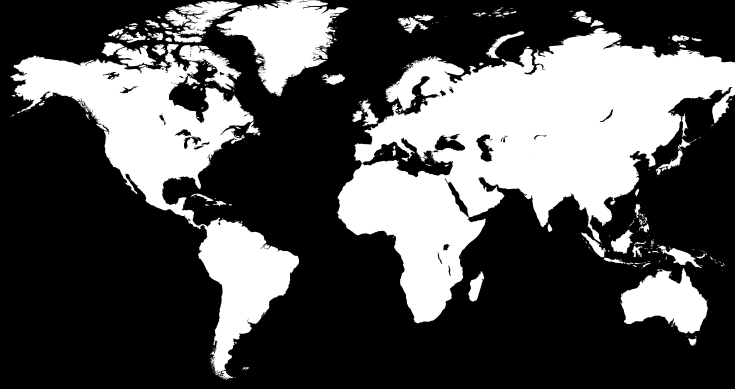


International Innovation

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Indoor

Units

Turning brownfields green

Professor Dr Peter Schwehr and Matthias Bürgin of the Competence Center Typology & Planning explain their current project, which aims to develop a new sustainable approach to make use of brownfield sites



What inspired you to undertake the Indoor Units project?

In Switzerland there are more than 350 brownfield sites – abandoned or underused industrial and commercial facilities – equal to an area of about 17 million m². The revitalisation of large spaces such as disused production plants does, however, pose a big obstacle – most demand is for small structures.

At the Competence Center Typology & Planning (CCTP) we research system behaviour, performance, transformation and the potential of different types of buildings and estates. We consider not only technical solutions, but also their implications for the users; that is to say, the interaction between human beings and their immediate environment.

You have developed the Indoor Unit system. How does this work and what makes it such a green innovation?

In order to effectively meet demand for new space by reusing existing sites, the Commission for Technology and Innovation (CTI) project 'Indoor-Units' developed a modular room-in-room unit which enables the temporary or permanent management of big halls for use in the creative industries. We created a square-dimensioned standard Indoor Unit with 25 m² of floor space, a double unit with 50 m² and a two-storey unit with two 25 m² units stacked on top of each other. Included is a self-supporting

wooden structure wall, a heat supply which works solely through internal thermal load and a tiny complementary electrical heating unit. Additional innovative aspects of the Indoor Units include their low cost, flexibility and an additional operating model that was developed to reduce a customer's effort when managing a hall with Indoor Units. That's why they are not just another type of container but an innovative holistic product.

With so many different types of brownfield sites, how can you ensure Indoor Units are suitable for any kind of site?

A cluster of Indoor Units can be erected in any hall if it is level, dry and floodlit, and if an electrical connection is available. If the ceiling height at the site is sufficient, the units can be stacked. Moreover, Indoor Units can be adapted to halls with a narrow column grid since they can be built around supporting pillars. Our units can even be disassembled and reassembled several times. Due to the modular concept, a set of units can be put together for the specific needs of any site. This means that a customer does not have to purchase standardised boxes but might choose the type and arrangement of the wall panels for each unit convenient to his/her specific site. Within the framework of the construction grid, other sizes of the unit are also possible.

What are the projected economic and environmental benefits of the Indoor Unit solution?

Indoor Units eliminate the need for expensive insulation for the building's superstructure, require very little in maintenance costs and increase land value.

This approach has several ecological benefits, including reusing existing land and structures and the energy savings that entails.

How do the Indoor Units and the existing warehouse building interact?

In order to establish the Units' necessary physical and social qualities, we have conducted a survey in a similar – but outdoor – project in Zurich. The results of this flowed into our project.

The host building and the set of Indoor Units are to be seen as a macro- and a microsystem which are interdependent: some tasks, like weather protection and the supply of sanitary installations, are provided by the host building, while privacy is guaranteed by each unit. For most of the qualities and requirements, the two systems work together: illumination, community, electricity supply and internet connection, atmosphere, fire protection, utility value, image, security, etc.

Who are the possible users of the Indoor Units? What are their specific needs that make them your core market?

When starting the project we were aiming to meet the needs of the creative industries and related branches as our core market. This is because their needs are often modest when it comes to interior fittings, but still retain a distinctive sense of design and space qualities.

These users are looking for low rental costs, enjoy communicative room settings, and are able to build and support community environments. In addition, such tenants are often inspired by the peculiar or bizarre surroundings of an industrial environment. As the project progresses we have also discovered interest in Indoor Units from companies that want to use our units for an 'conventional' office working environment. The upcoming first pilot project will offer valuable clues to the market chances.

Thinking outside the box

To make effective use of vacant brownfield sites, researchers at Switzerland's **Lucerne University** have developed a modular room-in-room system which provides economic, environmental and social benefits to the surrounding area

IN RECENT YEARS, the lack of new space for development purposes has created an interest in regenerating previously used land. In particular, brownfield sites – derelict and disused industrial or commercial land – are being redeveloped for residential, shopping and business use. Switzerland is home to hundreds of brownfield sites and there is an interest in bringing them back to life. However, there is very little demand for large structures such as industrial sites, warehouses and production halls, making it difficult to find a satisfying non-permanent solution. For this reason, the development of small, adaptable structures could present a possible answer.

