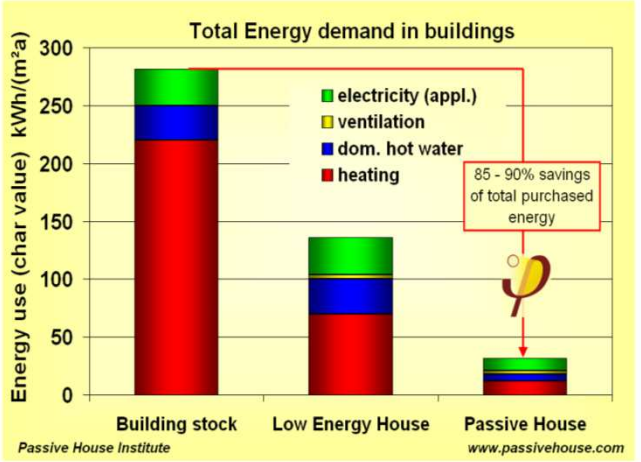
Financial workshop

Financing and funding deep energy retrofit

Dr. Witta Ebel
Passive House Institute



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

Financing

- Financing institutions: credit lines?
  - low risk investment
  - existing object as a collateral

- Funding concepts

Economy: Life cycle costs

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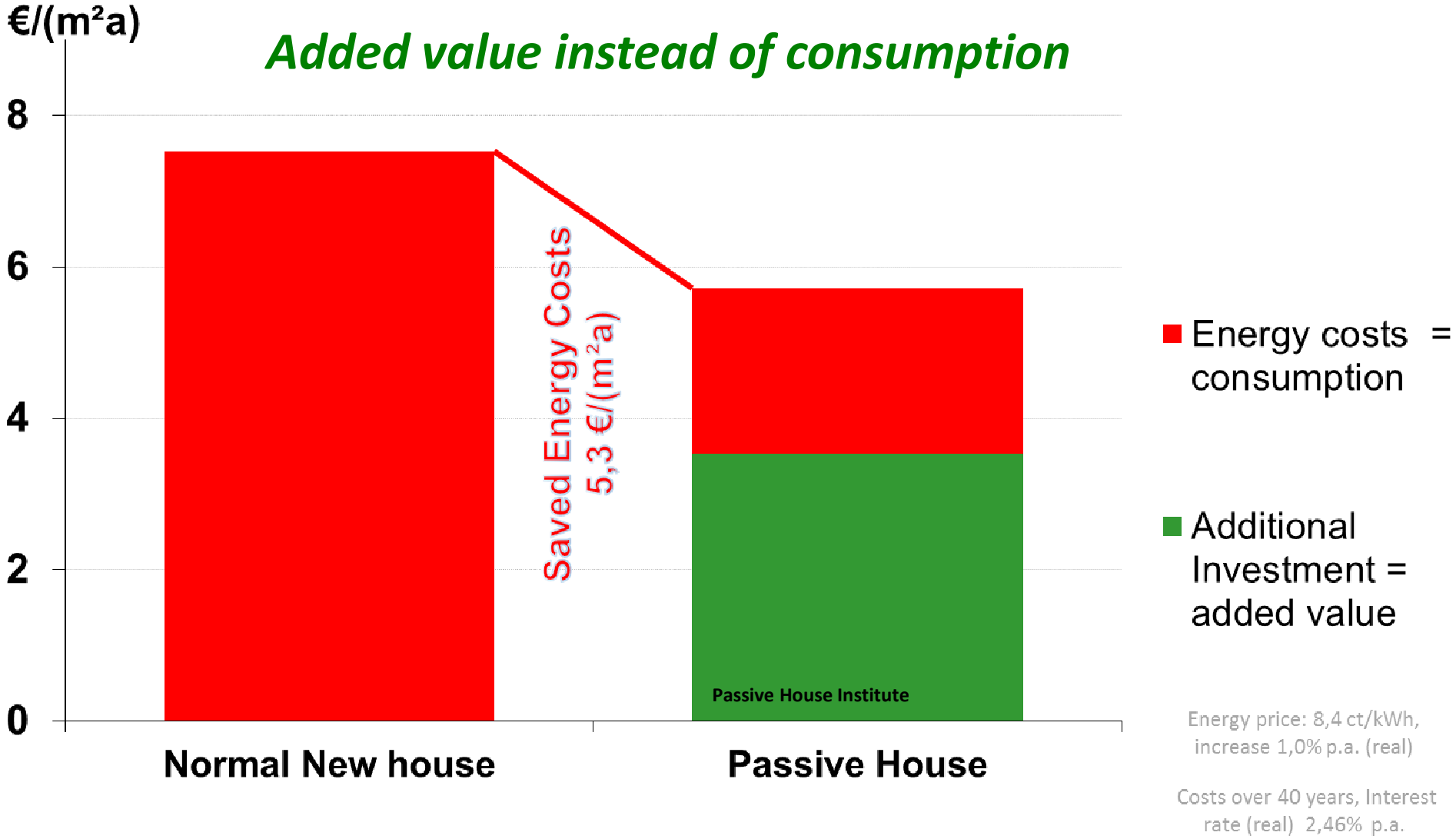

