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AlpHouse – Alpine Building Culture and Energy-efficiency
Joint synoptic report of analysis. Action 4.1 and 4.2
08.04.2011 **1/63**

by BYAK/TUM Landraum, EIV and Studio iSpace

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Cover: AlpHouse Pilot-municipality Murnau, aerial photo Klaus Leidorf for TUM Landraum 2010

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Energieinstitut Vorarlberg

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**Report coordinated by ByAK/TUM Landraum leading Workpackage 4,
laid down for Pilot-buildings' analysis by EIV,
for Pilot-villages' analysis by TUM Landraum for ByAK,
for Pilot-regions' analysis by Studio iSpace.**

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Bregenzerwald	Energieinstitut Vorarlberg
Mountain Community Valtellina di Sondrio	IREALP Istituto di Ricerca per l'Ecologia e l'Economia Applicate alle Aree Alpine, ERSAF Ente Regionale per i Servizi all'Agricoltura e alle Foreste
Valle d'Aosta	COA Energia Finaosta for Regione Autonoma Valle d'Aosta
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attachment with code and name (in case of citation of attached analysis)

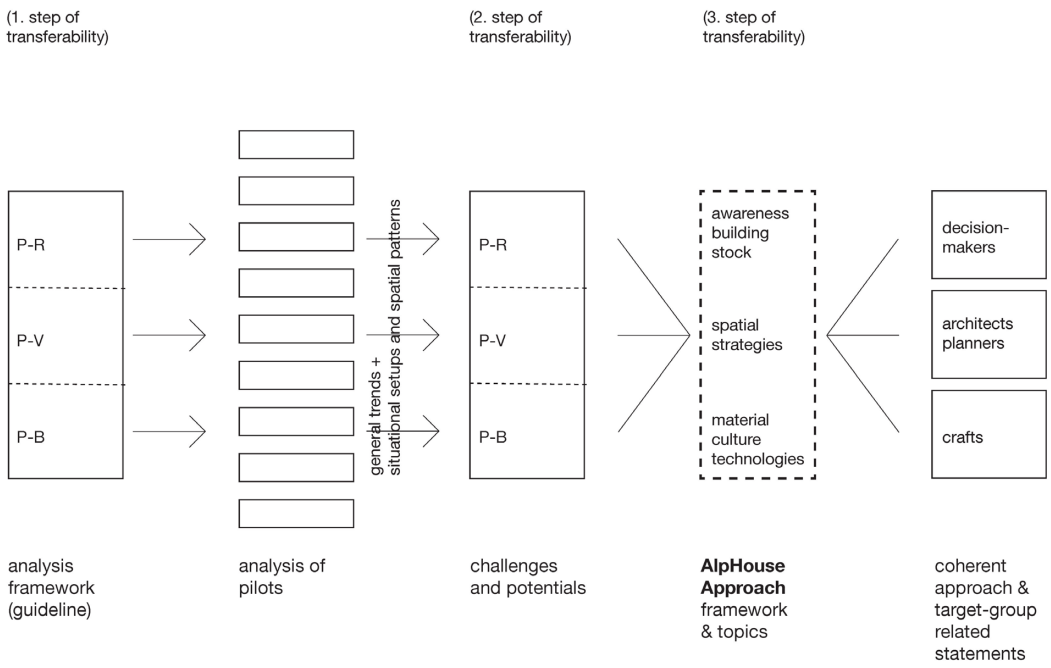


Fig.1: Structure of the joint report of analysis, with three steps of transferability, by TUM Landraum 2011

Introduction *(Jörg Schröder)*

This joint report is covering the compilation of the project partners' analysis documents executed on base of the common framework, as it has been convened in PM 3 Salzburg in April 2010 with the analysis guideline. Since for further steps of the project in implementation and in evaluation additional pilot analysis and development materials will be needed, this materials can be added later on and extend this compilation.

The report illustrates three steps of transregional transferability:

firsthand a common framework of analysis has been used by all project partners for their analysis work of the field of action, the challenges of and approaches to an alpine building culture with focus on renovation and energy-efficiency. The introduced categories and questions within this framework provide a transferable checklist for sustainable renovation strategies; regarding all three target areas of crafts, architecture and planning, as well as local and regional development.

In a second step transregional challenges and potentials, based on transalpine trends and situational outsets, suggest transfers and comparisons between pilots in their three scales of regions, villages and buildings. The drawn image of rich differences between the pilots though is advising not to compile a catalogue of standardised solutions. AlpHouse therefore is concentrating on a situational approach, that brings together experts from different fields for specific spatial and building situations and their specific horizons of use and cultural, economic and social contexts.

This approach in a third step of transferability is drafted as "The AlpHouse Approach" with the central issues of the need of expertise in a coherent spatial strategy carried forward by all three target groups, of awareness–building of the Alpine building stock, and the combination of a new material culture with a broad range of vernacular and innovative technologies. In this sense the Alpine building stock is not only calling to adapt procedures and techniques used for new constructions, but in itself is suggesting alternative solutions deriving from its inherent structure, the "Vernacular Intelligence".

The report is closing with a coherent communication strategy and with a first attempt to draft target-group related statements and advises, that are to be discussed and evaluated throughout the next steps of the project, as well as suggestions of further steps outside the actual project composition.

Remarks concerning AlpHouse CI complying use of the pilot analysis documents, legal and copyright issues can be found on p. 62 f.

1. Framework of the analysis strategy (first step of transferability)

1.1 Description of methodology, procedure and composition of the analysis documents

1.1.1 Methodology *(text by Landraum)*

Aim of the analysis is to gain knowledge on the specific topics related to energy efficiency and building culture. As there are enormous and fundamental differences in these topics in the various regions analysing is a basic part of the framework on gaining specific input for the regional activities in further work packages. The analysis is designed and carried out in the combination of the disciplines architecture and urbanism, energy expertise and regional planning.

Differentiation: Scale and content related

Although the AlpHouse project has a cross-scale approach the analysis is split in three parts:

1. Analysis of pilot regions
2. Analysis of pilot villages / - communities
3. Analysis of pilot buildings

This subdivision was developed to make the connections of influencing factors on building culture and energy efficiency more coherent. Their phenomena are more obvious and identifiable in each of the three scales.

Simplification

It is obvious that any standardisation for comparability and verifiability leads to a simplification of reality. These simplifications are necessary in a certain dose for our research and analysis, the needs of legal backgrounds and regulations and founding for constructing.
However they are not the driving force and the basic rule for in-depth solutions and the perception of reality. Therefore the elements of the analysis are not divided in mandatory and optional information they are part of the procedure to decide which analysis has to be done.

Field research as part of targeted analysis

Gain of Synthetic/Statistic Data and
Knowledge-oriented Data

The aim of a fieldwork and local research is to survey with a special target for the foreseen output. The research itself is part of generating topics and therefore it is an epistemic work. Doing it, leads to

a gain of knowledge. That is why it is a different research with synthetic or statistic data as the general basis.

Formulating the AlpHouse Approach from the analysis

1. Analysis: General information and description of pilot region, pilot village, pilot building (WP 4)
2. Defining challenges and potentials based on the analysis (WP 4)
3. Specification and abstraction: Transferable approach based on topics related to building stock, spatial strategies, material and technologies (part of WP5))
4. Development of target-group related key statements (part of WP 5))

1.1.2 Procedure *(text by Landraum)*

Workgroup

For the Analysis Framework itself the three project partners formed a workgroup. A guideline for the analysis was developed. The responsible partners are:
Pilot region / Geography: Studio iSpace, Austria
Pilot village / Architecture and urbanism: Bayerische Architektenkammer with TUM Landraum
Pilot buildings / Energy issues: Energieinstitut Vorarlberg

Structure of the Guideline

In order to make it easier to handle the word documents, regional analysis.doc is divided in 3 documents: analysis_pilotregion.doc, analysis_pilotvillage.doc and analysis_pilotbuilding.doc.
The Checklist is divided as well.

The delivered Document Folder contains: Checklist – Guideline –Template

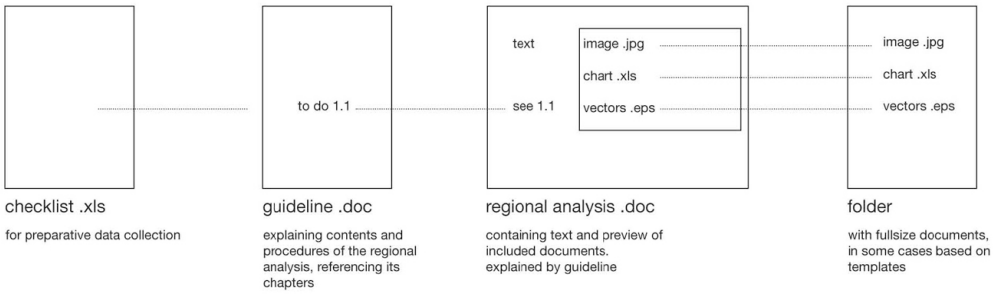


Fig. 2: AlpHouse analysis document procedure (as presented at PM2 in Salzburg 27.04.2010), by TUM Landraum

The structure of the framework can establish various outputs. The pages of regional analysis.doc can be used for presentations directly. They can also be used as material for further education. The documents in the folder are the raw material.

Timeline for WP 4 Analysis

27. April 2010	Presentation of the analysis framework by ByAK/TUM, EIV, iSpace Structure, Methodology, Output, Examples
28. April 2010	Workshop: How to use the guidelines
Till 19. May 2010	Feedback of project partners
10. June 2010	Hand-Out framework guidelines to project partners
June-November	Progress of analysis in each region
15. November 2010	Hand-in of analysis documents by project partners
30. November 2010	Call back by ByAK/TUM, EIV, iSpace
Dec 2010 - Mar 2011	Follow-up analysis hand-in
19. January 2011	Meeting for synoptic report, ByAK/TUM TUM, EIV, iSpace
28. February 2011	Meeting for synoptic report, ByAK/TUM TUM, EIV, iSpace
Calendar Week 14	Joint synoptic report by ByAK/TUM TUM, EIV, iSpace

1.1.3 Composition of the Analysis documents

1.1.3.1 Pilot-region level *(text by iSpace)*

The basis for the analysis was the decision on pilot-regions as well as on pilot-villages and pilot-buildings specified within the borders of the defined regions which are to be analysed. They are spread among the whole Alpine Region as shown in Figure 3. Hence, they represent all the different conditions and challenges that have to be faced concerning a sustainable refurbishment with local resources and local professionals in the Alpine Space.

The analysis itself is carried out using a document template indicating relevant topics for the three different analysis levels which grants that the design and structure of the different inputs is analogue. Anyhow the template works as an assumption of which a minimum number of inputs are required but not all information has to be delivered. It is up to the partners which topics are analysed in greater detail.

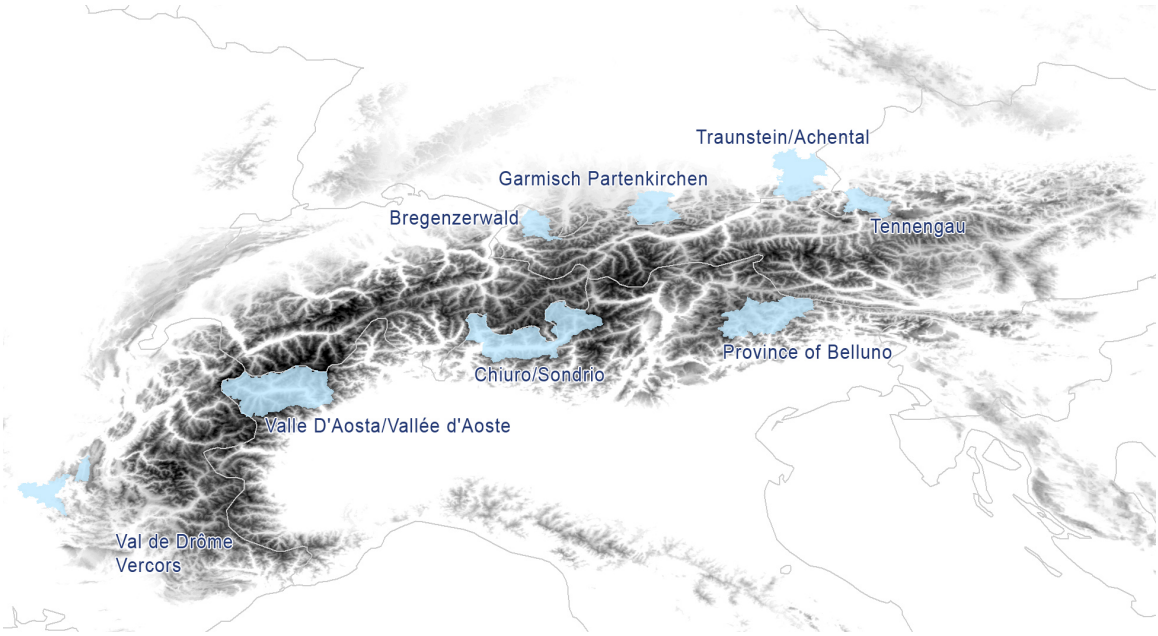


Fig. 3: Overview of AlpHouse pilot-regions, by iSpace 2010

The analysis of the pilot-regions is a rather short part which is meant to give an overview over selection criteria, the natural and socio-economical framework including settlement structures and climate and the building stock and energy background. The information collected here is mainly of use when preparing presentation material for decision makers and for dissemination activities where broader background information is needed.

1.1.3.2 Pilot-village level *(text by Landraum)*

The pilot-village analysis focused on architecture, urban planning and building culture (vernacular intelligence, identity generating potentials, spatial qualities). This strengthened the focus on the complexities of spatial issues and that understanding context is necessary for the complex process of renovations. The analysis is linked especially to the level of pilot-buildings, as the buildings are a basic part of identity. It is linked to the analysis of pilot regions e.g. as the background of the region is related to the villages background.

