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Average Occupancy

The average number of people in a building or area over a 24-hour period.

Balance Point Temperature

The outside temperature when there is no heating or cooling is required (thermally neutral). The point at which the internal heat gains of a building from lighting, people, and machines, etc. equals the losses through walls, roofs, and windows.

Ballast

A device is used with fluorescent and HID lamps to obtain the necessary starting and operating circuit conditions by modifying the incoming voltage and current.

Balance Point Temperature

The outside temperature when there is no heating or cooling is required (thermally neutral). The point at which the internal heat gains of a building from lighting, people, and machines, etc. equals the losses through walls, roofs, and windows.

Base Load

Energy requirements of a facility that are unaffected by weather. The minimum amount of electricity or natural gas livered or required over a given period of time at a steady rate.

Baseline

Energy consumption or costs for a specified time period to which future usage or costs are compared.

Billing Cycle

The regular periodic interval used by a utility for reading the meters of customers for billing purposes.

Authority having jurisdiction (AHJ)

The agency or agent responsible for enforcing this standard.

Base case

An operating scenario prior to consideration of energy efficiency measures (EEMs); used as a reference for evaluation of subject EEMs.

Building energy

Energy consumed by a building as measured at the boundaries of the building

Building energy model

First-principles engineering model that provides energy-using building system information (heating, ventilation, and air conditioning; lighting; occupancy; plug loads; building envelope). The model and weather data feed a computer building energy simulation program. The computer simulation program estimates building energy use and demand for a time interval specified in the building energy model. Simulation programs produce different outputs depending on their setup.

Combined heat and power (CHP)

The agency or agent responsible for enforcing this standard.

Distributed energy resource (DER)

The onsite production of electric power by any of a variety of technologies; may also include energy storage technologies.

Energy cost

The total cost for energy supplied to a building or building site, including such charges as base, demand, customer, power factor, and miscellaneous, such as sales taxes.

Energy Cost Index (ECI)

The total annual energy cost for the building divided by the gross floor area.

Energy efficiency measure (EEM)

An action taken in the operation or equipment in a building that reduces energy use of the building while maintaining or enhancing the building's safety, comfort, and functionality; also referred to as "energy conservation measure" (ECM).

Energy use intensity (EUI)

Total annual building energy use divided by the gross floor area. The EUI may be expressed as a site energy EUI or a building energy EUI.

Gross floor area

The sum of all building floor areas without deductions for floor penetrations other than atria. Covered walkways, open roofed-over areas, porches and similar spaces, pipe trenches, exterior terraces or steps, roof overhangs, parking garages, surface parking, and similar features are excluded from its measurement.

Interactive effect

The change in resultant energy savings estimates or actual energy savings due to analyzing or implementing multiple EEMs that impact one another.

Life-cycle cost analysis

A general approach to economic evaluation that encompasses several related economic evaluation measures, including life-cycle cost (LCC), net benefits (NB) or net savings (NS), savings-to-investment ratio (SIR), net present value (NPV), and adjusted internal rate of return (AIRR), all of which take into account all dollar costs related to owning, operating, maintaining, and disposing of a project over the appropriate study period.

Model

Mathematical representation or calculation procedure used to estimate the energy used in a building or facility. Models may be based on equations that specifically represent the physical processes.

Practical measure

An EEM that is determined to be technically feasible.

Owner's criteria

A set of criteria determined through communication between the owner or owner's representative and the qualified energy auditor by which recommendations and findings are evaluated.

Qualified energy auditor

An energy solutions professional who assesses building systems and site conditions; analyzes and evaluates equipment and energy use; and recommends strategies to optimize building resource use.

Renewable energy resource

A non fossilfuel energy source such as solar, wind, or geothermal energy. For purposes of this standard, consideration is to onsite opportunities for use of such sources.

Simple payback

Estimated initial EEM cost divided by the EEM first-year calculated cost savings. Both savings and costs are in dollars (\$) or other consistent monetary units, and the simple payback is expressed in years.

Simple return on investment (simple ROI)

The EEM first- year calculated cost savings divided by estimated initial EEM cost. Both savings and costs are in dollars (\$) or other consistent monetary units.

Site energy

Energy consumed by a building as measured at the boundaries of the building site E_{site} . Site energy use is the sum of annual electric use in kWh (converted to kBtu or MJ) and all other annual energy use (in kBtu or MJ). It includes fuel used for any onsite generation but not the output of that generation. Site energy use is net of onsite generation such as solar or wind.

