

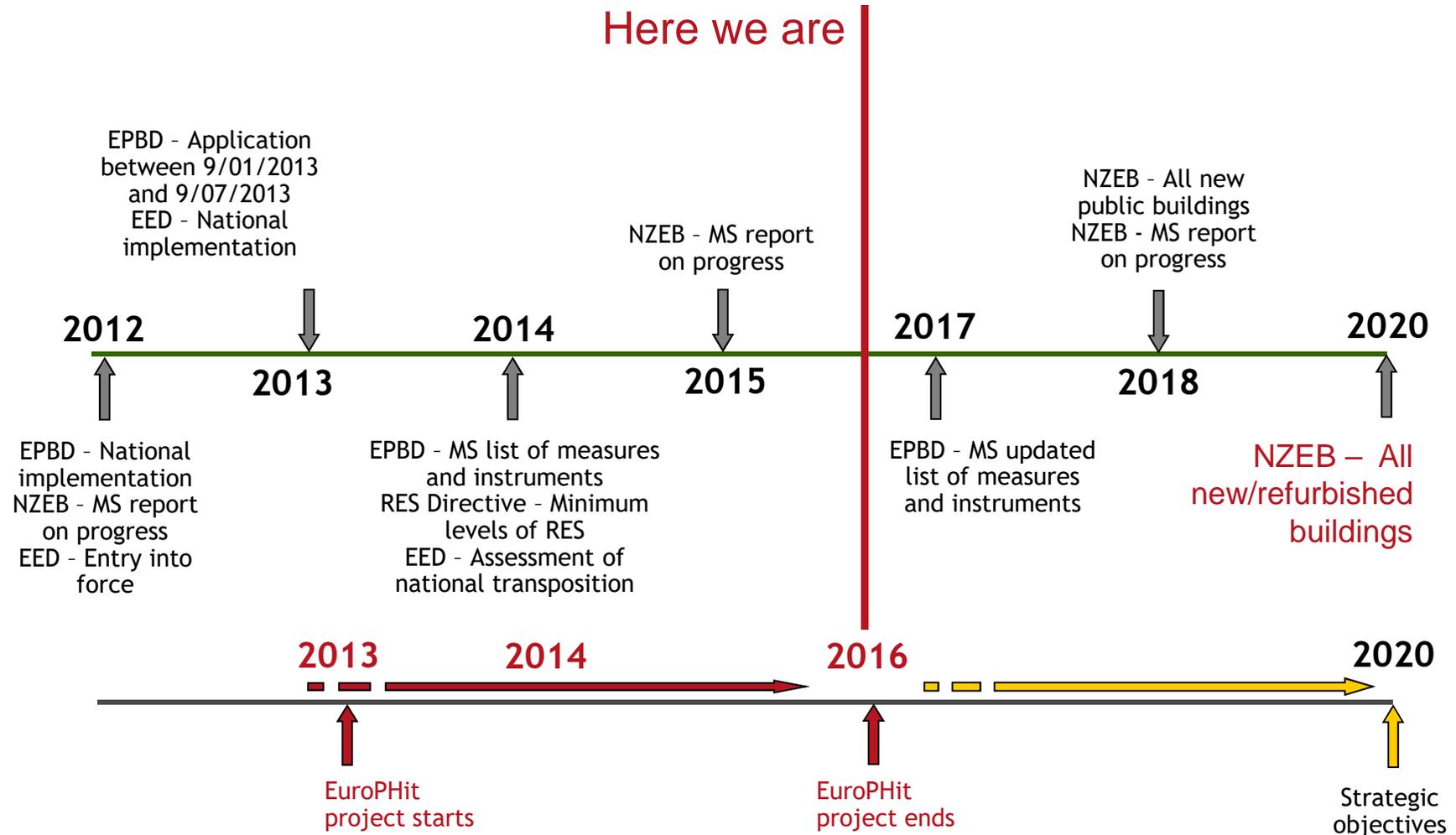
EuroPHit

**Deep retrofits and how to do it right,
even step by step**

Jan Steiger / Passive House Institute



The policy background



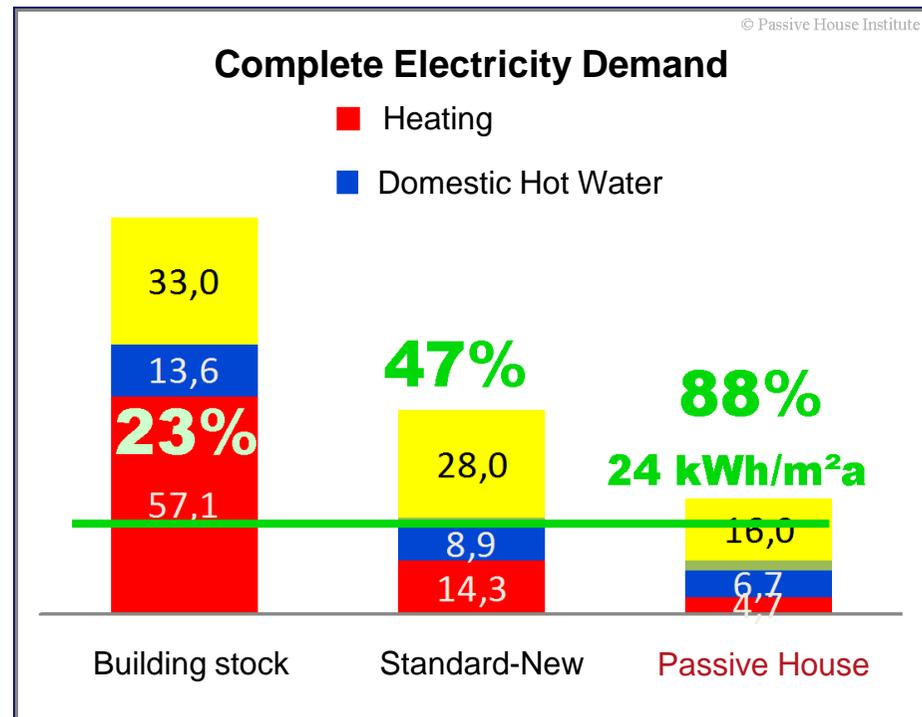
To allow future energy supply with RES

EuroPHit



Zaman / GAG Ludwigshafen:
16m² PV per 80m² dwelling

Only in a highly efficient building can the supply be (almost) completely covered by RES



Co-funded by the Intelligent Energy Europe Programme of the European Union



Retrofit goal: Reduce consumption!

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how to get there?

High efficiency

EU's 2020 objective:

All new/refurbished buildings as
NZEBs (Nearly Zero Energy Buildings)

Low efficiency



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Programme of the European Union



Governmental offices - Expost in Bozen (IT)

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Before



After refurbishment 12 kWh/(m²a)



Client: Provincia Autonoma di Bolzano-Alto Adige, IT

Architect: Michael Tribus Architecture, IT

Completion: 2006



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Listed office building – Becker in Rimbach (DE)

EuroPHit

Before



After refurbishment: 20 kWh/(m²a)



Client: Grundstücksgesellschaft Schlossstr. 9 Becker u. Martin GbR, DE

Architect: Peter Hinz, Planungsgruppe 7, DE

Completion: 2011



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Gymnasium Baesweiler - Energetische Sanierung (DE)

EuroPHit

Before



After refurbishment 15 kWh/(m²a)



