (organic matter in mineral and organic soils, including peat).

Carbon price: A price used to measure the costs associated with changes to production, investment or consumption, as well as costs associated with future abatement of emissions – in effect, the price for avoided or released CO₂. A carbon price may be a theoretical or notional cost, or it may be an internal tax/fee charged to a business activity based on emissions. In models used to measure the costs of mitigation, the carbon price represents the level of effort in a mitigation plan.

Climate: Average weather, measured over a period of time (the World Meteorological Organization uses 30 years), usually based on surface variables such as temperature, wind and precipitation.

Climate change: The IPCC defines climate change as a change in the state of the climate that can be measured by changes in the mean and/or the variability of its properties and that persists for an extended period of time. The IPCC definition encompasses both climate change attributable to human activities altering atmospheric composition and climate variability attributable to natural causes. Other definitions (*e.g.*, in the UNFCCC) only cover the former.

Climate-related opportunities: Opportunities arising from efforts to mitigate and adapt to climate change, admittedly varying based on the specific industry, market and region of a business. Opportunities may include improved resource efficiency or cost savings, resilience in supply chains, use of low-emission energy sources or development of new products and services.

Climate-related risks: The potential negative impacts of climate change on businesses fall into two categories, physical risk and transition risk.

- **Physical risk** encompasses the consequences of an increase in the frequency and the severity of extreme weather conditions that can damage corporate assets, both physical as well as natural. Physical risks also affect humans through loss of life or injury. Physical risk can be triggered, for example, by specific weather events, such as hurricanes, tornadoes, wildfires, droughts and flooding. These are known as acute risks. Physical risk can also be triggered by longer-term (chronic) shifts in climate, such as changes in precipitation, extreme weather variability and sustained higher temperatures, leading to retreat of glaciers, rise in sea levels and extreme heatwaves, as well as loss of biodiversity. Businesses may be affected by physical risk through damage to assets or disruptions to supply chains, or costs associated with addressing the impact of water- or food-insecurity, or of extreme temperatures, on operations, premises, supply chains or employee security.
- **Transition risk** encompasses risks associated with changes in policy, legal requirements, technology, business models, societal preferences and/or market forces associated with the transition to a lower-carbon, more resilient global economy. Transition risk can have reputational or financial implications.

Climate resilience: The ability of a business to adapt to climate change by managing associated climate-risks and embracing climate-related opportunities and, in particular, the ability to respond to physical risk and transition risk.

Climate scenario analysis: A process for identifying and measuring a range of potential outcomes of future events, namely how physical and transition risks may impact operations, strategies and performance of businesses over time, under different climate scenarios.

Climate system: Encompasses five components:

- the atmosphere (the air surrounding Earth);
- the hydrosphere (the Earth's water, including surface water, groundwater and water in the atmosphere);
- the cryosphere (snow, ice and frozen ground on and beneath the Earth's surface and oceans);
- the lithosphere (the upper layer of the Earth, both oceanic and continental); and
- the biosphere (parts of the Earth and atmosphere where living organisms exist or can exist),

and the interactions among them. The system evolves based on its own dynamics, and because of external “forcings” such as volcanic eruptions and solar variations as well as anthropogenic activities.

Decarbonization: The reduction of GHG emissions (particularly emissions of CO₂), and typically through reductions associated with electricity, transport and industry.

Emissions: Releases of gases (including GHGs, GHG precursors and aerosols associated with human activities) into the atmosphere. Emissions result, among other things, from the burning of fossil fuels, deforestation, land-use changes, livestock and fertilization. Emissions can be direct (also known as point of emission) or indirect (also known as emissions allocated to the end-use sector).

Emissions trading/ “cap and trade”: A market-based system used as part of mitigation strategies. Within the system, a limit (a “cap”) is set on the total amount of certain GHG emissions from installations covered by the system, and within the cap, companies buy (through auction) or receive emission allowances (permits), which they can trade with one another within the system. Companies must surrender emission permits equal to the volume of emissions. Those emitting less GHGs than authorized can sell their permits within the system to those emitting more than authorized. Trading systems can exist within companies, or domestically or internationally (*e.g.*, the EU Emissions Trading System). Trading systems can apply to CO₂, other GHGs or other substances.

Fossil fuels: Buried, combustible organic materials formed from decayed plants and animals that have been converted to coal, crude oil, natural gas or heavy oils through exposure to heat and pressure in the Earth's crust over millennia.