Block Rate Schedule

Rate schedule that provides different unit charges for various blocks of demand or energy.

Blowdown

Discharge of water from a boiler or cooling tower sump to control level of dissolved solids. May be continuous or cyclic.

Coil

A cooling or heating element made of pipe or tubing.

Color Rendering Index (CRI)

A measure of the degree of color shift objects undergo when illuminated by a light source as compared with the color of those same objects when illuminate by a reference source comparable color temperature. Based on a scale of 100.

Damper

A device used to vary the volume of air passing through and air outlet, inlet, or duct.

Daylighting

Using natural light through windows and skylights. Ideally used in conjunction with dimming controls to reduce amount of electrical light input to maintain constant lighting levels.

DDC (Direct Digital Control)

Usually refers to a computer based control system that can evaluate several conditions and provide a more complex response than a simple solid-state control. It is often referred to as a "distributed control unit" of a larger computerized system to provide localized control independently of the main data storage and analysis system.

Deadband

In a thermostat, the difference in degrees between the point where heating shuts off and the cooling mode comes on.

Capital Cost

The difference between the average daily temperature (°F) and a standard temperature of 65°F. Degree days are used to indicate patterns of deviation from a given temperature standard. Average daily temperatures above 65°F are cooling degree days and average daily temperatures below 65°F are heating degree days.

Dekatherm

The quantity of heat energy which is equivalent to one million (1,000,000) Btus.

Demand

The average rate of electrical energy usage over a specified period of time, usually 15 or 30 minutes. Measured in kilowatts (kW).

Demand Limiting

A technique to reduce demand by measuring in-coming electrical power and turning off specified loads to keep the rate of electrical usage under a preset level.

DX (Direct Expansion)

A system designed to recover energy from an exhaust air stream and utilize the energy for another purpose such as preheating ventilation air or domestic hot water.

ECM (Energy Conservation Measure)

A building modification or equipment change to reduce energy consumption. Usually refers to a capital improvement project with a payback longer than one or two years.

Economizer Cycle

A method of operating a ventilation system to reduce refrigeration load. Whenever the outdoor air conditions are more favourable (lower heat content) than return air conditions, outdoor air quantity is increased to provide "free" cooling.

ECO (Energy Conservation Opportunity)

Usually refers to opportunity to save energy through implementation of and operation and maintenance O&M measure or installation of an energy conservation measure (ECM).

EMCS (Energy Management Control System)

Some type of computer based control system whose primary function is the control of energy using equipment to reduce the amount of energy consumed

Efficacy

The luminous efficiency of a lamp expressed as the ratio of total lumens produced to the watts consumed.

Efficiency

The ratio of the useful energy (at the point of use) to the thermal energy input for a designated time period, expressed in percent.

Emissions

Waste substances released into the air or water.

End-use Sectors

The residential, commercial, industrial, and transportation sectors of the economy.

Energy

The capacity for doing work as measured by the capability of doing work (potential energy) or the conversion of this capability to motion (kinetic energy). Energy has several forms, some of which are easily convertible and can be changed to another form useful for work. Most of the world's convertible energy comes from fossil fuels that are burned to produce heat that is then used as a transfer medium to mechanical or other means in order to accomplish tasks. Electrical energy is usually measured in kilowatt-hours, while heat energy is usually measured in Btus.

Energy Accounting

A formal process of providing long term organization and monitoring of utility costs and consumption data for a facility.

Energy Audit

An assessment of the energy flows in a building or process, usually with a view to identify opportunities to reduce consumption.

Energy Consumption

The use of energy as a source of heat or power or as an input in the manufacturing process.

Energy Content

The intrinsic energy of a substance, whether as gas, liquid, or solid, in an environment of given pressure and temperature.

Energy Use Index

A representation of annual energy usage per square foot of a facility. May appear in any basic or common unit such as Btu, kWh, or therms per square foot per year.

ESCO (Energy Service Company)

A company that offers to reduce a client's energy consumption with the cost savings being split with the company to pay for installation costs of energy conservation measures.

Fixture

A complete lighting unit, or luminaire, consisting of one or more lamps, ballast if needed, and elements necessary to position and protect lamps, distribute light, and connect to a power supply

Flue

The exhaust stack of a combustion boiler or other combustion. A device to convey products of combustion to the outside.

