

Iksan-si (Jeollabuk-do), Republic of Korea



Austrian Embassy, Jakarta, Indonesia



Zhejiang PRC CHINA (Shanghai)



Austrian Embassy, Jakarta, Indonesia

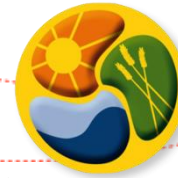


Kamakura, Kanagawa (Kanto), Japan

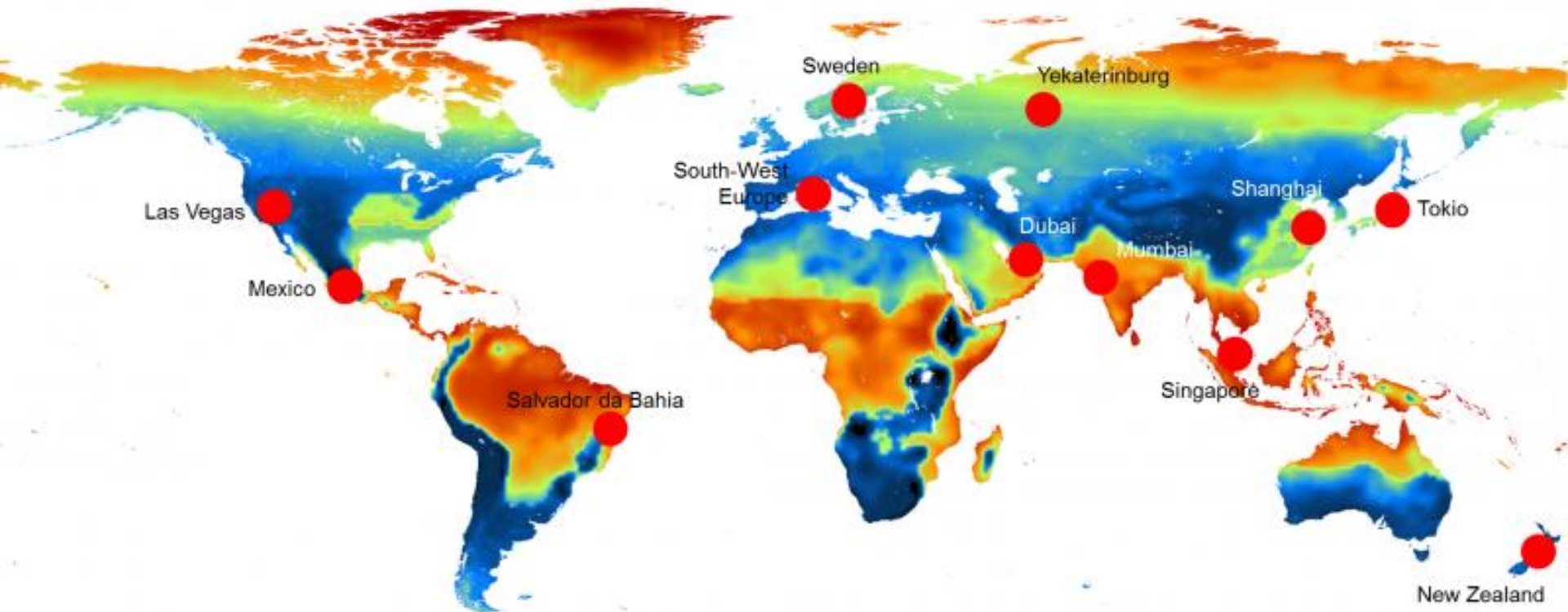


Zhejiang PRC CHINA (Shanghai)

