Wuppertal Institute
for Climate, Environment
and Energy

Combining theoretical analysis with empirical evidence from an international comparison:
Policy packages to make energy savings in buildings happen

Session 7

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Introduction

- **The policy problem.** (1) What are the policies and measures that can really make energy efficiency in buildings and appliances happen? There is still no 'magic formula'!
  (2) And what is 'good practice'?
  => Need **a refined methodology** for ex ante and ex post assessment

- **Hypotheses:** All members of the value chain must act in the right direction, or else the energy efficiency chain will break.

- Therefore, the specific market-inherent barriers and incentives of all relevant actors must be analysed to understand more thoroughly why they often do not implement energy efficiency.

- → Goal: Tailored policy packages to remove the barriers and strengthen the incentives identified

- Cross-check with reality: implemented and successful policy packages

Project context: bigEE – Bridging the information gap on energy efficiency in buildings

The bigEE web portal will cover

- residential buildings
- commercial / public buildings
- industry sector related building technologies
- appliances

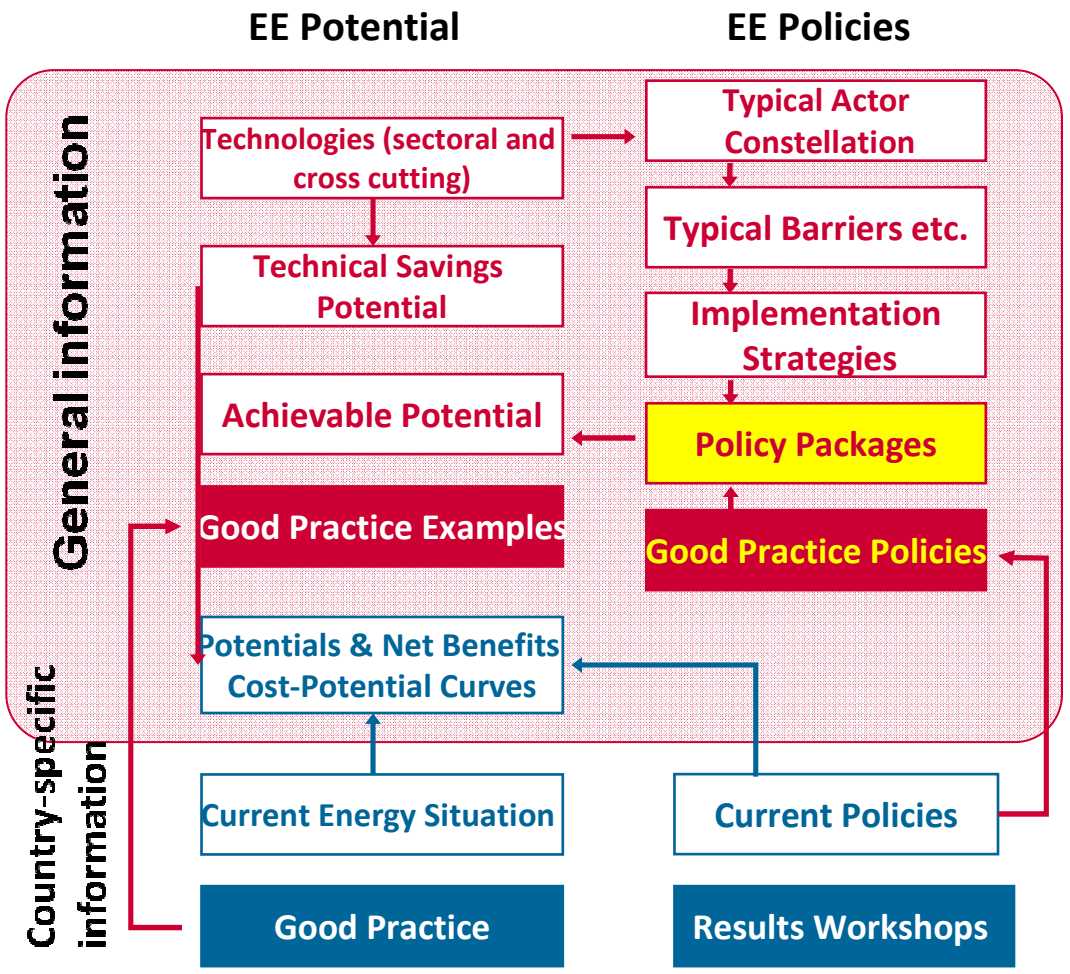
and will include information on

- technologies
- saving options and potentials
- actor constellations
- policies and measures
- good practices

on

- international and
- national level.

