

THE CLIMATE REPORT

GLOSSARY OF KEY CLIMATE CHANGE TERMS

A

A

ADAPTATION – An adjustment in natural or human systems to a new or changing environment. “Adaptation to [climate change](#)” refers to an adjustment in natural or human systems in response to actual or expected climate change or its effects that serves to moderate harm (or vulnerability to harm) or exploit beneficial opportunities. Adaptation can be either anticipatory (*e.g.*, building bridges higher to accommodate a future rise in sea level) or reactive (*e.g.*, using snow machines to offset decreased snowfall at ski resorts) and either autonomous (*e.g.*, migration of animal or plant populations toward areas with compatible habitat) or planned (*e.g.*, changes in crop selection and planting schedules).

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AFFORESTATION – The creation of a [carbon sink](#) through the conversion of unforested land to forested land. Under the [United Nations Framework Convention on Climate Change](#), afforestation is the direct human-induced conversion of land that has not been forested for a period of at least 50 years through planting, seeding, and/or the human-induced promotion of natural seed sources. Afforestation is one tool that can be used to generate [CER](#) offset credits under the [Kyoto Protocol's Clean Development Mechanism](#).

ALLOCATION – An approach in a [cap and trade](#) scheme by which emission [allowances](#) are distributed or “allocated” by the government to regulated entities at little or no cost. Such allocations can be based on a variety of policy factors but are generally tied to either a “grandfathering” approach based on past emissions in a base year or an “updating” approach based on more recent emissions data. The alternative to direct allocation is to sell allowances via an [auction](#). A cap and trade program may use a combination of auction and allocation to distribute allowances.

ALLOWANCE – A marketable, government-issued instrument that entitles the holder to emit a defined quantity of greenhouse gas, typically one metric ton of [carbon dioxide equivalent](#), into the atmosphere during a specified time period. Collectively, all allowances for a particular time period equal the [emissions cap](#) established under a [cap and trade](#) emissions reduction program.

ALTERNATIVE ENERGY – Energy derived from nontraditional sources, such as wind, compressed natural gas, biogas (cogeneration), or hydroelectric. “Alternative energy” is often used interchangeably with “renewable energy,” meaning energy derived from [renewable resources](#). However, some technologies not derived from renewable resources, such as nuclear power or coal gasification, may also be considered alternative energy.

AMERICAN CLEAN ENERGY AND SECURITY ACT OF 2009 (ALSO REFERRED TO AS “ACES” OR “WAXMAN-MARKEY”) – This bill, passed by the U.S. House of Representatives on June 26, 2009, would establish a [cap and trade](#) program for sources encompassing about 85 percent of U.S. greenhouse gas emissions; establish new federal energy efficiency mandates for vehicles, appliances, and buildings; and support development of low-carbon energy, smart grid power transmission, and carbon capture and sequestration technologies. The bill’s sponsors were Rep. Henry Waxman (D-CA) and Edward Markey (D-MA).

ANNEX A – The list of six [greenhouse gases](#) addressed by the [Kyoto Protocol](#)—[carbon dioxide](#), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur

hexafluoride—and the industrial sectors or source categories that emit them.

ANNEX B – The list established under the [Kyoto Protocol](#) setting out the agreed emissions limitations or reduction targets, known as the Quantified Emissions Limitation and Reduction Commitments (QELRC), of 38 countries and the European Union, relative to emissions in the base year (generally 1990) for the Protocol’s first Commitment Period (January 1, 2008, through December 31, 2012).

ANNEX I – The list established under the [United Nations Framework Convention on Climate Change](#) of 40 industrialized countries plus the European Union, including countries with “economies in transition,” taking on specific emissions reduction commitments. The countries listed on Annex I include those on [Annex B](#) to the [Kyoto Protocol](#), plus Turkey and Belarus.

ANTHROPOGENIC – Made by people or resulting from human activities. In the context of [climate change](#), the term refers to emissions of [greenhouse gases](#) attributable to human activities, such as burning [fossil fuels](#) for energy, [deforestation](#), and land-use changes. The term can also be used to distinguish between carbon that is naturally present in the environment (see [biogenic carbon](#)) and carbon that is present solely due to human activities, primarily the extraction and combustion of fossil fuels.

