



**TASK 59**  
SHC | EBC  
Energy in Buildings and Indoor Climate Programme  
INTERNATIONAL ENERGY AGENCY

AUTONOME PROVINZ  
BOZEN - SÜDTIROL



PROVINCIA AUTONOMA  
DI BOLZANO - ALTO ADIGE

PROVINZIA AUTONOMA DE BULSAN - SÜDTIROL

# Inspiring good practices: a database to trigger energy efficient renovations of historic buildings

**eurac**  
research

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7<sup>th</sup> February 2020.

HES (Historic Environment Scotland) ENERGY EFFICIENCY SEMINAR





# HISTORIC BUILDINGS ENERGY RETROFIT

250  
MILLION €  
BY 2050



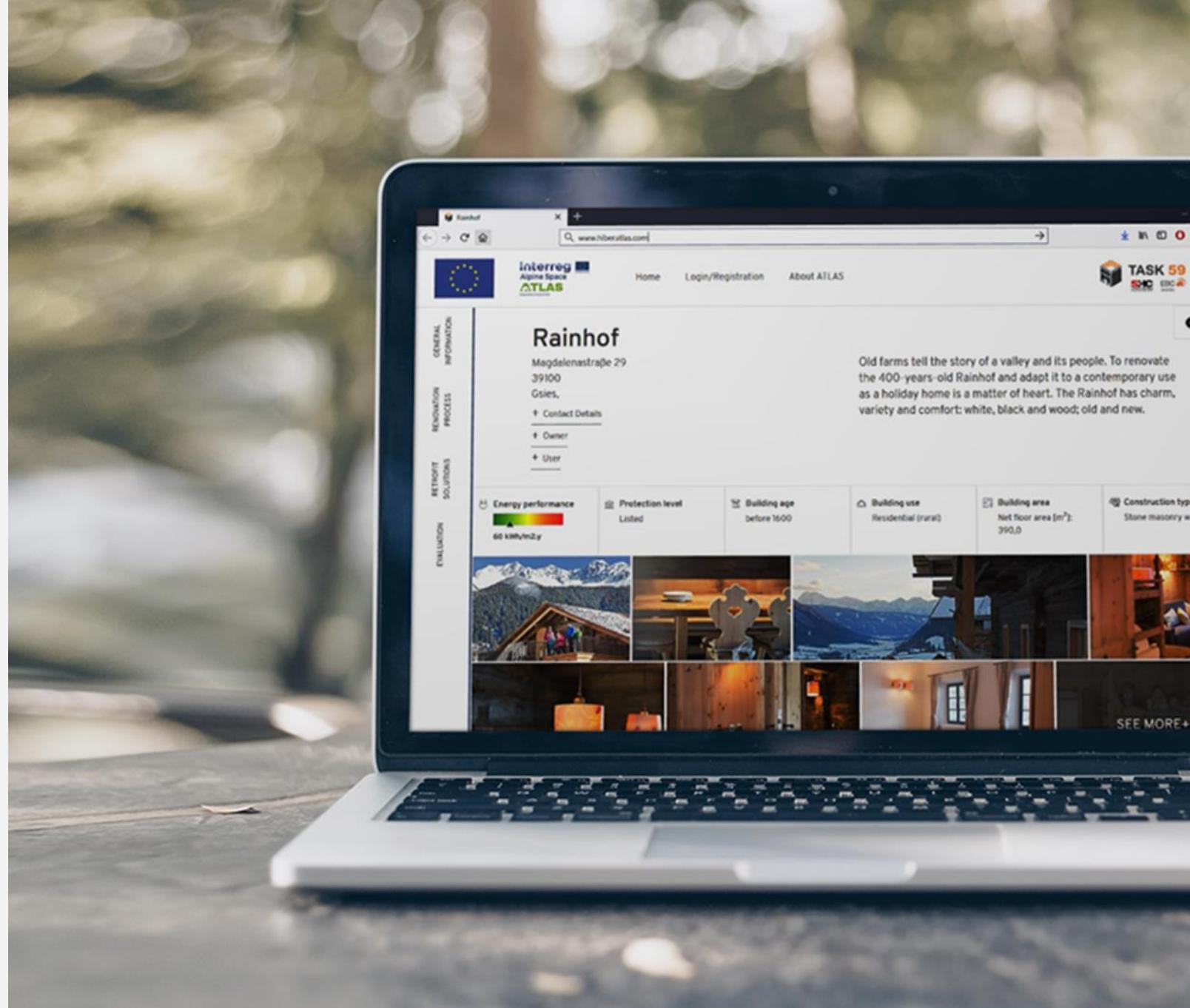
# WWW.HIBERATLAS.COM

## HISTORIC BUILDINGS

## ENERGY RETROFIT ATLAS

### A BEST PRACTICE DATABASE

The Historic Building Energy Retrofit Atlas compiles cases of building renovation that are exemplary both in terms of heritage conservation and energy efficiency in order to inspire and foster energy retrofits.





## HISTORIC buildings?

**Renovating toward NZEB** by bringing together design, efficiency and local use of renewable energy

According EN 16883 all buildings with elements “**worthy of preservation**”

*all types & ages, not just listed/protected buildings*





Rainhof



Lichtmayrgütl  
in Graming

Basilica di Santa  
Maria di Collemaggio



Hof 6,  
Schwarzenberg



before 1600

1600-1700

Mercado del Val,  
Valladolid



Klitgaarden

Mariahilfer Straße



Villa Catelli



Klostergebäude  
Kaiserstrasse

Osramhuset (The  
Osram Building)



1850-1899

Notarjeva vila



1900-1944

1945-1959

Welcome          EN

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 **Interreg** Alpine Space **ATLAS**   Zum Dashboard   

## Historic Building Energy Retrofit Atlas

 — 2019.03.04 <b>Rainhof</b> Land: IT Sprachen: en;de	 — 2019.03.11 <b>Villa Castelli</b> Land: IT Sprachen: en;de;it	 — 2019.04.03 <b>Downie's Cottage</b> Land: GB Sprachen: en
 — 2019.04.05 <b>Klostergebäude Kaiserstrasse</b> Land: AT Sprachen: en	 — 2019.04.12 <b>Farm house Trins</b> Land: AT Sprachen: en;de	 — 2019.04.30 <b>Lichtmayrgütl in Graming</b> Land: DE Sprachen: de;en
		

