

# Obligations in the existing housing stock: who pays the bill?

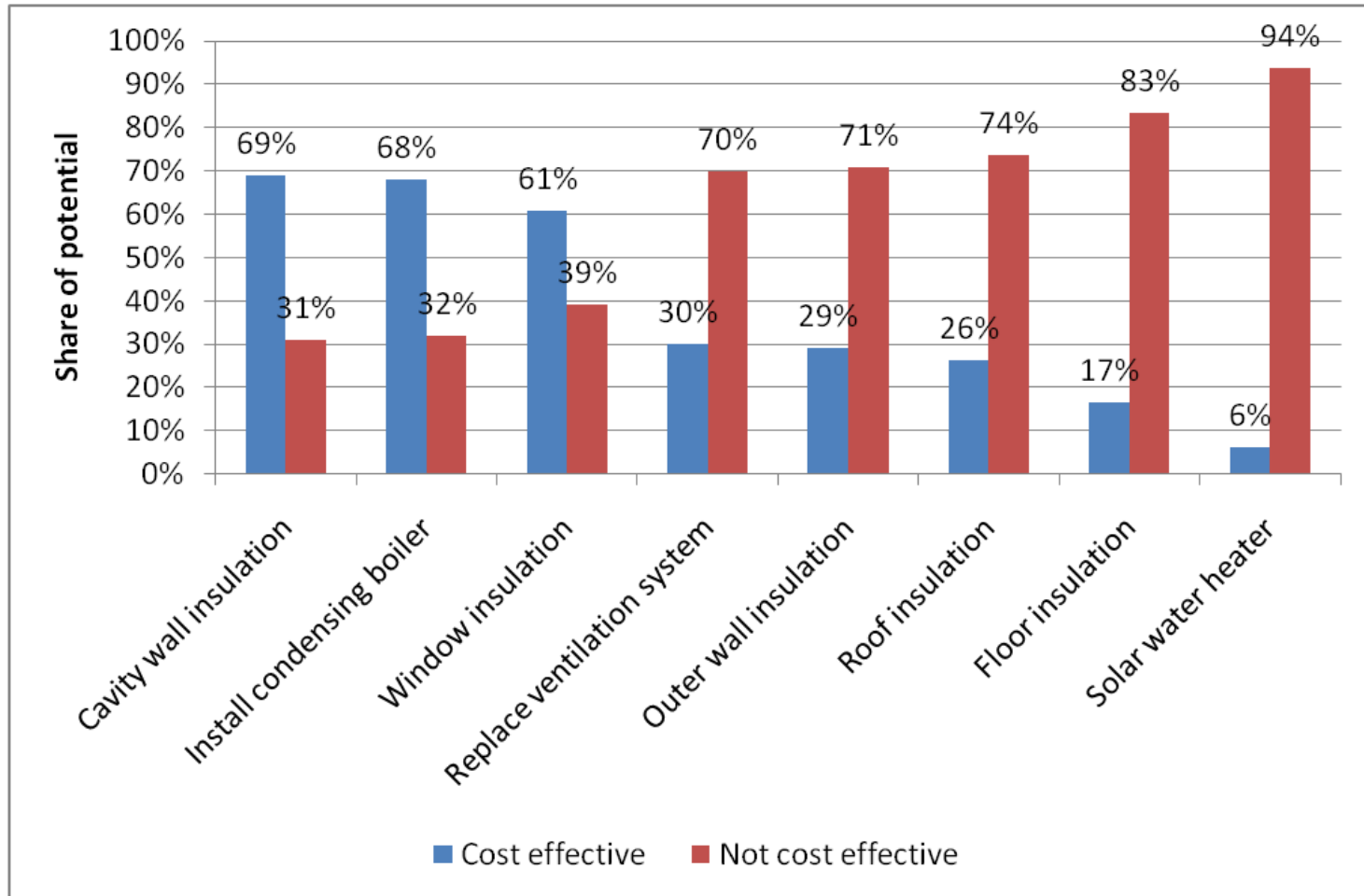
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## Virtual testing group (model) to test different policy measures

