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International Energy Agency  
International Energy Agency
Glossary

1 The terms that are independent entries in this glossary are highlighted in bold and italics in text as cross-references.

AAU
See assigned amount unit.

Activities Implemented Jointly (AIJ)
The pilot phase for joint implementation, as defined in Article 4.2(a) of the United Nations Framework Convention on Climate Change, that allows for project activity among developed countries (and their companies) and between developed and developing countries (and their companies). AIJ is intended to allow Parties to the United Nations Framework Convention on Climate Change to gain experience in jointly implemented project activities. There is no crediting for AIJ activity during the pilot phase. A decision remains to be taken on the future of AIJ projects and how they may relate to the Kyoto Mechanisms. As a simple form of tradable permits, AIJ and other market-based schemes represent important potential mechanisms for stimulating additional resource flows for the global environmental good. See also Clean Development Mechanism, and emissions trading.

Adaptation
Adjustment in natural or human systems to a new or changing environment. Adaptation to climate change refers to 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 adaptation, private and public adaptation, and autonomous and planned adaptation.

Additionality
Reduction in emissions by sources or enhancement of removals by sinks that is additional to any that would occur in the absence of a Joint Implementation or a Clean Development Mechanism project activity as defined in the Kyoto Protocol Articles on Joint Implementation and the Clean Development Mechanism. This definition may be further broadened to include financial, investment, and technology additionality. Under financial additionality, the project activity funding shall be additional to existing Global Environmental Facility, other financial commitments of Parties included in Annex I, Official Development Assistance, and other systems of co-operation. Under investment additionality, the value of the Emissions Reduction Unit /Certified Emission Reduction Unit shall significantly improve the financial and/or commercial viability of the project activity. Under technology additionality, the technology used for the project activity shall be the best available for the circumstances of the host Party.

Administrative costs
The costs of activities of the project or sectoral activity directly related and limited to its short-term implementation. They include the costs of planning, training, administration, monitoring, etc.

Afforestation
Planting of new forests on lands that historically have not contained forests. See also Deforestation and Deforestation.

AIJ
See Activities Implemented Jointly.

Alliance of Small Island States (AOSIS)
The group was formed during the Second World Climate Conference in 1990 and comprises small island and low-lying coastal developing countries that are particularly vulnerable to the adverse consequences of climate change, such as sea level rise, coral bleaching, and the increased frequency and intensity of tropical storms. With more than 35 states from the Atlantic, Caribbean, Indian Ocean, Mediterranean, and Pacific, AOSIS share common objectives on environmental and sustainable development matters in the UNFCCC (United Nations Framework Convention on Climate Change) process.

Alternative development paths
Refer to a variety of possible scenarios for societal values and consumption and production patterns in all countries, including but not limited to a continuation of today’s trends. In this Report, these paths do not include additional climate initiatives which means that no scenarios are included that explicitly assume implementation of the UNFCCC or the emission targets of the Kyoto Protocol, but do include assumptions about other policies that influence greenhouse gas emissions indirectly.

Alternative energy
Energy derived from non-fossil fuel sources.

Ancillary benefits
The ancillary, or side effects, of policies aimed exclusively at climate change mitigation. Such policies have an impact not only on greenhouse gas emissions, but also on resource use efficiency, like reduction in emissions of local and regional air pollutants associated with fossil fuel use, and on issues such as transportation, agriculture, land-use practices, employment, and fuel security. Sometimes these benefits are referred to as “ancillary impacts” to reflect that in some cases the benefits may be negative. From the perspective of policies directed at

2 For a discussion of the term forest and related terms such as afforestation, reforestation, and deforestation (ARD); see the IPCC Special Report on Land Use, Land-Use Change and Forestry, Cambridge University Press, 2000.
abating local air pollution. **greenhouse gas mitigation** may also be considered an ancillary benefit, but these relationships are not considered in this assessment. See also **co-benefits**.

**Anthropogenic emissions**

**Emissions of greenhouse gases**, **greenhouse gas precursors**, and aerosols associated with human activities. These include burning of **fossil fuels** for energy, deforestation and land-use changes that result in net increase in emissions.

**Annex I countries/Parties**

Group of countries included in Annex I (as amended in 1998) to the **United Nations Framework Convention on Climate Change**, including all the developed countries in the Organisation of Economic Co-operation and Development, and **Economies in transition**. By default, the other countries are referred to as **Non-Annex I countries**. Under Articles 4.2 (a) and 4.2 (b) of the Convention, Annex I countries commit themselves specifically to the aim of returning individually or jointly to their 1990 levels of **greenhouse gas emissions** by the year 2000. See also **Annex II, Annex B**, and **Non-Annex B countries**.

**Annex II countries**

Group of countries included in Annex II to the **United Nations Framework Convention on Climate Change**, including all developed countries in the Organisation of Economic Co-operation and Development. Under Article 4.2 (g) of the Convention, these countries are expected to provide financial resources to assist developing countries to comply with their obligations, such as preparing national reports. Annex II countries are also expected to promote the transfer of environmentally sound technologies to developing countries. See also **Annex I, Annex B, Non-Annex I, and Non-Annex B countries/Parties**.

**Annex B countries/Parties**

Group of countries included in Annex B in the **Kyoto Protocol** that have agreed to a target for their **greenhouse gas emissions**, including all the **Annex I countries** (as amended in 1998) but Turkey and Belarus. See also **Annex II, Non-Annex I, and Non-Annex B countries/Parties**.

**AOSIS**

See **Alliance of Small Island States**.

**Assigned amounts** (AAs)

Under the **Kyoto Protocol**, the total amount of **greenhouse gas emissions** that each **Annex B country** has agreed that its emissions will not exceed in the first commitment period (2008 to 2012) is the assigned amount. This is calculated by multiplying the country’s total **greenhouse gas emissions** in 1990 by five (for the 5-year commitment period) and then by the percentage it agreed to as listed in Annex B of the Kyoto Protocol (e.g., 92% for the European Union; 93% for the USA).

**Assigned amount unit (AAU)**

Equal to 1 tonne (metric ton) of **CO₂-equivalent emissions** calculated using the **Global Warming Potential**.

**Average cost**

**Total cost** divided by the number of units of the item for which the cost is being assessed. With **greenhouse gases**, for example, it would be the total cost of a programme divided by the physical quantity of **emissions** avoided.

**Banking**

According to the **Kyoto Protocol** [Article 3 (13)], Parties included in Annex I to the **United Nations Framework Convention on Climate Change** may save excess **emissions** allowances or credits from the first commitment period for use in subsequent commitment periods (post-2012).

**Barrier**

A barrier is any obstacle to reaching a potential that can be overcome by a policy, programme, or measure.

**Barrier removal costs**

The costs of activities aimed at correcting market failures directly or at reducing the transactions costs in the public and/or private sector. Examples include costs of improving institutional capacity, reducing risk and **uncertainty**, facilitating market transactions, and enforcing regulatory policies.

**Baseline**

A non-intervention **scenario** used as a base in the analysis of intervention scenarios.

**Benefit transfer**

An application of monetary values from a particular valuation study to an alternative or secondary policy-decision setting, often in a geographic area other than the one in which the original study was performed.

**Biofuel**

A fuel produced from dry organic matter or combustible oils produced by plants. Examples of biofuel include alcohol (from fermented sugar), black liquor from the paper manufacturing process, wood, and soybean oil.

**Biological options**

Biological options for mitigation of climate change involves one or more of the three strategies: **conservation** - conserving an existing carbon **pool**, and thereby preventing **emissions** to the atmosphere; **sequestration** - increasing the size of existing carbon pools, and thereby extracting carbon dioxide from the atmosphere; and **substitution** - substituting biological products for **fossil fuels** or energy-intensive products, thereby reducing carbon dioxide emissions.
Biomass
The total mass of living organisms in a given area or volume; recently dead plant material is often included as dead biomass. Biomass can be used for fuel directly by burning it (e.g., wood), or indirectly by fermentation to alcohol (e.g., sugar) or extraction of combustible oils (e.g., soybeans).

Bottom-up models
A modelling approach that includes technological and engineering details in the analysis. See also top-down models.

Bubble
Article 4 of the Kyoto Protocol allows a group of countries to meet their target listed in Annex B jointly by aggregating their total emissions under one “bubble” and sharing the burden. The European Union nations intend to aggregate and share their emissions commitments under one bubble.

Cap
See emissions cap.

Capital costs
Costs associated with capital or investment expenditure on land, plant, equipment, and inventories. Unlike labour and operating costs, capital costs are independent of the level of output for a given capacity of production.

Capacity building
In the context of climate change, capacity building is a process of developing the technical skills and institutional capability in developing countries and Economies in transition to enable them to participate in all aspects of adaptation to, mitigation of, and research on climate change, and the implementation of the Kyoto Mechanisms, etc.

Carbon cycle
The term used to describe the flow of carbon in various forms (e.g., as carbon dioxide) through the atmosphere, ocean, terrestrial biosphere, and lithosphere.

Carbon dioxide (CO$_2$)
A naturally occurring gas, and also a by-product of burning fossil fuels and biomass, as well as land-use changes and other 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 fertilization
The enhancement of the growth of plants as a result of increased atmospheric carbon dioxide concentration. Depending on their mechanism of photosynthesis, certain types of plants are more sensitive to changes in atmospheric carbon dioxide concentration. In particular, plants that produce a three-carbon compound (C$_3$) during photosynthesis; including most trees and agricultural crops such as rice, wheat, soybeans, potatoes and vegetables, generally show a larger response than plants that produce a four-carbon compound (C$_4$) during photosynthesis; mainly of tropical origin, including grasses and the agriculturally important crops maize, sugar cane, millet and sorghum.

Carbon leakage
See leakage.

Carbon tax
See emissions tax.

CDM
See Clean Development Mechanism.

CER
See certified emission reduction.