Passive Houses



Passive House



Passive House Standard

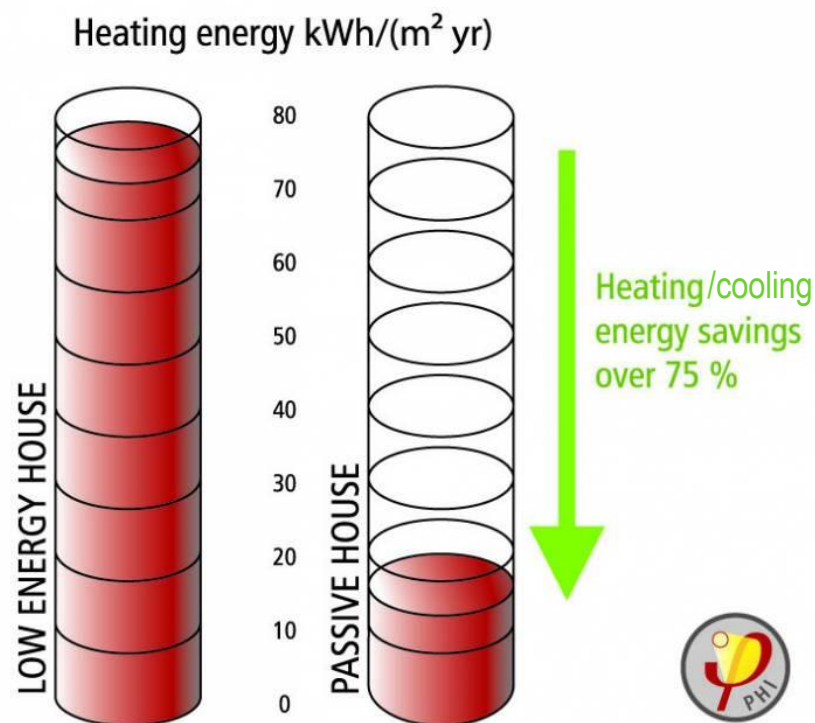
Passive House is a **building standard** for

- **energy efficient,**
- **comfortable,**
- **affordable** and
- **ecological**

construction concepts (*not a brand name*).

Passive Houses allow:

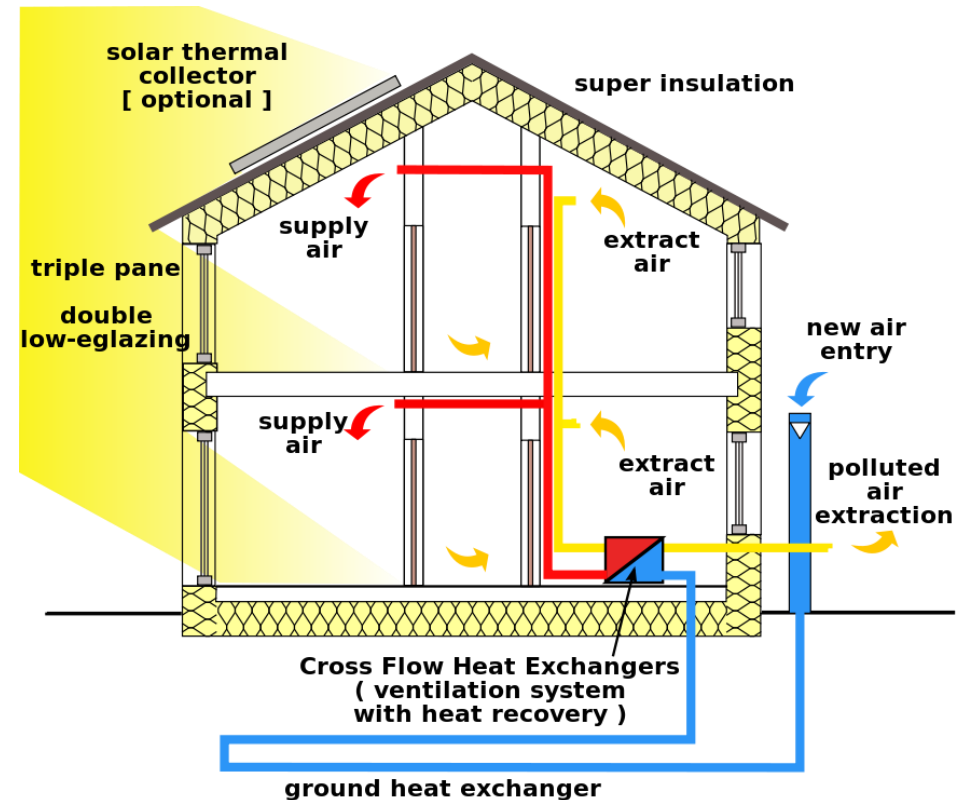
- energy savings related to heating and cooling of up to 90% compared with typical building stock and
- over 75% compared with average new buildings.



