

Intelligent Compact Housing Solutions

A Study commissioned by Vienna Housing Research.

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ABSTRACT

Motivation

The study emerged for a number of reasons. Firstly from a conviction that quality housing is not primarily a question of square meters, but of broadly useable layouts that are suited to everyday use. Secondly the fact that for decades in Vienna, the demand for small and medium sized apartments has increased. In 2010, according to Statistics Austria, one and two person households accounted for 73.61% of all households. In the Vienna city development plan, STEP 05 (2005), "small and medium sized apartments" were specified at 60 – 80 m². Furthermore, in the last two decades housing rents have steadily risen, and on the open housing market are currently around ten to twelve euros per square meter or more. At the same time the income of private households has decreased. At present there appears to be no end in sight to this widening gap.

It is therefore absolutely reasonable to look for types of accommodation that, despite a more reduced living area, still offer a high living quality and useability.

The third reason entails a glimpse into the future. Sue Roaf writes in her publication "Ecohouse 2" (Oxford 2003, p.1) that buildings in industrialized countries account for more than half of the total energy consumption and produce more than half of the environmental gases. The discussion and consideration of sustainable construction is however still in its infancy.

Sustainable construction is not only about creating a favourable energy balance for a house, it calls for an integrated and life-cycle-wide approach. In the future buildings will be needed that conserve resources and, in their construction, during their use and later, when they are disposed of, generate as little non-recyclable waste as possible. They should not give rise to health and climate-damaging emissions and should enable long service at the right location. Sustainably constructed buildings should also provide intelligent compact housing models.

Today sustainable considerations are still often argued against because of the higher construction costs. However there are already studies demonstrating that, with the right expertise, projects built on the principles of building biology are not significantly more expensive than those provided by conventional construction.

Aim

The aim of the study is to demonstrate a broad spectrum of small-scale housing models. The research area covers Europe, Japan, China, the USA and Chile in the period from about 1920. The diverse examples are intended to be understood as a stimulus. The particular challenges associated with developing compact intelligent housing solutions can provide an impetus for rethinking conventional spatial arrangements and bring about new proposals that correspond with present and perhaps also future needs.

Target Groups

The target groups for the small residences that I have examined are young people in education, small households of 1-2 persons, single parents and the self-employed, people who for example, also have their workplace at home. I also bring some examples of space-saving and variable use housing types for multi-person households.

Content

Examples

The research material is arranged according to examples as well as particular aspects. Among the examples are currently existing micro apartments under 20 m², mainly from Japan and China, two residential units 20 and 30 m² (one from London in 1933 and one from Japan in 2004) and some historical and current examples under the heading "service houses". Furthermore, there are four very elaborate living solutions ("32 - 34 - 35 - 55 m²"), three of which are or were occupied by the designers themselves.

The next section deals with four models, each with one bedroom, in which it is possible to walk around the apartment in a circle. These examples were further compressed (38 - 44 m²) and two of them adapted to buildings with a larger depth.

Floor plans of small residences with two individual rooms were shown amongst a total of twelve examples from Europe, the USA and China in the period from 1927 to 2005.

The designs of two Italian specialists in minimal living spaces, Pino Pizzigoni (1946) and Joe Colombo (1967), are addressed in a separate section.

Space-saving homes that allow for flexible use will be found under the heading "multi-person households". As young adults today live at home for longer (in Austria in 2010 it was, according to Statistics Austria, approximately 70% of 20-24 year old men and around 56% of women in the same age group) it is worth considering that residential floor plans for family households should be suited to the needs of several adults.

Lastly this chapter brings together some examples of the theme "weekend etc."

The second chapter deals with compressions of living space that can be described as "functional furniture". Here, the spectrum of prototypes, in which all or several functions of a residence are accommodated, ranges from "space-adapted prefab furniture" to space-saving pieces of furniture. The term "space-adapted prefab furniture" comes from the architect Margarete Schütte-Lihotzky. In the 1920s she was very engaged with this topic and has shown in calculations that, by already integrating furniture into a residence, 35 – 40 % of the living space can be spared.

Aspects

In addition, various elements of the research material were selected and viewed in relation to aspects that are important when planning compact living spaces. The chapter "saving space" uses examples to address the breaking-up of functional spaces, the adding together of living spaces, and the topics "cupboard walls" and "outsourcing". The aspect of "expanding space" is divided into five key words: proportions, movement ability, walls, windows, niches.

The last chapter of this section will again try to concretize some important aspects of the topic. "What is particularly important in compact living solutions" includes residential qualities that are desirable in all residences, but especially so in smaller spaces: storage space, free space (balconies etc.), no obstacles, view - light - ventilation, noise insulation, material.

Sustainability

The final substantive chapter of the study deals with the theme "sustainability – future capability". Compact housing solutions today – in contrast to similar considerations in the first decades of the 20th Century or in the period after the 2nd World War – are a current and future issue not only for reasons of affordability, but also in terms of resource conservation and sustainability.

The quality of space-saving housing solutions is closely linked to their future capability. To illustrate the problem: The "World Overshoot Day" which has been determined since 1987, refers to the day of the year on which the world's resources have already been used up for the following year. In 1987, this day was calculated for the 19th December, in 2010 already for the 21st August. But what isn't shown here is that this day in developed countries is even earlier: In 2006, the worldwide World Overshoot Day was calculated for the 9th October, but in the UK for instance, this day was already reached on the 16th April and in the U.S. on the 27th June.

In my research I've found no significant minimal-space apartments that have sustainable objectives in their planning. The examples in this chapter show three residential models that deal with specific aspects of sustainable construction: two of them are (partially) made from recycled industrial containers; the third is a residential complex in Chile where only a part of the home is completed, the rest is an open area between the apartments and can be expanded by the residents themselves.

Interviews

The concluding research material consists of interviews that were conducted with people aged between 32 and 57 who - alone or as a pair or with a child - live in small apartments and who sometimes also have their workplace there. These include an employee, a single parent, an unemployed person who cares for his child part-time and two discussion partners who do freelance work in the art / cultural sector.