

Sustainable Housing in the Province of Bolzano Alto Adige, Italy – “Climate House”

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SUMMARY

The development of a strategic plan for the improvement of the energy efficiency and sustainability of housing led to the creation of “Climate House”, an agency that today is synonymous with substantial energy saving in construction and combines well-being with financial saving.

The type of traditional construction born after the Second World War had become obsolete because it used considerable quantities of non-renewable sources of energy.

As a result the analysis of innovative building techniques began, techniques that limited the use of costly polluting fossil fuels and so also reduced CO2 emissions.

In 1992 the Province of Bolzano and the municipalities of the Alto Adige joined the Alliance for Climate, an international collaboration between European municipalities and indigenous tribes in the Amazon forest. Right from these years dedicated formative courses were set up to instruct planners and others working in the housing construction sector on the importance of the containment of energy consumption.

At the same time the first provincial fundings were introduced for renovations, that is, those who had renovated their homes complying with energy-saving criteria received a substantial financial contribution towards the costs incurred for renovation.

With this smart initiative in the Province of Bolzano a strong civic sense began to spread, resulting in the setting up of “Climate House”, a system of certification of conformity to specified energy-saving criteria for buildings, managed by the agency of the same name. The activities of this agency are spreading throughout Italy, increasingly becoming a point of reference for sustainable housing for all regions with a climate similar to that of the Alto Adige.

The energy certificate and climate house sign are the pillars of the classification system; in numerical terms, so far about 3,000 buildings have been certified by the agency in Italy. Its nationwide reach and range of action is also shown by the fact that 20,000 professionals have done at least one dedicated formative course.

The objective of this paper is to illustrate some of the smart initiatives in sustainable housing in the ambit of “Climate House” that are giving very important results, exceeding even the most optimistic predictions.

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1. INTRODUCTION

At the recent summit in Cancun in Mexico at the end of 2010, the representatives of 194 countries approved a package of initiatives for the fight against climate change. These are the Cancun Agreements which contain a list of general political declarations of intent, although they lack binding commitments for implementation.

One of the decisions taken concerns the Kyoto Protocol, which will have to continue after its natural expiry date in 2012. In addition, the commitments made move towards a net reduction of Co2 emissions (which, as is known, are responsible for global warming); by 2020 the most advanced countries should cut harmful emissions by 25 to 40 per cent compared to the values for 1990.

Many scientific studies show that the consequences resulting from an increase in temperatures of only 2 degrees centigrade could be the step that takes us from risky to extremely risky climate change. That is why we need to find renewable sources of energy and end our dependence on oil. For everyone, this can no longer be delayed.

In Italy, the Autonomous Province of Bolzano in the region of Alto Adige is certainly one of the areas that has been most attentive to the question of climate and environment, and one of the first to take action. Right from the early 80s, the first, initiatives for the promotion of energy saving were carried out with sustainable – type constructions.

Many enlightened actors have shown great competence and far-sightedness in transforming the desire for a concrete model of climate protection into an action that can be measured in terms of Co2 emission reduction and saved energy.

In the 1992s the Province of Bolzano and the municipalities of the Alto Adige joined the Climate Alliance, an international collaboration between European municipalities and indigenous tribes in the Amazon forest, which involves over 70 municipalities. The members of this alliance have undertaken to continuously reduce emissions: the target is to reduce Co2 emissions by 10 % every five years.

Starting already from these years, dedicated training courses were set up to instruct and sensitize planners, technicians and others working in the housing construction sector about the subject of curbing energy consumption, and they have achieved good results.

Excellent results have been obtained thanks to financial contributions provided by the Autonomous Province of Bolzano for “sustainable refurbishments”; these have helped considerably in the renovation of a large percentage of the existing housing stock.

Buildings emit about 40 – 45% of carbon emissions and consume about a half of global energy. The technologies for more energy – efficient buildings have already been available for some time, but are still not always applied today. Thanks to energy – saving refurbishment of existing buildings it is possible to limit carbon dioxide emissions produced by heating and production of hot water for domestic use by up to 50%.

Houses built before 1950 consume about 50% more energy per square meter than those built after 2000. So it is necessary to carry out large – scale intervention on the existing housing stock to save raw materials (avoiding the demolition and rebuilding of everything). This also makes it possible to significantly increase jobs and create interesting new opportunities in the local economy.

Also because of the climate of the region (which is usually much colder than other parts of Italy), in Alto Adige the problem is keenly felt and great attention is paid to it.

The Climate House Agency is a striking example of housing that allows considerable energy saving and is a reference model nationally. Its know-how has acquired prestige at international level.

2. CLIMATE HOUSE AGENCY

Starting in the early 2000s, the agency called “Agenzia Casa Clima” (Climate House Agency) was set up in the Autonomous Province of Bolzano. This agency, established with the approval of the provincial authorities, was inspired by the EU directive 91/2002 and took the Kyoto Protocol as a point of reference. Its aim is to improve new sustainably –constructed buildings by using the new technologies available, in order to reduce the consumption of fossil fuels, thus reducing heating costs and Co2 emissions.

2. 1 Climate House (Casa Clima) Categories And Sign

After the necessary calculations and assessments, the buildings that have a heating requirement lower than 50 kilowatt hours per square meter annually are awarded the climate house sign and can be placed in one of the following climate house categories:

- 1) **CLIMATE HOUSE GOLD:** Building with heating energy consumption below 10 kilowatt hours per square meter annually.
- 2) **CLIMATE HOUSE A :** Building with heating energy consumption below 30 kilowatt hours per square meter annually.
- 3) **CLIMATE HOUSE B :** Building with heating energy consumption below 50 kilowatt hours per square meter annually.
- 4) **CLIMATE HOUSE C (minimum standard):** Building with heating energy consumption below 70 kilowatt hours per square meter annually.
- 5) **CLIMATE HOUSE D (standard for existing houses):** Building with heating energy consumption below 90 kilowatt hours per square meter annually.

