EUROPHIT

**Stepwise EnerPHit retrofit:
New Certification Scheme and Online Platform**

**Jan Steiger and Dragos Arnautu,
Passive House Institute**

www.europhit.eu

Passive House Institute

STEP-BY-STEP RETROFIT IN HIGH EFFICIENCY STANDARD

Implementing deep retrofits step by step

EuroPHit

EnerPHit + RES

EnerPHit ✓ Certified Retrofit Passive House Institute

plan

refurbishment

overall

define step → Retrofit

• **High efficiency**

suggest the correct time → step

ventilation system

successful airthightness test

define step → by

define + execute → step

pre-certification after 1st step

threshold: minimum improvement

Building stock

• **Low efficiency**
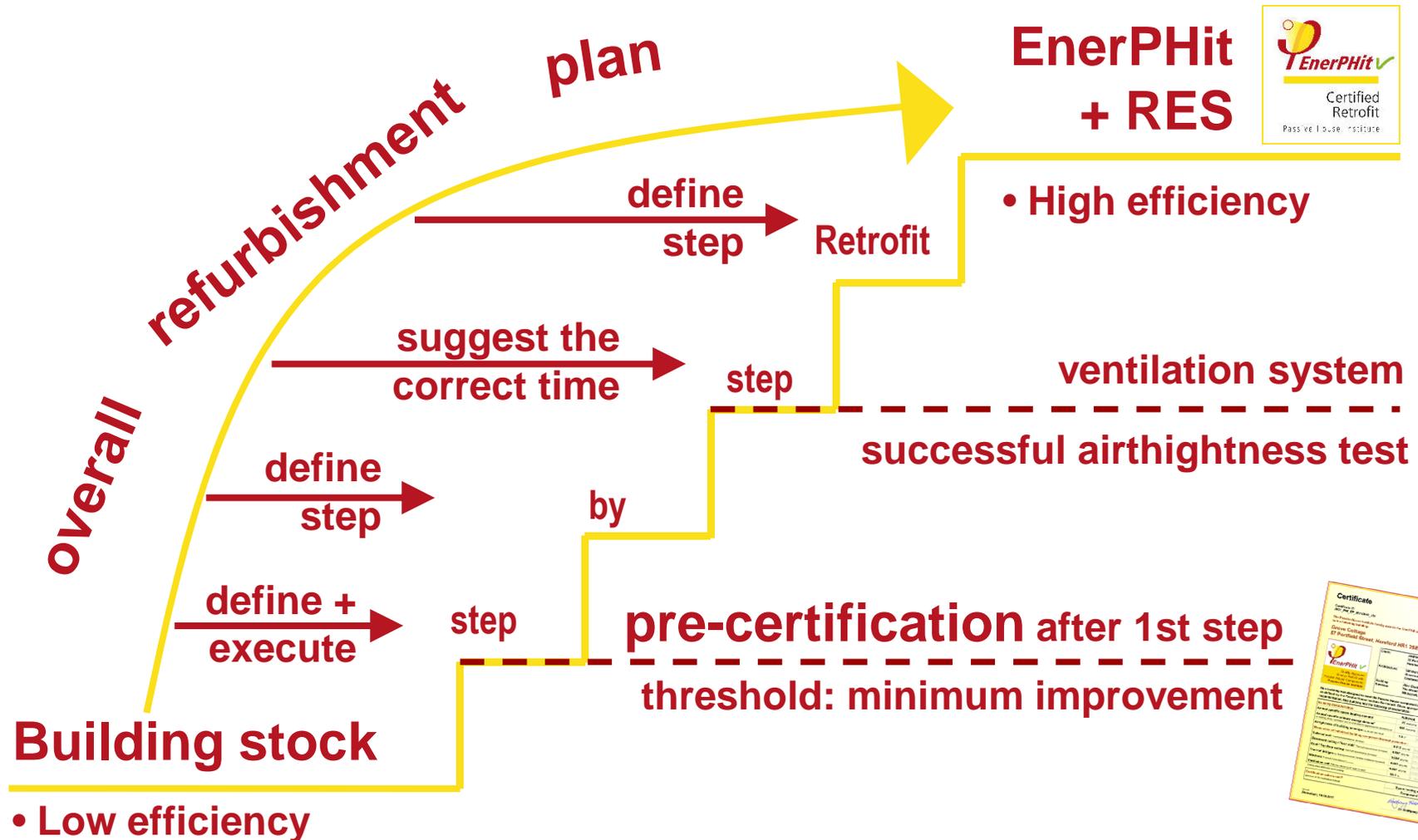
Energy balance calculation tool with Features for step by step retrofits