1. Representative survey households (N > 4700)
2. Packages of measures
  - On average 60 packages per respondent (total over 300.000 different options)
  - Tailor-made for specific dwellings
3. Calculation costs and benefits
  - Based on individual investments & real energy consumption figures
  - Including specific taxes and rental support schemes
4. Selecting most appealing packages
  - With respect to boundary conditions such as mandatory standards = **Policy effect!**

## Average ≠ individual cost effectiveness



## Why these differences?

- We've looked at differences in:
  - Technical properties dwelling
  - Construction year
  - Income of household
  - Household types
- These factors can't explain differences in cost-effectiveness
- **Heating behaviour correlates strongly with cost-effectiveness.**

# Heating factor

# Energy bill

## EPC

### Energie label woning

Afgegeven conform de Regeling energieprestatie gebouwen.

Veel besparingsmogelijkheden



**D**  
(zie toelichting in bijlage)



### Uw woning

Labelklasse maakt vergelijking met woning(en) van het volgende type mogelijk.

Rijwoning - Tussen

|                          |                  |
|--------------------------|------------------|
| Gebruiksoppervlak        | Adviesbedrijf    |
| 131,0 m <sup>2</sup>     | Advies BV        |
| Opnamedatum              | Inschrijffnummer |
| 01-01-2010               |                  |
| Energie label geldig tot | Handtekening     |
| 01-01-2020               |                  |
| Afmeldnummer             |                  |

Straat  
Dorpstraat  
Nummertoevoeging  
1  
Postcode  
0000 AA  
Woonplaats  
Hoofdstad

Energie label op basis van een ander representatief gebouw of gebouwdeel? -  
Adres representatief gebouw of gebouwdeel: -

### Standaard energiegebruik voor

Energiegebruik maakt vergelijking met andere woning(en) voor de

- Het standaard energiegebruik is de hoeveelheid primair energie voor verwarming van uw woning, de productie van warmte.
- De eventuele opbrengst van een zonnepaneel wordt in mindering gebracht op het standaard energiegebruik.
- Het energiegebruik wordt berekend op basis van de opstelling van de installaties van uw woning.
- Bij de berekening wordt uitgegaan van het gemiddeld aantal bewoners en gemiddeld bewoners.
- Het standaard energiegebruik wordt uitgedrukt in de volgende eenheden: dit wordt uitgesplitst naar elektriciteit (kWh), gas (m<sup>3</sup>) en warmte (GJ).

**76705 MJ**  
(megajoules)

1037 kWh (elektriciteit)  
1909 m<sup>3</sup> (gas)  
0 GJ (warmte)