Certified emission reduction (CER)
Equal to 1 tonne (metric ton) of CO$_2$-equivalent emissions reduced or sequestered through a Clean Development Mechanism project, calculated using Global Warming Potentials. See also emissions reduction units.

CFCs
See chlorofluorocarbons.

CH$_4$
See methane.

Chlorofluorocarbons (CFCs)
Greenhouse gases covered under the 1987 Montreal Protocol and used for refrigeration, air conditioning, packaging, insulation, solvents, or aerosol propellants. Since they are not destroyed in the lower atmosphere, CFCs drift into the upper atmosphere where, given suitable conditions, they break down ozone. These gases are being replaced by other compounds, including hydrochlorofluorocarbons and hydrofluorocarbons, which are greenhouse gases covered under the Kyoto Protocol.

Clean Development Mechanism (CDM)
Defined in Article 12 of the Kyoto Protocol, the Clean Development Mechanism is intended to meet two objectives: (1) to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the convention; and (2) to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments. Certified emission reductions from Clean Development Mechanism projects undertaken in non-Annex I countries that limit or reduce greenhouse gas emissions, when certified by operational entities designated by Conference of the Parties/Meeting of the Parties, can be accrued to the investor (government or industry) from Parties in Annex B. A share of the proceeds from the certified project activities is used to cover administrative expenses as well as to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation.
Climate change refers to a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer). Climate change may result from natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or in land use. Note that United Nations Framework Convention on Climate Change, in its Article 1, defines “climate change” as “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods”. United Nations Framework Convention on Climate Change thus makes a distinction between “climate change” attributable to human activities altering the atmospheric composition, and “climate variability” attributable to natural causes.

Climate Convention
See United Nations Framework Convention on Climate Change.

CO₂
See carbon dioxide.

CO₂-equivalent
The concentration of carbon dioxide that would cause the same amount of radiative forcing as the given mixture of carbon dioxide and other greenhouse gases.

Co-benefits
The benefits of policies that are implemented for various reasons at the same time – including climate change mitigation – acknowledging that most policies designed to address greenhouse gas mitigation also have other, often at least equally important, rationales (e.g., related to objectives of development, sustainability, and equity). The term co-impact is also used in a more generic sense to cover both the positive and negative side of the benefits. See also ancillary benefits.

Co-generation
The use of waste heat from electric generation, such as exhaust from gas turbines, for either industrial purposes or district heating.

Commercialization
Sequence of actions necessary to achieve market entry and general market competitiveness of new technologies, processes, and products.

Compliance
See implementation.

Conference of the Parties (CoP)
The supreme body of the United Nations Framework Convention on Climate Change, comprising countries that have ratified or acceded to the Framework Convention on Climate Change. The first session of the Conference of the Parties (CoP-1) was held in Berlin in 1995, followed by CoP-2 in Geneva 1996, CoP-3 in Kyoto 1997, CoP-4 in Buenos Aires, CoP-5 in Bonn, and CoP-6 in The Hague. See also CoP/MoP and Meeting of the Parties.

Consumer surplus
A measure of the value of consumption beyond the price paid for a good or service.

CoP
See Conference of the Parties.

CoP/MoP
The Conference of the Parties of the United Nations Framework Convention on Climate Change will serve as the Meeting of the Parties (MoP) the supreme body of the Kyoto Protocol, but only Parties to the Kyoto Protocol may participate in deliberations and make decisions. Until the Protocol enters into force, MoP cannot meet.

Cost-effective
A criterion that specifies that a technology or measure delivers a good or service at equal or lower cost than current practice, or the least-cost alternative for the achievement of a given target.

Deforestation
Conversion of forest to non-forest.

Demand-side management
Policies and programmes designed for a specific purpose to influence consumer demand for goods and/or services. In the energy sector, for instance, it refers to policies and programmes designed to reduce consumer demand for electricity and other energy sources. It helps to reduce greenhouse gas emissions.

Dematerialization
The process by which economic activity is decoupled from matter–energy throughput, through processes such as eco-efficient production or industrial ecology, allowing environmental impact to fall per unit of economic activity.

Deposit–refund system
Combines a deposit or fee (tax) on a commodity with a refund or rebate (subsidy) for implementation of a specified action. See also emissions tax.

Desertification
Land degradation in arid, semi-arid, and dry sub-humid areas resulting from various factors, including climatic variations and human activities. Further, the United Nations Convention to Combat Desertification (UNCCD) defines land degradation as a reduction or loss, in arid, semi-arid, and dry sub-humid

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3 See footnote 2.
areas, of the biological or economic productivity and complexity of rain-fed cropland, irrigated cropland, or range, pasture, forest, and woodlands resulting from land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns, such as: (i) soil erosion caused by wind and/or water; (ii) deterioration of the physical, chemical and biological or economic properties of soil; and (iii) long-term loss of natural vegetation.

Double dividend
The effect that revenue-generating instruments, such as a carbon tax or auctioned (tradable) carbon emission permits, can (1) limit or reduce greenhouse gas emissions and (2) offset at least part of the potential welfare losses of climate policies through recycling the revenue in the economy to reduce other taxes likely to be distortionary. In a world with involuntary unemployment, the climate change policy adopted may have an effect (a positive or negative “third dividend”) on employment. Weak double dividend occurs as long as there is a revenue-recycling effect; that is, as long as revenues are recycled through reductions in the marginal rates of distortionary taxes. Strong double dividend requires that the (beneficial) revenue recycling effect more than offset the combination of the primary cost and in this case, the net cost of abatement is negative. See also interaction effects.

Economic potential
Economic potential is the portion of technological potential for greenhouse gas emissions reductions or energy efficiency improvements that could be achieved cost-effectively through the creation of markets, reduction of market failures, increased financial and technological transfers. The achievement of economic potential requires additional policies and measures to break down market barriers. See also market potential, socio-economic potential, and technological potential.

Economies in transition (EITs)
Countries with national economies in the process of changing from a planned economic system to a market economy.

Ecosystem
A system of interacting living organisms and their physical environment. The boundaries of what can be called an ecosystem are somewhat arbitrary, depending on the focus of interest or study. Thus, the extent of an ecosystem may range from very small spatial scales to, ultimately, the entire earth.

Ecotax
See emissions tax

EITs
See economies in transition.

Emissions
In the climate change context, emissions refer to the release of greenhouse gases and/or their precursors and aerosols into the atmosphere over a specified area and period of time.

Emissions cap
A mandated restraint, in a scheduled timeframe, that puts a “ceiling” on the total amount of anthropogenic greenhouse gas emissions that can be released into the atmosphere. The Kyoto Protocol mandates caps on the greenhouse gas emissions released by Annex B countries/Parties.

Emissions factor
An emissions factor is the coefficient that relates actual emissions to activity data as a standard rate of emission per unit of activity.

Emissions permit
An emissions permit is the non-transferable or tradable allocation of entitlements by a government to an individual firm to emit a specified amount of a substance.

Emissions quota
The portion or share of total allowable emissions assigned to a country or group of countries within a framework of maximum total emissions and mandatory allocations of resources.

Emissions reduction unit (ERU)
Equal to 1 tonne (metric ton) of carbon dioxide emissions reduced or sequestered arising from a Joint Implementation (defined in Article 6 of the Kyoto Protocol) project, calculated using Global Warming Potential. See also certified emission reduction and emissions trading.

Emission standard
A level of emission that under law or voluntary agreement may not be exceeded.

Emissions tax
Levy imposed by a government on each unit of CO₂-equivalent emissions by a source subject to the tax. Since virtually all of the carbon in fossil fuels is ultimately emitted as carbon dioxide, a levy on the carbon content of fossil fuels – a carbon tax – is equivalent to an emissions tax for emissions caused by fossil fuel combustion. An energy tax – a levy on the energy content of fuels – reduces demand for energy and so reduces carbon dioxide emissions from fossil fuel use. An ecotax is designated for the purpose of influencing human behaviour (specifically economic behaviour) to follow an ecologically benign path. International emissions/carbon/energy tax is a tax imposed on specified sources in participating countries by an international agency. The revenue is distributed or used as specified by participating countries or the international agency.

Emissions trading
A market-based approach to achieving environmental objectives that allows those reducing greenhouse gas emissions below what is required to use or trade the excess reductions to offset emissions at another source inside or outside the country. In general, trading can occur at the intracompany, domestic, and international levels. The Second Assessment Report by the Intergovernmental Panel on Climate Change adopted the con-
vention of using “permits” for domestic trading systems and “quotas” for international trading systems. Emissions trading under Article 17 of the Kyoto Protocol is a tradable quota system based on the assigned amounts calculated from the emission reduction and limitation commitments listed in Annex B of the Protocol. See also certified emission reduction and Clean Development Mechanism.

Energy conversion
See energy transformation.

Energy efficiency
Ratio of energy output of a conversion process or of a system to its energy input.

Energy intensity
Energy intensity is the ratio of energy consumption to economic or physical output. At the national level, energy intensity is the ratio of total domestic primary energy consumption or final energy consumption to Gross Domestic Product or physical output.

Energy service
The application of useful energy to tasks desired by the consumer such as transportation, a warm room, or light.

Energy Tax
See emissions tax.

Energy transformation
The change from one form of energy, such as the energy embodied in fossil fuels, to another, such as electricity.

Equivalent CO₂
See CO₂-equivalent.

ERU
See emissions reduction unit.

Externality
See external cost.

External cost
Used to define the costs arising from any human activity, when the agent responsible for the activity does not take full account of the impacts on others of his or her actions. Equally, when the impacts are positive and not accounted for in the actions of the agent responsible they are referred to as external benefits. Emissions of particulate pollution from a power station affect the health of people in the vicinity, but this is not often considered, or is given inadequate weight, in private decision making and there is no market for such impacts. Such a phenomenon is referred to as an externality, and the costs it imposes are referred to as the external costs.

FCCC
See United Nations Framework Convention on Climate Change.