ATTRIBUTION – The process of establishing the most likely causes for a [detection](#) of climate variability with some defined level of confidence. As the [Intergovernmental Panel on Climate Change](#) has noted, the unequivocal attribution of [climate change](#) to [anthropogenic](#) causes would require controlled experimentation with the earth’s climate system, which is clearly not possible. Thus, from a practical perspective, attribution of observed climate change requires statistical analysis and assessment of multiple lines of evidence.

AUCTION – An approach in a [cap and trade](#) scheme by which emission [allowances](#) are sold by the government through an initial market offering. The allowances may be purchased by entities having emissions obligations or by other parties

desiring to participate in the [emissions trading](#) system (who may in turn bank, sell, or retire such allowances). The alternative to auctioning is to distribute allowances for free through a direct [allocation](#) process. A [cap and trade](#) program may use a combination of auction and allocation to distribute allowances.

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BANKING – A mechanism that can be included in a [cap and trade](#) scheme to increase flexibility in compliance (see also [borrowing](#)). “Banking” refers to saving excess emission [allowances](#) during a specific compliance period for use in a future compliance period. Limits may be imposed upon the ability to bank allowances, such as restricting the number of banked allowances permitted or imposing an expiration date on banked allowances. Banking is most worthwhile if the price of allowances is expected to increase over time.

BIODIESEL – A nonpetroleum diesel fuel derived from vegetable oils, animal fats, or recycled grease. Biodiesel has about 93 percent of the energy content of petroleum diesel and is so similar in performance that it can be used in most diesel engines with little modification. Although the popular media tends to focus on stories about cars running on french-fry grease scavenged from fast-food restaurants, 60 percent of U.S. biodiesel is currently derived from soybean oil.

BIOFUEL – A material derived from renewable [biomass](#), such as corn-derived ethanol, [biodiesel](#), and landfill gases, that can be used as a fuel to power vehicles or provide heat. According to one source, more than 80 percent of a biofuel must consist of renewable materials. Biofuels differ from [fossil fuels](#) in that fossil fuels are derived from organisms that have been dead for many years and are not renewable.

BIOGENIC CARBON – Carbon present in the environment as natural [biomass](#), such as wood, corn, or switchgrass. The [Intergovernmental Panel on Climate Change](#) does not view emissions of biogenic carbon (such as from the use of corn-derived ethanol and other [biofuels](#)) as contributing to [climate change](#), because this carbon was already part of the natural

[carbon cycle](#), through which carbon is removed from the environment by plants through photosynthesis and returned to the environment when the plant dies.

BIOMASS – Renewable organic matter from living (or recently deceased) organisms, such as agricultural crops and residue, grasses, wood and wood waste, aquatic plants, and the organic components of municipal and industrial waste, as well as the metabolic byproducts of living organisms, such as animal manure.

BORROWING – A mechanism that can be included in a [cap and trade](#) scheme to increase flexibility in compliance (see also [banking](#)). “Borrowing” refers to using emission [allowances](#) from a future compliance period to meet emission requirements for the current period. Future [allocations](#) of allowances would be reduced by the amount borrowed. Limits may be placed upon the ability to borrow allowances, such as by restricting the number of allowances that may be borrowed or discounting the value of borrowed allowances.

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CAP AND TRADE – An administrative approach used to control pollution whereby a central authority sets a limit or [emissions cap](#) on the total amount of a pollutant that can be emitted by all covered sources. A government entity or other central authority issues tradable emission [allowances](#) equal to the cap. Regulated entities must periodically surrender back to the regulator a quantity of allowances (or valid [offsets](#)) equal to that entity’s actual emissions. Entities with excess allowances (for example, companies that install technology to reduce their emissions) may sell those allowances via a [carbon market](#), referred to as a “trade.” Cap and trade has been used successfully in the U.S. to curb acid rain caused by sulfur dioxide emissions from large power plants, though there are some significant differences between the underlying circumstances of that effort and the effort to reduce [greenhouse gas](#) emissions.

