Financing of Sustainable Buildings Retrofit
EuroPHit Financial Workshop
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Friedrichsdorfer Institut zur Nachhaltigkeit IzN e.V
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1. Promotion of Energy Efficient Buildings
2. The Financial Face of a Project
3. Financial Instruments
4. Public Supports: EU-Policy and Promotion
5. Discussion and Questions

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Part 1

Promotion of Energy Efficient Buildings

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The challenge: European Objective

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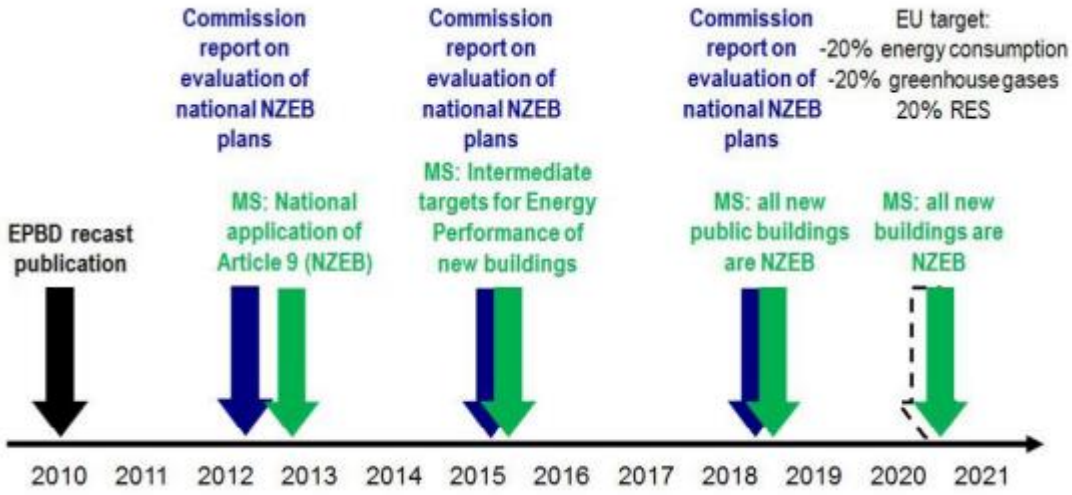
Article 9 of the recast EPBD requires that "*Member States shall ensure that (a) by 31 December 2020 all new buildings are nearly zero-energy buildings; and (b) after 31 December 2018, new buildings occupied and owned by public authorities are nearly zero-energy buildings*". Member States shall furthermore "*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*".



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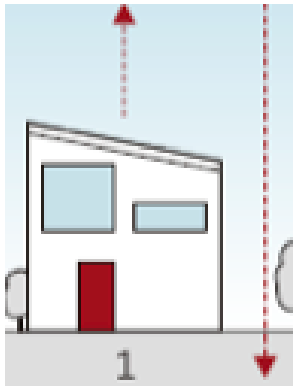
What you need to know – technical aspects

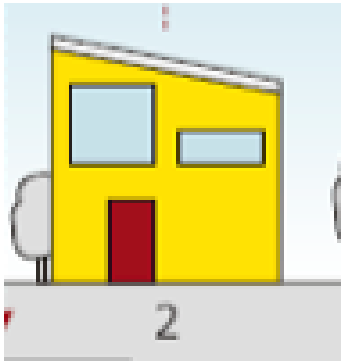
Holistic target based approach: Consider the entire building and not just a part of it. What is my final objective in terms of energy consumption (kWh/m^2/year) → even for step-wise refurbishment

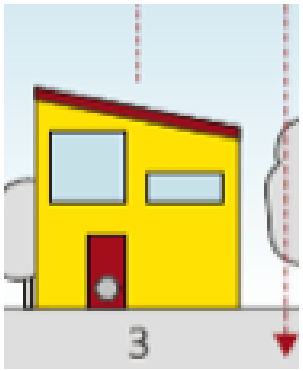
Target value for primary energy: The same amount of consumption for electricity, oil, gas or RE ***is different*** in terms of **primary energy**

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)

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Germany | *Building Energy Performance Standards*