# WHAT is documented?

Any building of historic and/or cultural value **independent of the level of protection** is considered - from medieval buildings over buildings from the 1920s to post WWII architecture.

# WHAT is documented?

The basic requirements for best-practices are

- ✓ Implementation of the project **completed**
- ✓ Renovation of the **whole building**
- ✓ **Significant reduction** of energy consumption (towards “lowest possible energy demand”)
- ✓ Evaluation of the **heritage compatibility** of the solutions
- ✓ Available **documentation** of technical solutions

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Zum Dashboard LOGOUT

**Historic Building Energy Retrofit Atlas**

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# HOW is it documented?

Second level of detail data and information

1. **images of the building and key figures of the intervention**
2. a description of the context and the rationale behind the solutions adopted
3. the different retrofit solutions implemented
4. evaluation of the intervention in terms of energy efficiency, internal climate, cost and environmental impact.

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 **Interreg**  
Alpine Space  
**ATLAS** [Zum Dashboard](#)

**Rainhof**

Magdalenastraße 29  
39100  
Gsies,  
[+ Contact Details](#)  
[+ Owner](#)

**GENERAL INFORMATION**

Energy performance	Protection level	Building age	Building use	Building area	Construction type
 60 kWh/m2.y	Listed	before 1600	Residential (rural)	Net floor area [m <sup>2</sup> ]: 390,0	Stone masonry wall

**RENOVATION PROCESS**

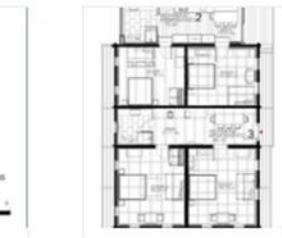
**RETROFIT SOLUTIONS**

**EVALUATION**

Old farms tell the story of a valley and its people. To renovate the 400-years-old Rainhof and adapt it to a contemporary use as a holiday home is a matter of heart. The Rainhof has charm, variety and comfort: white, black and wood; old and new.


