让我们共同打造气候中和的未来
Building a climate-neutral future together

Sino-Swiss Cooperation on Zero Emissions Building

Technical Report

Zero Emissions Districts

Sustainability Criteria

ENGLISH VERSION

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让我们共同打造气候中和的未来
Building a climate-neutral future together

This report has been produced within the framework Sino-Swiss Zero Emissions Building Project; an international collaboration funded by the Swiss Agency for Development and Cooperation in partnership with the Chinese Ministry of Housing and Urban-Rural Development.

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The Sino-Swiss Zero Emissions Building Project is an international collaboration funded by the Swiss Agency for Development Cooperation in partnership with the Chinese Ministry of Housing and Urban-Rural Development. The project aims to reduce greenhouse gas emissions and enable carbon neural development of the building sector in China by sharing Swiss know-how on sustainable and zero emission building.

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Contents

1. PROJECT BACKGROUND

About Sino-Swiss ZEB Project

In order to jointly address global climate change and to strengthen cooperation between China and Switzerland in the field of emission reduction in the construction industry, the Ministry of Housing and Urban-Rural Development of the People' s Republic of China and the Swiss Federal Ministry of Foreign Affairs signed a Memorandum of Understanding (MoU) on 24 November 2020. The Memorandum is about the development of cooperation in the field of building energy efficiency. Within the framework of this MoU, the Swiss Agency for Development Cooperation (SDC) initiated and funded the Sino-Swiss Zero Emission Building Project. The project aims to support China in formulating the technical standard of zero carbon buildings and long-term roadmaps for reducing carbon emissions in the construction industry. Switzerland contributes by sharing know-how and use cases of zero emission building demonstration projects in different climate zones, while carrying out various forms of capacity building activities, so as to ultimately promote the carbon-neutral development of China' s construction industry.

Project purpose

- Upgrading existing building energy efficiency standards to Zero Carbon technical Standards
- Implementing demo projects in 4 typical climate zones for testing the new ZEB standards and finding optimization potentials
- ZEB capacity building and knowledge dissemination

Project duration

- Phase I: 15. Mar. 2021 – 28. Feb. 2025

Project impact on climate protection

- Reduce CO2 Emission in building sector

Contribution of FHNW to the Sino-Swiss ZEB Project

The contribution of the FHNW Institute Sustainability and Energy of Constructions (INEB) is to develop ZED implementation guidelines of Zero Emission District (ZED) with specific thematic focusses and advice planning teams of selected Demo Project (DP) projects of Sino-Swiss ZEB Project.

FHNW conducted working meetings and lectures on sustainability in district development and visited some Sino-Swiss DP projects in China and gave practical inputs. Additionally, different Swiss district labels and the Chinese ZED Standard have been compared and the differences compiled. A booklet with the title "Overview of Sustainability Criteria" has been developed that addresses the main aspects for designing and operating sustainable districts. It gives a broad inside in all different sustainability aspects. Based on this booklet a survey was developed to obtain more information on the attitude towards the different sustainability criteria as well as the specific implemented measures in the DP Projects.

Content of this booklet

This booklet provides an overview of all the issues that need to be considered when a district shall be developed in a more sustainable way. It is separated in nine aspects and the related criteria. For each criteria the reason why the criteria is included and what intention resp. goal it follows. Possible measures to reach the goals are listed.

2. METHODOLOGY

2.1. Criteria for sustainable districts

To develop a district in a sustainable way, various criteria must be considered. The existing Chinese Evaluation Standard for Zero Carbon Community have been compared to the Swiss District certification systems Minergie, SNBS (Standard for Sustainable Construction Switzerland) and 2000-Watt-District and a comprehensive list of all sustainability criteria has been extracted.

Based on the comparison, nine sustainability main aspects and their criteria have been compiled (Table 1) This booklet includes background information for each criteria. It gives a general description of the criteria and reasons why these criteria are important. Furthermore the sustainability goals are addressed. To reach this goal possible measures are listed. Requirements for each criteria are compared between Swiss labels and the Chinese Evaluation Standard for Zero Carbon Community and the difference described.

The extracted criteria cover the planning and the operational phase. After planning a building or district, the operation should be compared to the design values and checked permanently for an efficient and optimized operation. careful planning is the basis for sustainability, but the district operations show year after year whether the implementation is successful.

The Plan-Do-Check-Act method or cycle (PDCA method) helps to control and continually improve the district operations (Figure 2):

- Plan – designing a monitoring concept
- Do – monitoring of different parameters
- Check – Analyzing the data and comparing them with target values
- Act – undertaking necessary measures to reach the targets
- Restart the cycle

The PDCA method should in minimum be applied to the measurable parameter:

- Energy
- Mobility
- Water/wastewater
- Waste

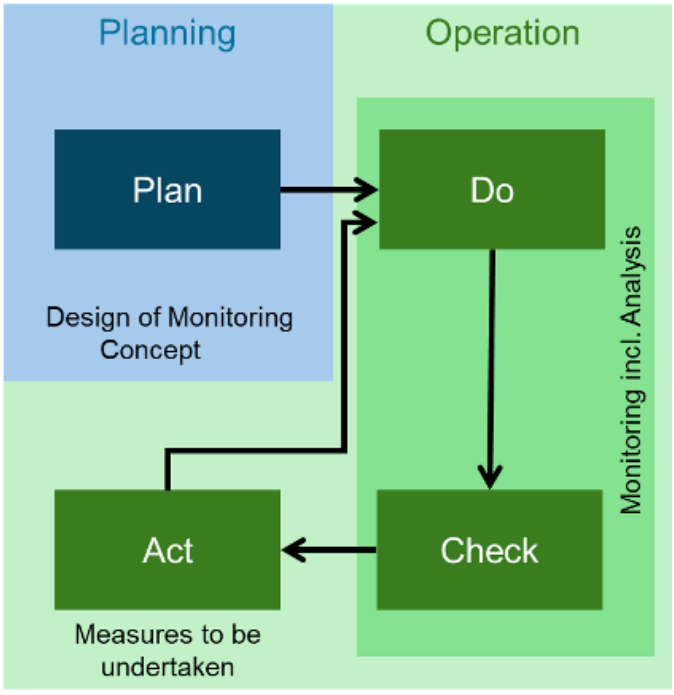

Figure 2: Plan-Do-Check-Act method applied to the certain criteria, Source: FHNW

Table 1: Overview of the main aspects and their criteria

No	Aspect	No	Criteria
1	Operation	1.1	Design of energy efficient building
		1.2	Quality of electricity and amount of self-consumption
		1.3	Environmental impact from the operation of the building
		1.4	Design of energy and monitoring concept
		1.5	Monitoring of operational energy
		1.6	Energetic process optimization
2	Construction	2.1	Environmental impact from the construction of the building
		2.1	Circularity in construction
3	Mobility	3.1	Environmental impact from everyday mobility
		3.2	Design of a mobility monitoring concept
		3.3	Monitoring of mobility behavior
		3.4	Mobility optimization measures
4	Supply and Disposal	4.1	Use of local energy resources
		4.2	Renewable electricity for efficient street lighting
		4.3	Water management
		4.4	Design of a water monitoring concept
		4.5	Monitoring of water consumption and wastewater
		4.6	Design of a waste management concept
		4.7	Design of a waste monitoring concept
		4.8	Monitoring of waste
5	Outdoor-Quality	5.1	Biodiversity
		5.2	Climate adaptation
		5.3	Economical land use and density of use
6	Sharing	6.1	Sharing services and offers
7	Diversity	7.1	Social mixing / Diversity of users
		7.2	Variety of uses and offers for daily needs
8	Planning Process	8.1	Public use of the ground floor
		8.2	Urban development and architectural concept
		8.3	Planning tools/instruments
		8.4	Quality assurance in planning and operation
9	Communication, Cooperation and Participation	9.1	Stakeholder and user involvement in sustainability