In order to merge the demand for small structures with the available supply of large halls, the Competence Center Typology & Planning (CCTP) at Lucerne University in Switzerland has developed a modular room-in-room solution which allows the temporary or permanent use of these big halls by dividing them into suitably-sized units. The solution from the 'Indoor Units' project seeks to capitalise on the advantages of these big halls, such as existing weather proofing, and minimise their disadvantages, such as poor insulation.

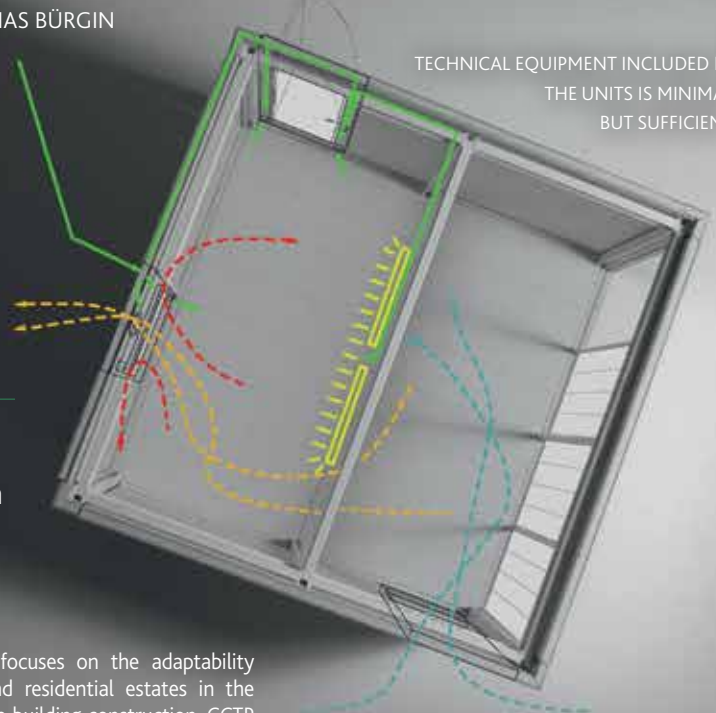


DIFFERENT SPATIAL ATMOSPHERES DUE TO THE MODULAR CONSTRUCTION

The work of CCTP focuses on the adaptability of building types and residential estates in the context of sustainable building construction. CCTP researches system behaviour and performance, as well as the potential of different types of buildings and estates. It also investigates how buildings react to changing user requirements, technical necessities and the demands for sustainable use of resources. A holistic approach and interdisciplinary exchange is of prime importance for the CCTP team. The aim is to not only consider technical solutions, but also the implications for the users, ie. the interaction between human beings and the built environment.

DEVELOPING A FLEXIBLE SYSTEM

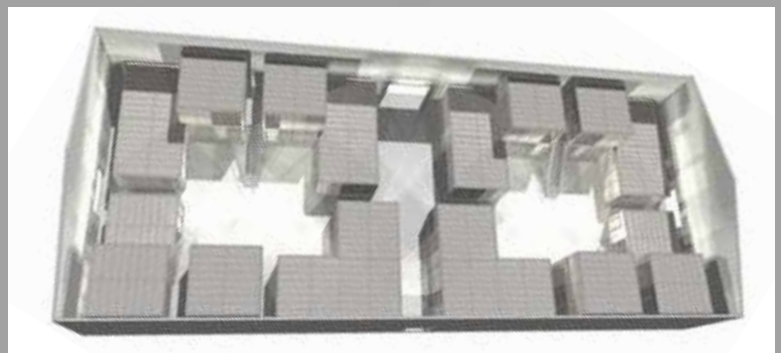
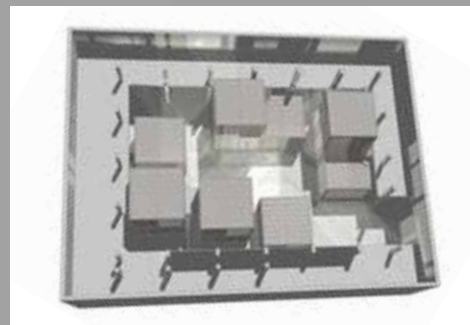
The Indoor Unit system consists of a single square unit of 25 m² that is self-contained, independently useable and functional. Due to its modular construction, other sizes are possible and the design of the facades can vary greatly.



TECHNICAL EQUIPMENT INCLUDED IN THE UNITS IS MINIMAL BUT SUFFICIENT

Such units are offered as 'white boxes', with decoration left to the tenant, in order to achieve flexibility and keep the costs down. Standard units have an estimated life cycle of 15 years and are able to withstand being disassembled and rebuilt three to five times.

