Interreg
Alpine Space
EUROPEAN UNION
ATLAS
European Regional Development Fund

ATLAS
HOLISTIC
DECISION-SUPPORT
METHODOLOGIES & TOOLS

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THE ATLAS HOLISTIC DECISION-SUPPORT METHODOLOGIES & TOOLS

Please note, that all the information presented in this file is collected within a timeframe of 2018-2021. Possible changes or modifications may occur outside the control of ATLAS.

The map below indicates the Alpine Space, to which the results of the ATLAS project aplly, aswell as the regions, where the studies were conducted.

LEGEND

The home button redirects to the starting page

The process phases guide through all steps of a historical building renovation

The ATLAS tools provide assistance in chosing the appropriate renovation strategie

Feature I

Feature II

To receive further information on the individual features, click the white boxes on the left

Feature III

Press the back button to return to the tool-overview

Press the info button or the highlighted flags to download detailed information

yellow tags direct to the related process phase

blue tags direct to the relevant ATLAS tools

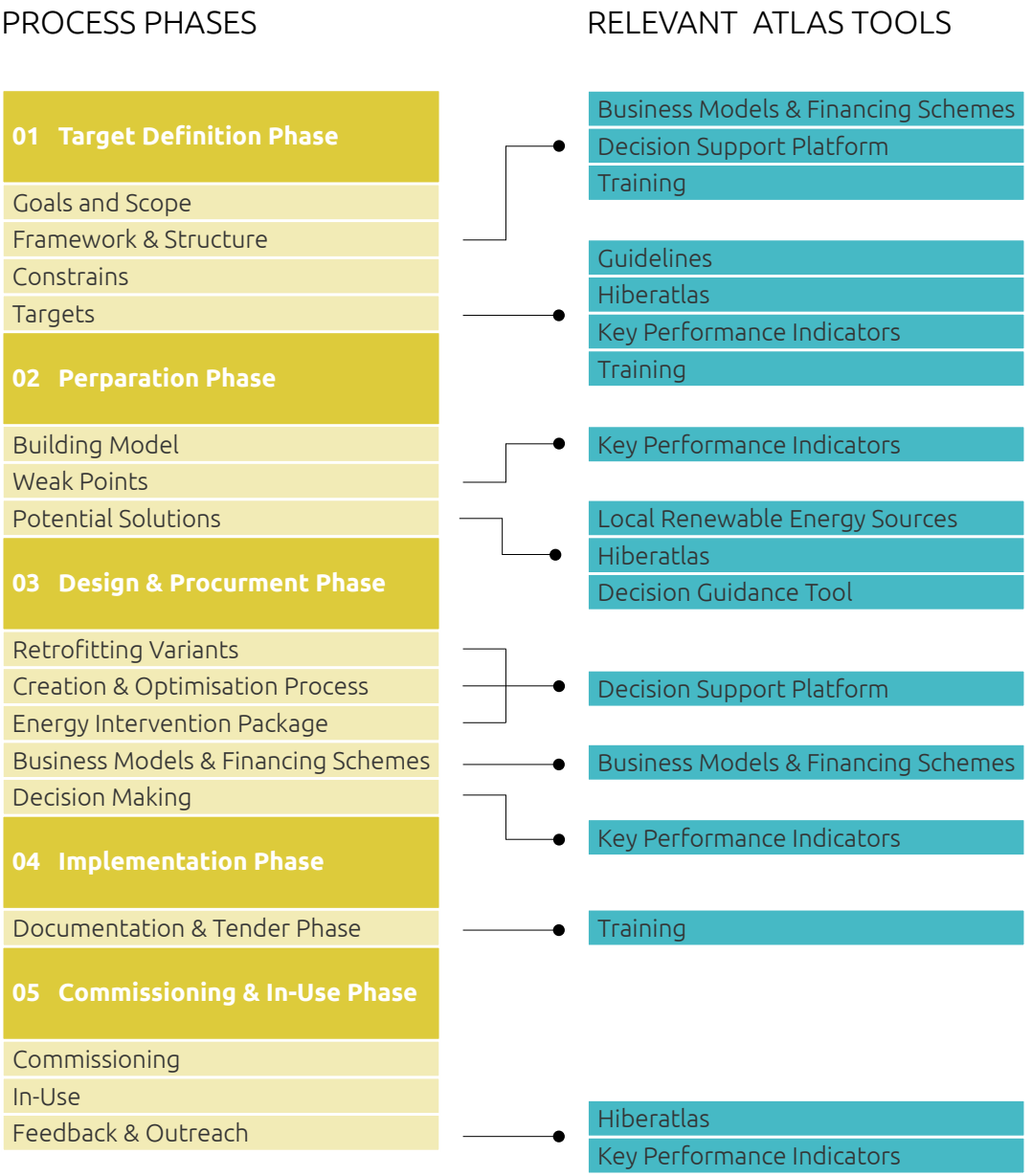
FURTHER READING

Within the EU-research project ATLAS, various tools and literature were delevoped to support the renovation process of historic buildings.

