Decision guidance tool: Website draft

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A best-practice database & decision guidance tool to exemplary energy efficient interventions in historic buildings
Monumental school NMS Hötting in Innsbruck

Architect Franz Baumann

Planed and built 1929/30
Monumental school NMS Hötting in Innsbruck

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PV array on monumental school in Innsbruck
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External walls

Windows

Roof

Basement

Heating system

Ventilation system

Solar energy
Decision guidance tool: Website draft

External walls
Windows
Roof
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Solar energy
Decision tool

Can renewables be installed on the roof?

YES  NO
Decision tool

Can renewables be installed on the roof?

YES  NO
Decision tool

Can renewables be installed on the roof?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

Is the facade available for renewables?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>
## Decision tool

- **Can renewables be installed on the roof?**
  - [ ] YES
  - [x] NO

- **Is the facade available for renewables?**
  - [ ] YES
  - [x] NO

- **Would the land be available for renewables?**
  - [ ] YES
  - [x] NO

| Free-standing renewables & renewables integrated into landscape | Participation models of renewable energies via power network |
Decision tool

Can renewables be installed on the roof?

YES  NO
Decision tool

Can renewables be installed on the roof?

- YES
- NO

Roof-integrated

Roof-non-integrated
Decision tool

Can renewables be installed on the roof?

- YES
- NO

Roof-integrated

Roof-non-integrated
Renovating Historic Buildings Towards Zero Energy

www.iea-shc.org

Working Group Solar-Integration

Information for selection of solutions / Step 1
Monumental School (NMS Hötting), Innsbruck, Austria (UIBK)

What is the solution?
Info like picture & schema & technology & installed power & location & building type.
Source of additional information: Article www.shc-worldbook

A PV-system with a size of around 10 by 3 meters with a peak power of 5 kW was installed at the south facing roof of the Monumental School (NMS Hötting), Innsbruck, Austria – a historically protected building in spring of 2014.

The PV-array is built from 20 pieces of photovoltaic modules "SOLARWATT Blue P60 250Wp", an inverter "ZOGER Pico 5.5" and "TIGO - energy control, monitoring and safety system" including sensors for module temperature and global radiation.

Figure 1: PV-array on the south facing roof, reversible mounting by the air roof fast-clamps.

Figure 1: View from the south at a distance of around 60 m
Decision guidance tool: Website draft

External walls

Windows

Roof

Basement

Heating system

Ventilation system

Solar energy
Selection through map

For the alpine space
With possibility to SKIP
Connection with building typology

- Blockbau (Architype Blockbau)
- Natural stone (Architype Innsalzachbauerweise)
- Decorated Wood (Architype Bundwerkbau)
- Wood and natural stone (Architype Salzburger Flachgauhof)
Connection with building typology

- ✔ Blockbau (Architype Blockbau)
- □ Decorated Wood (Architype Bundwerkbau)
- □ Natural stone (Architype Innsalzachbauweise)
- □ Wood and natural stone (Architype Salzburger Flachgauhof)
Which wall do you have?

- Solid timber wall
- Stone/Brick/Concrete masonry wall
- Concrete/Steel frame Wall/Timber frame
- Rammed Earth Wall
- Half Timber Framing
- Cavity Wall
Which wall do you have?

- Solid timber wall
- Stone/Brick/Concrete masonry wall
- Concrete/Steel frame Wall/Timber frame
- Rammed Earth Wall
- Half Timber Framing
- Cavity Wall

Protection of external?

- YES for appearance (frescos, not plastered wood/bricks)
- YES for proportions (volumes)
- NO
Which wall do you have?

- Solid timber wall
- Stone/Brick/Concrete masonry wall
- Concrete/Steel frame Wall/Timber frame
- Rammed Earth Wall
- Half Timber Framing
- Cavity Wall

Protection of external?

- YES for appearance (frescos, not plastered wood/bricks)
- YES for proportions (volumes)
- NO

Do you have a strategy for driving rain protection?