2.2. Glossary

Certified Green Electricity

A guarantee of origin is issued for every kilowatt hour of electricity generated. The guarantee of origin is decoupled from the physical flow of electricity and is traded separately as an independent certificate. It ensures that the electricity is not counted multiple time in different balances.

CO2-eq-Emissions (GHG Emission)

Cumulative quantity of all greenhouse gases (CO2, methane, nitrous oxide and other climate-impacting gases) emitted into the atmosphere. The greenhouse gas emission is expressed as an equivalent CO2-emission quantity (CO2-eq) that has the same greenhouse effect as the total greenhouse gas emissions.

End Energy / Final Energy

Energy that is available for consumption on-site. This is equal to the sum of energy supplied minus the self-generated energy used within the balance perimeter. The final energy is typically shown separately by energy source.

Energy Carrier

main energy carrier for buildings: electricity, wood, coal, heating oil, natural gas or liquefied natural gas, biogas, district heating, ambient heat, solar or wind energy and geothermal energy.

Everyday Mobility

The everyday mobility includes trips to work, sports, school and shopping. Leisure trips are not included.

Inner Urban Development

Development in already populated areas, avoidance of building on greenfields.

Negative Carbon Emissions

Carbon dioxide (CO2), which is technically removed from the atmosphere and permanently stored.

Self-consumption association

Association to use as much on-site generated energy as possible. The benefit is a low energy price.

Reuse Materials, Reuse Components

Use of e.g. windows, doors, wash basins, floor covering, tiles, bricks, steel/timber beams, photovoltaic systems of disassembled buildings in other buildings.

Useful Energy

Thermal energy that is directly available to the consumer, e.g. as heat in the room, as heat extracted from the room (cooling) or as hot water at the tapping point. Taking heat and conversation losses into account use energy is converted into final energy.

Phase Adapted

The planning of a building is divided in different phases: early design with a rough outline until handover to the owner/user. As the planning progresses the details become more and more precise. The more details are known, the better the planning can be.

Waste Water

Wastewater includes black- and greywater. Blackwater is wastewater from toilets and highly contaminated water from kitchens (fat, oil). It needs treatment due to health and environment risks. Graywater is only slightly contaminated wastewater from e.g. showers, hand washing, washing machines or dish washers. Graywater can be recycled and used for toilets, cleaning, washing machines, watering, etc.

3. CRITERIA DESCRIPTION

3.1. Operation

3.1.1. Criteria: Design of energy efficient building

Requirements from the Swiss labels

In Switzerland the energy law defines a maximum of weighted end energy for different building categories (e.g. Dwellings, Offices, Schools). Different energy carriers have different Swiss weighting factors (electricity: 2.0, fossil: 1.0, district heating: 0.4-1.0, sun/geothermal: 0). The labels are usually stricter and define lower benchmarks for end energy demand compared to the Swiss standard law. The weighted energy demand is calculated by multiplying the end energy demand by energy carrier with the specific weighting factor und summing them up to a building total. Creditable on site produced electricity can be subtracted.

Requirements from the Chinese Evaluation Standard for Zero Carbon Community (Prerequisite)

The ZED standard does not have prerequisites on the total end energy. Nevertheless, reducing the end energy helps to reduce the carbon emissions, especially when the district is supplied partly with non-renewable energies.

Difference between the Swiss and the Chinese ZED standard requirements

The big difference is that Switzerland has prerequisites on weighted end energy by law and the ZEB and ZED standard only focusses on carbon emissions.

General description of the criteria

The total end energy demand of a building includes the energy demand for heating, hot water, ventilation, air conditioning, lighting, appliances and general building technology minus the creditable on site produced electricity.

Reason

Globally the building operation is responsible for 28 % and the construction industry for 11 % of the total CO2-eq-emissions. This is because globally most buildings are still heated with fossil fuels and run on strongly fossil-based electricity.

Goal

Significant reduction of total energy demand for the operation of the buildings in a district.

Possible measures

Maximizing the amount of renewable energy produced on-site (e.g. Photovoltaics), reduction of demand: well insulated building envelope, using devices with a low energy consumption (e.g. China Energy Label), using a mechanical ventilation system with heat recovery, using LED lighting, efficient devices, etc.

3.1.2. Criteria: Quality of electricity and amount of self-consumption

Requirements from the Swiss labels

The Swiss labels have a strong focus on renewable energy including electricity. It is required that a very high percentage of the electricity demand is either generated on site or certified renewable electricity must be purchased from the electricity market. To relieve the load from renewable electricity in the power grid, a high degree of self-consumption is required. This is often regulated by an association for own use.

Requirements from the Chinese ZED standard (Prerequisite)

The carbon reduction rate for renewable electricity generation should be no less than 15 % for low-carbon communities, 25 % for nearly zero carbon communities, 25 % for nearly zero-carbon communities and 30 % for zero-carbon communities. The terminal electrification rate should be no less than 60 % for low-carbon communities and no less than 80 % for nearly zero and zero carbon communities. Furthermore, is it desirable to cover not less than 50 % of the roof area with photovoltaic systems.

Difference between the Swiss and the Chinese ZED standard requirement

The Swiss labels have a strong focus on a low benchmark for carbon emissions from operation. To achieve these requirements, the electricity consumer mix needs to have a very high percentage of renewable electricity. The ZED standard has carbon goals by defining the carbon reduction rate for the different levels of carbon communities.

General description of the criteria

Promotion of using as much renewable electricity as possible to operate a building. Increase the locally produced renewable electricity, use as much as possible on-site. The remaining demand should

then be covered by purchased certified green electricity. A certificate of green electricity ensures that the green electricity (electricity generated by renewable energy source) is taken into account only one time in an energy balance. The duration of the certified green electricity contract needs to be at least 10 years.

Reason

Globally the operation of buildings makes up 28 % of the carbon emissions. This is because most of the buildings still run with fossil fuels. The more buildings are run by renewable energy, the smaller the carbon impact of buildings gets.