**SEE MORE+** 




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eurac research 07.02.2020 – Daniel Herrera, Franziska Haas, D.

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RENOVATION PROCESS

Architecture

BUILDING DESCRIPTION

This listed rural building, Rainhof, was built around the 16th century in St. Magdalena at 1,500 m above level. Rainhof is located at the end of the Gsiesertal valley, just off the main road. It is one of the most precious rural buildings of the area. The ground floor was built with solid stone masonry walls, whereas first and top floor were built with the vernacular "Blockbau" (solid wood) technic. The building presents many traditional features, windows in deep lounges, decorated painted frames around the windows, and a vaulted ceiling at the entrance. The building was used as a typical agricultural dwelling. That means that it was usually inhabited by 3 generations (parents with children and grandparents). The traditional use of the ground floor was as living room and kitchen on one side and workshop and pantry on the other side; the entrance/corridor was used for animal slaughtering. Upstairs, sleeping rooms for the family and farm workers were located

HERITAGE SIGNIFICANCE

+ ELEMENTS WORTHY OF PRESERVATION

+ HERITAGE VALUE ASSESSMENT

STATE OF REPAIR

+ CONDITIONS OF THE ENVELOPE

+ DESCRIPTION OF PRE-INTERVENTION BUILDING SERVICES

The screenshot shows a web browser window with the URL www.hiberatlas.com. On the left, there's a vertical sidebar with tabs: GENERAL INFORMATION, RENOVATION PROCESS (which is active), RETROFIT SOLUTIONS, and EVALUATION. The main content area displays three images: a close-up of a wooden door with three black knobs, a balcony of a traditional wooden building, and a white-walled hallway with arched doorways. A large hand cursor is positioned over the 'HERITAGE VALUE ASSESSMENT' section in the sidebar.



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RETROFIT SOLUTIONS

External Walls

GENERAL INFORMATION

RENOVATION PROCESS

RETROFIT SOLUTIONS

EVALUATION

GROUND FLOOR - EXISTING STONE WALL

GROUND FLOOR - EXISTING STONE WALL "STUBE"

GROUND FLOOR - EXTENSION

In most part of the ground floor (except "Stube" and "Labe") the exterior wall in natural stone is insulated from the inside with a thin layer (4-6 cm) of insulating plaster (Calcetherm 0,068)

The insulating plaster is lime-based. Unlike a insulatino panel, the thin layer can follow the uneven historical wall surface in order to have a similar appearance to the original plaster.

U-value (pre-intervention) [W/m<sup>2</sup>K]:  
2,39  
W/m<sup>2</sup>K

U-value (post-intervention) [W/m<sup>2</sup>K]:  
0,87  
W/m<sup>2</sup>K

Windows

ALL WINDOWS

Substituition of all windows. The windows were made by a furniture maker. The aim was build a two-sash window with two glazing bars each, which on the one hand fulfils the demand on energy efficiency and which is on the other hand of high aesthetic quality.

In order to preserve the original appearance of the windows in the façade, the original window was used as a model for the new window in terms of proportions and profile widths. As glazing an insulating glass unit was installed.

Existing window U-value Glass [W/m<sup>2</sup>K]:

New window U-value Frame [W/m<sup>2</sup>K]:





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Welcome

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GENERAL INFORMATION

RENOVATION PROCESS

RETROFIT SOLUTIONS

EVALUATION

**Energy Efficiency**

- ENERGY PERFORMANCE
- ENERGY USE
- MEASURED PARAMETERS

**Internal Climate**

- TEMPERATURE
- INDOOR AIR QUALITY
- DAYLIGHT
- ACOUSTIC COMFORT
- ARTIFACT CONSERVATION

**Costs**

- FINANCIAL ASPECTS
- INVESTMENT COSTS
- RUNNING COSTS

**Environment**

- GREENHOUSE GAS EMISSIONS
- LIFE CYCLE ANALYSIS
- WATER MANAGEMENT
- TRANSPORT AND MOBILITY



Footer Navigation title

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Privacy  
Impressum

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Brennerstraße 16B,  
39100 Bozen,  
Montag -Freitag von 8:00 bis 17:00  
[info@teamblau.com](mailto:info@teamblau.com)

