



# New4Old

## New energy for old buildings

Promoting the integration of RES & RUE measures in historic buildings



## Renovation Franziscan Monastery Graz

Historic Building + Energy



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Picture: Franciscans Graz

- New4Old – what is it?
- Renovation and historic buildings
- Monastery – location and history
- Renovation and energy concept
- Renovation measures

Best practice  
Renewable Energy House (REH) Brussels:

## Network of "Renewable Energy Houses" (REH)

- Sustainable energy supply
- Basis to go to the market

## Technical Guidelines

(Integration of energy efficiency and renewable energy sources into historic buildings)



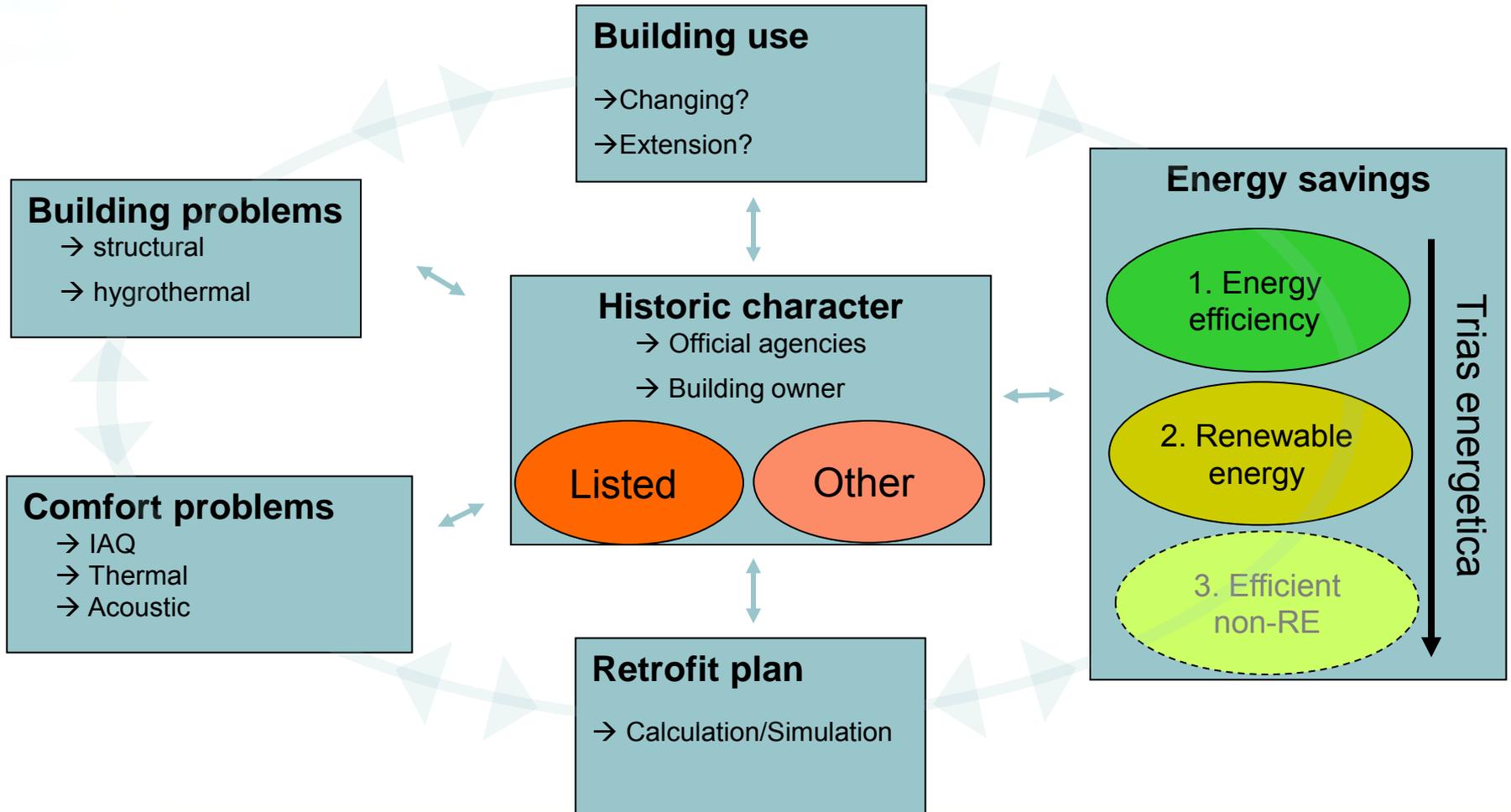
Website: [www.new4old.eu](http://www.new4old.eu)

### Project partners:



### Promoted by:





# Location

## Franciscan Monastery Graz



South view of the monastery (Source: Franciscans, Graz)



Aerial picture 2007 / Urban measuring Graz



East view from the Franciscans-Square with the Chapel of St. Jacob, Sacristy and Raised Choir (Source: Franciscans, Graz)