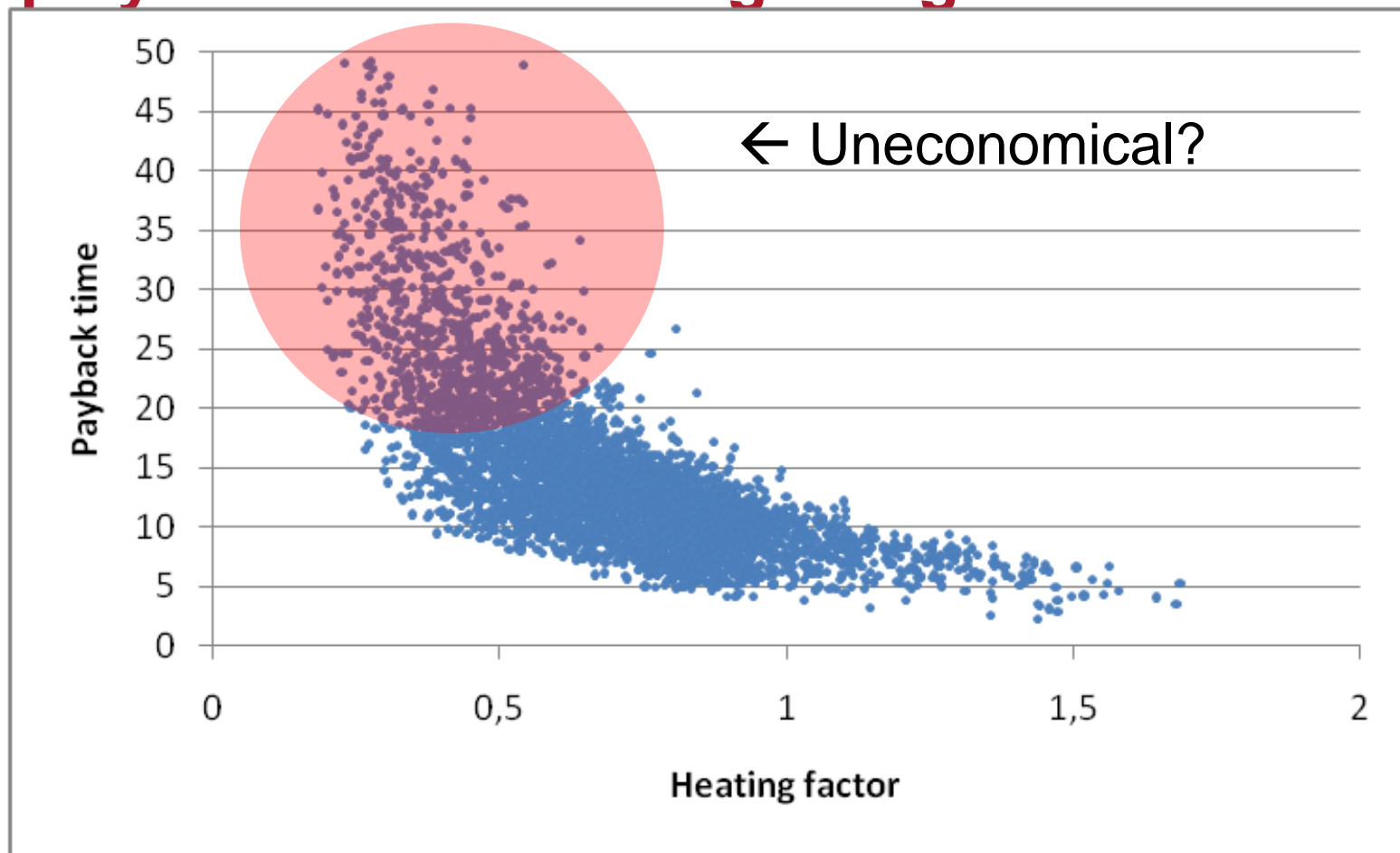
Totale kosten op deze jaark... 1.273,87

| Producten                          | Verbruik | van        | tot        |
|------------------------------------|----------|------------|------------|
| Gas (m <sup>3</sup> )              | 1070     | 07-12-2007 | 08-12-2008 |
| Elektriciteit laag tarief (kWh)    | 1208     | 07-12-2007 | 08-12-2008 |
| Elektriciteit normaal tarief (kWh) | 1023     | 07-12-2007 | 08-12-2008 |