CARBON CAPTURE AND STORAGE (also referred to as “carbon capture and sequestration”) – The process of

separating and capturing [carbon dioxide](#) (or another regulated gas) from an emission source (e.g., a power plant or industrial facility), converting it from a gaseous state to a supercritical fluid, transporting it (typically via pipeline or tanker truck) to an injection site, and injecting it into a deep subsurface rock formation for long-term storage. Key elements of this technology—carbon dioxide capture and deep geologic injection—have been employed in the petroleum industry to promote enhanced oil recovery, but the long-term stability of injected carbon dioxide is not well understood, and the technology has not yet been employed to eliminate emissions from a commercial coal-fired power plant. The term “clean coal” is often used as shorthand for this proposed technology.

CARBON CYCLE – The process through which carbon is cycled through the environment via air, soil, plants, animals, and [fossil fuels](#). Large amounts of carbon exist in the atmosphere as [carbon dioxide](#), which is absorbed by growing green plants during the process known as photosynthesis. Animals do the opposite of plants—they release carbon dioxide into the air as a waste product of respiration. Decomposition of dead organic matter also releases carbon dioxide into the environment. Decomposition is essential; without it, all of the carbon on the planet would eventually become locked up in dead carcasses and other trash. Carbon is also stored in fossil fuels such as coal, petroleum, and natural gas, and that carbon dioxide is released into the atmosphere through combustion.

CARBON DIOXIDE – A colorless, odorless [greenhouse gas](#) whose molecules are composed of one atom of carbon and two atoms of oxygen. This gas occurs naturally in the atmosphere and is released through the respiration of living organisms, the combustion of [fossil fuels](#), and the decay and combustion of other organic materials. Carbon dioxide is essential to the growth of plants, which use the process of photosynthesis to absorb carbon dioxide and produce oxygen within the natural [carbon cycle](#).

CARBON DIOXIDE EQUIVALENT (CO₂e) – A term describing the relative heat-trapping abilities of various [greenhouse gases](#) compared to [carbon dioxide](#). For example, according to the [Intergovernmental Panel on Climate Change](#), methane has a CO₂e of 21, meaning that a given quantity of methane

in the atmosphere is deemed 21 times as potent as the same quantity of carbon dioxide in contributing to [climate change](#). Among other greenhouse gases, nitrous oxide has a CO₂e of 310; hydrofluorocarbons have a CO₂e ranging from 140 to 11,700; perfluorocarbons have a CO₂e ranging from 6,500 to 9,200; and sulfur hexafluoride has a CO₂e of 23,900. See also [Global Warming Potential](#).

CARBON INTENSITY – When used to describe a fuel source, it is the amount of carbon emitted per unit of energy produced, such as grams of carbon per British thermal unit (Btu) of energy. Coal has a higher carbon intensity than petroleum, which has a higher carbon intensity than natural gas. When used to describe the dependence of business operations on [fossil fuel](#) usage, carbon intensity is expressed in terms of the amount of carbon emitted per unit of economic output. According to the Carbon Disclosure Project, global carbon intensity fell by 13 percent from 1990 to 2000, even though total carbon emissions actually increased over that period.

CARBON MARKET – A trading exchange, analogous to traditional commodities exchanges for everything from oil to soybeans, in which [allowances](#) to emit [greenhouse gases](#) and [offset](#) credits can be bought and sold. The [EU Emissions Trading Scheme](#) and the Chicago Climate Exchange are examples of existing carbon markets. In theory, carbon markets promote cost-effective compliance with [emissions caps](#) by allowing the free market to establish the economic “value” of emitting a ton of greenhouse gas. Those sources that can directly reduce their emissions for less than the market price can earn a profit by overreducing and selling their excess allowances or offsets to those sources whose emissions reduction costs would exceed the market price.

CARBON REDUCTION COMMITMENT (CRC) – A new mandatory carbon dioxide emissions trading program to be introduced in the United Kingdom in 2010 pursuant to enabling powers under the U.K. Climate Change Act 2008. The scheme will apply to large non-energy-intensive organizations whose half-hourly metered electricity consumption is greater than 6,000 megawatt-hours (MWh) per year.

CARBON SINK – A natural or man-made system that removes carbon compounds from the atmosphere and stores them

indefinitely. The most prominent natural carbon sinks are forests, whose trees and other plants absorb and store [carbon dioxide](#) through photosynthesis, and the oceans, which store carbon both through photosynthesis and by solubilizing carbon dioxide. Man-made examples include [afforestation](#) and carbon sequestration.