Goal

Reduction of the amount of fossil-fuel generated electricity and increase the amount of locally produced renewable electricity in the consumer mix.

Possible measures

Usage of renewable energy, use of power storage, introduce load management, install smart grids.

3.1.3. Criteria: Environmental impact from the operation of the building

Requirements from the Swiss labels

All the Swiss labels have specific benchmarks for carbon intensity per m2 heated floor area and year due to operation, which must be complied with.

Requirements from the Chinese ZED standard (Prerequisite)

The proportion of low-carbon building area in low-carbon communities should be no less than 50 %, the proportion of low-carbon building area in nearly zero-carbon communities should be no less than 80 %, and the proportion of low-carbon building area in zero-carbon communities should reach 100 %.

The Zero Emission Building (ZEB) standard defines clear limits regarding carbon intensity for different building categories in kg CO2-eq per m2 and year depending on the climate zone. It distinguishes between requirements for low-carbon, nearly zero-carbon and zero-carbon buildings.

Difference between the Swiss and the Chinese ZED standard requirements

In Switzerland in the different labels benchmarks for the whole district are defined. There are some differences between the labels and there is not yet any label requiring zero carbon emission. Therefore, it is possible to compensate between the different buildings. There is only one label on district level in Switzerland which requires that also most buildings need to fulfil the requirements of the label on a building level.

General description of the criteria:

Reduction of the amount of environmental impact caused by the operation of the building over its life cycle. To calculate the environmental impact the final energy consumption is needed. Usually, the calculation starts with use energy (heat/cooling demand, plug loads, …). Taking heat and conversation losses into account use energy is converted into final energy. For each energy carrier like gas or electricity the final energy consumption is determined and multiplied with the corresponding CO2-eq-emission factor. The total sum of each energy carrier gives the environmental impact of CO2-eq-emission for each building and can be compiled for the whole district. Usually, the amount of self-consumption from on-site generated energy like electricity from photovoltaic can be subtracted from the total sum.

One Swiss label allows to reduce the CO2-eq-emissions in the operation phase with the purchase of certified green electricity for a share of the operating energy. A long-term contract (10 years) is necessary.

Reason

Globally the building operation is responsible for 28 % and the construction industry for 11 % of the total CO2-eq-emissions. This is because globally most buildings are still heated with fossil fuels and run on strongly fossil-based electricity.

Goal

Significant reduction of energy and carbon emissions for the operation of the buildings in a district.

Possible measures

Use of local and renewable energies, reduction of energy consumption by insulating the building, avoiding fossil energy carriers, installation of a smart distribution system and a smart use of energy.

3.1.4. Criteria: Design of energy and monitoring concept

Requirements from the Swiss labels

Several Swiss labels require in the planning phase a monitoring concept which describes where (how

detailed), when (how often) and how (what appliances) the energy consumption and generation is measured.

Requirements from the Chinese ZED standard (Prerequisite)

There are no requirements regarding the energy and monitoring concept

Difference between the Swiss and the ZED standard requirements

The Swiss labels require an energy concept during the planning phase to ensure that the potential of renewable energy for heating and electricity is maximized. Furthermore, they require a monitoring concept in the planning phase to ensure that the total operational energy consumption and generation on site is periodically measured and evaluated.

General description of the criteria

An energy concept is crucial to maximize the amount of locally produced and sourced renewable energy for heat and electricity. A monitoring concept allows to collect and evaluate the amount and type of energy consumed on site for building operation. Based on the measured data the energy flows of the building operation can be analyzed, and large consumers can be determined. This gives the opportunity to check if all consumers work properly and shows where adjustments and optimizations are necessary. Measured data can be final or use energy.

Reason

Optimized building operation, reduction of the amount of bought in energy (final energy) and maximize the amount of renewable energy in the consumption mix.

Goal

100 % of the total energy consumed shall be renewable, as much energy as possible must be produced on-site (mainly photovoltaic on roof and façade) and with a good monitoring concept the consumption and production can be optimized.

Possible content

Analysis of the local energy situation, installation of plenty of photovoltaic modules on the roof and façade, installation of small wind turbines, use of ground heat, use of district heating, smart grid, self-consumption association, use of thermal and energy storage, use off efficient devices and lighting

3.1.5. Criteria: Monitoring of operational energy

Requirements from the Swiss labels

Continuous measurement and periodic evaluation of energy consumption. Use this data to check the operation and plan optimizations. Digitally display the generated data and make the main data available to users.

Requirements from the Chinese ZED standard (Prerequisite)

Low-carbon, nearly zero-carbon and zero-carbon communities should establish energy statistics and energy management systems.

Difference between the Swiss and the ZED standard requirements:

To be able to check and optimize the operational energy consumption most Swiss labels require an operational energy monitoring.

General description of the criteria

Detailed monitoring of operational energy is crucial for target-oriented optimization of the operational energy consumption of the district. The monitoring of the operating energy records the energy consumption, the energy generated on site and the energy supplied for the entire area as well as for the individual buildings, rental units and relevant facilities. Recommended are also individual consumption displays for the rental units to increase the awareness of the own energy consumption.

Reason

Only if a detailed monitoring of the operational energy is in place, it is possible to find those appliances with a very high energy consumption and to fix or replace them.

Goal

Reduction of the operational energy consumption and increase the amount of renewable energy in the consumption mix by maximizing the amount of self-generated renewable energy on site.

Possible measures

Various measuring points on the site but also in the building technology: electricity meters, heat meters, volume flow measurements, temperature/humidity sensors, charging status, etc.

3.1.6. Criteria: Energetic process optimization

Requirements from the Swiss labels

Some Swiss labels require a systematic commissioning and an energetic process optimization. Energy monitoring is sometimes also part of the process optimization.

Requirements from the Chinese ZED standard (Prerequisite)

There is no prerequisite on operation optimization in the ZED standard.

Difference between the Swiss and the ZED standard requirements

After having monitored and analysed many buildings in operation it has been found out, that many buildings and districts show a higher energy consumption as calculated. With an early energetic process optimization this can be easy adjusted.

General description of the criteria

The energetic process optimization consists of commissioning with adjustment after commissioning, a one-time energy optimization in the operation phase and energy monitoring as an implementation of the energy measurement concept.

Reason

Energetic process optimization opens up better energy efficiency in a simple way. Such measures are particularly attractive because they carry hardly any risks. They do not trigger replacement investments, they are highly cost-effective and the tenants do not usually need to be involved.

Goal

Reduction of amount of energy consumed

Possible measures

Checking the stability of the various control loops in dynamic operation, checking control sequences (e.g. heating, heat recovery, cooling) in dynamic operation, analyzing and testing the on/off and control behavior of demand-controlled systems (e.g. frequency converters, step switches, cascade circuits) in real operation (e.g. by means of trend analyses), checking the function and energy efficiency indicators of energy-relevant systems (e.g. chillers, heat recovery systems, heat pumps, waste heat recovery, solar systems), optimizing heating and cooling curves, optimizing hydraulic balancing, etc.