GHG: Greenhouse gas, which encompasses any gas that absorbs terrestrial (infrared) radiation in the atmosphere near the Earth's surface, trapping heat and contributing to the so-called

“greenhouse effect.” Some of the heat is absorbed by CO₂, water vapor, ozone and other gases and then reradiated back to Earth. GHGs include (using common definitions, as well as descriptions from the [US Environmental Protection Agency](#)):

- carbon dioxide – which enters the atmosphere through the burning of fossil fuels (coal, natural gas and oil), solid waste, trees and other biological materials;
- methane – which is emitted during the production and transport of coal, natural gas and oil, and also results from livestock and other agricultural practices, land use and decay of organic waste in waste landfills;
- nitrous oxide – which is emitted during agricultural, land use and industrial activities and combustion of fossil fuels and solid waste, as well as during wastewater treatment; and
- hydrofluorocarbons, sulfur hexafluoride and perfluorocarbons – which are synthetic GHGs emitted from a variety of industrial processes.

While carbon dioxide is the most common GHG emitted by anthropogenic activity, it is not the only GHG and, accordingly, GHGs may also be referred to as CO₂ equivalents. GHGs initially were identified as part of the Kyoto Protocol.

GHG emissions: Direct GHG emissions are within the control of a business, such the burning of fossil fuels or emissions from industrial processes, while indirect emissions are collateral consequences of activities of a business, such as the consumption of purchased energy or emissions from owned vehicles, air travel or waste disposal.

Global mean surface air temperatures/GMST: The estimated global average of near-surface air temperatures over land and sea-ice (*i.e.*, ice found at the sea surface that originated from the freezing of seawater) and of sea surface temperatures over ice-free regions.

Global warming: The IPCC defines global warming as the estimated increase in GMST averaged over a 30-year period, expressed relative to pre-industrial levels, unless otherwise specified. For 30-year periods that cover both past and future years, the current multi-decadal warming trend is assumed to continue.

Low-carbon economy: An economy based on low-carbon power sources with lower output of GHG emissions.

Mitigation of climate change: Human intervention to reduce the anthropogenic impact of climate change, including through strategies to reduce the source of GHG emissions and enhance GHG sinks. Mitigation measures can include processes (*e.g.*, waste management), practices (*e.g.*, changes in practices of commuters) and technologies (*e.g.*, renewable energy).

Net zero emissions, net zero carbon, carbon neutrality or net zero: The point at which a country produces no GHG emissions, either because it has phased out all GHG emissions or has removed a sufficient level of carbon from the atmosphere to offset the GHG emissions it releases. Net zero targets are also announced by regional governments, city governments, businesses, universities, insurance companies and large investors.

Paris-aligned scenarios: Scenarios consistent with limiting the increase in “global average temperatures” to below 2°C above pre-industrial levels and pursuing efforts to limit warming to

1.5°C, as set out in the [Paris Agreement](#) adopted by COP21 in December 2015. A plan by a party to take climate action (emission-reduction targets and plans, adaptation plans or other climate action goals) under the Paris Agreement is known as a nationally determined contribution (or NDC). The NDCs are defined in the UNFCCC.

Pre-industrial levels: The Paris-aligned scenarios are tied to increases in “global average temperatures” above “pre-industrial levels.” The Paris Agreement did not specify what is meant by “global average temperatures” and it did not specify what period in history should be considered “pre-industrial.” According to the IPCC in its [FAQ](#) for its 2018 [Special Report: Global Warming of 1.5°C](#), “In principle, ‘pre-industrial levels’ could refer to any period of time before the start of the industrial revolution. But the number of direct temperature measurements decreases as we go back in time. Defining a ‘pre-industrial’ reference period is, therefore, a compromise between the reliability of the temperature information and how representative it is of truly pre-industrial conditions. Some pre-industrial periods are cooler than others for purely natural reasons. This could be because of spontaneous climate variability or the response of the climate to natural perturbations, such as volcanic eruptions and variations in the sun’s activity.” The IPCC chose the reference period 1850–1900 to represent pre-industrial temperature, though some experts have identified earlier periods.

Renewables: A source of energy that is not depleted by use, such as water, wind or solar power.

