

Financing of Sustainable Housing Retrofit

Guidelines for Financial Institutions Workshop Dublin 20. March 2015

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1. Promotion of Energy Efficient Buildings
2. EU Policy and Promotion
3. Financial Instruments
4. The EuroPhit Project
5. The German Case
6. Ireland
7. Discussion and questions



Part 1

Promotion of Energy Efficient Buildings



What banks need to know – technical aspects

Holistic approach: Consider the entire building and not just a part of it. What is my final objective in terms of energy consumption (kWh/m²/year) → even for step-wise refurbishment

Target value for primary energy: The same amount of consumption for electricity, oil, gas or RE *is different* in terms of primary energy

Reliable calculation tools: For base case as well as actual savings

Certification systems: To know whether particular efficiency targets have been reached (especially for step-wise refurbishment)



Part 2

EU Policy and Promotion



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: Energy Saving Ordinances



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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

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About 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.

- [European wide funds](#)
- [National/Regional schemes for Individuals \(homeowners & tenants\)](#)
- [National/Regional schemes for Municipalities, Social Housing, Companies, Enterprises](#)
- [National/Regional schemes for Residential Buildings](#)
- [National/Regional schemes for Non-Residential Buildings and other Facilities](#)

Sort by in order | Show results per page

LIFE (2014-2020) and PF4EE, the financial instrument for energy efficiency
18689 visits | Building Energy related activities by the European Commission (directives and regulations)

COSME – the Programme for the Competitiveness of Enterprises and Small and Medium Enterprises (SMEs)
936 visits | Building Energy related activities by the European Commission (directives and regulations)

Horizon 2020 Framework Programme
4443 visits | EU funded energy related research projects (FP6, FP7)

European Structural and Investment Funds (ESI) 2014-2020
4726 visits | Building Energy related activities by the European Commission (directives and regulations)

Structural and Cohesion Funds 2007-2013
1962 visits | Building Energy related activities by the European Commission (directives and regulations)

Financial incentives supporting EPBD recast objectives (Article 10, Directive 2010/31/EU)
2238 visits | Information on legislation

Support schemes promoting the use of energy from renewable sources (as per Directive 2009/28/EC)
1613 visits | Information on legislation

Intelligent Energy – Europe programme (IEE)
2522 visits | Intelligent Energy Europe projects



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ELENA - European Local ENergy Assistance



EIB ELENA
Big investment
projects
> 50 million €

KfW

KfW ELENA
investment projects
< 50 Mio. €

Several facilities



CEB ELENA
Social investment
projects
< 50 Mio. €



European Bank
for Reconstruction and Development

EBRD ELENA
Focus on
municipalities
< 50 Mio. €

Part 3

Financial Instruments



Financial Instruments

- Overview
- Cash flow as basis for financing
- Cash flow analysis: Example
- Project- versus recourse finance
- More details:
 - Debt financing,
 - ESCO financing,
 - Forfaiting,
 - Leasing
- Public supports