3.2. Construction

3.2.1. Criteria: Environmental impact from the construction of the building

Requirements from the Swiss labels

All the Swiss labels have specific benchmarks for embodied energy and carbon per m2 heated floor area and year, which must be complied with. A building and a district is considered a resource repository with its own system boundary. The goal is to add as few new materials or components as possible to the system, if nevertheless necessary to use material/components from repositories of other systems and keep the resources in the system. The reuse of materials and components leads to circularity in construction.

Requirements from the Chinese ZED standard (Prerequisite)

The proportion of low-carbon building area in low-carbon communities should be no less than 50 %, the proportion of low-carbon building area in nearly zero-carbon communities should be no less than 80 %, and the proportion of low-carbon building area in zero-carbon communities should reach 100 %.

There are only prerequisites for “whole process zero-carbon buildings” with regards to embodied carbon. Such buildings must comply with the requirements of a “zero-carbon building”, the implicit carbon emissions should not be higher than 350 kg CO2-eq/m2 (over 60 years: 5.9 kg CO2-eq/m2) and their total carbon emissions throughout the building process should be less than or equal to zero. This can only be achieved by offsetting carbon emissions such as green power trading and carbon trading.

Difference between the Swiss and the Chinese ZED standard requirements

The ZED standard calculates the carbon reduction rate via an identical sized reference district or absolute values. The Swiss labels have benchmarks for the CO2-eq-emission in the construction phase per m2 heated floor area and year.

The Standard for Sustainable Construction of Districts in Switzerland requires the fulfilment of a certain number of offered aspects. These aspects are: components from buildings to be demolished on-site are reused on-site or passed on to be used at other external locations or dismantled components from other external locations are used on-side.

Compensation with negative CO2-eq-emissions is not considered in Swiss labels.

General description of the criteria

Reduction of the amount of environmental impact caused by the construction of the building over its life cycle.

Reason

Globally the building operation accounts for 28 % and the construction industry for 11 % of the CO2-eq-emissions. The importance of embodied carbon emissions from a building increase when the emissions from operation decrease.

Reduction of waste from the building sector as the landfill volume in many small countries is limited. A positive side effect is that using reuse materials also reduces the environmental impact of a building

Goal

Significant reduction of carbon for the construction resp. materialization. Extend the lifespan of building materials, components as well as whole buildings, in new or retrofit buildings use a much recycling and reuse materials and components as possible and design your buildings in way, that it can be easily disassembled at the end of life.

Possible measures

Short spans, vertical load transfer, compact designs, reduction of material thickness, sustainable materials, use of reuse-components (e.g. windows, steel and timber beams of disassembled buildings), design for disassembly, etc.

Use of recycling materials, use of reuse-Components (e.g. windows, steel and timber beams), keep building as long as possible (> 100 years), use high quality materials, don' t use glue within components (use screws and bolds), design for disassembly

3.2.2. Criteria: Circularity in Construction

Requirements from the Swiss labels

A building and a district is considered a resource repository with its own system boundary. The goal is to add as few new materials or components as possible to the system, if nevertheless necessary to use material/components from repositories of other systems and keep the resources in the system. The Reuse of materials and components leads to circularity in construction.

Requirements from the Chinese ZED standard (Prerequisite)

No requirements on the district level. On the building level (ZEB) there are requirements.

Difference between the Swiss and the Chinese ZED standard requirements

The Standard for Sustainable Construction of Districts in Switzerland requires the fulfilment of a certain number of offered aspects. These aspects are: components from buildings to be demolished on-site are reused on-site or passed on to be used at other external locations or dismantled components from other external locations are used on-side.

General description of the criteria

This criteria assesses the reuse of resources in the area with the aim of closing material cycles in the sense of the circular economy.

Reason

Reduction of waste from the building sector as the landfill volume in many small countries is limited. A positive side effect is that using reuse-materials also reduces the environmental impact of a building.

Goal

Extend the lifespan of building materials, components as well as whole buildings, in new or retrofit buildings use a much recycling and reuse materials and components as possible and design your buildings in way, that it can be easily disassembled at the end of life.

Possible measures

Use of recycling materials, use of reuse-Components (e.g. windows, steel and timber beams), keep building as long as possible (> 100 years), use high quality materials, don' t use glue within components (use screws and bolds), design for disassembly.

3.3. Mobility

3.3.1. Criteria: Environmental impact from everyday mobility

Requirements from the Swiss labels

Some Swiss labels have specific benchmarks for primary energy and CO2-eq-emissions for mobility per m2 heated floor area and year, which must be complied with.

Requirements from the Chinese ZED standard (Prerequisite)

Mobility is not part of the ZED Standard

Difference between the Swiss and the Chinese ZED standard requirements

No requirements in the ZED Standard

General description of the criteria

Reduction of the amount of environmental impact caused by the everyday mobility.

Reason

Mobility is globally responsible for 23 % of the total CO2-eq-emissions. Planning and building of new districts allow to influence the everyday mobility as it is depending on the location of the project and the mix of uses.

Goal

The goal is the reduction of the fossil-fueled motorized private transport to a minimum and to promote the use of public transport, bicycle and feet to reduce CO2-eq-emissions.

Possible measures

Reduction of parking lots for cars, increase of high-quality bike parking, good public transport in walking distance with high frequency, good bike and pedestrian trail network, attractive sharing options.

3.3.2. Criteria: Design of a mobility monitoring concept

Requirements from the Swiss labels

Planning and implementation of the monitoring of mobility behavior: The mobility monitoring concept includes a measurement and survey concept, operational implementation, survey, evaluation and presentation of the measured values.

Requirements from the Chinese ZED standard (Prerequisite)

Mobility is not part of the ZED Standard

Difference between the Swiss and the Chinese ZED standard requirements

No requirements in the ZED Standard

General description of the criteria

The mobility monitoring concept includes a measurement and survey concept, operational implementation, survey, evaluation and presentation of the measured values.

Reason

The development of a monitoring concept mobility is the first step to understand the mobility behavior of the inhabitants and workers of the district. After understanding their behavior it might be necessary to plan and implement measures to shift mobility towards more sustainability.

Goal

Starting point for the planning of the mobility monitoring

Possible content

Definition of how to collect the data, thoughts on how to boost the return ratio, definition of the grade of detail.

3.3.3. Criteria: Monitoring of mobility behaviour

Requirements from the Swiss labels

Users' mobility performance should be periodically surveyed, evaluated and communicated. The monitoring allows statements to be made about the total mobility mileage of everyday mobility as well as the mobility mileage of the various user groups and means of transports and the use of means of transportation

Requirements from the Chinese ZED standard (Prerequisite)

Mobility is not part of the ZED Standard

Difference between the Swiss and the Chinese ZED standard requirements

No requirements in the ZED Standard

General description of the criteria

By means of a survey for data collection in mobility, conclusions can be drawn about the mobility behavior of the district user. This data can be used to derive measures towards a more sustainable mobility.

