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Standard Terminology for Sustainability Relative to the Performance of Buildings¹

This standard is issued under the fixed designation E2114; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 This terminology² consists of terms and definitions pertaining to ~~sustainable development and, in particular, to sustainability relative to the performance of buildings.~~ sustainability.

1.2 The purpose of this terminology is to provide meanings and explanations of terms applicable to ~~sustainable development.~~ sustainability. In the interest of common understanding and standardization, consistent word usage is encouraged to help eliminate the major barrier to effective technical communication.

1.3 It is recommended that terms used only within an individual standard, and having a meaning unique to that standard, be defined or explained in the terminology section of that individual standard.

1.4 Certain standard definitions herein are adopted from other sources. Each is an exact copy. The source is identified at the right margin following the definition and is listed in Section 2.

1.5 Terms are listed in alphabetical sequence. Compound terms appear in the natural spoken order.

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:³

D1356 Terminology Relating to Sampling and Analysis of Atmospheres

E631 Terminology of Building Constructions

E833 Terminology of Building Economics

E943 Terminology Relating to Biological Effects and Environmental Fate (Withdrawn 2023)⁴

E1705 Terminology Relating to Biotechnology

E2921 Practice for Minimum Criteria for Comparing Whole Building Life Cycle Assessments for Use with Building Codes, Standards, and Rating Systems

¹ This terminology is under the jurisdiction of ASTM Committee E60 on Sustainability and is the direct responsibility of Subcommittee E60.21 on Terminology. Current edition approved Sept. 1, 2021/April 1, 2023. Published September 2021/April 2023. Originally approved in 2000. Last previous edition approved in 2019/2021 as E2114/E2114 – 21.19. DOI: 40.1520/E2114-21.10.1520/E2114-23.

² Boldfaced terms are defined in this terminology.

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

⁴ The last approved version of this historical standard is referenced on www.astm.org.

*A Summary of Changes section appears at the end of this standard

2.2 ISO Standard:⁵

ISO 14040 Environmental management — Life cycle assessment — Principles and framework

3. Terminology

3.1 Definitions:

alternative agricultural products, *n*—bio-based industrial products (non-food, non-feed) manufactured from agricultural materials and animal by-products.

alternative energy, *n*—see **renewable energy**.

bioaccumulation, *n*—the net accumulation of a substance by an organism as a result of uptake from all environmental sources. **(E943)**

biobased products, *n*—products fabricated from alternative agricultural materials and forestry materials, or both.

biodegradable, *adj*—capable of decomposing under natural conditions into elements found in nature.

biodiversity, *n*—the variability among living organisms from all sources including: terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species, and of ecosystems.

biological control agents, *n*—living organisms used to eliminate or regulate the population of other living organisms.

biological diversity, *n*—see **biodiversity**.

biomagnification, *n*—the increase in tissue concentration of poorly depurated materials in organisms along a series of predator-prey associations, primarily through the mechanism of dietary accumulation. **(E943)**

biomass, *n*—(1) All living material in a given area. (2) Any material which is or was a living organism or excreted from a microorganism.

DISCUSSION—
It often refers to vegetation.

building, *n*—(1) A shelter comprising a partially or totally enclosed space, erected by means of a planned process of forming and combining materials. (2) The act or process of constructing. **(E631)**

building performance, *n*—the behavior in service of construction as a whole, or of the building components. **(E631)**

building related illness, BRI, *n*—diagnosable illness of which cause and symptoms can be directly attributed to a specific pollutant source within a building (for example, Legionnaire's disease, hypersensitivity, pneumonitis). BRI differs from sick building syndrome (SBS) conditions because the symptoms of the disease persist after leaving the building, unlike SBS where the occupant experiences relief shortly after leaving the building.

carrying capacity, *n*—The theoretical maximum population of a biological organism that an ecosystem can sustain indefinitely.

DISCUSSION—
While the existence of a carrying capacity for a given species in a given ecosystem is commonly recognized, the specific number or range established as the carrying capacity is often debated.

