

Financing of Sustainable Buildings Retrofit EuroPhit Financial Workshop Frankfurt March 2016

Friedrichsdorfer Institut zur Nachhaltigkeit IzN e.V
Georg Kraft, Dr. Klaus Stocker, Dr. Rudolf Hennes



1. Promotion of Energy Efficient Buildings
2. The Financial Face of a Project
3. Financial Instruments
4. Social Aspects
5. Discussion and Questions



Part 1

Promotion of Energy Efficient Buildings



The challenge: European Objective

Article 9 of the recast EPBD requires that "Member States shall ensure that (a) by 31 December 2020 all new buildings are nearly zero-energy buildings; and (b) after 31 December 2018, new buildings occupied and owned by public authorities are nearly zero-energy buildings". Member States shall furthermore "draw up national plans for increasing the number of nearly zero-energy buildings" and "following the leading example of the public sector, develop policies and take measures such as the setting of targets in order to stimulate the transformation of buildings that are refurbished into nearly zero-energy buildings".



Overview of Promotional Schemes for Buildings in the EU

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

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National/Regional schemes for Non-Residential Buildings and other Facilities (47)

In this category you will find a list of the existing national and regional funding mechanisms that promote energy efficiency and renewable energy in **non-residential buildings and facilities**, such as commercial and office...

National/Regional schemes for Residential Buildings (79)

In this category you will find a list of the existing national and regional funding mechanisms that promote energy efficiency and renewable energy in **new and existing residential buildings**, regardless of who the owner, developer or tenant is...

National/Regional schemes for Municipalities, Social Housing, Companies, Enterprises (75)

In this category you will find a list of the existing national and regional funding mechanisms that are aimed at **legal persons**, e.g. companies, SMEs, municipalities, homeowners associations etc. These schemes have greater diversity than those...

National/Regional schemes for Individuals (homeowners & tenants) (67)

In this category you will find a list of the existing national and regional funding mechanisms that are aimed at **natural persons**, usually in the form of an owner or tenant of a residential building or apartment. These schemes are aimed at...

European wide funds (15)

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 energy** in the residential, commercial and industrial...



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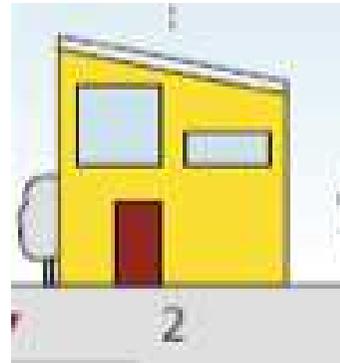
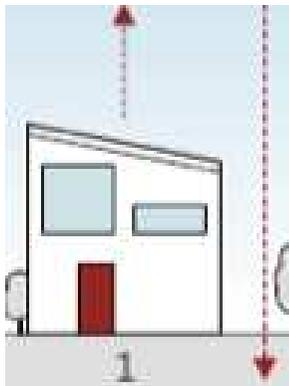
Holistic target based approach: Consider the entire building and not just a part of it. What is my final objective in terms of energy consumption (kWh/m²/year) → even for step-wise refurbishment

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-by-step refurbishment)