The Climate House categories make it possible to determine the energy consumption level of a building.

The lowest energy consumption is guaranteed by Climate House Gold, which requires 10 kilowatt hours per square meter annually. In practice, this can be ensured without an active heating system. Climate House Gold is also called “1-liter house”, because each square meter requires 1 liter of oil or 1 cubic meter of gas annually.

Houses with heat consumption below 30 kilowatt hours per square meter annually come under the category Climate House A, the so – called “3-liter house”, because each square meter requires 3 liters of oil or 3 cubic meters of gas annually.

Houses with heat consumption below 50 kilowatt hours per square meter annually come under the category Climate House B, the so – called “5-liter house”, because each square meter requires 5 liters of oil or 5 cubic meters of gas annually.

Lastly we have Climate House-plus, awarded to residential buildings distinguished not only by high levels of energy saving, but also by ecological construction, using sustainable materials and renewable power sources.

In May 2002 the first Climate House A was certified.

This new method of certification has aroused great interest and has met with widespread approval.

In October of the same year the city of Bolzano inserted the technical features of climate house in its building regulations. Thus for the first time in Italy, energy saving became compulsory for buildings, with the obligation to observe minimum standards for maximum internal room temperatures, with rules and regulations stricter than the ones previously in force.

In December 2004, the Council of the Autonomous Province of Bolzano brought in new rules called “*Regulations for the implementation of the town planning law with regard to energy saving*”. These regulations stated that for a building to be granted an occupancy permit, its annual energy requirement must be shown to be the same or less than that for category C of the Climate House certificate.

In July 2009, another provincial regulation stated that for properties to change ownership, they had to have an energy certification.

In 2010, together with 200 other European cities, the city of Bolzano signed the “Mayors’ Pact” in Brussels, by which mayors undertook to reduce Co2 emissions in their cities to levels below those established by the EU plan.

The city of Bolzano has not only fixed the attention of building sector operators on careful consumption, but also on the curbing of energy consumption by providing for interventions, to the extent that this is possible, for the passive recovery of energy, in order to guarantee the best energy- efficiency performance.

The Climate House A standard was therefore made compulsory (for new buildings) and reduction of energy consumption in the pre-existing housing stock must be promoted through special incentives, including the possibility of volume allowances. To this end, in urban transformation interventions it is compulsory to comply with the specific implementation plans for energy.

The “Masterplan” for the city of Bolzano is conceived as “a pact between town and country”. This means that construction and town planning must consider the area as a whole. It must assess the relationship between green areas, built-up areas and the surrounding slopes. It must also favour the containment of the land area used, paying great attention to free spaces, which must not necessarily be built on.

The Climate House Agency is an independent body free from external influences, and certifies buildings according to precise criteria and only after on-site checks during building. Every building must be examined by qualified Climate House Agency technicians, who are completely autonomous and independent from customers and builders, and extraneous to the planning and construction of the building.

The certificate issued is therefore an impartial and essential tool because it not only gives information about the energy quality of a building (envelope and systems) but also gives that property trustworthy and transparent added value.

Together with the Climate House certificate, a sign is conferred that is a visible testimony of the energy quality attained by the building. The Climate House certification rates buildings according to the energy efficiency of their envelope (energy requirement for heating), overall efficiency (envelope and systems with statement of Co2 emissions) and environmental sustainability.

The technical procedure necessary to obtain the Climate House certification can be briefly divided into two stages:

- a) The first is the application, which must be submitted before construction starts, together with the plans and all the documentation required by the agency, including the specific energy calculations. A technical examination is made of the plan, with checking for thermal bridges and heat-dispersing surfaces, checking of stratigraphies, systems, etc.
- b) The second is that of technical inspections at the building site to assess the quality of the work done and of the materials used. These materials must be endorsed by the agency, which must be certain of their quality and technical-constructional features. The final value for the energy class of the building is definitively established by the examination of the plan and the calculation of the Climate House Agency, followed by inspections, assessments and checks made at the building site during construction. The basic features of a Climate House are a high level of thermal insulation with very energy-efficient windows and doors, a compact hermetic structure, the absence of thermal bridges and the use of “clean” sources of energy such as solar energy (solar and photovoltaic panels), systems for recovering rainwater for the irrigation of green areas rather than for WC flushing, geothermal energy and close attention to systems

and construction.

To achieve the goal of smart energy use, there is a need for specialists with the necessary competences and to this end the Climate House Agency itself organises and runs training courses for planners and others working in the building sector to instruct them in the construction and refurbishment of energy-efficient buildings.

At the moment, the network of those who have qualified in this subject after doing at least one specific training course consists of about 20,000 professional technicians, including many surveyors.

The Climate House model guarantees the construction of sustainable housing with a reduction of Co2 emissions and greenhouse gases. The existing housing stock in the Province of Bolzano will be gradually replaced in order to protect the environment by drastically reducing the consumption of polluting and expensive fossil fuels, thus contributing to the fight against global warming.

In Italy today, especially in the regions of the north, Climate House is acquiring great importance and the project is spreading, thanks also to the commitment of surveyors.

The consequences of global warming and the greenhouse effect constitute an increasingly serious threat to the future of the planet. I believe that through our daily work, we surveyors must take on a leading role in adopting the principles of sustainability and respect for the environment in construction and promote an ever greater use of renewable sources of energy, in particular the use of solar power, which is our main sustainable source of energy.

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