



# Final BRISKEE Conference and ecee annual policy seminar Wednesday, 29 November 2017, Brussels

## Policy Conclusions

Wolfgang Eichhammer, Fraunhofer ISI



## Behavioural response to investment risks in energy efficiency



This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 649875. This presentation only reflects the authors' views and EASME is not responsible for any use that may be made of the information it contains.

# The discount rate dispute...

Discount rates (in real terms)	Standard discount rates of PRIMES	Modified discount rates due to EED	
		2015	2020 - 2050
Power generation	9%	9%	9%
Industry	12%	12%	12%
Tertiary	12%	11%	10%
Public transport	8%	8%	8%
Trucks and inland navigation	12%	12%	12%
Private cars	17.5%	17.5%	17.5%
Households	17.5%	14.75%	12%

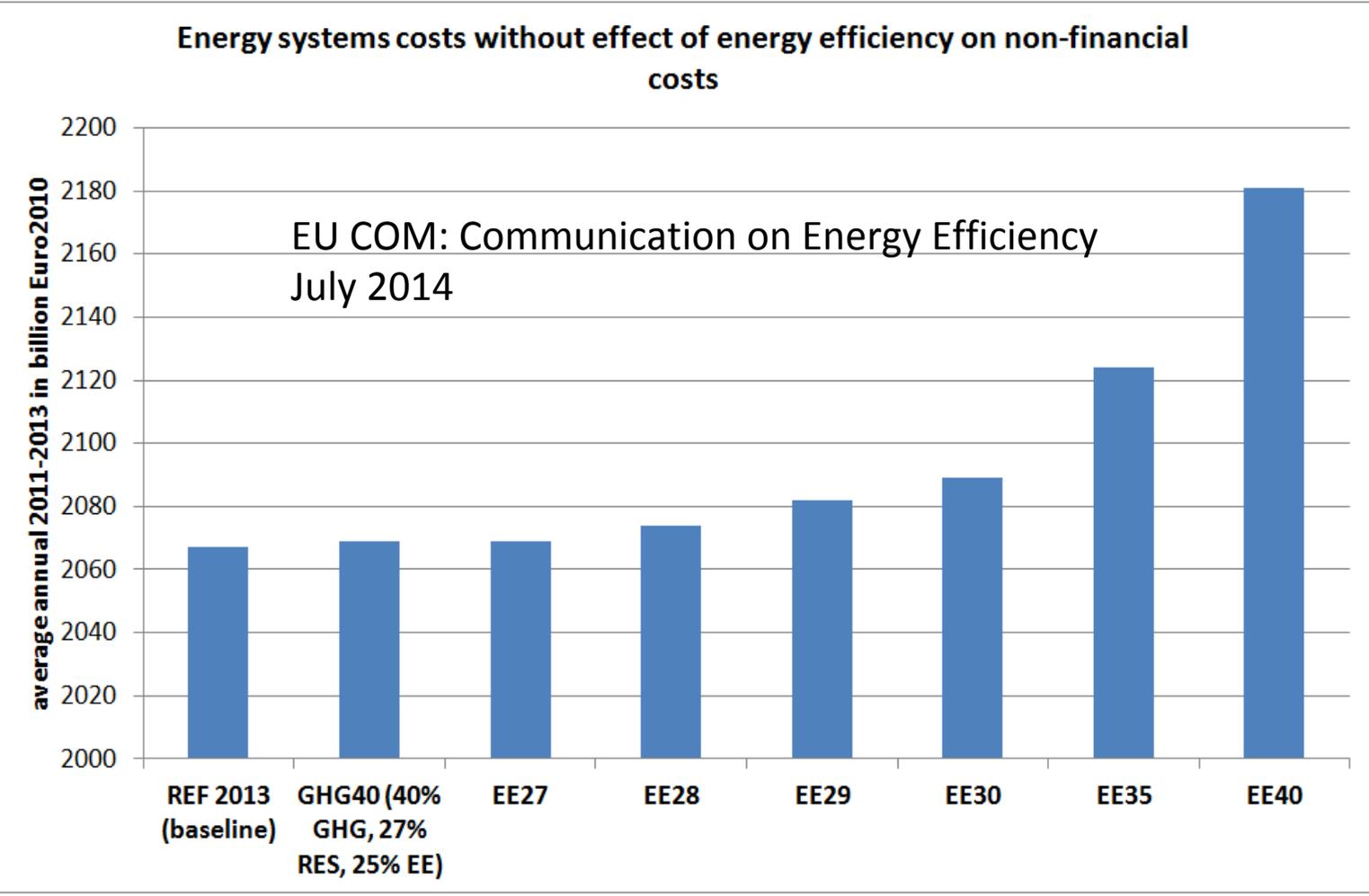
This boils down to the question in how far discount rates used to evaluate FUTURE policies shall reflect PRESENT individual decision making processes with rather imperfect mechanisms to include risk assessment into the discount rates.

