Standards

Green Buildings

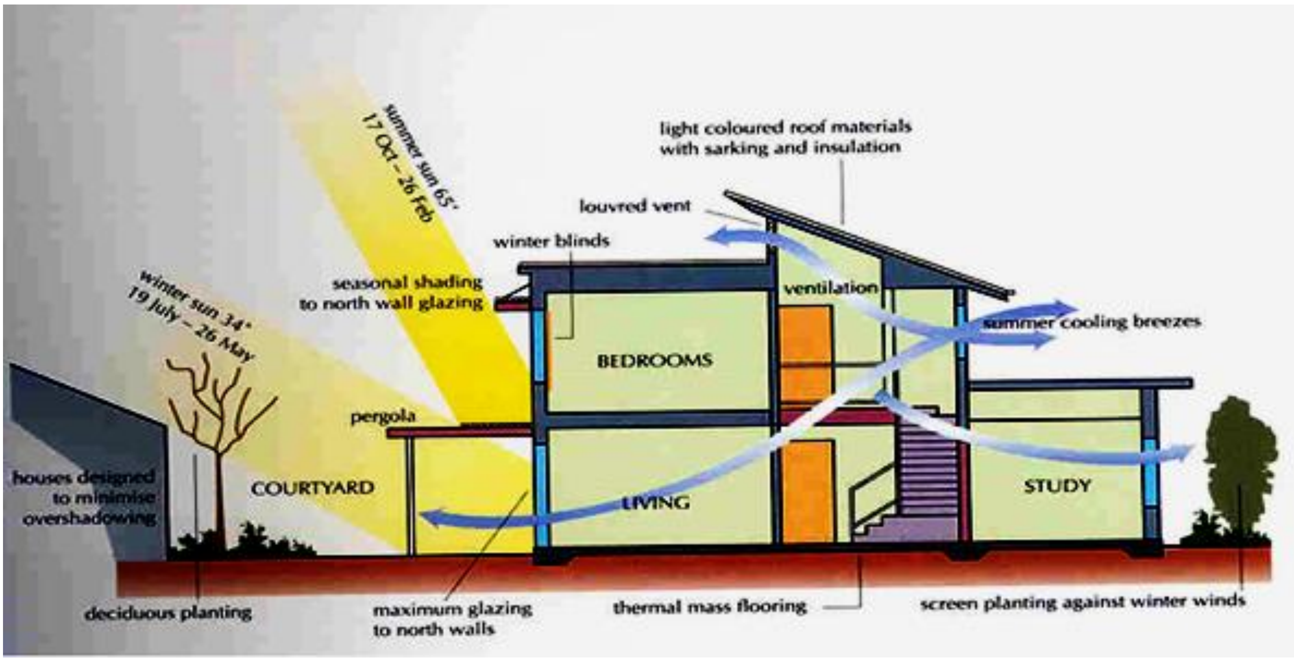
Standards for Green Building 标准.

The international perspective

The United Nations Environmental Programme (UNEP) has pointed out that standards and certification are an important mechanism to introduce green building through normative measures. This can be done thorough mandatory or through voluntary mechanisms: “The building sector offers major opportunities to bridge the emissions gap, due to its large share in global energy use, the dynamics of population growth, urbanisation and housing needs, and its large cost-effective mitigation potentials. … [W]ell-designed policy packages are critical to achieving the stated potentials combining building energy codes, building energy certification programs, together with appropriate incentives and information campaigns. … A strong and well implemented building energy code will take the building stock to a higher energy performance, and will be able to avoid locking-in obsolete solutions and high-emitting technologies, especially in rapidly developing regions. Building energy codes are increasingly being applied worldwide. In late 2015, mandatory and/or voluntary building energy codes were in place in over 60 countries at either national or subnational levels, making this one of the most widely used energy efficiency policy instruments. Building energy codes are expanding their coverage from new construction to renovations of existing buildings, which is particularly important for regions with mature building stocks. For instance, the European Directive on the Performance of Buildings requires energy performance improvements for major retrofits throughout the European Union (EU) (European Parliament, 2010). Building energy codes have also been expanding in their coverage of requirements – moving towards more complex, whole-building approaches, and requiring the integration of renewable energy generation. Most of these schemes are voluntary. In the case of the European Union, its mandatory Energy Performance Certification is required when buildings are sold or rented, or when they undergo major renovations. However, countries such as Germany also set energy performance requirements for minor retrofits. However, the existence of a building energy codes alone does not guarantee emission reductions. To ensure their effectiveness, the following principles need to also be adopted. … Compliance monitoring and enforcement are essential. … Certification of building energy performance is currently being used in at least 35 countries, worldwide.

Labelling schemes enable policy makers to tailor incentive schemes and other policy instruments, fostering a market transformation towards high-energy performance building stock. Certification may exist with or without a label, and can be combined with the provision of a set of recommendations for improvement.