Scope 1-3 GHG Emissions: The three types of GHG emissions categorized by the [GHG Protocol](#):

- Scope 1 GHG emissions are direct emissions that occur from sources that are owned or controlled by a business, which includes on-site fossil fuel combustion and fleet fuel consumption.
- Scope 2 GHG emissions are indirect emissions that occur from the generation of electricity, heat, steam or cooling purchased by, or otherwise brought onto the premises of, a business. These emissions are measured at the source.
- Scope 3 GHG emissions cover all indirect emissions outside Scope 2 that arise in a value chain (both upstream and downstream), such as business travel, purchased goods and services, employee commuting, transportation and distribution of products, solid waste disposal and wastewater treatment. There are 15 categories of Scope 3 emissions listed in the GHG Protocol.

Sea-level rise: Sea levels can change for various reasons – changes in the shape of the ocean basins, changes in the total mass of water and changes in water density. Sea-level rise is an increase in the mean level of the ocean. Sea-level rise can be the result of an increase in the volume of the ocean; it can also increase relative to land, either because of higher volume or land level subsidence, or both.

Sinks: Natural environments that can absorb more CO₂ than they release, including oceans (namely algae, vegetation and coral under the sea), forests, plants and soil.

Stranded assets: Assets that have suffered from unanticipated or premature write-downs, devaluations or conversion to liabilities. In short, these are assets whose values have dropped

due to external forces, and in the context of climate change that means the effects of physical risk and/or transition risk. This could be triggered by:

- direct or indirect effects of climate change (across the spectrum of physical risk, from increases in frequency and severity of extreme weather events and sea-level rise, to loss of biodiversity, desertification, land degradation, water scarcity and air pollution);
- carbon footprint reductions (that is, cutting production to keep carbon emissions within globally accepted “*carbon budgets*” – the cumulative amount of carbon emissions that can be released (energy sector emissions, together with land use and changes to land use, and industrial emissions) to keep average increases in global temperature to within 2°C above pre-industrial levels);
- changes in resource availability and shifts in prices of natural resources;
- new regulations (or changes in interpretations of existing regulations) – which could range from direct regulation of carbon by national, supranational (*i.e.*, the European Union) or local authorities, to indirect regulation, such as a limit on water usage or pollution controls;
- reductions in the cost (and improved price stability) of renewable energy solutions;
- greater efficiency of trucks, vessels and aircraft that reduce demands for fuel or that reduce the value of older, less efficient trucks, vessels and aircraft;
- the outcome, or threats, of litigation, which could range across a broad spectrum, for example, from actions against upstream or downstream energy operations to actions against commercial property owners;
- changes in consumer sentiment; or
- responses to social activist campaigns (changes in societal norms).

Global agreement on the price of carbon would put pressure on the values of carbon-intensive assets.

Relevant Conferences, Players and Frameworks

CDP (formerly the Carbon Disclosure Project): An organization that supports investors, companies, cities and governments in measuring and acting on environmental impacts.

Climate Disclosure Standards Board/CDSB: A consortium of business and environmental NGOs committed to advancing and aligning corporate reporting to equate natural capital with financial capital. The CDSB will be consolidated with the **ISSB** by June 2022.

Coalition for Environmentally Responsible Economies/CERES: An organization that promotes investment solutions that are environmentally, socially and financially sound.

Global Impact Investing Network/GIIN: An organization that works with impact investors to accelerate the scale and effectiveness of their investments.

COPs: Conference of the Parties, which is an annual UN climate change conference attended by the countries that signed the UNFCCC, as well as members of the media and representatives of

observer organizations. COP26 was held in Glasgow this month; it was delayed by a year due to the pandemic. At COP26, briefly, among other things:

- the UNFCCC parties agreed as part of the [Glasgow Climate Pact](#) to keep the target of 1.5°C alive, to “phase down” unabated coal power and “phase out” inefficient fuel subsidies;
- the UNFCCC parties finalized the framework for a market-based, global carbon-credit trading system (under Article 6 of the Paris Agreement – known as the Paris rulebook);
- more than 130 countries agreed to halt and reverse deforestation by 2030;
- more than 100 countries agreed to cut by 30% methane emissions by 2030; and
- over 450 financial institutions from 45 countries (known as the [Glasgow Financial Alliance for Net-Zero, or GFANZ](#)) [committed](#) to align their lending and investment portfolios with the goal of achieving net-zero by 2050.

[Global Reporting Initiative/GRI](#): An organization focused on sustainability reporting. GRI publishes the [GRI Standards](#).