Reason

Mobility is globally responsible for 23 % of the total CO2-eq-emissions. Planning and building of new districts allow to influence the everyday mobility as it depends on the location of the project, the mix of uses and offers for daily needs. To be able to influence the mobility towards more sustainability it is necessary to monitor the behavior.

Goal

The goal of the monitoring is to receive data on who is using which mean of transport in what extend. The analysis can be used to improve the mobility infrastructure.

Possible measures

Conducting a survey of the residents and workers: This can be made electronically or physically. Aspects can be: daily/yearly kilometers driven per vehicle, typical number of persons per vehicle, transport types, total of daily kilometers for everyday mobility, etc.

3.3.4. Criteria: Mobility optimization measures

Requirements from the Swiss labels

The fossil-fueled private transport shall be reduced by a range of measures: The area must be well accessible by bicycle, public transport and on foot. A maximum low number of parking spaces for the area and a minimum high number of bicycle parking spaces are defined. The design of all parking spaces must be attractive, practical and safe. Public transport services are to be promoted by the area administration, as well as sharing offers, e-car/e-bicycles charging points and offers of special bicycles.

Requirements from the Chinese ZED standard (Prerequisite)

There must be at least two or three bicycle parking spaces available on the site, close to the entrance points of the neighborhood (number depending on the level of certificate to be achieved). Public transport must be offered within a radius of 500 m around the neighborhood. Depending on the level of certificate, the area must have a coverage rate of e-charging stations of 20 %, 50 % or 100 % of the fixed parking spaces.

Difference between the Swiss and the Chinese ZED standard requirements

The ZED requirements are similar but less comprehensive to those of the Swiss labels.

General description of the criteria

Based on different measures like a low number of car parking spaces, a high number of bike parking spaces, offers of mobility sharing, a high number of changing points and a good connection to public transport, the use of fossil-fueled motorized private transport can be reduced significantly.

Reason

Mobility is globally responsible for 23 % of the total CO2-eq-emissions. Planning and building of new districts allow to influence the everyday mobility as it depends on the location of the project and the mix of uses.

Goal

The goal is the reduction of the fossil-fueled motorized private transport to a minimum and to promote the use of public transport, bicycle and feet to reduce greenhouse gas emissions.

Possible measures

Supporting of e-mobility, bicycle promotion, decrease number of parking lots, accessibility of public transport

3.4. Supply and disposal

3.4.1. Criteria: Use of local energy resources

Requirements from the Swiss labels

The potential of local renewable heat and electricity is to be exploited and the ratio of self-used electricity generated locally must be maximized.

Requirements from the Chinese ZED standard (Prerequisite)

Basic requirement: Using local renewable energy sources is crucial to reduce carbon emissions from operation.

Difference between the Swiss and the Chinese ZED standard requirements

Both, the Swiss labels and the ZED standard require a high amount of locally harvested energy resources.

General description of the criteria

The potential of local energy resources needs to be exploited in the best possible way.

Reason

Local renewable energy is a resource to be promoted to preserve the environment, minimize dependence on third parties and promote the local economy.

Goal

By raising the amount of sustainable local energy supply the carbon emissions from operation and the dependency on third parties' energy provider

can be reduced.

Possible measures

The use of photovoltaics, wind power, hydropower, solar thermal energy, geothermal probes, waste heat recovery, thermal and electric storage

3.4.2. Criteria: Renewable electricity for efficient street lighting

Requirements from the Swiss labels

No requirement for street lighting as the streets incl. lighting is in most cases becoming the property of the municipality in Switzerland and therefore can' t be influenced and chosen by the developer.

Requirements from the Chinese ZED standard (Prerequisite)

The share of renewable energy used for streetlights must be no less than 60 % for low-carbon communities, no less than 80 % for nearly zero carbon communities and 100 % for zero-carbon communities.

Difference between the Swiss and the Chinese ZED standard requirements

Not part of Swiss labels.

General description of the criteria

As much renewable energy as possible must be used to supply street lighting.

Reason

The use of renewable energy for street lighting ensures that the lighting, which often shines through the night, is powered by renewable energies.

Goal

No CO2-eq-emissions for the operation of street lightning.

Possible measures

Use of self-produced or purchased electricity from photovoltaics, hydropower or other renewable sources in combination with electrical storage and/or installation of streetlights with integrated photovoltaic panel.

3.4.3. Criteria: Water management

Requirements from the Swiss labels

The aim is to ensure that water is comprehensively considered throughout the entire life cycle of the site. The aim is the economic use of drinking water as well as to promote the management of rainwater that is as close to nature as possible,

Requirements from the Chinese ZED standard (Prerequisite)

The utilization rate of non-traditional water sources should be no less than 30 % for low-carbon communities, 40 % for near-zero-carbon communities, and 50 % for zero-carbon communities. Non-traditional water sources refer to water sources different from traditional surface water supply and underground water supply, including recycled water, rainwater, seawater and so on.

Difference between the Swiss and the Chinese ZED standard requirements

ZED focuses on reducing the proportion of surface and groundwater. In Switzerland, the aim is to reduce the amount of drinking water and relieve the burden on the sewer systems.

General description of the criteria

The area has a comprehensive water management system. This includes not only fresh water supply but also evaporation, infiltration and retention areas for rainwater and a system for the reuse/recycling of water.

Reason

The application of non-traditional water sources is an important indicator of water conservation.

Goal

The aim is to ensure that water is comprehensively considered throughout the entire life cycle of the area by promoting the management of rainwater that is as close to nature as possible, as well as by using drinking water as economically as possible.

Possible measures

Unsealing, underground retention, green roofs, above-ground infiltration system, underground infiltration system, rainwater harvesting, water-saving fittings

Criteria: Design of a water monitoring concept

Requirements from the Swiss labels

Planning and implementation of the monitoring for fresh- and wastewater. Water consumption is regularly discussed to implemented measures if deviations from targets occur.

Requirements from the Chinese ZED standard (Prerequisite)

Is not included in the ZEB.

Difference between the Swiss and the Chinese ZED standard requirements

Is not included in the ZEB.

General description of the criteria

The concept includes the measurement of not only the amount of freshwater, wastewater and, if available, greywater but also where does it come from. Fresh water is of drinking quality. Wastewater includes black and greywater. Blackwater is wastewater from toilets and highly contaminated water from kitchens (fat, oil). It needs treatment due to health and environment risks. Graywater is only slightly contaminated wastewater from e.g. showers, hand washing, washing machines or dish washers. Graywater can be recycled and used for toilets, cleaning, washing machines, watering, etc.

Reason

The development of a water monitoring concept is the first step to analyze the freshwater consumption and quality and amount of wastewater for optimization measures.

Goal

Starting point to optimize water streams.

Possible content

Define measuring points

3.4.4. Criteria: Monitoring of water consumption and wastewater

Requirements from the Swiss labels

The monitoring of water consumption should be implemented. Water consumption is regularly discussed, and measures are implemented in the event of deviations from targets.