CARBON TAX – The imposition of a tax on [fossil fuels](#), usually coal, petroleum, and natural gas, in proportion to their carbon content. Some jurisdictions distinguish between a “carbon tax” and a “carbon fee,” in that proceeds from a “carbon tax” can be used for any governmental purpose, while the proceeds from a “carbon fee” can be used only to address the actual or anticipated impact of the fee payers’ operations (*i.e.*, to reduce [greenhouse gas](#) emissions and/or their impact). Carbon taxes and [cap and trade](#) programs are typically identified as the primary regulatory alternatives for reducing greenhouse gas emissions.

CERTIFIED EMISSIONS REDUCTION (CER) – A unit of [greenhouse gas](#) emissions reduction issued pursuant to the [Clean Development Mechanism](#) under the [Kyoto Protocol](#). One CER represents a reduction of [greenhouse gas](#) emissions of one metric ton of [carbon dioxide equivalent](#). CERs may be used along with [ERUs](#) and [EUAs](#) to meet an entity’s obligations under the Kyoto Protocol’s [cap and trade](#) program.

CLEAN COAL – A term used in the context of [climate change](#) regulation to refer to technology that allows coal to be burned for energy with minimal or no [greenhouse gas](#) emissions. Clean-coal advocates believe that this objective can be achieved through the development and implementation of [carbon capture and storage](#) technology.

CLEAN DEVELOPMENT MECHANISM (CDM) – An [offset](#) mechanism provided under the [Kyoto Protocol](#) to assist developing countries in achieving sustainable development by permitting industrialized countries to receive [Certified Emissions Reductions](#) for financing projects that reduce otherwise unregulated [greenhouse gas](#) emissions in developing countries.

CLIMATE CHANGE – Any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change

may result from natural factors, such as changes in the sun’s intensity or slow changes in the earth’s orbit around the sun; natural processes within the climate system (*e.g.*, changes in ocean circulation); and human activities that change the atmosphere’s composition (*e.g.*, burning [fossil fuels](#)) or the land surface (*e.g.*, [deforestation](#), reforestation, urbanization, desertification).

CLIMATE FEEDBACK – The manner in which one climate process influences other climate processes, such as through the interaction between [greenhouse gases](#) and the climate system, including vegetation, water vapor, ice cover, clouds, sea ice, and oceans. A positive feedback intensifies the original process, while a negative feedback reduces the original effect. For example, if a warmer atmosphere increases the amount of carbon dioxide released from the soil, and the increased levels of carbon dioxide lead to further increases atmospheric temperature, positive climate feedback would be occurring. Conversely, negative climate feedback would occur if a warmer atmosphere led to greater evaporation of seawater, increasing cloud cover and reducing the amount of solar energy reaching the earth.

CLIMATE MODEL – A quantitative way of representing the interactions of the atmosphere, the oceans, the land surface, and ice. Models can range from relatively simple to complex, such as General Circulation Models, which are global, three-dimensional computer models of the climate system used to simulate human-induced [climate change](#).

CONFERENCE OF THE PARTIES (COP) – The supreme body of the [United Nations Framework Convention on Climate Change](#), charged with the task of regularly reviewing implementation of the Convention and any related instruments, such as the [Kyoto Protocol](#). The COP, which consists of more than 190 Parties (including the United States) and Observer States, meets at least annually.

COP15 – The 15th [Conference of the Parties](#) to the [United Nations Framework Convention on Climate Change](#) and the Fifth Meeting of the Parties to the [Kyoto Protocol](#), scheduled to take place in Copenhagen, December 7–18, 2009. Under the “road map” agreed at the UN Climate Change Conference in Bali in December 2007, COP15 is expected to

finalize an international agreement on a framework for combating [climate change](#) post-2012 (when the Kyoto Protocol's first Commitment Period ends).

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DEFORESTATION – The permanent conversion of forest to nonforest land. Forest land that has simply been harvested is not regarded as deforested, because trees may regrow or be replanted.

DETECTION – The process of demonstrating that an observed change in the climate is significantly different (in a statistical sense) than can be explained by natural internal variability, but without identifying the causes for that change or even implying that its causes are all understood. The process of determining the cause of a detection is [attribution](#).