The Links below direct to further information:

- Visit the **ATLAS Homepage**
- Watch the **ATLAS project video**
- **Baukultur oder kann das weg?** - Impulse zur Sanierung erhaltenswerter Gebäude

OVERVIEW


PROCESS PHASES
RELEVANT ATLAS TOOLS
01 Target Definition Phase
Goals and Scope
Framework & Structure
Constrains
Targets
02 Perparation Phase
Building Model
Weak Points
Potential Solutions
03 Design & Procurment Phase
Retrofitting Variants
Creation & Optimisation Process
Energy Intervention Package
Business Models & Financing Schemes
Decision Making
04 Implementation Phase
Documentation & Tender Phase
05 Commissioning & In-Use Phase
Commissioning
In-Use
Feedback & Outreach
Business Models & Financing Schemes
Decision Support Platform
Training
Guidelines
Hiberatlas
Key Performance Indicators
Training
Key Performance Indicators
Local Renewable Energy Sources
Hiberatlas
Decision Guidance Tool
Decision Support Platform
Business Models & Financing Schemes
Key Performance Indicators
Training
Hiberatlas
Key Performance Indicators

THE ATLAS HOLISTIC DECISION-SUPPORT METHODOLOGIES & TOOLS

Welcome to the ATLAS holistic decision-support.
Here you find guidance to an optimized renovation strategie, in terms of reducing the ecological footprint and carbon emissions as well as increasing the energy efficiency of a historical building stock.

press the highlighted buttons to be directed to the page of interest and receive detailed information.

get started and read about the different process phases of a historical building renovation:

explore the specifically designed ATLAS tools and find your customised solution:

01

01 Target Definition Phase

The target definition phase is the first phase in the project in which the project initiator needs to define the projects objectives, boundaries, possible stakeholders and the required resources.

02

02 Perparation Phase

The preparation phase is the phase in which the information about the building and its surrounding is gathered to serve as input for the project in the planning phase.

03

03 Design and Procurment Phase

In the design and procurement phase, the planers team develops a design concept that fulfils the defined S.M.A.R.T targets.

04

04 Implementation Phase

In the implementation phase the planners are to further crystalize the project concept by developing detailed drawings and specifications to facilitate the implantation of the design concept.

05

05 Commissioning and In-Use Phase

In the commissioning and in-use phase the project is transfered from contractor to client.

01 TARGET DEFINITION

- Goals & Scope
- Framework & Structure
- Constrains
- Targets

In this phase the decision makers need to initiate the project, define its goals, objectives, its boundaries, possible stakeholders and the required human and other resources. Based upon the project scope and the stakeholder analysis the project coordinator initiates a soft launch of the project's website in the ATLAS DS platform. The project coordinator also identifies the different stakeholders and assignes them to their role.

01 TARGET DEFINITION

Goals & Scope

Framework & Structure

Constrains

Targets

Definition of the Project Goals and Scope

The project starts with creating a project charter, which is a formal document issued by the project initiator or sponsor. It formally authorizes the work on the project to begin and the project manager to apply organizational resources to project activities.

The project charter shall include the following:

- High-level project description
- Project justification
- High-level development plan with project stages, time plan and milestones
- Estimated budget
- Project objective
- Project team structure
- Project communication plan

01 TARGET DEFINITION

Goals & Scope

Framework & Structure

Constrains

Targets

Setting up the Project Framework & Structure

The organization of the project framework and structure is done based on the defined objectives of the project charter. Therefore, the project coordinator creates a clearly defined structure of the project in terms of responsibilities, budget and funding options, physical boundaries and relevant stakeholders, which can have a positive influence on the project or wich have special competence that the project requires.

01 TARGET DEFINITION

Goals & Scope

Framework & Structure

Constrains

Targets

Defining the Project Constrains

Early on in the project, it is necessary to consider all constraints and restrictions, which may limit the planners in the application and selection of retrofitting solutions during the design phase.

The main constraints that occur in historical building energy retrofitting projects are:

- Legal constraints
- Technical constraints
- Financial constraints
- Environmental condition constraints
- Stakeholder based restrictions

01 TARGET DEFINITION

Goals & Scope

Framework & Structure

Constrains

Targets

Setting up the Project Targets

To get a clear direction in which the energy retrofitting project for the neighbourhood or single buildings should be developed, targets must be defined and transformed into measurable figures. The set targets must always be compatible with the regional and local guidelines. In the Alpine space countries, there are a number of guidelines and instructions that address the energy efficient renovation of historic buildings and in addition, there are agreements at European level.