Mandatory schemes are expected to have a higher overall impact, while voluntary schemes can be considered as information measures. Voluntary schemes may enhance the effectiveness of other policies, or be a transitional step towards a mandatory system. The effectiveness of certification and labelling schemes also depends on effective monitoring and enforcement, which should be an integral part of their design. Many countries have developed their own building energy performance certification schemes, like the Home Energy Rating (Chile), Greenship (Indonesia) and Green Mark (Singapore). Many other countries have adapted international certification systems to the local conditions. However, many of these schemes were developed before a stringent climate goal was universally accepted and, therefore, operate with less ambitious energy, or emissions performance levels than would be consistent with the global goal. Therefore, it is important that countries, before adopting energy performance certification programmes for buildings developed in the past, carefully examine their stringency from the perspective of carbon lock-in, and the energy and emissions performance requirements are brought as close to the state-of-the-art as possible.



Example for a PASSIVHAUS. Source: http://designinsightarchitects.org.uk/passivhaus/2230998

In terms of energy performance, one of the most ambitious building energy certification schemes is the so-called “Passivehaus” standard. This standard encourages very low-energy buildings from a heating and cooling perspective, with low thermal losses and optimized thermal gains. The Passivehaus standard has been adapted to different climate zones worldwide and further developed with the common target that annual final energy use for heating and cooling – not exceeding 15 kilowatt hour (kWh) per m2 per year.8 This target represents a reduction of up to 90 per cent in energy demand for heating and cooling for most existing buildings. The standard has become popular in several countries, and is experiencing a dynamic market adoption in several regions. The global floor area of Passivehauses has grown from 10 million m2 in 2010 to 46 million m2 in 2016, with the most activity occurring in Europe (personal correspondence: Passive House Institute and Gunter Lang). Presently, the price premium for new Passivehauses in several countries is comparable to standard construction costs. Net-zero energy buildings. The minimal remaining energy needs of highly efficient buildings can often be supplied with on-site renewable energy, thus creating a net zero energy building. The global market of this type of building reached US$630 million in 2014, and is expected to continue its growth, to reach US$1.4 trillion by 2035. Numerous examples of net zero energy buildings exist around the world. Energy positive (or e+) buildings. These are buildings that generate more (renewable) energy on-site than they use. Examples can be found in a number of countries, including Australia, France, Germany, Norway, the UK and the USA. These highly efficient buildings can play an important and more active role in the overall energy system, since they can act as potential micro-energy hubs, supplying energy to local neighbourhoods through peer-to-peer networks. This offers opportunities to generate and store renewable energy (both therefore, operate with less ambitious energy, or emissions performance levels than would be consistent with the global goal. Therefore, it is important that countries, before adopting energy performance certification programmes for buildings developed in the past, carefully examine their stringency from the perspective of carbon lock-in, and the energy and emissions performance requirements are brought as close to the state-of-the-art as possible.

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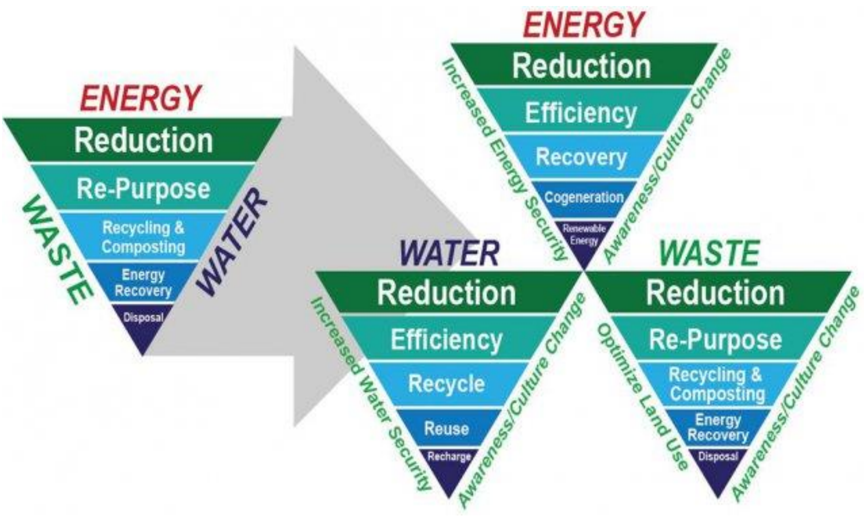

Net Zero Energy Design Principles. Source: http://science.dodlive.mil/2013/06/09/army-releases-net-zero-progress-report/

their societal co-benefits, some jurisdictions are now recommending or mandating them as standards for different building types. For instance, since 2010, in Brussels (Belgium) all new public buildings are mandated to be built to the Passivehaus standard, and as of January 2015 it is a mandatory requirement for all new buildings and major retrofits. Hannover, Germany does not have mandatory Passivehaus policies, however the local housing market has transformed to offer high efficiency as a standard option, and approximately one-third of all new construction voluntarily conforms to the Passivehaus standard." [1]

Credentials:

EC-LINK Green Building Position Paper.

Summary: Florian Steinberg.

Editing: Kosta Mathéy

[1] Source: UNEP. 2016. *The Emissions Gap Report 2016* - A UNEP Synthesis Report. Nairobi, pp. 31-35 http://uneplive.unep.org/media/docs/theme/13/Emissions_Gap_Report_2016.pdf