The pilot-village analysis is divided in 5 explorative and 1 re-capitulatory and result-oriented part:

2. Pilot-village analysis
2.1 General Description (explorative)
- Eligibility Criteria
- Local assets / Distinctiveness / Initiatives

2.2 Natural Forces and Resources (explorative)
- Natural space
- Water resources
- Hazard zones
- Microclimate
- Raw Materials
- Ecological protection areas

2.3 Habitat / Settlement (explorative)
- Overview of village
- Settlement development
- Building types according to age
- Building types according to use
- Storeys
- Roofscape
- Building types
- Renovation necessity

2.4 Infrastructure (explorative)
- Infrastructure / Transportation
- Energy infrastructure

2.5 Planning specifications (explorative)
- Municipal Zoning
- Local planning strategies
- Preservation regulations

2.6 Strategic factors (re-capitulatory)
- Building culture and identity generating potentials
- Vernacular intelligence
- Renovation potentials and local SME´s
- Energy potentials

1.1.3.3 Pilot-building level *(text by EIV)*

Like for the analysis pilot-region and pilot-village, the framework developed for the analysis of pilot buildings is intended to allow for different approaches of analysis. The framework leaves the definition of his focus of work to each partner. This open approach was chosen when it turned out, that the partner´s foci in building analysis were quite diversified.
As the analysis of the pilote buildings was defined in the framework and guidelines not only as analysis of the status quo and the past of the buildings, but also as an analysis of future chances (re-use, change of uses, changes in architectural layout, potentials of and concepts for energy efficiency and use of renewables), the workload defined for a full analysis was rather high.

The analysis of pilote buildings is divided into two main parts:

- analysis of actual state and the historic development of the building
- analysis of renovation potentials (with minor or bigger changes of structure and design, combined with concepts for energy efficiency and use of renewables.

In the analysis of actual state and the historic development of the building, the framework defined formats for issues like

- building´s spatial situation and location
- general data like building type, construction periode, type of construction, treated floor area, ratio surface/volume, ratio window area / living area etc.
- plans scale 1:250 (floor plans, elevations, sections + photographs) and 1:1000 (plan of site)
- description of historical part and present state of buildings (texts and plans, façade layers)
- description of building structure like layers of main constructions
- plans scale 1:250 (floor plans, elevations, sections + photographs) and 1:1000 (plan of site)
- description of energy concept
- calculation of quantitative indicators for energetic performance (annual heat demand, primary energy demand, CO_2 emissions)

In the analysis of renovation potentials, formats for the following issues were defined:

- plans scale 1:250 (floor plans, elevations, sections)
- overview of renovation / restoration approaches
- concept of renovation / restoration methods (description + plans)
- plans scale 1:250 (floor plans, elevations, sections + photographs) and 1:1000 (plan of site)
- description of heating / ventilation / solar systems (description + plans)

- calculation of quantitative indicators for energetic performance (annual heat demand, primary energy demand, CO_2 emissions)

As the calculation methodes for energy demand differ significanty in the European states, the calculation programme “PHPP” = “Passive house planning package” was recommended as a common tool for all partners. The programme is available in all participants' languages (Italian, French and German, and in English). Validations shows a very good consistence of calculation results and measured consumptions for new buildings and renovations.
Climatic data for calculations are available for any location worldwide as an interface to swiss climate data generator “meteonorm” exists. In the climatic data processed by meteonorm, the shading effects of topography can be quantified.
A short introduction to the programme structure was given to the partners by EIV.
For some of the formats, templates have been developed as shown below in the example of an input-output diagram (gains and losses).

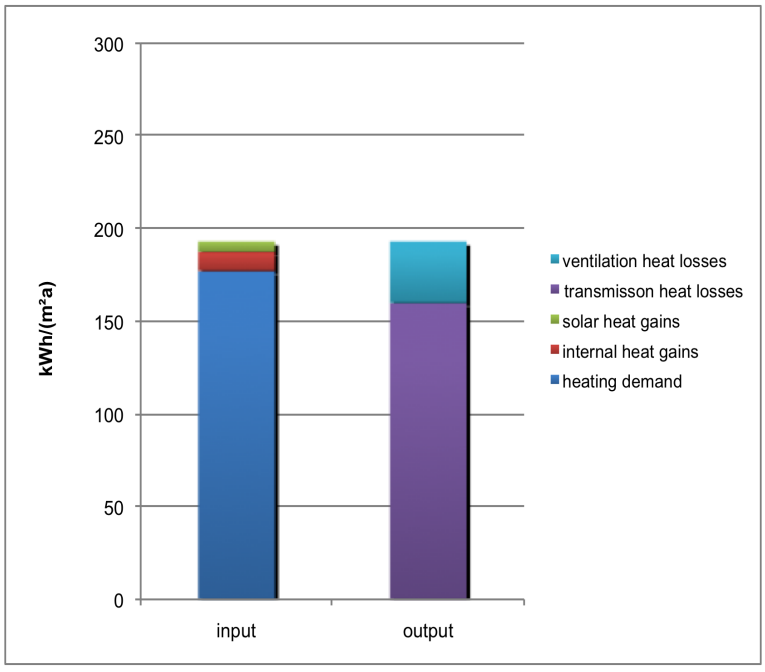


Fig. 4: Example of a template generated for analysis of energy balance of buildings, by EIV

1.2 Evaluation of the analysis output regarding methodology and guideline

1.2.1 General observations *(text by Landraum)*

Scales of the pilots
Executing the analysis showed that this subdivision is workable. However, some topics where not always clearly allocated to one scale.
The experts for the analysis of each project partner needed to identify the specific subjects of their analysis. As each region, village and building is different there might be important and less important parts of the analysis document.
Simplification
This was intended to be part of the development of topics. The partners solved these tasks in different ways and quality. As the craftsman has his special skills and techniques, experts for the analysis on pilotregions, -villages and -buildings are necessary.
Based on their knowledge and experience, they can do an output-oriented analysis with the aims for a building culture as well as for energy efficiency.
Conclusion: For further use of the analysis framework, it will be necessary to start it with a comprehensive workshop and discussion about the needs for analysing according to building culture and energy efficiency. This should not be done by the responsible persons of the partners but by their chosen experts.

Field research
All used methods and sources such as GIS-systems, field research or calculations for energy consumption are helpful for gaining key statements but they are a theoretic help and not a dogma.
Conclusion: Defining the AlpHouse Approach as result of the analysis is a dialectic process that needs expert knowledge for building culture and energy efficiency.

Formulating topics
All Partners were able to do step 1 without major problems. As very different educated and specialized experts worked on the analysis, they had different focuses and methods. Therefore huge differences in step 2 occurred.
Conclusion: It will be important for further use in WP 5, 6 and 7 to consider the gained cognition and the AlpHouse Approach as framework, that has to be interpreted, assembled and supplemented for specific issues as part of development of communication, territorial impact and education; following the target-group related communication strategy (see 3.2.2)

Structure of the guideline
The material will also be used for the AlpHouse homepage and the fair stand (awareness and communication of the project). This procedure has been established in several presentations done by the project partners.
Conclusion: an easier and more workable structure could be:

1. *A short design guide for the layout, and examples (different to WP4)*
2. *A Guideline, that explains contents and procedures of the regional analysis as well as standards for outputs (e.g. scales, possible research methods, illustration) (as done in WP 4)*
3. *A Checklist for data (as done in WP 4)*
4. *Output in format pdf with high resolution (different to WP4)*

In any case each partner has to take control over his intellectual property rights and has to decide about publications clearances. We ask the Leadpartner and the project management to take regard of this proceeding.

1.2.2 Pilot-region level *(text by iSpace)*

Most partners have chosen to do the whole analysis on the regional level with all its details as this can be used to introduce the region to anybody interested in further information from the AlpHouse project. Nevertheless some partners kept to a very short 1-2 page description of the region which is probably due to the fact that in these regions there is no great focus on the target groups of decision makers which need more information about general tasks than the other target groups.
A short pilot region analysis of Drome is announced and will be integrated in the collection later on; NEO is focussing mainly on villages and buildings.

1.2.3 Pilot-village level *(text by Landraum)*

Regarding the pilot villages for the AlpHouse project it is necessary to understand the complexity of spatial, social, economic and cultural systems and their links. Different approaches are necessary for the perception and understanding of the reality and needs of our building culture and settlement structures. One can be the evaluation of synthetic or statistic data. The other is to get involved with the subject under investigation so that we can understand our generated data at once and develop topics or key statements for further use in education.
For most Partners it was not obvious that Part 2.6 "Strategic facts" is output oriented.
Conclusion: It would be reasonable to draw a separate part "summary and conclusion"

1.2.4 Pilot-building level *(text by EIV)*

Most partners focused on certain aspects of the analysis. In some cases the analysis of the potentials of subsequent use was in the focus, in others, in which no change of use was needed or intended, energetic aspects were the focal theme.
The flexible structure of the framework allowed for both ways.
The calculation programme PHPP has been used mainly for quantification of potential energy savings in projects in Italy and Austria, but also for one project in Germany.
For some projects, the recommended calculation programme PHPP was not used as calulations have been made using national calculation tools. In this case, a comparison of results is hardly possible.

For other projects, a quantification of energetic quality of the buildings didn´t make sense as these buildings will be used only partially and/or temporarily. In some of theses cases, the duration of use and heating/dhw necessity was hardly predictable so that the boundary conditions for calculations were too vague.
In other projects, only small parts of the whole buildings were planned to be heated while others remained unheated buffers. For those buildings, only multizone-calculation models would lead to reliable results.

One aspect discussed among partners was, in how far solar gains of opaque surfaces, especially external walls are relevant for the overall energy balance of buildings. As exterior absorptivity and emissivity can be modelled in PHPP as well as the effect of the specific heat capacity of the building, a sensitivity study was made for a model house with high specific heat capacity (external walls: 50 cm of heavy natural stone)
While the annual heat demand without consideration of solar gains of opaque surfaces was 267 kWh/m^2_{TFA} a, the value for the identical building was 252 kWh/m^2_{TFA} a, when the solar gains of a light colored external plaster were considered. The influence of solar gains of opaque surfaces in normal light colours was found to be about 6%. For the same building with an external insulation of the walls, the effect of solar gains of these walls turned out to be significantly lower.
While EIV refered to scientific studies showing similar results, TUM pointed out, that the effect of solar gains of heavy walls are still subject to discussion.

Conclusion:
Results of building analysis show the correlation with the analysis in the other scales: only the knowledge of trends and tendencies like demography and market-situation both on regional and village level allow to understand, why certain concepts are chosen in the building scale: in a shrinking market with low prices the use of parts of a building may be an adequate means in order to preserve it; find-

ing a subsequent use is the predominant requirement. Adaptation of per capita treated floor area in this case may be a very important means to reduce energy consumption.
In regions, in which population is growing and prices are high, redensification and extension may be the appropriate way.
As for the strong correlation of the three scales analysed, the AlpHouse approach of combining all three scales of analysis turned out to be right.

Comments to the use of PHPP for the AlpHouse-Project *(text by Landraum)*
For the consistence of calculations of post-War Buildings PHPP seems to be an adequate tool because constructions are generally standardised and basic data of conductivity etc. is accessible. Exemplary calaculations (modellhaft) provided by PHPP are therefore useful regarding standard parts of the buildings.
Therefore within the analysis limitations of PHPP are to be remarked:

- Regarding different temperature levels inside a building (the attempt to lower temperature in this case from 20° to 18° is not satisfactory and needs to be proved).
- Unconstant conditions: Heterogeneous constructions, especially in old buildings, with various material, different stones and humid walls have no constant thermal conductivity which is basis for PHPP; question of heat storage and solar gains in any case remain.
- Use and Time: Many buildings in the Alps are not used constantly. Calculating the saved energy by PHPP misleads to oversized energetic renovations. In this case PHPP is a help, but not the solution for the dimensioning process of constructions and insulation (e.g. Haus S., Schleching, actual state: the calculated consumption differs more than 50% in regard to the real consumption).

Conclusion:
- The use of PHPP has to be decided for each renovation project very carefully. It can be a help but won´t lead to substantial results for all renovations of old buildings.
- Also other calculation methods such as wufi, dynamic simulations can be taken into account.
- In general a quantification even of partial and gradated energetically effective renovations (in regard to "full" versions of passive-house-concepts) seems reasonable, not only to enable funding decisions and planning permissions, but also to support design and decision processes during a project. The aim of embedding quanitative evaluation within a broader range of criteria though remains.

2. Evaluation of the transregional analysis (second step of transferability)

2.1 Selection of Pilots *(text by Landraum)*

For the analysis and for implementation activities the project partners choose pilots in three different scales: pilot-regions, pilot-villages and pilot-buildings. The decision to use this cross-scale approach reflects the cultural and economic role that spatial contexts do play in planning and realising object-related renovation works. The project partners conducted the analysis for their pilots in collaboration with regional experts and political bodies.

For a complete list of all chosen pilots please see 4.2.

The selection criteria for the pilots, based on the common framework of size and setup, have been defined individually by the responsible project partners, combining regional relevance of the pilots with existing initiatives in the fields of building culture and energy to which AlpHouse can be tied up.

- 9 project partners from 7 Alpine regions (plus Suisse), and from 4 nations (plus Suisse) selected:

- 9 pilot-regions (P-R) based on NUTS-3 or smaller (target size 700–1.000 km^2),

- with 14 pilot-villages (P-V), municipalities based on LAU-2 or smaller, with focus area,

- and with appr. 30 pilot-buildings (P-B), 18 are attached to this document, further appr. 12 analysis procedures are announced by the project partners to be integrated in further WPs.

The pilot-buildings represent the focus on the regional building stock, that every project partner defined; by means of the P-B approaches and procedures of renovation are developed and illustrated. For that best-practices and regional legal and technical background is integrated into the analysis.

The pilots illustrate the cross-scale dependencies of renovation decisions (Fig. 5 - 1), they provide a spectrum of transalpine challenges and changes of building culture (Fig. 5 - 2) – and though due to the impact-related selection process they provide not a complete catalogue of situations and solutions, cross transferability (Fig. 5 - 3) in both fields is amplifying common knowledge and awareness.