Passive House Standard

Thermal comfort is achieved through the use of passive measures:

- good levels of insulation with minimal thermal bridges
- passive solar gains and internal heat sources
- excellent level of airtightness
- good indoor air quality, provided by a whole house mechanical ventilation system with highly efficient heat & energy (cooling) recovery



The Passive House Standard can be applied not only to the residential sector but also to commercial, industrial and public buildings.

Passive House Standard

Developed for European climates - proven to work well in hot & humid climates

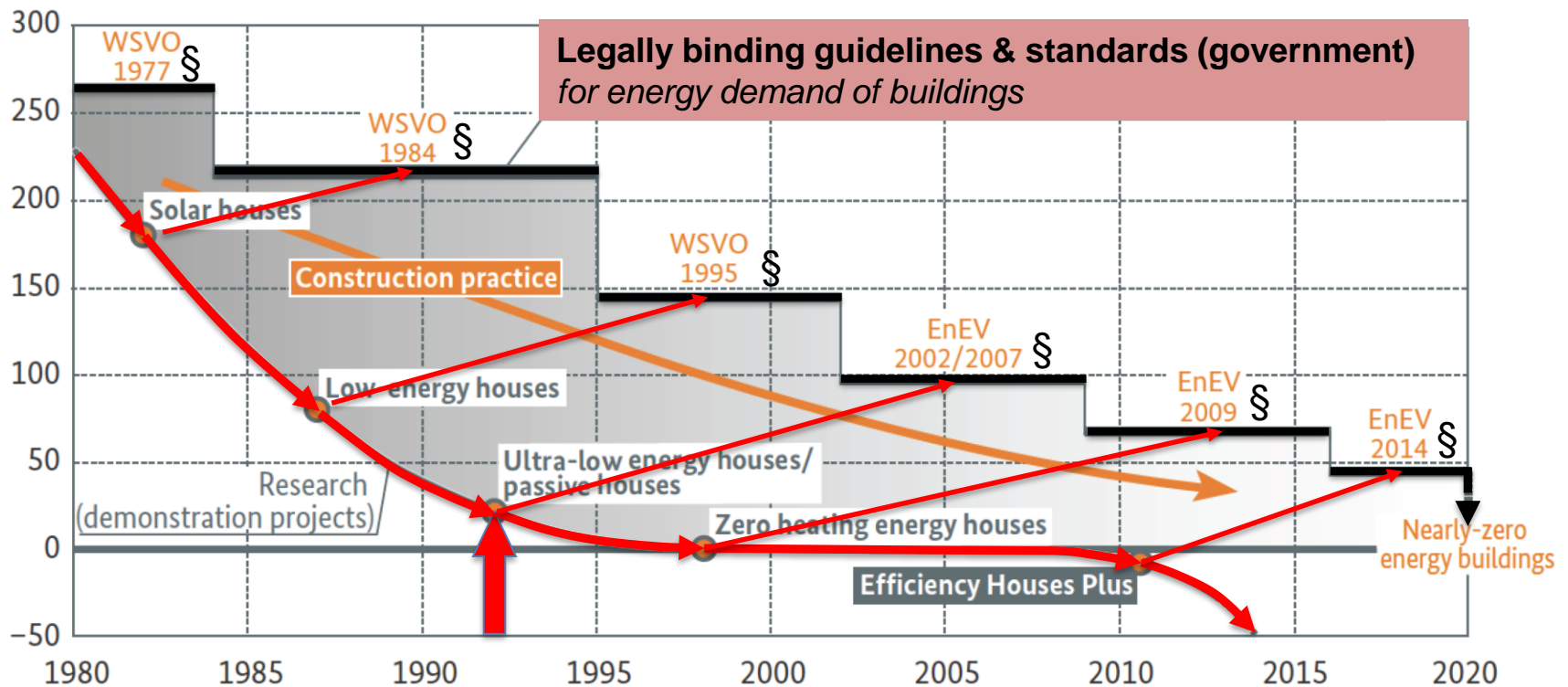
Outline Specification

The Passive House standard is a comprehensive low energy standard for new buildings. **Energy performance targets define the standard** and must be met in order for certification to be achieved:

