

# Financing of Sustainable Housing Retrofit

## Guidelines for Financial Institutions

**Friedrichsdorfer Institut zur Nachhaltigkeit IzN e.V**  
**Georg Kraft**



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

[www.europhit.eu](http://www.europhit.eu)



**To improve energy efficiency of buildings.  
we need to achieve a successful mix :**

- of regulatory policies**
- promotional schemes**
- market based instruments**



## Law, Regularory Policies

- **Energy Saving Act, Energy Saving Ordinance**, tighten the requirements from time to time. Must be economic (Law is form energy price crisis in the seventies)
- **Renewable Energies Heat Act**: Mandatory use of Renewable Energies of about 15 p.c. for new buildings (may be compensated)
- **Heating Costs Ordinance** commits owners of buildings to charge tenants with energy costs depending on individual consumption

## Promotional Systems, Financial Benefits

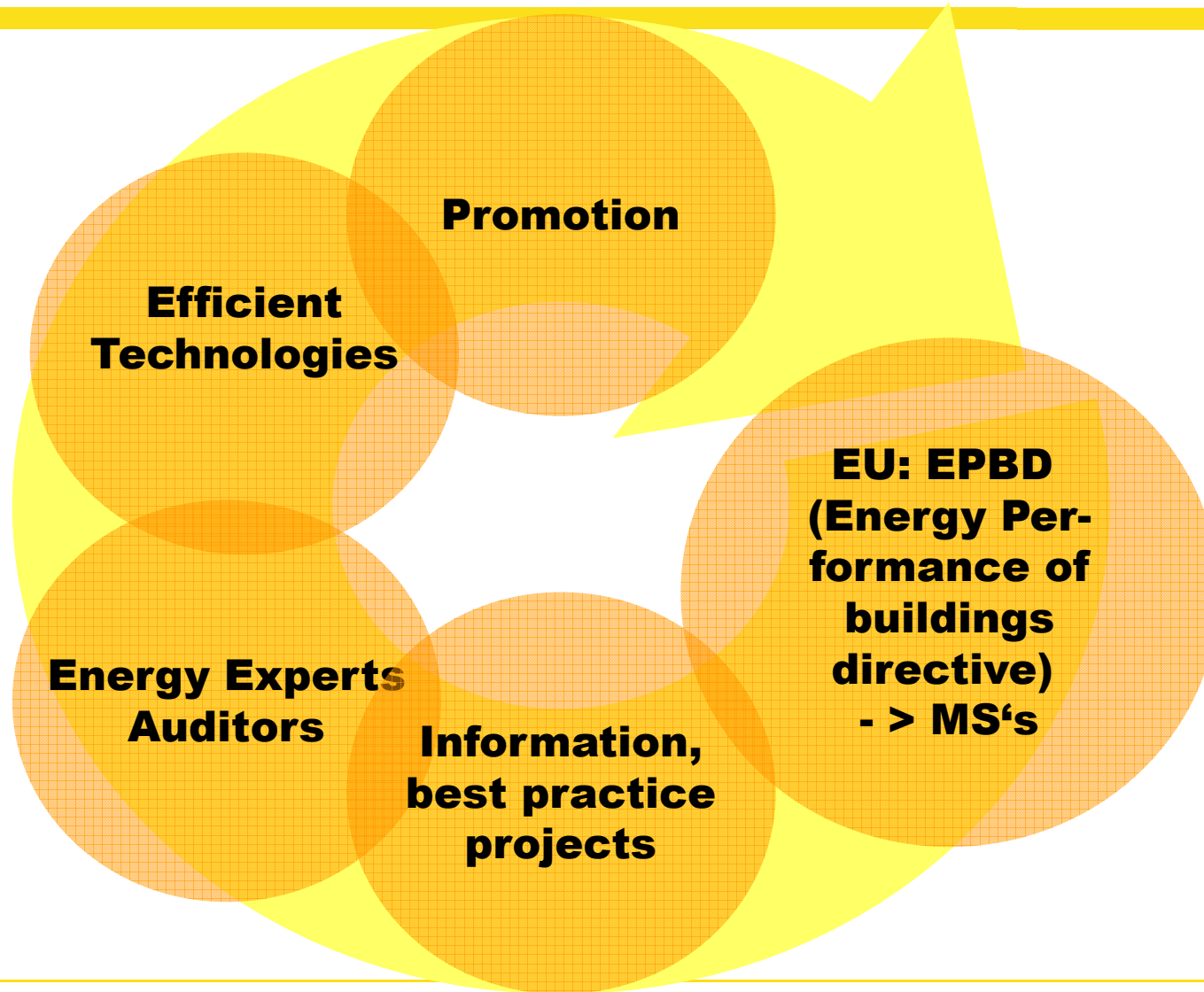
Promotion by KfW via financial intermediaries