Fluorescent Lamp

Low-pressure electric discharge lamp in which a phosphor coating transforms some of the ultraviolet energy generated by the discharge into light.

Foot-candle

Measure of luminance or light. The illumination of one lumen uniformly distributed on a one foot square surface

Forced Draft

A fan on the intake side of a combustion furnace or boiler burner that forces combustion air into the burner.

Generator

A machine that converts mechanical energy into electrical energy.

Glare

Any excessive brightness from a direct or reflected source that annoys, distracts, or reduces visibility.

HDD (Heating Degree Day)

The difference of the mean daily temperature below a base temperature of 65°F. A relative measure of how weather imposes a heating load on a building which assumes that the building will not require heating until the outdoor temperature drops below 65°F.

IES

Illuminating Engineering Society Illuminance-Lighting level measured in foot-candles or lux on a working surface such as a desktop or floor.

Induced Draft

A fan on the flue side of the burner which draws combustion air into the combustion chamber through negative air pressure.

kWh (kilowatt hour)

A unit of electrical energy equivalent of 1000 watts of power provided for one hour. One kWh equals 3,413 Btus.

Lamp

A light source, commonly called a bulb or tube.

Lighting Power Budget

The total amount of power that may be utilized by a lighting system in a given space or building.

Load

The amount of demand or required energy to satisfy the need of any system.

Lumen

A measure of the quantity of light produced by a light source.

Make-up Air

Outdoor air supplied to a building to compensate for air exhausted from the building.

Occupied Hours

The time when a commercial, industrial, or institutional building is normally occupied by people functioning in their jobs.

Off-peak

Generally refers to designated periods of relatively low system demand. NERC has defined these periods as 10 p.m. until a.m., Monday through Saturday and all day Sunday.

Payback Period

The length of time necessary to recover the initial investment of a project through energy or maintenance savings.

Peak Load or Peak Demand

The electric load that corresponds to a maximum level of electric demand in a specified time period

Present Value

The present worth of a dollar saved or spent at a determined point of time in the future. This concept reflects the time value of money.

Preventive Maintenance (PM)

A system of prescheduling adjustment, cleaning, calibration, lubrication, component replacement, repairs or whatever is necessary to eliminate minor equipment problems before they become major.

Radiation

The transfer of heat from one body to another by heat waves without heating the air between the bodies.

Ratchet Clause

A clause in the rate schedule of some electric utilities that bases a customer's demand charges on a specified percentage of the highest kW Demand usage during the proceeding eleven months.

Rate Schedule

The rates and conditions set by the utility for the use of electricity and natural gas.

Reactive Power

Power used by induction motors and transformers to excite magnetic fields. Measured in kVARs (kilovolt amperes reactive).

Real-time Pricing

The pricing of electricity based on the actual (as opposed to forecast) prices which fluctuate many times a day and are weather-sensitive, rather than varying with a fixed schedule (such as time-of-use pricing).

Reheat

The application of sensible heat to supply air that has been previously cooled below the temperature of the conditioned space by mechanical refrigeration or the introduction of outdoor air to provide cooling or ventilation.

Visual Task

Those details and objects which must be seen for the performance of a given activity, including the immediate background of details or objects.

Visible Spectrum

The range of light waves detectable by human eyes.

Watt

A unit of power which is the rate of energy either produced or used.
The rate of energy transfer equivalent to 1 ampere flowing under a pressure of 1 volt at unity power factor. One watt equals 3.413 Btu/h.

Work Plane

Plane at which work is usually performed and at which illumination is specified and measured. Unless otherwise indicated, the work plane is assumed to be a horizontal plane 30 inches above the floor.

Tariff

A document, approved by the responsible regulatory agency, listing the terms and conditions, including a schedule of prices, under which utility services will be provided.

Task Lighting

Lighting directed to a specific surface or area used for performing individual tasks.

Unoccupied Hours

The time when a commercial, industrial, or institutional building is normally empty of people, except for a few attendants or maintenance personnel.

Useful Life

That period of time for which a modification used under specific conditions is able to fulfill its intended function and which does not exceed the period of remaining use of the building being modified.

Energy sub-metering

The measurement and billing of energy consumption for individual suites in a multiunit building or provide separate meters on all major uses in the building, including chillers, car parks, air-handling fans, lifts and common area light and power

Energy security

In countries with economies based on exported oil and gas, the larger concern is security of demand, a demand with little changes

Green buildings

Buildings that are environmentally responsible and resource-efficient throughout, from siting to design, construction, operation, maintenance, renovation and deconstruction.

