

# CCTP COMPETENCE CENTRE FOR TYPOLOGY & FORESIGHT PLANNING IN ARCHITECTURE

Lucerne University of  
Applied Sciences and Arts




**HOCHSCHULE  
LUZERN**

Technik & Architektur

## THE COMPETENCE CENTRE

Nothing is permanent except change. What holds true in philosophy, also applies to (the built environment in) everyday life. Buildings and cities are under constant pressure to adapt. At CCTP (CC Typology & Foresight Planning in Architecture), our work focuses on the adaptability of building types and residential estates in the context of sustainable building construction. We research system behaviour, performance, and potential of different types of buildings and estates. During this process, we investigate how buildings react to changing user requirements, technical necessities, and the demands for sustainable use of resources.

Our work focuses on three fields of research:

-  Focus 1: *advanced retrofit*  
Holistic refurbishment strategies
-  Focus 2: *human building*  
Use and building
-  Focus 3: *living context*  
Building and neighbourhood

In research projects, a holistic approach and interdisciplinary exchange is of prime importance for the CCTP team. We not only consider technical solutions, but also the implications for the users, i.e. the interaction between human beings and their built environment. CCTP projects are supported by various institutions such as the SFOE (Swiss Federal Office of Energy), CTI (the Commission for Technology and Innovation), or IEA (International Energy Agency) and backed on a wide scale throughout the construction industry.



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## CCTP PUBLICATIONS



**001** Die Typologie der Flexibilität im Hochbau  
Natalie Plagaro Cowee, Peter Schwehr  
2008, 112 Seiten / INTERACT VERLAG Luzern  
ISBN 978-3-906413-58-7 // September 2008



**002** Contracting im Hochbau – Einführung in das Zyklische Systemmodell  
Jörg Lamster  
2008, 176 Seiten / INTERACT VERLAG Luzern  
ISBN 978-3-906413-59-4 // November 2008



**003** Module für das Haus der Zukunft  
Robert Fischer, Peter Schwehr  
2009, 88 Seiten / interact Verlag Luzern  
/ vdf Hochschulverlag AG Zürich  
ISBN: 978-3-7281-3286-4 (vdf) / ISBN: 978-3-906413-72-3 (interact) // September 2009



**004** Nachhaltige Quartiersentwicklung im Fokus flexibler Strukturen  
Amelie Mayer; Peter Schwehr; Matthias Bürgin  
2010, 204 Seiten / interact Verlag Luzern  
/ vdf Hochschulverlag AG Zürich  
ISBN: 978-3-7281-3287-1 (VDF) ISBN: 978-3-906413-73-0 (INTERACT) // November 2010

# SELECTION OF CCTP PROJECTS

## METHODOLOGY OF SOLAR STRATEGIES (2009-2011)

METHODOLOGY FOR REALISING SOLAR STRATEGIES IN ARCHITECTURAL DESIGN

This project investigates the potential of active and passive solar strategies for renovation of residential estates and new build replacements in urban areas based on two case studies. Through organisational, structural, and formal language, «solar buildings» are the flagship of an energy concept. This consistent climate rhetoric leads to new typologies of ecologically sound buildings and necessitates new integrative and holistic design strategies. The earlier solar strategies are integrated into the design, the higher the potential, and the cheaper their realisation.



Methodology of solar strategies (source: 3S Swiss Solar Systems)

## ENERBUILD (2009-2012)

ENERGY EFFICIENCY AND RENEWABLE ENERGIES IN THE BUILDING SECTOR IN THE ALPINE SPACE

The directive of this project is to promote energy efficient construction in the alpine space and to disseminate knowledge, innovation, and technology. Energy saving buildings are analysed and different energy labels compared. Enerbuild also facilitates know-how transfer and training for SMEs (subject matter experts), evaluates energy producing opportunities, and stimulates innovative pilot projects for ESAP-buildings (energy saving and producing buildings).

## IEA ANNEX 50 (2006-2011)

PREFABRICATED SYSTEMS FOR LOW ENERGY RENOVATION OF RESIDENTIAL BUILDINGS

The objective of this Annex is to develop and demonstrate an innovative, holistic building renovation concept for typical apartment buildings. The concept is based on standardised façade and roof systems that are suitable for prefabrication. The highly insulated building envelope includes the integration of a ventilation system. The concept focuses on typical apartment buildings representing approximately 40 % of the existing dwelling stock.