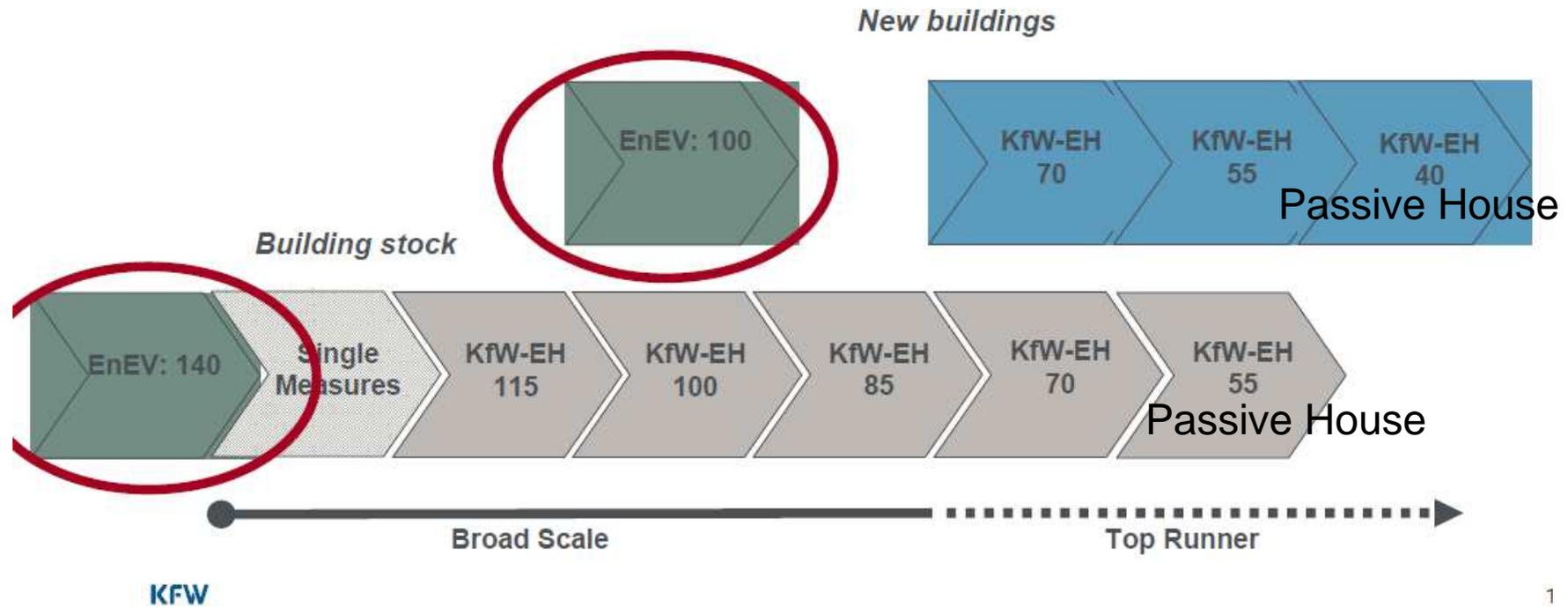


Certification is necessary to prove the achievement of individual steps (especially to outsiders like banks)



KfW Promotion: The benchmark is the legal requirement

For Passive Houses: International Passive House Standard with PHPP



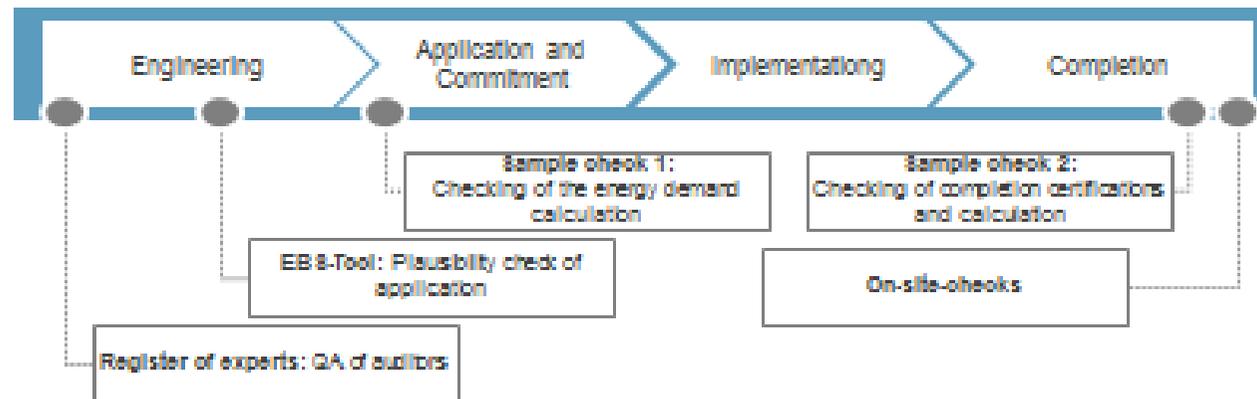
KfW Program 431

**Energieeffizient Bauen und Sanieren - Zuschuss
Baubegleitung (energy efficient construction and
retrofit – grant facility)**

**Grant provided for the energy efficient design,
supervision and certification in connection with the
building retrofit program (50% of costs up to Euro
4000,-)**



»»» Energieeffizient Bauen und Sanieren Wichtige Elemente der Qualitätssicherung



Quality Assurance is an holistic process and a permanent challenge!