# Location

Franciscan Monastery Graz



Layout: Göllés,  
[www.gams4.com](http://www.gams4.com)



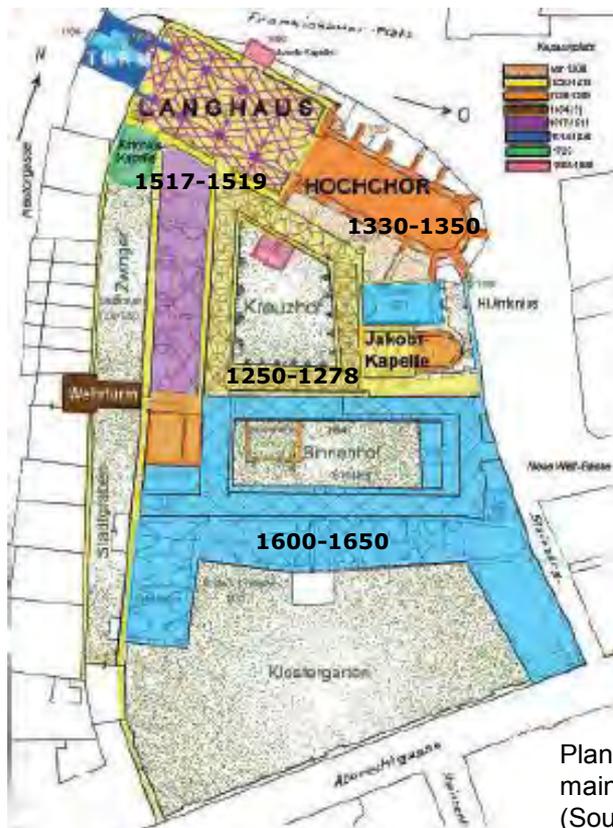
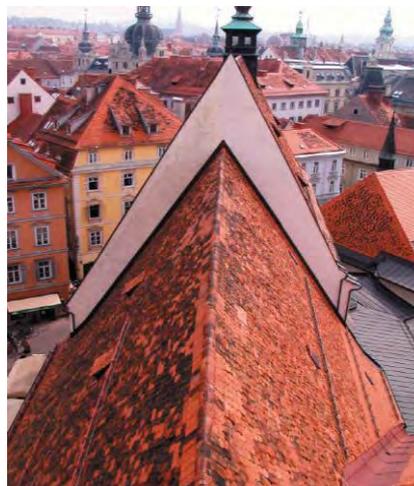
Monastery

Aerial picture 2007 (Source: Urban measuring Graz)

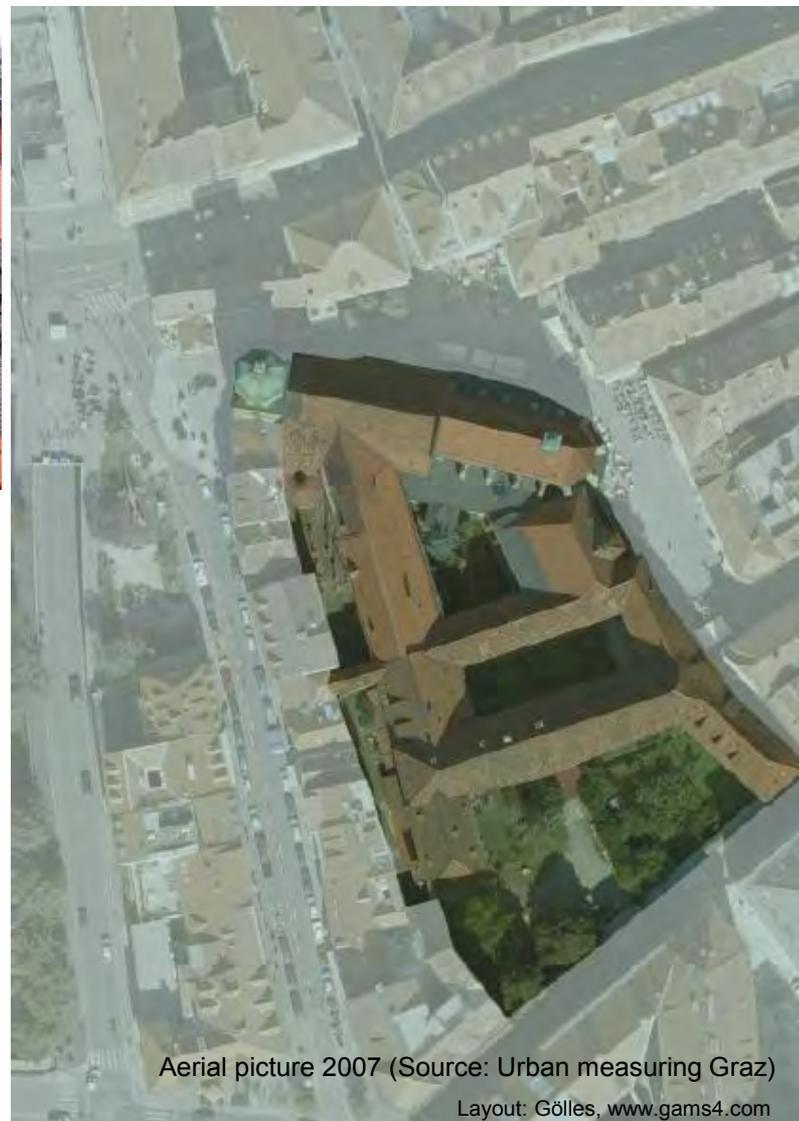
# Location

## Franciscan Monastery Graz

Typical pitched roof shape of the monastery and other historic buildings in Graz (Source: Franciscans, Graz)