⁵ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

cogeneration, *n*—the simultaneous production of electrical or mechanical energy (power) and useful thermal energy from a single energy stream, such as oil, coal, natural or liquefied gas, biomass, or solar.

compost, *n*—the stable humus material that is produced from a composting process.

composting, *v*—the controlled biological decomposition of organic material in the presence of air to form a humus.

contaminant, *n*—a physical, chemical, biological, or radiological substance or matter that has an adverse effect on air, water, or soil.

criterion, *n*—an established precedent, rule, measure, norm, or code upon which a decision may be based. **(E631)**

deconstruction, *n*—disassembly of buildings for the purpose of recovering materials.

ecological impact, *n*—the effect that an activity has on living organisms, their non-living (abiotic) environment, and the ecosystem.

ecological indicator, *n*—a characteristic of an ecosystem that is related to, or derived from, a measure of biotic or abiotic variable, that can provide quantitative information on ecological structure and function.

DISCUSSION—

An indicator can contribute to a measure of integrity and sustainability.

ecosystem, *n*—a community of biological organisms and their physical environment, functioning together as an interdependent unit within a defined area.

DISCUSSION—

For the purposes of this definition, human, animals, plants, and microorganisms are individually all considered biological organisms.

electromagnetic spectrum, *n*—a continuum of electric and magnetic radiation, encompassing all wavelengths from electricity, radio and microwaves, at the low-frequency end to infrared, visible light, and ultraviolet light in the midrange, to X-rays and gamma rays at the high frequency end of the spectrum. (As defined by the Institute of Electrical and Electronic Engineers, Inc. (IEEE),⁶ the spectrum of electromagnetic radiation consists of gamma rays, wavelengths shorter than 0.0006 nm; X-rays, 0.0006–5 nm; 0.0006 nm to 5 nm; ultraviolet rays, 5 nm–0.4 nm to 0.4 μm; visible light, 0.4–0.7–0.4 μm to 0.7 μm; infrared, 0.7 μm–0.1 μm to 0.1 mm; radio, greater than 0.1 mm.).

embodied energy, *n*—the energy used through the life cycle of a material or product to extract, refine, process, fabricate, transport, install, commission, utilize, maintain, remove, and ultimately recycle or dispose of the substances comprising the item.

DISCUSSION—

The total energy which a product may be said to “contain,” including all energy used in, *inter alia*, growing, extracting, transporting, and manufacturing. The embodied energy of a structure or system includes the embodied energy of its components plus the energy used in construction.

endangered species, *n*—a species that is in danger of extinction throughout all or a significant portion of its habitat range, as determined by the governmental entity having jurisdiction.

end-of-the-pipe technologies, *n*—technologies that reduce emissions of pollutants after they have formed.

DISCUSSION—

An example is scrubbers on a smokestack.

energy recovery, *n*—obtaining usable energy by consuming waste through a variety of processes.

⁶ Available from Institute of Electrical and Electronics Engineers, Inc. (IEEE), 445 Hoes Ln., Piscataway, NJ 08854-4141, <http://www.ieee.org>.

environmental indicator, *n*—a measurement, statistic or value that provides a proximate gage or evidence of the effects of environmental management programs or of the state or condition of the environment in a given area.

exotic species, *n*—an introduced species not native or indigenous to the area where it is found.

exposure, *n*—contact with a physical, chemical, biological, or radiological agent.

flush out, *v*—the process of reducing or removing volatile organic compounds (VOCs) and other airborne contaminants from a building.

green building, *n*—a building that provides the specified building performance requirements while minimizing disturbance to and improving the functioning of local, regional, and global ecosystems both during and after its construction and specified service life.

DISCUSSION—

A green building optimizes efficiencies in resource management and operational performance, and performance and minimizes risks to human health and the environment.

habitat, *n*—the place where a population of organisms lives and their surroundings, both living and non-living.

habitat indicator, *n*—a physical attribute of the environment measured to characterize conditions necessary to support an organism, population, or community.

hazard, *n*—the adverse effect(s) that may result from exposure(s). **(E943)**

heat island effect, *n*—see **urban heat island**.

indicator, *n*—quantitative value or qualitative information derived from a set of parameters that provides information about the state of a phenomenon.