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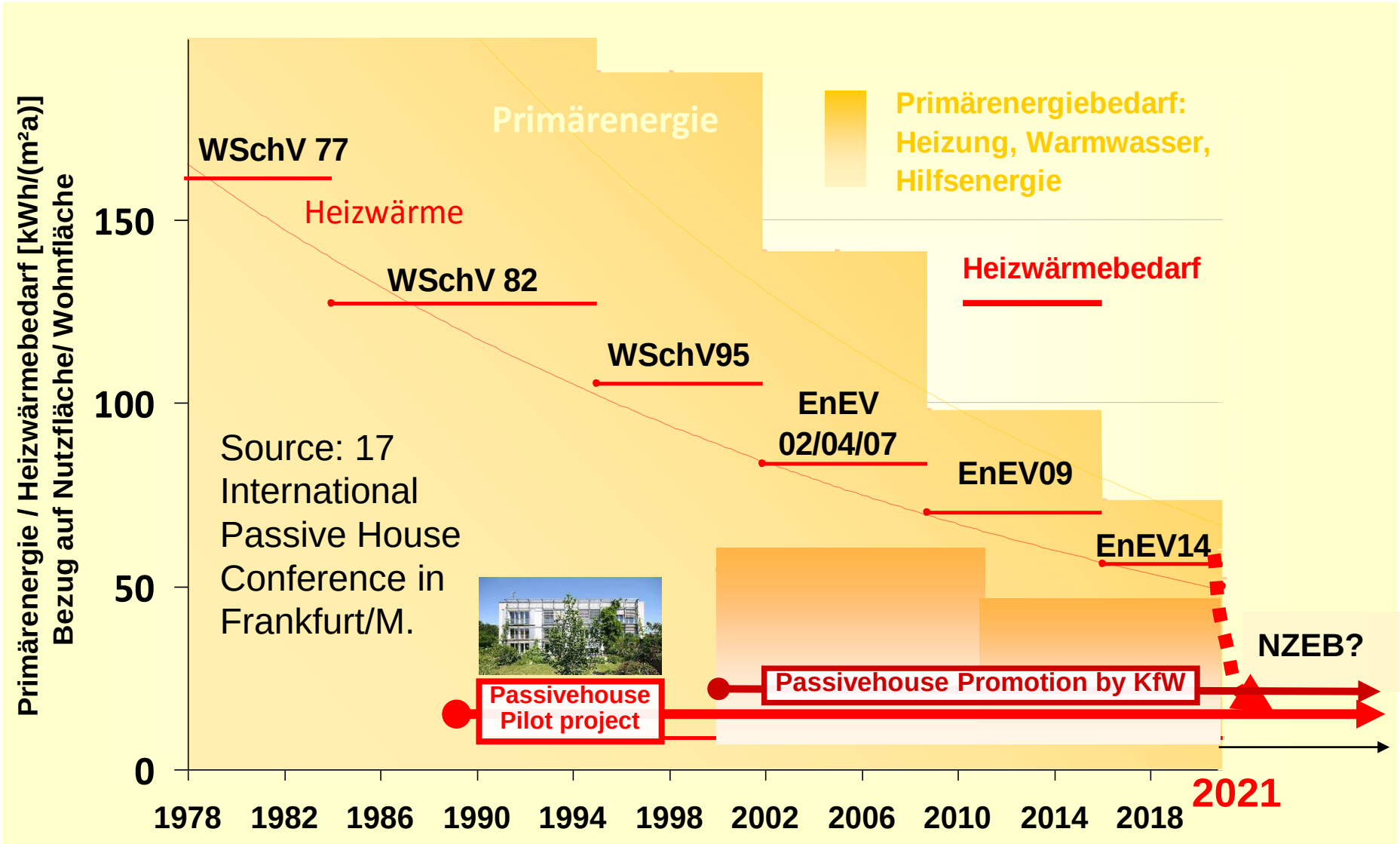
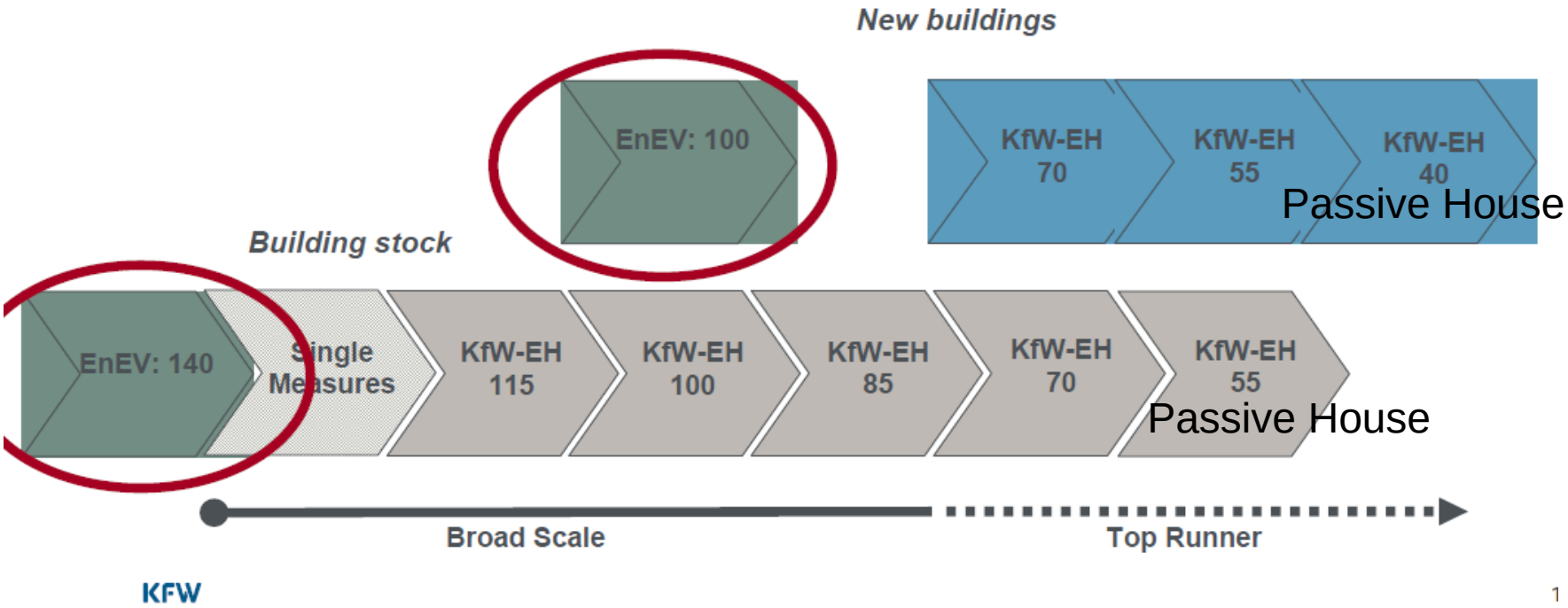