The basis for financing is the financial soundness of a project

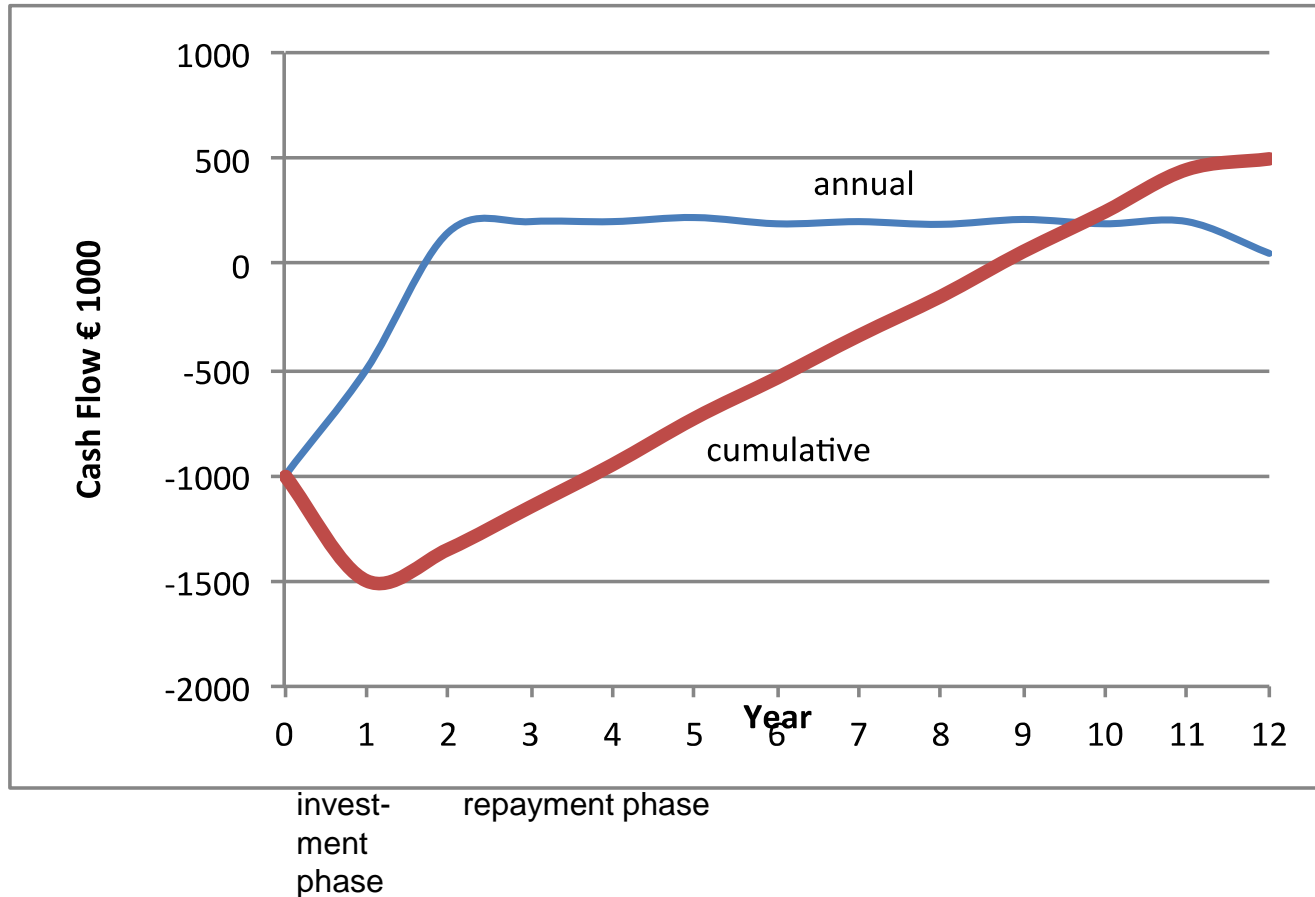
The basis for financial soundness is the cash flow.

- Economic benefits (externalities) are not considered, but they can serve as justification for public supports,
- Cash flow from energy efficiency projects consists of:

Inflows	Outflows
Savings from efficiency gains	Equity share at investment cost
	Operation cost
Higher rents (house-owners)	Higher rents (tenants)
Loan disbursements	Repayment/interest for loans

- Savings will arrive as avoided outflows.
- Savings usually fluctuate, they also depend on price developments and can only be measured if the base case values are known
- They do not always arrive at the same place as the outflows (investment versus operating budget; tenant versus landlord) -> conflict lines

Typical cash flow profile of an energy efficiency project



Cashflow example: Housing refurbishment (Rental homes)