Requirements from the Chinese ZED standard (Prerequisite)

Is not included in the ZEB.

Difference between the Swiss and the Chinese ZED standard requirements:

Is not included in the ZEB.

General description of the criteria

For the area, there is a monitoring concept to measure the amount of freshwater, wastewater and, if available, greywater.

Reason

Water consumption has no direct environmental impact. There is mainly a water problem in dry regions. Although in many regions water needs to be treated so it can be used as drinking water. Furthermore, drinking water is often used to rinse the toilet or for cleaning. This sewage then needs to be cleaned in a sewage plant. Treating and cleaning is energy intensive. Therefore, monitoring drinking as well as waste and grey water is crucial for reducing the consumption/production.

Goal

To obtain accurate data on the quantities of drinking-, waste- and greywater to be able understand where to optimize the reduce consumption/production.

Possible measures

Installation of volumetric instruments in drinking water and greywater pipes. The more detailed the measurement, the easier it is to detect areas with high consumption.

3.4.5. Criteria: Design of a waste management concept

Requirements from the Swiss labels

For the site, there is a phase-appropriate concept with an action plan for waste management (type and amount of waste). Disposal facilities for cardboard, PET, paper, glass, residual waste, organic waste and packaging material must be available on the site. In the area there is infrastructure for the delivery and collection of materials (less packaging material).

Requirements from the Chinese ZED standard (Prerequisite)

Low-carbon, nearly zero-carbon and zero-carbon communities should have a 100 % rate of separate waste collection. The number of recycling sites in low-carbon communities should be no less than one, and the number of nearly zero and zero-carbon communities should be no less than two.

Difference between the Swiss and the Chinese ZED standard requirements

The requirements in Switzerland and in the ZED standard are very similar

General description of the criteria

Good delivery and disposal facilities in the area make a significant contribution to closing material cycles. This applies to the recycling of waste as well as to the packaging material for delivered goods.

Good organization of delivery and waste disposal is especially important for more complex uses in the area. The separation of different materials helps to reach a high recycling rate.

Reason

A detailed waste management concept helps to reduce, recycle, reuse and dispose of waste in order to minimize environmental impact and protect public health.

Goal

High recycling rates for all types of waste through a cross-site waste management concept

Possible measures

Waste separation systems, delivery options and offers for recycling and disposal (e.g. compost, collecting sides for paper, cardboard, glass, aluminum tins, etc.).

3.4.6. Criteria: Design of a waste monitoring concept

Requirements from the Swiss labels

There is a concept for monitoring the various waste streams (type and amount of waste) on site.

Requirements from the Chinese ZED standard (Prerequisite)

There is no requirement for waste monitoring in the ZED Standard

Difference between the Swiss and the Chinese ZED standard requirements

Waste monitoring not required in ZED Standard

General description of the criteria

On the district, there is a phase-appropriate concept with an action plan for waste management. Preparations are being made to monitor the amount of waste.

Reason

In a densely populated neighborhood a lot of waste is generated. To be able to reduce this amount it is crucial to get an overview of the different waste streams to implement measures for better separation and subsequent recycling.

Goal

To create a concept to obtain accurate data on the different waste streams and recycling rates and subsequently get a good understanding of the volumes.

Possible measures

The content of a waste stream monitoring concept could be: separation / delivery of waste from daily needs such as paper, glass, cardboard on-site or within walking distance, pick-up service for bulky goods, electrical appliances with the possibility of temporary storage on-site or within walking distance, defined handling of biomass, food waste, grass clippings and possible energy recovery, etc.

3.4.7. Criteria: Monitoring of waste

Requirements from the Swiss labels

The waste monitoring is implemented when the neighborhood is in operation. The waste concept is regularly discussed, and measures are implemented in the event of deviations from targets. A functioning monitoring of waste volumes is implemented in the operation.

Requirements from the Chinese ZED standard (Prerequisite)

(recommended item) It is appropriate for communities to implement information and intelligent management of waste collection points or containers.

Difference between the Swiss and the Chinese ZED standard requirements

For some Swiss labels, waste monitoring is crucial to know the waste streams and to be able to reduce them. The ZED standard only recommends the implementation of monitoring.

General description of the criteria

Through the implementation of waste monitoring, the community can quickly identify the weak points regarding the different waste streams.

Reason

Waste must be reduced or avoided altogether, as incineration or landfilling leads to environmental pollution in the soil and air. To be able to act correctly and efficiently a monitoring of all waste streams is necessary.

Goal

The aim is to get a good understanding of the types and amounts of waste generated by the community. With this information it is possible to create measures to reduce and mitigate the waste stream.

Possible measures

Installation of volumetric instruments in waste collection. The more detailed the measurement, the easier it is to detect areas with high volume.

3.5. Outdoor-Quality

3.5.1. Criteria: Biodiversity

Requirements from the Swiss labels

Near-natural habitats are to be planned and implemented on the site (outdoors, on roofs and facades). The natural potential for flora and fauna should be used in the best possible way. The environment should be designed in such a way as to promote and protect local biodiversity. A certain proportion of woody plants is required on the site: 10 % to 20 % of the area.

Requirements from the Chinese ZED standard (Prerequisite)

The green space ratio should be no less than 30 % for low-carbon communities, 35 % for nearly zero-carbon communities and 40 % for zero-carbon communities.

Difference between the Swiss and the Chinese ZED standard requirements

The Swiss labels provide precise information on how biodiversity can be protected and promoted. ZED standard requires a certain proportion of green spaces. Recommended is an ecological greening; without specifying what this means.

General description of the criteria

Promotion of measures regarding the biodiversity of flora and fauna by providing habitats and contributing to the settlement of native species in the area. Biodiversity forms a central basis for decision-making for the open space concept.

Reason

Biodiversity is important because it supports the stability of ecosystems, the provision of vital ecosystem services, and the ability to adapt to changing environmental conditions.

Goal

Exploiting the natural potential of flora and fauna at the site

Possible measures

Pristine green spaces, enough trees and bushes, preservation of existing trees, façade greening, green roofs, mix of native plants (no monoculture), nesting aids, birds, insects and other small animal protection measures, avoidance of light pollution.

Criteria: Climate adaptation

Requirements from the Swiss labels

Some Swiss labels use the term “microclimate” and it includes following aspects: Provision of permeable green spaces in the outdoor space, shading of outdoor areas reflectance of surfaces, green roofs and façades and ventilation corridors between the buildings in the district. Another label uses the term “urban climate” and includes the aspects: Carry out investigations into the urban climate, take appropriate account of natural night ventilation and ensure low heating and high evaporation.