Bringing the concept of Indoor Units to life was not an easy task, according to Matthias Bürgin, who led the project along with Professor Dr Peter Schwehr: "Our main challenges were to keep the cost of the units as low as possible, satisfy fire safety hazard requirements, find the adequate construction materials, make the units strong enough to withstand being disassembled and reassembled several times, and find a solution that provides for a comfortable working environment year-round".



COMMUNAL SPACES ALLOW INTERACTION
BETWEEN USERS AND VISITORS



SUSTAINABLE AND ECONOMICAL

The known positive effects of temporary use for a municipality's brownfield sites are far-reaching, and the development of Indoor Units focused on satisfying all three dimensions of sustainability: economy, ecology and society. On an economic level, Indoor Units can provide the hall's management company with quickly-realised rental incomes. The installation of Indoor Units can generate revenues for a hall owner that would not otherwise arise, and are higher than for more basic uses such as storage.

The environmental sustainability of Indoor Units comes in part from cleaning up brownfield sites, which may be contaminated

The development of Indoor Units
focused on satisfying all three
dimensions of sustainability:
economy, ecology and society

by low concentrations of hazardous waste or pollution. Their careful reuse can help prevent contamination from spreading. Furthermore, by reusing existing buildings, the demand for new land, materials and energy is reduced. The design of the Indoor Units also ensures environmental sustainability by using only a subsidiary electrical booster heater to maintain a comfortable temperature inside, so there is no need for costly insulation.

Social sustainability is served by the creation of a communal area within the hall, which allows interaction with the public. This provides a sense of identity in the neighbourhood. A collection of Indoor Units in an industrial hall therefore creates the potential to accumulate social capital. "A warehouse or industrial hall fitted with Indoor Units can help reuse waste land in a community or township, and leverage local efforts to create a more attractive, creative and lively neighbourhood. It will

also be an opportunity to cover backlogged demands from the local authority," Bürgin and Schwehr add.

Moreover, by reusing existing sites in this way, space can be found for those local projects that might not otherwise find a home, such as self-help facilities, childcare, clubhouses, meeting rooms, life skills courses, leisure-orientated facilities, and business and information centres for cultural, social and other community organisations. Activities in such temporary spaces often result in a positive physical and social environment. As a result, many people feel connected to the space involved. Such bonds and identification enable greater stabilisation of the municipal community. Thus, utilising space in this way, end users show a desire to create, a dedication to their community, the ability to work with great flexibility and a strong sense of unconventional creative solutions.

INDUSTRIAL TIES

CCTP projects are supported by various institutions, such as the Swiss Federal Office of Energy (SFOE), the Commission for Technology and Innovation (CTI), and the International Energy Agency (IEA), and are backed on a wide scale throughout the construction industry. The Indoor Unit project particularly benefited from collaboration with Nüssli International Ltd, the world-leading enterprise for temporary infrastructures. "We were also reliant on the input of our partners and the owners of brownfield areas and are grateful that they chose Indoor Units to increase the value of these sites," Bürgin and Schwehr note.

The concept of Indoor Units has already received positive feedback and attention. Bürgin and Schwehr are considering the possibility of developing their units further, with the opportunity to adapt them them for residential use. "Before the project's completion, we already observed an interest in purchasing Indoor Units that extended beyond out project partners. Therefore it seems that with our product we are providing a solution for an obvious need," they highlight.

INTELLIGENCE

INDOOR-UNITS: AN INNOVATIVE SOLUTION FOR BROWNFIELD REVALUATION

OBJECTIVES

The revitalisation of large brownfield spaces faces a big obstacle due to the demand for small structures. To address this, the project developed a low-priced modular and adaptable room-in-room object, which enables temporary or permanent management of big halls for creative enterprises and related uses.

KEY COLLABORATORS

Nüssli International Ltd, Hüttwilen, Switzerland

Azireal AG, Murg, Switzerland

Immobilien Ziegelei, Oberwil, Switzerland

Losinger-Marazzi AG, Zurich, Switzerland

Lauber-IWISA AG, Naters, Switzerland

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Commission for Technology and Innovation (CTI), Switzerland

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PETER SCHWEHR received his PhD in Architecture from the University of Stuttgart, Germany in 2004. He has a longstanding partnership with Arat-Siegel & Partner Architects in Stuttgart. Since 2006 Schwehr has been Professor and Head of the Competence Centre for Typology and Planning in Architecture at the University of Applied Science, Lucerne. His research focuses on the transformation of buildings and cities in the context of sustainable living space.

MATTHIAS BÜRGIN studied Geography at the Swiss Federal Institute of Technology in Zurich in the 1970s. He now works as a freelance consultant for usage development in brownfield areas and serves as a research assistant in the Competence Center Typology & Planning at Lucerne University of Applied Sciences and Arts.

Lucerne University of
Applied Sciences and Arts

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