Space Heating Demand	not to exceed 15kWh annually or 10W (peak demand) per square meter of usable living space
Space Cooling Demand	roughly matches the cooling demand with an additional, climate-dependent allowance for dehumidification
Primary Energy Demand	not exceed 120kWh annually for all domestic applications (heating, cooling, hot water and domestic electricity) per square meter of usable living space
Airtightness	maximum of 0.6 air changes per hour at 50 Pascal pressure (as verified with an onsite pressure test in both pressurized and depressurized states)
Thermal Comfort	Thermal comfort must be met for all living areas year-round with not more than 10% of the hours in any given year with 25°C

Passive House

Primary energy demand for a semi-detached house – heating [kWh/m²a]



Passive House Standard

Low energy consumption + High energy efficiency

Building structure:

- Compact building structure
- Optimized orientation of the building
- building envelop with thermal insulation composite systems (ETICS)
- Free of thermal bridges
- High quality workmanship

Building services engineering:

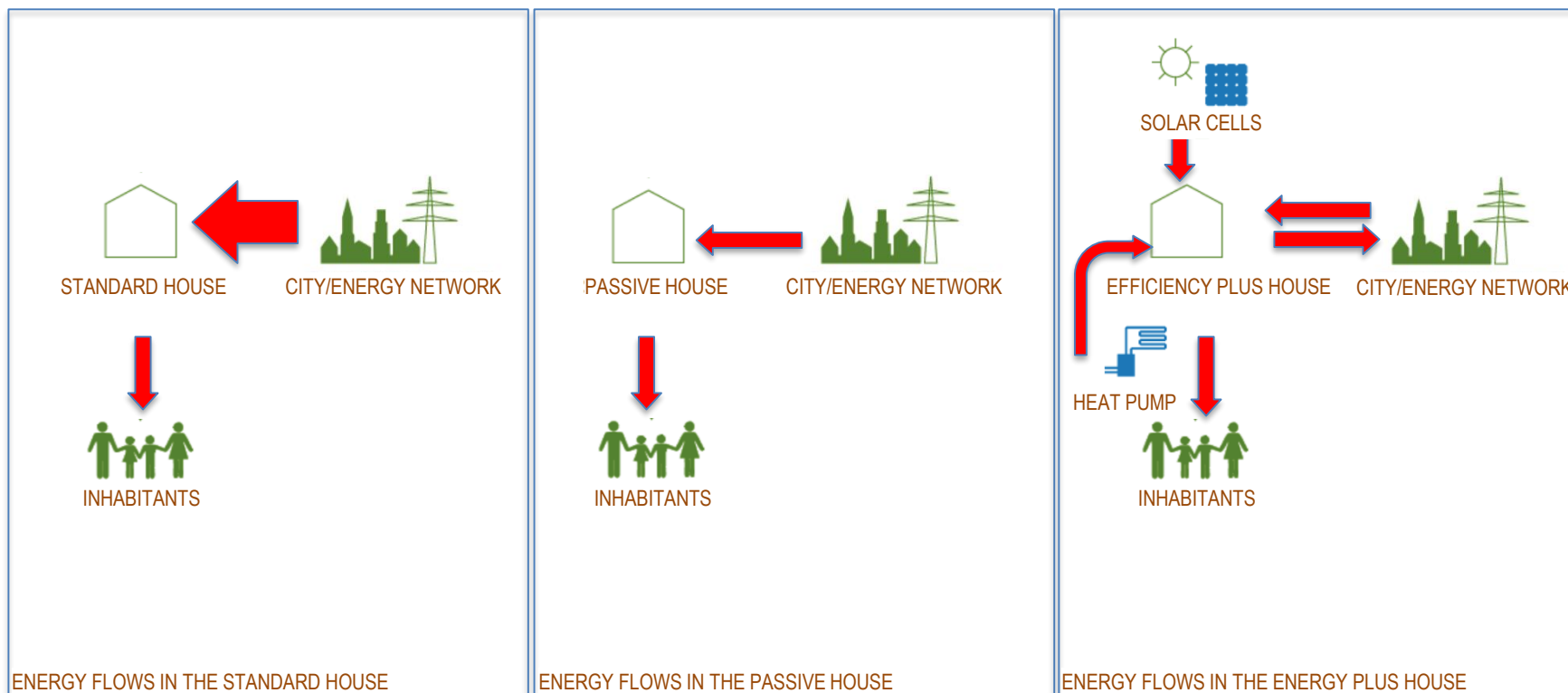
- Heat recovery ventilation systems
- Energy (cooling) recovery ventilation systems (*pre-cooling and dehumidification*)
- Thermal component activation
- Demand-driven heating-/cooling- & ventilation-systems
- Short lines inside the building
- Household appliances with best energy-performance label