Client: City of Baesweiler, DE

Architect: Rongen Architekten, DE

Completion: 2010

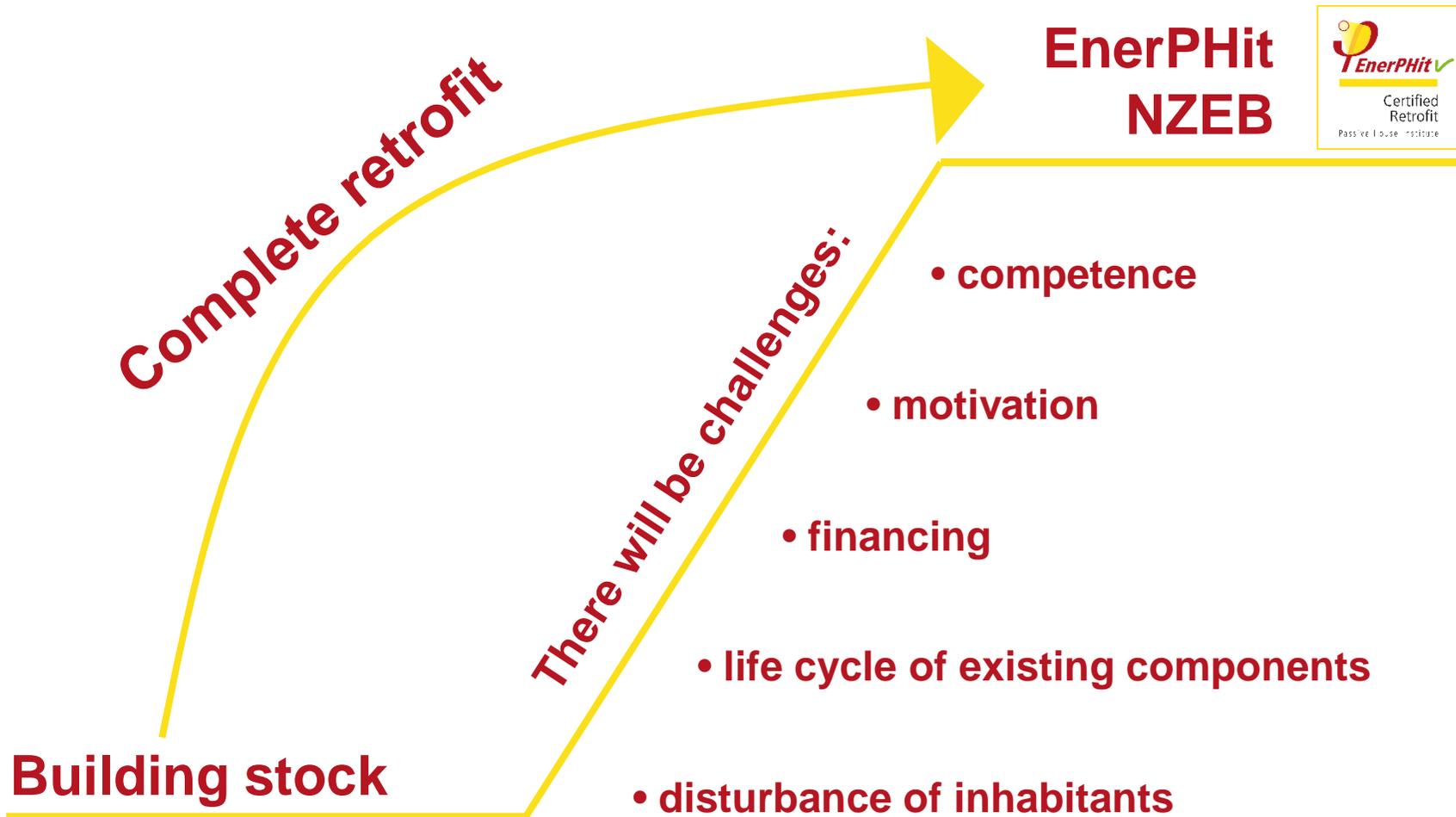


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All at once – we know it works!

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But: very few complete retrofits!

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According to the Bundesinstitut für Bau-, Stadt- und Raumforschung (BBSR), in 2014 in Germany

- **70% of all investments into refurbishments**
- **Of these 85% were retrofit measures only**
- **Only 6% were considered complete retrofits!**



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We need to improve step-by-step retrofit processes

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Overall refurbishment plan

Building stock

• criteria and software tool WP 2

step

• pilot projects WP 3

by

• financing instruments WP 4

step

• suitable products WP 5

Retrofit

• dissemination WP 6

EnerPHit
+ RES

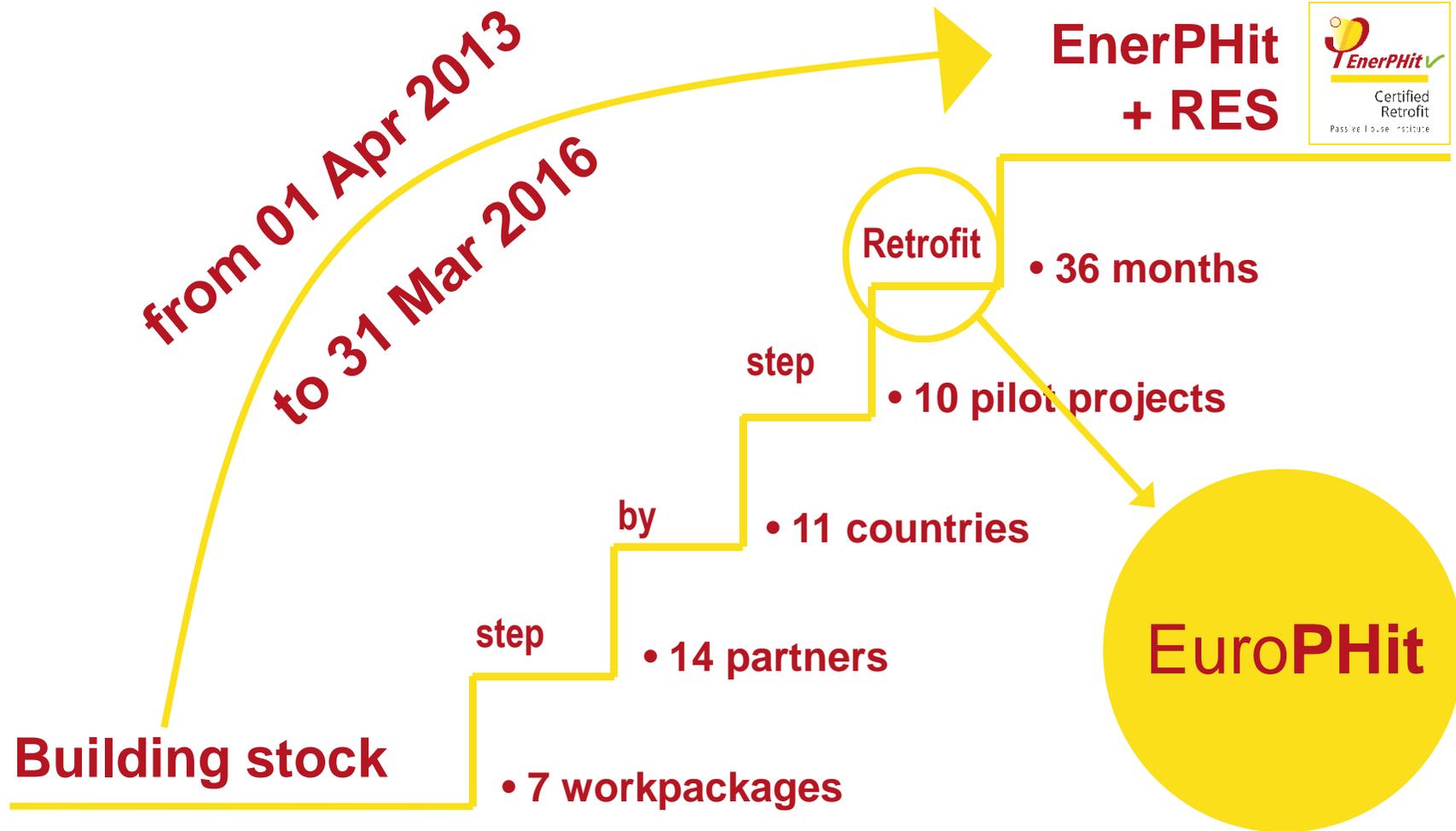


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Start NOW!