KfW



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»» Accompanying Services

Grant for engineering and supervision by a registered energy auditor
durch einen sachverständigen Energieberater

Services to be financed?	Granted only in connection with the following promotional programmes
Detailed Engineering	EE Retrofit Loan
Support in drafting TenderDocs and Tender Evaluation	EE Retrofit Grant
Supervision and Handing over	Programs by State Promotional Banks being refinanced by KfW men
Evaluation of sustainability (Green Building) ab 01.04.16	EE Construction Loans ab 01.04.16
Limits	Preconditions to be complied with by the auditor
50 % of cost	External and Independent
Up to 4.000 Euro per project	Registered with KfW/diens

KfW



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ELENA - European Local ENergy Assistance



**Europäische
Investitionsbank**

EIB ELENA
Big investment
projects
> 50 million €

KfW

KfW ELENA
investment projects
< 50 Mio. €

Several 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. €

2. The financial face of a project

- Making a project bankable:
 - Risks
 - Cash flow as basis for financing
- Refurbishment cost and “anyhow”-cost



Is the project bankable? →→ **RISKS**

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1. Technological risk

- Quality of design and construction, novelty of technology
- Expected savings will not be reached
- End-user behaviour affecting energy savings

2. Financial risk

- Price changes
- Budgeting of energy cost savings:
 - Are savings recognised as such?
 - Can they be separated from other cash flows?

4. Maturity match and country-adapted repayment periods:

- Maturities (=repayments to banks) must match annual cash flow derived from the project-savings (Debt service ratio). Sometimes this leads to unusually long repayment periods

5. Creditworthiness of borrower (private/municipalities/institution etc.) and /or collateral

6. Participation of public institutions (reduces risk)



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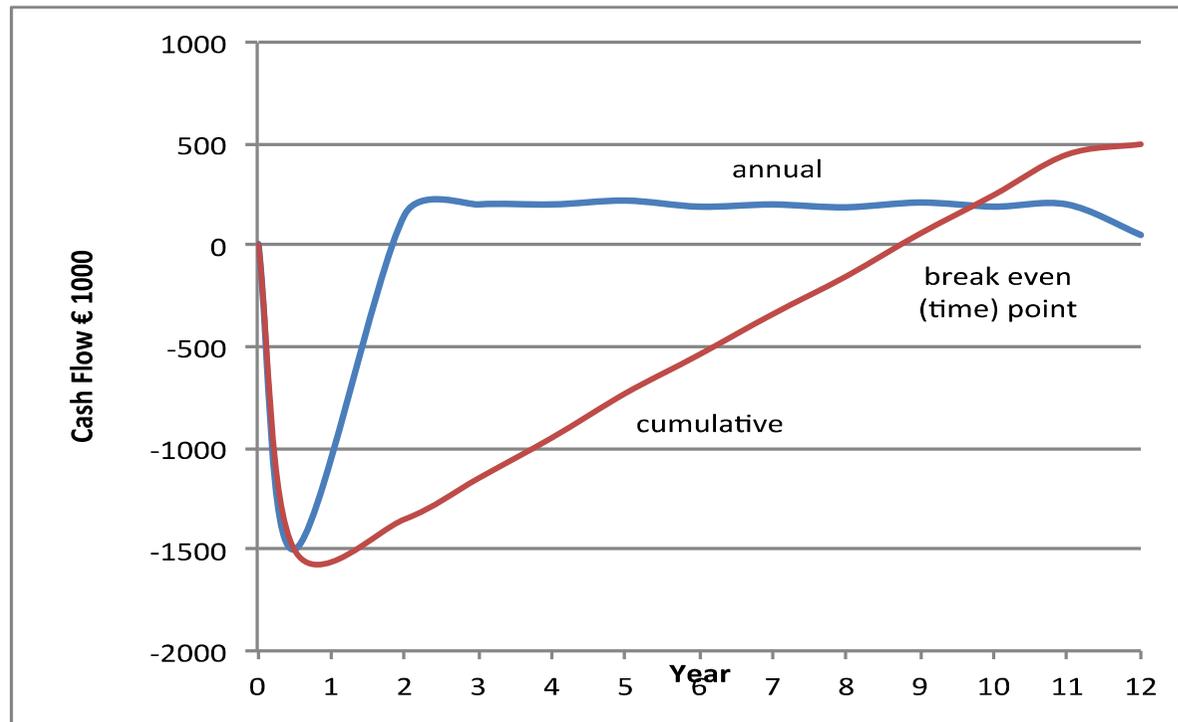
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- ❖ Usually houses undergoing energy efficiency refurbishment do also need other renovation,
 - ❖ e.g. the heating system is already 20 years old, the walls need repainting, the windows are close to breakdown and the roof is leaking.
 - ❖ It is advisable to couple energy saving measures with other, e.g. maintenance measures that are necessary or planned anyhow. For instance, a wall needing a new plastering can be insulated at the same time. In this case, only the additional costs are counted as energy efficiency investment.
- ❖ Energy savings alone can seldom recover total refurbishment cost. Therefore energy related cost and “anyhow cost” (incidental cost) have to be separated.