02 PREPARATION

Building Model

Weak Points

Potential Solutions

The preparation phase is the phase in which a fully functioning ATLAS platform is launched, the project stakeholders have been assigned to their project role and provided with the correct access rights to the project platform and the information about the building and its surrounding is gathered to serve as input for the project in the planning phase.

Find out more about the required data:

02 PREPARATION

Building Model

Weak Points

Potential Solutions

Populating the Building Model

To conduct an energy simulation, the planners need to collect comprehensive data, which can be facilitated when done in conjunction with the creation of a BIM model for the project. Retrofitting existing buildings and neighborhoods pose a far greater challenge in terms of data acquisition, the extent of acquired data and its accuracy, thus its reliability. The framework used in the ATLAS DS aims at reducing the redundancy, time and effort in collecting the required data by providing a list of minimum data, which is required to populate the building model in the ATLAS DS platform. This approach has a direct influence on the quantity and quality of the outputs of the simulation.

02 PREPARATION

Building Model

Weak Points

Potential Solutions

Identification of the Building Weak Points

The aim of this step is to analyze the current state of the building(s) according to its global sustainability performance by comparing its performance in contrast to the desired performance defined in the project charter.

Here the ATLAS KPIs can be used to set the performance domains and benchmarks. This allows the user of the ATLAS DS platform to identify the strengths and weaknesses of the building in terms of energy efficiency, cost efficiency and overall sustainability.

02 PREPARATION

Building Model

Weak Points

Potential Solutions

Identification of the Potential Solutions

In the retrofitting process for the energy improvement of historic buildings one possibility is the local renewable energy sources exploitation. To improve the energy and comfort performances of a historic building including also renewable energies, the combination of main factors such as protection constrains, energy efficiency, technical and economic feasibility and end user usability must be carefully weighted and evaluated.

In order to find the appropriate solution for individual building elements, the planners team can use the ATLAS „Hibertool“, which supports the user in the decision-making process.

The best practice examples documented on the website „Hiberatlas“ provide guidance in the varity of different solutions.

03 DESIGN & PROCUREMENT

- Retrofitting Variants
- Creation & Optimisation Process
- Energy Intervention Package
- Business Models & Financing Schemes
- Decision Making

In the design and procurement phase, the planers team develops design concepts that fulfil the defined S.M.A.R.T targets in the target definition phase. The planners might come up with a number of different concept variants, all of which fulfil the S.M.A.R.T targets. Therefore, all valid variants are later assessed in the decision-making step to choose the concept to be developed.

03 DESIGN & PROCUREMENT

Identification of the Retrofitting Variants in the ATLAS Decision Support Process

A retrofitting design variant in the terms of the ATLAS DS is a package of different retrofitting interventions applied to a single building or a group of buildings in the whole neighborhood and its energy related infrastructure like heat networks or power plants. Thus, each concept may contain several different design variants that on the one hand need to reach the set targets and as well must be in line with the identified constraints and restrictions determined in the strategic definition phase for a concept.

03 DESIGN & PROCUREMENT

Retrofitting Variants

Creation & Optimisation Process

Energy Intervention Package

Business Models & Financing Schemes

Decision Making

General Retrofitting Design Variants Creation & Optimisation Process

The objective of this phase is to create and optimize the selected and designed package of measures in terms of energy, heritage compatibility, cost efficiency as well as the over-all sustainability.

The ATLAS DS supports all project roles by providing structural guidance on how to achieve the aspired goals.

03 DESIGN & PROCUREMENT

Retrofitting Variants

Creation & Optimisation Process

Energy Intervention Package

Business Models & Financing Schemes

Decision Making

Selection & Optimisation of Energy Intervention Packages

As the compilation of a most efficient and optimized package of retrofitting solutions is a very challenging task the ATLAS DS supports the planners team by providing a structured sequential approach for the selection and optimization of interventions. Therefore, the ATLAS DS process foresees three different mechanisms for the optimization of the selected retrofitting solutions, which are:

- Interventions filtering based on set constraints and restrictions
- Interventions compilation based on diagnosis results
- Interventions sequence logic of application

03 DESIGN & PROCUREMENT

Retrofitting Variants

Creation & Optimisation Process

Energy Intervention Package

Business Models & Financing Schemes

Decision Making

Corporation of Business Models & Financing Schemes for Retrofitting Design Variants

To achieve a most effective refurbishment for a practical realization in terms of cost efficiency, the planners team needs to analyze the design variant by using different financial planning methods like payback period, rate of return and debt coverage. Moreover, after assessing the financial performance of the variant, based on the mentioned criteria, it is necessary to identify the most useful business models and financing schemes to finance the created package of interventions for the design variant.