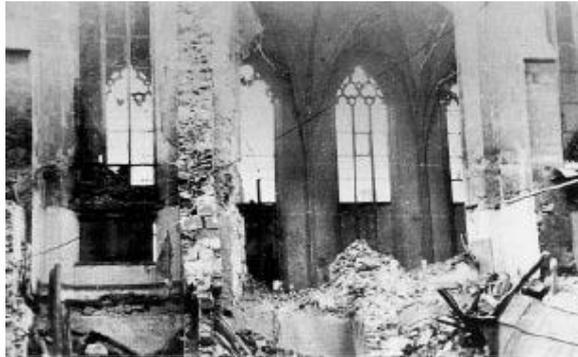


Plan of the building stages - main parts from 1250 to 1650 (Source: Franciscans, Graz)



Aerial picture 2007 (Source: Urban measuring Graz)

Layout: Göllés, www.gams4.com



Picture from: Walter Brunner „Bombs in Graz“



Watercolour of L. Kuwassegg, 1837



Detail from the copper engraving of Lorenz de Sype and Wenzel Hollar, ca. 1630

1239: First mention of the „Murkloster“ in Graz in a legal document

1515: Takeover of the monastery by the Franciscans

1999: Historic city of Graz became UNESCO world heritage



„Graffiti“ around 1670



Picture: Karin Haas-Trummer

# Place of Welcome

### CONFERENCE CENTRE

Vorträge, Symposium, Sitzungen...  
(Räume bereits saniert)  
→ Zugang über  
Franziskanerplatz-Kreuzhof

### MONASTERY HOSTEL

Herberge in zu sanierendem alten  
Klosterzellentrakt (im nördl. Westtrakt  
2.OG)  
→ Zugang über Franziskanerplatz-  
Kreuzgang Westtrakt und Kreuzgang-  
Nordtrakt

### YOUTH

Kultursaal Doppelnutzung (Umbau und  
Sanierung) und zu adaptierende  
Jugendprojekträume: Begegnungsräu-  
me, Matratzenlager  
→ Zugang über Kreuzgang

### CULTURE

Kultursaal und angrenzende Räume:  
Pflege des kulturellen Schaffens im  
Kloster (Förderung Architektur, Bild-  
hauerei, Malerei, Musik...)  
→ Zugang über Kreuzgang

### LIBRARY, LITERATURE

Bestehende wertvolle Bibliothek,  
Bibliothek-Neubau, Ausstellung |  
Empfang im zu sanierenden Festsaal,  
Forschungszentrum im nördl. Westtrakt  
1.OG  
→ Zugang über Albrechtgasse: entlang  
alter Stadtmauer bzw. Kreuzhof

### MONASTERY CREATIVE

→ Zugang über Neutorgasse-  
Kirche und Franziskanerplatz-  
Kreuzgang

### SACRED ROOMS

Gebäudeanlage mit Kirche, Jakobi-  
kapelle, Oratorium, Kreuzhof, Kreuz-  
gang · „Ort der Stille“  
→ Zugang über Neutorgasse-Kirche  
und Franziskanerplatz-Kreuzgang

### FREE MEALS, NIGHT SHELTER

Raumumbau mit flexibler Doppel-  
nutzung neben Haupteingang  
und Pforte: Umbau  
→ Zugang über Franziskanerplatz

### MONASTERY GATE SHOP and INFORMATION

Umbau der Pforte im flexiblen Bereich:  
Sekretariat, „Schnelle Seelsorge“,  
Empfang, Information  
→ Zugang über Franziskanerplatz

### SOCIAL WELFARE

Soziale Einrichtung z.B. für Behinderte  
oder Kinder, Ärzteberatungszentrum,  
Integrationswerkstätte, kultur-  
übergreifende Einrichtung, Beratung  
im Neubau Albrechtgasse  
→ Zugang über Albrechtgasse