PHPP
Passivhaus-Projektierungspaket
Version 9 (2015) © Passivhaus Institut
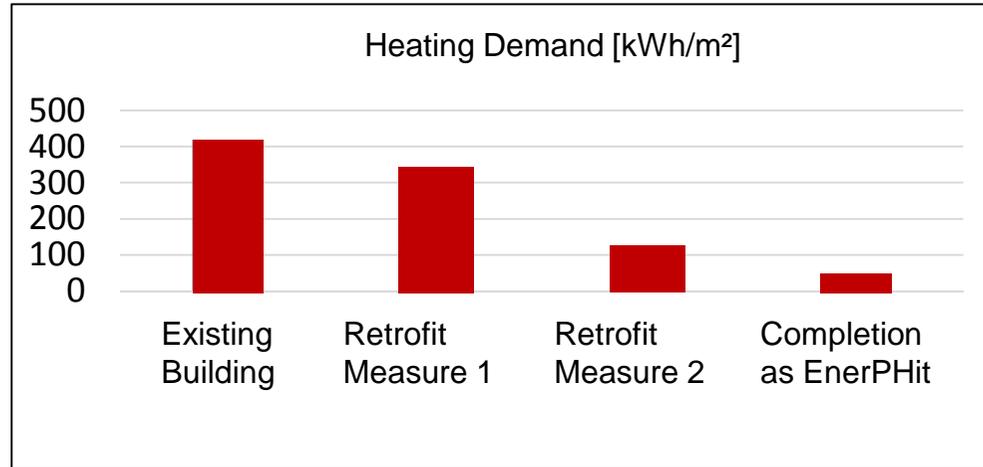
Das Energiebilanzierungs- und Planungstool
für effiziente Gebäude und Modernisierungen

PHPP

Das Energiebilanzierungstool und Planungstool für effiziente Gebäude und Modernisierungen
www.passiv.de

Heating Demand [kWh/m²]

	Existing Building	Retrofit Measure 1	Retrofit Measure 2	Completion as EnerPHit

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)

		aktive Variante wählen >>	aktiv 3-Passivhaus mit WP	Bestand	Schlechter Wärmeschutz	Mässiger Wärmeschutz	Passivhaus mit WP + Solarthermie
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

Pilot Projects

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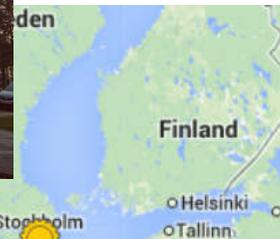
Base map

www.europhit.eu/projects

Passive House
Institute

Several activities: trainings, financial workshops, product development

EuroPHit

COMPONENT AWARD 2015
Passive House Institute

www.europhit.eu/events

www.europhit.eu

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Stepwise EnerPHit retrofit: New Certification Scheme

**Criteria
for the Passive House,
EnerPHit and
PHI Low Energy Building Standards**

Passive House Institute — Rheinstr. 44/46, 64283 Darmstadt, Germany, www.passiv.de