03 DESIGN & PROCUREMENT

Decision Making of the Optimised Design Variant

As a last step in the design and procurement phase, the design variant needs to be matched with the set targets that have been defined in the strategic definition phase. Therefore, the results of the design variant need to be compared against the KPIs targets.

As the planners team may create more than one optimized retrofitting design variant, it is necessary to identify later which of the variants suits best for a practical implementation.

04 IMPLEMENTATION

Documentation & Tender Phase

In this phases the goal is to create a set of detailed drawings and specifications to facilitate the implantation of the design concept. The drawings describe the design intent of the architects and engineers, including the quantities of materials and the relative relationship of each item. The specifications describe the quality of the materials and the general standards by which those materials shall be installed. Most important is, that the developed design reflects the end user's requirements defined in the concept phase.

Furthermore, in this phase the planners team in cooperation with the project oordinator needs to develop a detailed breakdown of the project budget that reflects the project cost estimations and to make sure that the developed design is within the project performance targets defined in the previous stages.

04 IMPLEMENTATION

Documentation & Tender Phase

Construction Documentation & Tender Phase

After approving the final design of the project, the preparation of the construction documentation and the tendering takes place. The contract documentation includes all the documents which form the basis of the contract.

This includes among others:

- Contract
- Contract condition
- Bill of quantities
- Drawings
- Specifications

The project manager initiates the tender process in which the project contractor (constructor) is chosen. The construction step begins with awarding the chosen bidder with the contractual document.

05 COMMISSIONING & IN-USE

Commissioning

In-Use

Feedback & Outreach

Near the end of the completion of the construction works, the commissioning and in-use phase starts. The handover of a project to the owner at the end of construction is a very important stage of the project procurement process and facility operation success. The transfer of the project from contractor to client can have an effect on health and safety, reliability, standards of operation, maintenance and operational cost efficiencies of the project.

05 COMMISSIONING & IN-USE

Commissioning

In-Use

Feedback & Outreach

Steps in the Commissioning Phase

1. Developing the handover and in use strategies
2. Handover and close out plan
3. Handing over the project as-built documents
4. Testing and commissioning plan

05 COMMISSIONING & IN-USE

Commissioning

In-Use

Feedback & Outreach

Steps in the In-Use Phase

A careful planning of the in-use phase is significantly important, as without appropriate planning and strategy for post-occupancy management in place, the newly installed systems and retrofit measures can be misused, preventing the achievement of the initially set energy saving targets.

1. Monitoring and optimizing the project performance using premium mode
2. Continuous post occupancy investigation to avoid sub-optimal use

05 COMMISSIONING & IN-USE

Commissioning

In-Use

Feedback & Outreach

Feedback & Outreach

In this stage it is useful to monitor the performance of the building and to ensure that the set performance targets are actually being fulfilled in the operation phase. A performance gap at this level is inevitable, though it can be kept to a acceptable margin by using the ATLAS KPIs. The constant and yearly update of the KPI values and comparing them with the design targets helps the owner and planners to identify the areas that are under- or overpreforming and to find the cause of it .

After the project completion, the project can be included into the website „Hiberatlas“ and be presented as a documented case study. Promoting the realized project via the website will allow others to learn from the project and understand the complexity of the renovation process.

THE ATLAS HOLISTIC DECISION-SUPPORT

BUSINESS MODELS & FINANCING SCHEMES

TRAINING

KEY PERFORMANCE INDICATORS

LOCAL RENEWABLE ENERGY SOURCES

DECISION SUPPORT PLATFORM

GUIDELINES

HIBERATLAS

DECISION GUIDANCE TOOL

BUSINESS MODELS & FINANCING SCHEMES

- Loans & Guarantees
- EU-Financing
- Grants
- EPC
- Tax Incentives
- Securities
- Crowdfunding

This chapter provides a review of the scope, applicability and constraints of the various financing and business models available for energy efficient renovations in the EU, without limiting it to historically protected buildings.

For detailed information read full deliverable:

BUSINESS MODELS
& FINANCING
SCHEMES

Loans & Guarantees

EU-Financing

Grants

EPC

Tax Incentives

Securities

Crowdfunding

Loans & Guarantees

Loans and loan guarantees are one of the most consolidated forms of energy efficiency financing, as their provisions and structures are derived from lending operations serving other forms of infrastructural lending. Operated by financial intermediaries of small-to-medium scale, as well as by public institutions, their success is linked to their affordability (ability to sustain the project due diligence and the lending obligations). For this reason, many loans for innovative interventions such as energy efficiency retrofits are usually paired with either parallel creditworthiness enhancements in the form of default backups (loan guarantees) or grants (soft loan), in order to increase accessibility.