**Market Based Instruments and strategies:** Prices, information, transparency in the market, best practice projects, energy certificates. Professional training, design tools, quality assurance, independent consulta

## Research



# The system of promotion of energy efficiency EuroPHit



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

[www.europhit.eu](http://www.europhit.eu)



# EU Directive 2002/91/EC on Energy Performance of Buildings

EuroPHit

- ➔ Application of minimum requirements for new buildings and existing buildings for primary energy consumption and energy losses
- ➔ Energy certification of buildings
- ➔ Member States shall have regulations and administrative provisions to comply
- ➔ Member States: Minimum requirements have to meet at least economic optimum with respect to life cycle costs!
- ➔ European Union: From 31.12.2020: All new buildings will be “Nearly Zero Energy”

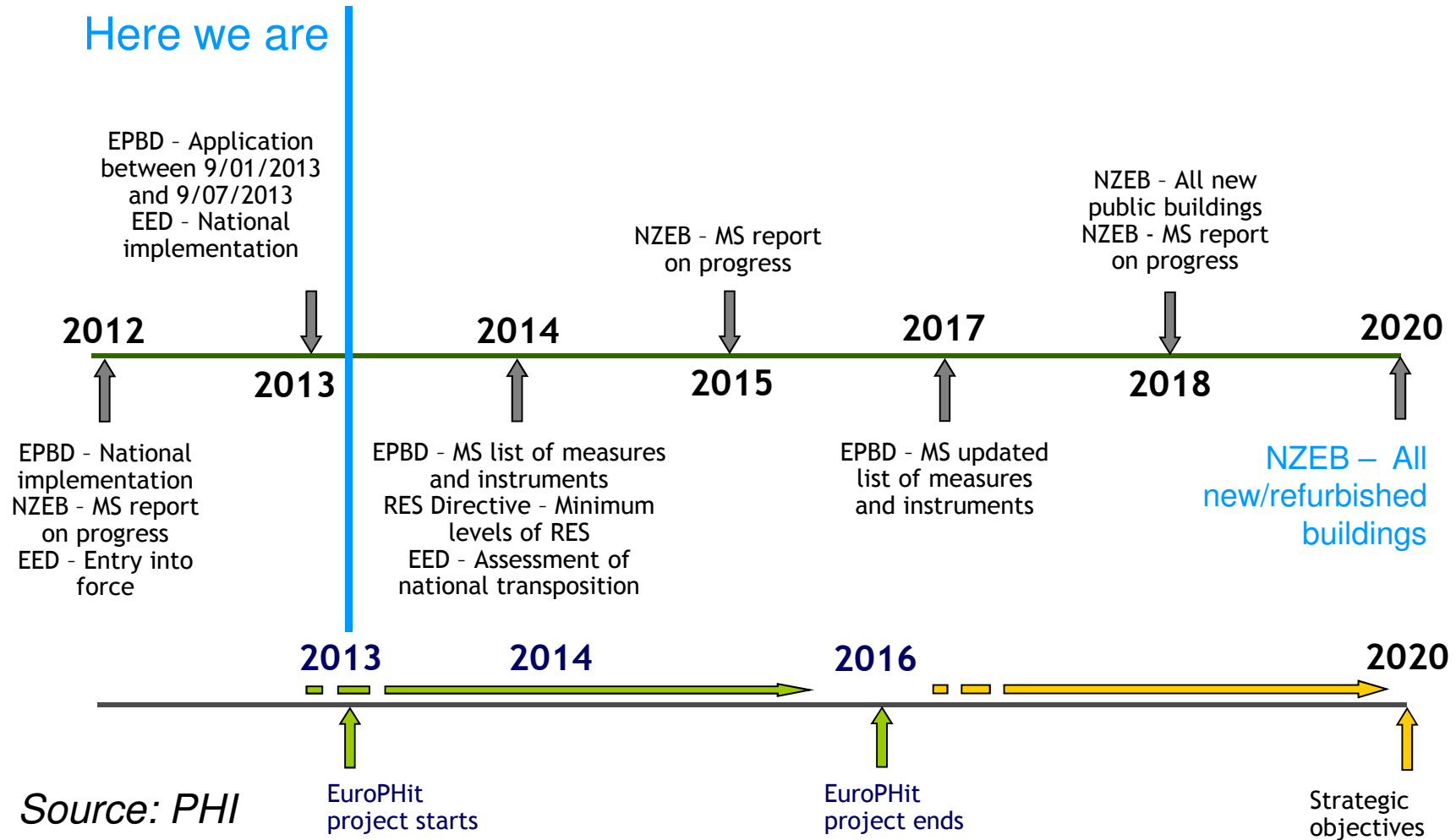


Co-funded by the Intelligent Energy Europe  
Programme of the European Union

[www.europhit.eu](http://www.europhit.eu)