Door uzelf doorgegeven via internet

**Example heating factor: 1070 m<sup>3</sup> / 1909 m<sup>3</sup> = 56%**

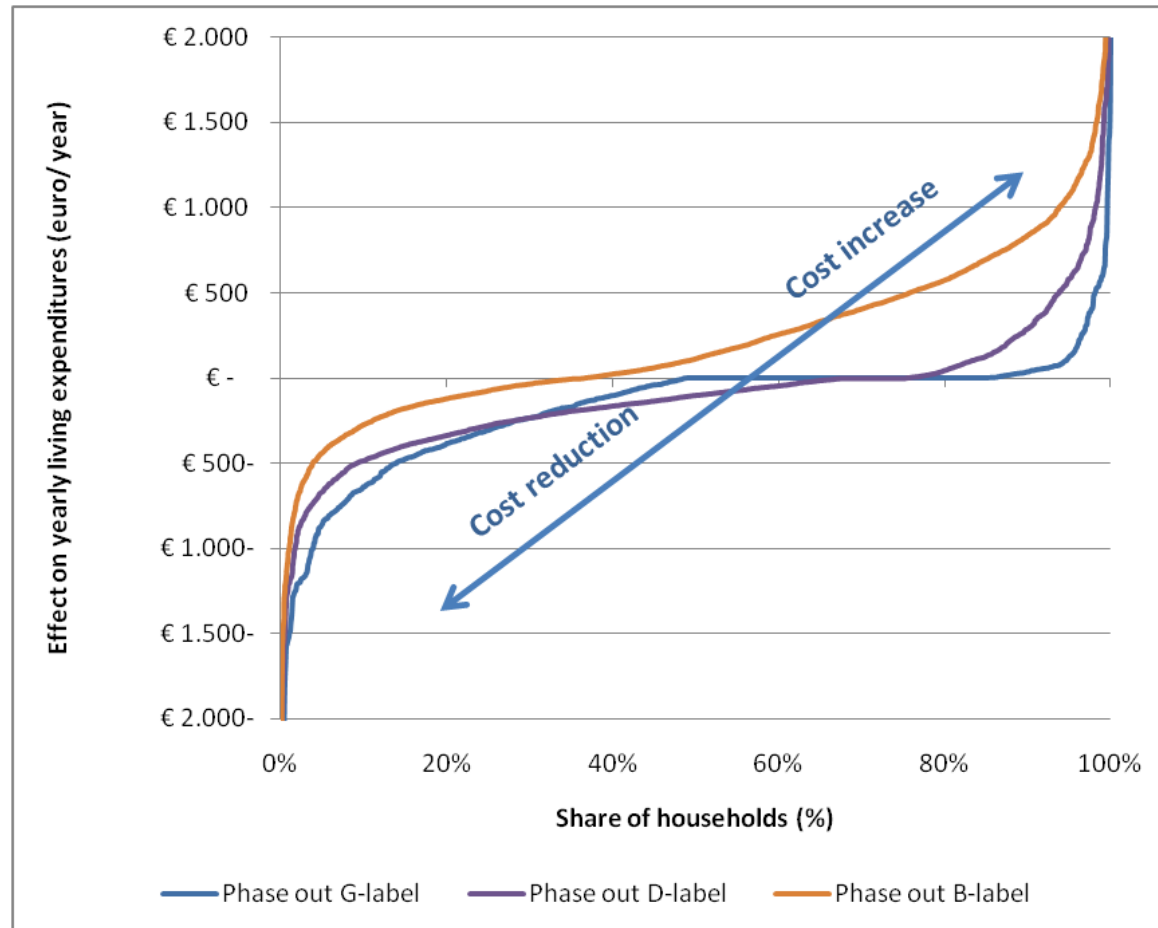
# Example: Correlation heating behaviour/ payback time Low E- glazing



## Obligations based on technical properties force households to uneconomical investments

- The stricter the obligations the higher the energy saving, but the more households will be harmed
- We looked at different types of obligations in different variations (over 60 in total)
  - Mandatory standards on components
  - Mandatory integral standards on houses based on EPC
  - White certificate schemes
  - Based on cost-effectiveness
  - etcetera