DOWNSTREAM – A [fossil fuel](#) becomes subject to [climate change](#) regulation at some point in its life cycle, from the upstream point, at which the fossil fuel is extracted from the earth and placed in the stream of commerce, to the downstream point, at which it is burned for energy. Thus, downstream climate change regulation involves placing the regulatory burden on the end-users of fossil fuels, such as coal-fired power plants.

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EMISSION REDUCTION UNIT (ERU) – A unit of emissions reduction issued pursuant to [Joint Implementation](#) under the [Kyoto Protocol](#). One ERU is equal to one metric ton of [carbon dioxide equivalent](#). ERUs may be used along with [CERs](#) and [EUAs](#) to meet an entity's obligations under the Kyoto Protocol's [cap and trade](#) program.

EMISSIONS CAP – A limit on the aggregate amount of specified [greenhouse gases](#) that can be emitted by all covered emission sources in a country or other geographical region

during a specified time frame. The emissions cap establishes the overall emission “ceiling” of a [cap and trade](#) program.

EMISSIONS TRADING – The purchase and sale via a [carbon market](#) of [greenhouse gas](#) emission [allowances](#) and [offsets](#) needed by emitters to meet the obligations imposed under a [cap and trade](#) emission control program. Emissions trading typically is open to any entity, not just greenhouse gas emitters, creating opportunities for speculative investors, such as hedge funds, to participate in the market.

EU EMISSION ALLOWANCE (EUA) – [Greenhouse gas](#) emission allowance, equal to one metric ton of [carbon dioxide equivalent](#), allocated by each member state of the European Union to those installations subject to the [EU-ETS](#).

EUROPEAN UNION EMISSIONS TRADING SCHEME (EU-ETS) – The EU's [cap and trade](#) system, which serves as its principal regulatory tool for meeting its [greenhouse gas](#) emissions reduction targets under the [Kyoto Protocol](#). Each EU member state's [National Action Plan](#) allocates [EU Emission Allowances](#) to affected installations within the member state; these EUAs can then be bought and sold on the EU-ETS, currently the world's largest [carbon market](#). The scheme, which was split into three trading periods (2005–07, 2008–12, and 2013 onward), was established under Directive 2003/87/EC and amended by Directive 2004/101/EC (the “Linking Directive”), which linked the EU-ETS with the Kyoto Protocol.

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FOSSIL FUEL – Carbon-based fuel formed by the natural fossilization of dead plants and animals over millions of years. Fossil fuels contain high percentages of [hydrocarbons](#) and are found in a wide range of forms, including methane (with its low carbon-to-hydrocarbon ratio), liquid petroleum, and anthracite coal (with its almost pure carbon content). Fossil fuels, whose burning results in the release of [carbon dioxide](#), a [greenhouse gas](#), comprise the primary source of energy production in the world and are nonrenewable resources.

FUEL CELL – A device that produces electricity from chemical energy. A fuel cell consists of two electrodes positioned around an electrolyte. Hydrogen fuel flows into one electrode (the anode), and oxygen flows into the other electrode (the cathode). Encouraged by a catalyst, the hydrogen atoms split into protons and electrons, and these electrons are harnessed to produce an electric current. Much of the hydrogen and oxygen used in generating electricity through a fuel cell combines to form water. Although fuel cells work best with hydrogen gas, alternative fuels (*e.g.*, methanol, formic acid, and gasoline) can also be used to generate the hydrogen used in the chemical reaction. Since fuel cells rely on a chemical reaction rather than combustion, their emissions of carbon and other byproducts are much lower than those of the cleanest [hydrocarbon](#) combustion engines. Current impediments to widespread commercial use of fuel cells include: (1) high capital costs, (2) difficulties with fuel availability and storage, (3) issues arising from the high temperatures at which they must operate, (4) susceptibility of the reaction to contaminants in the fuel source, and (5) problems with durability under start-stop cycling.