Typical cash flow profile of an energy efficiency project



invest-
ment
phase

repayment phase

Assumptions:
 3 125 € Investment/flat : 200 flats
 600 l oil equ savings per flat/year
 300 € savings p.a. per flat

Simplified cash flow example: Housing retrofit savings

2	in 1000 €	C	D	E	F	G	H	I	J	O	P	Q	R	S
3	Year		0	1	2	3	4	5	6	11	12	13	14	15
4	Estimated energy savings MWh (oil equiv.)			1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
5	Price light fuel oil € per l.		0,5	0,505	0,51	0,515	0,52	0,526	0,531	0,558	0,563	0,569	0,575	0,58
6	Price light fuel oil per KWh.		0,050	0,050	0,051	0,051	0,052	0,052	0,053	0,055	0,056	0,056	0,057	0,057
7	1. Estimated energy savings (monetary)	EUR 1000		60	61	61	62	62	63	66	67	68	68	69
8	2. Investment (energy efficiency part)		625											
9	3. Maintenance cost (2% ann.increase)			0,0	6,0	6,1	6,2	6,4	15,0	7,2	7,3	7,5	7,6	7,8
10	4. Project Cash Flow (energy)	line 7-9	-625	60,0	54,6	55,1	55,6	56,1	48,1	59,1	59,6	60,1	60,7	61,2
11	5. Equity		125											
12	6. Loan Finance													
13	7. Loan disbursement		500											
14	7.1 Principal repayment	500 /15		33,3	33,3	33,3	33,3	33,3	33,3	33,3	33,3	33,3	33,3	33,3
15	7.2. Loan Balance (minus 33,3 p. year)		500	500,0	466,6	433,3	400,0	366,6	333,3	166,7	133,3	100,0	66,7	33,3
16	7.3 Interest (on loan balance)	4%		20,0	20,0	18,7	17,3	16,0	14,7	8,0	6,7	5,3	4,0	2,7
17	8. Loan disbursement+debt service	line 14+16		53,3	53,3	52,0	50,7	49,3	48,0	41,3	40,0	38,7	37,3	36,0
18	Net Cash flow (Line 8-15, except Col. D)	line 10-17	-125	6,7	1,3	3,1	4,9	6,7	0,1	17,8	19,6	21,5	23,3	25,2
20	Plus repayment subsidy 15% (tax free)	15%		5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
21	Net cash flow after subsidy		-125	11,7	6,3	8,1	9,9	11,7	5,1	22,8	24,6	26,5	28,3	30,2
		Base case		Oil price 0,4		Energy savings - 10% less				Oil price 0,4 and savings less 10%				
22	Financial IRR)	3,7%		-11,3%		-2,7%				-19,3%				
23	After subsidy financial IRR	8,2%		4,5%		2,4%				-9,8%				