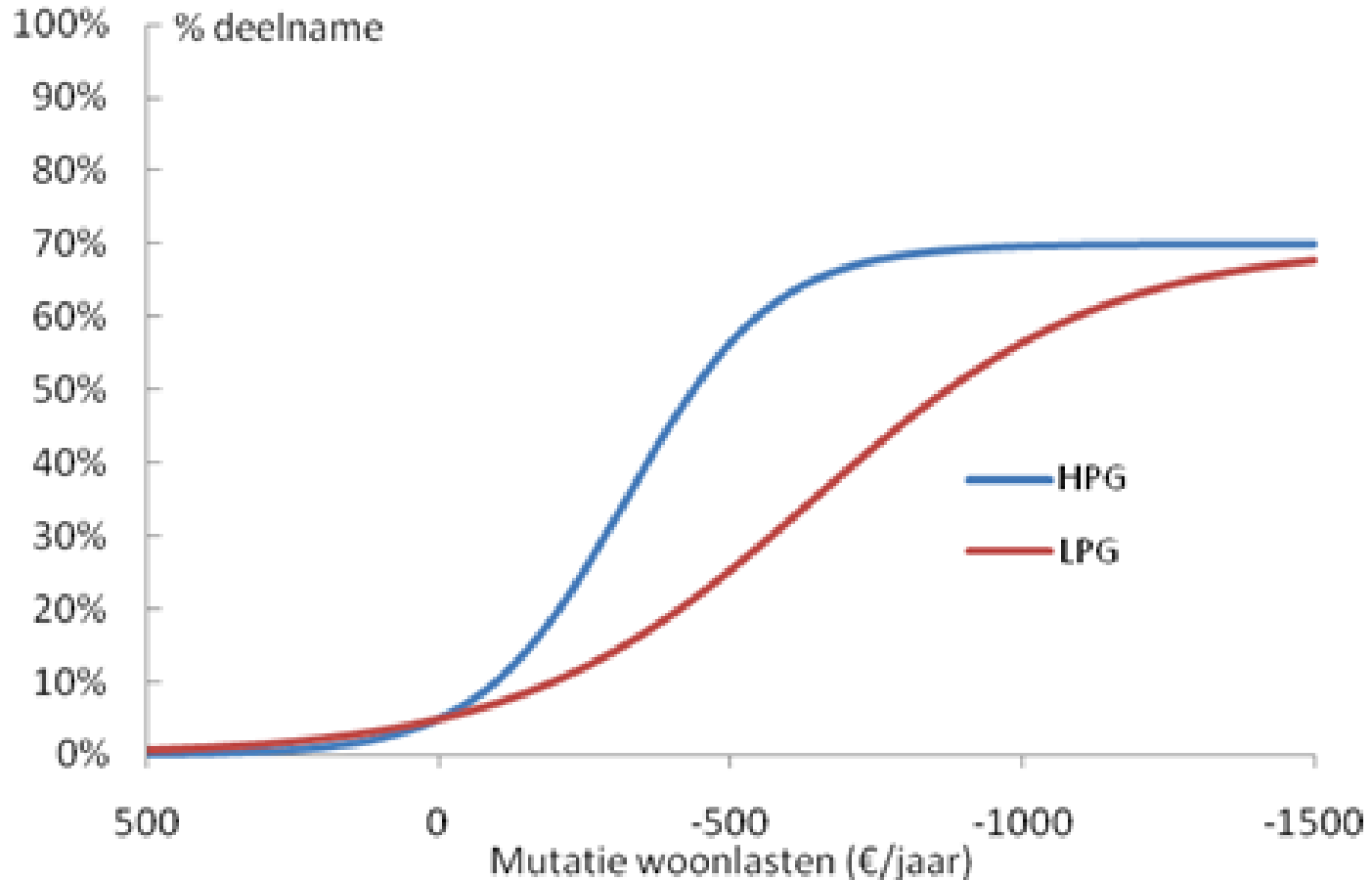
# Obligation example 1: Mandatory standards based on EPC's