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G

GLOBAL WARMING POTENTIAL (GWP) – An index used to compare the relative radiative forcing (*e.g.*, the capacity to cause warming) of different [greenhouse gases](#). The capacity of a particular greenhouse gas to cause warming depends upon its radiative properties, its molecular weight, and its lifetime in the atmosphere. The GWP of a greenhouse gas is calculated as the ratio of the radiative forcing that would occur from the emission of one kilogram of that gas to the forcing that would occur from the emission of one kilogram of [carbon dioxide](#) over a set time period (100 years is used in the [Kyoto Protocol](#)). Carbon dioxide is assigned a reference value of one. Therefore, if methane has a GWP of 21, it means that one kilogram of methane has the same effect on the atmosphere as 21 kilograms of carbon dioxide. See also [carbon dioxide equivalent](#).

GREENHOUSE EFFECT – A process through which solar energy received by the earth is trapped as heat in the atmosphere near the earth's surface. Some of the heat flowing

back toward space from the earth's surface is absorbed by certain compounds in the atmosphere, referred to as [greenhouse gases](#), and then radiated back toward the earth's surface. This is a natural process that keeps the earth's atmosphere about 59°F warmer than it would be otherwise. If atmospheric concentrations of greenhouse gases rise, the greenhouse effect suggests that the average temperature of the lower atmosphere will gradually increase.

GREENHOUSE GASES – A group of natural and man-made compounds that, when present in the atmosphere, allow radiant energy (*i.e.*, light) from the sun to pass through to warm the earth's surface but tend to block infrared energy (*i.e.*, heat) reflected back from the earth, thus trapping the energy in the atmosphere in what is referred to as the [greenhouse effect](#). Water vapor, [carbon dioxide](#), methane, and nitrous oxide are greenhouse gases produced by both natural and human processes. Entirely man-made greenhouse gases include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

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HYDROCARBON – Any organic compound composed solely of hydrogen and carbon, such as methane and benzene. Hydrocarbons are the principal energy-producing constituents of [fossil fuels](#), including petroleum and natural gas, and are also used as lubricants and ingredients in the manufacture of many products. The combustion of hydrocarbons generates energy, [carbon dioxide](#), and water.

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INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC) – A panel of government and nongovernmental organization (NGO) representatives established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) to provide an objective assessment of existing scientific and technical information (including practices and literature) relating to [climate change](#). The IPCC's reports address the causes and socioeconomic/

environmental impact of climate change and offer advice to the [United Nations Framework Convention on Climate Change](#) on mitigation of and/or [adaptation](#) to human-induced climate change. Although the IPCC's reports are frequently cited by public and private decision makers as an authoritative basis for climate change policies and initiatives, some critics have alleged that nonscientific political positions have influenced the panel's conclusions and that the panel's peer-review process is insufficient.

INTERNATIONAL ENERGY CONSERVATION CODE (IECC) –

A building code specifying energy efficiency standards for the design and construction of all buildings, prepared and published by the International Code Council (ICC), a nonprofit membership association founded by two long-standing code-creation entities: Building Officials and Code Administrators International, Inc. (BOCA), and the Southern Building Code Congress International, Inc. (SBC or SBCCI). Although the ICC is a private council with no governmental powers of its own, many governments have adopted one or more of its codes as positive law. The American Recovery and Reinvestment Act of 2009 (commonly referred to as the “Stimulus Bill”) set aside \$3.4 billion in energy assistance grants for states that have enacted the 2009 version of the IECC. (The IECC, like all ICC codes, is revised every 18 months and republished every three years.)

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JOINT IMPLEMENTATION (JI) – An [offset](#) mechanism under the [Kyoto Protocol](#) whereby a country included in [Annex I](#) of the Kyoto Protocol may acquire [Emission Reduction Units](#) by helping to finance projects that reduce net [greenhouse gas](#) emissions in another industrialized country (including countries with “economies in transition”).

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KYOTO PROTOCOL – The international treaty adopted in December 1997 in Kyoto, Japan. Although linked to the [United Nations Framework Convention on Climate Change](#),

the Protocol stands on its own and required separate ratification by governments. Among other things, the Kyoto Protocol sets binding [greenhouse gas](#) emission targets for developed countries that would reduce their emissions, on average, by 5.2 percent from 1990 levels, and it authorizes three market-based mechanisms to help countries reduce the cost of meeting their emissions reduction targets: [Joint Implementation](#), the [Clean Development Mechanism](#), and emissions trading.