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Financing | *Total annual costs compared*

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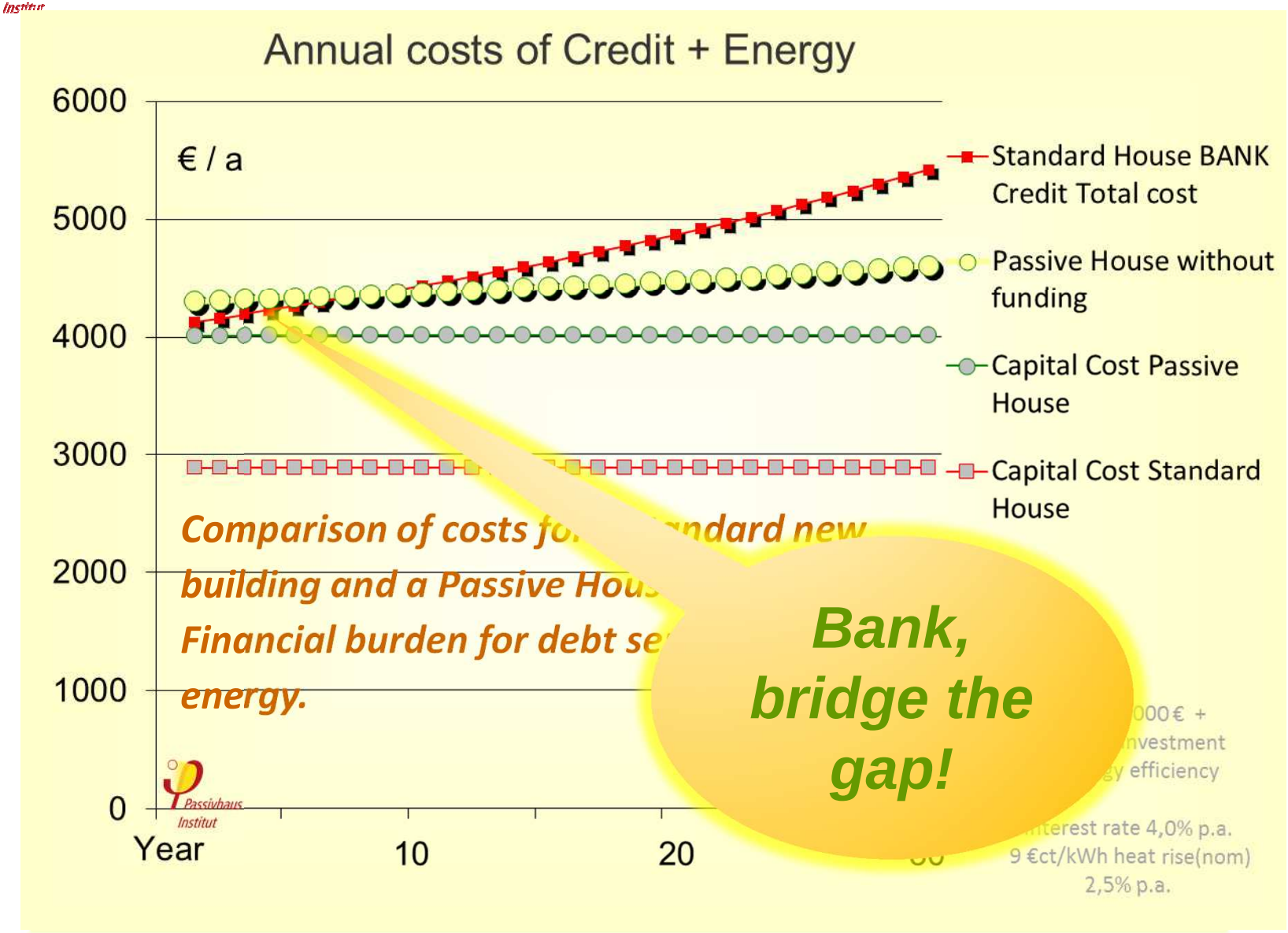