# EPBD: The policy background



# EU Directive 2002/91/EC on Energy Performance of Buildings

EuroPHit

## Energy Performance Certificate

- provides more transparency in the real estate market for tenants, buyers and owners
- provides reference values to promote CO2 reduction and for the design of credit programmes
- information on the thermal characteristics and energy performance (energy need, energy consumption)
- reference values such as current legal standards and benchmarks
- recommendations for the cost-effective improvement of the energy performance



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

[www.europhit.eu](http://www.europhit.eu)



Obligation to present an energy certification when dwellings and buildings are being let or sold.

Together with the energy certificates, modernization recommendations have to be presented if possible.

So prospective tenants and purchasers of buildings and dwellings will also be able to take energy efficiency into account

***BUT: calculation method should be improved!***

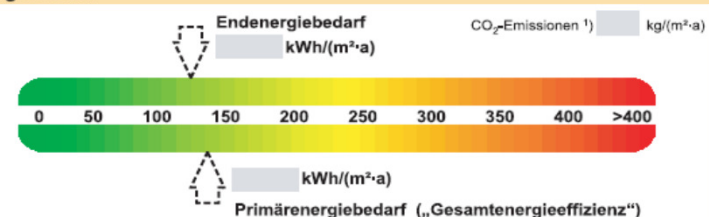
## ENERGIEAUSWEIS für Wohngebäude

gemäß den §§ 16 ff. Energieeinsparverordnung (EnEV)

### Berechneter Energiebedarf des Gebäudes

2

### Energiebedarf



### Nachweis der Einhaltung des § 3 oder § 9 Abs. 1 EnEV <sup>2)</sup>

Primärenergiebedarf		Energetische Qualität der Gebäudehülle	
Gebäude Ist-Wert	<input type="text"/> $\text{kWh}/(\text{m}^2 \cdot \text{a})$	Gebäude Ist-Wert $H_i$	<input type="text"/> $\text{W}/(\text{m}^2 \cdot \text{K})$
EnEV-Anforderungswert	<input type="text"/> $\text{kWh}/(\text{m}^2 \cdot \text{a})$	EnEV-Anforderungswert $H_i$	<input type="text"/> $\text{W}/(\text{m}^2 \cdot \text{K})$

### Endenergiebedarf

Energieträger	Jährlicher Endenergiebedarf in $\text{kWh}/(\text{m}^2 \cdot \text{a})$ für			Gesamt in $\text{kWh}/(\text{m}^2 \cdot \text{a})$
	Heizung	Warmwasser	Hilfsgeräte <sup>1)</sup>	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

### Sonstige Angaben

Einsetzbarkeit alternativer Energieversorgungssysteme

nach § 5 EnEV vor Baubeginn geprüft

Alternative Energieversorgungssysteme werden genutzt für:

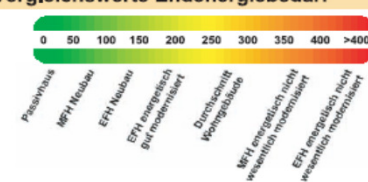
- Heizung  Warmwasser  
 Lüftung  Kühlung

#### Lüftungskonzept

Die Lüftung erfolgt durch:

- Fensterlüftung  Schachtlüftung  
 Lüftungsanlage ohne Wärmerückgewinnung  
 Lüftungsanlage mit Wärmerückgewinnung

### Vergleichswerte Endenergiebedarf



### Erläuterungen zum Berechnungsverfahren

Das verwendete Berechnungsverfahren ist durch die Energieeinsparverordnung vorgegeben. Insbesondere wegen standardisierter Randbedingungen erlauben die angegebenen Werte keine Rückschlüsse auf den tatsächlichen Energieverbrauch. Die ausgewiesenen Bedarfswerte sind spezifische Werte nach der EnEV pro Quadratmeter Gebäudenutzfläche ( $A_{n,0}$ ).