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LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN

(LEED) – A voluntary certification process developed by the United States Green Building Council (USGBC), a nonprofit membership association, to measure buildings' environmental sustainability. LEED establishes a point system for specified sustainable design elements in a building's construction or renovation. Building owners are generally free to choose which LEED elements to incorporate into their buildings. Many different combinations of choices may result in the same number of points. After construction, the owner may have the building certified at one of four levels (Certified, Silver, Gold, or Platinum), based on the project's point total. Even though LEED is not a building code, some governments have adopted its certification process as a substitute for developing, adopting, and enforcing their own sustainability code standards or as a qualification for grant funding.

LEAKAGE – The movement of carbon-intensive activity, such as steel or cement production, from a location subject to greenhouse gas emission standards to a location with less stringent standards or none at all, thereby avoiding some or all of the cost of compliance with the emission standards.

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M

MASSACHUSETTS V. ENVIRONMENTAL PROTECTION

AGENCY – A United States Supreme Court decision, 549 U.S. 497 (2007), in which the Court held 5-4 that U.S. EPA has statutory authority to regulate [carbon dioxide](#) and other

[greenhouse gases](#) under the Clean Air Act. The case was brought against U.S. EPA by 12 states and several U.S. cities after U.S. EPA denied their petition for rulemaking to regulate greenhouse gas emissions from motor vehicles under the Clean Air Act. In denying the petition, U.S. EPA asserted that the Clean Air Act did not authorize it to regulate such emissions. Even if it did, U.S. EPA asserted that the Agency had discretion to defer a decision until more research could be done on “the causes, extent and significance of climate change and the potential options for addressing it.” In its ruling, the Supreme Court ordered U.S. EPA to either promulgate regulations or provide a reasoned scientific basis for not doing so.

MIDSTREAM – [Fossil fuels](#) become subject to [climate change](#) regulation at some point in the fuel's life cycle, from the [upstream](#) point, at which the fossil fuel is extracted from the earth and placed in the stream of commerce, to the [downstream](#) point, at which it is burned for energy. Thus, midstream climate change regulation involves placing the regulatory burden on the entities, such as gasoline refiners, that purchase fossil fuel materials and then resell them, often after processing them to produce a more commercially valuable fuel.

MIDWESTERN REGIONAL GREENHOUSE GAS REDUCTION ACCORD – A regional agreement signed by the governors of six Midwestern states and the premier of one Canadian province to reduce [greenhouse gas](#) emissions to combat [climate change](#). The accord established the Midwest Greenhouse Gas Reduction Program, which aims to: (1) establish greenhouse gas reduction targets and time frames; (2) develop a market-based and multisector [cap and trade](#) mechanism; (3) establish a system to enable tracking, management, and crediting for entities that reduce greenhouse gas emissions; and (4) develop and implement additional steps as needed to achieve the reduction targets, such as low-carbon fuel standards and regional incentives and funding mechanisms.

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N

NATIONAL ACTION PLAN (NAP) (ALSO REFERRED TO AS “NATIONAL ALLOCATION PLAN”) – The governmental

blueprint for how an EU member state intends to meet its [greenhouse gas](#) reduction obligations under the [Kyoto Protocol](#). Each NAP specifies that member state's overall [emissions cap](#) on greenhouse gas emissions (*i.e.*, the total number of [EU Emission Allowances](#) available for covered sources within that country) and allocates the available EUAs among the covered sources. Each member state's NAP is submitted to the EU Commission for approval prior to the start of each trading period of the [EU-ETS](#).

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OFFSET (ALSO REFERRED TO AS “CARBON OFFSET”) – A marketable, government-issued instrument that entitles the holder to emit a defined quantity of [greenhouse gas](#), typically one metric ton of [carbon dioxide equivalent](#), into the atmosphere during a specified time period. An offset represents a reduction of greenhouse gas emissions from an otherwise unregulated source. For example, the Kyoto Protocol's Clean Development Mechanism allows entities to generate offsets, known as CERs, by financing certain types of emissions reduction projects in developing countries that are not subject to emissions reduction obligations under the Protocol. Since offsets reflect emissions reductions above and beyond those required by a [cap and trade](#) program, they do not represent part of the [emissions cap](#).

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P

PHOTOVOLTAIC – The process of generating electricity by exposing cells composed of semiconducting materials (*i.e.*, solar or PV panels) to radiant energy from the sun (*i.e.*, light).