www.bigee.net - **from November 2012**



Methodology

Actor-oriented theoretical analysis

Step 1
Analysis of actor-specific **barriers and incentives**

Step 2
Developing **implementation strategies** to address the barriers and incentives

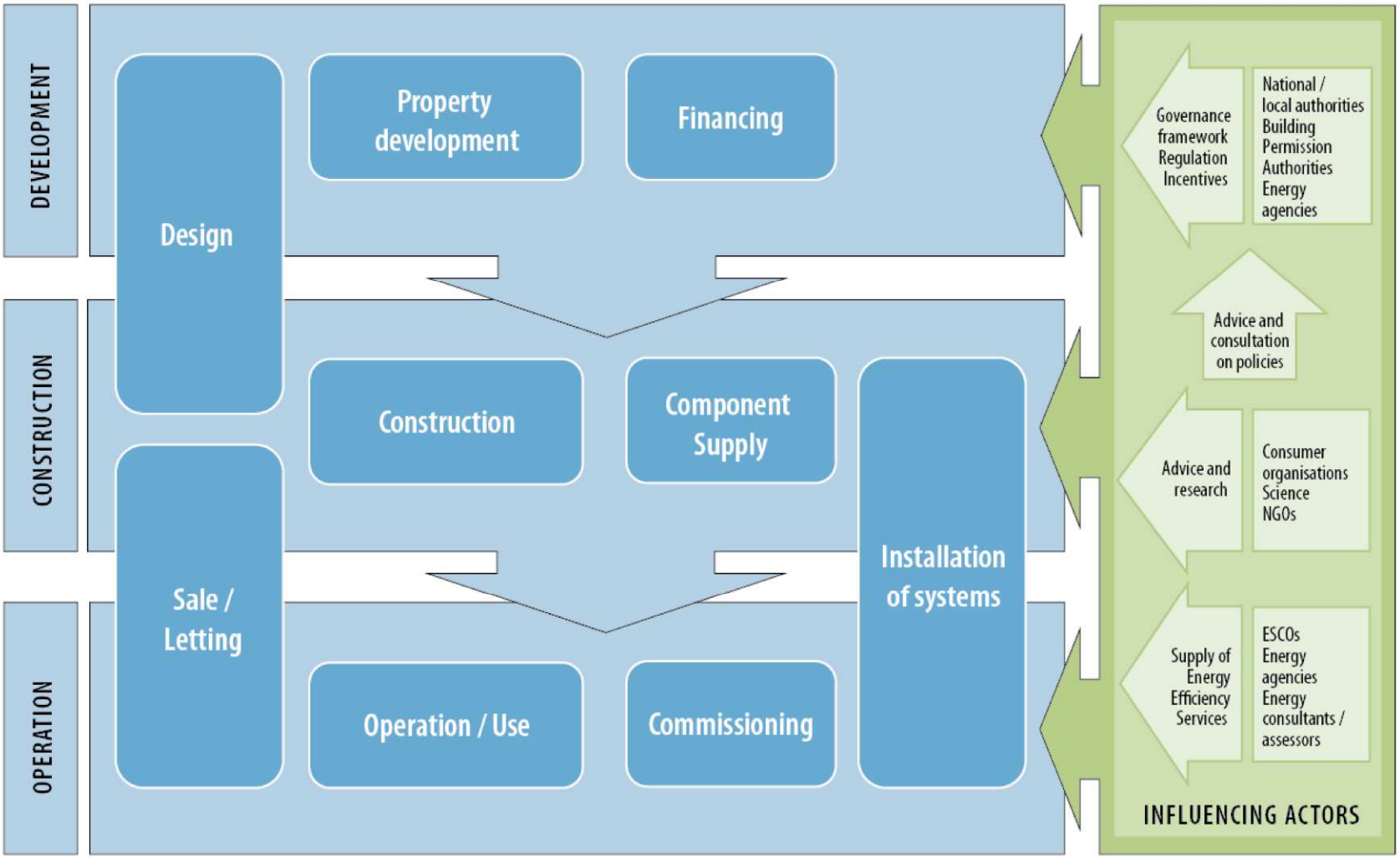
Step 3
From implementation strategies to **policy packages**