### LIVING HISTORY

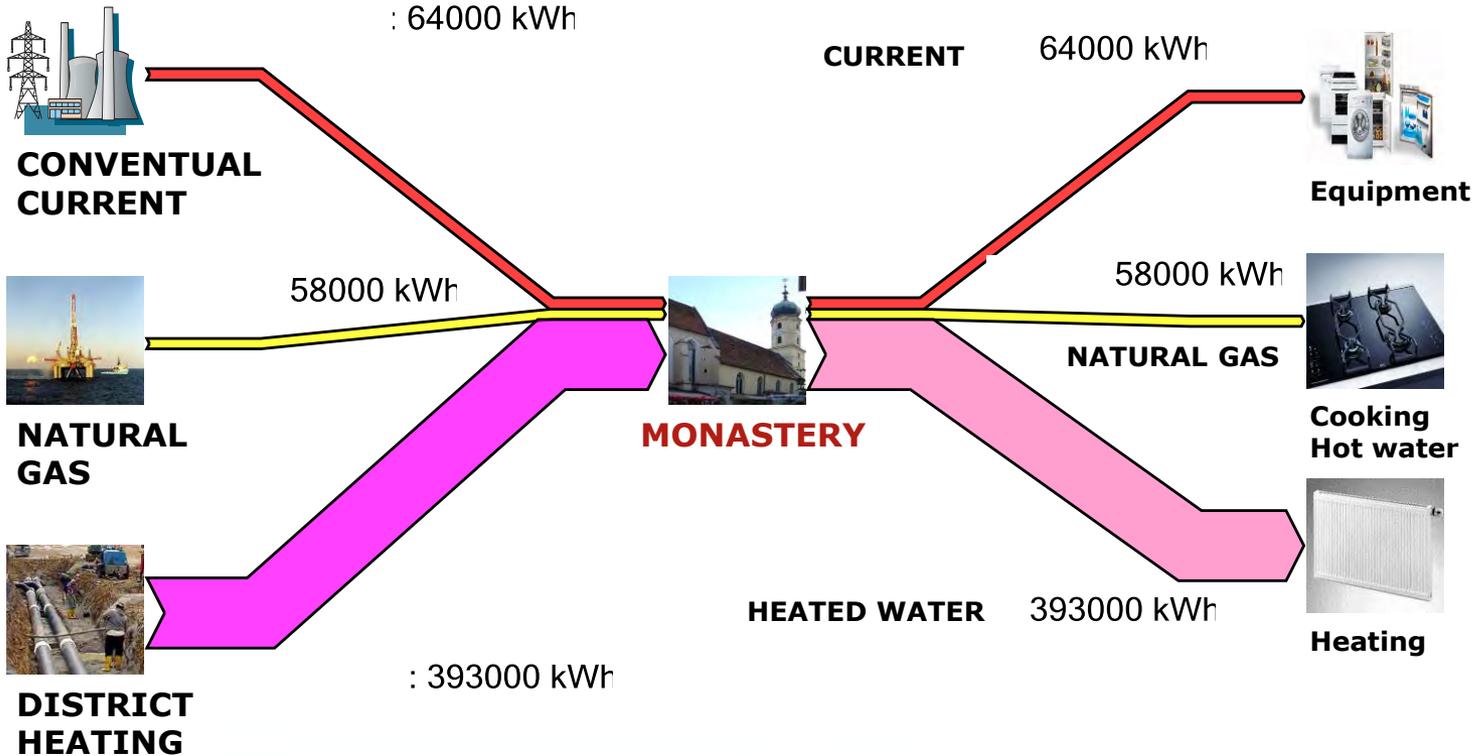
Anlage mit hist. Stadtgraben, Turm  
und zu sanierenden hist. wertvollen  
Klostergebäude - moderne Architektur.  
→ Zugang über Franziskanerplatz  
Kreuzgang bzw. Albrechtgasse



Source: Arch. DI Lingenhölle and  
Franciscans Graz, 2001 to 2007

## Energy flow chart

Situation in 2008



Source: Güssing Energy Technologies GmbH

## Zero Energy/Zero Emission Building

### 1. Step: **Energy efficiency measures**

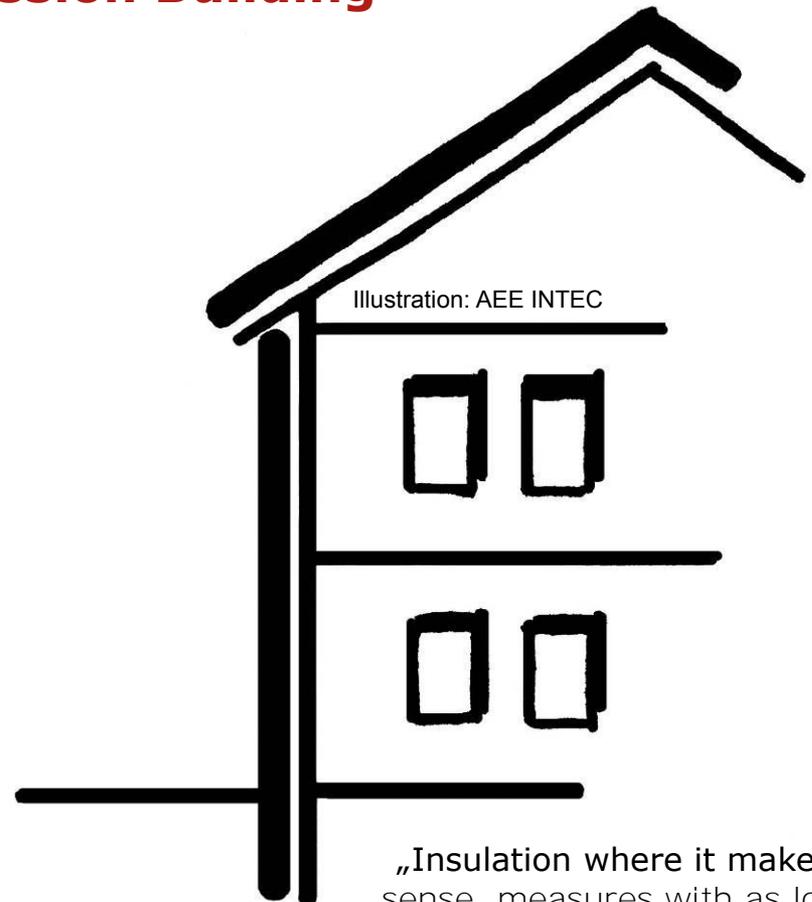
- Desiccation of the walls
- Insulation where possible
- Rooms used as buffers
- Renovation of box-type windows
- „Warming“ tints