<sup>1)</sup> freiwillige Angabe

<sup>2)</sup> nur in den Fällen des Neubaus und der Modernisierung auszufüllen

<sup>3)</sup> ggf. einschließlich Kühlung

<sup>4)</sup> EFH – Einfamilienhäuser, MFH – Mehrfamilienhäuser





# Ready for NZEB?

**Energy Performance Certificate is not enough**



## New Buildings

- Promotion of sustainable standards
- Efficiency first
- Passive House is an existing solution for the „nearly zero energy building“
- The goal of promotion is to achieve future proof standard already now, create awareness and best practice examples, and prepare the construction and product market (giving the right signals – creating demand)

## Retrofit

- EnerPHit standard: Retrofit with Passive House components

## Retrofitting step by step

- Retrofit is coupled with life cycle of components
- Refurbishment is done when there is a cause for intervention
- In most of the cases only one or two components
- It is always advisable to choose a sustainable efficiency standard worth to be promoted.
- After refurbishment of all components a sustainable standard (EnerPHit) is reached.

# The EnerPHit Standard

**Why retrofit and how to do it right**



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

[www.europhit.eu](http://www.europhit.eu)



# EnerPHit: Deep retrofit

# EuroPHit



When you do it, do it right



Quality renovation

...achieved with the EnerPHit Standard

Source: PHI



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

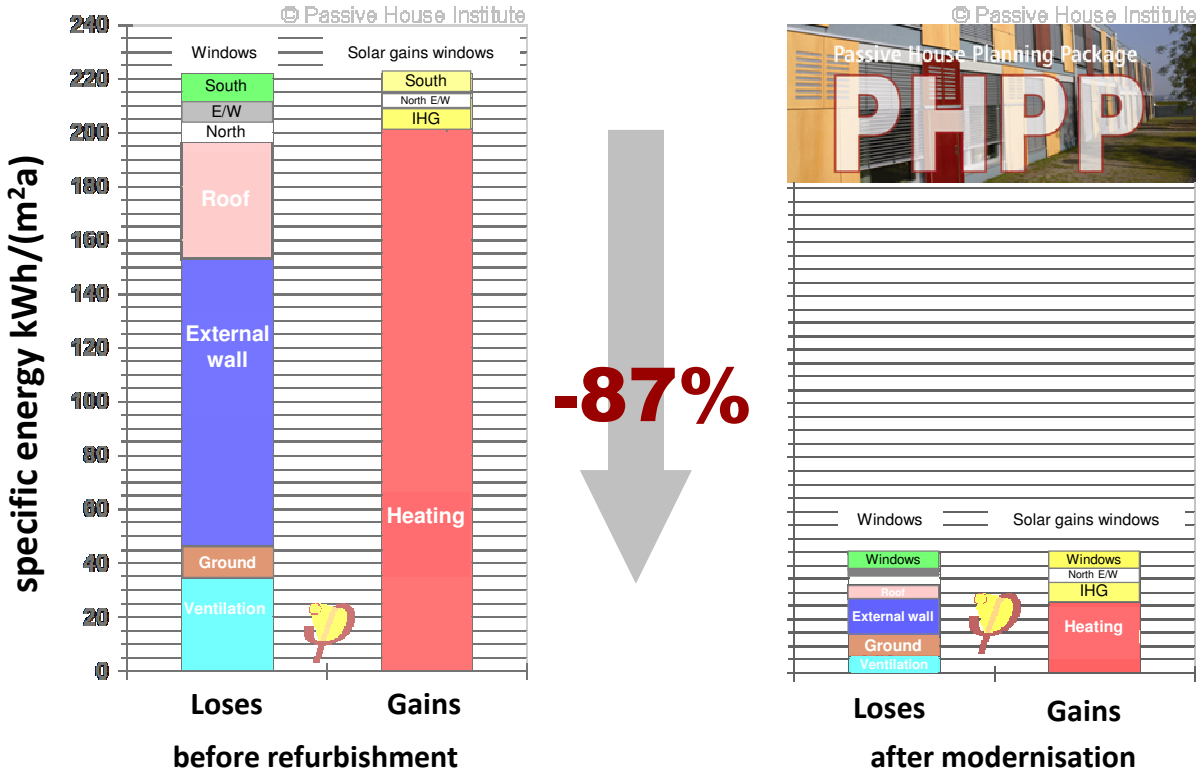
[www.europhit.eu](http://www.europhit.eu)



# Quality assurance with the PHPP

Efficiency can be designed!