KfW Promotion: The benchmark is the legal requirement

For Passive Houses: International Passive House Standard with PHPP



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The system of promotion of energy efficiency

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How does the promotional scheme work?

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Owner

Energy consultant

Owner´s bank

1

- Get information (www.energiesparen.kfw.de)

2

- Concept/plan for refurbishment activities
- Check if suitable for promotion (online tool)

Extra promotion available for integrated concept/energy efficiency consultancy

3

- Check/decide on creditworthyness
- File application for promotional loan

Near future: full online application process

4

- Loan commitment and disbursement

KFW

5

- Carry out refurbishment project

6

- Ongoing consultancy/supervision
- Confirm energy efficiency level reached

Up to 4.000 extra promotion available for supervision

7

- Confirm that promotional loans has been used in compliance with promotional loan conditions

8

- Partial debt relief is booked according to energy efficiency level reached

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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
- The Swiss Prognos AG, for example, estimates –in the basic scenario- 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.

- **The evaluation of external effects, however, is under dispute, depending on the respective standpoint**

Part 2

The financial face of a project

- Overview
- Cash flow as basis for financing
- Cash flow analysis: Example
- Project- versus recourse finance

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Why financing is sooooo important for EE buildings?

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- EE buildings require higher investments, but have long-term returns
- To achieve the political objectives in climate protection both new and existing buildings´energetic performance has to be addressed
- Retrofitting the building stock requires substantial amount of money!
- High expectations that investment will pay back by energy savings
- Funding is the key driver for existing buildings → subsidies
- Subsidies are linked to building standards
- Contracting as a new business model to solve financial and technical restraints
- Investor-User dilemma

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Is the project bankable?