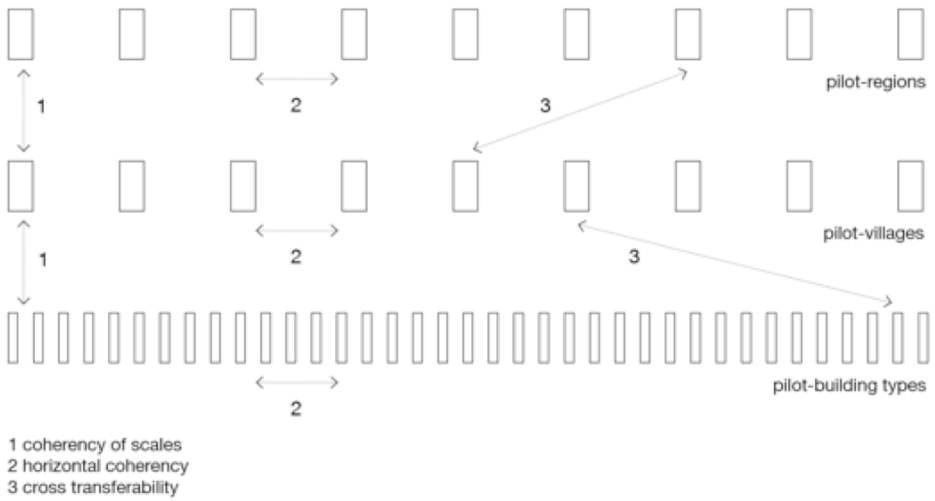


Fig. 5: AlpHouse pilots' cross-scale approach (as presented at PM2 in Salzburg 27.04.2010), by TUM Landraum

2.1.1 Selection of Pilot-regions *(text by iSpace)*

All the regions have been chosen due to a combination of the following reasons:

- A vernacular settlement pattern which results in the existence of an old building stock worth to be preserved
- The need to adapt the existing building stock to different uses and enhance its attractiveness
- Existing initiatives concerning sustainability, energy efficiency or renewable energy and resources
- Very active craftsmanship with knowledge of vernacular techniques
- Good examples for pilot buildings
- Willingness of regional and local stakeholders to support the project

2.1.2 Selection of Pilot-villages *(text by Landraum)*

As it is a basic idea of AlpHouse to amplify knowledge and awareness of the Alpine building stock, the qualitative selection of building types have to be not only connected with regional relevance and quantities. Selecting the building types within the pilot-villages provides insights into local contexts and dependencies, that increase the material values of the buildings, and provide an background both of building culture and of renewable energy strategies. Though the selection of the 14 pilot-villages did not aim at an overall image of Alpine diversities, a spectrum of different local conditions

and horizons of development can be observed in the selection. Demands on pilot-buildings differ extremely, expressed through sqm. prizes ranging from almost 0 € to up to 3,000 €. It can be stressed that individual decisions about renovations always include evalutation of context and location.

2.1.2 Selection of Pilot-buildings *(text by EIV)*

In general, buildings selected for analysis were residential buildings, only one was an office building. While many of the buildings will be used permanently, others are intended to be used temporarily (secondary homes, tourism).
Each partner selected his projects according to his own set of criteria. The following criteria turned out to be the most important for selection:

- building characteristic for regional building culture (construction, use, design…)
- building representing great part of building stock thus having great influence on regional concepts for energy efficiency
- high chance for realisation of concepts for renovation

2.2 Comparative challenges and potentials

2.2.1 Pilot-region level *(text by iSpace)*

Though the overall goal is the same in all regions the challenges to be faced differ. In general there seems to be a difference between the regions in the Northern part of the Alps and those in the South, not only according to language and climate but also according to the age of the building stock and the most important issues that have to be dealt with.

True for all the regions is that the main settlements with higher density can be found in the lower sites of the regions. Additionally scattered settlements with rural cores can be found also in the higher areas often expanded due to touristic reasons in the most cases. In the northern regions also second homes and settlement pressure during the last decades have led to additional splinter development. In general the rural settlement structure in the southern regions seems to be less influenced by modern trends than in the northern parts which can also be seen by the high amount of traditional buildings with preservation status.

Due to the mountainous climate of the chosen regions, heating and energy efficiency play an important role in all the regions. Summer overheating on the other hand is only an issue for the southernmost and low lying buildings. The increasing height of precipitation with increasing altitude which means due to low temperatures in winter also snow cover on roofs may reduce the energy output of potential solar collectors. Nevertheless especially in higher southern oriented sites they are an option to increase the usage of the sustainable local resource of higher radiation values in the mountains, forming a chance for any crafts SME specialising on this topic. Anyhow the integration in the vernacular preserved building culture of the southern regions is a big architectural challenge and needs additional knowledge.

In general the number of old traditional buildings is higher in the Southern Alps making the conflict between old and new and the preservation an even bigger issue in the refurbishment process longing for specific creative solutions which require special knowledge. The need to adapt old structures to new demands on the other hand is an important topic for all the regions. The reasons for that are:

- The decrease in agricultural usage of buildings and necessity to adapt them for other purposes.
- The demographic and social change which leads to more square metres per person, smaller family units and more single households as well as more elderly people which have different needs than those covered by the existing building stock.

Wood is probably more dominate in the Northern regions forming an important landscape element, being used as traditional building material and energy carrier for heating purposes. Still the highest percentage of heating systems is fuelled with fossil energy carriers although declining compared to biomass heating which are increasing.

Probably the latter is also a consequence to the national laws and funding systems according to buildings which have very specific requirements considering energy usage and sustainability, which have to be known in detail by any craftsmen to stay competitive. More detailed information on that can be found in the additional “Analysis of the legal frameworks” document.

The results collected within the regional analysis can especially be used for broader dissemination activities and the education of decision makers who also want to have an overview of influencing factors as they have to keep that in mind within their work. Additionally the general regional information can be used as an introduction to a very specific piece of information which is important for architects and craftsmen by starting the argumentation/visualisation/explanation at a general view and then showing the connection of some overall influences on the detail. e.g. showing a map with

the mean temperature and the heating degree days of the whole region explaining the values at different sites within the region to make them aware that the location is a very important factor and makes it necessary to treat buildings different based on where they are situated as their needs are different when it comes to the insulation thickness, window type, sun shading and heating dimension. This can be used to teach planners and craftsmen to keep the big picture and general influences in mind and improve their work by optimizing it for each and every location instead of performing scheme X for every building. That results in a general higher quality and the sustainability of the refurbishment work and the satisfaction of the customer can be assured for a longer time and to a higher percentage.

2.2.2 Pilot-village level *(text by Landraum)*

The selected pilot-villages are illustrating the local specific impacts of **transalpine trends**, that can be identified in different forms of demographic changes, in structural changes and repositioning of agriculture and tourism, in the impact of transalpine and regional transport infrastructures, the question of public transport, in ecological issues and adaptions to climate change; specifically for the AlpHouse project the energy saving and production questions; and generally economic and social processes of concentration and diffusion, combined with specific overlaying samples of growth and shrinking of economies and communities; in repositioning communities in the rural areas, and in different cultural backgrounds and mindsets. These trends are driving forces of settlement development, interacting with situational setups of communities and **specific patterns of existing settlements** and open spaces, building types and construction processes; this interaction of trends and situational conditions is putting forward the challenges for renovation on the pilot-village level; at the same time it is unfolding specific potentials.

Ongoing **suburbanisation** in the greater Salzburg area (P-V Kuchl) combined with questions of vacant **postagrarian building stock**, commuter and leisure interdependencies with the Munich metropolitan area of 5 Mio inhabitants (P-V Murnau) or the expected expansion to Bregenzerwald from the Rhein valley and Bregenz (P-V Andelsbuch), are suggesting intensified use of existing building stock as part of ecological inner development strategies. Housing demand could be channeled into older and 20th century's buildings to a greater extent, putting forward the need of renovation strategies, of exploring capacities both of the buildings and of common infrastructures. Exploration of capacities specifically regarding the postagrarian parts should not exclude deliberate replacements, but first-hand cultural and economic values and alternative ways of use should be considered.

Fig. 6: Settlement growth in the Munich metropolitan area: AlpHouse pilot municipality Murnau am Staffelsee, aerial photo by Klaus Leidorf for TUM Landraum

On the other hand **shrinking processes and vacancies** of buildings, connected with material, economic and social stabilisation demands, in the case of the villages in the Dora Baltea side valleys in Aosta (P-V Gressoney-La Trinité, Gressoney-St. Jean, Champorcher) are superposed by housing, leisure and tourism related influences of the *città diffusa* that spans between Turin and Venice. In the north of Belluno province (P-V Selva di Cadore, Vodo di Cadore) villages in side valleys or in higher expositions are undergoing shrinking processes, while in the main valleys ongoing new construction activities are to be observed. Similar observations can be made for the Chiuro province (P-V Chiesa, Chiuro). But aside from these superposition issues, questions of local strenghts, of rural identities, of models and modes of territorial settlement are to be faced. Therefore regional trends may not only be described as capillary modified – calling into question the use of generalised tools – but specific local conditions are calling for a tailored evaluation of potentials of the building stock within individual urbanistic concepts. Vacancies of postagrarian buildings are also to be noted in P-V Schleching,

shrinking issues are concerning the southern part of P-R Garmisch-Partenkirchen. Besides demograhical and economic issues in many cases the question of property because of splitted heritage seems crucial for vacancies of buildings.

Fig. 7: In the pilotregion Northern Part of Belluno shrinking and vacancies can be observed. Historic center Vinigo in AlpHouse pilot-village Vodo di Cadore with vernacular buildings, by Regione del Veneto and Comune Vodo di Cadore

Fig. 8: Postagrarian buildings (dark green) in the centre of AlpHouse pilot-village Schleching: vacancies in a balanced region, by TUM Landraum

The aim to re-use intensely regional specific vernacular buildings and settlement patterns from a building culture and energy point of view, is putting forward the topic of the **nuclei** of Alpine settlement; they are important also as places of production, of knowledge and of meaning. The alpine

nuclei are focal spaces concerning multiple infrastuctures and changing public spaces. The vernacular building stock, generally defined pre-industrial and before 1918, in all pilot-villages is identified as core issue of development perspectives: the also energetically intelligent dense pattern of houses forming the market in P-V Murnau or Kuchl; similar patterns in Chiuro and Chiesa; and the more porose nuclei of Selva di Cadore, Vodo di Cadore, Andelsbuch and the Aosta pilot-villages.

Fig. 9: Market in AlpHouse pilot-municipality Murnau am Staffelsee: ensemble monument and central space of services. Groundfloor uses 2010, by TUM Landraum

Fig. 10: Historic town centre of AlpHouse pilot-village Chiesa in Valmalenco with 50 buildings, by IREALP

Building stock of the postwar years, especially from the **60ies to the 80ies**, mainly single or double detached houses, in many villages is considered a main focus (e.g. P-V Kuchl, Murnau, Schleching, Andelsbuch, Chiuro). These buildings can play a decisive role for renovation strategies and energy saving, because of obvious renovation necessities due to poor construction qualities of that time and based on their apparently low cultural value. Just this evaluation of single buildings and settlements of those years, combined with scenario based design for their further use, appears from the analysis as challenge for the next years. Part of this considerations are infrastructure and adaption demands of older populations, the strategic moments for sustainable investments, new household and housing forms, multi-generation and living-working combinations. A focus on patterns and urbanistic combinations of this part of the building stock can provide added values; ensembles of buildings from that time can become target for small scale renewable energy production.

Fig. 11: AlpHouse pilot-village Andelsbuch: 43 % of the buildings are from 1950-94, aerial photo by Klaus Leidorf for TUM Landraum

This applies analogously to similar settlement patterns of **secondary residences and of small scale touristic buildings** (e.g. P-V Schleching, Saou) that in many cases are in need of renovation; in Vassieux even a further expansion of new secondary residences is planned. The role and spatial setup of touristic uses can be formulated more precisely within a comprehensive urbanistic strategy. There are locally specific limits and chances of the interferences between community life and touristic occupation; extremes can be identified as villages of high-impact-tourism or of *albergo diffuso* con-

cepts – but were decidedly not selected within the pilot-village spectrum aiming at more sustainable village models.

Fig. 12: Secondary residences and 1960-80 residential buildings in AlpHouse pilot-village Schleching, aerial photo by Klaus Leidorf for TUM Landraum

All selected pilot-villages are strongly influenced by the restricted possibilities of further expansion of settlement in the Alps due to the topographical setup of valleys and slopes; ecological objectives as ground sealing minimisation, nature protection, and adaption to natural hazards intensified by climate change, are demanding a more intelligent way to shape **Alpine settlement and territory**. Therefore the Alpine space due to its specific restrictions can assume the role of a laboratory for nationwide efforts to reconnect and reconcentrate settlements. Additionally especially in the Alps a re-evaluation of agriculture and of its spatial impact for identities and multidimensional added values can be observed, stressing further these concentration processes – and reflecting general new attention for nature, food and rural-urban relations and material flows.

The pilot-villages are highlighting that for the desired new setup of European energy supply, **saving and production strategies** can be combined and optimised **on a local level**; even in this sense the Alps with their broad offer of natural renewables can become a laboratory of settlement development. As the analysis shows, small scale specific systems in energy production of renewables would

answer local specific challenges in a really sustainable way – especially focussing on the added value of short networks and on-demand production. Therefore communal energy planning has to be conceived as part of urbanistic strategies, proposing intelligent solutions for positioning solar, wind, biomass, geothermic, water energy production.

Since **legal, regulatory and funding incentive backgrounds** for the pilot-villages prove to be different and adapted to particular national and regional backgrounds and challenges, the analysis stresses the strategic factor of local decisions: a valuable ensemble, a context of important old buildings, the positioning of renewable energy production can be decided on locally, and on base of a reasonable development strategy, in a more sustainable way than by generalised protection and incentive laws, that are fixed to single objects.

It is not aim of the analysis to formulate a typology of urbanistic strategies and interventions for generalised challenges and potentials; the specific differences of the selected 14 pilot-villages and the complex nature of urbanistic planning processes propose to transfer not recipes but a **methodological framework**. The analysis is to be seen as part of a comprehensive **transferable approach,** making basic information and interpretation available (like a structured checklist sampling regional focussed existing tools in architecture, urbanism and regional development). This AlpHouse Approach on the pilot-village level can in further steps stimulate spatial strategies on regional and building levels.