The energy balance & Passive House Design tool  
 Know how → Tool → Optimisation



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

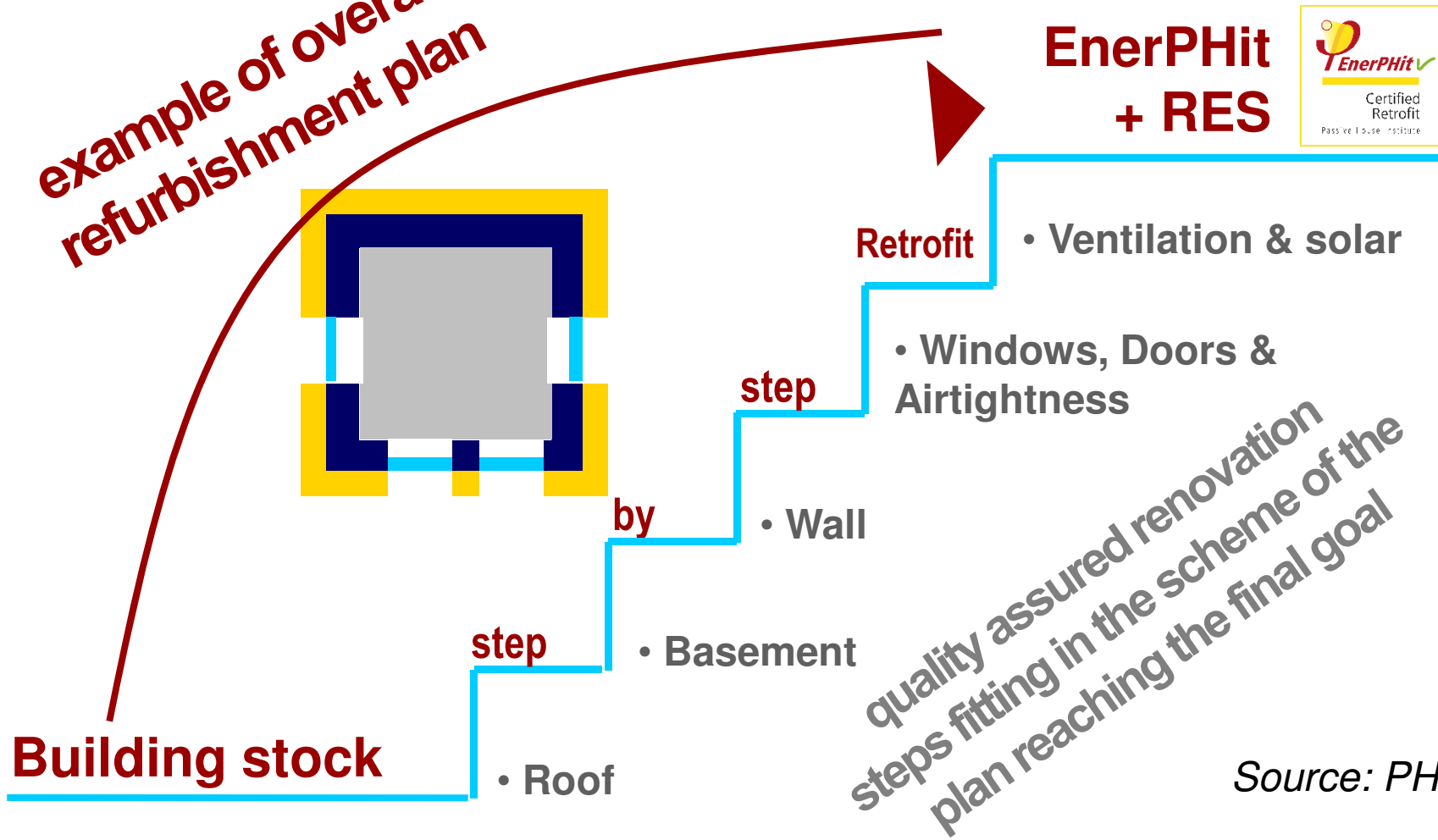
# The EuroPHit Project

**Deep retrofit – step by step**



# ... Step by step

example of overall refurbishment plan



Source: PHI



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

[www.europhit.eu](http://www.europhit.eu)

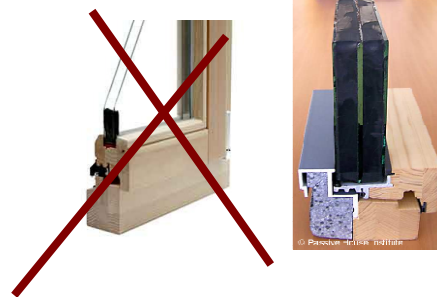


# When to change an old window?

- ... if it's damaged
- ... if I already plan to renovate
- ... if I get it as a gift.

**So, new windows only every 30+ years!**

Medium quality is not good for tomorrow – it is not sustainable, but improvement does not pay any more. It leads to an ecologic and economic impasse.