The empirical proof

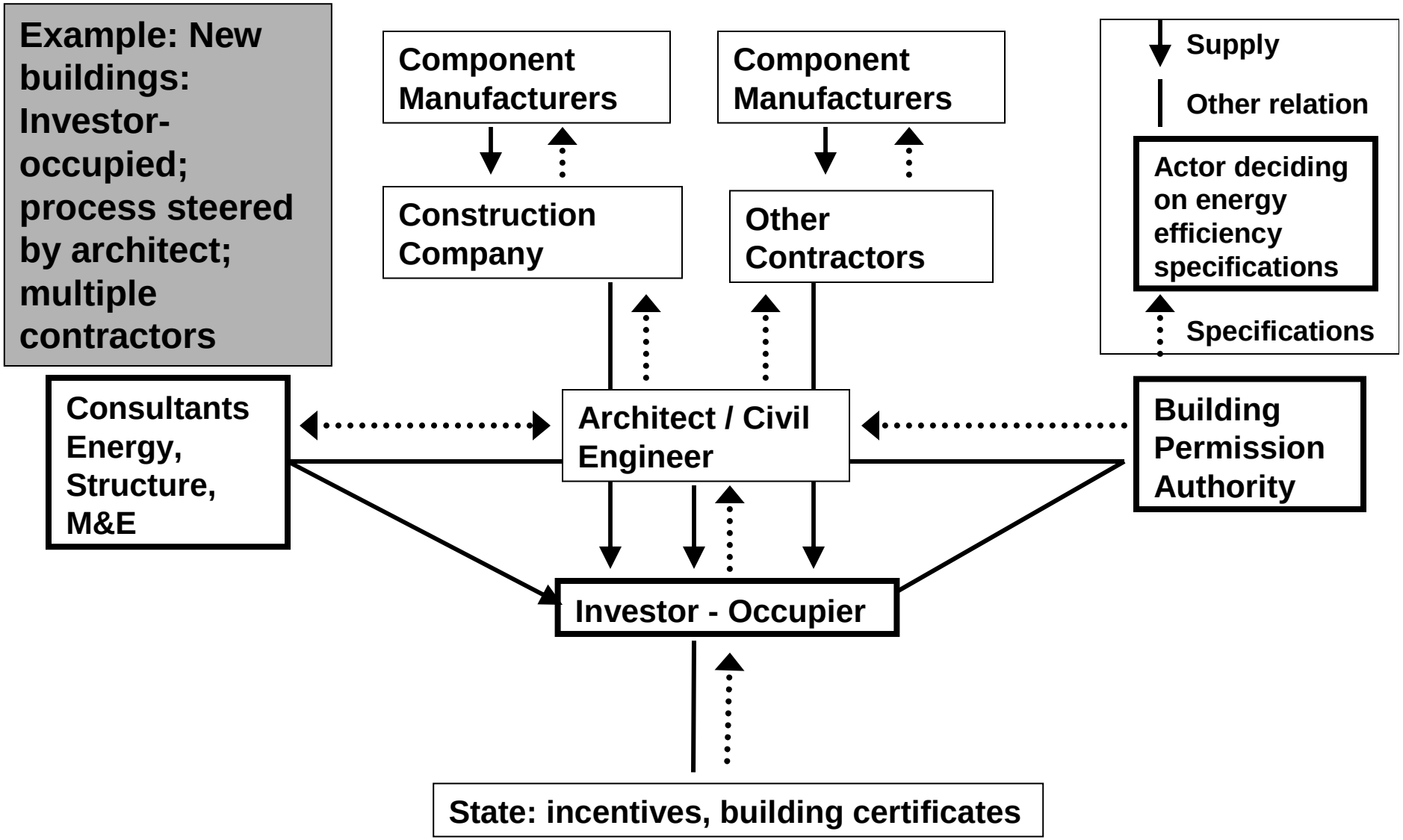
Step 4
Validate the resulting **‚recommended policy package‘** through **empirical evidence** of which instruments advanced countries have packaged together

PLUS: The multi-criteria assessment scheme to evaluate single policies: are they ‘good practice’?