[IFRS Foundation](#): An organization responsible for developing a single set of global accounting standards (known as the International Financial Reporting Standards - IFRS). At COP26, the IFRS Foundation [announced](#) the formation of the ISSB, the consolidation of the ISSB with the CDSB and the VFR by June 2022, and the publication of two prototypes, the [Prototype Climate-related Disclosures Requirements](#) and the [General Requirements for Disclosure of Sustainability-related Financial Information Prototype](#).

[Institutional Investors Group on Climate Change/IIGCC](#): A group, which launched the investor-led Paris-Aligned Investment Initiative and has over 270 members, principally pension funds and asset managers based in Europe. The group’s mission is to mobilize capital to low carbon transition and ensure resilience to the impact of climate change through collaboration with business, policymakers and investors.

[Intergovernmental Panel on Climate Change/IPCC](#): A body established by the United Nations Environment Programme and the World Meteorological Organization to provide policymakers with regular scientific assessments on climate change, its implications and potential future risks, as well as to put forward adaptation and mitigation options.

[International Integrated Reporting Council/IIRC](#): A group that established the International Integrated Reporting Framework. The IIRC merged with the SASB in June 2021 to form the [Value Reporting Foundation](#), which is to be consolidated with the CDSB as part of the ISSB.

[International Organization of Securities Commissions/IOSCO](#): A body that brings together the world’s securities regulators (including the US Securities and Exchange Commission). In 2020, the Chair of the Sustainable Finance Task Force of IOSCO confirmed IOSCO’s intention to play a part in improving the completeness, consistency and comparability of sustainability reporting.

[International Sustainability Standards Board/ISSB](#): A newly formed standard-setting body tasked with delivering a comprehensive global baseline of sustainability-related disclosure standards, the IFRS Sustainability Disclosure Standards.

Net-Zero Asset Owners Alliance: A UN-convened group formed in 2019 whose 34 institutional investors with assets under management of \$5.5 trillion seek to deliver on a commitment to transition their respective investment portfolios to net zero emissions by 2050.

Sustainability Accounting Standards Board/SASB: An organization founded in 2011 to help businesses to identify, manage and communicate material sustainability information to investors and the market. [The SASB Standards](#) provide detailed industry-specific disclosure topics and metrics, across 77 different industries. The SASB merged with the IIRC in June 2021 to form the [Value Reporting Foundation](#), which is to be consolidated with the CDSB as part of the ISSB

Task Force on Climate-related Financial Disclosures/TCFD: A body created by the Financial Stability Board (FSB) to establish uniform corporate climate-related risk disclosures. In 2017, the TCFD published a set of [recommendations](#) for companies on how to disclose climate-related risks and opportunities on a comparable and consistent basis. In its [2020 Status Report](#), the TCFD reported that over 1,500 organizations, including 1,340 companies with aggregate market capitalization of \$12.6 trillion and financial institutions responsible for assets of \$150 trillion, have expressed support for the TCFD.

Acceptance of the TCFD recommendations has accelerated as a result of the dramatic growth in investor demand for corporate climate-related disclosures. For example, members of [Climate Action 100+](#), representing more than 615 investors that are responsible for over \$60 trillion in assets under management, are engaging the world's largest corporate GHG emitters to strengthen their climate-related disclosures by implementing the TCFD recommendations. Over 110 regulators and governmental bodies support the TCFD recommendations, and central banks and supervisors, acting through the [Network for Greening the Financial System \(NGFS\)](#), are encouraging issuers of debt and equity securities to disclose in line with TCFD standards. The TCFD recommendations are also referenced in EU and UK disclosure standards.

United Nations Framework Convention on Climate Change/UNFCCC: One of the two Rio Conventions, it was adopted and opened for signature in 1992 (and entered into force in 1994) with the objective of stabilizing GHG concentrations at a level that would “prevent dangerous anthropogenic interference with the climate system.” The provisions of the UNFCCC were implemented under the 1997 Kyoto Protocol at COP3 and the Paris Agreement.

United Nations Principles for Responsible Investment/PRI: A group initially convened by the UN Secretary-General in 2005 launched the [six investment principles](#) for integrating ESG issues into investment decisions.

World Economic Forum Effective Climate Governance Principles: A set of tools (eight principles) for boards of directors to help directors steer climate risks and opportunities from a governance perspective. These principles continue to serve as the basis for convenings of business leaders, regulators, policymakers, academics and other corporate governance leaders. One example is the network established by the [Climate Governance Initiative](#) to promote these principles.

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