Retrofitting for the energy revolution, one step at a time

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Passive House Institute, Germany
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Agenda

1. EuroPHit project background
2. Energy retrofits
3. Case studies and Observers
4. Financing
1. EuroPHit project background

EU 2020 objective:
All new/refurbished buildings as NZEBs (Nearly Zero Energy Buildings)
Reducing barriers

Retrofitting challenges

- competence
- motivation
- financing
- life cycle of existing components
- disturbance of inhabitants

Building stock

Step by step vs. one shot

2. Energy retrofits
IF you do it, do it right!!

Quality renovation...achieved with the Passive House principles

Listed office building, Germany; Photos © Architect Planungsbüro Gruppe 7 GmbH & Co. KG

Elementary school, Czech Republic; Photos © Atrea s.r.o.

Goal: < 25 kWh/m²

Improving the performance of step by step retrofits

EuroPHit is facilitating the transition to Nearly Zero Energy Buildings by developing:

• Overall refurbishment plans
• Energy balance tools
• Step by step certification criteria
• Training materials
• Financial guidelines
• Product design briefs with manufacturers

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Many ways to go step by step

Example: component by component approach

Original state  Insulation  Windows, ventilation, airtightness  Heating system, RES

Example: one facade at a time

Original state  North facade  South facade, windows, ventilation, airtightness  East & west facade, heating system, RES

Products for step by step refurbishment

The right products

EuroPhit supports manufacturers in designing products that aid step by step renovation

Calling for

- Ideas for product suited to step by step retrofitting
- Manufacturers interested in working with EuroPHit on products

We want to hear from you!
3. Case studies and Observers Projects

Concrete examples:
Case studies and Observers

- CS01: Home for the Elderly, County Dublin
- CS02: Secondary School, Galway
- CS03: Hotel, Yabatera
- CS05: Social Housing, Céspedes
- CS06: Social Housing, Leiden
- CS15: Family Home, Tournon-sur-Rhône
- CS08: Therapy Centre, Asturias
- CS16: Single Family Home, Santander
- CS11: Two Schools, Girona
- CS12: Family Home, Schwabach
- CS13: Rehab Workshop, Hammersmith
- CS14: Council Apartment, Block, Portsmouth
Observers projects

Call for observers projects

→ Do you have an old building in need of retrofitting?
→ Do you want to retrofit with a view to energy efficiency?
→ Want to get involved in EuroPHit?

Even if you are only planning to make a single upgrade on the way to a step by step renovation, EuroPHit could help you.

We are interested in your experiences!
Contact us to get involved!

5. Financing
Passive House Planning Package
Each case study will be analysed with a new version of PHPP allowing parallel calculation of variants.

Insulation, improving airtightness, eliminating thermal bridges, replacing windows etc. will be evaluated based on resulting energy savings and profitability.

PHPP V9 – what is to come next?

Parametric studies & economic feasibility
→ direct comparison of different components
→ long term plan for EnerPHit retrofit

Results:
<table>
<thead>
<tr>
<th></th>
<th>Units</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual heating demand</td>
<td>MWh/Y</td>
<td>13.8</td>
<td>13.7</td>
<td>20.4</td>
<td>22.6</td>
</tr>
<tr>
<td>Overall specific space cooling demand</td>
<td>MWh/m²</td>
<td>10.0</td>
<td>51.9</td>
<td>19.3</td>
<td>10.0</td>
</tr>
<tr>
<td>Frequency of overheating</td>
<td>%</td>
<td>3.3</td>
<td>0.3</td>
<td>1.0</td>
<td>1.1</td>
</tr>
<tr>
<td>Certified as Passive House?</td>
<td>yes/no</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
</tbody>
</table>

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LCA (Life cycle cost analysis): Comparison of renovation projects / variants

- cash value of energy consumption costs (for 20 years, end energy: 0.07 €/kWh)
- cash value of maintenance (costs for 20 years)
- cash value of EE-investment minus ‘anyway’ costs minus residual value (20 years)

Period of consideration: 20 years, interest rate: 3%, EndEnergy_heating: 0.07 €, EndEnergy_electricity: 0.22 €

<table>
<thead>
<tr>
<th></th>
<th>Present Value of Investment Costs (–residual –anyway costs) [€/m²] (20 yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>typical 'old building'</td>
<td></td>
</tr>
<tr>
<td>project 1 (pilot)</td>
<td>325</td>
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<tr>
<td>project 2 (lessons learned)</td>
<td>189</td>
</tr>
<tr>
<td>project 2 cost optimized (EnerPHit)</td>
<td>16</td>
</tr>
<tr>
<td>low-e-building (EnerPHit)</td>
<td>81</td>
</tr>
</tbody>
</table>

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Proper financing

Energy retrofits pay off!!! …still, finding appropriate financing for the investment needed is key.

EuroPHit is providing financial institutes with the information they need to offer appropriate financial products for step by step retrofits.

Financial surveys

Financial workshops across the EU

Help guide EuroPHit's work today by completing the online financial survey for construction project managers, surveyors, financiers, and other stakeholders.

Financial guidelines for energy efficient refurbishment

www.europhit.eu

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Getting involved

Join the EuroPHit network free of charge!

→ become part of a pool of competence on energy retrofitting
→ access to the EuroPHit Forum
→ be kept up to date on project progress and key project outcomes

Or help out by

→ filling out a financial survey
→ joining with an observer project
→ letting us know about product ideas and manufacturer interest

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19th INTERNATIONAL PASSIVE HOUSE CONFERENCE 2015

Leipzig | Germany
17 - 18 April 2015
with exhibition and framework programme

Including special sessions on step by step retrofits, EuroPHit project results, and more!

www.passivehouseconference.org
With step by step retrofit projects, EnerPHit refurbs and Passive House buildings taking part throughout the 11 partner countries and beyond!

www.passivehouse-database.org