**IF you do it, do it right!**

Source: PHI



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

[www.europhit.eu](http://www.europhit.eu)





## **Principles**

- EE- requirements to be more ambitious than legal requirements
  - Using energy auditors and calculation tools as for the energy certificate, Mandatory requirement of qualified engineers and architects (quality assurance)
- Promotional incentives correspond with achieved standard



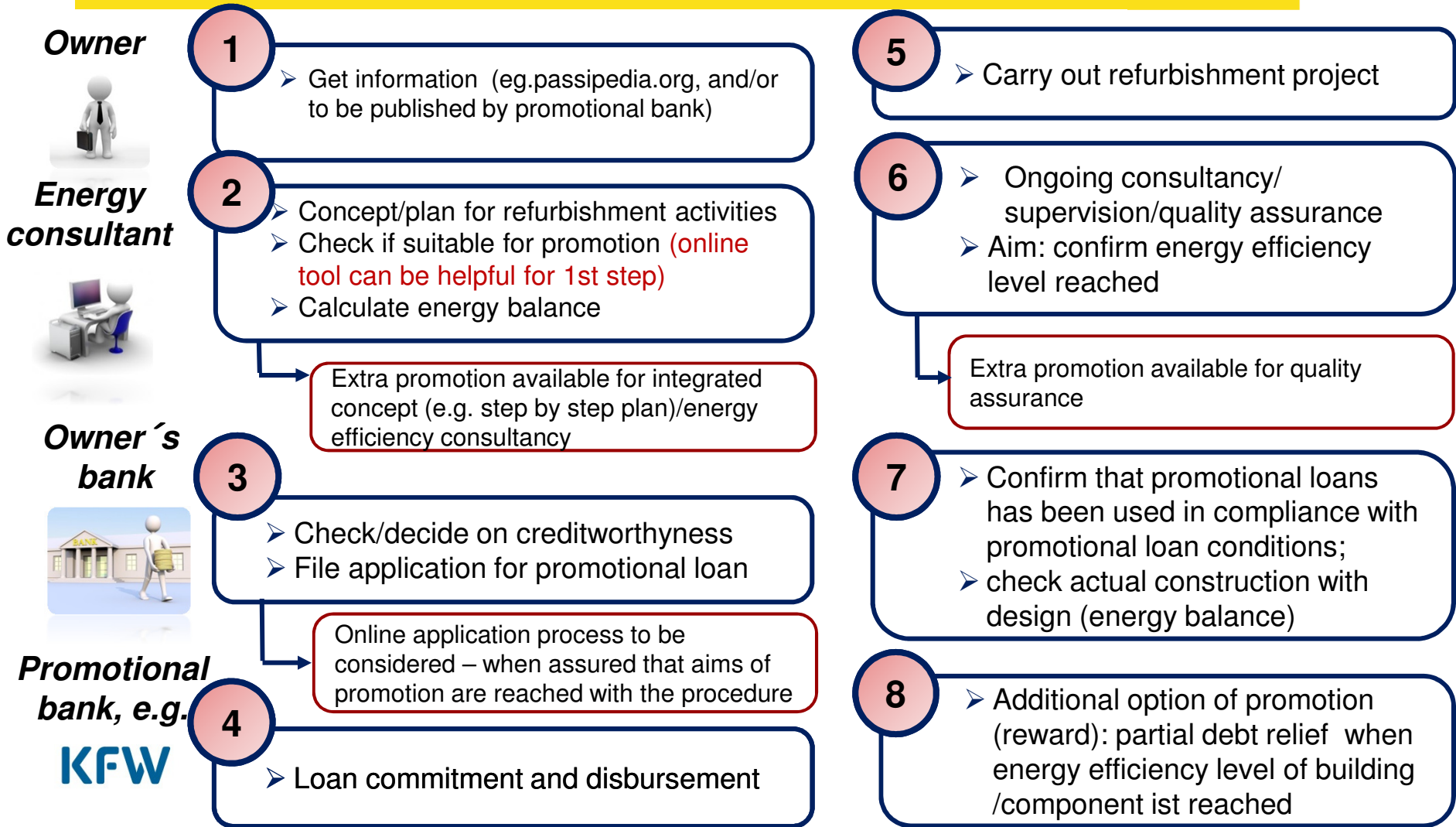
## Necessary – often to be improved in future

- We are aiming at NZEB -> VERY ambitious requirements!
- Quality design and assurance is essential
- Challenge for regional product efficiency and quality is ok and needed
- Address effects of learning and scale, help to reduce learning costs, and enhance quality
- There is no need to support suboptimal solutions
- Avoid lock in effects
- Aim of promotion: Dispensable in future!