in 1000€		C	D	E	F	G	H	I	J	K	L	M	N	
Year			0	1	2	3	4	5	6	7	8	9	10	
4	1. Revenue		0	169	169	169	169	169	169	169	169	169	169	
5	Renovation Rent increase			85	85	85	85	85	85	85	85	85	85	
6	Rent increase energy efficiency			84	84	84	84	84	84	84	84	84	84	
7	2. Investment (energy efficiency part)		625											
8	3. Maintenance cost (2% ann. increase)			0,0	6,0	6,1	6,2	6,4	15,0	6,6	6,8	6,9	7,0	
9	4. Project Cash Flow (energy)	line 6-8	-625	84,0	78,0	77,9	77,8	77,6	69,0	77,4	77,2	77,1	77,0	
10	4a. Project Cash Flow after tax	line 9-18		83,5	78,0	77,9	77,8	77,2	69,0	75,7	74,9	74,1	73,3	
11	5. Equity		125											
12	7. Loan Finance													
13	8. Loan Disbursement + debt service	line 14+15	500	70,0	70,0	68,0	66,0	64,0	62,0	60,0	58,0	56,0	54,0	
14	8.1 Principal	line 16+15		50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0	
15	8.2 Interest	4%		20,0	20,0	18,0	16,0	14,0	12,0	10,0	8,0	6,0	4,0	
16	Loan Balance		500	500,0	450,0	400,0	350,0	300,0	250,0	200,0	150,0	100,0	50,0	
17	Net Cash flow before tax	line 9-11-13	-125	14,0	8,0	9,9	11,8	13,6	7,0	17,4	19,2	21,1	23,0	
18	Profit before tax (**)			1,5	-4,5	-2,6	-0,7	1,1	-5,5	4,9	6,7	8,6	10,5	
19	Profit tax 35%	35%	-125	0,5	0	0	0	0,4	0	1,7	2,4	3,0	3,7	
20	Net Cash flow after tax	line 17-19	-125	13,5	8,0	9,9	11,8	13,2	7,0	15,7	16,9	18,1	19,3	
21	Plus repayment subsidy 15% (tax free)	15%		7,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5	
22	Net cash flow after tax + subsidy		-125	21,0	15,5	17,4	19,3	20,7	14,5	23,2	24,4	25,6	26,8	
22	Net cash flow after tax + subsidy		-125	21,0	15,5	17,4	19,3	20,7	14,5	23,2	24,4	25,6	26,8	
23	Pre tax financial IRR*)	2,4%	Sensitivity analysis: If additional income 10%:											
24	After tax financial IRR*	1,1%	After tax IRR 9,1%; DSR in year 2 below 1											
25	After tax/subsidy financial IRR*	9,8%												
26	*) Refers to equity **) For profit principal repayment has to be added and depreciation (here 10 years) deducted													
27	Debt service cover			1,20	1,11	1,15	1,18	1,21	1,11	1,29	1,33	1,38	1,43	
28	Debt service cover after tax			1,19	1,11	1,15	1,18	1,21	1,11	1,26	1,29	1,32	1,36	
29	Debt service cover after subsidy			1,30	1,22	1,26	1,29	1,32	1,23	1,39	1,42	1,46	1,50	
30	Economic IRR													
31	Total investment (energy)		-625											
32	Project cash flow	line 9	-625	84	78	78	78	78	69	77	77	77	77	
33	Total cash flow + repayment subsidy		-625	92	86	85	85	85	77	85	85	85	84	
34	Economic IRR*)	4,1%												
35	Economic IRR incl. repayment subs. *)	6,0%												
	*) No externalities included													



Project versus recourse finance:

- **Recourse (or balance sheet finance):** Finance is granted on the basis of the creditworthiness of the investor (mostly supported by a collateral). Cash flow and NPV are (for the bank) of secondary importance
- **Project finance:** Finance is granted on the basis of the financial soundness (cash flow) of the project. The investor has to prove that the cash flow is sufficient to cover the repayment (debt service ratio >1 ; Life loan ratio > 1 , at all times)
- **Recourse and project finance:**
 - Project finance for energy efficiency part
 - Recourse finance for the incidental and modernisation part (since there are no visible future financial benefits)

Financial Instruments for Energy Efficiency Investments in Buildings

- ① Debt financing, credit lines, revolving funds,
- ② ESCO financing,
- ③ Forfaiting
- ④ Leasing

Debt financing, Credit lines, Revolving funds,

- **A conventional bank loan is the simplest form of debt**
- **As recourse financing:**
 - Creditworthiness of borrower, not necessarily project
- **As project finance:**
 - Private house-owner: Standardised procedures, normally under a public programme requiring standardised technical as well as financial ratios
 - Community: Cash-flow must be sufficient for loan-service
 - Separate finance for “incidental part” (equity or recourse financing)