Criteria for the Passive House, EnerPHit and PHI Low Energy Building Standards, revised 20.03.2015   1/23
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PHI building criteria update 2015
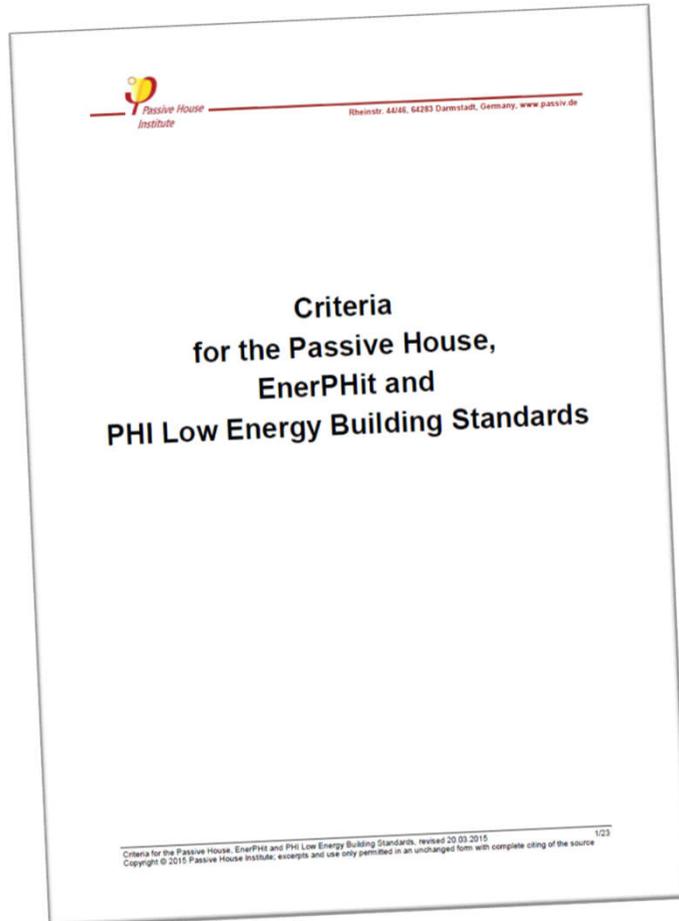
- All PHI building energy standards combined in one document

- Verification according to Renewable Primary Energy (PER) demand and generation (optional)

- Classification as Passive House or EnerPHit Classic, Plus and Premium

- Criteria for all standards applicable worldwide

- Introduction of the new PHI Low Energy Building Standard

- **Pre-certification for stepwise retrofit**

➢ **In effect for english-speaking users from late 2015**

(Release of PHPP9 EN)

Passive House standard for energy retrofits?

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**Unfavourable
A/V ratio**
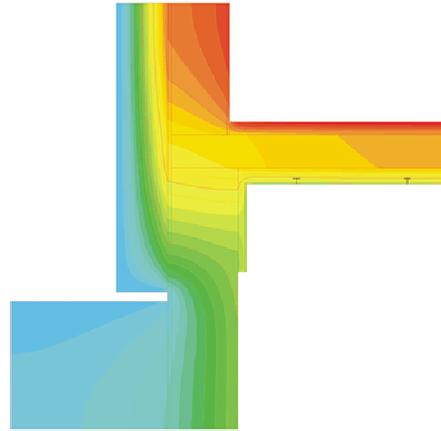
Thermal bridges

Airtightness

**Unfavourable
window orientation**

200 cm
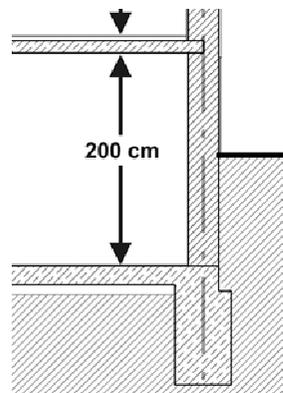
**No space
for insulation**

Heritage protection restrictions

EnerPHit Standard

- Guideline and incentive for an optimal efficiency standard for retrofits
- Certification as quality assurance for building owners

„Energy Retrofit with Passive House Components"

Timeline for EnerPHit Criteria

2010

EnerPHit Standard introduced for residential buildings in cool-temperate climates

2012

extended to non-residential buildings and buildings with interior insulation

Late 2015 (April 2015 for German PHPP)

extended to all climates worldwide,

introduction of EnerPHit classes Classic, Plus, and Premium

Late 2015 (for German and English PHPP)

pre-certification for stepwise retrofit to EnerPHit Standard

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International EnerPHit criteria

Climate zone legend:
- 7 Very hot
- 6 Hot
- 5 Warm
- 4 Warm, tempered
- 3 Cool, tempered
- 2 Cold
- 1 Arctic
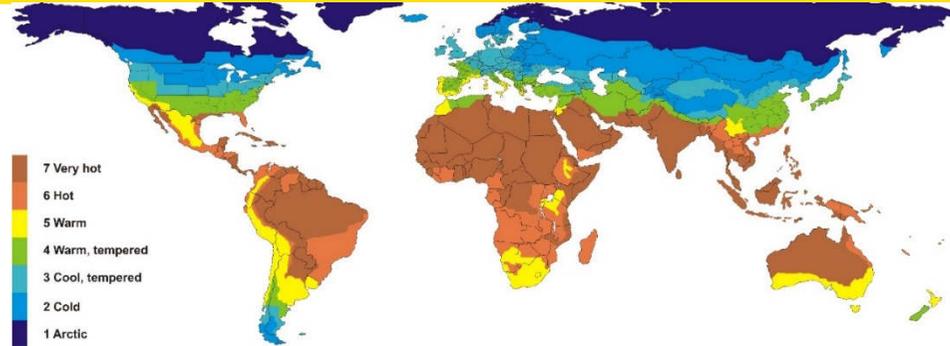
building component method:

or alternatively,

energy demand method:

Climate Zone according to PHPP	Opaque envelope[1] against...				Windows (including exterior doors)			Ventilation	
	...ground	...ambient air			Overall[4]	Glazing	Solar load[5]		
	Insulation	Exterior insulation	Interior insulation[2]	Exterior paint[3]	Max. heat transfer coefficient ($U_{D/W,installed}$)	Solar heat gain coefficient (g-value), only if active heating present	Max. specific solar load during cooling period	Min. heat recovery rate[6]	Min. humidity recovery rate[7]
	Max. heat transfer coefficient (U-value)			Cool colours					
	[W/(m²K)]			-	[W/(m²K)]	-	[kWh/m²a]	%	
Arctic	Determined in PHPP from project specific heating and cooling degree days against ground.	0.09	0.25	-	0,45 0,50 0,60	$U_g - g*0.7 \leq 0$	100	80%	-
Cold		0.12	0.30	-	0,65 0,70 0,80	$U_g - g*1.0 \leq 0$		80%	-
Cool-temperate		0.15	0.35	-	0,85 1,00 1,10	$U_g - g*1.6 \leq 0$		75%	-
Warm-temperate		0,30	0,50	-	1,05 1,10 1,20	$U_g - g*2.8 \leq -1$		75%	-
Warm		0.50	0.75	-	1,25 1,30 1,40	-		-	-
Hot		0.50	0.75	Yes	1,25 1,30 1,40	-		-	60 % (humid climate)
Very hot		0.25	0.45	Yes	1,05 1,10 1,20	-		-	60 % (humid climate)

Climate Zone according to PHPP	Heating	Cooling
	Max. heating demand	Max. cooling + dehumidification demand
	[kWh/(m²a)]	[kWh/(m²a)]
Arctic	35	equal to Passive House requirement
Cold	30	
Cool-temperate	25	
Warm-temperate	20	
Warm	15	
Hot	-	
Very hot	-	