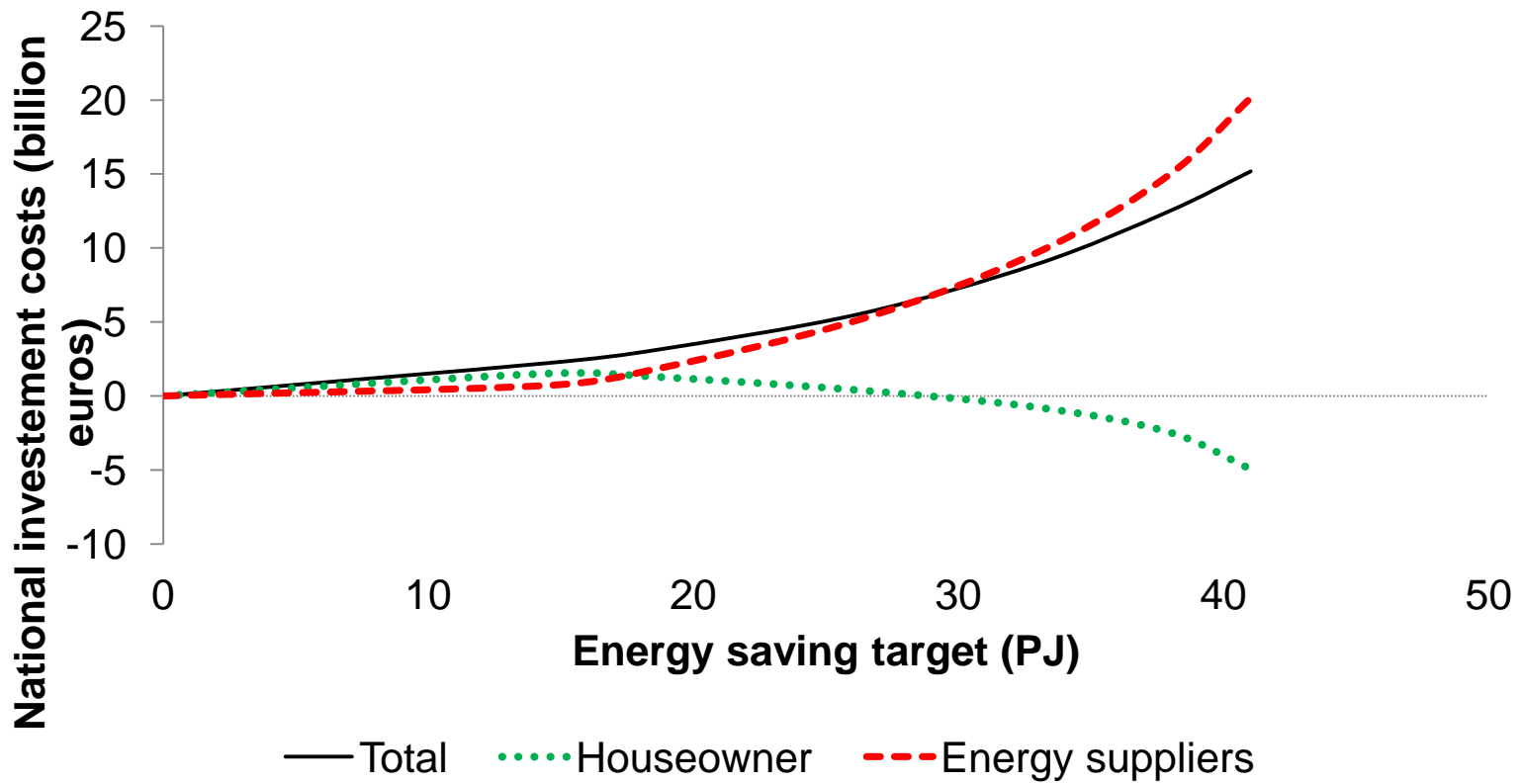
## Obligation example 2: Energy supplier obligations (White certificate scheme)

- Positive:
  - Households aren't forced to do uneconomical investments,
- but:
  - Energy suppliers have to issue premiums for households.
  - Costs recharged in energy tariffs
  - More ambitious target → higher premium → higher tariffs → higher energy bill for all households
  - All households pay implicitly for efficiency measures minority

# Assumption!



# Division of costs with supplier obligations



## Obligation type 3: Cost-optimality (recast EPBD)

- Obligations to install cost-optimal energy efficiency measures on major renovations
- Reference buildings used (theoretical heating behaviour)
- Households with a low energy demand are forced to do uneconomical investments
- Potential danger that can undermine the support for recast EPBD

## Main conclusions

- There is a huge cost-effective energy saving potential in houses, but this doesn't mean that it's cost-effective for all households.
- Cost effectiveness isn't solely linked to technical features of buildings, but also to heating behaviour
- Every type of obligations (aimed at energy suppliers, end-user, or based on cost-optimality) will have it's negative side-effects.
- Heating factor could be used as a way to exclude groups of households.
- But in the end it's a political choice: "Who pays the Bill?"

## Thank you

- More info:
  - ECEEE paper :  
<http://www.ecn.nl/publications/ECN-M--11-070>
  - [www.ecn.nl](http://www.ecn.nl)
  - [www.ecn.nl/units/ps/themes/built-environment/](http://www.ecn.nl/units/ps/themes/built-environment/)
  - [Tigchelaar@ecn.nl](mailto:Tigchelaar@ecn.nl)

## Additional slide (Rebound effect?):