Learn more about the individual funding opportunities in your country:

BUSINESS MODELS
& FINANCING
SCHEMES

Loans & Guarantees

EU-Financing

Grants

EPC

Tax Incentives

Securities

Crowdfunding

EU-Financing Programmes

Next to the traditional funding programs, there are other EU instruments that do not involve direct funding and that could be relevant for heritage house owners:

- CCS Guarantee Facility
- COSME
- EU Programme for Employment and Social Innovation
- Enterprise Europe Network
- European Solidarity Corps
- EUROPEANA
- European Energy Efficiency Fund (EEEF)

BUSINESS MODELS & FINANCING SCHEMES

Loans & Guarantees

EU-Financing

Grants

EPC

Tax Incentives

Securities

Crowdfunding

Grants

Grants at the EU level are provided by either the Council of Europe (CoE) or the EU Commission (EC). On the national scale each state has the freedom to organize its grant program as it sees fit.

Learn more about the individual funding opportunities in your country:

BUSINESS MODELS & FINANCING SCHEMES

Loans & Guarantees

EU-Financing

Grants

EPC

Tax Incentives

Securities

Crowdfunding

Energy Performance Contracting

EPC is a contractual arrangement between the beneficiary and the provider, an Energy Service Company (ESCO), for delivering energy efficiency or a renewable energy project, where investments are paid for in relation to a contractually agreed level of energy efficiency improvement. Through this approach the client transfers the technical risks to the ESCO, based on performance guarantees given by the former. In these contracts, the ESCO remuneration is based on a demonstrated performance: the level of energy savings.

The EPC business model can take various forms, depending upon how the ESCO is financed and the range of energy services that are included, but essentially it creates an obligation on the property owner to pay for outsourcing energy related services which may include retrofitting.

BUSINESS MODELS & FINANCING SCHEMES

Loans & Guarantees

EU-Financing

Grants

EPC

Tax Incentives

Securities

Crowdfunding

Tax Incentives

Fiscal measures are an important class of support and can relate to a reduced rate of tax for the owners, properties and/or contracting organisations, as well as specific tax and VAT benefits on the various cost or profit elements. Eligibility criteria are usually transient, and quite specific in terms of type and final outcome of the interventions. To incorporate fiscal measures, in particular, requires a business model with the requisite detail for the developers and the development. This is an open question for the modelling specification, as tax details can become very intricate. One benefit of fiscal measures is that they are capillary and don't have credit-worthiness-related access criteria, hence they can be utilized by individual private owners for small domestic energy retrofits.

Learn more about the individual funding opportunities in your country:

BUSINESS MODELS
& FINANCING
SCHEMES

Loans & Guarantees

EU-Financing

Grants

EPC

Tax Incentives

Securities

Crowdfunding

Securities

Securitization is the financial practice of pooling various types of contractual debt and selling their related cash flows to third party investors as securities, which may be described as bonds or collateralized debt obligations (CDOs). Investors are repaid from the principal and interest cash flows collected from the underlying debt and redistributed through the capital structure of the new financing. Securities backed by assets (e.g. a RE plant or the results of an EE retrofit) are called asset-backed securities (ABS).

BUSINESS MODELS
& FINANCING
SCHEMES

Loans & Guarantees

EU-Financing

Grants

EPC

Tax Incentives

Securities

Crowdfunding

Crowdfunding

Crowdfunding is a form of alternative finance through which a project is funded by raising monetary contributions from a large number of people and giving in return either shares of the company operating the projects (equity crowd-funding) or revenues from the project itself (rewards crowdfunding).

Learn more about the individual funding opportunities in your country:

TRAINING

Consultants

Craftsmen

Qualified planners, consultants and craftsmen are essential to ensure a successful project, as the renovations of a historical building often requires different knowledge aswell as craftsmanship techniques than new buildings. Knowledge transfer can take place in diverse forms, such as training for energy and renovation consultants or by training for craftsmen and companies.

For detailed information read full deliverable:

TRAINING

Consultants

Craftsmen

Training for Consultants

The project targets often depend on the knowledge, experience and skills of the people involved. If certain restoration techniques are not known, either to the planner or the craftsmen, they cannot be applied and thus a specific goal cannot be achieved. In order to achieve a defined project goal, e.g. the preservation and restoration of historical windows in the existing building, the participants must have the knowledge to do so. Moreover, it is very important to not only bring knowledge to the technicians but also to disseminate it to the investors.

For example, there is a training module „historical buildings“ for energy consultants in Vorarlberg.

TRAINING

Consultants

Craftsmen

Training for Craftsmen

It is important that the planners bring the theoretical considerations to the construction site and that they are implemented there as planned. This requires good plans, a good construction manager and craftsmen who have the skills to implement them. To ensure this, the people involved must have the knowledge and expertise of the individual processes. This knowledge and skills can be transferred through the training of consultants, planners and craftsmen.