Financing through low-interest loans

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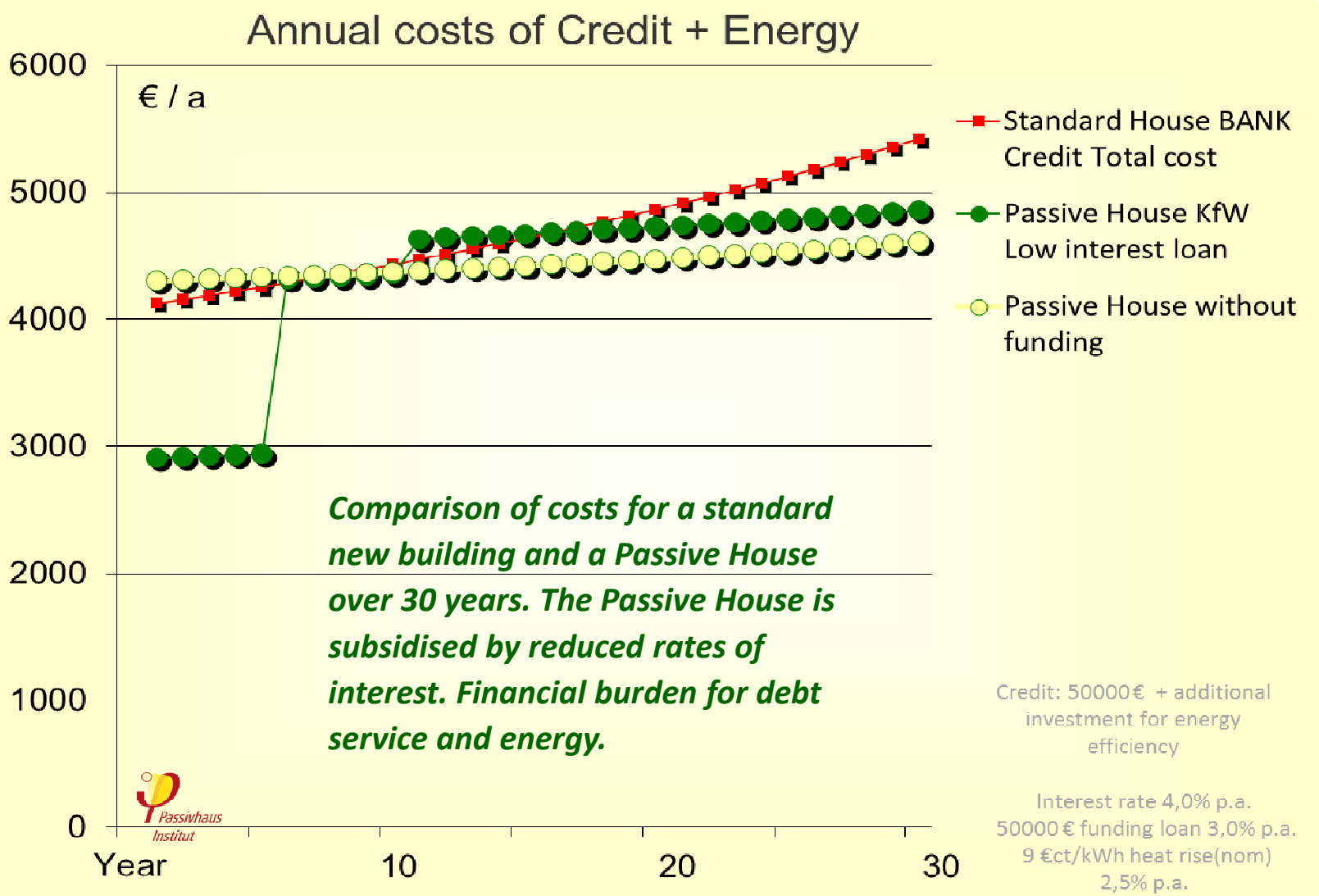


Assumptions: subsidies by KfW-loan (50 000 Euro); interest rate (mortgage) 4% p.a. = calculatory interest rate (expected rate of return); interest rates funding bank (analog KfW) (nominal) 2,50% p.a., for 10 years fixed; Fuel price: 8.4 ct/kWh, electricity:25 ct/kWh, rise in energy prices 1% p.a. (real).

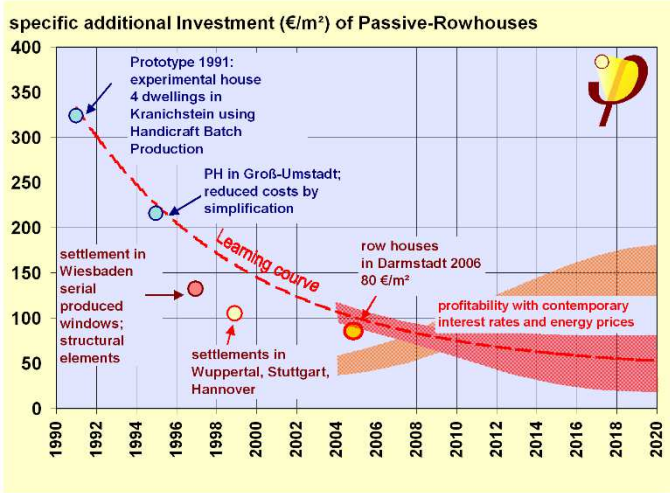
Why the market sometimes fails..