Requirements from the Chinese ZED standard (Prerequisite)

There are no prerequisites for climate adaptation in the ZED standard. The recommendations are: Community planning should optimize the spatial layout of buildings, reasonably select and use landscape, ecological greening and other measures to enhance natural ventilation and reduce the heat island effect in the community in summer and increase sunshine in winter to avoid the impact of cold winds on buildings. The main orientation of the buildings should be north-south, and the main entrance should avoid the dominant wind direction in winter.

Difference between the Swiss and the Chinese ZED standard requirements

Climate adaptations do not have to be implemented in the ZED standard, they are recommended to make the implementation of green spaces even more efficient. In the case of Swiss labels, some of the measures must be implemented to a certain extent.

General description of the criteria

A climate adapted design helps to avoid heat islands, promotes the biodiversity and efficient use of water. Climate adaptations include ventilation corridors, green spaces, infiltration, use of local plants, optimization of the layout of buildings and shading. Also, rainwater management is included to save the usage of fresh water and prevention against heavy rain incidences.

Reason

In view of climate change, extreme weather events (heat waves and droughts, heavy rainfall, storms,

etc.) may occur more frequently, which can have an impact on the well-being and health of site users. Certain measures can be taken to reduce the impact on humans.

Goal

To create a neighborhood that reacts positively to extreme weather events so that the users are not unduly negatively affected.

Possible measures

Ventilation corridors between the buildings, façade greening, green roofs, planting trees, unsealing the ground, low reflectivity of surfaces, shading elements, water management for heavy rain and maximal use for on-side plant.

3.5.2. Criteria: Economical land use and density of use

Requirements from the Swiss labels

The handling of soil as a resource is considered in some labels by taking into account the national and local spatial planning framework conditions. To ensure economical land use, the potential of the area in terms of inward densification and settlement development must be examined at an early stage of development.

Swiss labels also consider the density of use which can be influenced by offering flexibly usable spaces and control measures regarding the number of people living in an apartment.

Requirements from the Chinese ZED standard (Prerequisite)

Basic requirement: Considering that communities are distinguished from cities, districts, parks, etc. in terms of physical scope, and taking into account factors such as the size of the community' s land use, service capacity, and personnel density, the scope of the community should not be more than 100,000 m2, the number of people in the community should be higher than 2,500, and the number of households should be more than 1,000 households.

Difference between the Swiss and the Chinese ZED standard requirements

The ZED standard defines the minimum population density and number of households. In Switzerland, high-quality inner densification is required (building on greenfield sites is almost no longer possible) and various measures are also being taken to increase the occupancy density.

General description of the criteria

In a first step, a maximum structural utilization of the property will be sought within the framework of the inner urban development (development in already populated areas, avoidance of building in pristine landscapes), and in a second step, the occupancy density will be increased by means of various measures.

Reason

Soil is a non-renewable and finite resource. Accordingly, it must be taken care of. The per capita environmental impact for the construction and operation of the buildings in the area decreases per capita the more people live there.

Goal

Use the available space as efficiently as possible and reduce the environmental impact per capita as much as possible.

Possible measures

Monitoring the living area per capita, controlling the person area, offering shared rooms (e.g. for washing, working, meeting, etc.).

3.6. Sharing

3.6.1. Criteria: Sharing services and offers

Requirements from the Swiss labels

On the district the owner and/or user offer different mobility sharing services including (e-)bike, (e-)car and (e-)cargo-bikes to reduce the number of private vehicles. Premises/Rooms for communal use will also be provided as for example common rooms, co-working space and hotel/pension rooms, to reduce the floor area per apartment and therefore per capita.

Requirements from the Chinese ZED standard (Prerequisite)

Sharing services and offers are not part of the ZED standard.

Difference between the Swiss and the Chinese ZED standard requirements

Sharing services and offers are not part of the ZED standard.

General description of the criteria

Range of vehicle-sharing services and offers for all users in the district. Range of shared rooms for common use to reduce the space required for each

apartment.

Reason

The reduction of space requirements (sufficiency) and the elimination of unnecessary ancillary use and traffic areas leads to less material expenditure, less environmental impact and thus to more cost-effective construction.

Mobility sharing services and offers reduces on one side the number of private cars and bikes and increases the utilization of the sharing vehicles and on the other side it offers the people in the district alternative means of transportation with less environmental impact.

Goal

Reduction of the environmental impact from mobility, increase of quality of life through better air quality and less noise. Furthermore reduction of environmental impact from construction and operation of the buildings by reduced space requirement.

Possible measures

Electric car sharing, different (e-)bike sharing services and offers all over the district, different sharing room offers (common room, guestroom, sauna, washing machines, etc.).

3.7. Diversity

3.7.1. Criteria: Social Mixing / Diversity of Users

Requirements from the Swiss labels

Cost-effective construction for equal opportunities. The site sponsorship ensures a social mix of the area and a variety of users (through various uses and price segments).

Requirements from the Chinese ZED standard (Prerequisite)

Not included in the ZED standard.

Difference between the Swiss and the Chinese ZED standard requirements

Not included in the ZED standard.

General description of the criteria

The developer respectively the owner ensures a social mix of the area and a variety of users (e.g. through various offers of use, different price segments, etc.).

Reason

A social mix in a neighborhood promotes social cohesion as it leads to a diverse exchange of ideas, experiences and resources. It also supports the creation of an inclusive environment that promotes equal opportunities and reduces social isolation.

Goal

To create a lively neighborhood with all different types of people promoting equal opportunities and reducing social isolation.

Possible measures

Apartments and offices in different price segments, different apartment layouts: assisted living, multi-generational house, apartments for the elderly, shared flats, family flats, student flats.

3.7.2. Criteria: Variety of uses and offers for daily needs

Requirements from the Swiss labels

In and around the district there should be a variety of uses (residential, administration, educational buildings, restaurants and commerce, open space, services, social facilities, etc.) to reduce the everyday mobility and to attract people.

Requirements from the Chinese ZED standard (Prerequisite)

ZED recommends (no prerequisite) that the area should have different uses such as shopping facilities, medical services and educational facilities. The distribution of the buildings should be adapted to the size of the municipality. Cultural activities must be as central and CO2-neutral as possible and there must be at least two offers.

Difference between the Swiss and the Chinese ZED standard requirements

There are no major differences between the ZED standard and the Swiss labels. ZED recommends cultural activities to be operated CO2-neutral.

General description of the criteria

The range of uses in the district consolidate, complement or expand the existing range of uses in the neighborhood. These include uses such as residential, office, retail, restaurant, cultural facilities, medical and social services and school facilities.

Reason

A good mix of uses reduces the everyday mobility and attracts people to live there.

Goal

To reach all social, work, cultural, commercial and medical offers in and around the area within a 15-minute walk reduces the everyday mobility significantly.

Possible measures

Residential, Administration, Restaurant, Post, Bank, Shopping, Cinema, Workshop, School, Day-care.

3.8. Planning Process

3.8.1. Criteria: Public use of the ground floor

Requirements from the Swiss labels

On the ground floor, freely accessible rooms with a minimum height of 3.20 m are offered, which are suitable for public-oriented use.