Efficiency Plus House Standard

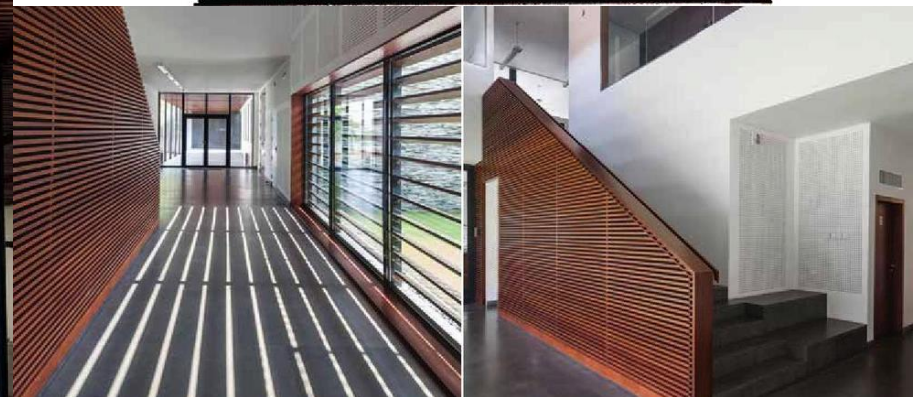
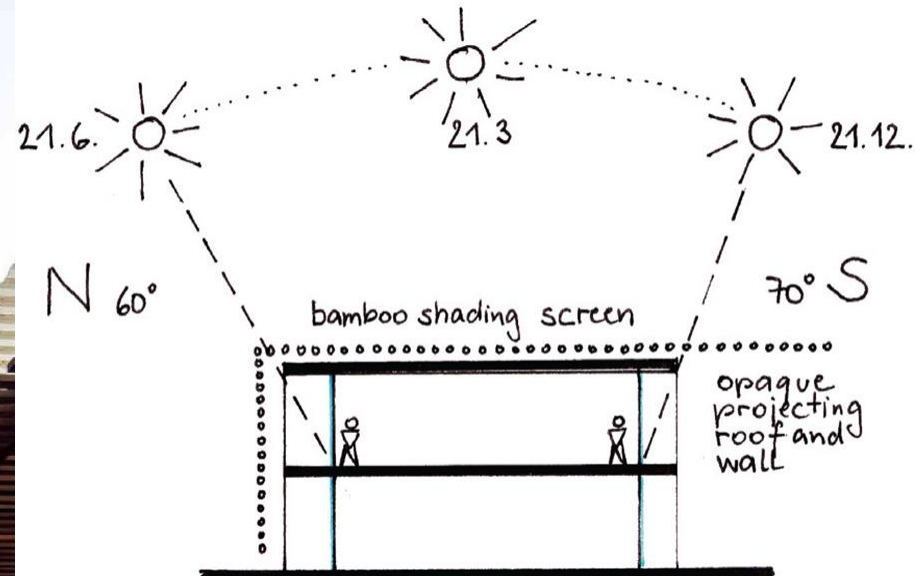
Use of renewable energy

- Solar thermal generators
- Solar power generators (*photovoltaic*)
- Geothermal heat pumps (*energy*)
- Air-air heat pumps
- Local wind energy generators
- Energy buffer storage

Energy Flows, *Standard house, Passive House, Efficiency Plus House*



Passive House Standard, *Innovative architectural approach for hot and humid climates*



Passive House Standard, *Innovative architectural approach for hot and humid climates*

The new building concept respects the principles of effective sun protection and adopts the Passive House-Standard to hot humid climate conditions.

Key features:

- careful shading of all openings,
- high thermal insulation standard for exterior walls,
- double glazed windows,
- an air-tight building shell,
- a ventilation plant with energy recovery and
- cooling via CCT (concrete core tempering).

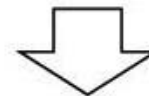
Austrian embassy Jakarta / environmental data

What does the environment gain?