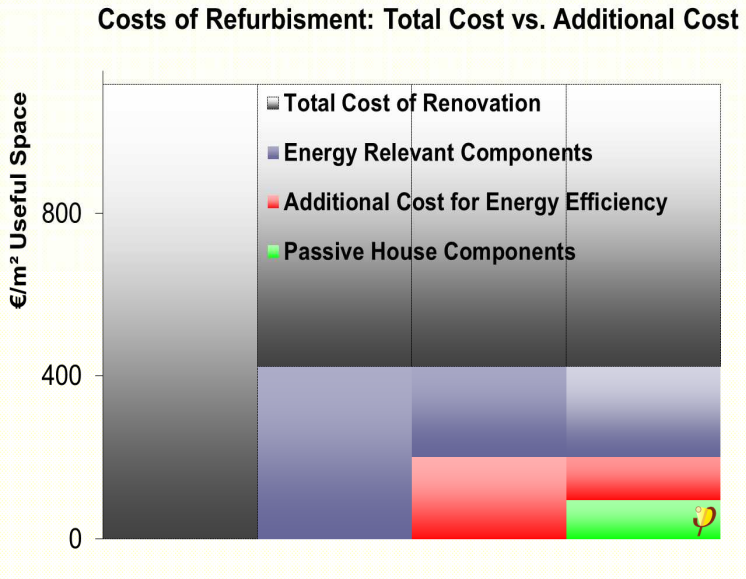
- Lack of information , skills
- Lack accessible capital (collaterals)
- Innovation and learning costs
- Longevitiy of buildings: short-term contra long-term

- Investment is not arbitrarily divisible
- Low hanging fruits seem more attractive
- „Empowering“
  later is not economically feasible –

→„lost opportunities“ and „substandards“

→ lock-in effects

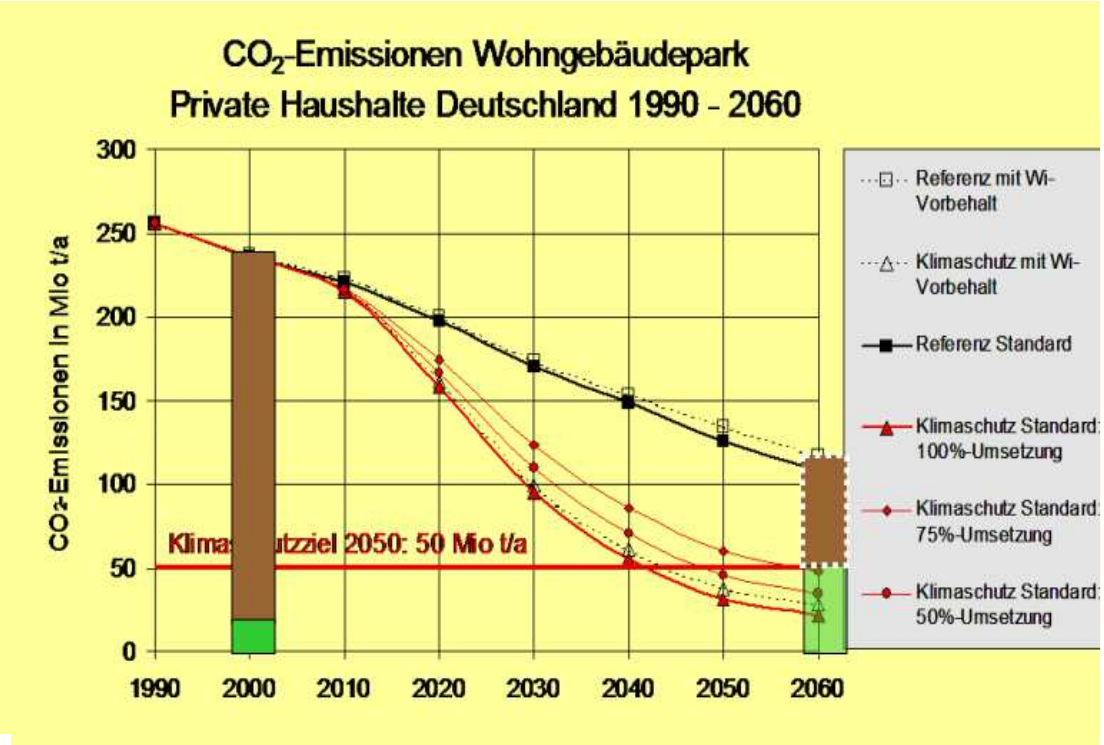




Climate protection and sustainability

- Present common construction practice
  - Produces „lost opportunities“
  - Establishes „sub-standards“ of moderate quality
- Climate protection targets can not be met this way
- For all types of structures, every new building and all types of replacements/renovation:

  Take the chance! to achieve high energetic quality.