- YES
- NO
**Which wall do you have?**

<table>
<thead>
<tr>
<th>Wall Type</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid timber wall</td>
<td><img src="image1.jpg" alt="Solid timber wall image" /></td>
</tr>
<tr>
<td>Stone/Brick/Concrete masonry wall</td>
<td><img src="image2.jpg" alt="Stone/Brick/Concrete masonry wall image" /></td>
</tr>
<tr>
<td>Concrete/Steel frame Wall/Timber frame</td>
<td><img src="image3.jpg" alt="Concrete/Steel frame Wall/Timber frame image" /></td>
</tr>
<tr>
<td>Rammed Earth Wall</td>
<td><img src="image4.jpg" alt="Rammed Earth Wall image" /></td>
</tr>
<tr>
<td>Half Timber Framing</td>
<td><img src="image5.jpg" alt="Half Timber Framing image" /></td>
</tr>
<tr>
<td>Cavity Wall</td>
<td><img src="image6.jpg" alt="Cavity Wall image" /></td>
</tr>
</tbody>
</table>

**Protection of external?**
- **YES for appearance** (frescos, not plastered wood/bricks)
- **YES for proportions** (volumes)
- **NO**

**Do you have a strategy for driving rain protection?**
- **YES**
- **NO**

**Protection of internal?**
- **YES for appearance**
- **YES for proportions**
- **NO**
### PRINCIPLES

<table>
<thead>
<tr>
<th>Internal insulation</th>
<th>Internal insulation</th>
<th>External removable facade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capillary active</td>
<td>Condensate limiting</td>
<td></td>
</tr>
</tbody>
</table>

### EXAMPLES

<table>
<thead>
<tr>
<th>Dense Wood fiber</th>
<th>Calcium Silicate</th>
<th>Mineral wool</th>
<th>Facade with cellulose insulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal insulation Capillary active</td>
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<td>Internal insulation Condensate limiting</td>
<td>External removable facade</td>
</tr>
</tbody>
</table>

See also solutions for WINDOWS
REMOVABLE EXTERNAL INSULATED FACADE

What is the solution?

The solution is a removable external insulated façade inclusive windows. The insulation is made of blown cellulose. The façade is prefabricated, also the windows are assembled in the factory. The connection is ensured by steel console mounted on the existing wall and a steel counter piece on the new façade. A wooden distance beam ensures the positioning of the façade although irregularity of the existing wall. The existing façade is measured with a laser. Some details can be finished in the building site, such as the adjustment layer in the window reveal and plaster layer.

Why does it work?

This solution gives the possibility to refurbish (with energy improvement) the existing façade of buildings with small building site's effort and high quality. The solution fits to historical building because it is reversible. The thermal bridges (window-wall) are also optimized, thanks to the prefabrication. The moisture safety is ensured by the plates of the façade.

Description of the context:

The building where the solution was built is an old not listed farmer building. The wish of the building owner was to refurbish the building energetically. The old façade hasn't particular historical value apart from one painting. This was covered with the façade and in future will be available again.

Pros and Cons:

The biggest pros are the small building site's effort and the high quality reached thanks to the prefabrication. One con is the covering of the existing façade, especially in case of historical value of it. The change of the outside volume of the building can also be considered as a con for the conservation compatibility.

Discover more about the building where this solution was built in!

See also solutions for WINDOWS

PRINCIPLES

Internal insulation

Capillary active

EXAMPLES

Dense Wood fiber

Internal insulation

Capillary active

Facade with cellulose insulation

External removable façade

Calcium Silicate
Removable Facade WALLS

Active Overflow HVAC

Internal insulation WALLS

Integrated PV SOLAR

Adding Glass from inside WINDOWS
Summary:

- Define the renovation measure (PROBLEM)
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- Associating the archetypes & GUIDE users to the appropriate renovation approach to find SOLUTION
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- Define the renovation measure (PROBLEM)
- Associating the architypes & GUIDE users to the appropriate renovation approach to find SOLUTION
- DEMONSTRATE on real cases
- „Inspire users to renovate, not to rebuilt, by demonstrating real solutions“
HiBER ATLAS platform

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