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1. Real and perceived technological risk

- Quality of design and construction
- Expected savings will not be reached
- Novelty of technology and previous experience

2. Financial risk

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

3. End-user behaviour affecting energy savings

4. Maturity match and country-adapted length of repayment periods: Maturities depend on the monthly or annual cash flow derived from the project (savings). Depending on the country, repayment periods are unusual

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

6. Participation of public institutions

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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, weather or user behaviour 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**

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Anyhow cost and energy related cost

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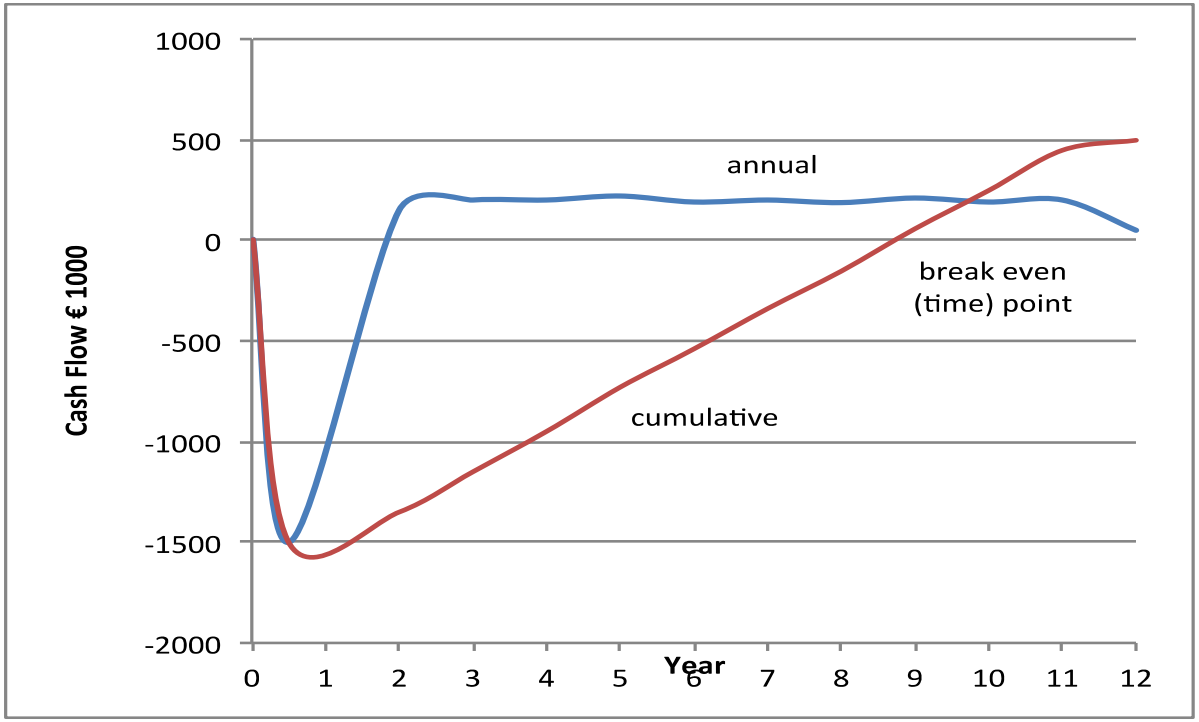
- Usually houses undergoing energy efficiency refurbishment do also need other renovation,
  - e.g. the heating system is already 20 years old, the walls need repainting, the windows are close to breakdown and the roof is leaking.
  - It is advisable to couple energy saving measures with other, e.g. 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

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Cash flow example: Housing refurbishment (Rental homes)

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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 * c15		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 Cashflow 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 Cashflow 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 21 below 1									
25	After tax/subsidy financial IRR*	9,8%											
26	*) refers to equity		**) For profit principal repayment has to be re-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												

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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)

Part 3: Financial Instruments for Energy Efficiency Investments in Buildings

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

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Financing ladder for public buildings