PRECAUTIONARY PRINCIPLE – The proposition that governments should take action to prevent irreversible damage from [climate change](#), even in the absence of full scientific certainty, because conclusive scientific evidence of such damage may become available too late to avert it. As expressed in the [United Nations Framework Convention on Climate Change](#), “Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason

for postponing cost-effective measures to prevent environmental degradation.”

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R

REGIONAL GREENHOUSE GAS INITIATIVE (RGGI) – A cooperative effort by 10 Northeast and Mid-Atlantic states to limit [greenhouse gas](#) emissions. RGGI is a [cap and trade](#) program in which participating states have agreed to cap [carbon dioxide](#) emissions from the power sector, requiring a 10 percent reduction in such emissions by 2018. Regulated power plants may use [allowances](#) issued by any of the 10 participating states to comply with the state programs governing their facilities. Accordingly, the 10 individual state programs will function as a single regional [carbon market](#) for carbon emissions.

RENEWABLE ENERGY CREDITS (RECS) – Tradable environmental commodities that represent proof of one megawatt-hour (MWh) of electricity generated from an eligible renewable (or [alternative energy](#)) resource. These are also known as Green Tags, Renewable Energy Certificates, Tradable Renewable Certificates, or Alternative Energy Certificates.

RENEWABLE PORTFOLIO STANDARD (RPS) – Statutory requirements that a certain percentage of a utility’s power plant capacity or generation come from [renewable resources](#) by a given date. Alternative Energy Portfolio Standards are similar but often include a broader range of acceptable energy resources, such as coal mine methane or coal gasification. Both types of programs often support tradable credits known as Renewable Energy Credits (or Alternative Energy Certificates) that utilities can purchase to fulfill their obligations under the RPS.

RENEWABLE RESOURCES – Fuels and methods for producing energy that do not rely on unsustainable resources such as [fossil fuels](#). Renewable resources traditionally include [bio-fuels](#), [biomass](#), hydropower, geothermal, solar, and wind. They can also include the use of ocean thermal, wave, and tidal action technologies, though these resources are currently in the early stages of development. In certain states, bulk

electricity generation, on-site electricity generation, distributed electricity generation, demand response, and demand reduction (energy efficiency) technologies are considered renewable resource applications for utilities.

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S

SMART GRID – An advanced electricity transmission and distribution network (“grid”) that utilizes digital information and control technology to improve reliability, security, and efficiency.

SMART METER – An advanced electricity meter that utilizes real-time sensors to provide information on power consumption and price.

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U

UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC) – The treaty adopted at the June 1992 “Earth Summit” in Rio de Janeiro (and in force since March 1994). The UNFCCC’s ultimate objective, and that of the [Kyoto Protocol](#) and other instruments later attached to the Convention, is “to achieve ... stabilization of [greenhouse gas](#) concentrations in the atmosphere at a level that would prevent dangerous [anthropogenic](#) interference with the climate system.” The Convention, which was ratified by the United States, included a nonbinding call for developed countries to return their emissions to 1990 levels by the year 2000.

UPSTREAM – [Fossil fuels](#) become subject to [climate change](#) regulation at some point in the fuel’s life cycle, from the upstream point, at which the fossil fuel is extracted from the earth and placed in the stream of commerce, to the [downstream](#) point, at which it is burned for energy. Thus, upstream climate change regulation involves placing the regulatory burden on fossil fuel extractors, such as coal-mining companies.

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W

WAXMAN-MARKEY BILL – See [American Clean Energy and Security Act of 2009](#).

WESTERN CLIMATE INITIATIVE (WCI) – A collaboration of independent jurisdictions in the western U.S. and Canada that have committed to take cooperative action to address [climate change](#) and implement a joint strategy to reduce greenhouse gas emissions at the regional level. This includes developing a regional target for reducing [greenhouse gas](#) emissions, participating in a multistate registry to track and manage such emissions in the region, and developing a market-based program to achieve the regional emissions reduction target. The current members of the WCI are the States of Arizona, California, Montana, New Mexico, Oregon, Utah, and Washington and the Canadian Provinces of British Columbia, Manitoba, Ontario, and Quebec.

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