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

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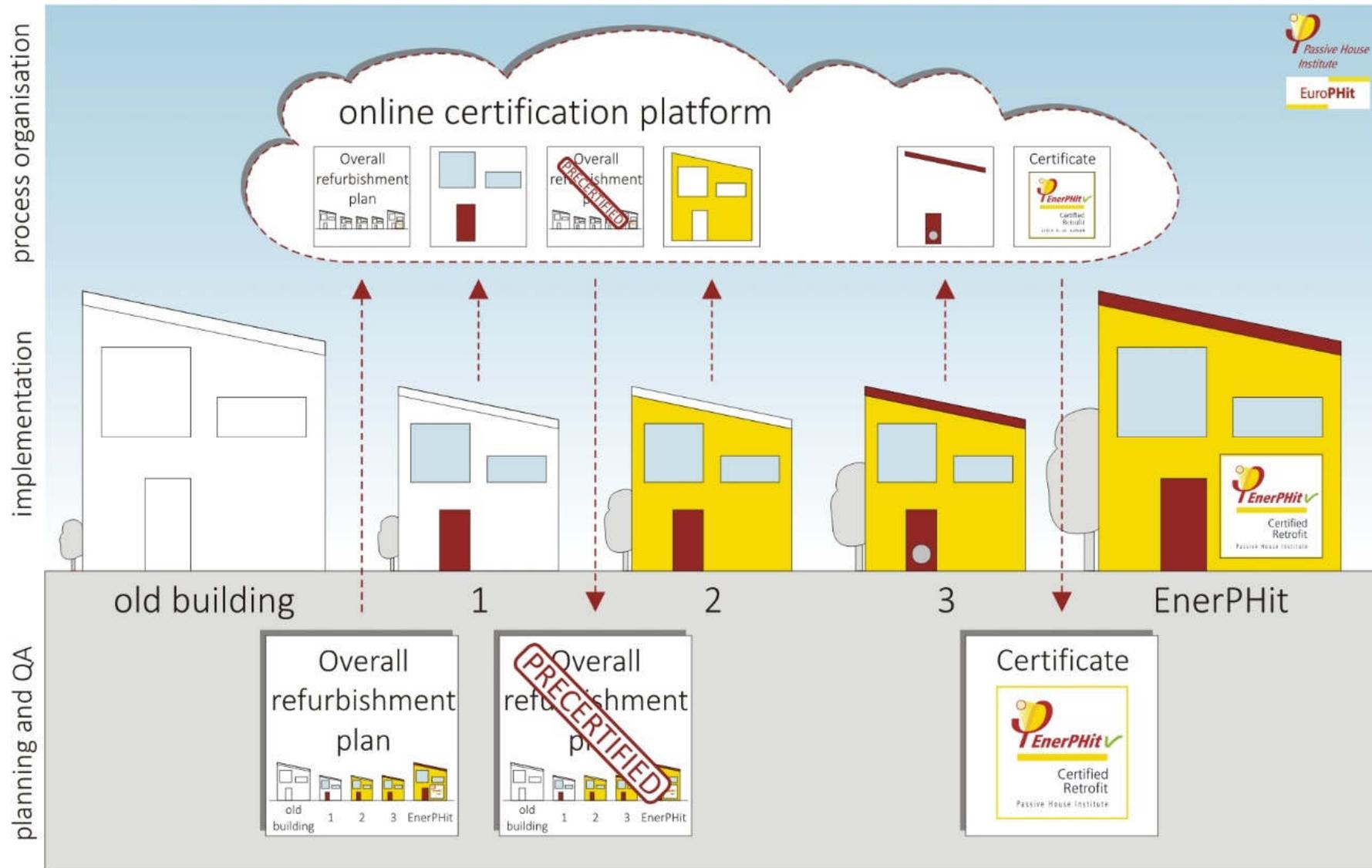
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Overall Retrofit Plan (ORP)

EuroPHit

Detail drawings for first step
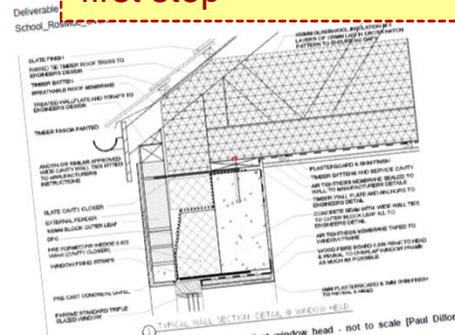
Schematic drawings for future steps
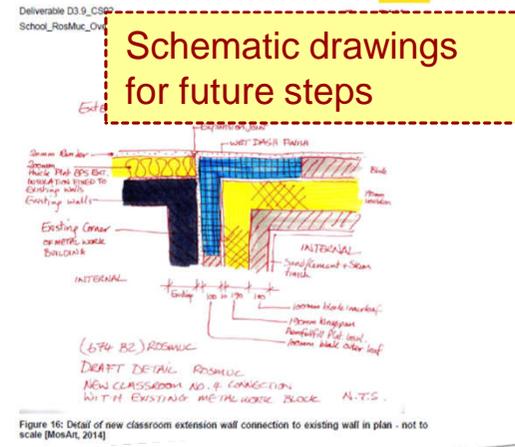
Survey of the existing building

PHPP for all steps with schedule and qualities for all energy saving measures

PHPP 9 with energy balance for stepwise retrofit

Variantenberechnung

Passivhaus mit PHPP Version 9.1

Passivhaus-Reihenendhaus / Klima: PHPP-Standard / EBF: 156 m² / Heizen: 19,86 kWh/(m²a) / Übertemperatur: 0,7 % / PER: 43,8 kWh/(m²a)