Scenarios by R. Vallentin

Dilemma of the middle way

Avoid Performance Gap!

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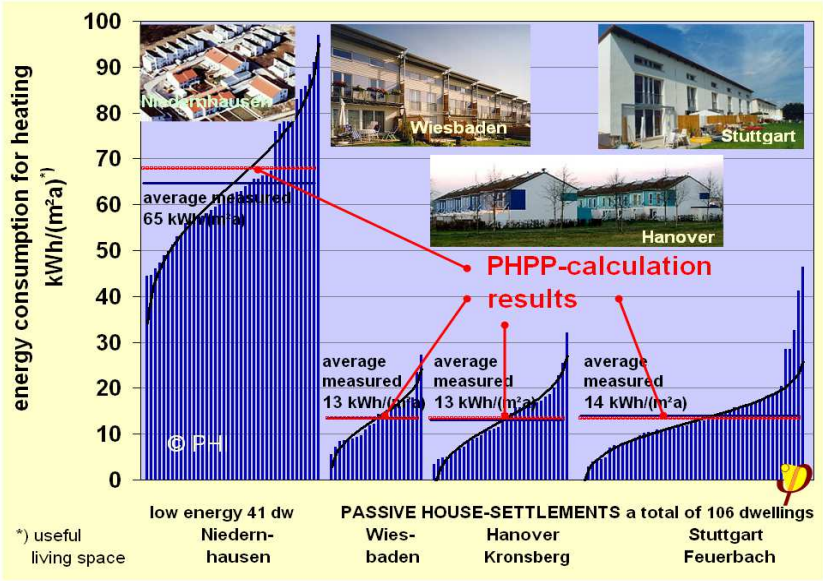
- Quality is crucial
- Take the whole! to a sustainable standard. Additional costs are low in comparison – and are those investments that pay. Meet the goals is important for sustainability AND for economy
- This is why all incentives should especially keep in mind qualitiy and avoid performance gaps.



Planning tool PHPP

Pro & contra, learnin from real examples
e.g.KfW , or Funding in Hesse. Deep retrofit?

- EnerPHit refurbishment („with Passive House components“
- Ambitious deep renovation: aims at EnerPHit standard. Required heating demand (PHPP) 25 kWh/(m²a)
- Exceptions (e.g. listed buildings)

single measures

Wall ≤ 0.15 kWh/(m²a)

Roof ≤ 0.12 kWh/(m²a)

Window: Uw ≤ 0.8 kWh/(m²a)