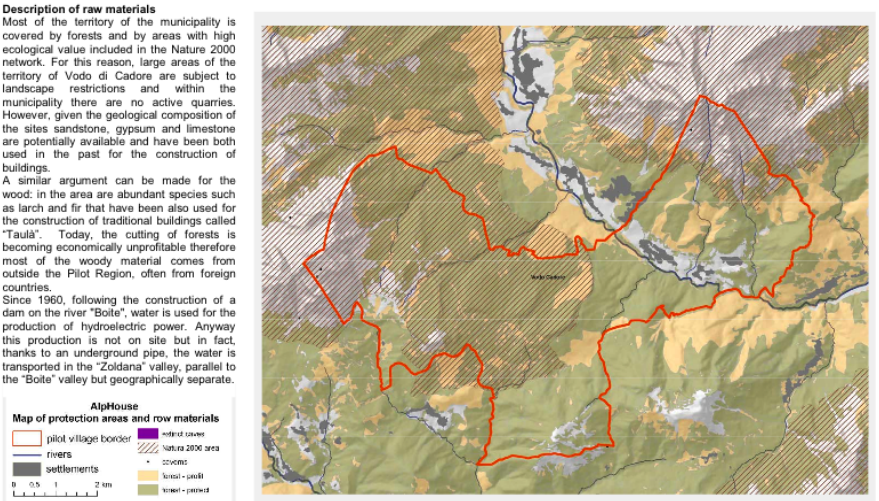
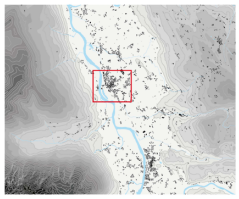


Fig. 13: Settlement concentration in the Boite valley and huge wood areas of AlpHouse pilot-village Vodo di Cadore, by Regione del Veneto

PILOTVILLAGES

011 KUCHL



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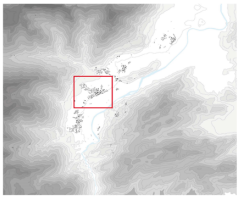
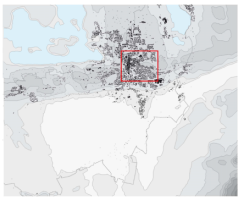


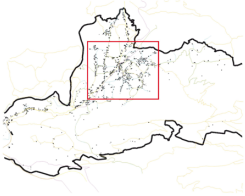
031 MURNAU



041 SELVA DI CADORE

042 VODO DI CADORE

051 ANDELSBUCH



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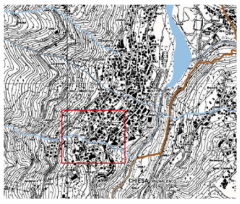
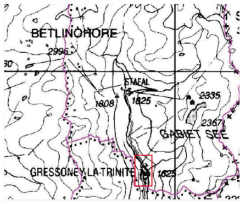


062 CHIURO

063 PONTE IN VALTELLINA

071 GRESSONEY-LA-TINITÈ



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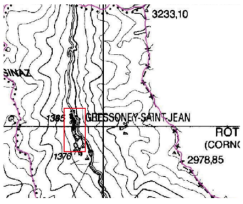
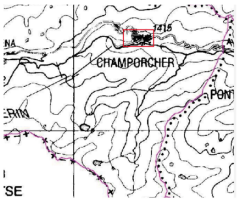
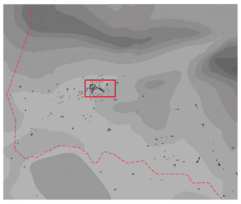


073 CHAMPORCHER



081 SAOU



091 VASSIEUX-EN-VERCORS

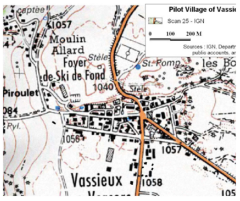


Fig. 14: AlpHouse's 14 pilot-villages, by TUM Landraum and all AlpHouse project partners 2011

Fig. 15: AlpHouse's 14 pilot-villages, data source Google Earth, edited by TUM Landraum 2011

2.2.3 Pilot-building level *(text by EIV)*

The pilot-buildings selected differ very much in age, type of construction, actual and intended future use etc. The oldest buildings have been erected in the 16th century, a great part in the 19th century while another great part originate from the 50s to the late 70s of the 20th century.
Massive construction is predominant among the buildings selected, only one wooden building has been analysed while some represent a mix of massive and wood constructions.
As many of the buildings have not been used as residential buildings and some will only be used partially or temporarily, a comparison of energy demand in the actual state makes no sense among all projects. For many of the older buildings finding a new use, restoring damages and respecting requirements arising from monument protection are in the focus of analysis.

In order to give an overview over all projects, four groups of buildings will be presented below by typical examples:

Group 1: Residential buildings from the 50s to late 70s of the 20th century, intense use
Group 2: Small residential buildings of different ages, temporary or intense use
Group 3: Residential buildings from the 19th century, intense use
Group 4: Large buildings of different ages, partial, temporary or intense use

Group 1: Residential buildings from the 50s to late 70s of the 20th century, intense use

For different reasons, buildings from this periode are very interesting in terms of total energy savings:

- In most regions, buildings from the periode represent a big part of the total building stock (>1/3 of total building stock)
- As these buildings have been planned and erected in times of very cheap energy, their energetic quality is very poor, their demand may be higher, than the demand of older buildings
- Many of the buildings of the postwar periode are heated by oil, a smaller part by gas. CO_2-emissions may be reduced drastically by a change to wood
- Most of them have not undergone major renovations. Due to their age of 30 to 60 years, a great part will need an overall renovation within the next years
- If the energetic improvement in a very high quality is combined with such an “anyway” renovation, economic feasibility of energy saving measures is generally very good

Figure 16 shows a typical house of this periode:

Fig. 16: Typical building from the 1970s of AlpHouse pilot-region Bregenzerwald, photo EIV

The annual heating demand$_{PHPP}$ for the buildings of group 1 – all of them are already used as residential buildings - range from 118 to 265 kWh/m$^2_{TFA}$a (5 examples from Bregenzerwald).
For the buildings analysed, the annual heat demand can be reduced to 20 to 30 kWh/m$^2_{TFA}$a by using Passive house components where feasible.

As the projects from Bregenzwerwald region show, the primary energy demand$_{PHPP}$ for heating, dhw and auxiliary energy for pumps and ventilators will be as low as 14 to 21 kWh/m$^2_{TFA}$a .
CO_2-Emissions for heating, dhw and auxiliary electricity can be reduced from values of 78 to 131 kg/m$^2_{TFA}$ a for actual state in the buildings equipped with oil burners and 32 kg/m$^2_{TFA}$ a in a building heated by wood in the actual state to only 3,5 to 5,3 kg/m$^2_{TFA}$ a in the renovated buildings.
The reasons for these very low values are the reduction of energy demand (Factor 5 to 9 lower compared to actual state), very efficient technical systems (with ventilation systems with heat recovery in all buildings) and the use of wood in all buildings after renovation.

It must be stressed, that for the total building stock only a combination of strong reductions of the energy demand, efficient energy supply and a low CO_2 emitting energy carrier will lead to the reduction rates stated as necessary by climatologists.
As estimations of the potentials of wood as an energy carrier show for Germany, Austria and whole Europe, wood will only play a significant role in the energy mix, if the energy demand can be lowered significantly.

In some regions, the finite nature of biomass potentials is obvious right now: In regions like Vorarlberg, that have been funding wood as an energy carrier since a long time, funding for district

heating station powered by wood has been stopped in 2011 as the potentials available for the moment don´t allow for a higher share of wood in the energy mix.

Group 2: Small residential buildings of different ages, temporary or intense use

These buildings of different periodes that will be used only partially or temporarily are represented by a building from Schleching in the pilot region of Traunstein.

The building from the 50s of the 20th century has a living area of less than 60 m². As in future more space will be needed temporarily, different strategies of enlargement have been analysed. The focus of analysis is on identifying the renovation concept best adapted to the new need.

Concept 1

In concept 1, the building is enlarged on one side, the existing roof is enlarged. The new heated space is used as living room, while sleeping rooms, bath and kitchen remain in the old part of the house. The new part of the house is realized in a high energetic quality, minor energetic interventions are proposed for the existing part of the house.

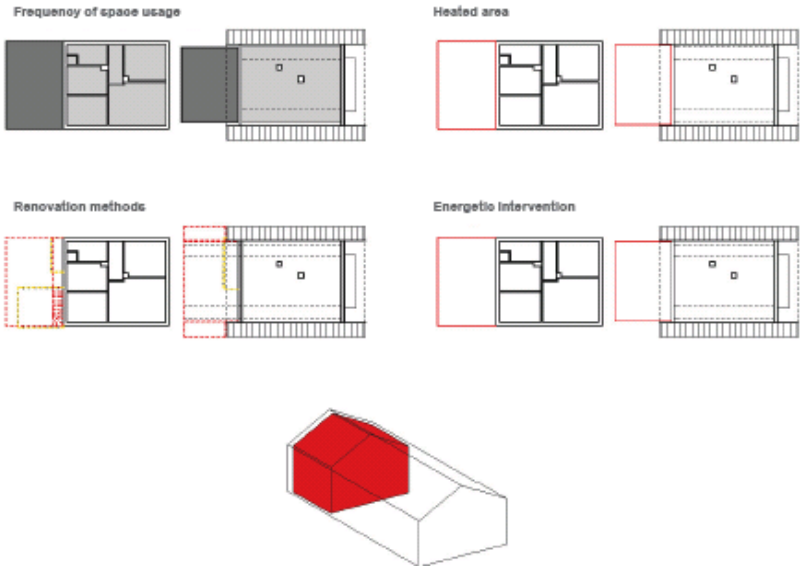


Fig. 17: Alternative concepts for AlpHouse pilot-building S. in Schleching-Ettenhausen, by TUM Landraum

Concept 2
In concept 2, the building is enlarged on one side. The new living room stands alone and has a flat roof. The new heated space is realized in a high energetic quality, minor energetic interventions are proposed for the old house.

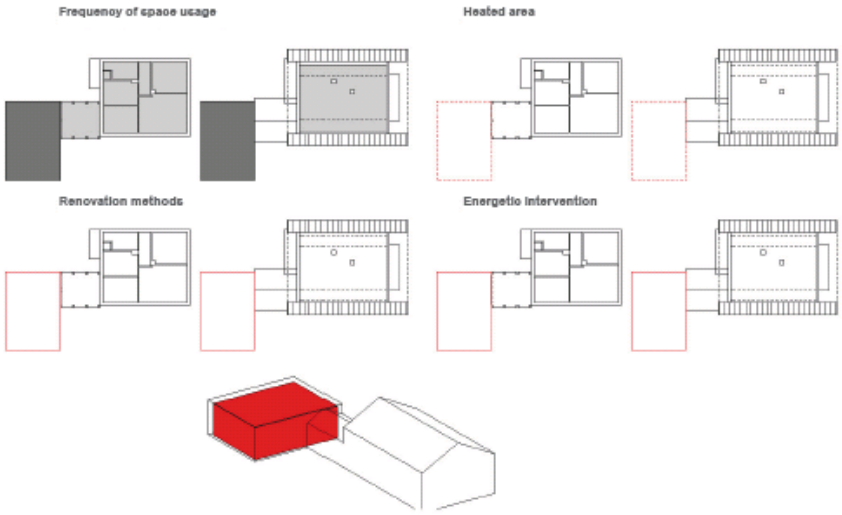


Fig. 18: Alternative concepts for AlpHouse pilot-building S. in Schleching-Ettenhausen, by TUM Landraum

Group 3: Residential buildings from the 19th century, intense use
Group 3 represent buildings from the 19th century with an intensive use.
First example is a typical, wooden Bregenzerwälderhaus from 1860, the second example a house in mixed construction in Selva di Cadore, Veneto. Third example is a former farmhouse in Gressoney-La-Trinité that will be converted to a guesthouse

Example 1: Bregenzerwälderhaus
The annual heat demand of the typical Bregenzerwald Building from the 1860s in the actual state is about 177 kWh/m^2_{TFaA} a.
Be realizing the measures proposed, it can be reduced to about 42 kWh/m^2_{TFA} a. The external insulation proposed will be accepted by the “Gestaltungsbeirat”. A few buildings of this type have been renovated before using external insulation. While in previous renovations 6 to 8 cm of external insulation have been realized, for the project analysed, 16 cm are proposed. The analysis of the building

outline shows, that proportions will not be changed too much by adding the external insulation. As new shindles will be added, the outer appearance will be similar as before. A special construction for a box window minimizes the change in the outer appearance.
The primary energy demand for heating, dhw and auxiliary electricity for pumps and fans can be as low as 24 kWh/m^2_{TFA} a. CO_2-Emissions can be reduced from 80 to 6 kg/m^2_{TFA} a due to the reductions in demand and as wood will be used as energy carrier.

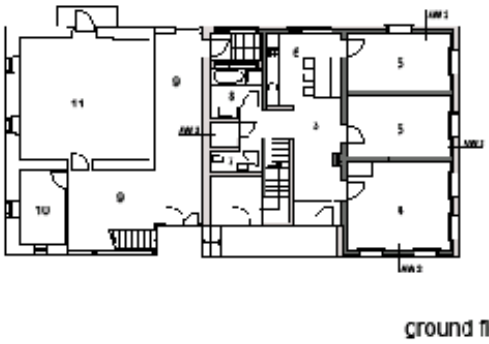


Fig. 19: AlpHouse pilot-building R. in Andelsbuch, floor plan Bregenzerwaldhaus from 1860s after renovation, by Arch. G, Gruber for EIV

While the typical structure of the old rooms “Stuben” will not be changed, other zones are adapted to new needs.