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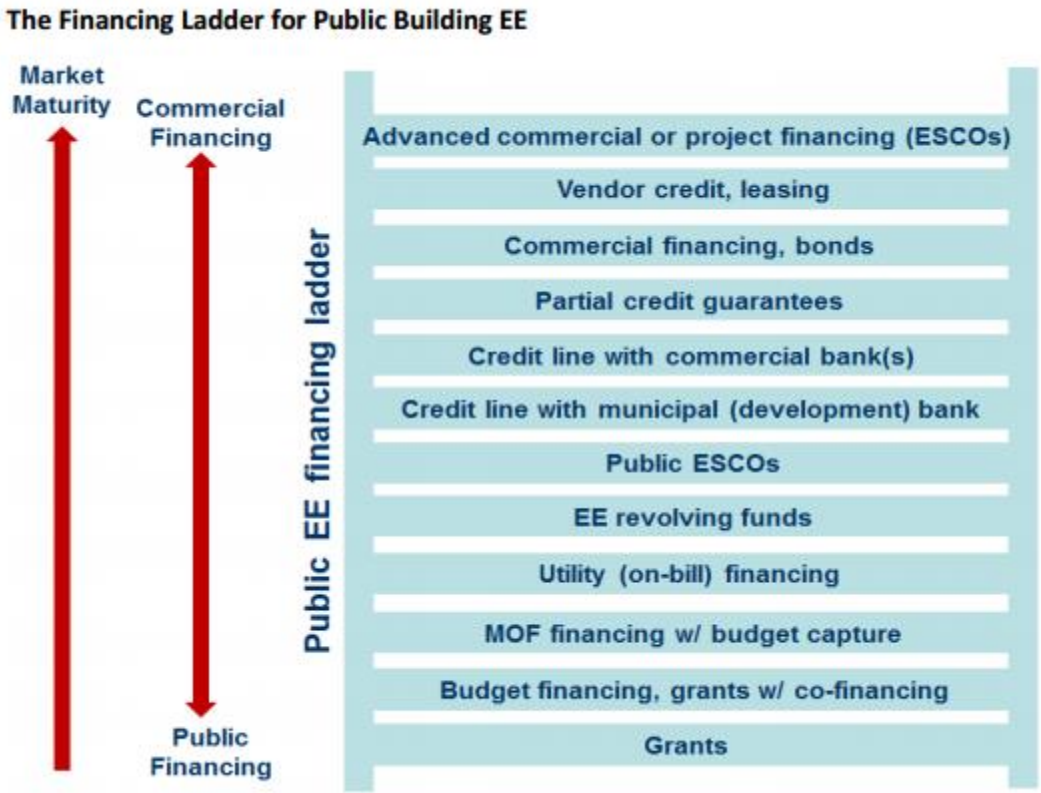

Source: J. Singh WB

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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