For example, there is a workshop on techniques for the restoration of historical wooden windows in South Tyrol.

KEY PERFORMANCE INDICATORS

- Energy & Emissions
- Material
- Water
- Indoor Quaility
- Life Cycle Cost
- Heritage Value

To get a clear direction in which the energy-retrofitting project for the neighbourhood or single buildings should be developed, the target issues have to be transformed into measurable figures.

A target therefore should be S.M.A.R.T as defined below:

- Specific - target must be clearly defined
- Measurable - targets must be quantifiable
- Attainable - target must be realistic and achievable
- Relevant - are the targets relevant for retrofitting goals?
- Time-bound - specify when the result(s) can be achieved

For detailed information read full deliverable:

KEY PERFORMANCE INDICATORS

Energy & Emissions

Material

Water

Indoor Quaility

Life Cycle Cost

Heritage Value

Energy & Emissions

The ATLAS KPI „energy and emission“ is composed of two themes: „energy“ and „environmental impact“. Those are represented by a set of indicators, of which six are mandatory and one is recommended.

For detailed information have a look at the overview:

KEY PERFORMANCE INDICATORS

Energy & Emissions

Material

Water

Indoor Quaility

Life Cycle Cost

Heritage Value

Material

The ATLAS KPI „material“ is composed of three recommended indicators.

For detailed information have a look at the overview:

KEY PERFORMANCE INDICATORS

Energy & Emissions

Material

Water

Indoor Quaility

Life Cycle Cost

Heritage Value

Water

The ATLAS KPI „water“ is composed of two recommended indicators.

For detailed information have a look at the overview:

KEY
PERFORMANCE
INDICATORS

Energy & Emissions

Material

Water

Indoor Quaility

Life Cycle Cost

Heritage Value

Indoor Environmental Quality

The ATLAS KPI „indoor environmental quality“ is composed of two themes: „indoor air quality“ and „comfort“. Those are represented by a set of indicators, of which four are mandatory and one is recommended.

For detailed information have a look at the overview:

KEY
PERFORMANCE
INDICATORS

Energy & Emissions

Material

Water

Indoor Quaility

Life Cycle Cost

Heritage Value

Life Cycle Cost

The ATLAS KPI „life cycle cost“ is composed of one recommended indicator.

For detailed information have a look at the overview:

KEY
PERFORMANCE
INDICATORS

Energy & Emissions

Material

Water

Indoor Quaility

Life Cycle Cost

Heritage Value

Heritage Value

The ATLAS KPI „heritage value“ is composed of the theme: „heritage preservation“. It is represented by a set of indicators, of which four are mandatory and one is recommended.

For detailed information have a look at the overview:

LOCAL RENEWABLE ENERGY SOURCES

RES in Switzerland

RES in Germany

RES in Austria

RES in Slovenia

The final energy consumption in the building sector could be sustainable covered by local, renewable energy sources (RES) and in order to improve energy and comfort performances of historic buildings, renewable sources could be considered as well. For each country, there are methodologies and tools to quantify the potentials and strategies, which allow the share of a given renewable source to increase at National, Regional or Local Level. The most important RES: Solar (photovoltaic and solar thermal), Wind, Hydroelectric, Hydrothermal, Geothermal and Biomass.

For detailed information read full deliverable:

LOCAL RENEWABLE ENERGY SOURCES

RES in Switzerland

RES in Germany

RES in Austria

RES in Slovenia

RES in Switzerland

Strategies to promote the use of RES are set usually at national level and subsequently implemented on regional and local scale. Besides, at regional level there are techno-economic models to promote renewable energies and local associations support the federal and cantonal energy policy. There are specific regulations, handbooks or cantonal guidelines when considering the implementation and use of renewable energies in historic buildings and protected areas. Interactive WEB-GIS tools and maps provide comprehensive information on all renewable energies.

For further information read Swiss fact sheet:

LOCAL RENEWABLE ENERGY SOURCES

RES in Switzerland

RES in Germany

RES in Austria

RES in Slovenia

RES in Germany

National and regional interactive WEB-GIS maps provide comprehensive information on all renewable energies. The tools include different layers and take references to inventories (Historic Buildings and protected areas) into account.

Most important planning instrument on the regional level in Bavaria is the web portal Energie-Atlas Bayern, developed by the Bavarian Government.

On a local level, the Energy Use Plan (Energienutzungsplan = ENP) is a common strategical planning instrument that provides a comprehensive overview of a municipality's current and future energy demand and supply situation.

For further information read German fact sheet:

LOCAL RENEWABLE ENERGY SOURCES

RES in Switzerland

RES in Germany

RES in Austria

RES in Slovenia

RES in Austria

In Austria, and also in the state of Vorarlberg, there are also interactive tools for solar potential calculation and visualization or tools which provides the electrical energy balance of a building or for comparison of heating systems.