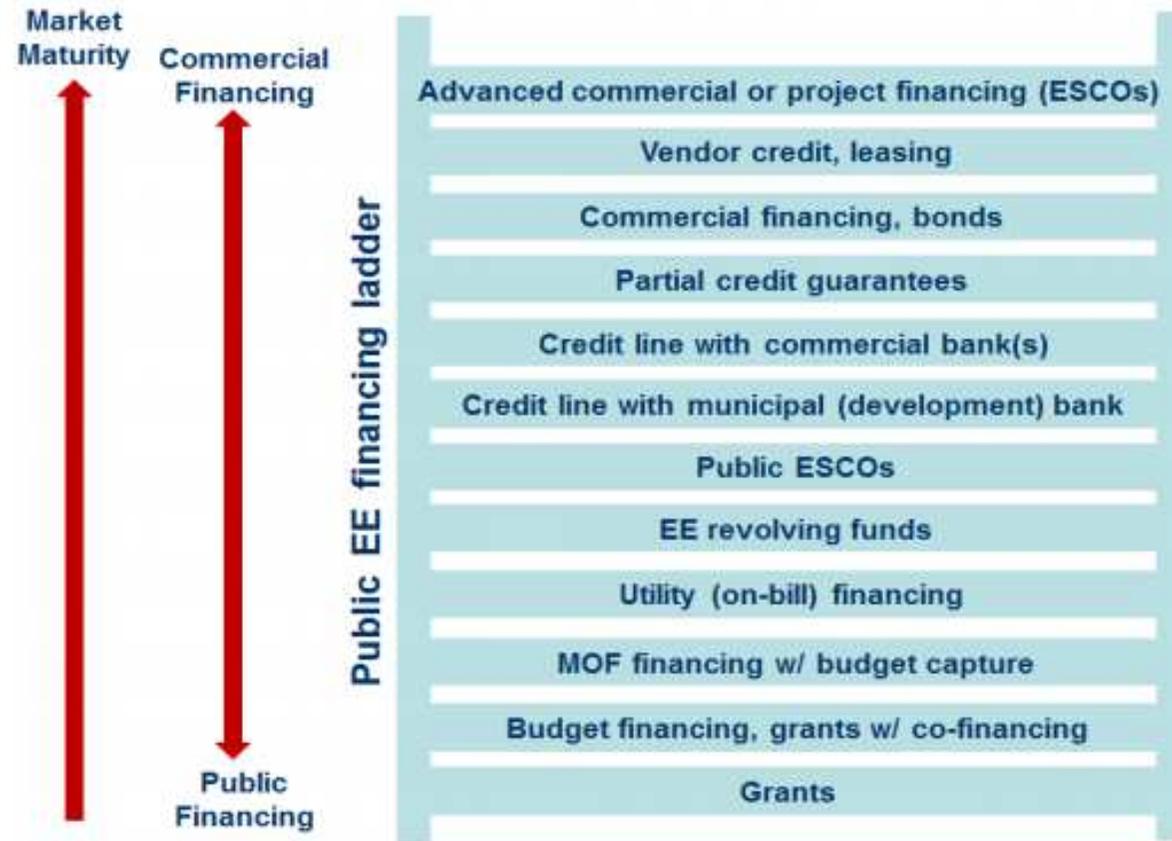
3. Financial Instruments for Energy Efficiency Investments in Buildings