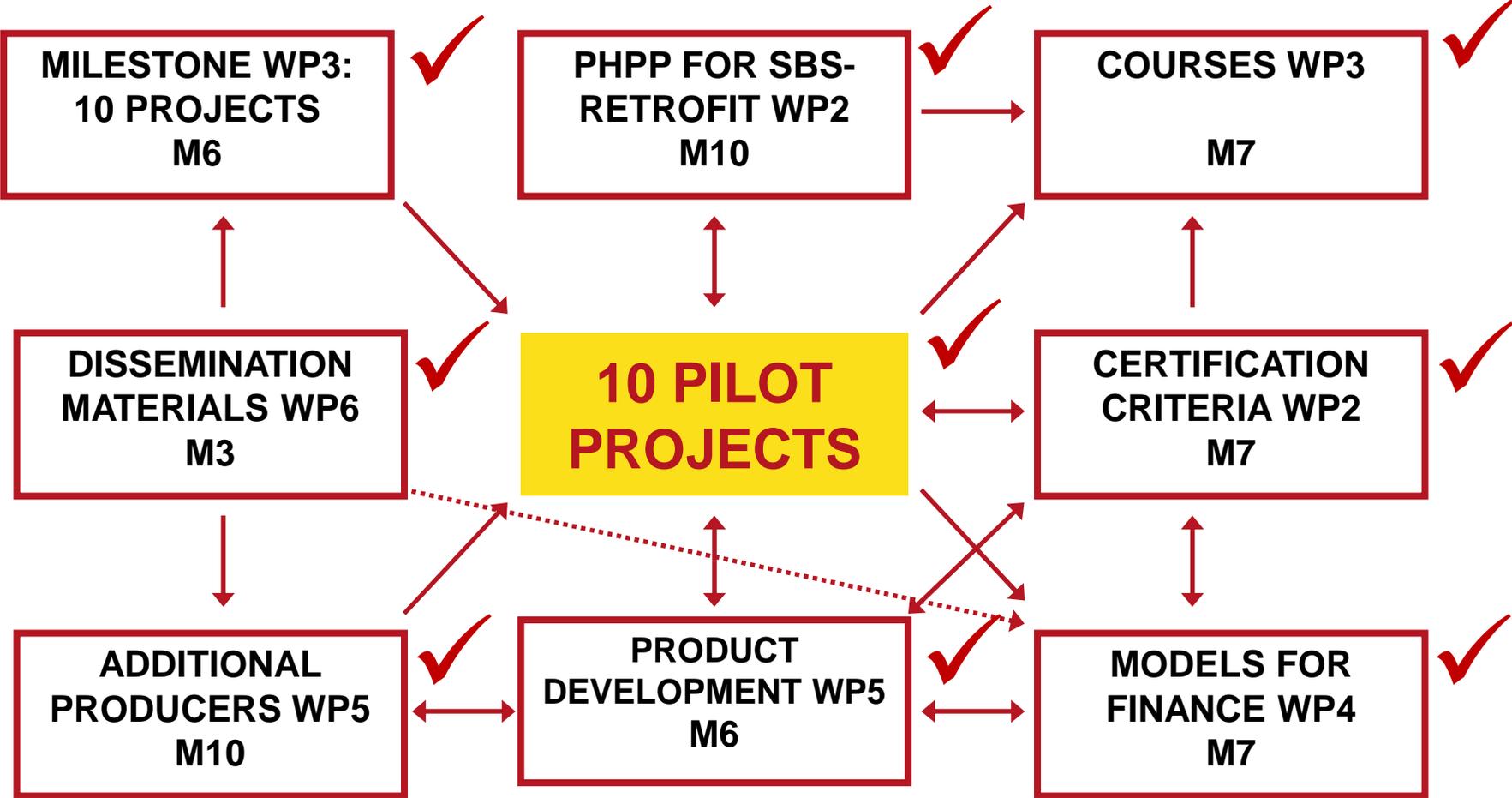
EuroPHit



Co-funded by the Intelligent Energy Europe Programme of the European Union



Project structure



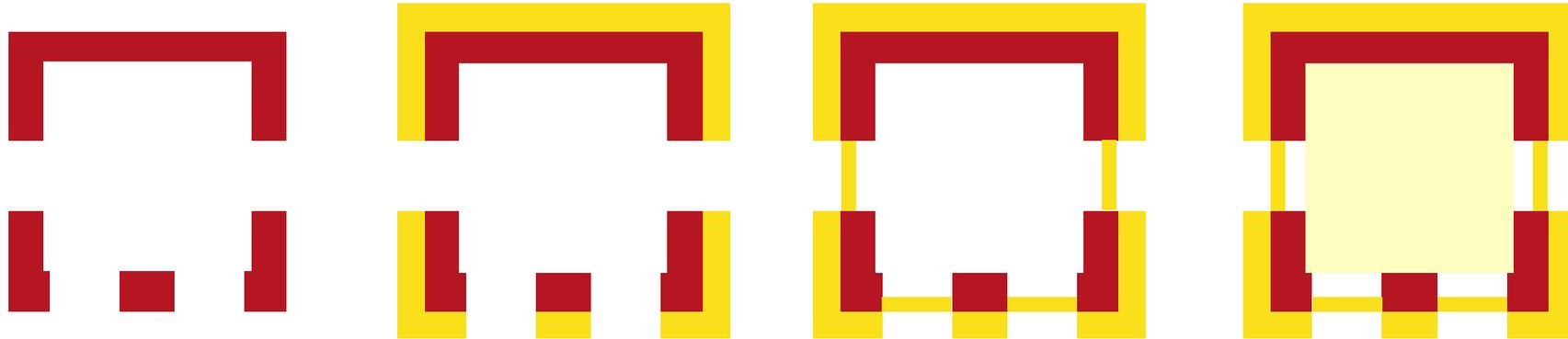
Expected results:

- **Criteria for step-by-step retrofits ✓**
- **Certificate scheme for step-by-step energy-efficient retrofits ✓**
- **Target group based elaboration / adaptation of key results**
- **Appraisal guideline for energy efficient retrofits including RES**
- **Special financing models and market incentive programmes**
- **Design concepts for future product development**
- **Energy balance tool for the step-by-step energy retrofits ✓**

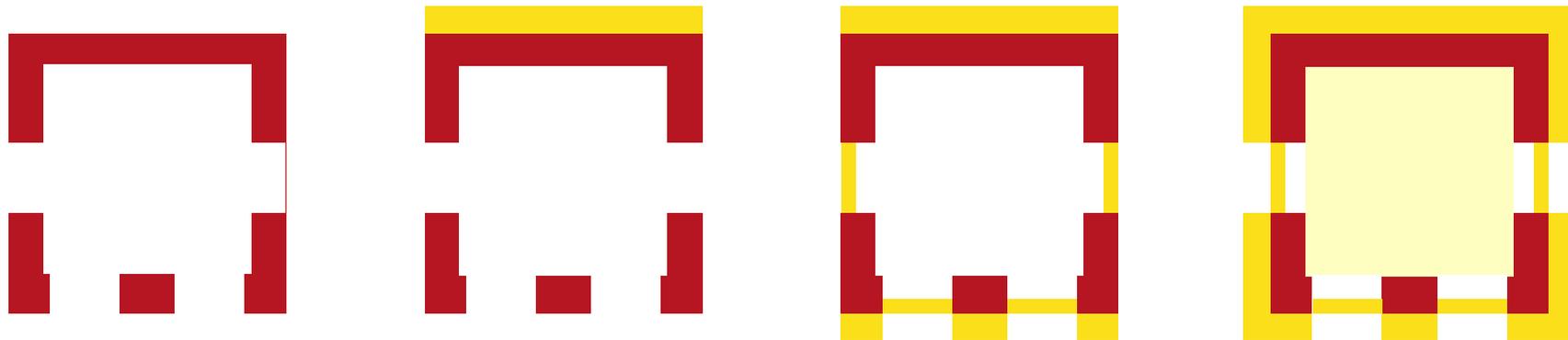


What is a step-by-step retrofit?

