Drawing Down N_2O

To Protect Climate and the Ozone Layer

A UNEP Synthesis Report

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Glossary, Acronyms and Abbreviations

Glossary

Aerosols – are collections of airborne solid or liquid particles with a typical size between 0.01 and 10 micrometre. They may influence the climate directly by scattering and absorbing radiation, and indirectly by acting as cloud condensation nuclei or modifying the optical properties and lifetime of clouds.

Annex I Countries – the industrialised countries (and those in transition to a market economy) which took on obligations to reduce their greenhouse gas emissions under the United Nations Framework Convention on Climate Change.

Atmospheric Deposition – removal of suspended material from the atmosphere, classed as either 'wet' or 'dry'. Wet deposition occurs when material is removed from the atmosphere by precipitation. In dry deposition, gases and particles are removed from the atmosphere by contact with a surface.

Atmospheric Lifetime – the time it takes for 63% of the abundance of a chemical to be removed from the atmosphere in the absence of emissions.

Atmospheric Nitrogen – a molecule also called dinitrogen (N_2), which contains two nitrogen atoms. It is an inert and harmless gas not usable by most life forms. It makes up 78% of the volume of the atmosphere.

Biofuels – non-fossil fuels (e.g. biogas, biodiesel, bioethanol). They are energy carriers that store the energy derived from organic materials (biomass) including plant materials and animal waste.

Biological Nitrogen Fixation (BNF) – the process of converting atmospheric nitrogen (N_2) by bacteria, fungi, and blue-green algae into reactive forms, usable by plants and animals, including humans.

Black Carbon – a form of air pollution consisting of carbon particles produced by incomplete combustion of fuels. It is produced especially by diesel-powered vehicles, open biomass burning, cooking stoves and other sources.

Business-As-Usual (BAU) – a scenario used for projections of future emissions assuming no action, or no new action, is taken to mitigate emissions.

Carbon Credits – tradeable permits that aim to reduce greenhouse gas emissions by giving them a monetary value.

Carbon Dioxide Equivalent (CO_2e) – a simple way to place emissions of various climate change agents on a common footing to account for their effect on climate. It describes, for a given mixture and amount of greenhouse gases, the equivalent weight of carbon dioxide that would have the same global warming ability, when measured over a specified timescale.

Carbon Leakage – according to the Intergovernmental Panel on Climate Change, carbon leakage occurs when there is an increase in carbon dioxide emissions in one country as a result of an emissions reduction by a second country. For example, an increase in local fossil fuel prices resulting from mitigation policies may lead to the re-allocation of production to regions with less stringent mitigation rules (or with no rules at all), thus causing higher emissions in those regions.

Certified Emission Reductions (CERs) – emission reductions from CDM project activities in accordance with the CDM rules and requirements, which are expressed in units equal to one metric tonne of carbon dioxide equivalent, calculated using global warming potentials defined by Decision 2/CP.3 of the United Nations Framework Convention on Climate Change or as subsequently revised in accordance with Article 5 of the Kyoto Protocol.

Clean Development Mechanism (CDM) – one of the three market-based mechanisms under the Kyoto Protocol to the United Nations Framework Convention on Climate Change, whereby developed countries may finance greenhouse gas emission-avoiding projects in developing countries, and receive credits for doing so, which they may apply towards meeting mandatory limits on their own emissions.

Denitrification – the microbial regeneration of dinitrogen (N_2) or nitrous oxide (N_2O) from nitrate (NO_3^-). N_2O represents an intermediary on the overall pathway of denitrification to form N_2.

Dobson Unit (DU) – a common unit used to measure overhead column ozone amounts. One DU is the number of molecules of ozone that would be required to create a layer of pure ozone 0.01 millimeters thick at a temperature of 0°C and a pressure of 1 atmosphere (the air pressure at the surface of the Earth).

Emission Factor (EF) – a representative value that relates the quantity of a pollutant released to the atmosphere with the activity associated with its release. The EF is used in estimating emissions from various sources of air pollution using the formula: Emissions = EF x Activity.