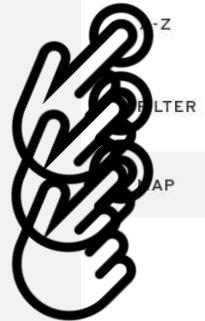


# HOW is it documented?

Allowing focusing only on those buildings that are most relevant.

According to:

- Geographical area
- Building use
- Construction period
- Typology
- Construction material
- Solutions applied



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Interreg Alpine Space ATLAS

Zum Dashboard

Map showing the Alpine Space region with several buildings highlighted by callouts, each containing a small image of the building. The buildings are located in various towns and regions, including Samnaun, Nauders, Wildspitze, Hochgurgl, St. Leonhard in Passeier, Rainhof, Gsies, Toblach, Rabland, Schenna, Meran, Klausen, Kastelruth, Seis, Tiers, Canaz, Moena, and Pardatsch.

# WHO is documenting?

This is a **joint development** of two research projects:

- The European Interreg Alpine Space project "**ATLAS**"
- The International Energy Agency (IEA) project "**IEA-SHC Task 59**".

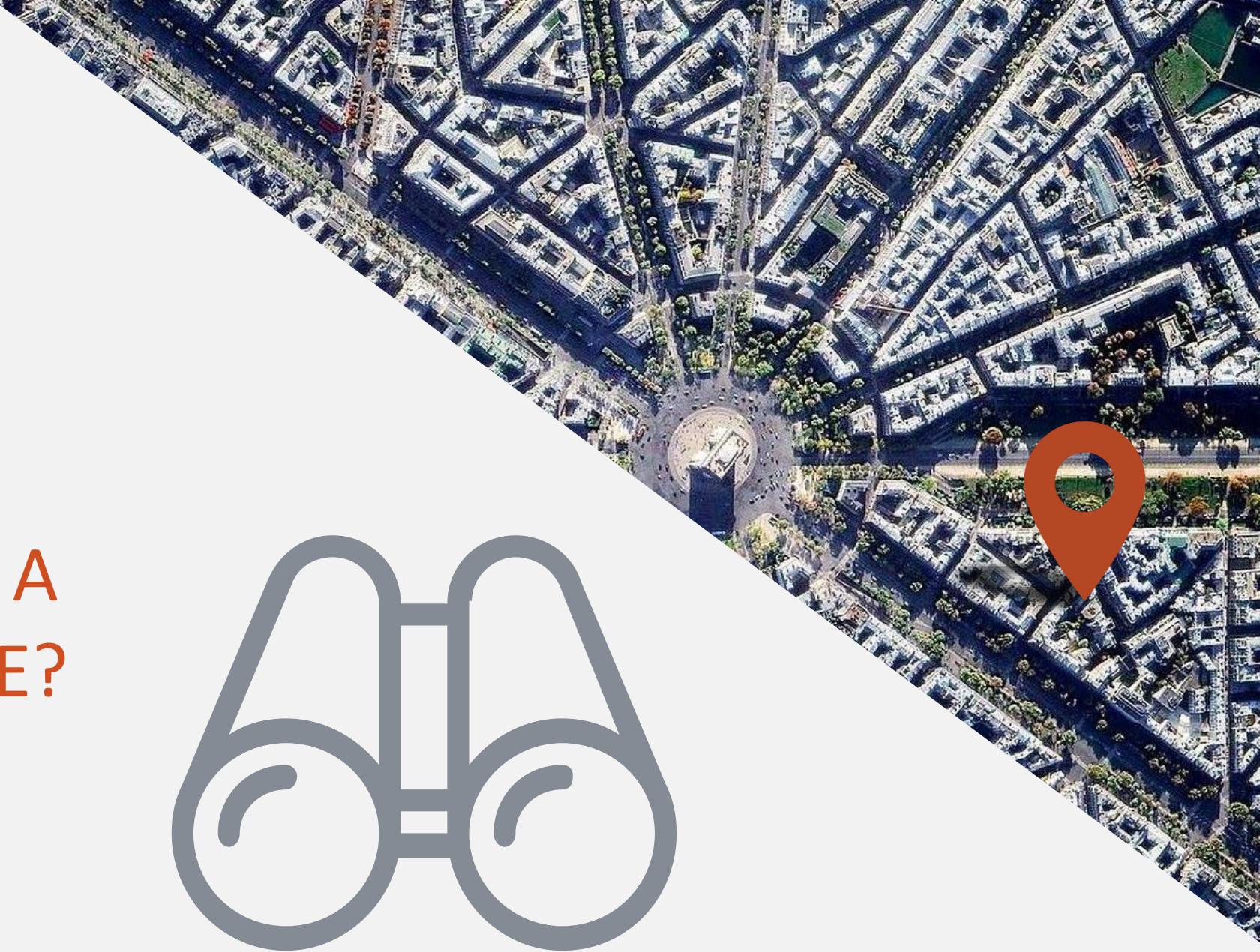
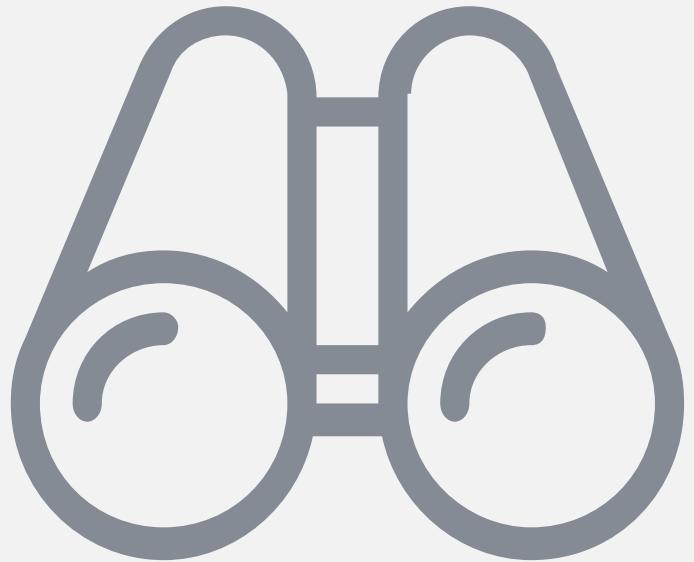
Initially, the partners of both projects are contributing with evaluated case studies. In a **second stance, owners and designers** of suitable example are invited to participate.