		aktiv					
aktive Variante wählen >>		5-EnerPHit	Bestand	Fenster und Türen	Außenwand-dämmung	Dach und Luftdichtheits-test	EnerPHit
Ergebnisse	Einheit	5	1	2	3	4	5
Heizwärmebedarf	kWh/(m²a)	**19,9**	174,2	107,1	48,5	27,8	19,9
Heizlast	W/m²	**13,2**	71,9	47,3	25,0	16,7	13,2
Kühl- + Entfeuchtungsbedarf	kWh/(m²a)						
Kühllast	W/m²						
Übertemperaturhäufigkeit (> 25 °C)	%	**0,7**	0,2	0,2	0,4	0,6	0,7
PER-Bedarf	kWh/(m²a)	**43,8**	214,2	140,5	76,0	52,2	43,8
Passivhaus Classic?	ja / nein	**nein**	nein	nein	nein	nein	nein
▼ **Endenergie**		-	-	-	-	-	-
▼ **Nutzerdefiniert: verknüpfte Ergebnisse**			0,0	0,0	0,0	0,0	0,0

Eingangsgrößen	Einheit	Wert	1	2	3	4	5
▼ **Bauteilschichten**	U-Werte						
▼ **Strahlungsbilanz**	Flächen						
▼ **Wärmebrücken**	Flächen						
▼ **Fenster und Verschattung**	Fenster	Verschattung					
▼ **Lüftung**	Lüftung	SommLuft					
▼ **Wärmeerzeuger**	PER	WP					
▼ **Kompressor-Kühlgeräte**	Kühlgeräte						
▼ **Nutzerdefiniert**							

Heizwärmebedarf [kWh/(m²a)]
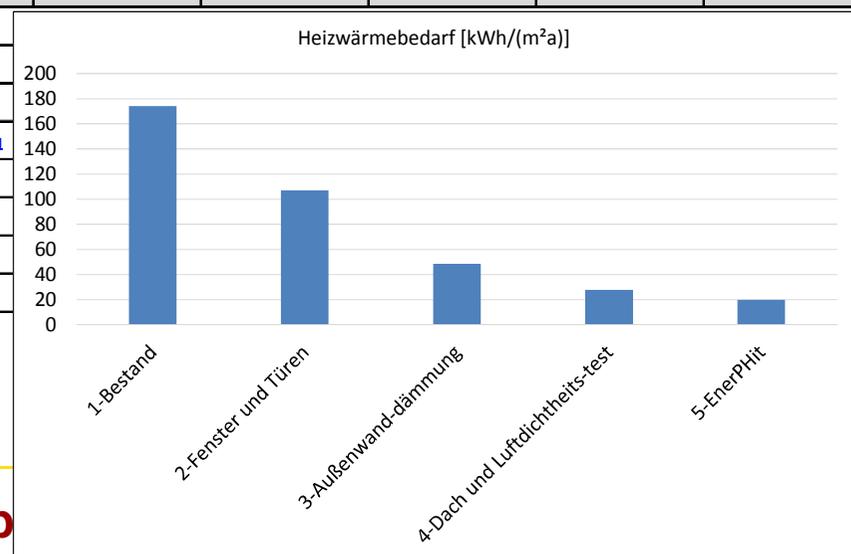
www.europ

EuroPHit

Communication Platform for
Consultancy and Certification

www.europhit.eu

- To develop **a tool which offers guidance** for the Passive House Designers and Certifiers **throughout the planning, building and certification processes**;

- To be **user-friendly, flexible and interactive**;

- To assure the **energy efficiency and quality of the design**.

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Certifier ⟷ Designer

Certifier	Designer
1. Login;	1. You receive from the Certifier your Login information via email;
2. Create a designer acount for your project's contact person;	2. Login;
3. Create a new project and customize the checklist acording to the challenges;	3. Start working on the project following a well structured checklist.
4. Start working on the project.	

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HOW DOES THE PLATFORM LOOK?

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EuroPHit

Test the best → Project Name

Passive House or EnerPHit: Passive House
Use   residential
Type of project   SFH
                         Test Street
                         64295 Test City
                         Hessen
                         Germany
Certifier   Dragos
Designer   Norman_Foster
Project checklist created on March 12, 2015, 3:35 p.m.