Requirements from the Chinese ZED standard (Prerequisite)

(Recommended items) It is desirable for the community to have supporting infrastructures such as commercial, medical and educational facilities. The community should ensure the rational distribution of public facilities based on the specific characteristics and scale of different neighborhoods, employing both centralized and decentralized approaches as appropriate.

Difference between the Swiss and the Chinese ZED standard requirements

In the ZED standard, this criteria is regulated indirectly, via the recommendation of a public infrastructure. However, there is no explicit requirement for a large proportion of public ground floor use.

General description of the criteria

Usable space on the ground floor, suitable for public-oriented and public use. The technical development and access from the outside space are adapted to the use. The premises must be barrier-free and have a clear height of at least 3.20 m.

Reason

A public and public-facing use of the ground floor will enliven the neighborhood and strengthen interactions between users.

Goal

Wide and freely accessible range of uses on the ground floor

Possible measures

A variety of rooms to be used for different public uses as for example: Workshop, Café, Restaurant, Retail, Flower shop, etc.

3.8.2. Criteria: Urban development and architectural concept

Requirements from the Swiss labels

In a cooperative process, the urban development concept is determined based on a suitable selection procedure and made binding. Necessary measures are being taken to mitigate the negative effects on the urban climate.

Requirements from the Chinese ZED standard (Prerequisite)

(only recommended item) District planning should optimize the spatial layout of buildings, reasonably select and use landscape, ecological greening and other measures to enhance natural ventilation and reduce the heat island effect in the community in summer and increase sunshine in winter to avoid the impact of cold winds on buildings. The main orientation of the buildings should be north-south, and the main entrance should avoid the dominant wind direction in winter.

Difference between the Swiss and the Chinese ZED standard requirements

The Swiss urban development process is cooperative and broader in aspects compared to the ZED Standard.

General description of the criteria

Purely urban planning and architectural aspects of the construction project are considered. It is assessed whether the sub-areas of society, economy and environment are brought together to form an identity-forming whole with an identifiable design quality.

Reason

The criteria meets the federal government’s strategic goal of achieving a high level of building culture. It leads to inclusive places, creates shared values and thus makes a valuable contribution to the sustainable development of the living space.

Goal

High urban planning and architectural quality

Possible measures

-

3.8.3. Criteria: Planning tools/instruments

Requirements from the Swiss labels

The following instruments are frequently used in Swiss district developments:

Mission statement: Describes the goals, basic principles and self-image that should guide all those involved in site development.

Target agreement: In this agreement, all needs, goals and framework conditions relevant to site development are summarized jointly by the client and the planner. A target agreement that is well structured from the outset can be refined, detailed and, if necessary, adapted during the planning and construction process. In doing so, it serves as an instrument for quality assurance for the originally defined goals over all subsequent project phases.

Utilization concept: Agreed sustainability goals, needs analyses and defined requirements for the future use of the site are set out here. Usage requirements are described qualitatively and, if possible, substantiated with quantitative specifications.

Specifications: It brings together all the content developed at the end of the "preliminary studies" and is the basis for the subsequent "project planning" and "implementation". The functional specification serves as a binding basis for the client and the planning team. Derogations must be well justified and approved by the parties involved.

Concepts: Refer to strategic ideas, plans or frameworks that form the basis for the design and development of an area. They serve as a guideline and orientation aid for planning decisions and measures during the development process.

Requirements from the Chinese ZED standard (Prerequisite)

ZED does not mention planning instruments the way the Swiss labels do.

Difference between the Swiss and the Chinese ZED standard requirements

The Swiss labels mention different common planning tools as these tools can be used to ensure more sustainability in the planning process. No planning instruments have been found in the ZED standard.

General description of the criteria

Following planning instruments shall be agreed on between the stakeholder of the planning process and the operation phase and updated as needed: Mission statement, target agreement, utilization concept, specifications, management concept, real estate development concept, energy concept, mobility concept and open space concept.

Reason

At the beginning of all projects and developments are the ideas and needs of the clients. In the context of the implementation of their needs, their ecological goals, their social motivation and their economic approaches, which are shaped by constantly changing parameters of their environment, will be decisive. The development, planning and realization of an area is a complex process that often takes several years and involves more and more stakeholders. The interactions between ecological and economic as well as technical and social issues increase the complexity of the development, planning and construction process. Accordingly, the process must be well structured, and clearly documented.

Goal

All the planning tools serve to comprehensively, phase-appropriate and systematically integrate the sustainability criteria into the development and decision-making process of projects.

Possible measures

Mission statement, target agreement, utilization concept, specifications, management concept, real estate development concept, energy concept, mobility concept, open space concept, etc.

3.8.4. Criteria: Quality assurance in planning and operation

Requirements from the Swiss labels

District management defines an appropriate internal quality management procedure for achieving or maintaining the certificate. User satisfaction is surveyed periodically.

Requirements from the Chinese ZED standard (Prerequisite)

There is no quality assurance in planning an operation required.

Difference between the Swiss and the Chinese ZED standard requirements

Quality assurance in planning and operation is only required in some Swiss labels

General description of the criteria

Quality management is intended to ensure the process of achieving or maintaining the sustainability

certificate

Reason

Over the long period of site development in planning, implementation and operation, it is important to have an accompanying quality management system in place to achieve the goals of label requirements.

Goal

Timely recognition of “wrong” decisions in the planning, implementation and operation phases with the possibility of taking countermeasures.

Possible measures

Introduction of quality management system with periodic surveillance

3.9. Communication, Cooperation and Participation

3.9.1. Criteria: Stakeholder and user involvement in sustainability

Requirements from the Swiss labels

The relevant stakeholders for the planning, implementation and operation of the site are recorded by the developer or owner, analyzed for their role and appropriately involved in the project. The owners ensure that users are regularly sensitized to efficient energy use and environmentally friendly mobility behavior with information and offers during the company. The owners communicate to the outside world their exemplary activities to achieve sustainability goals.

Requirements from the Chinese ZED standard (Prerequisite)

Low-carbon communities should have no less than two low-carbon trainings and activities throughout the year, nearly zero-carbon communities should have no less than three, and zero-carbon communities should have no less than four trainings and activities.

Difference between the Swiss and the Chinese ZED standard requirements

There is only one overlap regarding the training and activities which is also required in some Swiss labels.

General description of the criteria

Future users of the site are to be involved in the development of the area and their concerns are to be considered. The exchange is to be promoted.

Reason

Through communication, cooperation and participation, a high degree of acceptance of sustainability issues is promoted.

Goal

A high degree of participation by the concerned stakeholders and later the users, good communication between owner, administration and user as well as towards the public helps significantly for a smoother development and higher degree of acceptance. Stakeholders and the local population are involved in the planning, implementation and operation processes.

Possible measures

Brainstorming, Workshops, Meetings, Working groups, Articles in the Newspaper, Information leaflets, Information evenings, websites, etc.

让我们共同打造气候中和的未来
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