- Debt financing
- ESCO financing
- Forfaiting
- (Leasing)
- Public supports



Financing ladder for public buildings

The Financing Ladder for Public Building EE



Source: J. Singh WB

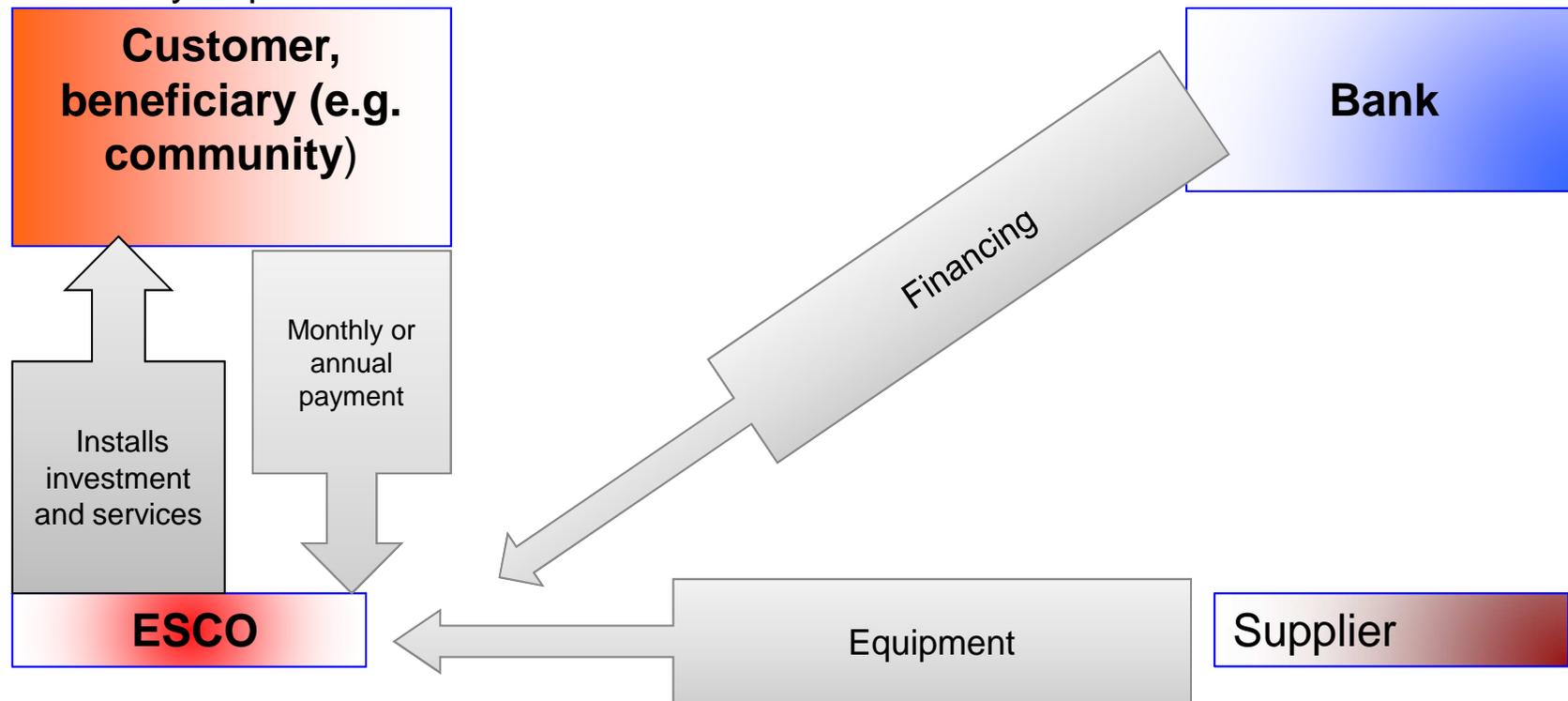


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ESCO: ESCO (Energy service company): “Natural or legal person who delivers energy services or other energy efficiency improvement measures in a final customer’s facility or premises



FORFAITING (in brief):

- **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.

Public Supports: from EU, Government, Regional Government, City 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 reduce technical risks for the forerunners and to ease market introduction for new technologies and approaches
- **But for Buildings outside the public sector: they will always require additional market based financing (Ideal: combination of both)**

The main barriers to energetic retrofit in case of joint home ownership are:

Investments in common property

Most energetic relevant parts of the building are common property

Renovation cycles normally do not include energy efficiency investments

Cumbersome decision-making



Solution approaches for Home Owner Associations

Solution approaches to the owner-tenant dilemma

- **Information strategy, early information, transparent, demonstration projects**
- **Demonstrate technical feasibility and financial viability**
- **Step by Step approach**
- **Ease the the decision making process on energy retrofits**
Introduce mandatory retrofits in the respective legislation
- **Consider users/tenants as an important part of the retrofit process**
- **Social support**



Thank you

for further information see:

**Financing of Sustainable
Housing Retrofit
Guidelines for Financial
Institution**

<http://europhit.eu/downloads>
(go to financial guidelines)



Part 5

Discussion and questions