*Savings after the first step up to 25%!*

### 2. Step: **Solar thermal energy use**

- For hot water and heating
- Component heating (to dry and pre-temperate the walls)
- Low temperature heating
- Supply of adjacent buildings

*Savings after the second step up to 50%!*



„Insulation where it makes sense, measures with as low technical input as possible“

## Zero Energy/Zero Emission Building

### 3. Step: **Heating system, heat pump**

- Solar- and water-coupled heat pump
- Annual use efficiency > 5
- 3 storage tanks with together 15 m<sup>3</sup>
- Central heating room *inside* the building
- Two pipes distribution (flow/return flow)
- Three decentralized tiled stoves

*Savings after the third step up to 92%!*

### 4. Step: **Power generation**

- Photovoltaics (at buildings)
- Or green power investments
- Or green power (wind, PV) purchase

*Rest: Around 8% of the original consumption!*

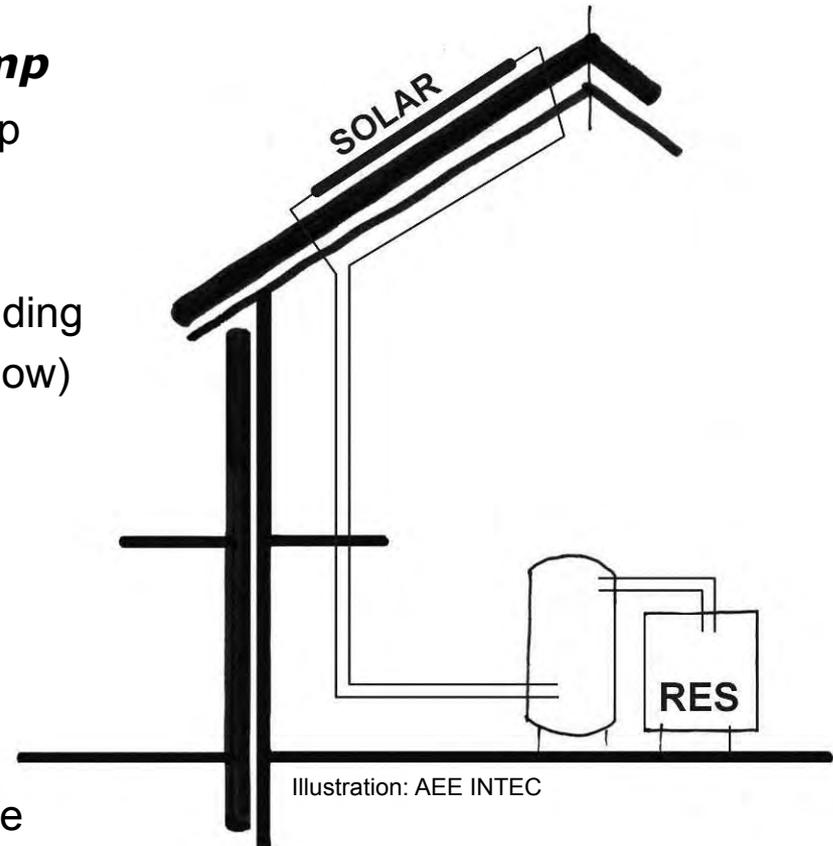
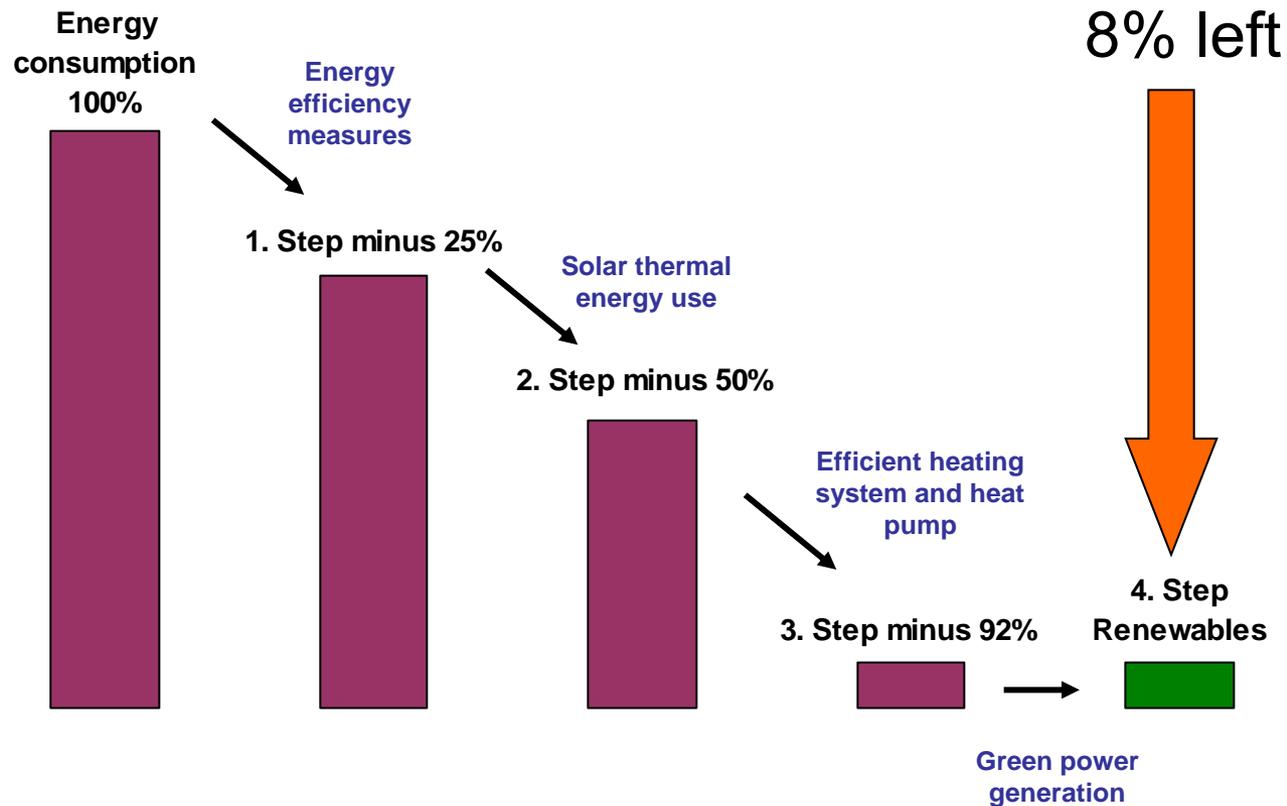