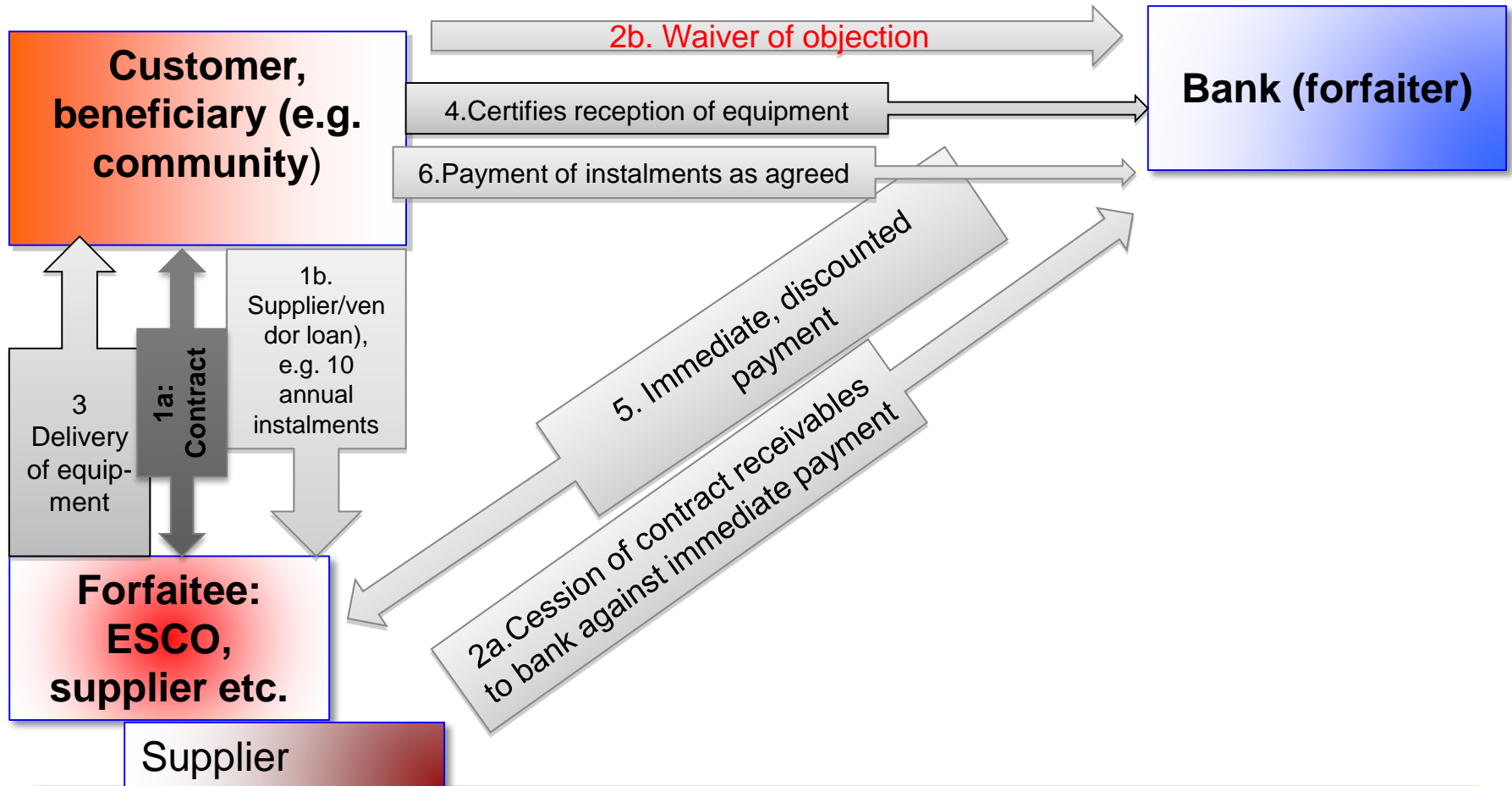
EPC and ESCO FINANCING :