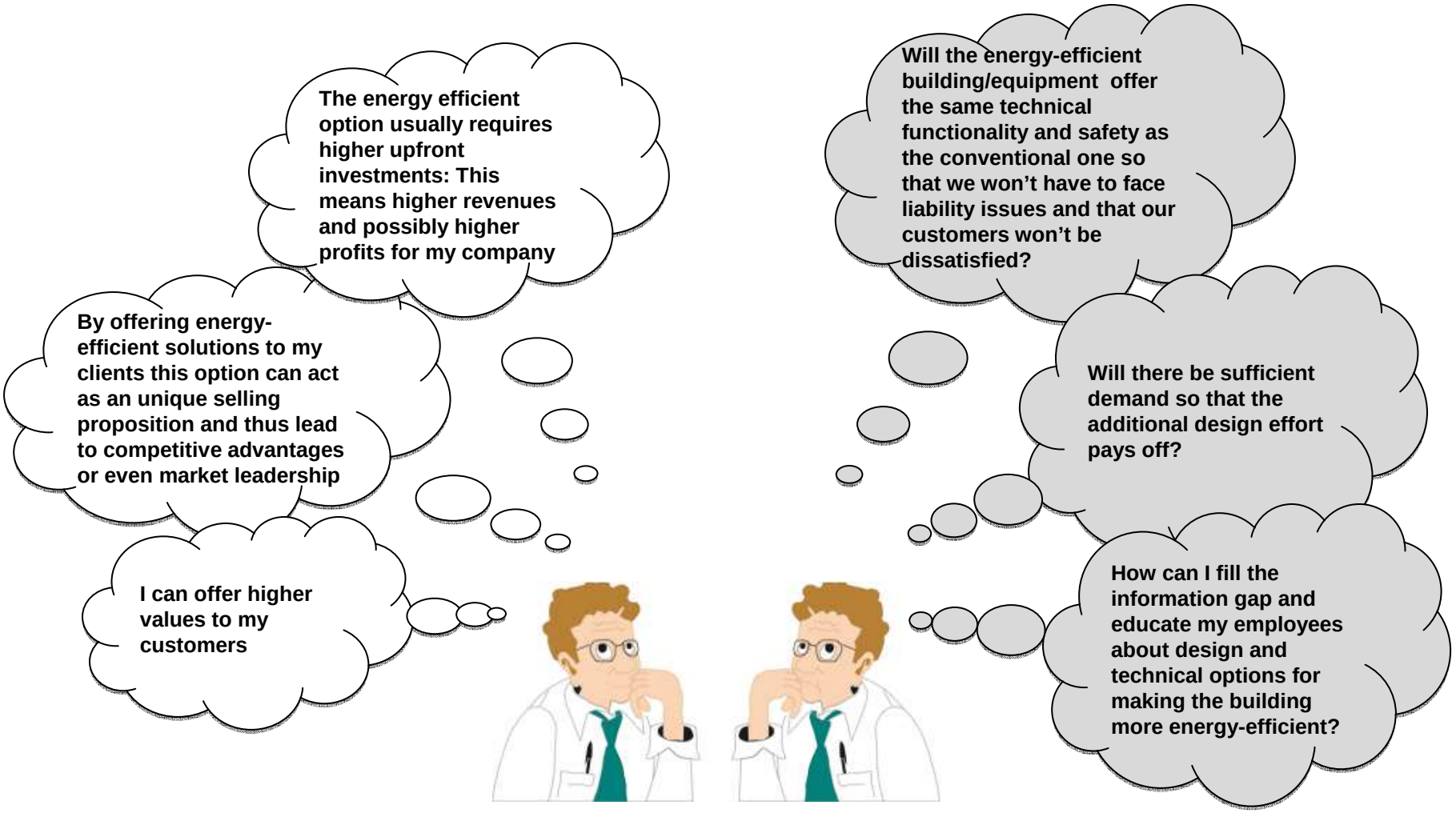
General Actor Constellation New Buildings



Step 1: Analysis of actor-specific barriers and incentives (example: new build)



Step 1: Analysis of actor-specific barriers and incentives (example: building designers or suppliers)