Final energy
Energy supplied that is available to the consumer to be converted into usable energy (e.g., electricity at the wall outlet).

Flexibility mechanisms
See Kyoto Mechanisms.

Forest
A vegetation type dominated by trees. Many definitions of the term forest are in use throughout the world, reflecting wide differences in bio-geophysical conditions, social structure, and economics. See also afforestation, deforestation and reforestation.

Fossil fuels
Carbon-based fuels from fossil carbon deposits, including coal, oil, and natural gas.

Fuel switching
Policy designed to reduce carbon dioxide emissions by switching to lower carbon-content fuels, such as from coal to natural gas.

Full-cost pricing
The pricing of commercial goods – such as electric power – that includes in the final prices faced by the end user not only the private costs of inputs, but also the costs of externalities created by their production and use.

G77/China
See Group of 77 and China.

GDP
See Gross Domestic Product.

General equilibrium analysis
General equilibrium analysis is an approach that considers simultaneously all the markets and feedback effects among these markets in an economy leading to market clearance. See also market equilibrium.

Geo-engineering
Efforts to stabilise the climate system by directly managing the energy balance of the earth, thereby overcoming the enhanced greenhouse effect.

GHG
See greenhouse gas.

4 See footnote 2.
Global warming
Global warming is an observed or projected increase in global average temperature.

Global Warming Potential (GWP)
An index, describing the radiative characteristics of well-mixed greenhouse gases, that represents the combined effect of the differing times these gases remain in the atmosphere and their relative effectiveness in absorbing outgoing infrared radiation. This index approximates the time-integrated warming effect of a unit mass of a given greenhouse gas in today’s atmosphere, relative to that of carbon dioxide. Note that GWP also stands for Gross World Product.

GNP
See Gross National Product.

GPP
See Gross Primary Production.

Greenhouse effect
Greenhouse gases effectively absorb infrared radiation emitted by the earth’s surface, by the atmosphere itself from these same gases, and by clouds. Atmospheric radiation is emitted to all sides, including downwards to the earth’s surface. Thus, greenhouse gases trap heat within the surface–troposphere system. This is called the natural greenhouse effect. Atmospheric radiation is strongly coupled to the temperature of the level at which it is emitted. In the troposphere the temperature generally decreases with height. Effectively, infrared radiation emitted to space originates from an altitude with a temperature of, on average, –19°C, in balance with the net incoming solar radiation. However, the earth’s surface is kept at a much higher temperature of on average +14°C. An increase in the concentration of greenhouse gases leads to an increased infrared opacity of the atmosphere, and therefore to an effective radiation into space from a higher altitude at a lower temperature. This causes a radiative forcing, an imbalance that can only be compensated for by an increase in the temperature of the surface–troposphere system. This is the enhanced greenhouse effect.

Greenhouse gas (GHG)
Greenhouse gases are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the earth’s surface, the atmosphere, and clouds. This property causes the greenhouse effect. Water vapour (H2O), carbon dioxide, nitrous oxide, methane and ozone (O3) are the primary greenhouse gases in the earth’s atmosphere. Moreover, there are a number of entirely human-made greenhouse gases in the atmosphere, such as the halocarbons and other chlorine- and bromine-containing substances, dealt with under the Montreal protocol. Beside carbon dioxide, nitrous oxide and methane, the Kyoto Protocol deals with the greenhouse gases sulphur hexafluoride, hydrofluorocarbons, and perfluorocarbons.

Gross World Product (GWP)
An aggregation of the Gross Domestic Products of the world. Note that GWP also stands for Global Warming Potential.

Gross Domestic Product (GDP)
The sum of gross value added, at purchasers’ prices, by all resident and non-resident producers in the economy, plus any taxes and minus any subsidies not included in the value of the products in a country or a geographic region for a given period of time, normally 1 year. It is calculated without deducting for depreciation of fabricated assets or depletion and degradation of natural resources.

Gross National Product (GNP)
GNP is a measure of national income. It measures value added from domestic and foreign sources claimed by residents. GNP comprises Gross Domestic Product plus net receipts of primary income from non-resident income.

Gross Primary Production (GPP)
The amount of carbon fixed from the atmosphere through photosynthesis.

Group of 77 and China (G77/China)
Originally 77, now more than 130 developing countries that act as a major negotiating bloc in the UNFCCC (United Nations Framework Convention on Climate Change) process. G77/China is also referred to as non-Annex I countries in the context of the United Nations Framework Convention on Climate Change.

GWP
See Global Warming Potential, Gross World Product.

Harmonized emissions/carbon/energy tax
Commits participating countries to impose a tax at a common rate on the same sources. Each country can retain the tax revenue it collects. A harmonized tax would not necessarily require countries to impose a tax at the same rate, but imposing different rates across countries would not be cost-effective. See also emissions tax.

HFCs
See hydrofluorocarbons.

Hydrofluorocarbons (HFCs)
Among the six greenhouse gases to be curbed under the Kyoto Protocol. They are produced commercially as a substitute for chlorofluorocarbons. HFCs largely are used in refrigeration and semiconductor manufacturing. Their Global Warming Potentials range from 1300 to 11,700.

IEA

IGO
See Intergovernmental Organization.
Implementation
Implementation refers to the actions (legislation or regulations, judicial decrees, or other actions) that governments take to translate international accords into domestic law and policy. It includes those events and activities that occur after the issuing of authoritative public policy directives, which include the effort to administer and the substantive impacts on people and events. It is important to distinguish between the legal implementation of international commitments (in national law) and the effective implementation (measures that induce changes in the behaviour of target groups). Compliance is a matter of whether and to what extent countries do adhere to the provisions of the accord. Compliance focuses not only on whether implementing measures are in effect, but also on whether there is compliance with the implementing actions. Compliance measures the degree to which the actors whose behaviour is targeted by the agreement, whether they be local government units, corporations, organizations, or individuals, conform to the implementing measures and obligations.

Implementation costs
Costs involved in the implementation of mitigation options. These costs are associated with the necessary institutional changes, information requirements, market size, opportunities for technology gain and learning, and economic incentives needed (grants, subsidies, and taxes).

Income elasticity
The percentage change in the quantity of demand for a good or service, given a 1% change in income.

Industrial ecology
The set of relationships of a particular industry with its environment; often refers to the conscious planning of industrial processes so as to minimize their negative interference with the surrounding environment (e.g., by heat and materials cascading).

Industrialization
The conversion of a society from one based on manual labour to one based on the application of mechanical devices.

Inertia
Property by which matter continues in its existing state of rest or uniform motion in a straight line, unless that state is changed by external force. In the context of climate change mitigation, it is associated with different forms of capital (e.g., physical man-made capital, natural capital, and social non-physical capital, including institutions, regulations, and norms).

Infrastructure
The basic installations and facilities upon which the operation and growth of a community depend, such as roads, schools, electric, gas and water utilities, transportation, and communications systems.

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 evaluate the status and the consequences of environmental change and the policy responses to it.

Interaction effect
The result or consequence of the interaction of climate change policy instruments with existing domestic tax systems, including both cost-increasing tax interaction and cost-reducing revenue-recycling effect. The former reflects the impact that greenhouse gas policies can have on the functioning of labour and capital markets through their effects on real wages and the real return to capital. By restricting the allowable greenhouse gas emissions, permits, regulations, or a carbon tax raise the costs of production and the prices of output, thus reducing the real return to labour and capital. For policies that raise revenue for the government, carbon taxes and auctioned permits, the revenues can be recycled to reduce existing distortionary taxes. See also double dividend.

Intergovernmental Organization (IGO)
Organizations constituted of governments. Examples include the World Bank, the Organization of Economic Co-operation and Development (OECD), the International Civil Aviation Organization (ICAO), the Intergovernmental Panel on Climate Change (IPCC), and other UN and regional organizations. The Climate Convention allows accreditation of these IGOs to attend the negotiating sessions.

International emissions/carbon/energy tax
See emissions tax.

International Energy Agency (IEA)
Paris-based energy forum established in 1974. It is linked with the Organization for Economic Co-operation and Development (OECD) to enable member countries to take joint measures to meet oil supply emergencies, to share energy information, to co-ordinate their energy policies, and to co-operate in the development of rational energy programmes.

International product and/or technology standards
See Standards.

JI
See Joint Implementation.

Joint Implementation (JI)
A market-based implementation mechanism defined in Article 6 of the Kyoto Protocol, allowing Annex I countries or companies from these countries to implement projects jointly that limit or reduce emissions, or enhance sinks, and to share the Emissions Reduction Units. JI activity is also permitted in Article 4.2(a) of the United Nations Framework Convention on Climate Change. See also Activities Implemented Jointly and Kyoto Mechanisms.
Known technological options
Refer to technologies that exist in operation or pilot plant stage today. It does not include any new technologies that will require drastic technological breakthroughs.

Kyoto Mechanisms
Economic mechanisms based on market principles that Parties to the Kyoto Protocol can use in an attempt to lessen the potential economic impacts of greenhouse gas emission-reduction requirements. They include Joint Implementation (Article 6), the Clean Development Mechanism (Article 12), and Emissions Trading (Article 17).

Kyoto Protocol
The Kyoto Protocol to the United Nations Framework Convention on Climate Change was adopted at the Third Session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change in 1997 in Kyoto, Japan. It contains legally binding commitments, in addition to those included in the UNFCCC. Countries included in Annex B of the Protocol (most OECD countries and countries with Economies in transition) agreed to reduce their anthropogenic greenhouse gas emissions (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride) by at least 5% below 1990 levels in the commitment period 2008 to 2012. The Kyoto Protocol has not yet entered into force (November 2000).

Land use
The total of arrangements, activities, and inputs undertaken in a certain land-cover type (a set of human actions). The social and economic purposes for which land is managed (e.g., grazing, timber extraction, and conservation).