Ergonomic

A type of science that makes use of the correct equipment design in the workplace, this is used to maximize productivity in the workplace

Greenhouse gas emissions

Gases that can absorb the solar radiation and trap it in the earth's atmosphere. These gases include carbon dioxide, water vapor, methane, nitrous oxide and others

Humidification

The artificial regulation of humidity in home environments, industrial environments and health care applications such as artificial respiration.

Best practice

A technique or, in this case, operating methodology that has been proven to reliably lead to a desired result

Building condition surveys

A method that will let you understand the general condition of a building, including all building defects.

Net floor area

Agent's lettable area (i.e. gross area minus common areas and ancillary spaces)

Normalised performance indices

A total delivered energy per m² performance indicator adjusted to take account of factors such as geographic location and hours of use to allow comparisons to be made between buildings

Energy Efficiency

Energy efficiency is a fundamental principle in high-performance building design. It refers to the use of technology and design strategies to reduce energy consumption and minimize waste. For example, using energy-efficient lighting fixtures, insulation, and HVAC systems can help reduce a building's energy usage and lower operating costs.

Passive design

Passive design uses natural elements like sunlight, ventilation, and thermal mass to regulate temperature and lighting in buildings, creating comfortable, energy-efficient spaces without relying on mechanical systems.

Renewable Energy

Renewable energy sources like solar panels, wind turbines, and geothermal systems are crucial in high-performance building design, reducing reliance on fossil fuels and minimizing environmental impact.

Building Envelope

The building envelope, comprising exterior elements like walls, windows, doors, and roof, is crucial for thermal comfort, air leakage prevention, and energy loss reduction.

Life Cycle Assessment

Life Cycle Assessment (LCA) evaluates a building's environmental impact from construction to demolition, considering materials, energy use, and waste generation, enabling designers to minimize carbon footprint.

Green Building Certification

Green building certification programs like LEED and BREEAM acknowledge buildings meeting sustainability criteria, demonstrating environmental responsibility and potentially increasing a building's market value.

High Performance Building Design

High performance building design is a holistic approach focusing on sustainability, energy efficiency, and occupant well-being. It involves integrating various parameters to create sustainable, energy-efficient, and environmentally friendly buildings, with architects responsible for ensuring these attributes are met.

Passive Design Strategies

Passive design strategies utilize natural elements like sun, wind, and shade to enhance energy efficiency and create a comfortable indoor environment, reducing artificial lighting and solar heat gain.

Energy-Efficient Systems

Energy-efficient systems, including high-performance HVAC, lighting controls, and renewable energy sources, significantly reduce a building's energy consumption and carbon footprint.

Sustainable Materials

Sustainable materials, like recycled steel and bamboo, are crucial for high-performance building design, promoting a circular economy and improving indoor air quality and occupant health.

Building Envelope Design

Building envelope design, including walls, roof, windows, and doors, regulates thermal comfort and energy efficiency. Advanced insulation materials, air barriers, and high-performance glazing minimize heat loss, reducing costs.

Energy informatics

Energy informatics utilizes advanced technologies like artificial intelligence, machine learning, and big data analytics to optimize energy consumption, improve efficiency, and reduce costs in energy-related processes.

Smart buildings

Smart buildings use advanced technologies to monitor and control HVAC systems, enhancing energy efficiency and occupant comfort. They use sensors, actuators, and communication networks for real-time data collection and analysis.

Smart grid integration

Smart grid integration integrates digital technologies into traditional electrical grids for improved reliability, efficiency, and sustainability. It allows bidirectional communication between utilities, consumers, and distributed energy resources, enabling dynamic energy supply and demand adjustments.

Lumen (lm)

A lumen is the unit of measurement for luminous flux, which quantifies the amount of visible light emitted by a source per unit time

Lux (lx)

Lux is a unit of illuminance, representing the amount of luminous flux per unit area. One lux is equivalent to one lumen per square meter.

Color Temperature (CCT)

The color temperature, measured in Kelvin (K), describes the appearance of light emitted by a source. Lower values (2000K - 3000K) indicate warmer (yellowish) light, while higher values (5000K - 6500K) represent cooler (bluish) light.

CRI (Color Rendering Index)

The Color Rendering Index (CRI) is a quantitative measure of a light source's ability to accurately reproduce the colors of various objects in comparison to a natural light source. The scale ranges from 0 to 100, with higher values indicating better color fidelity.