- **EPC (Energy performance contracting)** refers to the contractual arrangement between a provider of energy services and the customer
- **ESCO (Energy service company):** “Natural or legal person who delivers energy services or other energy efficiency improvement measures in a final customer’s facility or premises” (*Energy Efficiency Directive (EED, 2012/27/EU)*)
- **ESCO by itself is not yet a financing solution.** Depending on the share of hardware/equipment to be installed upfront there is still a financing problem for the ESCO which might also affect the customer: Financial solutions like project finance or forfaiting will have to be applied

FORFAITING:

- **Financing a forfait means:**
 - Selling a receivable for a discounted lump sum to a bank (forfaiter), normally on the basis of bills of exchange
 - Example: A sum of € 1 Million in 10 annual repayment instalments, discounted at a forfaiting fee of 4% annually yields an immediate payment of € 880.000 (minus around 0,25% provision fee etc.)
 - Passing on all accountability from the financial obligation, meaning: There is no more financial obligation from the side of the seller of the receivable (e.g. ESCO) in case of breach of contract, non fulfilment etc.
 - This “abstractness of the forfaiting document” will be further emphasised by a “waiver of objection”, which means the customer waives his right to object legally against his repayment obligation because of any dispute (like non fulfilment of conditions, late delivery, warranties etc.)

FORFAITING:



Forfeiting pros and cons:

- Immediate cash for the contractor (ESCO etc.)
- For the contractor: **The debt is not booked on his balance sheet**, so the potential for further debts remains unlimited (in principle)
- Forfeiting needs **immaculate creditworthiness** of the debtor and/or the project (otherwise it becomes expensive or impossible)
- The debtor is always the institution which receives the investment (never the ESCO or the supplier)
- The **waiver of objection** poses the problem that the investor cannot stop the payments any more if contractual obligations are not reached
- This can, however, be avoided if the **operational part is separated from the investment part** (Operation cost normally need no financing anyway)

LEASING:

- Investment goods are only **leased to the investor** and will be taken back after an agreed time (with the option to buy them at an agreed residual value)
- **Operating Leasing:** Leasing period is much shorter than life time
- **Financial Leasing:** Leasing period approaches life time
- Normally leasing makes only sense for **goods that can be given back** without high cost for de-installation: therefore leasing will be the **exception for housing retrofits** (if ever: financial leasing with the option to buy)
- **Tax reductions:** Leasing (in particular cross border leasing) reached some positive (as well as negative) reputation on the basis of tax saving models. Contracts, however, are complicated, sometimes tricky and therefore a good team of international tax experts and lawyers are needed

Public supports

Justification is over energy savings, external effects (CO₂/GHG-reduction), demand induced tax revenues, employment effects etc.

- Grant programs
- Credit lines and guarantee schemes
- Redemption Grants
- EU Funding for Sustainable Energy in Buildings
 - Europe-wide funds
 - National and Regional schemes
 - National/Regional schemes for Individuals
 - National/Regional schemes for Individuals for Municipalities/Social Housing
 - National/Regional schemes for Residential Buildings
 - National/Regional schemes for Non-Residential Buildings
- European Development Financial Institutions
 - CEB/EIB/EBRD
 - National Development Institutions (like KfW)

Public supports

Justification is over energy savings, external effects (CO₂/GHG-reduction), demand induced tax revenues, employment effects etc.

Public supports can help:

- To shorten the long repayment periods and to make a project financeable by market based instruments
- To create trust for a refurbishment project in order to find financing sources, especially in countries where the type of project is still unknown
- To improve the cash flow and the net-present value of a project in order to find project sponsors (equity as well as loan financing)
- To compensate for external, but intangible benefits (like CO₂ reduction)
- To improve the financing structure in particular for communities and public institutions lacking financial sources under strict saving requirements
- But: they will always require additional market based financing

http://ec.europa.eu/energy/efficiency/studies/doc/2014_guidance_energy_renovation_buildings.pdf