Leakage
The part of emissions reductions in Annex B countries that may be offset by an increase of the emission in the non-constrained countries above their baseline levels. This can occur through (1) relocation of energy-intensive production in non-constrained regions; (2) increased consumption of fossil fuels in these regions through decline in the international price of oil and gas triggered by lower demand for these energies; and (3) changes in incomes (and thus in energy demand) because of better terms of trade. Leakage also refers to the situation in which a carbon sequestration activity (e.g., tree planting) on one piece of land inadvertently, directly or indirectly, triggers an activity, which in whole or part, counteracts the carbon effects of the initial activity.

Macroeconomic costs
Usually measured as changes in Gross Domestic Product or growth in Gross Domestic Product, or as loss of “welfare” or loss of consumption.

Marginal cost pricing
The pricing of commercial goods and services such that the price equals the additional cost that arises from the expansion of production by one additional unit.

Market barriers
In the context of mitigation of climate change, conditions that prevent or impede the diffusion of cost-effective technologies or practices that would mitigate greenhouse gas emissions.

Market-based incentives
Measures intended to use price mechanisms (e.g., taxes and tradable permits) to reduce greenhouse gas emissions.

Market equilibrium
The point at which demand for goods and services equals the supply; often described in terms of the level of prices, determined in a competitive market, that “clears” the market.

Market penetration
Market penetration is the share of a given market that is provided by a particular good or service at a given time.

Market potential
The portion of the economic potential for greenhouse gas emissions reductions or energy efficiency improvements that could be achieved under forecast market conditions, assuming no new policies and measures. See also economic potential, socio-economic potential, and technological potential.

Methane (CH₄)
Methane is one of the six greenhouse gases to be mitigated under the Kyoto Protocol.

Methane recovery
Method by which methane emissions, for example from coal mines or waste sites, are captured and then reused either as a fuel, or for some other economic purpose (e.g., reinjection in oil or gas reserves).

Meeting of the Parties (to the Kyoto Protocol) (MoP)
Conference of the Parties to the United Nations Framework Convention on Climate Change serving as the meeting of the Parties to the Kyoto Protocol. It is the supreme body of the Kyoto Protocol.

Mitigation
An anthropogenic intervention to reduce the sources or enhance the sinks of greenhouse gases. See also biological options, geo-engineering.

Mitigative capacity
The social, political, and economic structures and conditions that are required for effective mitigation.

Montreal Protocol
The Montreal Protocol on Substances that Deplete the Ozone Layer was adopted in Montreal in 1987, and subsequently adjusted and amended in London (1990), Copenhagen (1992), Vienna (1995), Montreal (1997) and Beijing (1999). It controls the consumption and production of chlorine- and bromine-containing chemicals that destroy stratospheric ozone, such as...
cholorofluorocarbons, methyl chloroform, carbon tetrachloride, and many others.

**MOP**
See *Meeting of the Parties* (to the Kyoto Protocol).

**N₂O**
See *nitrous oxide*.

**National Action Plans**
Plans submitted to the *Conference of the Parties* by Parties outlining the steps that they have adopted to limit their anthropogenic *greenhouse gas emissions*. Countries must submit these plans as a condition of participating in the *United Nations Framework Convention on Climate Change* and, subsequently, must communicate their progress to the *Conference of the Parties* regularly. The National Action Plans form part of the National Communications, which include the national inventory of *greenhouse gas sources* and *sinks*.

**Nitrous oxide (N₂O)**
One of the six *greenhouse gases* to be curbed under the *Kyoto Protocol*.

**Non-Annex I Parties/Countries**
The countries that have ratified or acceded to the *United Nations Framework Convention on Climate Change* that are not included in Annex I of the *Climate Convention*.

**Non-Annex B countries/Parties**
The countries that are not included in Annex B in the *Kyoto Protocol*.

**No regrets options**
See *no regrets policy*.

**No regrets policy**
One that would generate net social benefits whether or not there is climate change. *No regrets opportunities* for *greenhouse gas emissions* reduction are defined as those options whose benefits such as reduced energy costs and reduced emissions of local/regional pollutants equal or exceed their costs to society, excluding the benefits of avoided climate change. *No regrets potential* is defined as the gap between the *market potential* and the *socio-economic potential*.

**No regrets potential**
See *no regrets policy*.

**Optimal policy**
A policy is assumed to be “optimal” if marginal abatement costs are equalized across countries, thereby minimizing *total costs*.

**Opportunity**
An opportunity is a situation or circumstance to decrease the gap between the *market potential* of any *technology* or practice and the *economic potential*, *socio-economic potential*, or *technological potential*.

**Opportunity cost**
Opportunity cost is the cost of an economic activity forgone by the choice of another activity.

**Ozone**
Ozone, the triatomic form of oxygen (O₃), is a gaseous atmospheric constituent. In the troposphere it is created both naturally and by photochemical reactions involving gases resulting from human activities (“smog”). Tropospheric ozone acts as a *greenhouse gas*. In the stratosphere it is created by the interaction between solar ultraviolet radiation and molecular oxygen (O₂). Stratospheric ozone plays a decisive role in the stratospheric radiative balance. Its concentration is highest in the ozone layer.

**PAMs**
See *Policies and Measures*.

**Pareto criterion / Pareto optimum**
A requirement or status that an individual’s welfare could not be further improved without making others in the society worse off.

**Pareto improvement**
The opportunity that one individual’s welfare can be improved without making the welfare of the rest of society worse off.

**Performance criteria**
See *standards*.

**Perfluorocarbons (PFCs)**
Among the six *greenhouse gases* to be abated under the *Kyoto Protocol*. These are by-products of aluminium smelting and uranium enrichment. They also replace *chlorofluorocarbons* in manufacturing semiconductors. The *Global Warming Potential* of PFCs is 6500–9200 times that of *carbon dioxide*.

**PFCs**
See *perfluorocarbons*.

**Policies and Measures (PAMs)**
In *United Nations Framework Convention on Climate Change* parlance, *policies* are actions that can be taken and/or mandated by a government—often in conjunction with business and industry within its own country, as well as with other countries—to accelerate the application and use of measures to curb *greenhouse gas emissions*. *Measures* are technologies, processes, and practices used to implement policies, which, if employed, would reduce *greenhouse gas emissions* below anticipated future levels. Examples might include carbon or other energy taxes, standardized fuel efficiency *standards* for automobiles, etc. “Common and co-ordinated” or “harmonized” policies refer to those adopted jointly by Parties.
Pool
See reservoir.

PPP
See Purchasing Power Parity. It also stands for polluter-pays-principle.

Precautionary Principle
A provision under Article 3 of the United Nations Framework Convention on Climate Change, stipulating that the Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost.

Present value cost
The sum of all costs over all time periods, with future costs discounted.

Price elasticity
The responsiveness of demand to the cost for a good or service; specifically, the percentage change in the quantity consumed of a good or service for a 1% change in the price for that good or service.

Primary energy
Energy embodied in natural resources (e.g., coal, crude oil, sunlight, uranium) that has not undergone any anthropogenic conversion or transformation.

“Primary market” and “secondary market” trading
In commodities and financial exchanges, buyers and sellers who trade directly with each other constitute the “primary market”, while buying and selling through the exchange facilities represent the “secondary market”.

Private costs
Categories of costs influencing an individual’s decision-making are referred to as private costs. See also social cost, external cost, and total cost.

Producer surplus
Returns beyond the cost of production that provide compensation for owners of skills or assets that are scarce (e.g., agriculturally productive land). See also consumer surplus.

Project costs
Project costs are all the financial costs of a project such as capital, labour, and operating costs.

Purchasing Power Parity (PPP)
Estimates of Gross Domestic Product based on the purchasing power of currencies rather than on current exchange rates. Such estimates are a blend of extrapolated and regression-based numbers, using the results of the International Comparison Program. PPP estimates tend to lower per capita Gross Domestic Products in industrialized countries and raise per capita Gross Domestic Products in developing countries. PPP is also an acronym for polluter-pays-principle.

QELRCs
See quantified emission limitation or reduction commitments.

Quantified emission limitation or reduction commitments (QELRCs)
The greenhouse gas emissions reduction commitments, in percentage terms relevant to base year or period, made by developed countries listed in Annex B of the Kyoto Protocol. See also targets and timetables.

Radiative forcing
Radiative forcing is the change in the net vertical irradiance (expressed in Watts per square meter: Wm$^{-2}$) at the tropopause due to an internal change or a change in the external forcing of the climate system, such as, for example, a change in the concentration of carbon dioxide or the output of the Sun. Usually radiative forcing is computed after allowing for stratospheric temperatures to readjust to radiative equilibrium, but with all tropospheric properties held fixed at their unperturbed values. Radiative forcing is called instantaneous if no change in stratospheric temperature is accounted for.

Rebound effect
Occurs because, for example, an improvement in motor efficiency lowers the cost per kilometre driven; it has the perverse effect of encouraging more trips.

Reforestation
Planting of forests on lands that have previously contained forests but that have been converted to some other use. See also afforestation and deforestation.

Regulatory measures
Rules or codes enacted by governments that mandate product specifications or process performance characteristics. See also standards.

Renewables
Energy sources that are, within a short timeframe relative to the earth’s natural cycles, sustainable, and include non-carbon technologies such as solar energy, hydropower, and wind, as well as carbon neutral technologies such as biomass.

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5 See also footnote 2.
**Research, development, and demonstration**
Scientific and/or technical research and development of new production processes or products, coupled with analysis and measures that provide information to potential users regarding the application of the new product or process; demonstration tests, and feasibility of applying these products processes via pilot plants and other pre-commercial applications.

**Reserves**
Refer to those occurrences that are identified and measured as economically and technically recoverable with current technologies and prices. See also resources.

**Reservoir**
A component of the climate system, other than the atmosphere, which has the capacity to store, accumulate or release a substance of concern, e.g. carbon, a greenhouse gas or a precursor. Oceans, soils, and forests are examples of reservoirs of carbon. Pool is an equivalent term (note that the definition of pool often includes the atmosphere). The absolute quantity of substance of concern, held within a reservoir at a specified time, is called the stock.