Illustration: AEE INTEC

## Zero Energy/Zero Emission Building



Be praised, my Lord, through all  
your creatures,  
especially through my lord  
Brother Sun,  
who brings the day; and you give  
light through him.  
And he is beautiful and radiant in  
all his splendor!  
Of you, Most High, he bears the  
likeness.

Source: Out of the „Canticle of  
the sun“, Francis of Assisi, 1224



Picture: Gölles, [www.gams4.com](http://www.gams4.com)

# Solar thermal – first plans

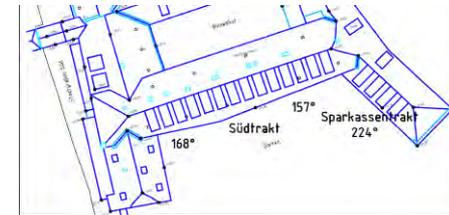
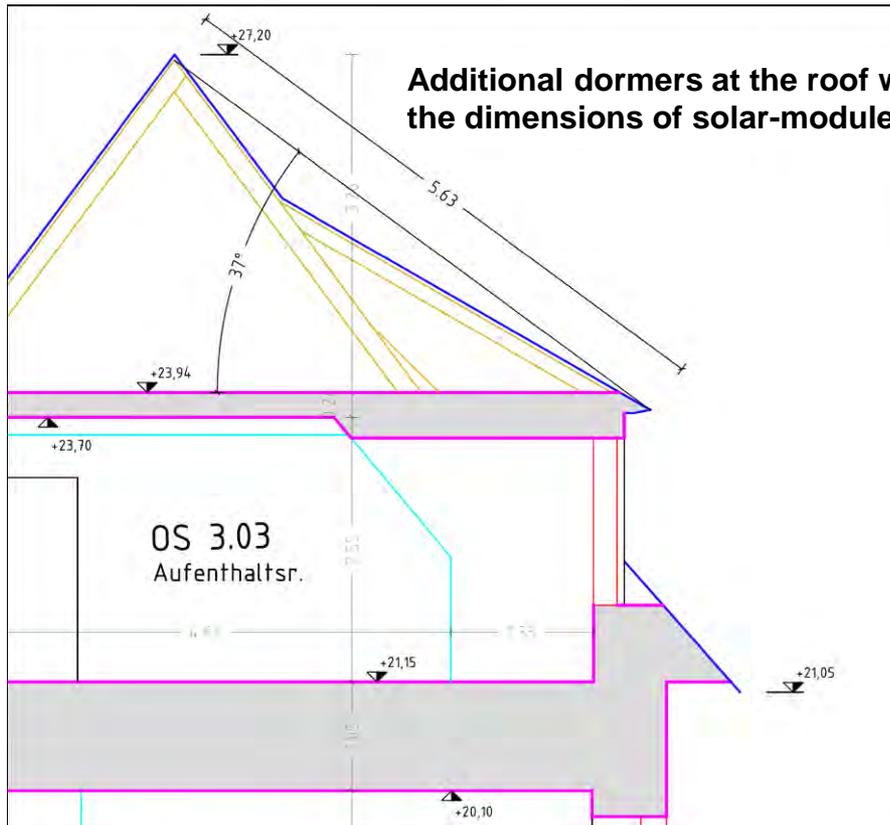
Franciscan Monastery Graz