Footcandle (fc)

A footcandle is a unit of illuminance that measures the amount of light falling on a surface. One footcandle is equivalent to one lumen per square foot.

Beam Angle

The distribution of light from a source is known as the beam angle. It is defined as the angle between the points at which the light intensity falls to 50% of its maximum value.

Photometric Distribution

Photometric distribution describes how light is distributed in a three-dimensional space from a lighting fixture. This distribution is often represented in photometric charts, which illustrate the intensity of light at various angles.

Luminaire*

A luminaire is a complete lighting unit that includes a light source (lamp), fixture, and any necessary components for mounting and controlling the light output.

Dimming

Dimming is the process of reducing the intensity of light emitted by a fixture. Various methods, such as electronic dimmers, mechanical dimmers, or variable transformers, can achieve this

Fixture efficiency

Percentage of light that gets out of the frame compared to light emitted by a lamp(s).

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Fluorescent

Lamp family, in which the interior phosphor coating transforms UV energy into visible light.

Full-spectrum lighting

Often a marketing-hype term used to sell lamps and bulbs at outrageous prices.

HID (high intensity discharge)

Lamp category that includes MH (metal halide), HPS (high pressure sodium), and mercury vapor.

Lamp catalogs often also include LPS (low pressure sodium).

Lamp life (rated life)

Rated lamp life is in the middle of a bell shape curve when half of the lamps have burned out and half are still working under laboratory conditions. See Cycles above for more information.

SPD (spectral power distribution)

Graph of the radiant power emitted by a light source as a function of wavelength. SPDs provide a “fnger print” of the color characteristics throughout the visible part of the spectrum.

Spectrally enhanced lighting

Formerly called scotopically enhanced lighting. Lighting with more blue content, which increases perceived brightness and acuity.

Suspended indirect fixture

Suspended or pendant fixture that provides from significant to all upright. This is very popular in new and remodeled office buildings

**T5, T5HO, T8, T12,
etc**

For these linear fluorescent lamps, T stands for tubular, and the number stands for how many eighths of an inch in diameter. HO stands for high output.

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Task ambient lighting

Combination of task lighting and ambient lighting. With task lighting, the ambient lighting amount is reduced.

Task lighting

Lighting is directed at the desk or other specific surface or area to illuminate certain tasks, like reading. The most common task light application is undercabinet in module office cubicles.

Task modified lumens

Lumens based on scotopically or spectrally enhanced lighting. Three classifications are brightness, paper tasks, and computer tasks.

Warm-up time

The time it takes for a cold lamp to reach at least 90% of maximum light output, which can be quite long for some HID lamps.

Troffer

Long, recessed lighting fixture with the bottom usually flush with ceiling. Most common type is 2' wide by 4' long, very typical in offices.

Tunable

Dimming and warm to cool white color changing. Also called dimming and Kelvin changing or shifting.

LED (Light Emitting Diode)

Highly efficient light sources with a long lifespan, available in various color temperatures and intensities. LEDs have become the standard for both general and specialized lighting applications.

Halogen Lamp

Halogen Lamp is a type of incandescent lamp that incorporates halogen in order to increase the average life and light output of the light source.

Heat Sink

Device incorporated in LED Lighting Systems to disperse heat away from the LED diode.

Magnetic Ballast

Often Called "Core-and-Coil" ballast. Magnetic ballasts contain a magnetic core with copper windings. Magnetic ballast typically have greater power losses than electronic ballasts.

Refraction

Bending of light as it passes through a medium. The bending in light is a result of the change of speed as it passes from one medium to the next.

Transformer

An electrical device that transfers electricity from one voltage to another. Step down transformers takes a higher voltage to a lower voltage. Step-up transformers take lower voltage to a higher voltage.

Wall Sconce

Decorative Style Luminaire commonly hung on walls.

High Bay:

Type of Light Fixture typically used for commercial and industrial applications with high ceilings (>20 ft).

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Beyond Smart Cities is the world's first marketplace for green technology. It connects millions of sustainability experts, green building experts, energy experts, commissioning experts, carbon accounting experts, fire safety experts, climate change experts, and green product and technology manufacturers with independent talent from all over the world.

Our mission is to build and support a global community of experts with the highest standards of professional practise in sustainability, green building, energy, commissioning, environment, health & safety, fire safety, climate change, GHG accounting, carbon auditing, and managing GHG emissions.

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