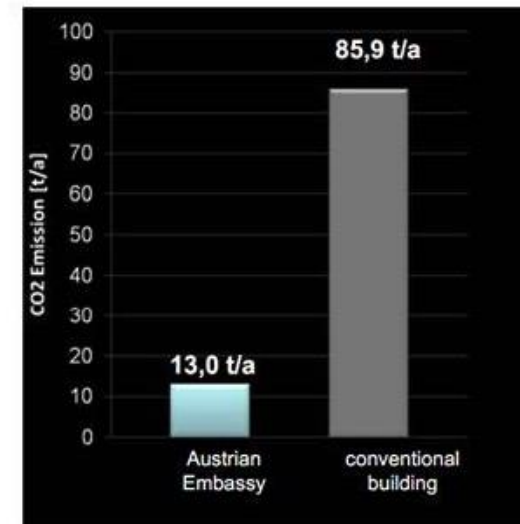
CO₂ Emission (equivalent)
in tons per year

AEJ building 13,0
standard building 85,9

Reduction of CO₂
emissions by 84,8%



Significant
contribution to cope
with global warming



Passive House Standard, *Innovative architectural approach for hot and humid climates*

96 m2 photovoltaic
generator

sun protection by external
screen of local timber

air tight and thermally
insulated building shell

interior good natural day-
light conditions

cooling by concrete core
temperature control

green spaces with water
seepage & rain water
cistern

Bamboo stands :
co2 sequester

slow speed air ventilation
with energy recovery



Passive House

The Passive House Institute has compiled the following points to support and to trigger effective climate protection measures in the building sector at the local level:

Passive House legislation for new public buildings and retrofits

“New public buildings belonging to the city or local authority will only be built to the Passive House Standard in future.

As far as possible, renewable energies will be used.

The same applies for new buildings rented by cities, i.e. the aim is to achieve a heating and cooling demand of less than 15 kWh/m²/a each.

Refurbishments of owned or rented buildings will only be carried out with Passive House suitable components, meaning refurbishment to the Passive House international Standard or a retrofit yielding a reduction in energy usage by a factor of 10.

Renewable energies will also be taken into account in the case of refurbishments.”

Passive House

Legislation for land belonging to local authorities

“Land belonging to the local authority will only be sold on condition that construction will take place according to the Passive House Standard, or that refurbishment will be carried out using Passive House components, with the integration of renewable energies. Suitable verification (e.g. preliminary planning with the PHPP) should be provided.”

Municipal urban planning adapted to climate

“Municipal urban planning will be adapted to the climate. The topographic situation of the building, its compactness and its orientation in relation to the sun, the prevailing wind direction, and the shading will all be taken into account. Such planning will be supported by binding specifications of mechanical and building energy supply systems.”

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Passive House legislation for municipal housing companies

“Housing companies belonging to the municipality will be obliged to construct their new buildings in accordance with the Passive House Standard and to modernize their existing building stock using Passive House components, with integration of renewable energies.”

Financial incentive programmes

“The city or local authority will create its own financial incentive programme for investors and private building owners in order to encourage participation in climate protection measures through the construction of Passive House buildings, through refurbishment using Passive House components, and via the use of renewable energy sources.”

Passive House

Quality assurance by means of milestones

“Quality assurance by means of milestones will be used to check whether the required standard of work has actually been provided. Milestones include, for example, planning approval, execution planning, initial site meeting post completion of the building shell, second site meeting post completion of the airtight building envelope, completion of the building, assessment of technical measurements, independent certification.”

Climate-neutral urban districts with Passive House Standard

“Climate-neutral urban districts based on the Passive House Standard will be developed as pilot projects.”

Passive House

Further training and informational events

“Informational events and further training will be offered to communicate with investors, builders, building owners (commercial and private), residents, architects, craftsmen, local companies, urban planning experts, and political decision makers. Providing consultations prior to the issuing of building approvals will be mandatory. Appropriate advisory facilities will be set up.”

Encouragement of use of energy-saving technologies

“The use of energy-saving household appliances and building system technology, as well as replacement of electricity intensive technology will be encouraged, for example, through information campaigns or financial incentives.”

As a federal enterprise, GIZ supports the German Government in achieving its objectives in the field of international cooperation for sustainable development.

Published by
Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Registered Offices, Bonn and Eschborn, Germany

“Integrated Resource Management in Asian Cities: the Urban Nexus”

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