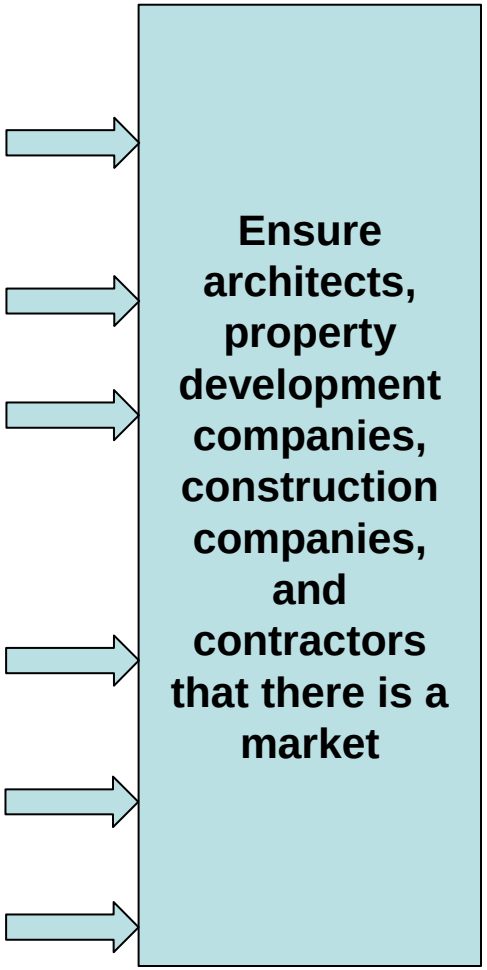
Step 2: Developing implementation strategies to address the barriers and incentives

Barriers tackled

- (Property development companies) Lack of knowledge about the market demand for energy-efficient buildings: will customers be willing to pay a premium?
- (Architects) Need to change proven designs and constructions: will there be a market worth the effort?
- (Manufacturers, retailers, wholesalers) Prevailing price competition or predominance of other product features over energy efficiency; therefore low priority by developers and low willingness to pay (more) for energy-efficient buildings.
- (Component manufacturers, manufacturers of pre-fabricated houses) Risk of technical development and production (change): will there be a market for energy-efficient buildings or products? Will we be able to recover the costs?

Incentives strengthened

- (Architects, property development companies, construction companies, and contractors) Present ourselves as innovative and caring for the environment => gain competitive advantage and social recognition
- (Property development company) Increase value of the property developed; from a supply perspective, this means higher revenues and possible higher profits. Justification for higher prices



Step 3a: From implementation strategies to policy instruments

Ensure architects, property development companies, construction companies, and contractors that there is a market

Policy options for the implementation strategy (already a **package**!)

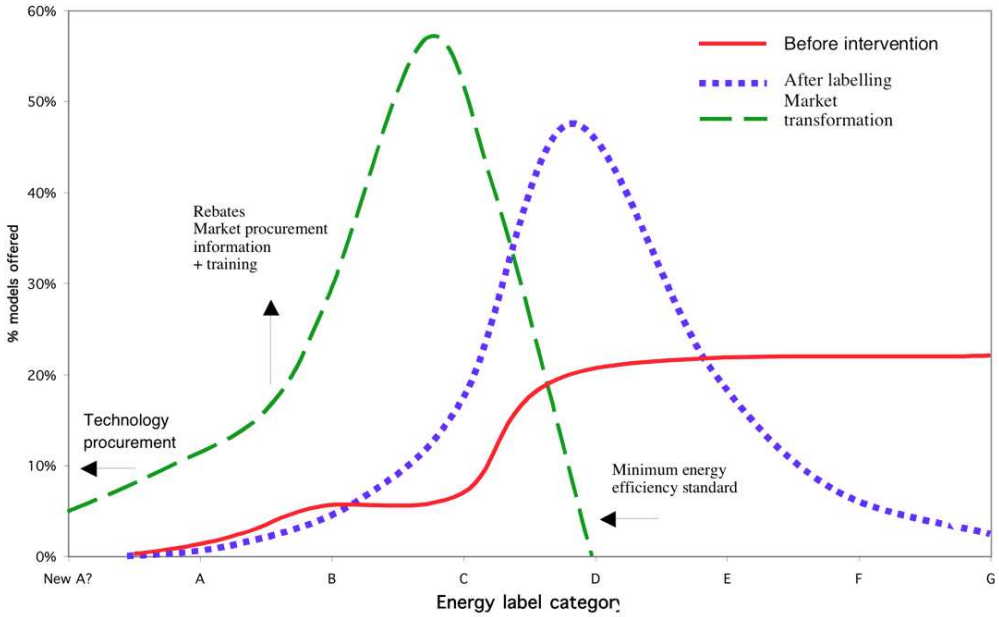
- Long-term strategies/ political commitments: e.g. Zero Net Energy targets and roadmap
- Dynamic building codes: Step 1 remove conventional practice from the market; step 2 announce future tightened levels to create expectation of future market
- Financial incentives and Soft loans for very energy-efficient new buildings (grants, tax subsidies)
- Promotion of innovative financing schemes such as on-bill financing, functional services, pay as you save (PAYS) schemes
- Social housing investment (to provide a first visible demand)
- Mandatory (initially maybe also voluntary) building energy performance certificates to enable and prove differentiation
- Information and advice and training programmes both for building investors and for architects, construction companies, and contractors
- Bulk purchasing and co-operative procurement