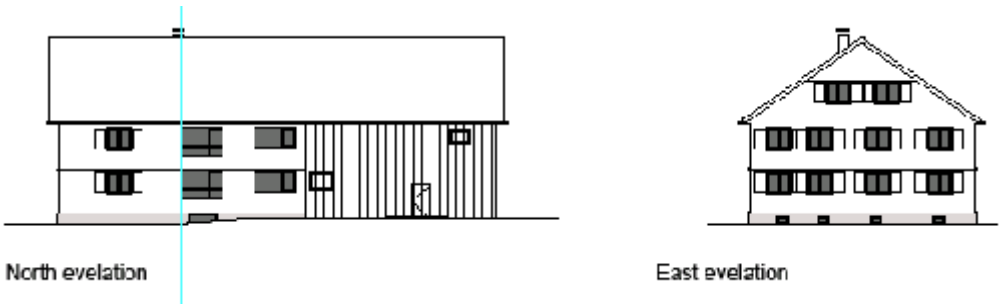


Fig. 20: AlpHouse pilot-building R. in Andelsbuch, elevations Bregenzerwaldhaus from 1860s after renovation, by Arch. G, Gruber for EIV

While the typical gable-side of the house remains unchanged, the former stable-part is adapted to the needs.

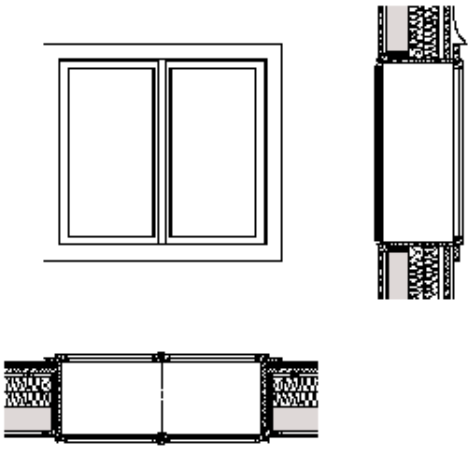


Fig. 21: AlpHouse pilot-building R. in Andelsbuch, window details after renovation, by Arch. G, Gruber for EIV

Box type windows as combinations of high efficiency interior window (double glazed) and external whether-protection window close to historical window in appearance represent a good compromise between keeping the character and fulfilling energetic needs.

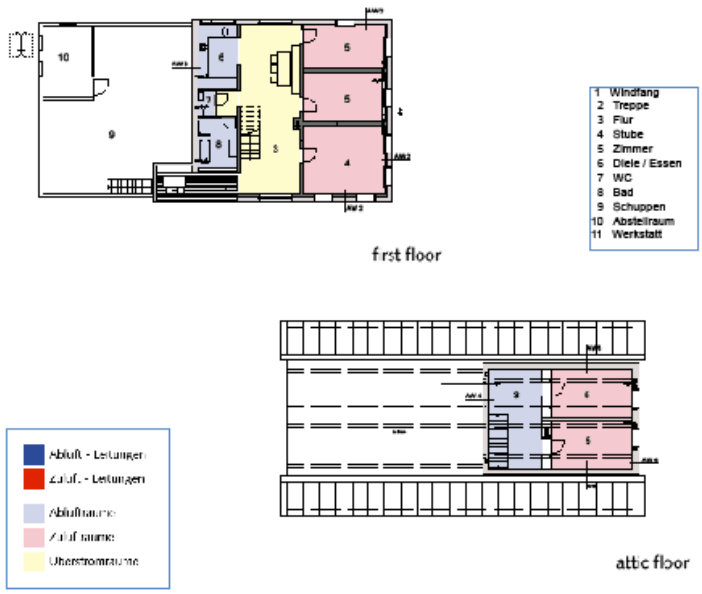


Fig. 22: AlpHouse pilot-building R. in Andelsbuch, integration of ventilation system in Bregenzerwaldhaus from 1860s after renovation, by Arch. G, Gruber for EIV

As the analysis shows, a ventilation system with heat recovery can be integrated with low impact on the old room´s appearance. Ducts can be integrated into the internal layer of the external wall.

Example 2: House in Selva di Cadore

As the house is set in a historical context of considerable value, the renovation had to take into consideration historical and environmental aspects while combining them with the need to convert the building to residential use by using the spaces formerly used for agriculture like stables etc. or the 19th century building in Selva die Cadore, it was possible to keep the character while adapting it to the new needs. For the project, it was possible to keep the character, adapt to the new needs and on the same time to reduce reach a high energetic quality. The house reached Label A of Casa Clima.

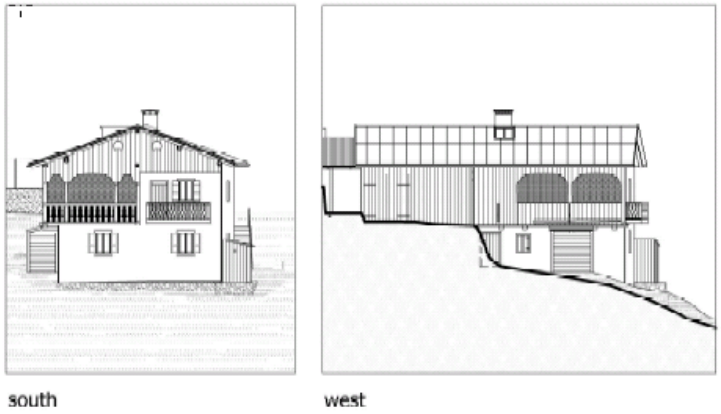


Fig. 23: AlpHouse pilot-building in Selva di Cadore, elevations, by Studio Arch. Giusto for Regione del Veneto

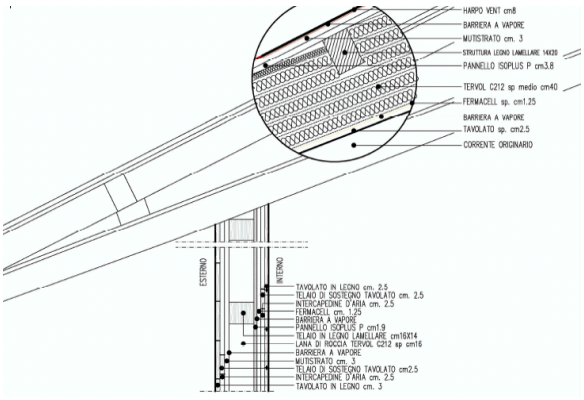


Fig. 24: AlpHouse pilot-building in Selva di Cadore, sectional detail after renovation, by Studio Arch. Giusto for Regione del Veneto

Example 3: House in Gressoney-La-Trinité, Edelboden inferior
The house origins from 1661 and has extensions from 1733 and 1887. The original use was a combination of residential + rural, the building will be converted to a guesthouse.
The intervention consists of restoration, functional rehabilitation and conservation works as well as energy saving measures.

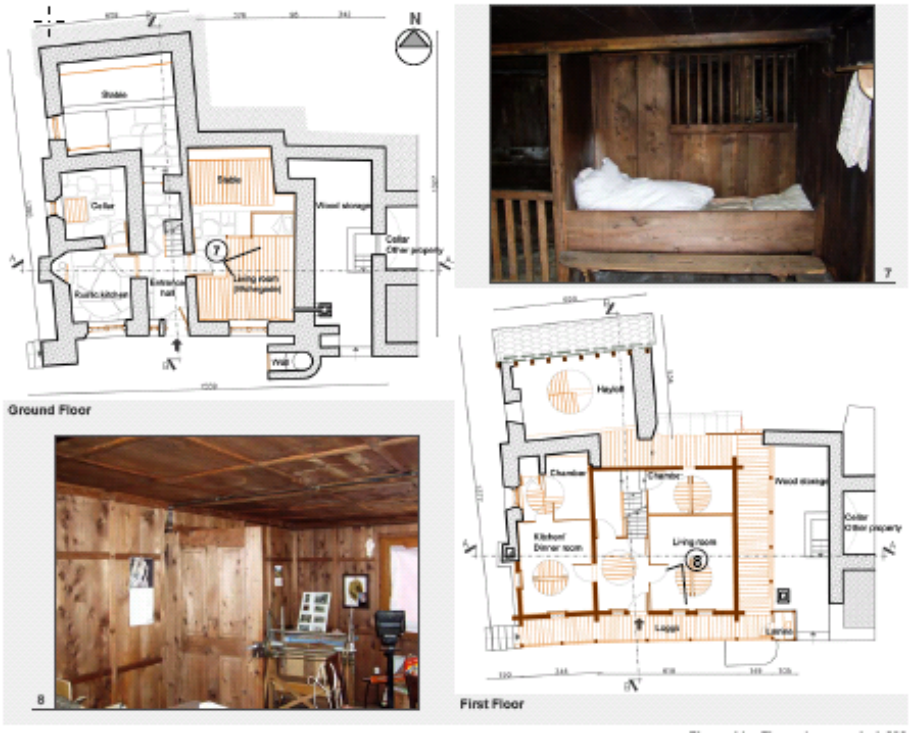


Fig. 25: AlpHouse pilot-building Welf in Gressoney-La-Trinité, , floor plans of actual state, by Arch. Luigi Chiavenuto and COA Energia Finaosta for Regione Autonoma Valle d'Aosta

The floor plans show the mix of residential use with agricultural use like stable and hayloft. The construction is massive in the lower part and Holz-Blockbau in the upper. In the original state, only a small part of less than 40m² have been heated.
As the analysis shows, a change of use without energy saving measures would result in an extremely high energy demand.

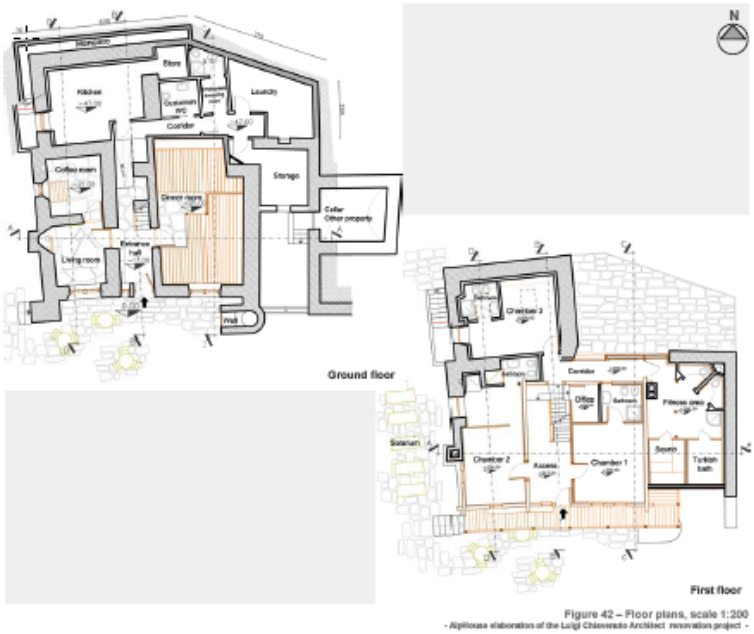


Fig. 26: AlpHouse pilot-building Welf in Gressoney-La-Trinité, floor plans after renovation, by Arch. Luigi Chiavenuto and COA Energia Finaosta for Regione Autonoma Valle d'Aosta

The floor plan after renovation shows, that the treated floor area after the conversion to a guesthouse is enlarged to about 250 m^2.

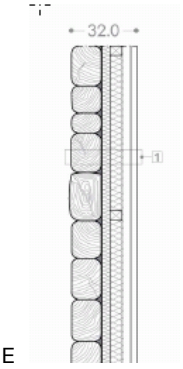


Fig. 27: AlpHouse pilot-building Welf in Gressoney-La-Trinité, sectional detail of Blockbau wall with internal insulation after renovation, by Arch. Luigi Chiavenuto and COA Energia Finaosta for Regione Autonoma Valle d'Aosta

As an external insulation is not possible both for the massive and the Blockbau-part of the house, an internal insulation of 6 to 8 cm is proposed.

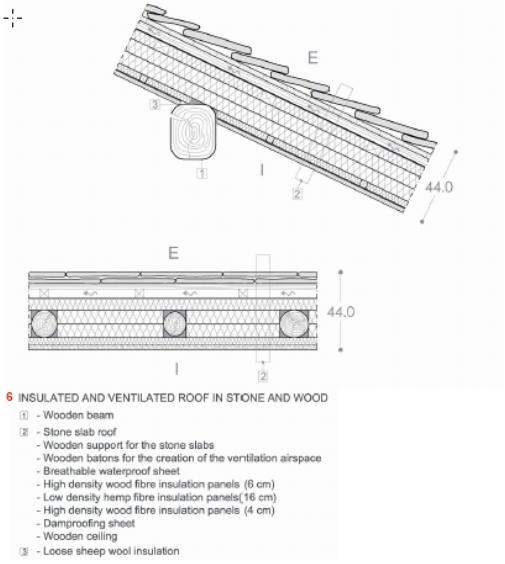


Fig. 28: AlpHouse pilot-building Welf in Gressoney-La-Trinité, sectional detail of roof, by Arch. Luigi Chiavenuto and COA Energia Finaosta for Regione Autonoma Valle d'Aosta

For the roof, a combination of hemp fibre and wood fibre insulation is proposed. In order to minimize thermal bridges, the insulation between the rafters is combined with one layer of insulation on top oft he rafters and one below the rafters. Even in a building, that can not be insulated on the external side, the annual heat demand according to PHPP can be reduced to about 105 kWh/m^{2}a.

Group 4: Large buildings of different ages, partial, temporary or intense use

The group is represented by two examples: an postagrarian building from Tennengau, and the former Gasthof E. in Schleching.

Example 1: Tennengauer Einhof

Fig. 29: AlpHouse pilot-building Tennengauer Einhof in Kuchl, by BAUakademie Lehrbauhof Salzburg

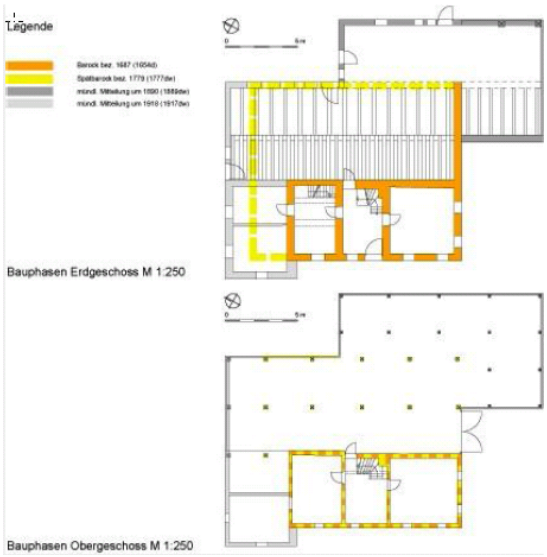


Fig. 30: AlpHouse pilot-building Tennengauer Einhof in Kuchl, floor plans showing the historic development of the building, by BAUakademie Lehrbauhof Salzburg

The original building has been erected in 1687, a major reconstruction in 1779. At the end of the 19th and the beginning of the 20th century, the building has been enlarged.
The building combined agricultural use with a residential use of about 140 m².