**Resources**
Resources are those occurrences with less certain geological and/or economic characteristics, but which are considered potentially recoverable with foreseeable technological and economic developments.

**Resource base**
Resource base includes both reserves and resources.

**Revenue recycling**
See interaction effect.

**Safe landing approach**
See tolerable windows approach.

**Scenario**
A plausible and often simplified description of how the future may develop, based on a coherent and internally consistent set of assumptions about key driving forces (e.g., rate of technology change, prices) and relationships. Note that scenarios are neither predictions nor forecasts.

**Sequestration**
The process of increasing the carbon content of a carbon reservoir other than the atmosphere. Biological approaches to sequestration include direct removal of carbon dioxide from the atmosphere through land-use change, afforestation, reforestation, and practices that enhance soil carbon in agriculture. Physical approaches include separation and disposal of carbon dioxide from flue gases or from processing fossil fuels to produce hydrogen (H₂) and carbon dioxide-rich fractions and long-term storage underground in depleted oil and gas reservoirs, coal seams, and saline aquifers.

**SF₆**
See sulphur hexafluoride.

**Sinks**
Any process or activity or mechanism that removes a greenhouse gas, an aerosol, or a precursor of a greenhouse gas or aerosol from the atmosphere.

**Social costs**
The social cost of an activity includes the value of all the resources used in its provision. Some of these are priced and others are not. Non-priced resources are referred to as externalities. It is the sum of the costs of these externalities and the priced resources that makes up the social cost. See also private cost, external cost, and total cost.

**Socio-economic potential**
The socio-economic potential represents the level of GHG mitigation that would be approached by overcoming social and cultural obstacles to the use of technologies that are cost-effective. See also economic potential, market potential, and technology potential.

**Source**
A source is any process, activity or mechanism that releases a greenhouse gas, an aerosol, or a precursor of a greenhouse gas or aerosol into the atmosphere.

**Spillover effect**
The economic effects of domestic or sectoral mitigation measures on other countries or sectors. In this report, no assessment is made on environmental spillover effects. Spillover effects can be positive or negative and include effects on trade, carbon leakage, transfer, and diffusion of environmentally sound technology and other issues.

**Stabilization**
The achievement of stabilization of atmospheric concentrations of one or more greenhouse gases (e.g., carbon dioxide or a CO₂-equivalent basket of greenhouse gases).

**Stabilization analysis**
In this report this refers to analyses of scenarios that address the stabilization of the concentration of greenhouse gases.

**Stabilization scenarios**
See stabilization analysis.

**Stakeholders**
Person or entity holding grants, concessions, or any other type of value or interest that would be affected by a particular action or policy.

**Standards**
Set of rules or codes mandating or defining product performance (e.g., grades, dimensions, characteristics, test methods, and rules for use). International product and/or technology or
performance standards establish minimum requirements for affected products and/or technologies in countries where they are adopted. The standards reduce greenhouse gas emissions associated with the manufacture or use of the products and/or application of the technology. See also emissions standards, regulatory measures.

Stock
See reservoir.

Storyline
A narrative description of a scenario (or a family of scenarios) that highlights the main scenario characteristics, relationships between key driving forces, and the dynamics of the scenarios.

Structural change
Changes, for example, in the relative share of Gross Domestic Product produced by the industrial, agricultural, or services sectors of an economy; or more generally, systems transformations whereby some components are either replaced or potentially substituted by other ones.

Subsidy
Direct payment from the government to an entity, or a tax reduction to that entity, for implementing a practice the government wishes to encourage. Greenhouse gas emissions can be reduced by lowering existing subsidies that have the effect of raising emissions, such as subsidies to fossil fuel use, or by providing subsidies for practices that reduce emissions or enhance sinks (e.g., for insulation of buildings or planting trees).

Sulphur hexafluoride (SF₆)
One of the six greenhouse gases to be curbed under the Kyoto Protocol. It is largely used in heavy industry to insulate high-voltage equipment and to assist in the manufacturing of cable-cooling systems. Its Global Warming Potential is 23,900.

Supplementarity
The Kyoto Protocol states that emissions trading and Joint Implementation activities are to be supplemental to domestic actions (e.g., energy taxes, fuel efficiency standards, etc.) taken by developed countries to reduce their greenhouse gas emissions. Under some proposed definitions of supplementarity (e.g., a concrete ceiling on level of use), developed countries could be restricted in their use of the Kyoto mechanisms to achieve their reduction targets. This is a subject for further negotiation and clarification by the parties.

Targets and timetables
A target is the reduction of a specific percentage of greenhouse gas emissions from a baseline date (e.g., “below 1990 levels”) to be achieved by a set date, or timetable (e.g., 2008 to 2012). For example, under the Kyoto Protocol’s formula, the European Union has agreed to reduce its greenhouse gas emissions by 8% below 1990 levels by the 2008 to 2012 commitment period. These targets and timetables are, in effect, an emissions cap on the total amount of greenhouse gas emissions that can be emitted by a country or region in a given time period. See also quantified emission limitation or reduction commitments.

Tax-interaction effect
See interaction effect.

Technological potential
The amount by which it is possible to reduce greenhouse gas emissions or improve energy efficiency by implementing a technology or practice that has already been demonstrated. See also economic potential, market potential, and socio-economic potential.

Technology
A piece of equipment or a technique for performing a particular activity.

Technology or performance standard
See standard.

Technology transfer
The broad set of processes that cover the exchange of knowledge, money, and goods among different stakeholders that lead to the spreading of technology for adapting to or mitigating climate change. As a generic concept, the term is used to encompass both diffusion of technologies and technological co-operation across and within countries.

Tolerable windows approach
These approaches analyse greenhouse gas emissions as they would be constrained by adopting a long-term climate - rather than greenhouse gas concentration stabilization - target (e.g., expressed in terms of temperature or sea level changes or the rate of such changes). The main objective of these approaches is to evaluate the implications of such long-term targets for short- or medium-term “tolerable” ranges of global greenhouse gas emissions. Also referred to as safe landing approaches.

Top-down models
The terms “top-down” and “bottom-up” are shorthand for aggregate and disaggregated models. The top-down label derives from how modellers applied macroeconomic theory and econometric techniques to historical data on consumption, prices, incomes, and factor costs to model final demand for goods and services, and supply from main sectors, like the energy sector, transportation, agriculture, and industry. Therefore, top-down models evaluate the system from aggregate economic variables, as compared to bottom-up models that consider technological options or project specific climate change mitigation policies. Some technology data were, however, integrated into top-down analysis and so the distinction is not that clear-cut.

Total cost
All items of cost added together. The total cost to society is made up of both the external cost and the private cost, which together are defined as social cost.
Trace gas
A minor constituent of the atmosphere. The most important trace gases that contribute to the greenhouse effect are, inter alia, carbon dioxide, ozone, methane, nitrous oxide, perfluorocarbons, chlorofluorocarbons, hydrofluorocarbons, sulphur hexafluoride, methyl chloride, and water vapour.

 Tradable quota system
See emissions trading.

Trade effects
Economic impacts of changes in the purchasing power of a bundle of exported goods of a country for bundles of goods imported from its trade partners. Climate policies change the relative production costs and may change terms of trade substantially enough to change the ultimate economic balance.

Umbrella Group
A set of largely non-European developed countries who occasionally act as a negotiating bloc on specific issues.

United Nations Framework Convention on Climate Change (UNFCCC)
The Convention was adopted on 9 May 1992 in New York and signed at the 1992 Earth Summit in Rio de Janeiro by more than 150 countries and the European Economic Community. Its ultimate objective is the “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”. It contains commitments for all Parties. Under the Convention Parties included in Annex I aim to return greenhouse gas emission not controlled by the Montreal Protocol to 1990 levels by the year 2000. The convention entered in force in March 1994. See also Conference of the Parties and Kyoto Protocol.

Uncertainty
An expression of the degree to which a value (e.g., 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 ambiguously defined concepts or terminology, or uncertain projections of human behaviour. Uncertainty can therefore be represented by quantitative measures (e.g., a range of values calculated by various models) or by qualitative statements (e.g., reflecting the judgement of a team of experts).

UNFCCC
See United Nations Framework Convention on Climate Change.

Value added
The net output of a sector after adding up all outputs and subtracting intermediate inputs.

Value
Worth, desirability, or utility based on individual preferences. The total value of any resource is the sum of the values of the different individuals involved in the use of the resource. The values, which are the foundation of the estimation of costs, are measured in terms of the willingness to pay (WTP) by individuals to receive the resource or by the willingness of individuals to accept payment (WTA) to part with the resource.

Vision
Picture of a future world, usually a desired future world.

Voluntary agreement
An agreement between a government authority and one or more private parties, as well as a unilateral commitment that is recognized by the public authority, to achieve environmental objectives or to improve environmental performance beyond compliance.