Various level of ESCO involvement

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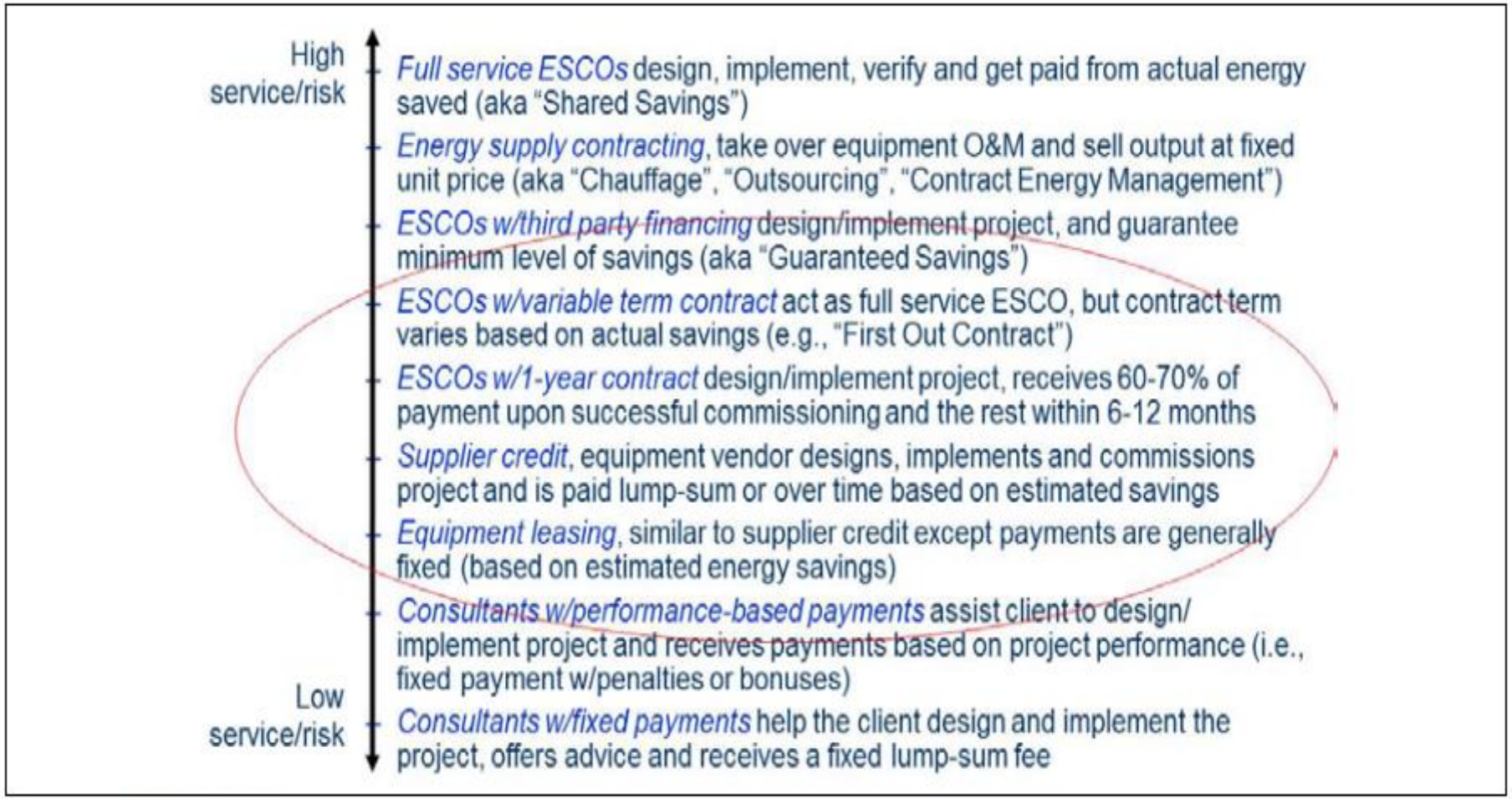

Source: ESMAP

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ESCROW ACCOUNT

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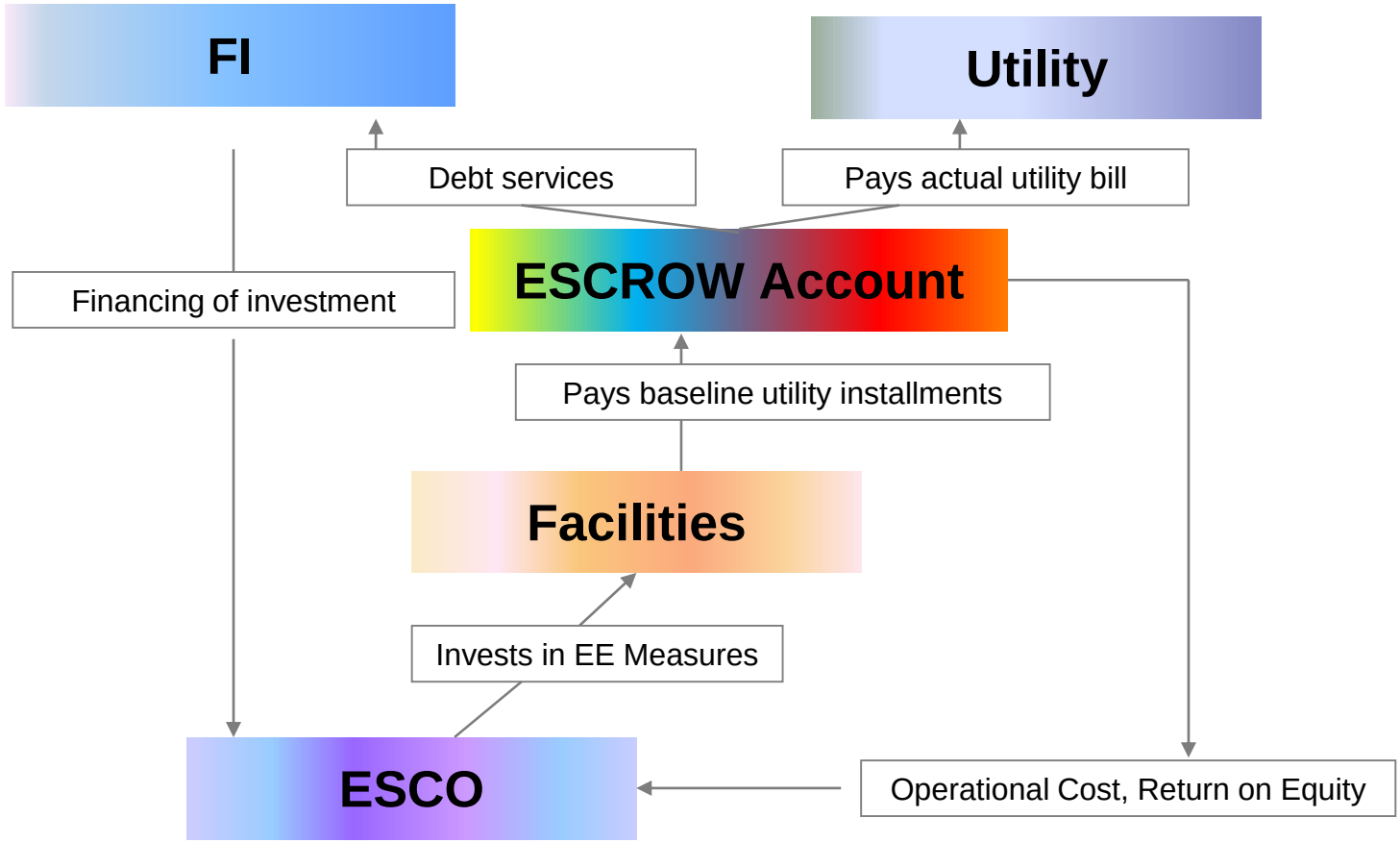