→ Project Information

▾ Dialog bar

Date: April 1, 2015, 2:46 p.m.
From: jens

Great project. I'm so proud that Norman Foster builds passive houses with us! äöüßâéù€

Send notification (the message will be sent also by e-mail):

→ Main Conversation Bar

Progress: 25.0 %
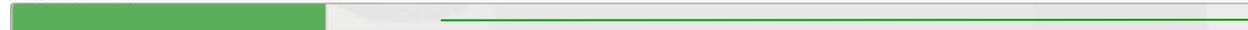
→ Progress Bar

Obsolete content and buttons for adding and deactivating items:
[Hide] [Show]

▸ ❌ 1. PHPP, general
▸ ✅ 2. Drawings
▸ ✅ 3. Areas and U-Values
▸ ❌ 4. Thermal Bridges
▸ ❌ 5. Windows/doors (Product data sheets, all values with 2 decimals)
▸ ❌ 6. Ventilation
▸ ❌ 7. Electricity
▸ ❌ 8. Heating/ Cooling + Plumbing
▸ ❌ 9. Construction phase

→ Interactive Checklist

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THE INTERACTIVE CHECKLIST

EuroPHit

Progress: 23.0 %

Obsolete content and buttons for adding and deactivating items:

[Hide] [Show]

1. PHPP, general — Category

1.1 Completed PHPP as *.xls file — Subcategory

Please check the corresponding checkboxes and upload the PHPP.

☒ Okay by designer

☐ Okay by certifier
☐ Notify designer
— Validation/Notification

• Thu, 2 Apr 2015 15:55:30 +0200 Dragos:

  ○ 18/PHPP_Example.xlsx — Upload documents

• New comment: — Write comments

[Durchsuchen...] Keine Datei ausgewählt.

• ☑ 1. Have you made sure that the PHPP corresponds with the submitted documentation?
• ☑ 2. Are all the criteria for certification met?
• ☑ 3. Generally you should use the newest PHPP available, when the Client signed the contract with the Certifier. Have you done this?
• ☐ 4. Have additional worksheets been added to PHPP?
• ☑ 5. PHPP/Verification Sheet. Have you entered all information on the building, adress, type, use, construction year?
• ☑ 6. PHPP/Verification Sheet. Have you entered all information on building owner, architect ?
• ☑ 7. PHPP/Climate. Does the chosen climate correspond to the site?
• ☑ 8. PHPP/Climate. Is the Climate Data validated by the Passive House Institute?
• ☑ 8. Other questions you find suitable

— Checkboxes with punctual assignments/questions

1.2 Overall refurbishment plan

1.3 Map Link

2. Drawings

3. Areas and U-Values

4. Thermal Bridges

5. Windows/doors (Product data sheets, all values with 2 decimals)

6. Ventilation

7. Electricity

8. Heating/ Cooling + Plumbing

9. Construction phase

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Thank you
for your attention

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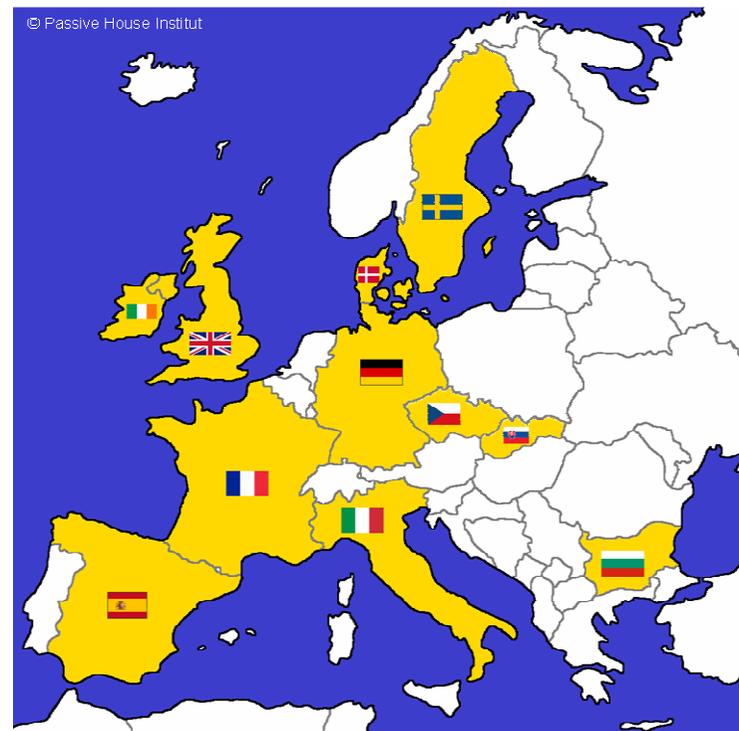
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