IEA Task 41 Solar-Energy (source: CCTP)

## IEA TASK 41 SOLAR-ENERGY (2009-2012)

«MAKE ARCHITECTURAL DESIGN THE DRIVING FORCE FOR THE USE OF SOLAR ENERGY»

The objective of IEA SHC Task 41 is to incorporate solar strategies into the architectural design process. Three sub tasks «active solar systems», «tools for architects» and «exemplary international solar architecture» primarily investigate the potential for integrating available active solar energy products and means to support solar architecture in the early planning stages. Presentation of good, international solar architecture also conveys strategies and guidelines for architects, tool developers, and solar product developers.



SanStrat (source: CCTP)

## SANSTRAT (2010-2012)

HOLISTIC RETROFIT STRATEGIES FOR RESIDENTIAL BUILDINGS AND ESTATES (1940-1970)

Conflicts of interest between energy-related and conservation-related aspects lead to delays in renovation and intensifies renovation backlog. In terms of protecting public interest, it is vital to weigh up arguments in the early stages and to develop guidelines for holistic refurbishment strategies with high added value, i.e. those with the greatest benefit for everyone involved and as a result, to achieve a high multiplication potential.

## SCHOOL VENT COOL (2010-2012)

VENTILATION, COOLING AND STRATEGIES FOR HIGH PERFORMANCE SCHOOL RENOVATIONS

Throughout Europe, both energy and education-related developments necessitate adaptations to school buildings. Comprehensive school building renovation should meet the technical and educational needs of the future. Necessary from a technical point of view, are optimized building operation, high quality construction, and users' indoor comfort. Knowledge gained in the project "residential building refurbishment strategies with prefabricated retrofit systems" is adapted to develop value adding refurbishment strategies for school buildings with a high multiplication potential.



School vent cool (source: René L. Kobler)

## E2REBUILD (2011-2014)

INDUSTRIALISED ENERGY EFFICIENT RETROFITTING OF RESIDENT BUILDINGS IN COLD CLIMATES

The vision of E2ReBuild is to transform the retrofitting sector from the current craft and resource based construction towards an innovative, high tech, energy efficient industrialised sector. E2ReBuild combines and shares knowledge gained from previous and ongoing research studies, as well as industrial experience in order to address one of the identified barriers to successful, sustainable retrofitting of residential buildings. The aim is to investigate, promote, and demonstrate cost effective and advanced energy efficient retrofit strategies that add value to existing apartment buildings and encourage users to stay and build a dynamic society.

## COMMONHOLD PROPERTY RENOVATION (2010-2012)

THE INFLUENCE OF CONFLICTING INTERESTS IN COMMONHOLD ASSOCIATIONS ON MAINTENANCE AND RENOVATION OF THE BUILDING STOCK.

Commonhold was recognized as a form of property ownership throughout Switzerland in 1965, and has become increasingly popular. Today, commonhold property of the first generation is either in need of major structural renovation or has been renovated in recent years. This was the reason to investigate the strategies chosen by commonhold associations with regard to building maintenance, repair, partial and total renovation, and building replacement. The investigation focuses on the factors that influence the strategies, their interrelationship, and improvement potential.

## IEA ANNEX 56 (PROPOSAL)

IEA Annex 56 aims to develop rules and procedures as the basis for future standards enabling cost effective refurbishment of existing residential buildings within the international commitments to reduce greenhouse gas emissions and climate change mitigation. This implies rehabilitation towards nearly zero emission buildings. The main objective is to provide tools, guidelines, recommendations, best practice examples, and background information for policy makers, designers, users, owners, and promoters to reduce GHG emissions in the existing building sector.

The proposal submitted by CCTP assumes that energy-related refurbishment has a far greater potential for the building to increase in value, than merely representing a savings potential in maintenance fees. If a building is to undergo a comprehensive energy-related refurbishment, arguments other than energy-related ones, such as added value, should be highlighted in order to motivate property owners. The project outline provides a basis to determine values and exemplifies this with case studies.

➔ For further projects and information see: [www.hslu.ch/cctp](http://www.hslu.ch/cctp)