For further information read Austrian fact sheet:

LOCAL RENEWABLE ENERGY SOURCES

RES in Switzerland

RES in Germany

RES in Austria

RES in Slovenia

RES in Solvenia

In the National Renewable Energy Action Plan 2010-2020 (NREAP), Slovenia has a goal set forth, namely by 2020 achieve 25% share of RES in gross final energy consumption.

All Slovenian strategic documents related to energy production, renewable energy sources and efficient use of energy are covering the national level. As Slovenia doesn't have a regional administration, also the majority of grant/subsidy systems are based on the national level.

For further information read Slovenian fact sheet:

DECISION SUPPORT PLATFORM

Preparatory Steps

Retrofit Scenarios

The ATLAS decision-support platform supports and facilitates the use of external tools for detailed design through providing the necessary base information like a geometric model, an estimation of the required ventilation type and allows for storing the information on the platform for all stakeholders after the intervention has been implemented. This improves the traditional design and decision-making approach greatly, as all the created information will be available in a central place and can be accessed by all relevant stake holders in digital form instead of being scattered between different stakeholders.

Register and initiate your project wirh the ATLAS Decision Support Platform:

DECISION
SUPPORT
PLATFORM

Preparatory Steps

Retrofit Scenarios

Preparatory Steps

In order to test different retrofit scenarios for one or more historic buildings, the user must insert as much as detailed information on its object as possible, such as building type, age, dimension, heating system , energy consumption and further more. The more precise the information, the more accurate are the results of the simulation. Nevertheless, even with little information, the tool may give you a forecast of possible solutions.

Register and initiate your project wirh the ATLAS Decision Support Platform:

DECISION SUPPORT PLATFORM

Preparatory Steps

Retrofit Scenarios

Retrofit Scenarios

The desicion support platform allows users to simulate different retrofit scenarios for one or more buildings. The tool facilitates the decision making process, by providing the opportunity to compare the different retrofit solutions with its specific assets and efforts.

Register and initiate your project wirh the ATLAS Decision Support Platform:

GUIDELINES

- General
- HVAC
- Insulation
- PV, Solar
- Windows

In the Alpine Space countries there are quite a number of guidelines and instructions that address the energy efficient renovation of historic buildings. These guidelines and instructions reflect the local and regional approaches and provide information on standards and laws to be observed. In addition, there are agreements at European level, such as the EN 16883 - 2017-08 Conservation of cultural heritage - Guidelines for improving the energy performance of historic buildings. Besides the local and regional legal conditions, these handouts represent a large pool of knowledge. Often, possible scope for action for locally typical buildings or components is pointed out.

For detailed information read full deliverable:

GUIDELINES

General

HVAC

Insulation

PV, Solar

Windows

General

Existing guidelines for the energy-efficient renovation of the historic building stock generally refer to regional situations and usually deal with the following topics:

1. Advice on the procedure: How and when should the heritage authorities be involved? What advisory services are available? Which norms/regulations have to be fulfilled?

2. What quality standards are there for planning and implementation with regard to heritage preservation and building physics aspects?

3. Exemplary solutions for the refurbishment of existing buildings in the region (mostly focused on regional building typologies) with an evaluation of the advantages and disadvantages of individual solutions.

GUIDELINES

General

HVAC

Insulation

PV, Solar

Windows

HVAC

Based on the fact, that improving technical systems is usually a very efficient and also heritage-compatible measure in the renovation process of a historic building, there is more need in introducing guidlines reffering to HVAC. In some cases, there is information covered in the general guidlines of each region.

GUIDELINES

General

HVAC

Insulation

PV, Solar

Windows

Insulation

Historic buildings' character and significance is defined mostly by the design of their exterior envelope. Thus, the improvement of the energy performance and with it the thermal conductivity of the walls results mostly in the application of internal wall insulation. However, this could change considerably the moisture dynamics of the wall and must be assessed carefully. Therefor the practical guidelines focusing in particular on the insulation of exterior walls in historic buildings, deal with the special problems of interior insulation: Air tightness of the building envelope, capillary active insulation systems, hygrothermal calculation methods, risk assessment for mould growth, connections to intermediate ceilings and walls as well as the junction to openings (windows/ doors/ etc.).

GUIDELINES

General

HVAC

Insulation

PV, Solar

Windows

PV, Solar

Special recommendations for the use of PV and solar systems in a historic context draw attention to existing legal regulations and subsidies and provide examples of how such systems can be implemented. The solutions presented are usually aimed at ensuring that the PV and solar panels are not visible or are not installed directly on the monument, but instead use neighbourhoods and outbuildings. Aspects such as architectural integration on the one hand and reversibility on the other play a role in the different considerations, although not all regions pursue the same strategy for that issue.