Fig. 31: AlpHouse pilot-building Tennengauer Einhof in Kuchl, model and elevations after renovation, by BAUakademie Lehrbauhof Salzburg

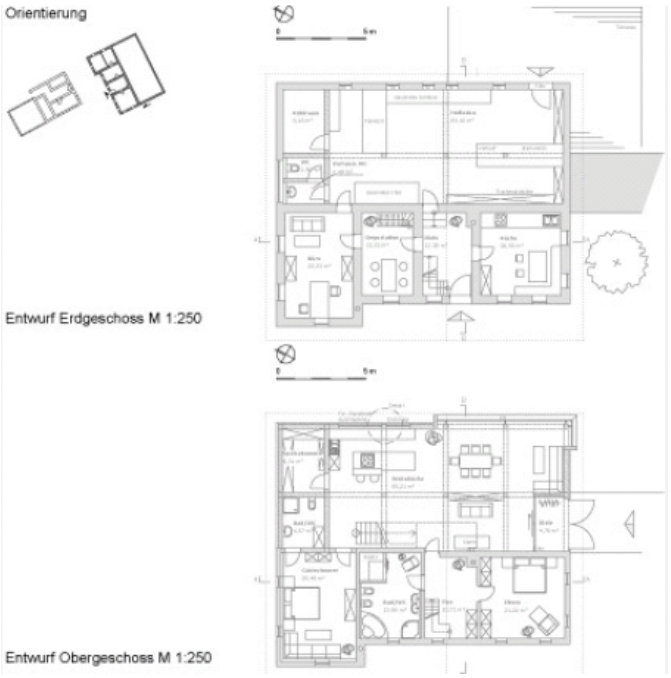


Fig. 32: AlpHouse pilot-building Tennengauer Einhof in Kuchl, floor plans renovation, by BAUakademie Lehrbauhof Salzburg

As a new use, a mainly residential function is proposed. Combination with a studio and/or a little shop for agricultural products may be possible.

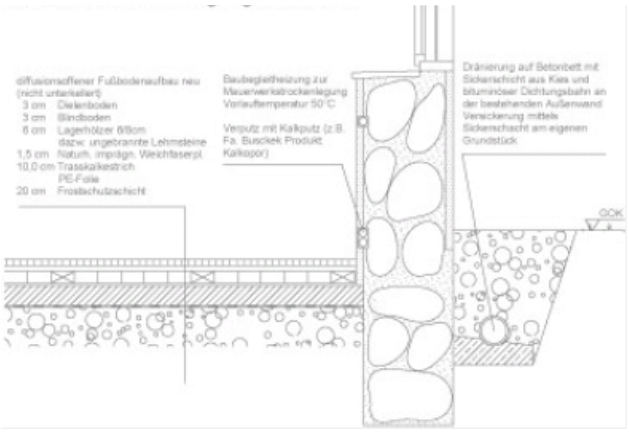


Fig. 33: AlpHouse pilot-building Tennengauer Einhof in Kuchl, wall tempering system, by BAUakademie Lehrbauhof Salzburg

As in many historical buildings, moisture problems in the foundation block have to be solved as part of the renovation/restoration. For the project, a combination of new drainage unter the whole floor area and on the outside of the external walls, a horizontal gasket and a heating pipe in the socket area are proposed. By heating the lower part of the wall to approx. 50° C, it will automatically be dryed.

Example 2:
Gasthof E., Schleching, pilot-region Traunstein
As the former farm of the village church, the building follows the type of the late-baroque Traunstein mountain houses, with a grand fassade and cantilevering roof. The roof is dated 1850.
The building is an example for postagrarian buildings in the Traunstein region that combine a living part, a stable and a barn in one huge volume; it has been used afterwards as an hotel, but also this use is obsolete. A re-use of the vacant building is the focal theme of the analysis.

Fig. 34: AlpHouse pilot-building E. in Schleching, layers of facade, by TUM Landraum

As the building is of historic value, detailed analysis of structur, historic development and layout have been done. The pictures shows the study on façade layers of the building.

Fig. 35: AlpHouse pilot-building E. in Schleching, type of use and energy system of actual state, by TUM Landraum

As the re-use is the most important theme of analysis, the actual state of construction, rooms and energy system have been analysed in detail.

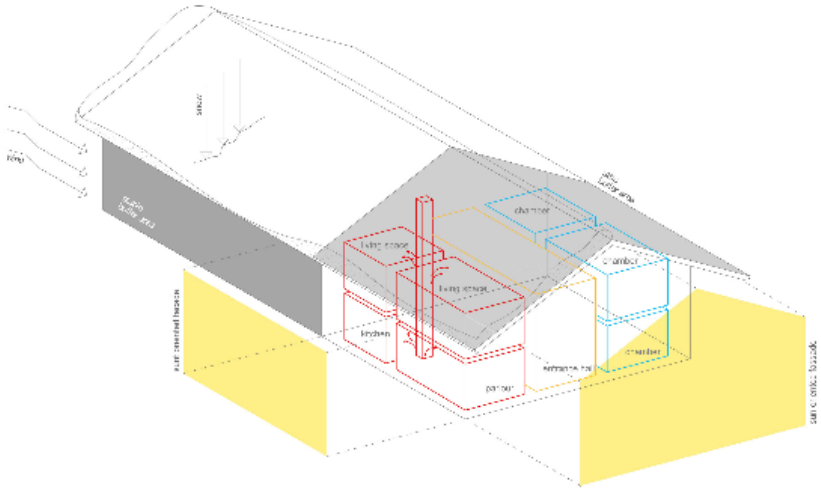


Fig. 36: AlpHouse pilot-building E. in Schleching, vernacular energy concept, by TUM Landraum

The analysis of the vernacular heating and energy system provides concepts for actual measures.

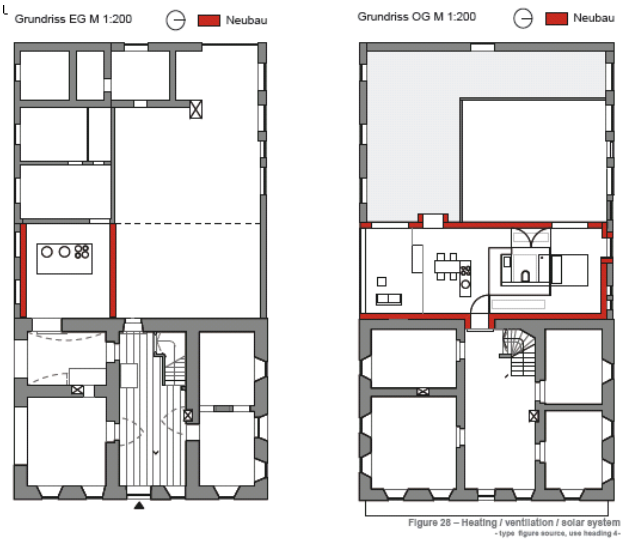


Fig. 37: AlpHouse pilot-building E. in Schleching, design alternative, by Sarah Hartmann for TUM Landraum

As the most likely re-use will be a residential one, concepts for different kinds of residential use have been analysed: single family house, secondary residence or guesthouse/hotel.
The image shows one of the renovation concepts, that starts with the implementation of one comfortable room; the other parts of the huge volume later on can be renovated in different steps, and in the meantime or for longer be used as storage, workshop, sales area. The new "box" within the barn part of the house can be optimised in passive-house-standard and is providing all technical infrastructures. The former living part, the stable, the fassades in further steps can be adapted to uses, with gradated energy levels. The barn itselb may remain permanently a room inbetween uses and climate *(Zwischenklima),* a buffer, storage and maybe producer of energy.
Depending on the sort and intensity of use and of monument protection status as well as ensemble valutation, an external insulation plaster or an internal insulation of the traditional part of the building can be evaluated.

3. Framework, communication strategy and perspectives of a coherent AlpHouse Approach (third step of transferability)

3.1 The AlpHouse Approach – framework and key topics *(text by Landraum)*

Based on the insights of the analysis, the AlpHouse Approach stresses on transnational transferability and interfaces inside and between the target groups: that means between different crafts, between architects, planners, energy and heritage experts, between decision makers on regional and local levels. The AlpHouse Approach aims at repositioning Alpine Building Culture in a changing Alpine space, concerning energy objectives, strategic planning and ecomomic prospects for crafts and architecture SMEs. It focuses firsthand on the existing building stock, but can give incentives even for new construction as part of a coherent vision of settlement and territory.

The AlpHouse Approach is operation-oriented in reference to the identified transalpine challenges and potentials; it proposes to operate with specific strategies and procedures tailored for the situational outsets of the pilots in their different scales. As a transferable approach it aims to influence specific initiatives, inside the next steps of the project, as well as in the long run for the selected pilots. The AlpHouse analysis framework is constituting a reciprocal knowledge base and operational starting point for the Approach. Therefore the AlpHouse Approach is opposed to current practices and efforts of standardisation and certification that neither provide operative or procedural support nor correspond to specific local potentials. The AlpHouse Approach includes three key topics and combined fields of operation:

3.1.1 Operating with Spatial Strategies *(text by Landraum)*

Buildings and villages are complex bodies formed by use, design, construction and infrastructures. Frequencies, intensities, form and sort of use are becoming more important with changing demographics and redrafted communities. Exposition, orientation and concentration are identified as focal themes for buildings and settlements – a single exposed house is even energetically the weakest. This complex background and local specific spatial, social and economic challenges and potentials are provoking a **demand for plans and expertise,** for a **conceptual design** on different scales from details and joints, to layout and sections, to villages and valleys; combining spatial-architectural approaches with private's and communities' strategic planning. It is to highlight that vernacular construction has been governed by expertise and professional knowledge; experts of that time were travelling through Europe to gather ideas and innovations. Migrant experts influenced regional build-

ing cultures. Vernacular construction's insights therefore regard not only the material output, but also the processes of its creation.

The interfaces between the planning disciplines architecture and urbanism, energy expertise and regional planning, included also monument preservation, up to now are not optimised for coherent operational procedures regarding the building stock. At the same time gaps between procedures and focusses of planning levels (region, village, building, detail) are observed in the analysed pilots. AlpHouse therefore suggests a **culture of planning interfaces** as well as a **cross-scale design approach.**

Since most new construction in the Alps involves existing buildings; and since it is a general issue of AlpHouse to combine vernacular and industrial technologies, for the planning disciplines AlpHouse is suggesting a **continuity of conception and of work**: transferring vernacular intelligence to new constructions, implementing new processes and techniques to existing buildings. As the pilot-buildings demonstrate, there is no border between pure renovation and new construction: conversion, addition, extension, expansion, replacement are constituting an area of interference. It can be understood as the core of a continuity, to which all the planning disciplines need to adapt their abilities and skills.

For the renovation strategy for buildings their **involvement (contextualisation)** in the contexts of village and region is in the analysis proved as decisive. With the aim to reduce ground sealing and to secure infrastructures, inner development is the one most important issue for these contexts. It is connected with a re-evaluation of centralities and with cooperations between villages. If inner development is also understood as making use of existing built-up and infrastructures, it has to consider smaller centres of dispersed settlement and the territorial patterns of built-up and open spaces, as well as connections with agricultural spaces. AlpHouse supports a **decentralised energy supply** based on communal and regional level as important part of a new setup of an European renewable energy strategy, that should be integrated into spatial strategies.

Though similar requirements for all pilot-regions have to be stated – due to the agreements on European level– the different national and regional laws, regulations and funding incentives, as well as different administration procedures, and different ways to handle planning processes, energy issues, and heritage do highly handicap transnational comparision and transferability. Though AlpHouse stresses a situational and specific approach on the different planning and design levels, a **comparison of implementation tools and operations** should play a certain role within the evaluation (e.g. a certificate of energy performance of buildings *(Energieausweis)* as obligatory part of planning permissions).

Fig. 38: Spatial strategy chart (as presented at the Dornbirn pilot training 26.07.2010), by TUM Landraum

3.1.2 Raising Awareness of the Building Stock *(text by Landraum)*

The values connected with the Alpine building stock – material values, cultural values, financial values – can be described as decisive factors for local identities, tourism and for **ecological reconstruction and renovation of settlements and territory.** Moreover the **added values** of the Alpine real estate constitute a sustainable basis for economic perspectives of crafts and architecture firms; this is opposed to the postwar and recent years of self-centred construction industries in the Alps, having been one of the driving forces of sprawl and unsustainable built-up. Since up to 90% of the Alpine building stock was constructed before the introduction of energy standards, it plays an important role for a **new setup of an European renewable energy strategy,** concerning production as well as saving.

In regard to the inherent values of the Alpine building stock, but also from an ecological point of view the decoupling of the annual heating demand from the aims of the reduction of CO_2 emission is highly reasonable. The expended energy in the production of building and insulation materials, the recycling questions and both ecolgical as economic balances are embedding the question of annual heating demand into more sustainable approaches (as ETH Zürich is suggesting with the initiative **"zero emission architecture"**). This argumentation seems especially valid for the Alpine space with its renewable energy sources.

Comment 1 (text by Landraum)
In the public debate after the launch of the initiative, topics that are interesting for AlpHouse have been raised: how to valuate and combine energetic, ecological, cultural and economic aspects? To what extent and in which constellations the us of renewables is sustainable? What about energy transport and storage? How can energy issues be intergrated into architectural and strategic planning concepts and processes? Architecture and urbanism with their approach of operational science can support political decisions in this fields; the decisions would have to evaluate and combine natural and social science research outputs and approaches. Within next steps of the project, AlpHouse can make use of this debate to clarify aims and suggestions.