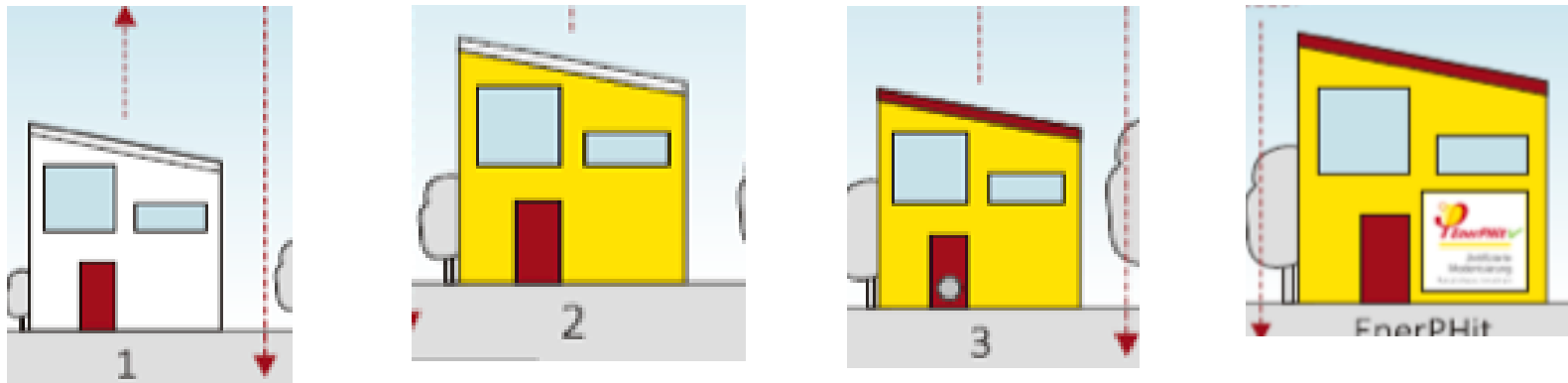
Document title	Financing the energy renovation of buildings with Cohesion Policy funding
Job Number	ENER/C3/2012-415
Prepared by	Julien Paulou (ICF International), Jonathan Lonsdale (ICF International), Max Jamieson (ICF International), Isabella Neuweg (ICF International), Paola Trucco (Hinicio), Patrick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



Part 4

The EuroPhit Project and the EnerPhit Standard





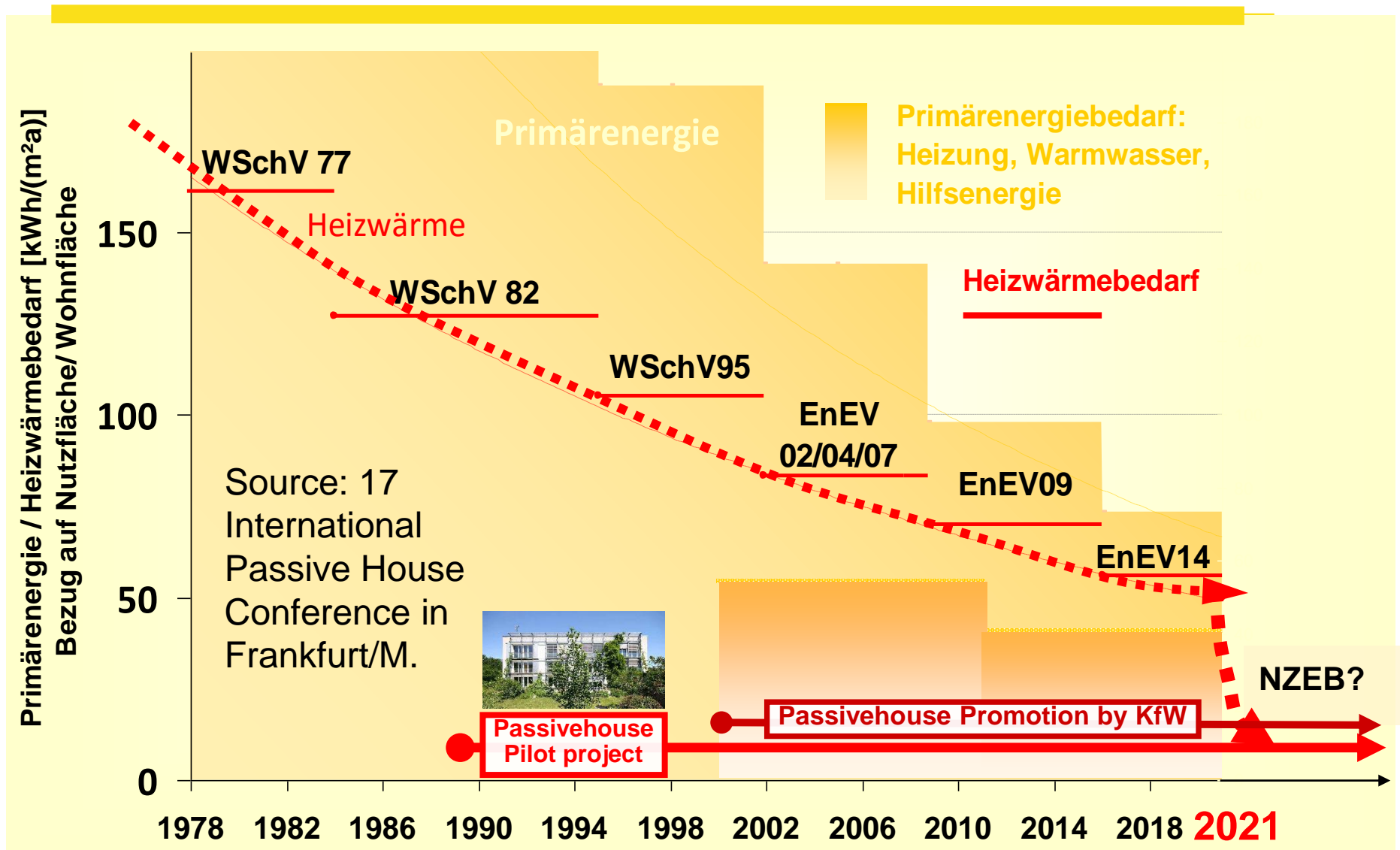
Certification is necessary to prove the achievement of individual steps (especially to outsiders like banks)