# How can the promotional scheme work?

# EuroPHit



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

[www.europhit.eu](http://www.europhit.eu)



# Financial Instruments for Energy Efficiency Investments in Buildings

## *Public Finance Mechanisms, Policies and Programs*

- *Preferential Soft loans*
- *Grants - Redemption grants*
- *Guarantee schemes*

*Debt financing, Credit lines, Revolving funds,*

*ESCO financing*

*Leasing*



# Financing the retrofit of buildings

EuroPHit

[http://ec.europa.eu/energy/efficiency/studies/doc/2014\\_guidance\\_energy\\_renovation\\_buildings.pdf](http://ec.europa.eu/energy/efficiency/studies/doc/2014_guidance_energy_renovation_buildings.pdf)

<b>Document title</b>	Financing the energy renovation of buildings with Cohesion Policy funding
<b>Job Number</b>	ENER/C3/2012-415
<b>Prepared by</b>	Julien Paulou (ICF International), Jonathan Lonsdale (ICF International), Max Jamieson (ICF International), Isabella Neuweg (ICF International), Paola Trucco (Hinicio), Patrick Maio (Hinicio), Martijn Blom (CE Delft), Geert Warringa (CE Delft)
<b>Checked by</b>	Jonathan Lonsdale (ICF International)
<b>Date</b>	14 February 2014



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

[www.europhit.eu](http://www.europhit.eu)



# EU Funding for Energy Efficiency in Buildings

<http://www.buildup.eu/financing-schemes/>



**BUILD UP**  
energy solutions for better buildings

**Financing Schemes**  
THE EUROPEAN PORTAL FOR ENERGY EFFICIENCY IN BUILDINGS

Home | Financing Schemes | Browse all

### Financing Schemes

In this section of BUILD UP you can find information involving financing schemes for investments in energy efficiency and renewable energy measures in buildings.

Within each scheme you will find a description of the scheme but also useful information relevant to the scheme such as best practice guidelines, links to finance providers, case studies, updates/amendments to schemes, application procedures etc.

You can contribute to the financing schemes section by providing relevant content to the general BUILD UP sections (events, publications, cases etc). Selecting the theme "Financing, socio-economics" and relevant tags (keywords) for the material that you upload, will help the Financing Schemes section maintainers identify this content and link it to a financing scheme if deemed relevant.

[Hide this description]

**Advanced Search**

Search:

Sort by  in  order | Show  results per page

### Highlighted Schemes Info

#### European wide funds

In this category you will find a list of the existing **European funding mechanisms** that are aimed at promoting, improving and supporting **energy efficiency and renewable...**

Tags: [EU financing instruments](#) | [EU funded projects](#) | [EU Funding](#) | [Financing energy efficiency](#)

5 Schemes	32 Countries	193 Publications
82 News	188 Links	4 Events

Latest | Most Visited

#### Highlighted Cases

- Life Cycle Tower One Building
- Local water authority in Sorgue

[View All](#)



## National/Regional schemes for Individuals (homeowners & tenants) Slovakia

### Štátny fond rozvoja bývania (State Housing Development Fund) - Slovakia

1379 visits | National official sites

### Dotácie na slnečné kolektory a kotly na biomasu (Subsidies for solar collectors and biomass boilers) - Slovakia

1659 visits | National and regional energy agencies and organisations

### SLOVSEFF - Zlepšovanie tepelno-technických vlastností verejných budov (Slovak Energy Efficiency and Renewable Energy Finance Facility) - Slovakia

976 visits | National official sites

[View All Schemes](#)

[http://www.buildup.eu/financing-schemes/35693?keys=slovakia&field\\_global\\_countries\\_value=All&date\\_filter\[min\]\[year\]=&date\\_filter\[min\]\[month\]=&date\\_filter\[min\]\[day\]=&date\\_filter\[max\]\[year\]=&date\\_filter\[max\]\[month\]=&date\\_filter\[max\]\[day\]=&scheme\\_content\\_types=all&s\\_cr=wnhs&s\\_ob=DESC&views\\_page\\_filter\\_schemes\\_content=1](http://www.buildup.eu/financing-schemes/35693?keys=slovakia&field_global_countries_value=All&date_filter[min][year]=&date_filter[min][month]=&date_filter[min][day]=&date_filter[max][year]=&date_filter[max][month]=&date_filter[max][day]=&scheme_content_types=all&s_cr=wnhs&s_ob=DESC&views_page_filter_schemes_content=1)



## ELENA - European Local ENergy Assistance



**Europäische  
Investitionsbank**

**EIB ELENA**  
Big investment  
projects  
> 50 million €

**KfW**

**KfW ELENA**  
investment projects  
< 50 Mio. €

Severla facilities



**CEB**  
COUNCIL OF EUROPE DEVELOPMENT BANK

**CEB ELENA**  
Social investment  
projects  
< 50 Mio. €



**European Bank**  
for Reconstruction and Development

**EBRD ELENA**  
Focus on  
municipalities  
< 50 Mio. €



# The ELENA grant can be used for the preparation and implementation of the Investment Projects

**EuroPHit**

## Eligible costs

- › Feasibility studies
- › Energy audits
- › Implementation of tender procedures
- › Contractual arrangements
- › Hiring or training of staff (e.g. project implementation unit)