DISCUSSION—

It is used for reference or comparative purposes for decision-making at a specified level.

indigenous species, *n*—a species that is likely, due to historical presence, to occur at a specified site for some portion of its life span. **(E943)**

DISCUSSION—

An indigenous species is one having originated in and being produced, growing, living, or occurring naturally in a particular region or environment as opposed to cultivated, domesticated, or exotic.

indoor air pollution, *n*—the level of air pollution in an enclosed environment.

DISCUSSION—

Based on the definition of air pollution in Terminology **D1356**, indoor air pollution relates to the levels of unwanted material in the air.

indoor air quality, IAQ, *n*—the composition and characteristics of the air in an enclosed space that affect the occupants of that space.

DISCUSSION—

The indoor air quality of a space refers to the relative quality of air in a building with respect to contaminants and hazards and is determined by the level of indoor air pollution and other characteristics of the air, including those that impact thermal comfort such as air temperature, relative humidity, and air speed.

indoor environmental quality, IEQ, *n*—the condition or state of the indoor environment.

DISCUSSION—

Aspects of IEQ include but are not limited to characteristics of the thermal, air, luminous, and acoustic environment. Primary areas of concern in

considering the IEQ usually relate to the health, comfort, and productivity of the occupants within the indoor environment, but may also relate to potential damage to property, such as sensitive equipment or artifacts.

integrated pest management, IPM, *n*—(1) The judicious use and integration of various pest control tactics of the associated environment of the pest in ways that complement and facilitate the biological and other natural controls of pests to meet economic, public health, and environmental goals. (2) An environmentally sound system of controlling landscape pests, which includes understanding of the pest’s life cycle and well-timed non-toxic treatments.

invasive species, *n*—an exotic species that alters the native ecosystem and negatively impacts native species, resulting in habitat loss, water-table modification, or other disruptions.

DISCUSSION—

Typically the exotic species adapt to conducive or similar growing conditions as those found in the region from which it was exported. Because such a species usually has no natural enemies (pests, diseases, or grazers), it flourishes so strongly that the disruption readily occurs.

key species, *n*—a species of special concern for ecological reasons. **(E943)**

life-cycle, *n*—(1) *in economic impact management*, the length of time over which an investment is analyzed. **(E833)**

(2) *in environmental impact management*, consecutive and interlinked stages of a product system, from raw material acquisition or generation from natural resources to final disposal. **(ISO 14040)**

DISCUSSION—

Refer to the distinction between life-cycle assessment (LCA) and life-cycle cost (LCC) method.

life-cycle assessment, LCA, *n*—a compilation and evaluation of inputs, outputs, and the potential environmental impacts of a product system throughout its life cycle.

DISCUSSION—

At each stage, the product system is evaluated based upon inputs and outputs, including flows such as materials, energy, pollutants, and waste. Life cycle stages include, where relevant, raw material acquisition, processing, manufacturing, fabrication, transportation, installation, use and maintenance, and end-of-life (for example, reuse, recycle, recovery of energy, or final disposal).

life-cycle cost (LCC) method, *n*—a technique of economic evaluation that sums over a given study period the costs of initial investment (less resale value), replacements, operations (including energy use), and maintenance and repair of an investment decision (expressed in present or annual value terms).

DISCUSSION—

LCC method is distinct from LCA in that LCA is an environmental review methodology and LCC method is an economic review methodology.

microclimate, *n*—uniform localized climate conditions within a given area.

multiple chemical sensitivity, MCS, *n*—a diagnostic label for people who suffer multi-symptom illnesses as a result of contact with, or proximity to, a variety of airborne agents and other substances.

native species, *n*—(1) A species that is indigenous in a specified area for all or part of its life span. (2) A plant whose presence and survival in a specific region is not due to human intervention.

DISCUSSION—

Certain experts argue that plants imported to a region by prehistoric peoples should be considered native. The term for plants which are imported and then adapt to survive without human cultivation is “naturalized.”

non-point sources, *n*—diffuse pollution sources (that is, without a single point of origin or not introduced into a receiving stream from a specific outlet).

DISCUSSION—

Water pollutants are generally carried off the land by storm water. Common non-point sources are agriculture, forestry, urban, mining, construction, dams, channels, land disposal, saltwater intrusion, and city streets. Air pollution from non-point sources ~~include~~includes automobile exhaust.

non-renewable resource, *n*—resource that exists in a fixed amount that cannot be replenished on a human time scale.