Voluntary measures
Measures to reduce greenhouse gas emissions that are adopted by firms or other actors in the absence of government mandates. Voluntary measures help make climate-friendly products or processes more readily available or encourage consumers to incorporate environmental values in their market choices.
III

Acronyms, Abbreviations, and Chemical Compounds
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>AAUs</td>
<td>Assigned Amount Units</td>
</tr>
<tr>
<td>ABWR</td>
<td>Advanced Boiling Water Reactor</td>
</tr>
<tr>
<td>ACEA</td>
<td>European Automobile Manufacturer’s Association</td>
</tr>
<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
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<tr>
<td>AEEI</td>
<td>Autonomous Energy Efficiency Improvement</td>
</tr>
<tr>
<td>AIJ</td>
<td>Activity Implemented Jointly</td>
</tr>
<tr>
<td>ALGAS</td>
<td>Asia-Least-Cost Greenhouse Gas Abatement Strategy</td>
</tr>
<tr>
<td>ARD</td>
<td>Afforestation, Reforestation and Deforestation</td>
</tr>
<tr>
<td>ASF</td>
<td>Atmospheric Stabilization Framework</td>
</tr>
<tr>
<td>BAU</td>
<td>Business-As-Usual</td>
</tr>
<tr>
<td>BIGCC</td>
<td>Biomass Integrated Gasification Combined Cycle</td>
</tr>
<tr>
<td>BOP</td>
<td>Balance-Of-Payments</td>
</tr>
<tr>
<td>BWR</td>
<td>Boiling Water Reactor</td>
</tr>
<tr>
<td>C</td>
<td>Carbon</td>
</tr>
<tr>
<td>C₂F₆</td>
<td>Perfluoroethane / Hexafluoroethane</td>
</tr>
<tr>
<td>CAC</td>
<td>Command and control</td>
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<tr>
<td>CAFE</td>
<td>Corporate Average Fuel Economy</td>
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<tr>
<td>CANZ</td>
<td>Canada, Australia and New Zealand</td>
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<tr>
<td>CBA</td>
<td>Cost Benefit Analysis</td>
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<tr>
<td>CCGT</td>
<td>Combined Cycle Gas Turbine</td>
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<tr>
<td>CDM</td>
<td>Clean Development Mechanism</td>
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<tr>
<td>CEA</td>
<td>Cost-Effectiveness Analysis</td>
</tr>
<tr>
<td>CERs</td>
<td>Certified Emission Reduction</td>
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<tr>
<td>CF₄</td>
<td>Perfluoromethane / Tetrafluoromethane</td>
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<tr>
<td>CFCs</td>
<td>Chlorofluorocarbons</td>
</tr>
<tr>
<td>CFL</td>
<td>Compact Fluorescent Lamps</td>
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<tr>
<td>CGE</td>
<td>Computable General Equilibrium</td>
</tr>
<tr>
<td>CH₄</td>
<td>Methane</td>
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<tr>
<td>CHP</td>
<td>Combined Heat and Power</td>
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<tr>
<td>CO</td>
<td>Carbon-monoxide</td>
</tr>
<tr>
<td>CO₂</td>
<td>Carbon-dioxide</td>
</tr>
<tr>
<td>COP</td>
<td>Conference of Parties</td>
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<tr>
<td>CSD</td>
<td>Commission for Sustainable Development</td>
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<tr>
<td>DCs</td>
<td>Developing Countries</td>
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<tr>
<td>DES</td>
<td>Development, Equity, and Sustainability</td>
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<tr>
<td>DMF</td>
<td>Decision Making Framework</td>
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<tr>
<td>DSM</td>
<td>Demand Side Management</td>
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<tr>
<td>EBRD</td>
<td>European Bank for Reconstruction and Development</td>
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<tr>
<td>EEA</td>
<td>European Environmental Agency</td>
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<tr>
<td>EITs</td>
<td>Economies In Transition</td>
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<tr>
<td>EMS</td>
<td>Environmental Management Standard</td>
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<tr>
<td>ERUs</td>
<td>Emission Reduction Units</td>
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<tr>
<td>ESCOs</td>
<td>Energy Service Companies</td>
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<tr>
<td>ESTs</td>
<td>Environmentally Sound Technologies</td>
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<tr>
<td>EU</td>
<td>European Union</td>
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<tr>
<td>FAO</td>
<td>United Nations Food and Agricultural Organization</td>
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<tr>
<td>FBC</td>
<td>Fluid Bed Combustion</td>
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<tr>
<td>FDI</td>
<td>Foreign Direct Investments</td>
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<tr>
<td>FGDA</td>
<td>Flue Gas Desulphurization</td>
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<tr>
<td>GATT</td>
<td>General Agreement on Trade and Tariff</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>GEF</td>
<td>Global Environment Facility</td>
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<tr>
<td>GHPs</td>
<td>Greenhouse Gases</td>
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<tr>
<td>GNE</td>
<td>Gross National Product</td>
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<tr>
<td>GWP</td>
<td>Global Warming Potential / Gross World Product</td>
</tr>
<tr>
<td>H₂O</td>
<td>Water vapour</td>
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<tr>
<td>HC</td>
<td>Hydrocarbons</td>
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<tr>
<td>HCFC</td>
<td>Hydrochlorofluorocarbon</td>
</tr>
<tr>
<td>HDI</td>
<td>Human Development Index</td>
</tr>
<tr>
<td>HFCs</td>
<td>Hydrofluorocarbons (hydrogenated Fluorocarbons)</td>
</tr>
<tr>
<td>HFE</td>
<td>Hydrofluorothers</td>
</tr>
<tr>
<td>HVAC</td>
<td>Heating, Ventilation and Air Conditioning</td>
</tr>
<tr>
<td>IA</td>
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</tr>
<tr>
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<td>International Atomic Energy Agency</td>
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<td>IAMS</td>
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<td>ICAO</td>
<td>International Civil Aviation Organization</td>
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<td>ICE</td>
<td>Internal Combustion Engine</td>
</tr>
<tr>
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<td>International Energy Agency</td>
</tr>
<tr>
<td>IET</td>
<td>International Emissions Trading</td>
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<tr>
<td>IGCC</td>
<td>Integrated Gasification Combined Cycle</td>
</tr>
<tr>
<td>IGCCS</td>
<td>Integrated Gasification Combined Cycle or Supercritical</td>
</tr>
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<td>IMO</td>
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<td>IPCC</td>
<td>Intergovernmental Panel on Climate Change</td>
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<td>IS92</td>
<td>IPCC 1992 Scenario</td>
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<td>ISIC</td>
<td>International Standard Industrial Classification</td>
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<td>IUCN</td>
<td>International Union for the Conservation of Nature and Natural Resources</td>
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<tr>
<td>JI</td>
<td>Joint Implementation</td>
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<tr>
<td>LESS</td>
<td>Low CO₂ - emitting Energy Supply System</td>
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<td>Liquid Natural Gas</td>
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<td>Liquefied Petroleum Gas</td>
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<td>Light Water Reactor</td>
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<td>MAC</td>
<td>Marginal Abatement Cost</td>
</tr>
<tr>
<td>MDB</td>
<td>Multilateral Development Banks</td>
</tr>
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<td>MEA</td>
<td>Multilateral Environmental Agreements</td>
</tr>
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<td>MNCs</td>
<td>Multinational Corporation</td>
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<tr>
<td>N</td>
<td>Nitrogen (element)</td>
</tr>
<tr>
<td>N₂</td>
<td>Nitrogen (gas)</td>
</tr>
<tr>
<td>N₂O</td>
<td>Nitrous oxide</td>
</tr>
<tr>
<td>Na₃AlF₆</td>
<td>Cryolite</td>
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<td>Nomenclature des Activites dans la Communauté Européenne (Index of Business Activities in the European Union)</td>
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<td>Non-Governmental Organizations</td>
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<td>NH₃</td>
<td>Ammonia</td>
</tr>
<tr>
<td>NH₄⁺</td>
<td>Ammonium ion</td>
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<td>NICs</td>
<td>Newly Industrialized Countries</td>
</tr>
<tr>
<td>Acronyms, Abbreviations, and Chemical Compounds</td>
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<tr>
<td>-----------------------------------------------</td>
<td>------------------------------------------------</td>
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<tr>
<td>NMHC</td>
<td>Non-Methane Hydrocarbon</td>
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<tr>
<td>NMVOCs</td>
<td>Non-Methane Volatile Organic Compounds</td>
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<tr>
<td>NO</td>
<td>Nitric oxide</td>
</tr>
<tr>
<td>NO₂</td>
<td>Nitrogen dioxide</td>
</tr>
<tr>
<td>NOₓ</td>
<td>The sum of NO and NO₂</td>
</tr>
<tr>
<td>O₂</td>
<td>Oxygen</td>
</tr>
<tr>
<td>O₃</td>
<td>Ozone</td>
</tr>
<tr>
<td>ODA</td>
<td>Official Development Assistance</td>
</tr>
<tr>
<td>ODS</td>
<td>Ozone Depleting Substances</td>
</tr>
<tr>
<td>OECD</td>
<td>Organization for Economic Co-operation and Development</td>
</tr>
<tr>
<td>OPEC</td>
<td>Organization of Petroleum Exporting Countries</td>
</tr>
<tr>
<td>PEM</td>
<td>Proton exchange membrane</td>
</tr>
<tr>
<td>PFC</td>
<td>Perfluorocarbon</td>
</tr>
<tr>
<td>PPM</td>
<td>Processes and Production Method or Parts Per Million</td>
</tr>
<tr>
<td>PPP</td>
<td>Purchasing Power Parity or Polluter Pays Principle</td>
</tr>
<tr>
<td>PV</td>
<td>Photo Voltai</td>
</tr>
<tr>
<td>PWR</td>
<td>Pressurized Water Reactor</td>
</tr>
<tr>
<td>QELRCs</td>
<td>Quantified Emission Limitation or Reduction Commitments</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>SAR</td>
<td>Second Assessment Report of the IPCC</td>
</tr>
<tr>
<td>SBSTA</td>
<td>Subsidiary Body for Scientific and Technological Advice</td>
</tr>
<tr>
<td>SF₆</td>
<td>Sulfur hexafluoride</td>
</tr>
<tr>
<td>SMEs</td>
<td>Small and Medium Sized Enterprises</td>
</tr>
<tr>
<td>SO₂</td>
<td>Sulphur dioxide</td>
</tr>
<tr>
<td>SOₓ</td>
<td>Sulphur oxides</td>
</tr>
<tr>
<td>SPM</td>
<td>Summary for Policymakers</td>
</tr>
<tr>
<td>SRES</td>
<td>Special Report on Emissions Scenarios</td>
</tr>
<tr>
<td>SRLULUCF</td>
<td>Special Report on Land-Use, Land-Use Change and Forestry</td>
</tr>
<tr>
<td>TAR</td>
<td>United Nations Conference on Environment and Development</td>
</tr>
<tr>
<td>UNDP</td>
<td>United Nations Development Programme</td>
</tr>
<tr>
<td>UNEP</td>
<td>United Nations Environment Programme</td>
</tr>
<tr>
<td>UNFCCC</td>
<td>United Nations Framework Convention on Climate Change</td>
</tr>
<tr>
<td>VA</td>
<td>Voluntary Agreements or Value - Added</td>
</tr>
<tr>
<td>VAT</td>
<td>Value Added Tax</td>
</tr>
<tr>
<td>VOC</td>
<td>Volatile organic compound</td>
</tr>
<tr>
<td>WCED</td>
<td>World Commission on Environment and Development</td>
</tr>
<tr>
<td>WEC</td>
<td>World Energy Council</td>
</tr>
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<td>WG I</td>
<td>Working Group One of the IPCC</td>
</tr>
<tr>
<td>WG II</td>
<td>Working Group Two of the IPCC</td>
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<tr>
<td>WG III</td>
<td>Working Group Three of the IPCC</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
<tr>
<td>WTA</td>
<td>Willingness to Accept compensation</td>
</tr>
<tr>
<td>WTO</td>
<td>World Trade Organization</td>
</tr>
<tr>
<td>WTP</td>
<td>Willingness to Pay</td>
</tr>
<tr>
<td>WWF</td>
<td>World Wide Fund for Nature</td>
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IV