## Amount of grant

› amounts up to 5% of Investment costs

› covers up to 90% of eligible costs



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

[www.europhit.eu](http://www.europhit.eu)



## ELENA – Eligible Investment Projects

- › Increase of energy efficiency in public and private buildings
- › Integration of renewable energy sources into the built environment and in urban transportation
- › Investments in renovation, extension or new district heating/cooling networks
- › Municipal programmes for energy-efficient equipment and appliances in SMEs and private households

## Partnering Banks, Final Beneficiaries, Investors

Partnering Financial Intermediaries (PFIs)	Final Beneficiaries		
<ul style="list-style-type: none"><li>› Banks operating in the EU member states, Norway, Iceland, Liechtenstein or Macedonia.</li><li>› Banks receive global loans from KfW to fund the financing of investment projects of Final Beneficiaries / Investors.</li></ul>	<ul style="list-style-type: none"><li>› local or regional authorities (incl. members of the Covenant of Mayors) or associations of such bodies</li><li>› other Public Bodies, created by a public authority, with a public service mission, with more than 50% funding from public sources.</li></ul> <thead><tr><th>Investors</th></tr></thead> <tbody><tr><td><ul style="list-style-type: none"><li>› Local or regional authorities or other public bodies</li><li>› Private investors</li></ul></td></tr></tbody>	Investors	<ul style="list-style-type: none"><li>› Local or regional authorities or other public bodies</li><li>› Private investors</li></ul>
Investors			
<ul style="list-style-type: none"><li>› Local or regional authorities or other public bodies</li><li>› Private investors</li></ul>			



## Specific aspects of KfW ELENA Facility

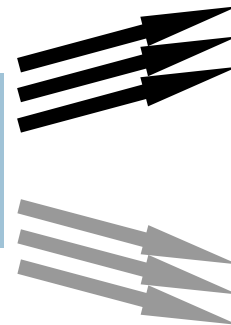
### Global loans to local financial intermediaries

Global loan for the Investment Programme [+ ELENA Grant]

[Larger part of the ELENA grant for in house capacity building in the municipality/region and/or consultancy services]



Partnering financial intermediary



Final Beneficiaries: Municipalities, Regions, ESCOs

Private Investors: Housing Assoc., Healthcare Org., ESCOs

[Smaller part of the EU grant for system building in the banks through technical assistance]

Individual loans for the Investment Projects



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

[www.europhit.eu](http://www.europhit.eu)



## KfW ELENA Examples of Investment Programmes

BPCE	<ul style="list-style-type: none"> <li>› France</li> <li>› 2,985 m EUR</li> </ul>	<ul style="list-style-type: none"> <li>› programme for local and regional energy efficiency projects for individuals and private housing co-ownership, especially one stop agencies and public guarantee funds in order to lower financial risk in loans to housing co-ownership</li> </ul>
Deutsche Bank	<ul style="list-style-type: none"> <li>› Germany</li> <li>› 2,43 m EUR</li> </ul>	<ul style="list-style-type: none"> <li>› programme for energy efficiency and renewables for municipalities, municipal owned companies and ESCOs</li> </ul>
Erste Bank	<ul style="list-style-type: none"> <li>› Austria</li> <li>› 2,43 m EUR</li> </ul>	<ul style="list-style-type: none"> <li>› new programme for energy efficiency and renewables for municipalities, including marketing and sales concept for a regional coverage throughout the country</li> </ul>
Kommune-Kredit	<ul style="list-style-type: none"> <li>› Denmark</li> <li>› 2,4 m EUR</li> </ul>	<ul style="list-style-type: none"> <li>› new programme for promoting energy efficiency and renewables investments by municipalities and regions</li> </ul>



## Next Steps

Internal decision of the Partnering Financial Intermediary

- › Market analysis
- › Interest of the bank for this type of programme
- › Evaluation of the needs (volume of grant / volume of global loan)

### ELENA Grant

- › Preparation of the application (information on the applicant, the targeted region, the volume and use of the grant, the types of Investment Projects, the schedule of implementation, ...)

### Global Loan

- › Negotiations with KfW about the financing conditions (volume, term, interest, collateral, etc)
- › Preparation of a Term Sheet





## Special Aspects

- Co-operation
- Comprehensive Programs
- Viability and Feasibility  
(technical solution - energy audit – loan conditions)
- Know How (energy advisors)
- FaQ



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

[www.europhit.eu](http://www.europhit.eu)





Thank you