**DO YOU KNOW A  
GOOD EXAMPLE?  
GET IN TOUCH!**

[Task59@eurac.edu](mailto:Task59@eurac.edu)





# CONNECTIVITY

Combining efforts – Linking online resources

The screenshot shows the homepage of the Interreg Alpine Space ATLAS. It features a map of the Alpine Space region and a search bar. Below the map, there are sections for 'partners' (21 observers), '21 observers', and '60 case studies'. Each section includes a thumbnail image and a brief description. A red arrow points from the text '100+ examples' to the 'case studies' section.

100+ examples

The screenshot shows a detailed view of the Rainhof project in Gsies, Toblach, South Tyrol, Italy. It displays several images of the building and its surroundings, along with a short description. A red arrow points from the 'Rainhof' section on the left to the main image area.



SOLAR HEATING & COOLING PROGRAMME  
INTERNATIONAL Energy Efficient  
Buildings



2018 ANNO EUROPEO  
DEL PATRIMONIO CULTURALE

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# IEA Task 59 | SHC programme

Deep renovation of historic buildings towards lowest possible energy demand and CO<sub>2</sub> emissions (NZEB)



Develop a **solid knowledge base** on how to save energy in historic buildings in a cost efficient way

Assess **replicable procedures** for multidisciplinary collaboration and promote **tools** for the implementation of EN16883

Identify and assess **conservation compatible retrofit** solutions and approached in a “whole building perspective”

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