1. Components step-by-step

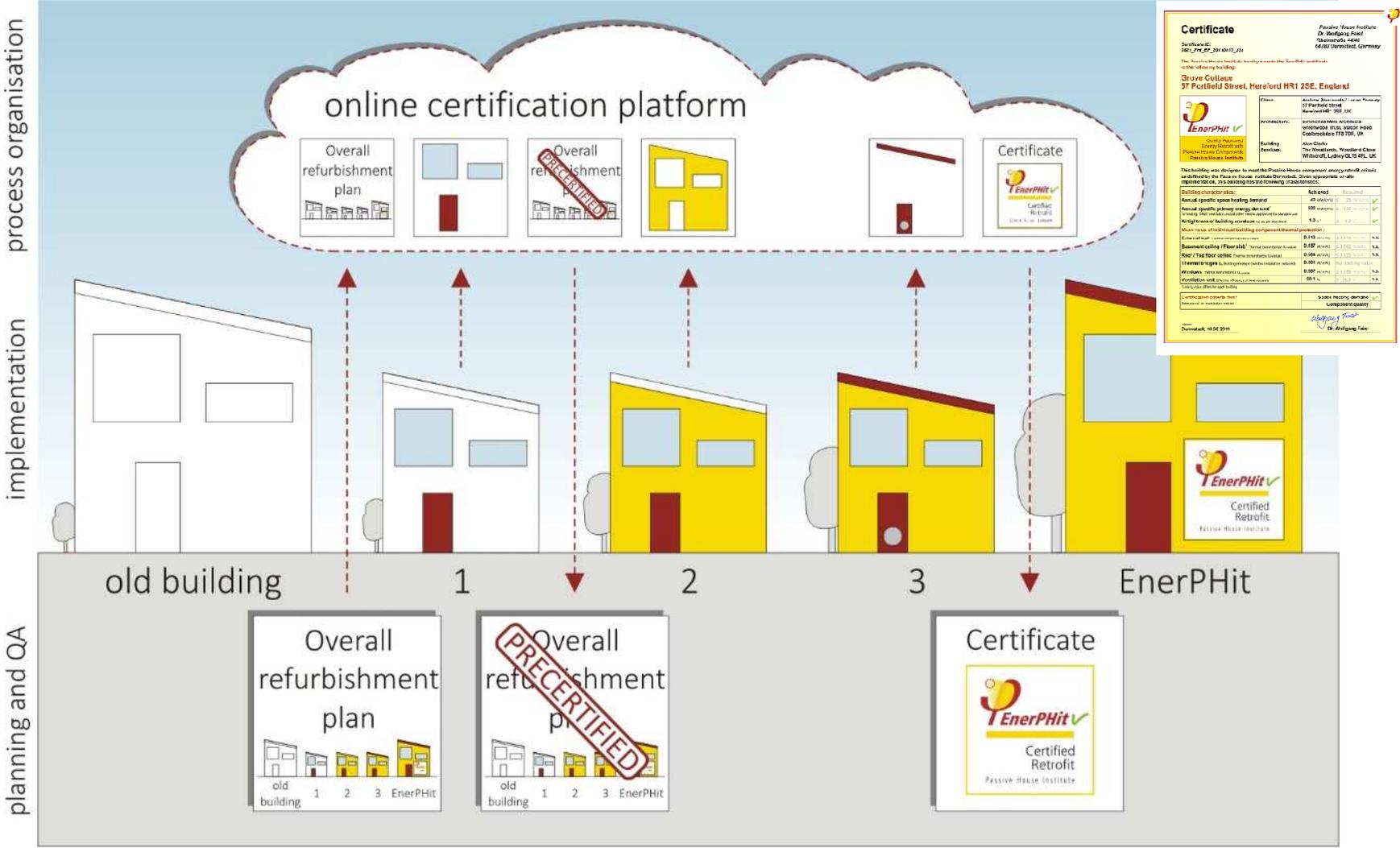


2. Facades / units / parts / whole sections step-by-step



Certification criteria and scheme

EuroPHit

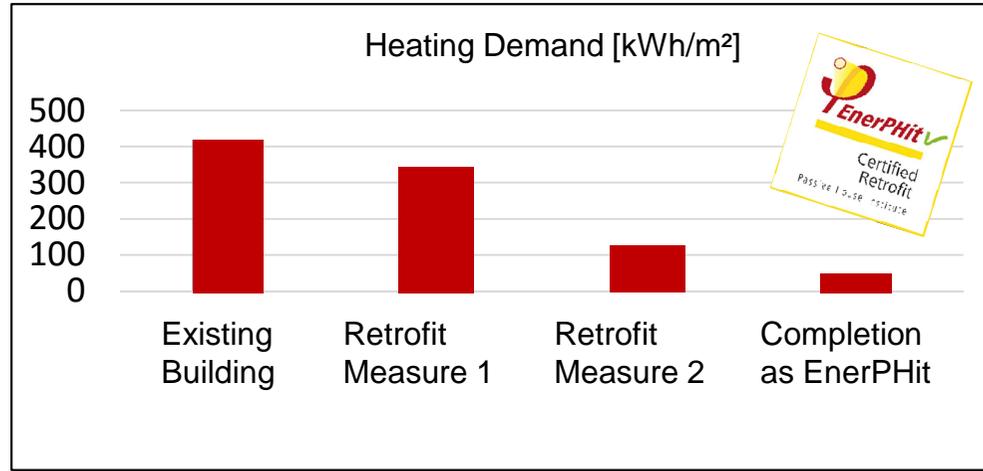


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Energy balance calculation tool and overall retrofit plan

EuroPHit



Das Energiebilanzierungs- und Planungstool

für effiziente Gebäude und Modernisierungen



Variantenberechnung

Passivhaus mit PHPP Version 9.1

Passivhaus-Reihenendhaus / Klima: PHPP-Standard / EBF: 156 m² / Heizen: 61,7 kWh/(m²a) / Übertemperatur: 0,1 % / PER: 13,1 kWh/(m²a)

		aktiv				
		3 Passivhaus mit WP	Bestand	Schlechter Wärmeschutz	Mässiger Wärmeschutz	Passivhaus mit WP + Solarthermie
aktive Variante wählen >>						
Ergebnisse	Einheit	3	1	2	3	4
Heizwärmebedarf	kWh/(m²a)	61,7	418,8	107,1	61,7	11,6
Heizlast	W/m²	36,3	175,1	62,1	36,3	9,5
Kühl- + Entfeuchtungsbedarf	kWh/(m²a)					
Kühllast	W/m²					
Übertemperaturhäufigkeit (> 25 °C)	%	0,1	2,9	1,6	0,1	1,0
PER-Bedarf	kWh/(m²a)	13,1	1131,0	255,9	13,1	33,3
Passivhaus Classic?	ja / nein	nein	nein	nein	nein	nein
Endenergie						
Heizleistung Wärmeerzeuger	kW	8,7	30,3	12,7	8,7	4,5



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Case Study Projects

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- Home for the Elderly, County Dublin
- Secondary School, Galway
- Hotel, Valcanover
- Social Housing, Courcelles
- Social Housing, Liévin
- Family Home, Tourmon-sur-Rhone
- Therapy Centre, Asturias
- Single Family Home, Santander
- Two Schools, Gabrovo
- Family Home, Svartbäcksvägen
- Rehab Workshop, Naestved
- Council Apart. Block, Porto



Base map



www.europhit.eu/projects



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overall refurbishment plans

EuroPHit



EnerPHit verification

Building: Hotel Restaurant Valcanover
Street: _____
Postcode/City: _____
Country: Italy
Building type: Masonry construction
Climate: Porgine
 Altitude of building site (in [m] above sea level): 459

Year of Construction: 1928
Number of dwelling units: 1
Number of Occupants: 37.0
Exterior vol. V_e: 2948.8 m³

Interior temperature winter [C°]: 20.0
Interior temp. summer [C°]: 25.0
Internal heat gains winter [W/m²]: 9.4
IHG summer [W/m²]: 15.38
Spec. capacity [W/K per m² TFA]: 204
Mechanical cooling:

Specific building demands with reference to the treated floor area	Requirements	Fulfilled?
Space heating Annual heating demand	269 kWh/(m²a)	no
Heating load	128 W/m²	-
Space cooling Overall specific space cooling demand	4 kWh/(m²a)	-
Cooling load	13 W/m²	-
Frequency of overheating (> 25 °C)	%	-
Primary Energy Heating, cooling, desalinating, DHW, space heating and auxiliary electricity	868 kWh/(m²a)	no
Specific primary energy reduction through solar electricity	445 kWh/(m²a)	-
Airtightness Pressurization test result n ₅₀	10.0 1/h	no

I confirm that the values given herein have been determined following the PHPP methodology and were determined based on the characteristics of the building. The PHPP calculations are attached to this application.