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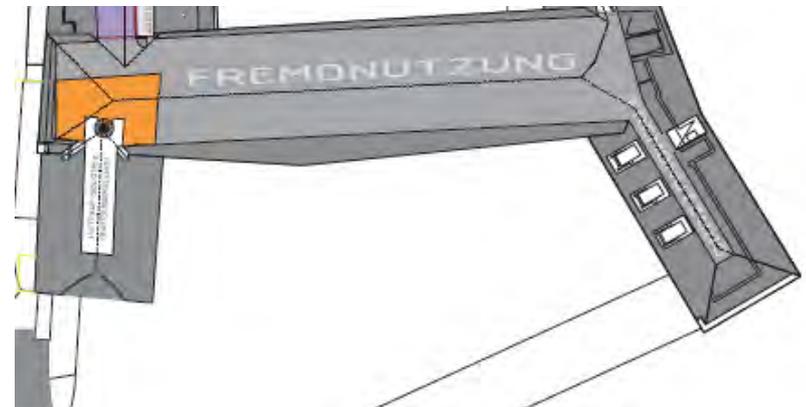


picture: Gölles, [www.gams4.com](http://www.gams4.com)

### Energy gaining roof of the South wing



Source: Güssing Energy Technologies GmbH



Existing topview: Arch. DI Michael Lingenhölle and Franciscans, Graz

# Solar thermal system

Franciscan Monastery Graz



New energy for old buildings



## Implemented solar thermal system



Pictures: AEE INTEC

# During construction works...

Franciscan Monastery Graz



Numbering the slabs in the cloister

Restoration of old wooden doors



Excavation work in the ground floor and...



Mounting the component heating into brickwall

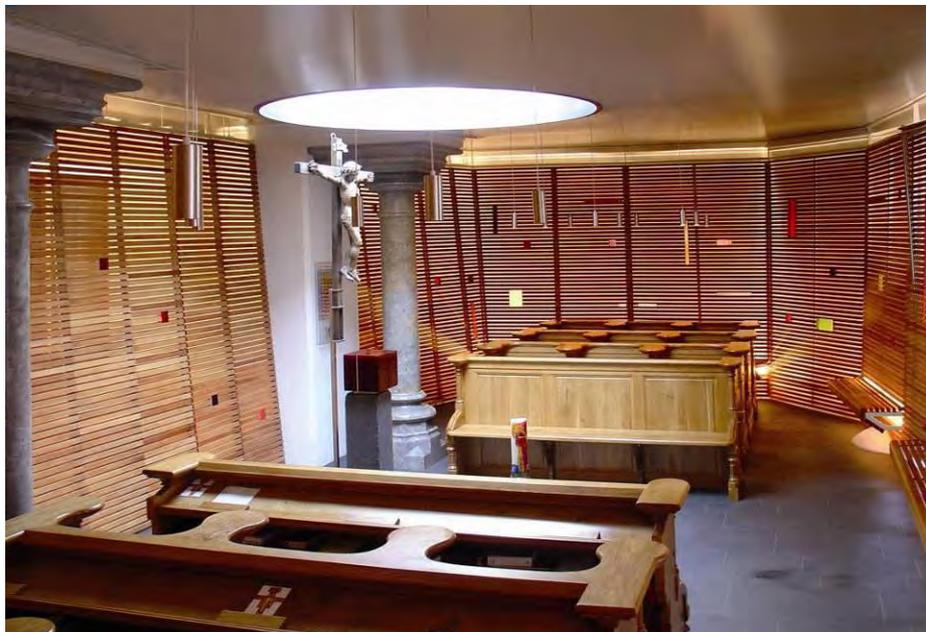
Start of the 2<sup>nd</sup> part of the renovation works:  
February 2010



...in the room, where the storage tanks will be placed

# Already finished parts...

Franciscan Monastery Graz



Prayer room (Source: Franciscans, Graz)