GUIDELINES

General

HVAC

Insulation

PV, Solar

Windows

Windows

Guidelines focussing on the renovation of historic windows usually deal with the various possible structural variants for increasing energy efficiency, from sealing and repairing the existing, to replacing individual elements such as glass panes, to extending and adding layers (e.g. extending from a single glas window to a box type window). In most cases, the focus is on aesthetic aspects; only some of the handouts consider the problems of building physics in detail.

HIBERATLAS

General Information

Renovation Process

Retrofit Scenarios

Evaluation

The Historic Building Energy Retrofit Atlas (Hiberatlas) presents best-practice examples of how historic buildings can be renovated to achieve high levels of energy efficiency while respecting and protecting its heritage significance. The documentation and information found in the website can serve as inspiration source for the planners, owner or decision maker during the preparation phase to find suitable solutions. Moreover, the owner or decision maker can find though the website names and addresses of qualified and experienced planners that can help realize the project targets.

For further information visit www.hiberatlas.com :

HIBERATLAS

General Information

Renovation Process

Retrofit Scenarios

Evaluation

General Information

Each case study presentation starts with a series of powerful pictures and plans. A teaser gives a first impression of the strengths of the project. The main actors are mentioned, as well as some key details on energy demand, building geometry and monument status.

For further information visit www.hiberatlas.com:

HIBERATLAS

General Information

Renovation Process

Retrofit Scenarios

Evaluation

Renovation Process

The description of the building architecture includs construction characteristics, state of repair and the heritage significance of the building. The explanations about the renovation process indicate the aim of the retrofit, tools used, stakeholder involvment and lessons learned.

For further information visit www.hiberatlas.com:

HIBERATLAS

General Information

Renovation Process

Retrofit Scenarios

Evaluation

Retrofit Scenarios

Here you find a description of the interventions on walls, windows, roof and floors with special emphasis on compatibillity of the implementation measures with the heritage assessment results. Furthermore a summery of original and new building services for heating and DHW, cooling, and ventilation is provided as well as the integration of Renewable Energy Sources.

For further information visit www.hiberatlas.com:

HIBERATLAS

General Information

Renovation Process

Retrofit Scenarios

Evaluation

Evaluation

This part of the presentation summerize the results of the intervention ragarding the improvement of the energy efficiency, internal climate (among others Temperature and indoor air quality), financial aspects as well as environmental aspects of the intervention, like LCA and water managment.

For further information visit www.hiberatlas.com:

DECISION GUIDANCE TOOL

HVAC

Solar

Walls

Windows

The so called “HiBERtool” (Historic Building Energy Retrofit tool) supports planners and building owners in the decision-making process. With the HiBERtool a possibility is given to explore and find different solutions for the energy-efficient retrofit of historical buildings. The tool documents solutions for windows, walls, ventilation, heating and solar. By clicking on the desired element you will be forwarded to a decision tree which filters all documented solutions to the solutions that are interesting for your project. Afterwards you have the possibility to download the documentation of the solution as a PDF. Many solutions are part of a fully documented best practice example. Furthermore, not only solutions but also general technical information are available for the respective topics.

Find your ideal solution and check out the HiBERtool:

DECISION
GUIDANCE TOOL

HVAC

Solar

Walls

Windows

HVAC

Energy-efficient solutions with no or low impact on the historic value of the building. Ventilation systems and solutions are specifically considered as they may help avoid risks (e.g., moisture damage, especially in conjunction with interior insulation) while having positive effects on the energy efficiency, indoor air quality and climate.

For further information read the HVAC solutions:

(part 1)

(part 2)

DECISION
GUIDANCE TOOL

HVAC

Solar

Walls

Windows

Solar

Solar systems, integrated or not (BIPV/BIST or BAPV/BAST), could be used in historic buildings. New solutions with high-performance levels allow an efficient use of solar energy - thermal and photovoltaics - while preserving the heritage and architectural quality and character of historic buildings and sites.

For further information read the solar solutions:

(part 1)

(part 2)

DECISION
GUIDANCE TOOL

HVAC

Solar

Walls

Windows

Walls

Thermal enhancement of external walls respecting all the relevant conservational, building physical and economical needs. The collection includes various categories such as interior insulation, exterior insulation, cavity insulation, frame infill insulation and reversible systems.

For further information read the walls solutions:

DECISION
GUIDANCE TOOL

HVAC

Solar

Walls

Windows

Windows

Conservation and restauration of historic windows with enhanced energy efficiency and user comfort. Solutions with different levels of impact will be presented, from minimal impact on the appearance (e.g., repairing the window) to changes on the interior appearance (e.g., replacing the interior glazing, complete replacement of the window).

For further information read the windows solutions: