Glossary

Complete Glossary of the bigEE website

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A

Absorption-type refrigeration appliance	In an absorption-type refrigeration appliance an absorption process using heat as energy source effects the refrigeration. A compression-type appliance has a higher energy efficiency of about a factor three.
Achievable energy savings	(The part of the overall) energy saving potential, which might be achieved due to the implementation of a policy or measure, or policy package.
Actor	Individuals, companies, organisations or political entities whose decisions can influence the energy efficiency of buildings, appliances, etc. and who can therefore be target groups of policies and measures (see Policies & Measures). See also market actors.
Actor constellation	Description of the relations between (market and influencing) actors, most importantly supplier – customer relations and who defines specifications on energy efficiency, but also of their competitive advantages and their positions of power.
Advanced Efficiency Approach	An Advanced Efficiency Approach is needed to attain the low levels of energy consumption of an Ultra-Low-Energy Building. It can be cost-effective, depending on the relationship between extra building costs and saved energy costs, but this may not always be the case. Such an Advanced Efficiency Approach sets more ambitious energy efficiency standards, using the most-energy-efficient components and systems (Active Options) available. Remaining energy consumption should preferably be met by renewable energy sources (solar radiation, ambient and geothermal energy, sustainable biomass).
Appliance	Appliances are standardised units that the investor purchases “off the shelf” and just connects to the energy and in a few cases to the water network. The energy efficiency optimisation is done by the manufacturer, but the choice between very energy-efficient and inefficient models is influenced by all market participants.

B

Best Available Technology (BAT)	The most energy-efficient technology for an end use or purpose that is available on the market in a country.
Best Not (yet) Available Technology (BNAT)	A technology that would be technically feasible through an optimal combination of already known technical solutions, but has not yet been commercialised.
Building code	See minimum energy performance standards (MEPS)

C

Closed building	These building mainly use active technologies (e.g. heating or cooling plants and equipment) to condition the internal environment throughout the year. This allows for a greater control within stricter thermal comfort levels.
Co-benefits	Co-benefits can be achieved by improving a building's energy performance or by making an appliance more energy-efficient. Such co-benefits may provide economic benefits in the same range as the direct energy cost savings. The most interesting of these co-benefits are improvements in health, higher workers' productivity through better indoor climate and lighting, and higher living standards by making energy bills affordable.
Cold climate	Cold climates have a high heating demand for all or part of the year and no or little cooling demand. Heating Degree Days 18 ≥ 1000, Cooling Degree Days 10 < 1000
Compression-type refrigeration appliance	In a compression-type appliance, refrigeration is effected by means of a motor-driven compressor. Such an appliance has a higher energy efficiency of about a factor three than an absorption-type refrigeration appliance.
Conventional building	The name given a building that is built according to common conventional practice in a country or according to a building energy code or minimum energy performance standard that does not require at least low energy buildings. A conventional building does not use any improved design, passive solar strategies, energy-efficient building envelope, or energy-efficient active energy end-use technologies better than established as common practice or required by law to reduce energy use and energy costs.

D

Demand flow technology (in water heaters)	Flow-based power modulation technology in tank-less hot water heaters makes them more energy efficient than full on/full off water heaters storage. Typical less efficient boilers are turned on full power regardless of the temperature and flow rate. On the other hand more sophisticated water heaters measure the flow rate of water and will modulate overall power output to compensate for the flow rate change so as to maintain more precise temperature level.

E

Energy audit	Individual advice to homeowners or tenants in order to show what they can save and what is cost-effective.
Easy Efficiency Approach	The Easy Efficiency Approach is characterised by an intelligent building design in combination with an appropriate choice of efficient technologies for heating, cooling, hot water production, lighting and so on. By fulfilling basic rules of energy-efficient design especially 'Passive Options', relatively high amounts of energy can be saved with relative low effort and costs. In the majority of cases,

	relatively moderate extra investment costs are more than compensated by energy cost savings within a few years and certainly over the lifetime of the buildings.
Energy efficiency	Ratio between an output of performance, service, goods or energy, and an input of energy [2006/32/EC and CEN/CLC Task Force 189 (CEN/CLC 2009)].
Energy efficiency fund	Energy efficiency funds are special entities founded and funded by the state for organisation and funding of energy efficiency programmes. Energy efficiency funds (also known as energy efficiency trusts) can implement such energy efficiency programmes as an alternative to, but also jointly with energy companies or the government itself. Energy efficiency funds or trusts may be given greater flexibility in implementing energy efficiency programmes than government agencies or energy companies, and may receive a stable funding by creating dedicated levies or taxes on energy to feed the fund or trust.
Energy efficiency programme	A type of energy efficiency policy or measure other than a legal requirement or energy price modification. It aims at concrete energy efficiency actions and targets many actors. In contrast to an energy efficiency service, a programme is not or only partly financed by the actors who benefit, with the rest normally coming from government budgets, energy efficiency funds, or an energy company's revenues (and hence, all its customers).
Energy efficiency service	An energy efficiency service is an agreed task or tasks designed to lead to an energy efficiency improvement and maybe other agreed performance criteria, which have proven in "normal circumstances" to lead to verifiable and measurable or estimable energy efficiency improvement and/or primary energy savings.
Energy label	Energy labels present the best products on the market and are primarily made for buyers and end-users. Energy labels can either use a classification scheme, e.g. from A to G with A as most energy efficient, or endorsement labels, that are awarded to products / buildings that meet specific standards.
Energy Performance Certificate (EPC)	A classification energy label for buildings.
Energy Service Company (ESCO)	Any entity that delivers energy efficiency services and in so doing takes some kind of financial risk and meets some defined energy efficiency performance criteria.
Energy Saving Obligation (ESO) (for companies)	Energy supply and/or distribution system operator companies can be mandated by law to save a certain amount of energy in energy end uses (i.e. on the demand side, with their customers) and prove achievement of that target. The energy companies thus receive both the responsibility and the right of cost recovery for the organisation and funding of energy efficiency programmes.
Evaluation	Quantitative assessment of the impacts (in terms of energy savings and benefits achieved and costs incurred) and thus of the effectiveness and cost-effectiveness of a certain policy or measure, using a proven and accepted calculation methodology. In addition to such *impact assessments* (see also

	impact assessment) or *evaluations*, there can also be *process evaluations* aiming at understanding whether a policy or measure works as intended, in order to identify possibilities for improvement.
External costs / Externalities / External effects	External costs / externalities / external effects relate to the consequences of an action by an individual or group as they have an impact (negative or positive) on others and are not (yet) included in the cost of the individual or group who took the action. Without any further policy intervention, such internalisation will not take place.

F

Feed-In-Tariff (FIT) (for certified energy savings)	Feed-in-tariffs (FITs) have already been implemented in the field of electricity generated from renewable energies in many countries. In a similar way, a country could also offer providers of standard energy efficiency programmes or of large energy efficiency projects a fixed remuneration for every certified unit of energy saved. This could be an alternative to energy saving obligations for energy companies that creates more competition in the energy efficiency market.
Final energy	Final energy is the energy made available to the user after the conversion of primary energy into e.g., heating oil, electricity, etc.
Free-rider effect	Energy savings attributable to actors who would have implemented an energy efficiency improvement action anyway but make use of facilities or support provided by a policy or measure.

G

Good practice policies or measures	Good practice policies or measures are more successful or innovative than most other policies or measures of the same or similar type. Within bigEE, a list of ten criteria has been developed to assess whether an existing policy or measure can be seen as good practice.

H

Hot and arid climate	Hot and Arid climates have a cooling and no heating demand throughout the year as well as low relative humidity levels throughout the year. Heating Degree Days 18 <1000, Cooling Degree Days 10 ≥ 1000
Hot and humid climate	Hot and Humid climates have a cooling and no heating demand throughout the year as well as a high humidity level throughout the year, with a humidity level of over 50% in the hottest month. Heating Degree Days 18 <1000, Cooling Degree Days 10 ≥ 1000
Hybrid Building	Hybrid Buildings use both passive and active technologies to maintain thermal

	comfort. These buildings are designed so that for the greater part of the year the passive design options maintain the thermal comfort and only under extreme climatic conditions where this is not possible the active option is used.

I

Incremental costs of improved energy efficiency	Incremental costs of improved energy efficiency are the difference in investment, operation, and maintenance costs between an energy-efficient and a conventional, not energy-efficient solution. For instance in thermal insulation of a building, the incremental costs are only the material and salaries for the insulation, whereas the scaffolding, the plaster and the final coating would be needed anyway, also for the conventional building. They are part of the full costs but not of the incremental energy efficiency costs.
Instrument	An instrument is a tool used by governments (or other actors) to implement their policies, programmes, or services (e.g. legal standards, taxation, financial incentives, voluntary agreements, energy performance contracting).
Internalisation of external costs	Incorporating the cost of the damage caused by energy production and consumption / CO_2 emissions into the price of fossil fuels and other energy using activities.

K

Kilowatt (kW)	A unit of power equal to 1,000 watts. The rate of flow of energy, e.g. into a building. See peak demand.
Kilowatt-hour (kWh)	A unit of energy: defined as a power equal to 1,000 Watts consumed for one hour. 1 kWh = 3.6 MJ (million J).

L

Lighting controls	Lighting controls like occupancy sensors turn lamps on, when somebody enters a room, or turns off, when nobody has been present for some time. They can be controlled locally or can be scheduled to operate suit usage patterns of the occupants. Lighting controls keep a check on unintentional and negligent behaviour and avoid unwanted energy usage.
Life-cycle costs	Life-cycle costs are the sum of costs over the full life span or specified time (usually covering purchase / planning / design, use and disposal) of a good (e.g., building or appliance) or service (e.g., energy efficiency service).
Lock-in effect	Once renovated or built, it will not be cost-effective to further upgrade the energy efficiency of these buildings for several decades. In other words, inadequate action now means losing cost-effective opportunities for long-term investment, energy and carbon emissions.

Lost opportunity	The difference between the actual energy efficiency improvement or energy savings realised due to business-as-usual new construction or retrofit or appliances, or due to a policy or measure promoting suboptimal energy efficiency action or levels, and the level of improvement or energy savings that could be achieved if state-of-the-art design options and BAT were implemented. As a consequence of lost opportunities, buildings or equipment with an unnecessarily high energy consumption will be in use for many years, which is known as the lock-in effect.
Low energy buildings	Low-Energy Building (LEB) can be designed by what we call an Easy Efficiency Approach. This can achieve primary energy savings for cooling, heating, ventilation and domestic hot water in a range of about 40% to 60% LEB is, however, not a clearly defined term and can therefore include various design and technology options. The most important advantage of these buildings is that they are - as a rule - economically attractive over their lifetime because they make use of the 'low hanging fruits' of energy efficiency options.

M

Marginal costs	Marginal costs equal the change in total (or variable) costs that come with producing one more unit of a good or service. The marginal costs of supplying one unit of energy are actually what can be saved through improved energy efficiency. This direct economic benefit of energy efficiency can be calculated from either the investor's perspective or that of the society and be compared with the incremental costs of energy efficiency improvements from the same of the two perspectives.
Market (volume)	Number of technology units (appliances or buildings) sold on a specific market in a specific year (see also „Stock (volume)"). $Market_{year\ t}$ = $Stock_{year\ t}$ - $Stock_{year\ t-1}$ + number of old technology units to be replaced (because the technical lifetime is exceeded)
Market actors	All actors that are of major relevance on the market for a specific product. For the buildings market in general, these would be e.g. building companies, architects, manufacturers of building components, installers, house-owners, tenants. See also actor.
Measurement & Verification (M&V)	Different Measurement and Verification (M&V) approaches exist. The simplest way is to stipulate deemed saving assumptions for certain energy efficiency options before its installation. For example, many jurisdictions in the USA have technical reference manuals documenting these savings. A more complex way is to conduct short-term tests to obtain inputs for saving calculation. A complete M&V can include whole building analysis, such as calibrated simulation modelling, or extensive metering of end-use equipment or systems. Which approach to be chosen depends on data availability, the predictability of equipment operation, and/or the trade-offs between M&V precision and cost (Neme et al. 2012).

Measures	Measures are concrete actions taken by governments or organisations to implement their policies, making use of the different types of instruments or services. Sometimes, also concrete actions taken by end-users or other market actors to improve the energy efficiency of a building or piece of equipment are called "measures". In bigEE, we do not use the term in this way.
Minimum Energy Performance Standards (MEPS)	By setting an upper limit for the allowed energy consumption of a building, minimum energy performance standards (MEPS; also known as energy building codes or regulations) are used to exclude at least the most inefficient building concepts and technologies from the market.
Monitoring	Gathering and keeping record of the data that is required for ex-post evaluation of a P&M (e.g., number of participants, sales figures, etc.).

N

Nearly zero energy building (nZEB)	(Nearly) Zero and Plus-Energy Buildings take the concept of Ultra-Low-Energy Buildings a step further. In addition to a highly energy-efficient building performance, the (nearly) Zero-Energy Building and the Plus-Energy Building concepts include on-site renewable energy technologies for generating power and also meeting cooling and heating requirements of the buildings. As on-site generation is normally more expensive than reducing energy consumption, advanced levels of energy efficiency should be achieved first. If the amount of produced energy is roughly equivalent to the annual primary energy consumption, the building can be described as a nearly Zero-Energy Building (nZEB).
Net Present Value	A measure of the economic attractiveness of an investment

O

Open Building	These buildings are open and have no active technologies. These are also known as free running buildings. Temperatures can be to some extent controlled through passive options. Indoor temperatures follow the outside temperature. Internal temperatures ranging at best from the lowest temperature to the outside shade temperature in the tropics. In Hot Climates and Temperate Summer Climates the internal loads e.g. persons or technologies can add a significant gains to the internal temperature.

P

Passive house	The Passive House concept is the best-known and mature example of an Ultra-Low-Energy Building in the closed concept construction. Although it has been developed and proven for temperate and cold climate zones, it is in principle feasible all over the world with certain adaptations. Passive houses are generally described as “a building, for which thermal comfort (ISO 7730) can be achieved solely by post-heating or post-cooling of the fresh air mass, which is required to achieve sufficient indoor air quality conditions – without the need for additional recirculation of air.” (Passipedia 2012). In contrast to the general terms Low-Energy Building and Ultra-Low-Energy Building, Passive House (PH) is associated with a certified label with clear certification criteria requirements.
Photovoltaics (PV)	Photovoltaics (PV) is a semiconductor technology for converting sunlight directly into electricity. PV installed on the roof and walls can net meet the total electricity consumption of a single family house built to Ultra-Low- Energy Building (ULEB) standards in most climate zones. The cost of electricity produced by PV varies between €0.09/kWhel in sunny regions closer to the equator and €0.17/kWhel in Northern Europe.
Plus-Energy Building (PEB)	(Nearly) Zero and Plus-Energy Buildings take the concept of Ultra-Low-Energy Buildings a step further. In addition to a highly energy-efficient building performance, the (nearly) Zero-Energy Building and the Plus-Energy Building concepts include on-site renewable energy technologies for generating power and also meeting cooling and heating requirements of the buildings. As on-site generation is normally more expensive than reducing energy consumption, advanced levels of energy efficiency should be achieved first. If the energy production exceeds the consumption, the term Plus-Energy Building (PEB) will be used.
Policy	A plan, guiding principle or course of action (outlined or taken by governments or other organisations) to influence and determine decisions and actions and achieve (a) desired outcome(s) with regard to a particular issue (here: energy efficiency improvement).
Policy instruments	E.g. label, information campaigns, individual consulting
Policy roadmap	A policy roadmap including ambitious, yet achievable energy saving targets as well as comprehensive medium- to long-term strategies pro-

	vides a reliable planning framework to market actors and reduces investment risk: for investors in energy-efficient buildings they enhance trust that such buildings will retain a higher value, while for suppliers of energy-efficient buildings and technologies they create confidence that there will be a market demand.

R

Rebound Effect	Rebound effect means that as a result of an increase of energy efficiency, there is an increasing demand for products and services that reduces the energy savings derived from the energy efficiency improvement. Direct rebound effect: the initial energy-saving effect of an energy efficiency improvement measure is reduced because part of the avoided expenditures on energy is used to increase comfort levels (e.g., increasing room temperature in cold climates and seasons after implementing insulation measures). In industrialised countries, it may on average reduce energy savings by between 10 and 15 %, in developing countries it may be higher. Indirect rebound effect: the energy-saving effect is reduced because end-users use the avoided expenditures to buy other goods or services, the manufacturing, provision, possibly operation and disposal of which also requires energy use. It has been estimated at around 10 % of the energy savings. Energy taxation at the pace of energy efficiency improvements is a good general instrument to counterbalance rebound effects, along with policy-specific measures.
Refrigerant	The liquid used in a refrigerator or freezer is called refrigerant. It evaporates at an extremely low temperature, so it can create freezing temperatures inside the refrigerator.
Research & Development (R&D)	According to the IEA's definition, energy Research & Development R&D) covers • basic research when it is clearly oriented towards the development of energy-related technologies, • applied research, and • experimental development. Demonstration and deployment is exluded in this definition (IEA 2011).
Research, Development & Demonstration (RD&D)	According to the IEA's definition, energy Research, Development & Demonstration (RD&D) covers • basic research when it is clearly oriented towards the devel-

	opment of energy-related technologies, • applied research, • experimental development, and • demonstration. Deployment is exluded in this definition (IEA 2011). RD&D activities in the buildings sector mainly focus on "developing low energy housing design, allowing for optimal heat, air and moisture flows in buildings, and optimising building envelope technologies, i.e. new insulation and building materials" (IEA 2011).

S

Setback temperature	The setback temperature is a temperature a few degrees above or below the normal (space set point) temperature within a room or building. By adjusting the thermostat to a setback temperature during nights and diurnal absence the energy consumption can be significantly reduced. In addition, the room temperature can be adjusted to a normal (set point) temperature more easily from a setback temperature than by turning off the system completely.
Side Effect	All other effects that occur as a result of an energy efficiency improvement policy or measure apart from the primarily intended energy-saving effect: avoiding lost opportunities, dynamic market transformation, creating spill-over effects, and minimising rebound effects.
Simple Payback Time (SPB)	A measures of the riskiness of an investment
Snap back Effect	Even though the term is sometimes used as a synonym for 'rebound effect', we define it differently here: the snap-back effect occurs when the impact of an energy efficiency improvement policy or measure is partly or completely reversed after the policy or measure ends. E.g., the sales rates of super-efficient appliances would increase significantly due to a rebate programme but sharply drop again (in the worst case back to what they were before the programme started) as soon as the rebates are not available anymore. Markets fall back to lower energy efficiency levels
Spill over Effect	The initial energy-saving effect of an energy efficiency improvement measure is increased due to a market transformation, i.e. the market or some the end-users will implement energy efficiency improvement actions automatically without further policies and measures being required.

Standard offer programme (SOP)	A SOP provides performance-based incentives to larger customers, paying them a certain amount per estimated kWh or kW saved through the installation of energy saving equipment in a specific programme.
Subsidy	A subsidy is a benefit given by the government to groups or individuals in the form of tax reduction or cash payment. Subsidies can be put on energy consumption or energy production, the goal is to lower energy prices. By reforming subsidy schemes that push energy prices below market level, energy subsidy removal/reform profoundly changes incentive structures for end-users and producers alike, thus giving energy saving behaviour and energy efficiency investments the financial value they deserve.
Sustainability	Sustainability is to meet the needs of the present without compromising the ability of future generations to meet their own needs. Source: Brundtland report
Sustainable development	"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: • the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given; and • the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs." Source: Brundtland report

T

Temperate climate	Temperate climates have both a heating and cooling demand for all or part of the year. Heating Degree Days 18 ≥ 1000, Cooling Degree Days 10 ≥ 1000
Test standard	A test standard includes a standard definition of the daily or annual specific energy consumption per unit plus a test procedure. Such a test standard makes it possible to introduce minimum energy performance standards and energy labels.
Top Runner Approach	The Top Runner Approach is a standard setting tool which (at one point in time) identifies the most energy-efficient appliance of a given product category and, secondly, defines this efficiency value as the standard for the product group.

U

Ultra low energy buildings (ULEB)	The Ultra-Low-Energy Building (ULEB) maximises a building's energy efficiency potential. In the context of the bigEE project, an Ultra-Low-Energy Building is defined to achieve a primary energy savings of 60% to 90% for cooling, dehumidification, heating, ventilation and domestic hot water.

W

Watt (W)	Unit of power defined as one joule per second, measures the rate of energy conversion or transfer.

Z

Zoned Building	Zoned Buildings are a combination of both passive and active building models. Here the building is divided into different zones, which are conditioned accordingly to their needs. Passive zones are usually found on the buildings perimeter and active zones in the buildings interior. This allows for the passive options such as natural light, solar insolation as well as natural ventilation to be used to the optimum.

bigEE

Your guide to energy efficiency in buildings.

bigee.net

bigEE is an international initiative of research institutes for technical and policy advice and public agencies in the field of energy and climate, co-ordinated by the Wuppertal Institute (Germany). Its aim is to develop the international web-based knowledge platform bigee.net for energy efficiency in buildings, building-related technologies, and appliances in the world's main climatic zones.

The bigee.net platform informs users about energy efficiency options and savings potentials, net benefits and how policy can support achieving those savings. Targeted information is paired with recommendations and examples of good practice.

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