Access to the organ gallery (Source: Franciscans, Graz)



Hostel rooms (Source: AEE INTEC)



Room of the priest (Source: AEE INTEC)

# Already finished parts...

Franciscan Monastery Graz

New energy for old buildings



New access door



Roof extension



Refurbished wine cellar



New seminar room



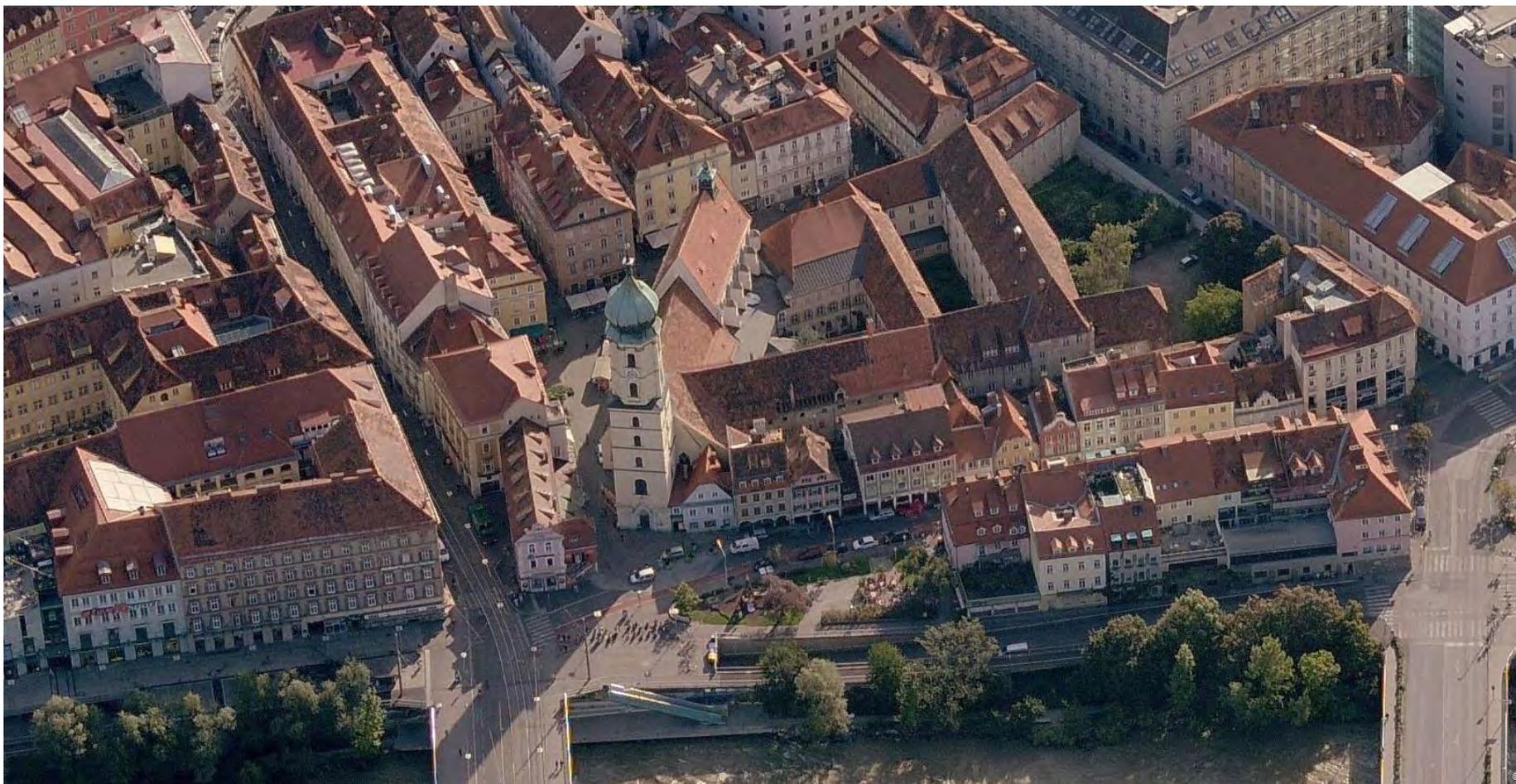
New entrance area

***The energy performance certificate was calculated as good as possible for such historic buildings with the following results:***

	before retrofit	after retrofit
Gross floor area	3,590 m <sup>2</sup>	3,585 m <sup>2</sup>
A/V-ratio	0.53 /m	0.36 /m
Energy performance	198 kWh/m <sup>2</sup> a	85.38 kWh/m <sup>2</sup> a
Energy demand heating	711,307 kWh	329,744 kWh
Heating load	256,4 kW	142,4 kW

*Table: Values calculated with HDT = 3,588 Kd and min. outside temperature –10,5 °C before and after retrofit (Source: TB Köstenbauer und Sixl GmbH)*

*Please note: a detailed calculation method for historic buildings is still missing.*



Thank you for your attention!