! *Some instruments are alternative to each other, but usually several instruments should be coordinated in an adequate policy package to establish synergy effects and realise the implementation strategy*

Step 3b: An 'ideal' recommended policy package for EE in new buildings resulting from the actor-centred analysis

- Summing up the partial policy packages for all implementation strategies will yield the **overall recommendable policy package** that should be able to address all barriers and strengthen incentives
- Most instruments achieve higher savings, if they operate in combination with other measures, and often these impacts are synergistic, i.e. the impact of the two is larger than the sum of the individual expected impact
- However, some instruments alternative to each other (e.g. grants and tax rebates):
  too many instruments with the same function could confuse market actors

The package for the whole building energy performance of new buildings is and works similar to that for appliances (but with higher emphasis on training and demonstration)**:**



Step 4a: Validate the resulting ‚ideal package' through empirical evidence

- As the most advanced countries show, the policy package that we derived from our actor-centred analysis comes close to what countries have introduced to approach very high levels of energy efficiency

Policy	California	China	Denmark	Germany	Tunisia
Targets	x	x	x	x	
Energy Agency	(x)	(x)	x	x	x
Funds or DSM	x	(x)	x	(x)	x
MEPS	x	x	x	x	x
Labels	(x)	(x)	x	x	(x)
Advice/audits	x	x	x	x	x
Grants	x	(x)	x	(x)	(x)
Soft loans/PAYS	x			x	x
Training	x	x	x	x	x

Step 4b: The multi-criteria assessment scheme to evaluate single P&Ms and packages

Selection based on **10 criteria:**

- Policy is implemented and not too old;
- Well-designed: addressing market players and barriers, avoids lost opportunities and lock-in, dynamic efficiency levels, lasting results and spillover effects;
- Innovative (elements or package) and promoting high energy efficiency standards (BAT or LLCC);
- Evaluated and shown to be cost-effective;
- Achieves high energy savings per unit and overall;
- Has no negative side-effects;
- The model examples cover many world regions

Step 4b: The multi-criteria assessment scheme to evaluate single P&Ms

- Example for policies which were (successfully) evaluated by the multi-criteria assessment scheme:
- Brazilian refrigerator replacement programme
  - offered to low-income households: free exchange of old refrigerators against higher energy efficiency refrigerators
  - Funded from public benefit funds and aimed to reduce non-payment
  - Well designed: synergies with refrigerator recycling scheme and energy label (only A label refrigerators exchanged for the old ones)
  - Programme was evaluated and often cost-effective
  - Energy savings of up to 80 %; 190 GWh/year and 23 MW (2008 to 2010)
  - However, more households could be reached
- bigEE screened many existing policies to present just one or two per type of policy in detail

Conclusion

- There is not one silver bullet that will transform the buildings and appliances market overnight - instead we need consistent policy packages, carefully tailored to the needs and incentive structures of all actors in the buildings and appliance value chain.
- The method of the actor-centred theoretical analysis can guide policy makers in defining an effective set of policies appropriate to national circumstances. **Full version: www.bigee.net**
- The set of criteria we developed can be used by policy-makers and analysts to identify good practice policies and eventually to improve them.
- However, the lack of thoroughly documented and evaluated policies makes it very difficult to identify good practice examples, compare their effectiveness and enable others to learn from them.

Our key message for policy makers is therefore...

...it is crucial to consider already in the policy design phase both the incentive structures of the actors concerned *and* the data needs for monitoring and evaluation.

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Many thanks for your attention !

For further information
please visit our website:
www.wupperinst.org

And our project website with a full
analysis of the presented approach:
www.bigee.net