Comment 2 (text by EIV)
The decoupling of the annual heating demand from the aims of the reduction of CO_2-Emissions as stated above is not a logic concept or aim: As energy supply systems in many european states will be converted from fossile (and nuclear) to renewable energy sources, the annual demand for all energy applications will only be one indicator of the energetic quality while the synchronism of energy demand and energy production (from renewables) will be another. As energy production from solar energy and hydro energy are significantly higher in summer, the reduction of the energy demand in winter (heating and dhw) will remain of great importanceas as long, as a seasonal storage of an energy surplus from summer to winter is technically possible and economically feasible.

Even in the alps, biomass potentials will not be high enough to cover up for the energy demand for heating and dhw of the whole building stock. In some regions, the narrowness of biomass shows event todey: in Vorarlberg, the funding for wood heat plants has been stopped as the deductible potential has almost been exhausted.

As seasonal storage of energy is not yet economically feasible and biomass potentials are limited, the reduction of energy demands remains an important first step to energy-autonomy. As scientific studies show, the primary energy demand for production of insulation materials is easily compensated by savings in energy demand. If an ecological approach to construction and energetic renovation is taken, the question of recycling of insulation materials can easily be solved: wood should be used as wood-fibre insulation for the lifespan of a house; the energy embodies in the material can be used for heating or co-generation when the house is demolished.

The re-evaluation of the **building stock as an incentive** for cultural and economic approaches to construction, connected with ideas of living and community, local materials and craft techniques, focuses specifically on the vernacular buildings and settlements. They can be understood as a **database for a new building culture**; vernacular Alpine building can be described as a model how to deal with climate and topography, how to save energy and to use materials appropriately. This **vernacular intelligence** is not about style, but about inherent structural assets in all three scales of the AlpHouse Approach: on a regional level in territorial setups and material flows, on a local level in settlement concentration and exposition, on a building level in layout, sections, materials, and detailing. The energetic knowledge of the vernacular construction raises questions about standards, interdependencies and lifestyles, that can incite innovations for standardised energy saving.

The composition of regional and local building stocks shows a **differenciation** both inside the so called vernacular part (defined as "built before industrialised construction", or as "before 1918") and in the 20th century's. Vernacular construction prevailed in some regions up to the middle of the 20th century. Later constructions are highly diverse according to regional conditions. The vernacular construction evolved and changed over centuries, the "successful" types and buildings are result of trial and error, of adjustments to use, to economic, cultural and social changes.
The focus of AlpHouse are not specifically the protected building monuments, that account for maybe 3 % of the building stock (this figure differs in the regions). The key area of interest is the large number of existing buildings within settlement patterns. **The Alpine building stock is not one solid body, neigther "old" nor "new", it is a differenciated collection** that underlies constant changes of condition and valuation.

This diversity of the Alpine building stock and the issues of its embedding in contexts of villages and regions are regarded not as problem for generalised industrial appliances, but as incentives and chances for specific approaches, local knowledge and meaning. Dealing with the building stock **requests regional and local expertise**, as well as **public awareness of its potentials**. A situational approach in this sense is based on knowledge and skills in anamnesis and diagnosis of villages, buildings, and details. This expertise dealing with the existing building stock has to be regained, since it had been under-valuated throughout the 20th century.

Fig. 39: Alpine vernacular building stock: a selction of the 30 AlpHouse pilot-buildings (as presented at PM3 in Aosta 06.10.2010), by TUM Landraum and all AlpHouse project partners

3.1.3 Combining Material Culture and Technology *(text by Landraum)*

Vernacular technologies neither have all survived industrialisation, nor have been a fixed standard but an evolving field of knowledge and abilities. Actual ideas of life styles, comfort, about work and living, about public and private space, to which technologies correspond, are clearly different to before 1918. In regard to the multiple fractions of society and technology during 20th century, older buildings within the project are called vernacular, not traditional, also the connected technologies. But it is an aim of AlpHouse to regain and reconsider vernacular technologies that are necessary to deal with the building stock, its materials and joints, its constructions and spaces. The **paradigm of repair** promoted by AlpHouse is an ecological tool to reduce energy and material efforts, but beforehand it can be defined as cultural issue. Therefore the AlpHouse Approach can be described as **counter flow operation**: adapting and deciding about the use of techniques and materials that derive from new construction (e.g. passive-house-elements, or appliances and controls), as well as **re-discovering vernacular materials and technologies**, even transferring to new construction (e.g. wood or adobe).

Due to the differentiated and specific nature of the Alpine building stock a **broad range of techniques** for renovation has to be collected and developed, in the fields of construction as well as appliances like heating and cooling, and for calculation and planning tools; they have to respond to different levels of energy saving adapted to the regional specific Alpine building stock's conditions. Both on the building level and on the village/valley level energy concepts need to be developed with

expertise, on base of real demands and in combining reasonably the sources. In this area up to now legislation and incentives are not intensively supporting small scale power stations, the use of process heat, or the small scale storage.

If regions aim at **regional flows of materials and energy**, wood is an interesting material due to its dual use: for construction and for energy production. Processing the raw materials locally contains not only economic aspects, but also is a source for knowledge and identities. This potential can be observed in P-V Schleching: 2/3 of the municipal area are woods (3.000 ha), 90 % of it is in State property; most of the timber is exported to Austria and re-imported as products. AlpHouse suggests to integrate these flows into regional building cultures, examples like Bregenzerwald show that material can be an incentive for a new setup of regional craft and architecture.

A new awareness for **"material culture"** (Richard Sennett) is connected to sustainable lifestyles and a focus for local issues, not only after the world economic crisis; the experience in modifying material can be identified as a field of desires, the idea of "**crafts for everyone**" suggests a new appeal for the connection of the professional work of architects and of craftsmen. The haptic quality of raw materials, their regional backgrounds, their production and refinement processes, can become a basis for regional flows of materials and knowledge.

Fig. 40: Natural stone course of Grisons' Craft Association, Tschanüff castle, photo Laura Egger for TUM Landraum 2010

3.2 Strategy for a coherent target-group approach in communication and education

(text by Landraum)

The project AlpHouse – focussing on the Alpine building stock in its vernacular parts as well its 20th century's – addresses energetic and ecological issues in the context of an Alpine Building Culture which creates a multiplicity of material and immaterial values. The different target groups of the communication output of AlpHouse not only have to collaborate in optimising the processes that **establish this Building Culture as common value and economic power**; but the **interfaces** between the specific areas of knowledge, abilities and influence of the target groups are seen as **laboratory of innovation.** Innovation in this sense is constructed with transdisciplinary analysis co-operation, with the re-evaluation of the rich pool of building stock not only in a sustainability perspective but also as incentive for the inherent knowledge (vernacular intelligence) and the **use of local materials and specific techniques.**

Following the AlpHouse Approach, the setup of a **coherent communication strategy** – within the task to deal with every target groups specific background and interests – has to integrate two dimensions: the question of scale and the question of interfaces. The overlapping of these dimensions proposes specific areas, where communication input will be efficient and sustainable.

The **AlpHouse pilots** in their different scales are integrative part of the communication strategy, and not only material for the qualitative analysis. At best the initiative of AlpHouse convinces privates to begin renovation within the project's cycle, then real time pilot building sites can be used for education and communication purposes. In any case they are involving both privates and communities, providing also incentives on the village scale, and are appealing a regional public based on their representative value. The pilots provide on-site experience for the three target groups in themselves and for their strategic interfaces. AlpHouse convinces official bodies to shapen their development strategies with the help of urban planners, privates to begin to think about renovation strategies with the help of architects within the project's cycle.

3.2.1 AlpHouse target group matrix *(text by Landraum)*

As illustrated in the matrix the three target groups are decision makers, architects and planners as well as craftsmen. AlpHouse also addresses a general public interested in investing and building in the Alps. As the AlpHouse Approach is proposing, sustainable use of the building stock can only be achieved by combining object-related optimisation with settlement and regional development, by a new awareness the values and potentials of Alpine building culture, as well as by a focus on materi-

ality and detailing. For the three decisive scales the terms Pilot-regions, Pilot-villages, Pilot-buildings have been introduced. The transferable framework used for the analysis offers insights in actual status, perspectives and processes of renovation and re-use. The AlpHouse matrix offers a constant tool of design and evaluation of the individual and regionally specific communication measures during the next steps of the project.

An actual status of the discussion regarding the project's impact for the three target groups can be described as follows:
For decision-makers (first column in the matrix) a stronger focus on regional and local contexts can improve ecological and cultural values of building renewal, instead of highlighting generalised approaches to single buildings, that are in many cases misleading funds and incentives, and are not effective in terms of energy-efficiency.
For architects and planners (second column in the matrix) the improving of a culture of interfaces between architecture/urbanism, energy expertise, regional development, and heritage preservation, beginning with the analysis of status-quo and of the development needs of the building stock, as well as the implementation of spatial strategies is seen as transferable output of AlpHouse.
For the crafts a regional focus of materials and techniques is discovered as potential strong economic and cultural asset (e.g. the use of wood in Bregenzerwald: landscape element, renewable resource, specific building techniques, furniture).

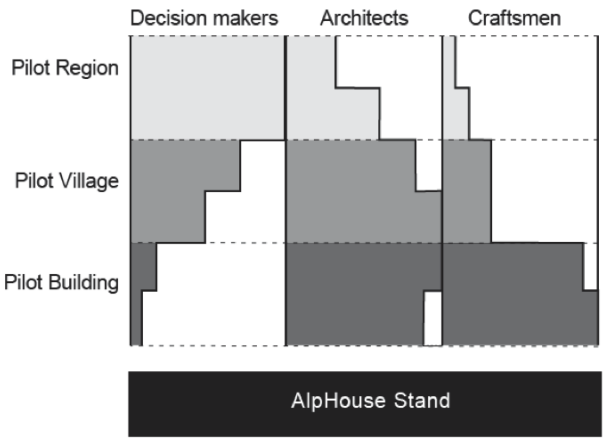


Fig. 41: AlpHouse target group matrix (as presented at PM3 in Aosta 06.10.2010), by TUM Landraum

3.2.2 AlpHouse transfer matrix *(text by Landraum)*

In order to gain main lines of the communication strategy of the AlpHouse Approach, clear questions on the output-oriented content have been discussed at the Aosta PM3. In three groups questions referring to the three target groups, their backgrounds and the right way to address them and their needs and interests were formulated; desired forms of communication, of tools, instruments and interfaces were discussed. In order to clarify the crucial role of interfaces and of the AlpHouse cross-scale focus for all target groups, all questions were discussed and placed on the matrix. Next steps of the project can refer to this matrix as a basement for project ideas, as well as for target group focussed statements.

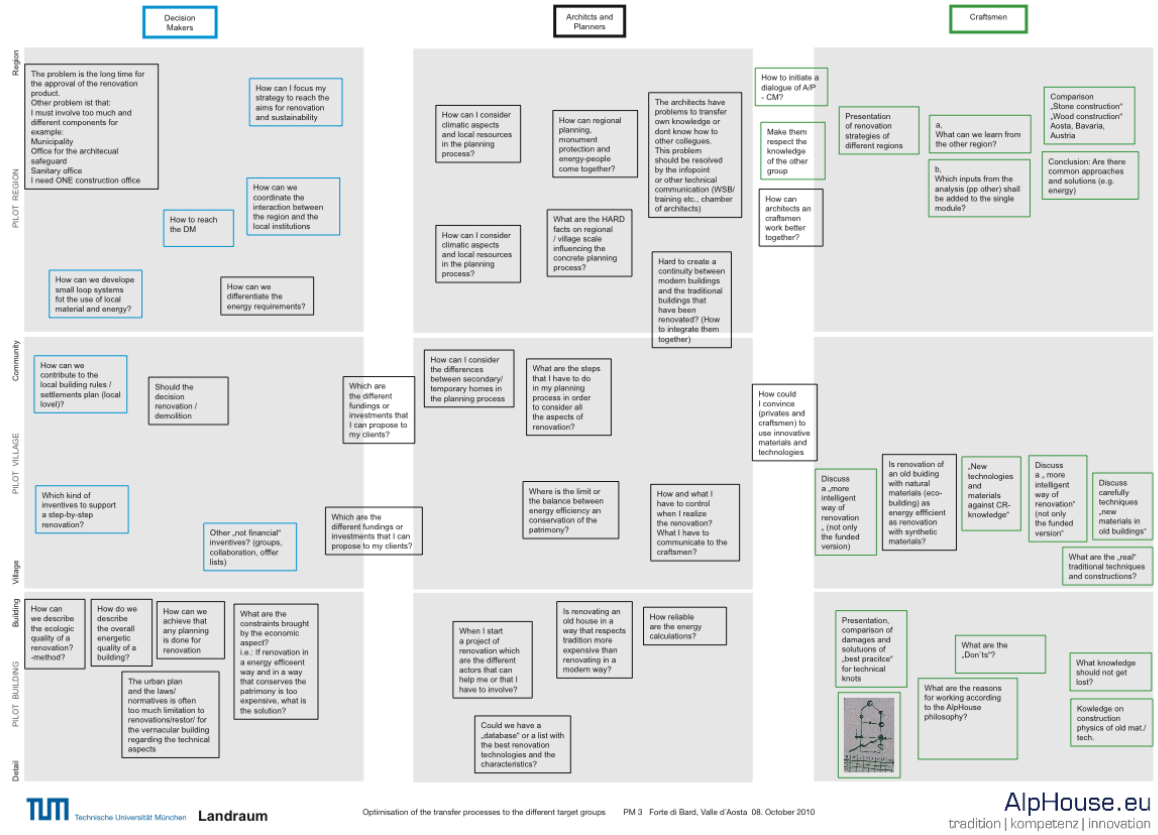


Fig. 42: Transfer Matrix as elaborated at PM3 in Aosta 06.10.2010 (full version in the attachment), by TUM Landraum

3.2.3 Target group related statements

Based on the transfer matrix of 3.2.2 this compilation collects statements from interviews with different target-group and pilot-related persons and institutions, from discussions between the project partners, in the workgroups of each project partner and with external experts. This selection of relevant statements is a first attempt to draft target group related statements and advises and is to be discussed and evaluated throughout the next steps of the project.