EnerPHit building retrofit (acc. to heating demand)? **no**

Name: _____ Company: _____ Registration number PHPP: _____
 Surname: _____ Issued on: _____
 _____ Signature

EnerPHit verification

Building: Hotel Restaurant Valcanover
Street: _____
Postcode/City: _____
Country: Italy
Building type: Masonry construction
Climate: Porgine
 Altitude of building site (in [m] above sea level): 459

Year of Construction: 1928
Number of dwelling units: 1
Number of Occupants: 37.0
Exterior vol. V_e: 3281.5 m³

Interior temperature winter [C°]: 20.0
Interior temp. summer [C°]: 25.0
Internal heat gains winter [W/m²]: 9.4
IHG summer [W/m²]: 15.38
Spec. capacity [W/K per m² TFA]: 204
Mechanical cooling:

Specific building demands with reference to the treated floor area	Requirements	Fulfilled?
Space heating Annual heating demand	18 kWh/(m²a)	yes
Heating load	22 W/m²	-
Space cooling Overall specific space cooling demand	5 kWh/(m²a)	-
Cooling load	13 W/m²	-
Frequency of overheating (> 25 °C)	%	-
Primary Energy Heating, cooling, desalinating, DHW, space heating and auxiliary electricity	123 kWh/(m²a)	-
Specific primary energy reduction through solar electricity	kWh/(m²a)	-
Airtightness Pressurization test result n ₅₀	1.0 1/h	yes

I confirm that the values given herein have been determined following the PHPP methodology and were determined based on the characteristics of the building. The PHPP calculations are attached to this application.

EnerPHit building retrofit (acc. to heating demand)?

Name: _____ Company: _____ Registration number PHPP: _____
 Surname: _____ Issued on: _____
 _____ Signature



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Trainings

EuroPHit



www.europhit.eu/events



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20 projects – 11 completed

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CS01_Dun Laoghaire / IE



CS02_Ros Muc / IE / cancelled



CS06_Auby / FR



CS15_Tournon sur Rhone / FR



CS16_Santander / ES



CS10_Gabrovo / BG



CS11_Gabrovo / BG



CS23_Madrid / ES



CS07_Madrid / ES / cancelled



CS14_Portsmouth / UK



OP17_Zellingen / DE



OP09_Madrid / ES / cancelled



St Cyr Au Mont d'Or / FR



Wicklow Town / IE



OP22_Bansko / BG



CS12_Stockholm / SE



OP23_Perjina Valsugana / IT



OP25_Gothenburg / SE



OP27_San Sebastian / ES



CS05_Courcelles / FR



CS03_Perjina / IT / cancelled



CS08_Gijón / ES / cancelled



CS13_Næstved / DK



OP19_Montbrison / FR

Total of TFA to be retrofitted : 40.000 m²
Budget for 1st steps started in EuroPHit : 26 Mio €



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Single family homes



CS12

Single Family Home
Stockholm / SE

- Basement floor insulation
- Roof insulation
- Windows

- 70.000 €



OP 17

Single Family Home
Zellingen / DE

- External walls
- Roof insulation
- Basement ceiling

- 95.000 €



CS16

Single Family Home
Santander / ES

- Roof insulation

- 7.000 €



OP21

Single Family Home
Wicklow Town / IE

- Roof insulation
- North facade
- Ventilation
- 95.000 €



Public buildings

EuroPHit



CS13

Rehabilitation
Workshop
Næstved/ SE

- Wall insulation
- Windows
- On 2 sides only!

- 107.000 €



CS01

Home For Elderly
Dun Loaghaire / IE

- Complete retrofit
- Additional 3rd evel

- 3.250.000 €



OP24

Community Centre
Pergine Vals. / IT

- Complete retrofit
- With extension

- 2.000.000 €



CS10

Primary School,
Gabrovo/ BG

- Roof insulation

- 880.000 €



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Multifamily buildings

EuroPHit



CS05

Multifamily Social Housing
Courcelles / FR

- windows
- Improvement of airtightness

- 480.000 €



CS14

Multifamily House
Portsmouth / UK

- Roof insulations
- Wall insulation
- Windows
- Ventilation

- 16.000.000 €



OP25

Stjärnhus Stacken
Gothenburg / SE

- Wall insulation
 - Windows
 - PV façade
 - PV roof
- 660.000 €



OP23

Treviana Social Housing
Madrid / ES

- 1 flat retrofitted
 - Internal insulation
- 13.000 €

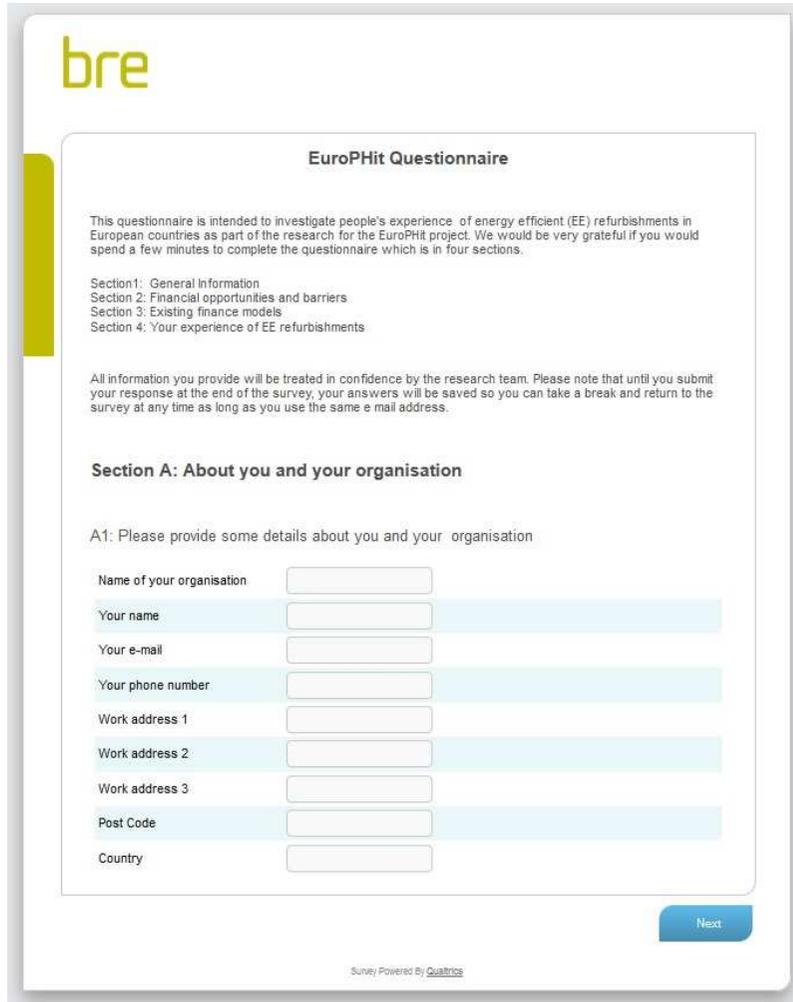


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Programme of the European Union



Questionnaires

EuroPHit



The screenshot shows a web-based questionnaire titled "EuroPHit Questionnaire". At the top left is the "bre" logo. The main heading is "EuroPHit Questionnaire". Below this is an introductory paragraph: "This questionnaire is intended to investigate people's experience of energy efficient (EE) refurbishments in European countries as part of the research for the EuroPHit project. We would be very grateful if you would spend a few minutes to complete the questionnaire which is in four sections." This is followed by a list of sections: "Section 1: General Information", "Section 2: Financial opportunities and barriers", "Section 3: Existing finance models", and "Section 4: Your experience of EE refurbishments". A confidentiality notice states: "All information you provide will be treated in confidence by the research team. Please note that until you submit your response at the end of the survey, your answers will be saved so you can take a break and return to the survey at any time as long as you use the same e-mail address." The current section is "Section A: About you and your organisation". The question is "A1: Please provide some details about you and your organisation". The form contains several input fields: "Name of your organisation", "Your name", "Your e-mail", "Your phone number", "Work address 1", "Work address 2", "Work address 3", "Post Code", and "Country". A blue "Next" button is located at the bottom right of the form area. At the very bottom of the page, it says "Survey Powered by Qualtrics".