Amount of funding

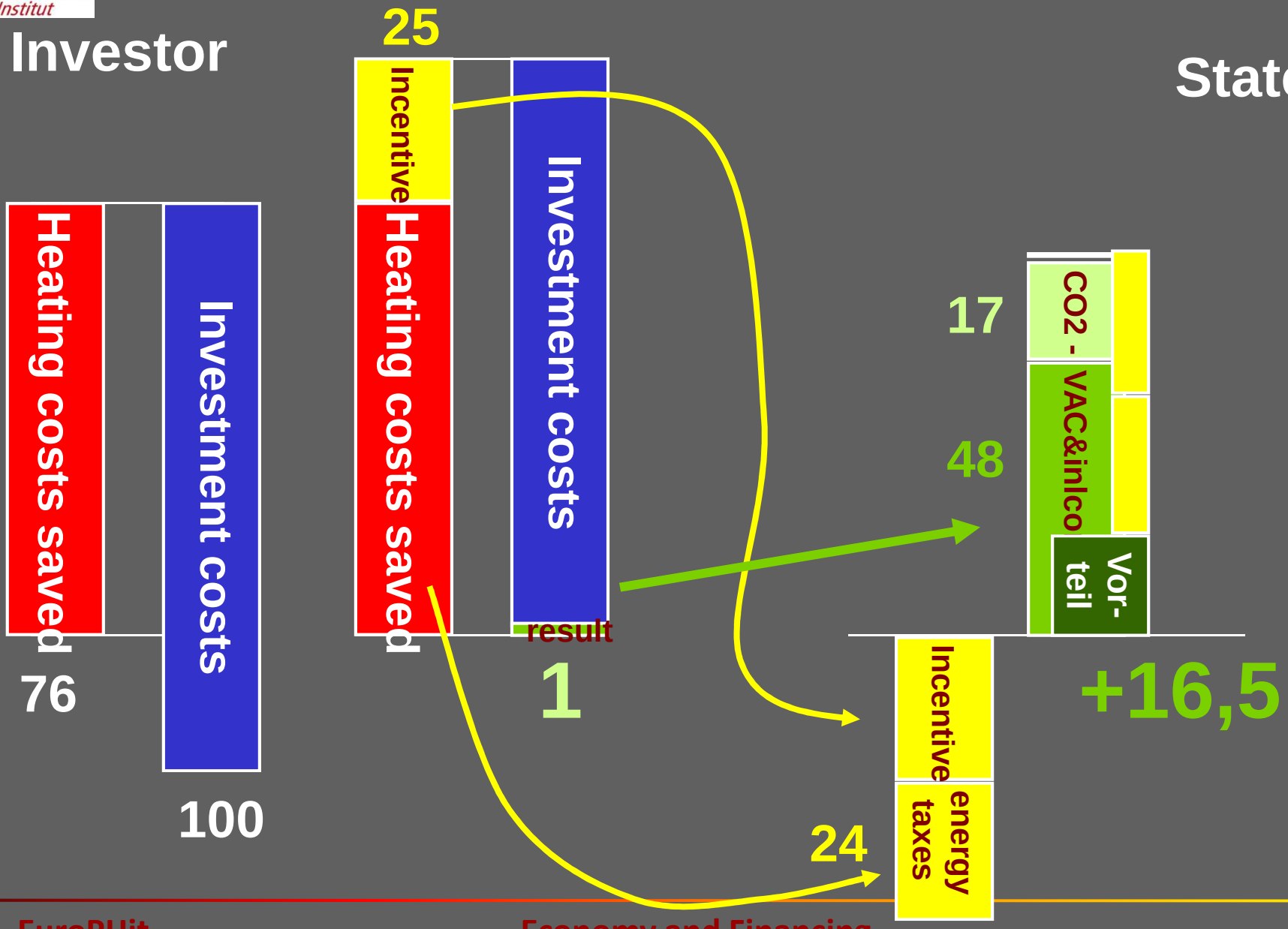
- Max. 50 % of expense
  - Flat-rate cost funding of building measures

Building elements	Eligible (add.) costs	Funding (50%)
Outer wall	35,00 €/m²	17.50 €/m²
Roof	30,00 €/m²	15,00 €/m²
Upper ceiling	12,00 €/m²	6,00 €/m²
Basement ceiling / floor slab	12,00 €/m²	6,00 €/m²
Windows and doors	100,00 €/m²	50,00 €/m²

- ventiltion system (50%)
- additional TGA costs (50%)
- 10% of total renovation planning cost (50%)