Eutrophication – the over-fertilization of an aquatic ecosystem by inorganic nutrients (e.g. nitrate, phosphate). This may occur naturally or through human activity (e.g., from fertilizer runoff and sewage discharge). It typically promotes excessive growth of algae, which could result in the depletion of available dissolved oxygen.

Feed Conversion Ratio – measure of the efficiency of how animals (livestock or fish) convert feed mass to body mass. It provides an indication of how much feed is required to achieve a specified body mass.

Global Warming Potential (GWP) – a relative index that enables comparison of the climate effect of the emissions of various greenhouse gases (and other climate changing agents). Carbon dioxide, the greenhouse gas that causes the greatest anthropogenic radiative forcing because of its overwhelming abundance, is chosen as the reference gas. GWP is also defined as an index based on the radiative forcing of a pulsed injection of a unit mass of a given well-mixed greenhouse gas in the present-day atmosphere, integrated over a chosen time horizon, relative to the radiative forcing by a unit mass of carbon dioxide over the same time horizon. The GWPs represent the combined effect of the differing atmospheric lifetimes (i.e., how long these gases remain in the atmosphere) and their relative effectiveness in altering the energy balance at the tropopause. The Kyoto Protocol uses GWPs from pulse emissions over a 100-year time horizon.

Haber-Bosch Process – a high pressure chemical process which synthesizes reactive nitrogen as ammonia (NH_3) from the reaction of N_2 and H_2.

Joint Implementation (JI) – projects that allow a country with an emission reduction or limitation commitment under the Kyoto Protocol (Annex B Party) to earn emission reduction units (ERUs) from an emission reduction or emission removal project in another Annex B Party. Each ERU is equivalent to one tonne of CO_2, which can be counted towards meeting its Kyoto target.

Kyoto Protocol – the international Treaty intended to reduce greenhouse gas emissions. It adds additional provisions to the United Nations Framework Convention on Climate Change.

Leaching – the washing out of soluble ions and compounds by water draining through soil.

Nitrates Directive – a European Commission Directive (1991) which regulates agricultural practices that can lead to losses of nitrate to the environment.

Nitrification – a two-step process, carried out mostly by microorganisms in soils and water bodies, involving the oxidation of NH_4^+ to NO_2^- which is then further oxidized to NO_3^-

Nitrogen Fixation – a process through which inert dinitrogen (N_2) is converted to reactive nitrogen forms such as ammonia (NH_3) and nitrates (NO_3). Nitrogen is fixed in nature by microorganisms or lightning. It is referred to as biological nitrogen fixation when it is performed by microorganisms (see Biological Nitrogen Fixation).

Nitrogen Use Efficiency (NUE) - A measure of performance in converting inputs of nitrogen compounds into useful products. There are several ways of expressing NUE, with the simplest being the amount of nitrogen in a product divided by the amount of nitrogen used, often expressed as a percentage.

Non-Annex I Countries – a group of developing countries that have signed and ratified the United Nations Framework Convention on Climate Change. They do not have binding emission reduction targets.

Ozone Depleting Substances – refers to substances that can deplete the stratospheric ozone layer and that are listed in the Montreal Protocol.

Ozone Depletion Potential (ODP) – a measure of the extent of stratospheric ozone layer depletion by a given ozone depleting substance, relative to that depleted by an equivalent mass of CFC-11. (CFC-11 has an ODP of 1.0).

Radiative Forcing – a measure of how a climate forcing agent influences the Earth's energy balance, with a positive value indicating a net heat gain to the lower atmosphere (warming), and a negative value a decrease (cooling).

Reactive Nitrogen – collectively any chemical form of nitrogen other than dinitrogen (N_2). Reactive nitrogen (N_r) compounds include NH_3, NO_x, N_2O, NO_3^- and many other chemical forms, and are involved in a wide range of chemical, biological and physical processes.

Root-Exudates – Substances released from a plant root system in drops or small quantities containing