Units, Conversion Factors, and GDP Deflators
### Units

#### SI (Systeme Internationale) Units

<table>
<thead>
<tr>
<th>Physical Quantity</th>
<th>Name of Unit</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>length</td>
<td>metre</td>
<td>m</td>
</tr>
<tr>
<td>mass</td>
<td>kilogram</td>
<td>kg</td>
</tr>
<tr>
<td>time</td>
<td>second</td>
<td>s</td>
</tr>
<tr>
<td>thermodynamic temperature</td>
<td>kelvin</td>
<td>K</td>
</tr>
<tr>
<td>amount of substance</td>
<td>mole</td>
<td>mol</td>
</tr>
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</table>

#### Fraction Prefixes and Symbols

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Prefix</th>
<th>Symbol</th>
<th>Multiple</th>
<th>Prefix</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10^{-1}$</td>
<td>deci</td>
<td>d</td>
<td>10</td>
<td>deca</td>
<td>da</td>
</tr>
<tr>
<td>$10^{-2}$</td>
<td>cent</td>
<td>c</td>
<td>$10^{2}$</td>
<td>hecto</td>
<td>h</td>
</tr>
<tr>
<td>$10^{-3}$</td>
<td>milli</td>
<td>m</td>
<td>$10^{3}$</td>
<td>kilo</td>
<td>k</td>
</tr>
<tr>
<td>$10^{-6}$</td>
<td>micro</td>
<td>µ</td>
<td>$10^{6}$</td>
<td>mega</td>
<td>M</td>
</tr>
<tr>
<td>$10^{-9}$</td>
<td>nano</td>
<td>n</td>
<td>$10^{9}$</td>
<td>giga</td>
<td>G</td>
</tr>
<tr>
<td>$10^{-12}$</td>
<td>pico</td>
<td>p</td>
<td>$10^{12}$</td>
<td>tera</td>
<td>T</td>
</tr>
<tr>
<td>$10^{-15}$</td>
<td>femto</td>
<td>f</td>
<td>$10^{15}$</td>
<td>peta</td>
<td>P</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$10^{18}$</td>
<td>eta</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$10^{21}$</td>
<td>zeta</td>
<td>Z</td>
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</table>

#### Special Names and Symbols for Certain SI-Derived Units

<table>
<thead>
<tr>
<th>Physical Quantity</th>
<th>Name of SI Unit</th>
<th>Symbol for SI Unit</th>
<th>Definition of Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>force</td>
<td>newton</td>
<td>N</td>
<td>kg m s⁻²</td>
</tr>
<tr>
<td>pressure</td>
<td>pascal</td>
<td>Pa</td>
<td>kg m⁻¹ s⁻² (=N m⁻²)</td>
</tr>
<tr>
<td>energy</td>
<td>joule</td>
<td>J</td>
<td>kg m² s⁻²</td>
</tr>
<tr>
<td>power</td>
<td>watt</td>
<td>W</td>
<td>kg m² s⁻³ (=J s⁻¹)</td>
</tr>
<tr>
<td>frequency</td>
<td>hertz</td>
<td>Hz</td>
<td>s⁻¹ (cycles per second)</td>
</tr>
</tbody>
</table>

#### Decimal Fractions and Multiples of SI Units Having Special Names

<table>
<thead>
<tr>
<th>Physical Quantity</th>
<th>Name of Unit</th>
<th>Symbol for Unit</th>
<th>Definition of Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>length</td>
<td>ångstrom</td>
<td>Å</td>
<td>$10^{-10}$ m = $10^{-8}$ cm</td>
</tr>
<tr>
<td>length</td>
<td>micron</td>
<td>µm</td>
<td>$10^{-6}$ m</td>
</tr>
<tr>
<td>area</td>
<td>hectare</td>
<td>ha</td>
<td>$10^{4}$ m²</td>
</tr>
<tr>
<td>force</td>
<td>dyne</td>
<td>dyn</td>
<td>$10^{-5}$ N</td>
</tr>
<tr>
<td>pressure</td>
<td>bar</td>
<td>bar</td>
<td>$10^{5}$ N m⁻² = $10^{5}$ Pa</td>
</tr>
<tr>
<td>pressure</td>
<td>millibar</td>
<td>mb</td>
<td>$10^{2}$ N m⁻² = 1 hPa</td>
</tr>
<tr>
<td>mass</td>
<td>tonne</td>
<td>t</td>
<td>$10^{3}$ kg</td>
</tr>
<tr>
<td>mass</td>
<td>gram</td>
<td>g</td>
<td>$10^{-3}$ kg</td>
</tr>
<tr>
<td>column density</td>
<td>Dobson units</td>
<td>DU</td>
<td>$2.687 \times 10^{16}$ molecules cm⁻²</td>
</tr>
<tr>
<td>Stream function</td>
<td>Sverdrup</td>
<td>Sv</td>
<td>$10^{6}$ m³ s⁻¹</td>
</tr>
</tbody>
</table>
Non-SI Units

°C  
degree Celsius (0 °C = 273 K approximately)
Temperature differences are also given in °C (=K) rather than the more correct form of “Celsius degrees”.

ppmv  
parts per million (10^6) by volume

ppbv  
parts per billion (10^9) by volume

pptv  
parts per trillion (10^12) by volume

yr  
year

Btu  
British Thermal Unit

MWe  
megawatts of electricity

tce  
tonnes of coal equivalent

toe  
tonnes of oil equivalent

boe  
barrels of oil equivalent

The units of mass adopted in this report are generally those which have come into common usage and have deliberately not been harmonized, e.g.,

kt  
kilotonnes (10^3 tonnes)

GtC  
gigatonnes of carbon (1 GtC = (10^9 tonnes C = 3.67 Gt carbon dioxide)

PgC  
petagrammes of carbon (1 PgC = 1 GtC)

MtN  
megatonnes (10^6 tonnes) of nitrogen

TgC  
teragrammes of carbon (1 TgC = 1 MtC)

TgCH_4  
teragrammes of methane

TgN  
teragrammes of nitrogen

TgS  
teragrammes of sulphur

Conversion Factors\(^1\)

C - CO\(_2\) Conversion Factor

\(\frac{C}{CO_2} = \frac{1}{3.67}\)

General Conversion Factors for Energy

<table>
<thead>
<tr>
<th>To:</th>
<th>TJ</th>
<th>Gcal</th>
<th>Mtoe</th>
<th>MBtu</th>
<th>GWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>From:</td>
<td>multiply by:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TJ</td>
<td>1</td>
<td>238.8</td>
<td>2.388 x 10^{-5}</td>
<td>947.8</td>
<td>0.2778</td>
</tr>
<tr>
<td>Gcal</td>
<td>4.1868 x 10^{-3}</td>
<td>1</td>
<td>10^{-7}</td>
<td>3.968</td>
<td>1.163 x 10^{-3}</td>
</tr>
<tr>
<td>Mtoe</td>
<td>4.1868 x 10^{-4}</td>
<td>10^{-7}</td>
<td>1</td>
<td>3.968 x 10^{-7}</td>
<td>11630</td>
</tr>
<tr>
<td>Mbtu</td>
<td>1.0551 x 10^{-3}</td>
<td>0.252</td>
<td>2.52 x 10^{-8}</td>
<td>1</td>
<td>2.391 x 10^{-4}</td>
</tr>
<tr>
<td>GWh</td>
<td>3.6</td>
<td>860</td>
<td>8.6 x 10^{-5}</td>
<td>3412</td>
<td>1</td>
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</table>

### Conversion Factors for Mass

<table>
<thead>
<tr>
<th>From:</th>
<th>kg</th>
<th>t</th>
<th>lt</th>
<th>st</th>
<th>lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>kilogram (kg)</td>
<td>1</td>
<td>0.001</td>
<td>9.84 E-4</td>
<td>1.102 E-3</td>
<td>2.2046</td>
</tr>
<tr>
<td>tonne (t)</td>
<td>1000</td>
<td>1</td>
<td>0.984</td>
<td>1.1023</td>
<td>2204.6</td>
</tr>
<tr>
<td>long ton (lt)</td>
<td>1016</td>
<td>1.016</td>
<td>1</td>
<td>1.120</td>
<td>2240.0</td>
</tr>
<tr>
<td>short ton (st)</td>
<td>907.2</td>
<td>0.9072</td>
<td>0.893</td>
<td>1</td>
<td>2000.0</td>
</tr>
<tr>
<td>Pound (lb)</td>
<td>0.454</td>
<td>4.54 E-4</td>
<td>4.46 E-4</td>
<td>5.0 E-4</td>
<td>1</td>
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</tbody>
</table>