Autor: PHI | WE

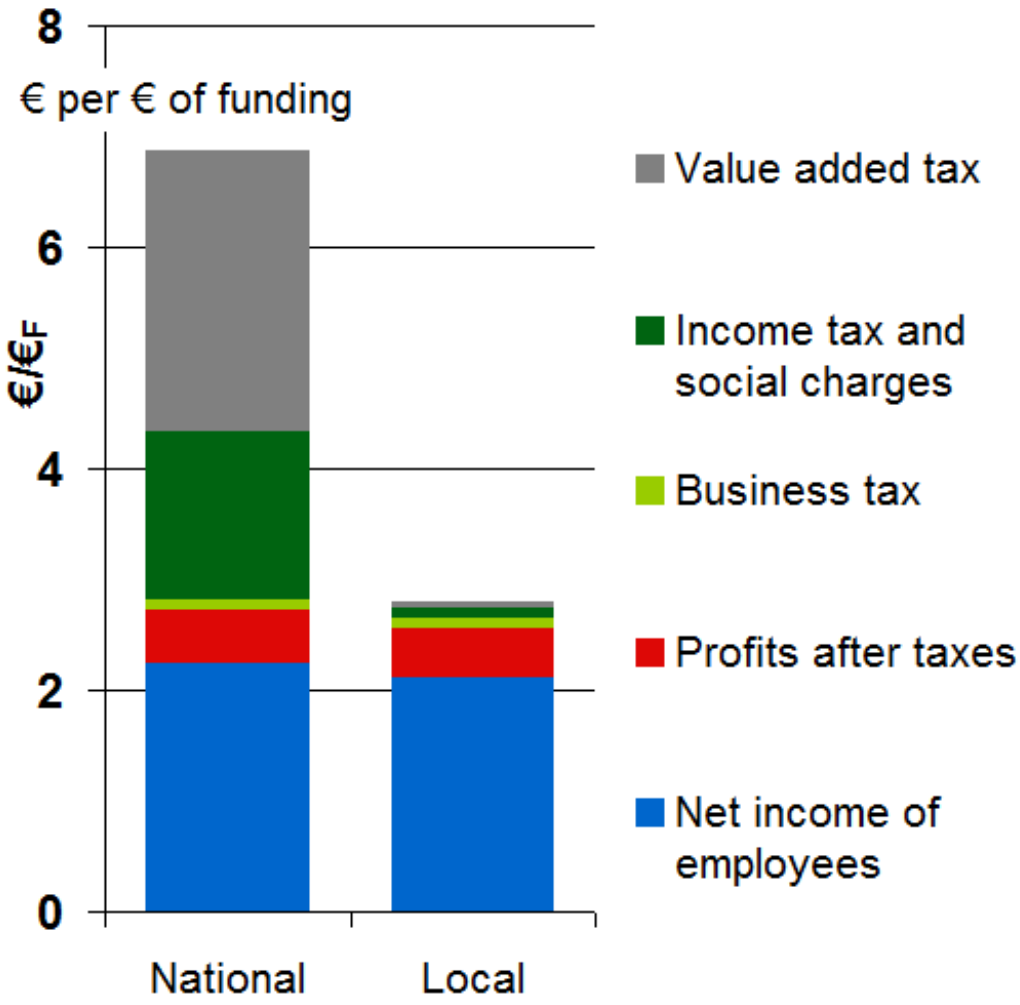
Added Value: Macroeconomic perspective



Local result of funding EE in buildings

Every Euro of incentive

- generates a total investment of 16 €,
- while the additional investment for additional efficiency is only 2 € (but double the value of the incentive)
- creates added value of 7 €
- generates a local labour equivalent to 3 €.



Questions

- Ideas to remove barriers
- Elements of funding concept
  - Amount of funding – and how measured (investment, saved energy. saved CO2 costs, ...
  - Minimum requirements, sustainability conditions
  - Quality and performance
  - Which type? subsidies, tax reduction, low interest credit
  - Benchmark and assessment procedures
  - Non-monetary funding elements
  - Supplementing measures

Goals of funding concepts

- Make investments wanted economically attractive for the investor: capital is directed
- Reduce financial barriers (too high burden even for economic investments)
  - liqidity, accessability to capital, eg.provide collaterals (e.g.: to get bank loans)
- Awareness rising and incentive
- mobilise positive motivation (instead of formal regulations)
  - but avoid unwanted side effects (high costs, fix technology, lock-ins)
- Performance is decisive to reach goals: guarantee quality (funding allows for better consulting and control)
- Push innovation, more and more attractive solutions, push cost reduction on the market
  - but reduce transaction costs, make funding accessible
- Macroeconomic perspective: State revenues by taxes, reduction of unemployment, saving expenses for external costs born by the general public; securitiy of supply
  - Especially important: Climate change mitigation. Problems: long term relevance, and costs are uncertain and depend significantly on scenarios or paths.
- The strategy and the results achieved must fit in o a sustainable development and future.
  - The assessment should reflect the future supply system
  - Avoid lock-in effects

Some trade-offs have to be solved

Groups

Suggested:

1. business concepts, banking concepts

2. Concepts of public funding

Conditions of funding concepts

- Expenditures to be funded
  - Investment or annual capital costs (flat or actual)
  - Quality procedure costs: consultation and renovation plan; supporting measures: training of building and banking professionals
- Level of funding, benchmark for the amount of subsidies/grants/ incentives
  - Investment
  - Additional investment for energy efficiency
  - Added value and macroeconomic payback
    - Short term
    - Long term
  - Achievement of political and ecological goals, climate protection contibution
- Accessibility of funding
  - Direct subsidies, tax reduction, or credit lines? → depends on target group
  - Simple and transparent
  - positive-list of eligible measures as a help
  - Reduce transaction costs, (e.g. use existing structures when possible)
  - Low-cost procedure, reduce burocracy

Conditions of funding concepts

- Reqirements for funding and assessment schemes and eligibility
  - ambitious minimum requirements for funding
  - avoid windfall gains and price increases
  - standards, not special technologies: use competition and innovation, but:
  - set the right goals and use proper benchmark and assessment procedure
    - realistic
    - transparent and convincing
  - oriented on the the goal/level achieved, better measures get better funding
  - future-proof, regard long lifetimes: minimum rquirements for funding
  - focus on quality, and use proper tools for effective design, realistic calculation
  - Risk prevention and and maintaining future scope of action
  - Sustainable level and no half-way measures, fit in sustainable future

Elements of funding concepts

- Reduce financial burden
  - Reduce investment costs (direct subsidy)
  - Annual tax reduction
  - Low interest loans
  - Provide collaterals

- The amount is calculated as the present value of the funding payments or cost savings. It can / shoud be related to
  - The investment costs
  - The additional costs for energy efficiency (including quality insurance costs)
  - The economic gap with respect to life-cycle costs (if any)
  - Avoided external costs
  - Or a combination these