Part 5

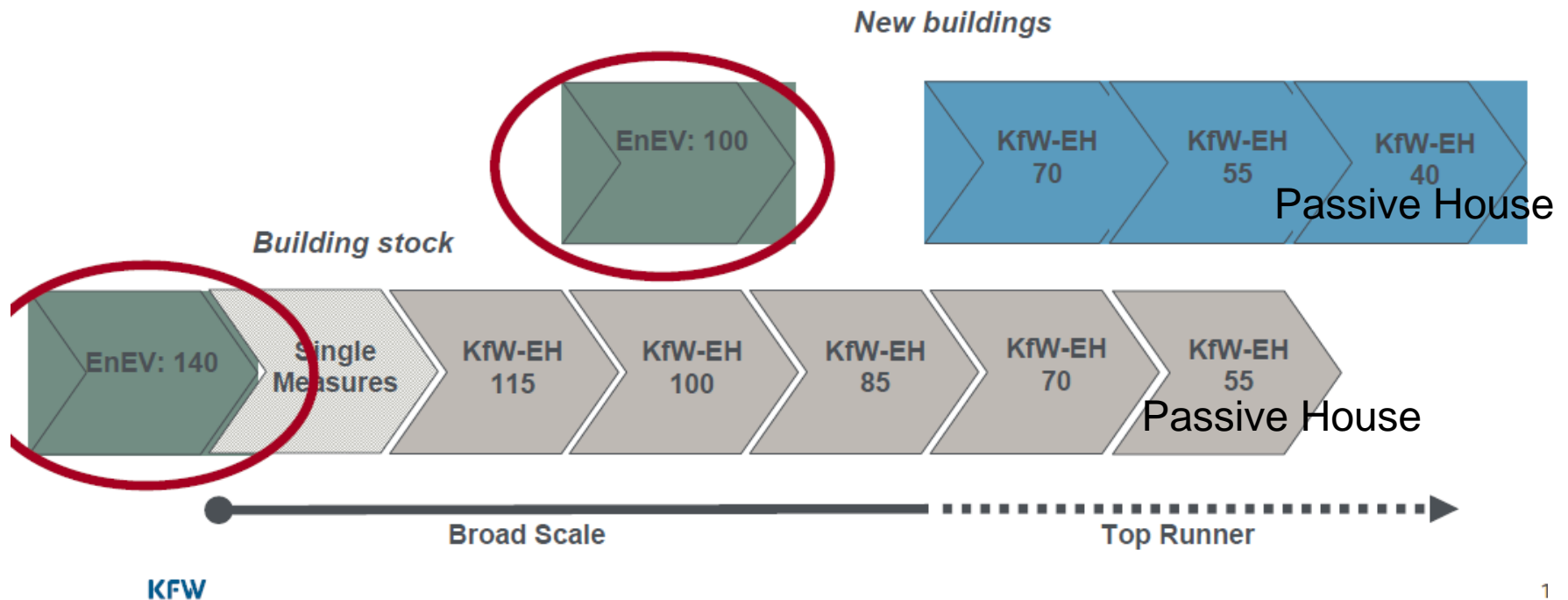
The German Case





KfW Promotion: The benchmark is the legal requirement

For Passive Houses: International Passive House Standard with PHPP





Budgetary effects and external effects

Public supports create investments and they can contribute to achieve external effects like GHG savings, health improvements etc.

- Theoretically a 20% subsidy for an investment project can generate VAT incomes for the government. With a 20% VAT it could be budget neutral
- In addition there are multiplier effects
- There is also the benefit of GHG savings (indicator CO₂): Depending on the value attached to a ton of CO₂ the savings can be between US\$ 25 (IMF) and € 80 (German environmental agency)
- The Swiss Prognos AG, for example, estimates –in the basic scenario in a study for KfW - the following values: (Bn Euro)
Subsidy fund 25 → investments 428 → tax revenue 39 → total value added 80, energy cost savings 92 and CO₂ reduction 15,6 Million ton p.a.,



Part 6

Ireland





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National/Regional schemes for Individuals (homeowners & tenants)

National, Regional, Local

Scheme Contents

2 Items

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Warm Homes scheme – Northern Ireland, UK

1043 visits | National official sites

Better Energy Homes scheme - Ireland

1120 visits | National and regional energy agencies and organisations

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Better Energy Homes scheme - Ireland