(text by iSpace)

Regarding political decision makers:

The analysis of the pilot regions already shows that next to the conflict between preserving the old structures and the adaption to new needs, there is a strong need for knowledge in raising the energy efficiency and the usage of renewable energy in consistence with regional building culture.

Additionally the analysis shows the knowledge is not equally shared among the regions and the different professions giving a big potential to the project when individual involved organisations disseminate the outcomes of the project partners to their own region and clients improving the knowledge in all regions.

As the project partners have a different background starting from craftsmen to architects, energy professionals to geographers very different approaches to the same tasks are demonstrated which show different perspectives which can be combined to a holistic approach in examining renovation targets. This will add value to the results a craftsman can offer being able to do that by completing an AlpHouse Learning Module bringing all these findings in line which can improve his competitiveness.

The modules held for planners and decision makers which include “the big overview” can improve the overall situation by creating awareness for certain facts that have to be considered when talking about sustainable renovation and competitiveness of the regional SMEs. They can be considered successful if they trigger measures like new funding instruments and mechanisms, changes in national law and new public investments supporting and pioneering a sustainable development in the regional building sector.

One result could be the support of the regional SMEs by providing infrastructure and tools to ease their work e.g. a project to settle the developed prototype tools in the existing information services of the region which would include further investments and operating the system.

Another result could be additional government grants for further education, which would enhance the attractiveness to invest time and money in further education for the craftsmen and architects which is one way how they can improve their competitiveness actively.

There are numerous ways how decision makers can make use of the findings of the AlpHouse project to support their own work and decisions to improve the performance of their regions and contribute to a sustainable Alpine space.

(text by Landraum)

Regarding architects and planners:

Gaining skills and abilities in analysis and design regarding vernacular buildings

Developing skills and abilities to integrate energy expertise into strategic planning

Improving transfer from vernacular techniques and materials to new construction

Supporting regional building culture in material and knowledge flows as economic factor

Improving interfaces to related planning disciplines

Leading spatial strategy approaches

Improving skills and abilities to contextualise industrial energy applications

Developing sustainable and situational planning instead of standardised operations

Developing situational approaches (the same constructions do not lead to the same renovations)

Regarding crafts:

Gaining skills and abilities in vernacular techniques and materials

Developing skills and abilities in percieving challanges and potentials of vernacular and 20th century buildings

Supporting regional building culture in material and knowledge flows as economic factor

Improving interfaces to related craft specialisations

Building awarness of taking part in spatial strategy approaches

Strenghtening cooperations between crafts and architects

Developing skills and abilities to transfer re-gained vernacular techniques and materials to new construction

Improving skills and abilities to contextualise industrial energy applications

Regarding decision makers:

Valuating the building stock as database and incentive for Alpine Futures

Setting incentives for Alpine Building Culture and its protagonists: architects and crafts

Shifting funds and incentives from generalised and object related approaches to the AlpHouse Approach of higher differenciation and to specific communal and regional contexts

Highlighting and funding expertise for communal and regional spatial strategies that include energy matters, and their implementation

Balancing energy saving, energy production, and ecology related incentives and regulations, with a greater attention to sustainable spatial strategies on the municipality level

Developing common databases, instruments and measuring tools throughout the Alps, for example regarding age classes of the building stock or the performances of local materials

Granting subsidies and loans not only based on calculations, but on qualitative evaluation

Regarding general public:

Building awareness of the Alpine Space as shaped by geology&nature, agriculture and the built environment – the character of the Alps is strongly influenced by nature, but also by cultural dynamics

Building awareness that agriculture, food production and tourism are essential economic bases of the alpine space and therefore are strongly influencing building culture

Implementing knowledge of the potentials and chances of re-using the building stock, in economic and cultural ways; in order to discuss common beliefs that new construction is in regard to finances, time, implementation of uses more convenient than renovation

Supporting material culture as part of sustainable lifestyles

Promoting experience and knowledge of Alpine architecture and crafts as decisive strategic factor for ecological renewal

(text by EIV)

Regarding decision makers:

The project shows the importance of understanding, that the building stock is not a monolithic structure but very differenciated. This differenciation should play a greater role for example in funding: funding systems should take into account the aspects analysed in the AlpHouse project.

The project results show, that in a grat part of the building stock, very high energy savings can be reached, when “anyway” renovation are combined with energetic measures of highest quality. Especially for buildings of the postwar-periode (from 1945 to 1980), guidance activities, sensitizing activities and funding should be concentrated on high efficiency renovations and on those buildings, in which a change of users allows for adaptation of needs. By helping high efficiency renovations for this part of the building stock, lower savings for more complex, regional typical buildings may be assured.

Regarding architects and planners:

For Architects and planners it will be most important to combine the different aspects of building analysis. Only an integrated approach like in the AlpHouse project assures, that neither urbanistic, nor architectural, economic, ecologic and energetic aspects are neglected.
For architects, the combination of the aspects described above may lead to a greater share in the market of renovation that has been neglected for a long time.
For all planners, specialized courses on topics like internal insulation, moisture transport in constructions, thermal bridges, air tightness should be further developed.
For engineers, the integration of ventilation systems and of solar-thermal and PV systems should be a focus in further education.

Regarding crafts:

For crafts, the analysis results demonstrate that renovation will be the driving force in the building market in future. It will be of importance to integrate special techniques and methodes of analysing buildings and constructions into education and further education.

3.3 Perspectives beyond the project *(by TUM Landraum, iSpace and EIV)*

3.3.1 AlpHouse Competition

A transalpine competition of municipalities or groups of municipalities concentrated on building culture, crafts and strategic planning that include energy saving and production, can further divulge the AlpHouse Approach. At the same time it provides a constant tool of monitoring of best practices and specific Alpine building culture. A political incitation of the competition would facilitate its implementation. Selection criteria in a qualitative sense will form the core of the evaluation process, due to the specific nature of local building cultures and strategies. Quantitative indicators will complement these critera, according to the renovation rates, energy efficiency grades, renewable energy rates and ecologisation rates of the building/housing sector in Alpine communities. The latter could lead to unlock directly private investments.

3.3.2 AlpHouse Case Studies

Since the focus of AlpHouse is on private housing objects, it is not yet clear if a realised pilot-object can be finalised within the project's course. For that a series of real Case Studies, to establish on-site cooperation of the best experts in architecture and energy expertise as well as already evaluated excellent pilot-craft-SMEs could be a further step working on the issue. For that an investment funding would be necessary. The examples of the market introduction of high efficiency new houses in regions like Vorarlberg demonstrate, that house owners, architects, craftsmen and decision makers can only be convinced by projects realised and well documented. For typical alpine buildings, only very few projects of both architectural and energetic high quality have been realised yet.

3.3.3 AlpHouse Research&Development

Building Culture and Strategic Planning for different levels of action in the Alpine space needs to be re-shaped and re-gained; due to massive changes of the built environment in the last 20 years, to the actual aims of inner development and concentration, and of energy, and due to diverse demographical changes, both analysis tools and concepts, as well as architectural design and strategic planning processes and instruments are to be adjusted; answering the foreseeable demand of expertise for privates, for communal and regional bodies, that is stated in this analysis.
Regarding the use, calculation, estimation of working with local materials and vernacular technologies basic research is identified to be needed, for example about different types of stone walls and their energetics and physics, and especially about the buildings as complex systems. Research in this direction up to now is concentrated and funded mainly on new materials and new technical tools, not regarding the 90% of the Alpine building stock built before 1990, and its settlement contexts.

4.1 List of the attached pilot analysis documents *(by TUM Landraum)*

WP4 OVERVIEW OF ANALYSIS DOKUMENT

Kategory	Code and Name	Project partner	Number of pages	Language
PR	**01 Tennengau**	iSpace	8	EN
PV	**011 Kuchl**	iSpace	18	EN
PB	0111 Tennengauer Einhof	LBH	19	DE, some EN
PR	**02 Traunstein (Achental)**	TUMLandraum	25	EN
PV	**021 Schleching**	TUMLandraum	57	DE
PB	0211 Einfirsthof S.	TUMLandraum	16	DE
PB	0212 Einfirsthof Gasthof E.	TUMLandraum	20	DE
PB	0213 Haus S.	TUMLandraum	23	DE
PR	**03 Garmisch-Partenkirchen**	TUMLandraum	21	EN
PV	**031 Murnau**	TUMLandraum	47	DE
PB	0311 Town Houses	TUMLandraum	17	DE
PB	0312 Molohof	TUMLandraum	17	DE
PR	**04 Northern Part of the Province of Belluno**	VEN	8	EN
PV	**041 Selva di Cadore**	VEN	24	EN
PB	0411 Rural House	VEN	32	EN
PV	**042 Vodo di Cadore**	VEN	24	EN
PR	**05 Bregenzerwald**	EIV	8	DE
PV	**051 Andelsbuch**	EIV	30	DE
PB	0511 Ritter (vernacular)	EIV	22	DE
PB	0512 Ritter	EIV	22	DE
PB	0513 Metzler	EIV	22	DE
PB	0514 Mätzler	EIV	21	DE
PB	0515 Wielander	EIV	29	DE
PB	0516 Wirth	EIV	22	DE
PR	**06 Mountain Community Valtellina di Sondrio**	Irealp	10	EN
PV	**061 Chiesa in Valmalenco**	Irealp	51	EN
PV	**062 Chiuro**	Irealp	53	EN
PB	0621 Quadrio Building	Irealp	31	EN
PV	**063 Ponte in Valtellina**	Irealp	58	EN
PR	**07 Valle d'Aosta**	COA Energia	14	EN
PB	0700 Introduction to pilot-buildings	COA Energia	4	EN
PV	**071 Gressoney-La-Trinité**	COA Energia	4	EN
PB	0711 Welf	COA Energia	42	EN
PV	**072 Gressoney-Saint-Jean**	COA Energia	3	EN
PB	0721 Squindo	COA Energia	5	EN
PV	**073 Champorcher**	COA Energia	3	EN
PB	0731 Villa Biamonti	COA Energia	39	EN
PR	**08 Val de Drôme**	NEO	announced	
PV	**081 Saou**	NEO	29	FR, attached EN
PR	**09 Vercors**	NEO	10	EN
PV	**091 Vassieux-en-Vercors**	NEO	23	EN
PB	0911 Cecconi	NEO	13	EN

Fig. 43: List of the attached pilot analysis documents, by TUM Landraum

4.2 AlpHouse CI complying use of the pilot analysis documents *(by TUM Landraum)*

An AlpHouse CI complying procedure for lectures and courses prescribes that all slides form the analysis documents **maintain their original logo** (of the project partner who did draw this analysis) and the **copyright details** specified for images and figures; the same procedure applies for zooms, here are also to maintain logo and copyright details. The slides from the analysis can be used with new slides, that the speaker specifically for his use of the materials draws, like headwords, introduction, arrangement. These new slides carry the logo of the speaker's project partner organisation. The procedure is to be observed carefully, not only to appreciate each project partner's analysis work and to comply to this AlpHouse CI indication, it is also a legal issue. **The copyright details of the single images and figures are to maintain strictly for all presentation and communication uses.**

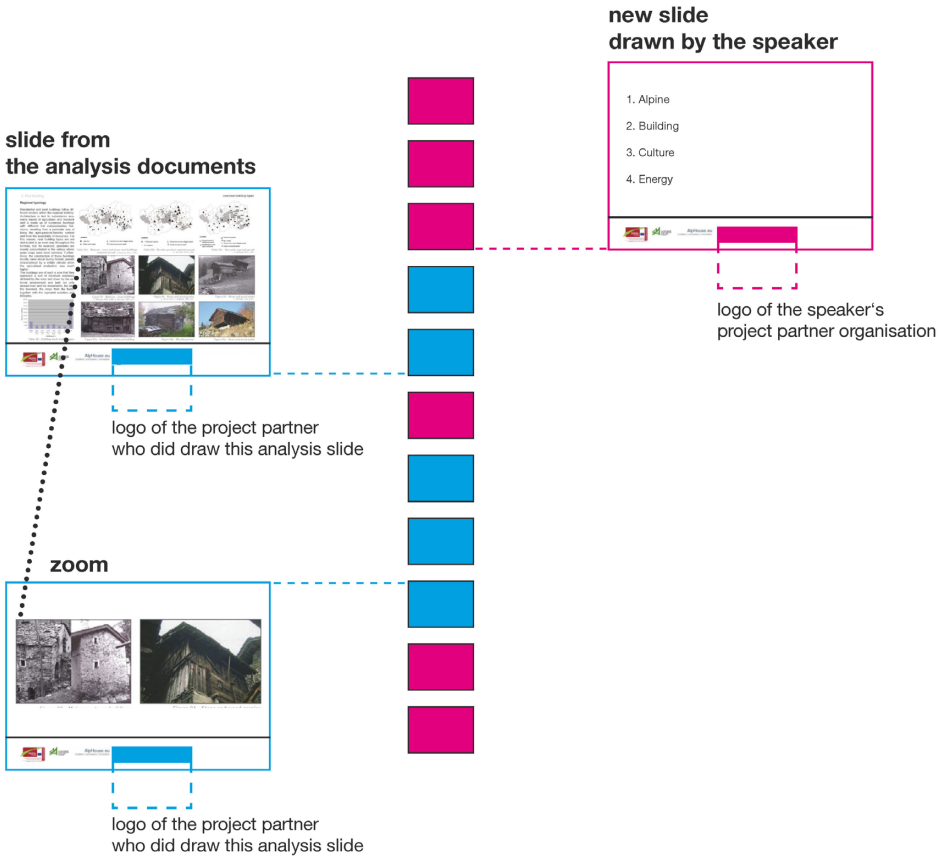


Fig. 44: AlpHouse CI complying procedure how to use the analysis documents for lectures and courses, by TUM Landraum

4.3 Copyright

Bayerische Architektenkammer, TUM Landraum, Energieinstitut Vorarlberg, Studio iSpace (ed.): ALPHOUSE – ALPINE BUILDING CULTURE AND ENERGY-EFFICIENCY. JOINT SYNOPTIC REPORT OF ANALYSIS. ACTION 4.1 AND 4.2. München 2011
attachment with code and name (in case of citation of attached analysis)

Thanks to all project partners for the great collaboration!