- Regard non-monetary funding elements

Elements of funding concepts

- Condition: No unwanted side-effects. Especially:
  - Regard longevity of buildings and ist components: measures musst be adequate until the end of their life-cycles
  - Keep high quality
  - Don‘ keep cost of supply chain on a high level as a consequence of funding
  - instead aim at reducing (e.g. achieve „standard costs“ instead of actual costs; supplementing measures)
  - Avoid lock-in effects, avoid high future costs to reach a sustainable level
  - Subsidize standards, not special technologies

Proposal of funding concepts

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- Define minimum requirements for funding: sustainable and no risk of lock-in effect

- Investment costs must be in a proper relation to the effect. Therefore, also the contribution of reduction of external costs, e.g. greenhouse gases, counts. This is assessed … by the energy saved by the measure. (rationale: we don‘ use primary energy factors that depend on the supply system. Biomass is limited in e renwable world, therefore it belongs to everybody and not specially to those using it for their heating. The same holds for CPH systems: The assessment for the heating is only as good as CPH can replace fossile and nuclear plants, but not when it replaces power from renewables).

- The amount of funding is limited by max yy * saved energy E [kWh]. A higher standard thus leads to higher funding for largeer savings.

- The amount, calculated as the present value, is max xx% of the investment costs. Calculation of additional investment is usualy not known, and life cycle costs is even more complicated. Usually this should be between 25 and 40% of the investment, regarding that is a percentage of full costs and not of additional costs. Therefore, it can be extremely attractive. In order to give the right signals to manufacturers and building professionals, it is announced that the funding will be reduced in future

Proposal of funding concepts

- In addition, a flat zz for quality assurance and funding application is granted. It is limited, because the service should be provided cost effectively , and a contribution of the beneficiary can be expected. Max: 500 E for a single family house.

- For stepwise refurbishment, a plan has to be provided and checked. For this, another flat is provided, ww (max 500 € for a single family building). With the steps, the funding rates for the correspondent investments are paid.

Proposal of funding concepts

- Which energy/emissions??
  - Transparency: Purchased (final) energy
  - Reduce damage, external costs, climate change: nonrenewble primary energy (PE), or CO2
  - Sustainable, renewable future: primary energy renewable (PER)
  - Or a combination?
- How to calculate?
  - Realistic calulation
  - Procedure for reliable design give predictable results

- For partial refurbishments, a step by step refurbishment plan has to be provided and checked. For this, another flat is provided, ww (max 500 € for a single family building). With the steps, the funding rates for the correspondent investments are paid

- object related loans might be an otion (proof how legal and tax framework can be adjusted)

Results of funding concepts

- Reduce barriers for investors and owners: economy, and liquidity
- Awareness and image of energy efficiency
- Added Value in construction sector
  - Better buildings, longer life time
  - more employment (esp. trades)
  - better knowledge and skills
  - funding is multiplied: boost investment
  - innovation (solutions, costs, reliability, simplicity, maintenance: wen know that it works, from PH experience)
  - „extra benefit“ (health, comfort, better working conditions → productivity of work

Results of funding concepts

- Climate protection and sustainability
  - low emissions, reliable
  - on a level to 1,5-2° goal
  - consistent with renewable future with supply from lockal and regional sources

- Macroeconomic results
  - payback of taxes and social insurance contributions
  - jobs in construction sector: avoid costs of unemployment
  - economic growth by multiplie funding
  - securitiy of supply

Economy of Energy Efficiency: Summary

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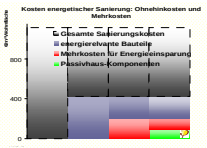
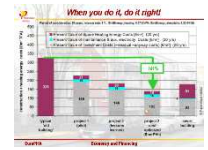
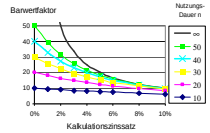
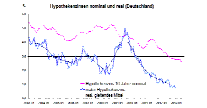
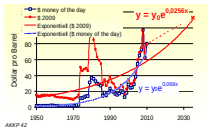
- Capital Cost
  - Attributed Costs – not full costs.
  - High quality design: Avoid additional costs
- Life cycle
  - Only life cycle costs
  - When calculation period is different, residual values must be regarded
- Discount rate/required rate of return
  - High required rates of return → high capital costs (annuities)
  - → depreciate revenues
  - Alternative investments are riskless investments
- Energy costs
  - Energy price uncertain –Reliable energy performance (→ energy savings)
- Planning for the future
  - Regard long life cycles - when you do it, do it right!

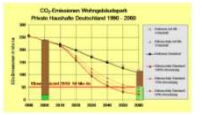












- Adequate financing and funding
  - Financing models should reflect low risk and lower the initial financial burdens
  - Funding always linked to high quality und high performance
  - Avoid lock in effects
  - Create added value and win win situations
  - Use funding to create awareness!