We are interested in your experience! Check

www.europhit.eu/questionnaires



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Financial workshops

EuroPHit



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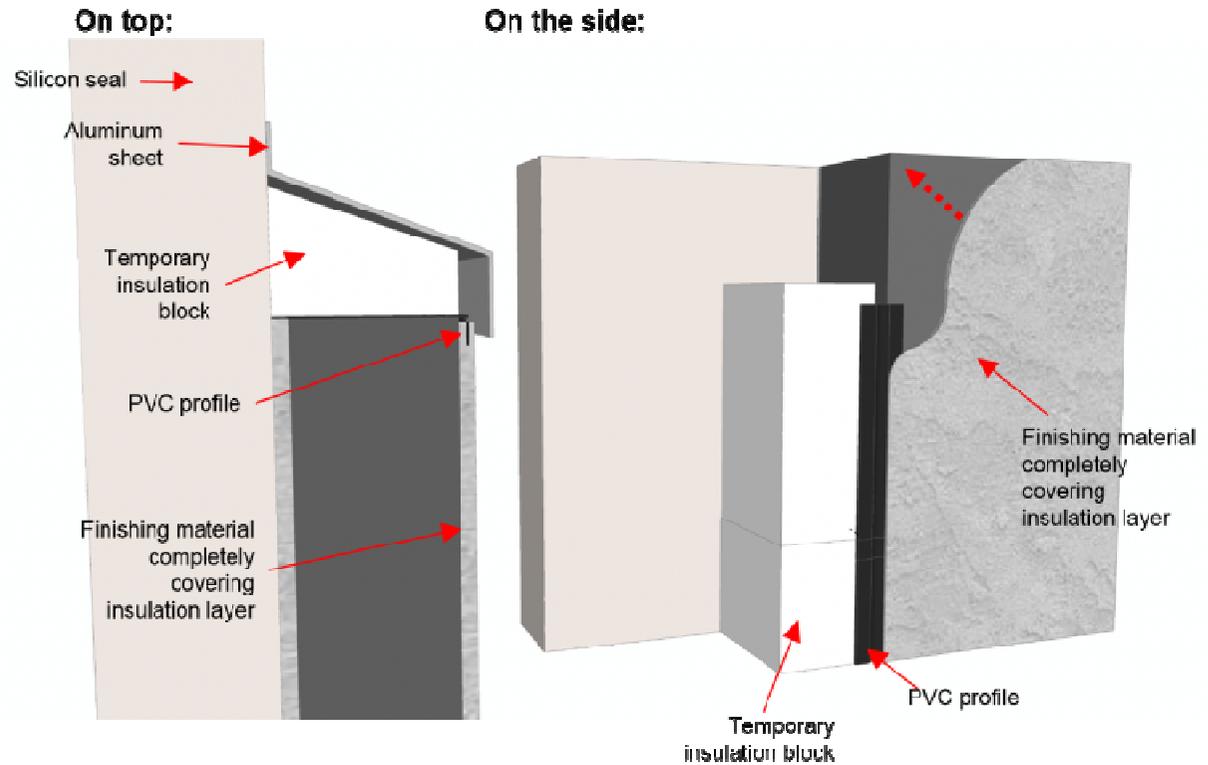
Product Development: EIFS edges

EuroPHit

Current situation:



Possible solution:

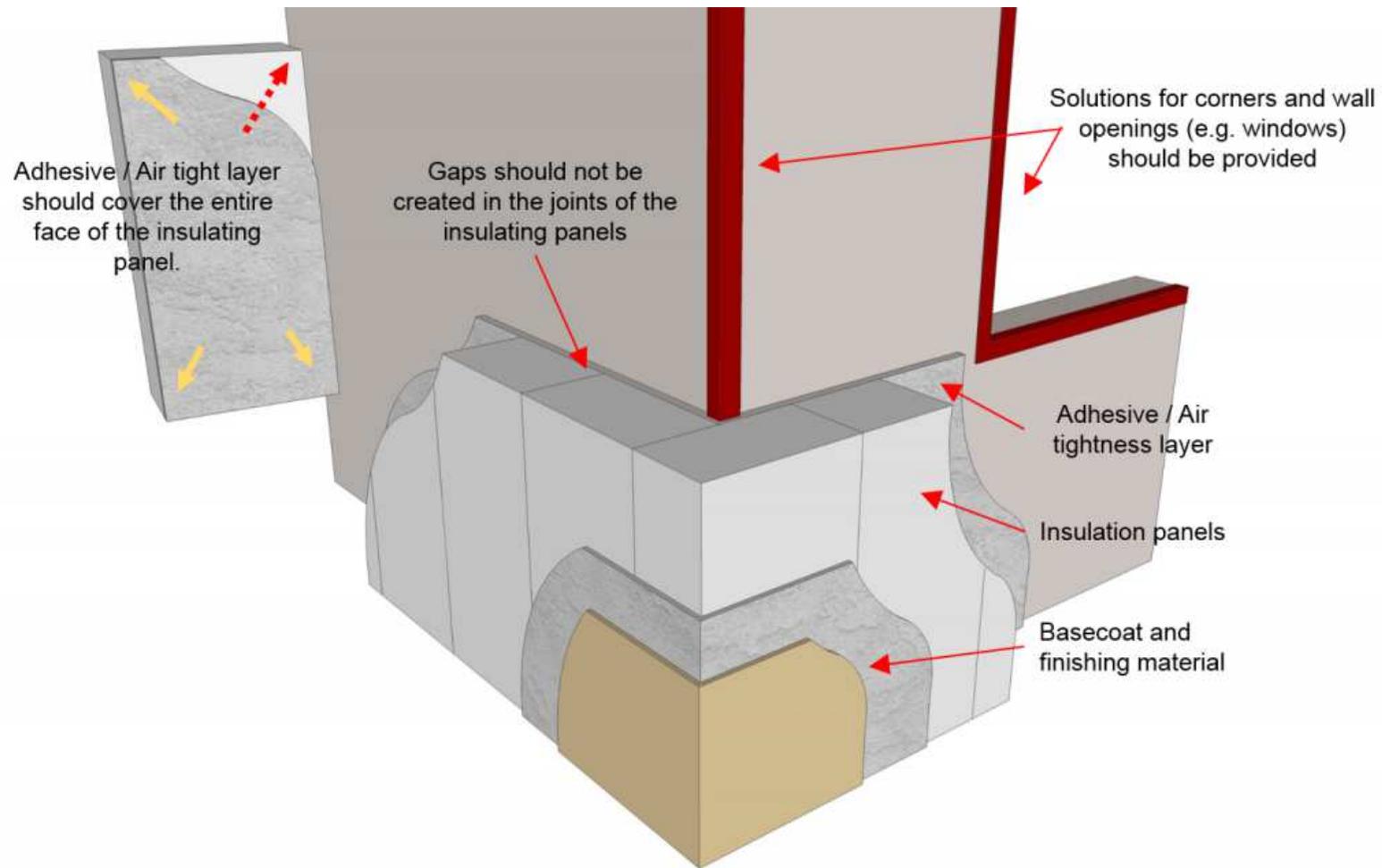


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Product Development: airtight EIFS