 Like  0  1120 visits

Posting Date | 1 March 2013

Country | Ireland

Geographic Coverage | [National](#)

Available link languages | [English](#)

Theme | [Energy policies](#), [Financing](#), [socio-economics](#)

Target Group | [Local/regional/national authorities and facilitators](#), [Building professionals](#), [Building occupants](#)

Type of Link | [National and regional energy agencies and organisations](#)

Tags: [SEAI](#) | [renovation grants / energy savings / residential buildings](#) | [NEEAP](#) | [NEEAP scheme](#)

URL | http://www.seai.ie/Grants/Better_energy_homes/

Through the Better Energy Homes scheme and the Sustainable Energy Authority of Ireland (SEAI) the Irish Government provides incentives to **homeowners** in the form of **Cash Grants** to install various upgrade measures.

The objectives of the scheme are to:

1. Support homeowners in making intelligent choices to improve the energy performance of their home
2. Reduce energy use, costs and greenhouse gas emissions
3. Build market capacity and competence by driving contractor standards and quality
4. Stimulate market innovation.

Grants are available to eligible applicants for undertaking works in the following fields:

1. Insulation
2. Heating System



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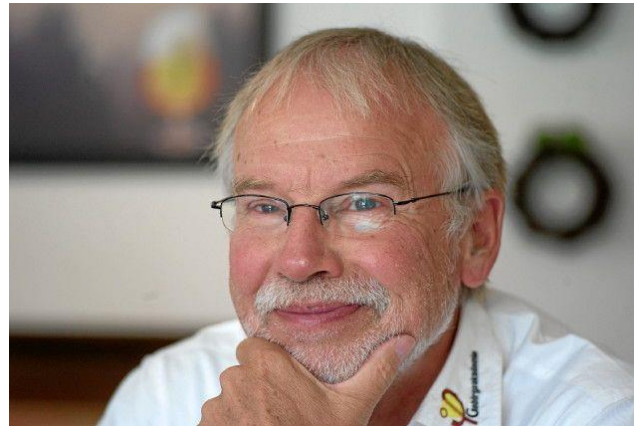
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Part 7

Discussion and questions





Thank you