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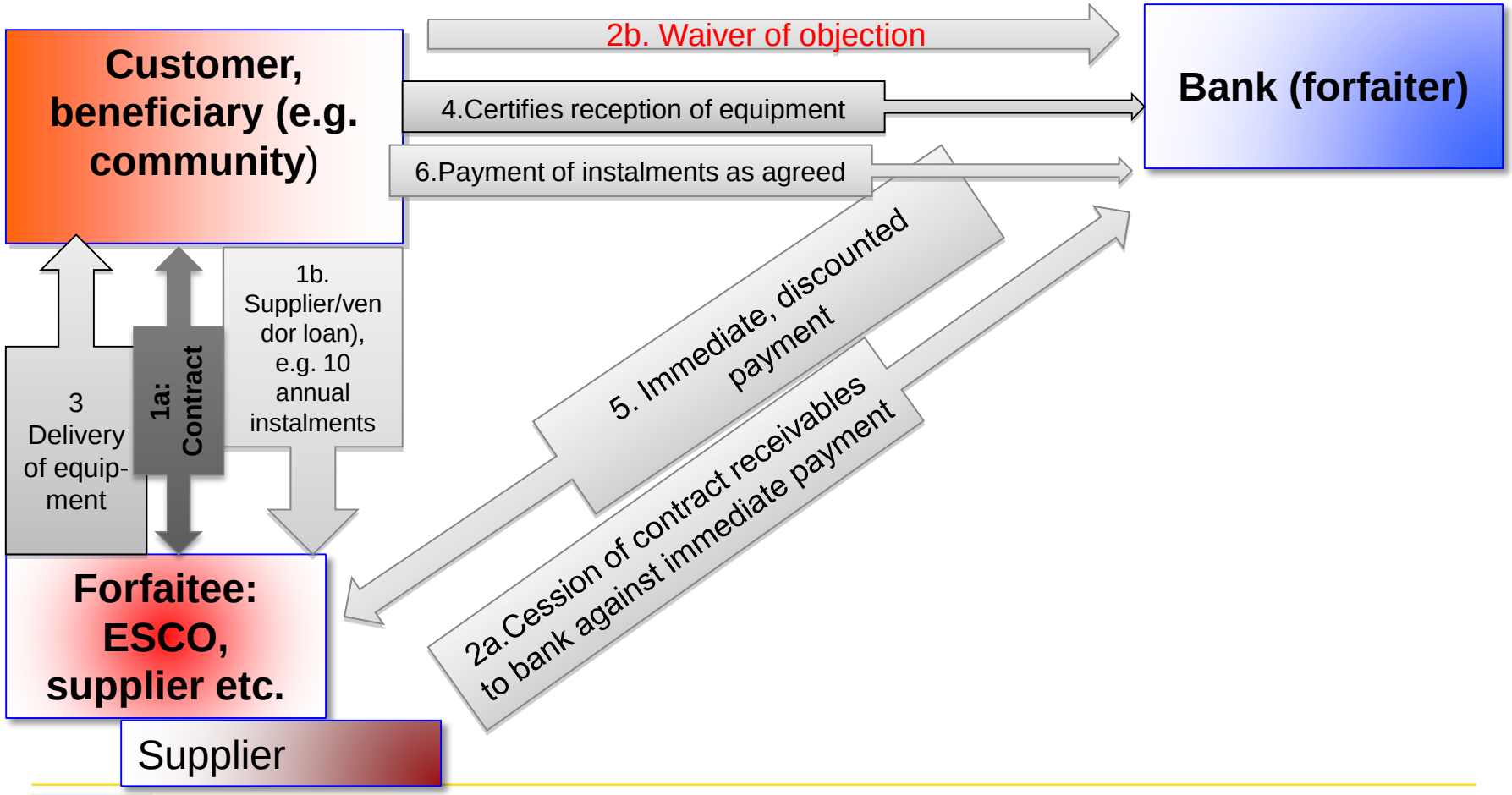
FORFAITING:

- **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:



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Forfaiting 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)
- Forfaiting 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 then 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

Part 4

Public Supports: EU Policy and Promotion

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EU Funding for Energy Efficiency in Buildings

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

- 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)

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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. €

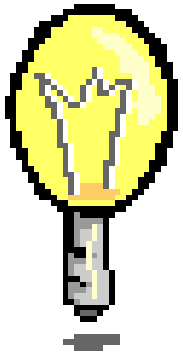
Public Supports

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 CO_2 reduction)
- To improve the financing structure in particular for communities and public institutions lacking financial sources under strict saving requirements
- To reduce technical risks for the forerunners and to ease market introdiction for new technologies and approaches

- **But for Buildings outside the public sector: they will always require additional market based financing (Ideal: combination of both)**



Part 5
Discussion and questions

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Thank you

for further information see:

Financing of Sustainable Building Retrofit Guidelines for Financial Institution

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Thank you
for your attention

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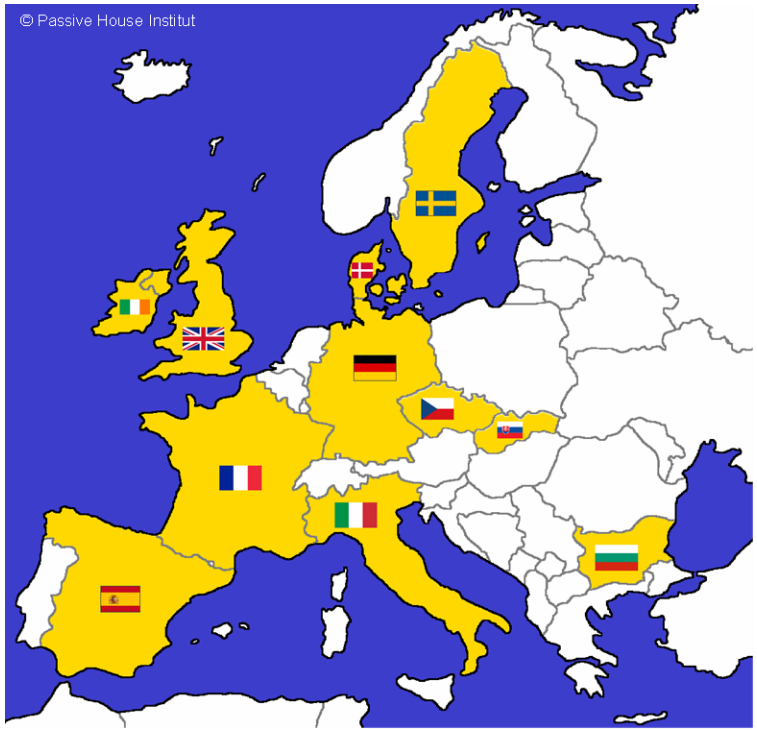

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