EuroPHit

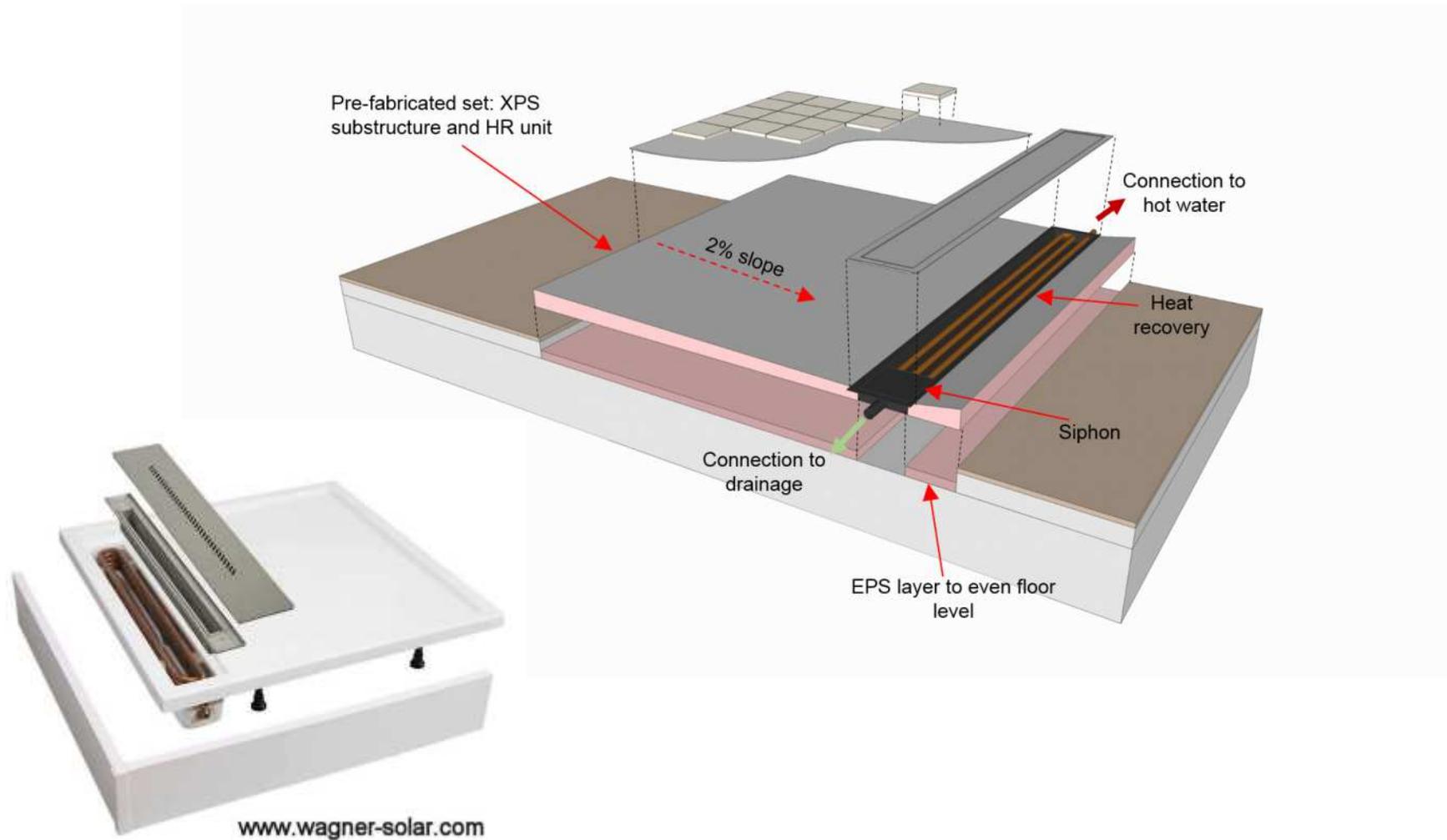


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Product Development: SWHR

EuroPHit



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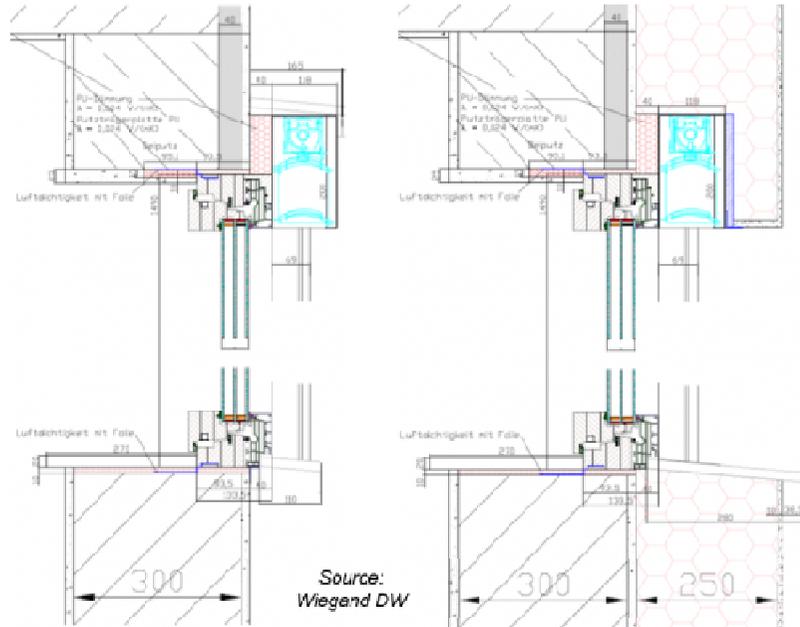


Product Development: component AWARDS 2015 + 2016

EuroPHit

CASE 1.

The window is installed in front of the existing wall, it remains in place when insulation is added.



1. New window is installed on the edge of the existing wall

2. Insulation is installed around the window at a later stage.

Source:
Wiegand DW

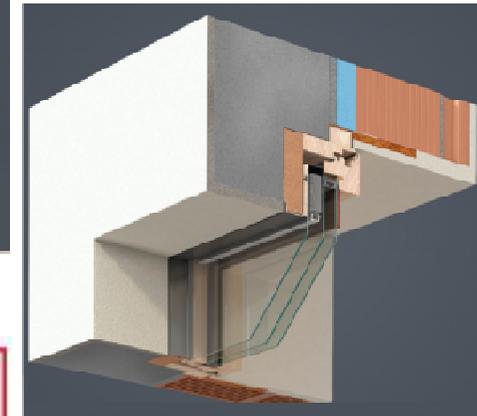
CASE 2.

Window is installed in the same position, and moved into the insulation layer when the latter is installed.



1. New window is installed in the same position as the old window.

Source: Lorber / Pro Passivhaufenster



2. When the insulation layer is added, the window is moved to the ideal installation situation.



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EuroPHit - Website

EuroPHit

Regularly updated with new data –
Case studies, Events, News, Info material... Your input is welcome!

Retrofitting for the energy revolution, one step at a time

EuroPHit

Home Energy Retrofits Projects Finance Products Events Info & News Members

© Passive House Institute

The EuroPHit Project

With the EnerPHit Standard as the goal and Passive House principles as the basis, EuroPHit applies knowledge on deep energy retrofits to the oft-overlooked yet critical area of step-by-step refurbishments.

Sign up with the EuroPHit network, free of charge, and become part of a pool of competence on energy retrofitting. Benefits include access to the EuroPHit Forum as well as being kept up to date on project progress and key project outcomes.

Upcoming Events

- Int'l Passive House Days
7-9 November, 2014
- Int'l Passive House Conference
17-18 April, 2015

Further Info

Retrofitting for the energy revolution, one step at a time

EuroPHit

Home Energy Retrofits Projects Finance Products Events Info & News Members

Home » Projects » Case Studies

Case Studies

CS01 Rochestown Home for Elderly
Building Owner/Consulting EuroPHit Partner: Dun Laoghaire Rathdown (DLR) County Council / MosArt
Country: Ireland
Existing treated floor area: 1 613.00 m²

CS02 RosMuc Secondary School
Building Owner/Consulting EuroPHit Partner: Vocational Educational Committee (VEC) / MosArt
Country: Ireland
Existing treated floor area: 579.57 m²

CS03 Hotel-Restaurant Valcanover
Building Owner/Consulting EuroPHit Partner: Maria Biasi and Monica Valcanover / ZEPHIR
Country: Italy
Existing treated floor area: 586.00 m²

Upcoming Events

- Int'l Passive House Days
7-9 November, 2014
- Int'l Passive House Conference
17-18 April, 2015

Further Info

- Passive House Institute
- IPHA The International Passive House Association
- Passipedia: The Passive House resource
- Passive House Database



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Forum – Log in and share your experience!

EuroPHit

- EuroPHit Forum was integrated to iPHA forum with separate section with topic and polls
- EuroPHit MONDAYS: The most posting 3 participants could win the PHPP bundle before the conference
- Interesting posts published on EuroPHit website and iPHA Newsletters

Hot EuroPHit Forum Discussions NOW!

Join weekly EuroPHit posts!