### Conversion Factors for Volume

<table>
<thead>
<tr>
<th>From:</th>
<th>gal US</th>
<th>gal UK</th>
<th>bbl</th>
<th>ft³</th>
<th>l</th>
<th>m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Gallon (gal)</td>
<td>1</td>
<td>0.8327</td>
<td>0.02381</td>
<td>0.1337</td>
<td>3.785</td>
<td>0.0038</td>
</tr>
<tr>
<td>UK Gallon (gal)</td>
<td>1.201</td>
<td>1</td>
<td>0.02859</td>
<td>0.1605</td>
<td>4.546</td>
<td>0.0045</td>
</tr>
<tr>
<td>Barrel (bbl)</td>
<td>42.0</td>
<td>34.97</td>
<td>1</td>
<td>5.615</td>
<td>159.0</td>
<td>0.159</td>
</tr>
<tr>
<td>Cubic foot (ft³)</td>
<td>7.48</td>
<td>6.229</td>
<td>0.1781</td>
<td>1</td>
<td>28.3</td>
<td>0.0283</td>
</tr>
<tr>
<td>Litre (l)</td>
<td>0.2642</td>
<td>0.220</td>
<td>0.0063</td>
<td>0.0353</td>
<td>1</td>
<td>0.001</td>
</tr>
<tr>
<td>Cubic metre (m³)</td>
<td>264.2</td>
<td>220.0</td>
<td>6.289</td>
<td>35.3147</td>
<td>1000.0</td>
<td>1</td>
</tr>
</tbody>
</table>

### Specific Net Calorific Values

#### Crude Oil*

<table>
<thead>
<tr>
<th>Country</th>
<th>toe/tonne</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saudi Arabia</td>
<td>1.0160</td>
</tr>
<tr>
<td>United States</td>
<td>1.0286</td>
</tr>
<tr>
<td>Former USSR</td>
<td>1.0050</td>
</tr>
<tr>
<td>Iran</td>
<td>1.0190</td>
</tr>
<tr>
<td>Venezuela</td>
<td>1.0685</td>
</tr>
<tr>
<td>Mexico</td>
<td>1.0115</td>
</tr>
<tr>
<td>Norway</td>
<td>1.0260</td>
</tr>
<tr>
<td>People’s Rep. of China</td>
<td>1.0000</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>1.0415</td>
</tr>
<tr>
<td>UAE</td>
<td>1.0180</td>
</tr>
</tbody>
</table>

#### Petroleum Products*

<table>
<thead>
<tr>
<th>Product</th>
<th>toe/tonne</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refinery gas</td>
<td>1.150</td>
</tr>
<tr>
<td>LPG</td>
<td>1.130</td>
</tr>
<tr>
<td>Ethane</td>
<td>1.130</td>
</tr>
<tr>
<td>Motor Gasoline</td>
<td>1.070</td>
</tr>
<tr>
<td>Jet Fuel</td>
<td>1.065</td>
</tr>
<tr>
<td>Kerosene</td>
<td>1.045</td>
</tr>
<tr>
<td>Naphtha</td>
<td>1.075</td>
</tr>
<tr>
<td>Gas/Diesel Oil</td>
<td>1.035</td>
</tr>
<tr>
<td>Fuel Oil</td>
<td>0.960</td>
</tr>
<tr>
<td>Other Products</td>
<td>0.960</td>
</tr>
</tbody>
</table>

#### Coal*

<table>
<thead>
<tr>
<th>Country</th>
<th>toe/tonne</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peoples’s Rep. of China</td>
<td>0.500</td>
</tr>
<tr>
<td>United States</td>
<td>0.646</td>
</tr>
<tr>
<td>India</td>
<td>0.477</td>
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<tr>
<td>South Africa</td>
<td>0.564</td>
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<tr>
<td>Australia</td>
<td>0.597</td>
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<tr>
<td>Russia</td>
<td>0.444</td>
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<tr>
<td>Poland</td>
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* for selected countries

* selected products – average values

* steam coal production for selected countries
### Gross Caloric Values

#### Natural Gas*

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* for selected countries (production).

Note: to calculate the net heat content, the gross heat content is multiplied by 0.9.

### Conventions for Electricity

Figures for electricity production, trade and final consumption are calculated using the energy content of the electricity (i.e. at a rate of 1TWh = 0.086 Mtoe). Hydro-electricity production (excluding pumped storage) and electricity produced by other non-thermal means (wind, tide, photovoltaic, etc.) are accounted for similarly using 1TWh = 0.086 Mtoe. However, the primary energy equivalent of nuclear electricity is calculated from the gross generation by assuming a 33% conversion efficiency, i.e. 1TWh = (0.086/0.33) Mtoe. In the case of electricity produced from geothermal heat, if the actual geothermal efficiency is not known, then the primary equivalent is calculated assuming an efficiency of 10%, so 1TWh = (0.086/0.1) Mtoe.
## GDP Deflators and Changes in Consumer Prices

*(Per cent)*

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**Memorandum**

**Median inflation rate**

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V

List of Annex I, Annex II, and Annex B Countries
### List of Annex I Countries, UNFCCC

- Australia
- Austria
- Belarus
- Belgium
- Bulgaria
- Canada
- Croatia
- Czech Republic
- Denmark
- European Union
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Iceland
- Ireland
- Italy
- Japan
- Latvia
- Liechtenstein
- Lithuania
- Luxembourg
- Monaco
- Netherlands
- New Zealand
- Norway
- Poland
- Portugal
- Romania
- Russian Federation
- Slovakia
- Slovenia
- Spain
- Sweden
- Switzerland
- Turkey
- Ukraine
- United Kingdom of Great Britain and Northern Ireland
- United States of America

### List of Annex II Countries, UNFCCC

- Australia
- Austria
- Belgium
- Canada
- Denmark
- European Union
- Finland
- France
- Germany
- Greece
- Iceland
- Ireland
- Italy
- Japan
- Luxembourg
- Netherlands
- New Zealand
- Norway
- Portugal
- Spain
- Sweden
- Switzerland
- Turkey
- United Kingdom of Great Britain and Northern Ireland
- United States of America

### Note:

- Party included in Annex I means a Party included in Annex I to the Convention, as may be amended, or a Party which has made a notification under Article 4, paragraph 2(g), of the Convention.
- Countries that are undergoing the process of transition to a market economy.
- Countries added to Annex I by an amendment that entered into force on 13 August 1998, pursuant to Decision 4/CP.3 adopted at CoP 3.
- Source: 
### List of Annex B Countries, Kyoto Protocol

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* Countries that are undergoing the process of transition to a market economy.

Source: Annex B to the Kyoto Protocol to the Convention on Climate Change, p.28.
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List of Major IPCC Reports
Climate Change—The IPCC Scientific Assessment
The 1990 Report of the IPCC Scientific Assessment Working Group (also in Chinese, French, Russian, and Spanish)

Climate Change—The IPCC Impacts Assessment
The 1990 Report of the IPCC Impacts Assessment Working Group (also in Chinese, French, Russian, and Spanish)

Climate Change—The IPCC Response Strategies
The 1990 Report of the IPCC Response Strategies Working Group (also in Chinese, French, Russian, and Spanish)

Emissions Scenarios
Prepared for the IPCC Response Strategies Working Group, 1990

Assessment of the Vulnerability of Coastal Areas to Sea Level Rise—A Common Methodology
1991 (also in Arabic and French)

Climate Change 1992—The Supplementary Report to the IPCC Scientific Assessment
The 1992 Report of the IPCC Scientific Assessment Working Group

Climate Change 1992—The Supplementary Report to the IPCC Impacts Assessment
The 1992 Report of the IPCC Impacts Assessment Working Group

Climate Change: The IPCC 1990 and 1992 Assessments
IPCC First Assessment Report Overview and Policymaker Summaries, and 1992 IPCC Supplement

Global Climate Change and the Rising Challenge of the Sea
Coastal Zone Management Subgroup of the IPCC Response Strategies Working Group, 1992


Preliminary Guidelines for Assessing Impacts of Climate Change, 1992

IPCC Guidelines for National Greenhouse Gas Inventories
Three volumes, 1994 (also in French, Russian, and Spanish)

IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations
1995 (also in Arabic, Chinese, French, Russian, and Spanish)

Climate Change 1994—Radiative Forcing of Climate Change and an Evaluation of the IPCC IS92 Emission Scenarios, 1995


Climate Change 1995—Economic and Social Dimensions of Climate Change – Contribution of Working Group III to the Second Assessment Report, 1996

Climate Change 1995—IPCC Second Assessment Synthesis of Scientific-Technical Information Relevant to Interpreting Article 2 of the UN Framework Convention on Climate Change 1996 (also in Arabic, Chinese, French, Russian, and Spanish)

Technologies, Policies, and Measures for Mitigating Climate Change – IPCC Technical Paper I
1996 (also in French and Spanish)
An Introduction to Simple Climate Models used in the IPCC Second Assessment Report – IPCC Technical Paper II
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Aviation and the Global Atmosphere - IPCC Special Report, 1999

Land Use, Land Use Changes and Forestry - IPCC Special Report, 2000

Methodological and Technological Issues in Technology Transfer - IPCC Special Report, 2000

Emissions Scenarios - IPCC Special Report, 2000

Climate Change 2001: The Scientific Basis, 2001

Climate Change 2001: Impacts, Adaptation, and Vulnerability, 2001


ENQUIRIES: IPCC Secretariat, c/o World Meteorological Organization, 7 bis, Avenue de la Paix, Case Postale 2300, 1211 Geneva 2, Switzerland
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<td>51, 459, 616, 661</td>
</tr>
<tr>
<td>Wind energy see Renewable energy</td>
<td>50-51, 421, 435-437</td>
</tr>
<tr>
<td>World Trade Organisation (WTO)</td>
<td>50-51, 421, 435-437</td>
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