- Determination of airtightness
- Competence of persons involved
- Perceived barriers and solutions to financing
- More demonstration projects needed

EuroPHit
Moderator: eva.vahalova@passiv.de

NEW TOPIC Search this forum... Search

Mark topics read • 31 topics • Page 1 of 2

ANNOUNCEMENTS	REPLIES	VIEWS	LAST POST
EuroPHit CALLS FOR by eva.vahalova@passiv.de » Fri 23. Jan 2015, 12:49	4	46	by eva.vahalova@passiv.de » Fri 23. Jan 2015, 13:16
EuroPHit - Retrofitting for the energy revolution by eva.vahalova@passiv.de » Thu 22. Jan 2015, 19:01	8	121	by eva.vahalova@passiv.de » Mon 23. Mar 2015, 12:20

TOPICS	REPLIES	VIEWS	LAST POST
Integrated ventilation concepts by eva.vahalova@passiv.de » Mon 23. Mar 2015, 12:18	0	5	by eva.vahalova@passiv.de » Mon 23. Mar 2015, 12:18
Target groups by eva.vahalova@passiv.de » Mon 23. Mar 2015, 12:17	0	3	by eva.vahalova@passiv.de » Mon 23. Mar 2015, 12:17
Products for step-by-step retrofits by eva.vahalova@passiv.de » Mon 23. Mar 2015, 12:16	0	1	by eva.vahalova@passiv.de » Mon 23. Mar 2015, 12:16
Lock-in situation before change of ownership by eva.vahalova@passiv.de » Mon 16. Feb 2015, 22:47	1	14	by jastor » Thu 19. Mar 2015, 02:07
Temporary EIFS connections by eva.vahalova@passiv.de » Tue 10. Feb 2015, 15:50	4	21	by jastor » Thu 19. Mar 2015, 01:44
Connection detail by eva.vahalova@passiv.de » Mon 16. Mar 2015, 11:08	0	5	by eva.vahalova@passiv.de » Mon 16. Mar 2015, 11:08
One Stop Shop in energy efficient retrofit by eva.vahalova@passiv.de » Mon 16. Mar 2015, 11:07	0	4	by eva.vahalova@passiv.de » Mon 16. Mar 2015, 11:07
Financial institution for financing retrofits by eva.vahalova@passiv.de » Mon 16. Mar 2015, 11:07	0	4	by eva.vahalova@passiv.de » Mon 16. Mar 2015, 11:07
Media to approach with EuroPHit findings by eva.vahalova@passiv.de » Tue 10. Feb 2015, 15:52	3	22	by nesifranz » Thu 12. Mar 2015, 15:48
Existing financings models by eva.vahalova@passiv.de » Mon 23. Feb 2015, 15:14	2	18	by iglika » Wed 11. Mar 2015, 13:08
Suitable details wanted by eva.vahalova@passiv.de » Tue 10. Feb 2015, 15:48	1	12	by jastor » Tue 10. Mar 2015, 14:36
Single retrofit steps common practice? by eva.vahalova@passiv.de » Tue 10. Feb 2015, 15:40	1	23	by jastor » Tue 10. Mar 2015, 14:28
Requirements for financial institutions by eva.vahalova@passiv.de » Mon 9. Mar 2015, 12:38	0	3	by eva.vahalova@passiv.de » Mon 9. Mar 2015, 12:38
Implications of quality assurance by eva.vahalova@passiv.de » Mon 9. Mar 2015, 12:38	0	7	by eva.vahalova@passiv.de » Mon 9. Mar 2015, 12:38
Case studies & financial implications by eva.vahalova@passiv.de » Mon 9. Mar 2015, 12:37	0	3	by eva.vahalova@passiv.de » Mon 9. Mar 2015, 12:37
Planning decreasing heat demand by eva.vahalova@passiv.de » Mon 23. Feb 2015, 15:13	1	13	by sp@passivhus.dk » Wed 4. Mar 2015, 18:08

Board index • Technical • Building envelope and building services

User Control Panel (0 new messages) • View your posts
[Moderator Control Panel]

EuroPHit - Retrofitting for the energy revolution
Moderator: eva.vahalova@passiv.de

POST/REPLY Search this topic... Search

EuroPHit - Retrofitting for the energy revolution
by eva.vahalova@passiv.de » Thu 22. Jan 2015, 19:01

EuroPHit

In this EuroPHit Forum are weekly posted topics related to step-by-step retrofits, technical and conceptual details, project financing, product ideas and also weekly opinion polls. Experienced *Passive House Institute* researchers and EuroPHit partners are ready to answer your questions and help you to get your renovations done correctly.

Participate now for a chance to win PHPP9 and designPH bundle or free iPHA Membership!

All Forum participants with a minimum of 15 posts will be entered into a random draw for a chance to win one of 3 free bundle packs of PHPP9 and designPH or 3 six-month iPHA Memberships. Winners will be announced at the 19th International Passive House Conference.

"IF YOU DO IT, DO IT RIGHT"

1st Week: 2.2.-8.2.2015
by eva.vahalova@passiv.de » Tue 10. Feb 2015, 15:39
Single retrofit steps common practice? <http://forum.passivpeda.org/viewtopic.php?12981194>, INCLUDING POLL

Determination of airtightness <http://forum.passivpeda.org/viewtopic.php?12981195>

Example projects for step-by-step retrofits wanted <http://forum.passivpeda.org/viewtopic.php?12981196>

2nd Week: 9.2.-15.2.2015
by eva.vahalova@passiv.de » Tue 10. Feb 2015, 15:47
Suitable details wanted <http://forum.passivpeda.org/viewtopic.php?12981197>

Temporary EIFS connections <http://forum.passivpeda.org/viewtopic.php?12981198>, INCLUDING POLL

Media to approach with EuroPHit findings <http://forum.passivpeda.org/viewtopic.php?12981199>

3rd week - 16.2.-22.2.2015
by eva.vahalova@passiv.de » Mon 16. Feb 2015, 22:43



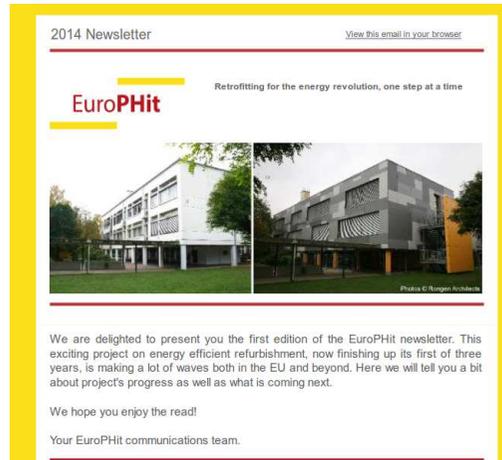
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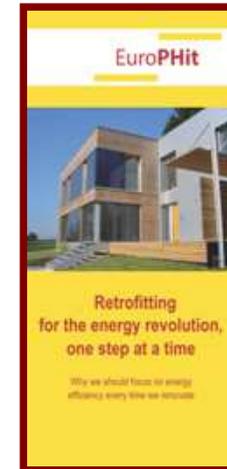
Completed PR Material

EuroPHit

✓ **Project Newsletter (D6.2)**
Template + all translations



✓ **Project leaflet (D6.3)**
Template + all translations



✓ **Presentation update (D6.4)**
Template + all translations



✓ **General poster (D6.5)**
Template + all translations

- English version
- Bulgarian version
- Czech version
- Danish version
- French version
- German version
- Italian version
- Slovakian version
- Spanish version
- Swedish version

- New Partners: ONYX and Askeen



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PH Open Days: with sbs-projects

EuroPHit



PASSIVE HOUSE RESIDENTS WORLDWIDE OPEN THEIR HOMES:

International Passive House Days

11–13
November
2016

Invitation

Visit Passive House buildings or showcase your own project!

Doing more with less:

- » Superior comfort
- » Minimal heating and cooling costs
- » For new builds and retrofits alike

Experience Passive House buildings first hand!

- Visits and guided tours offered across the globe
- Architects show how it's done
- Residents share their experiences

Please see
www.passivehouse-international.org
for further information. Participating buildings
will be listed as of September on
www.passivehouse-database.org

Foto: Alexandra Lechner Photography

International
PASSIVE HOUSE
Association



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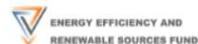
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