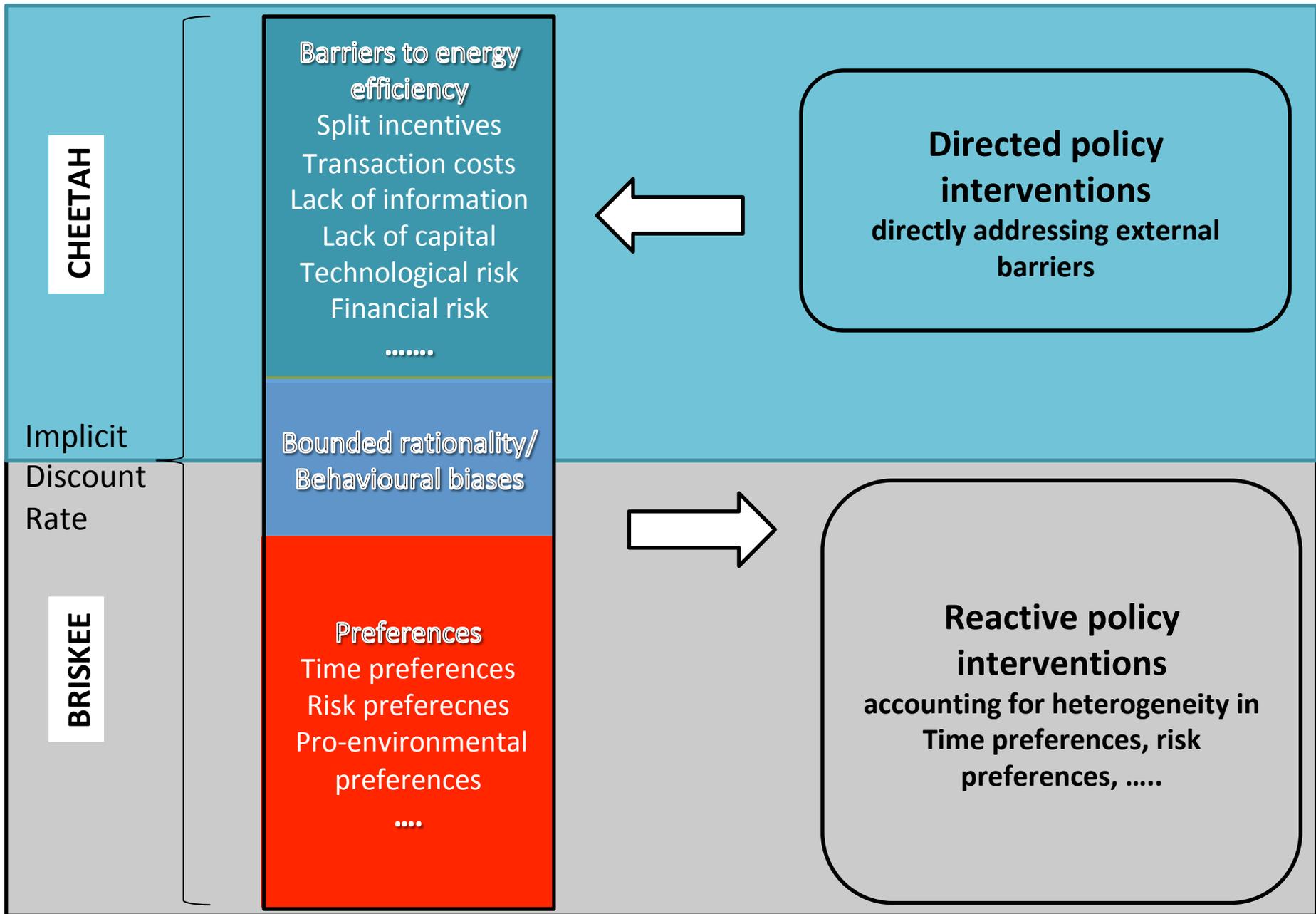
## PRIMES 2013/EC

PRIMES integrates **(perceived or existing) risks** into the discount rates to a large degree, our scenario approach essentially uses usual **capital costs, considering that there are instruments to mitigate the risks and the risk perception**

Sectors	Scenarios	Discount rates
Household - space heating and hot water	All	3.1% to 3.7%
Tertiary - space heating and hot water	All	4.7% to 5.4%
Household - Appliances	Potential_2030_LPI Potential_2030_HPI Potential_2030_NE	Typically 6% (discount rates vary between different countries, appliances) 2% (assuming removal of barriers from 2020)
Tertiary - Appliances	Potential_2030_LPI Potential_2030_HPI Potential_2030_NE	15% 5% 5%
Industry	Potential_2030_LPI Potential_2030_HPI Potential_2030_NE	Payback up to 2 years accepted by 50% of companies; heating systems 15% Payback up to 5 years accepted by 60% of companies; heating systems 15% Companies accept longer payback periods <sup>3)</sup> heating systems 3%
Transport	N/A	N/A

# Policy Consequences of Discount Rates





# Results Micro Analysis energy efficiency technology adoption decisions - implications for policy (1)

	LED	Appliances	Retrofit	Implications for policy
<b>Preferences</b>				
<i>Patience</i>	+		(+)	Alter the timing of the cost/revenue streams, less up-front outlays; offer rebates (rather than tax breaks), low-interest loans Target group: lower income and less educated households with no children
<i>Risk aversion</i>			(-)	Lower perceived financial/technological risk of adopters, e.g. via warranties (technical risk), energy performance contracting (financial risk); information: highlight “asset character” of investment in energy efficiency (less vulnerable to changes in energy prices); Target group: older, female, lower educated, lower income households with children
<i>Loss aversion</i>				
<i>Environmental identity</i>	+	+	+	Provide information on environmental effects (e.g. via labelling, information activities, energy advice); Retrofit: retain promotion of building performance certificates and highlight environmental criteria in performance certificates; Target group: older, female, high education households with children
<i>Social norms</i>	+	+	+	Use social comparisons in information campaigns; Clearly communicate environmental effects of fossil heating systems and provide information on renewable alternatives; Try to shape social norms, e.g. via information campaigns; Target group: high income households
<b>Behavioral biases</b>				
<i>Present bias</i>	-	-	- (-)	Offer policies for present biased people, which alter the timing of the cost/revenue streams, less up-front outlays; offer rebates (rather than tax breaks), delay payments; low-interest loans; contracting

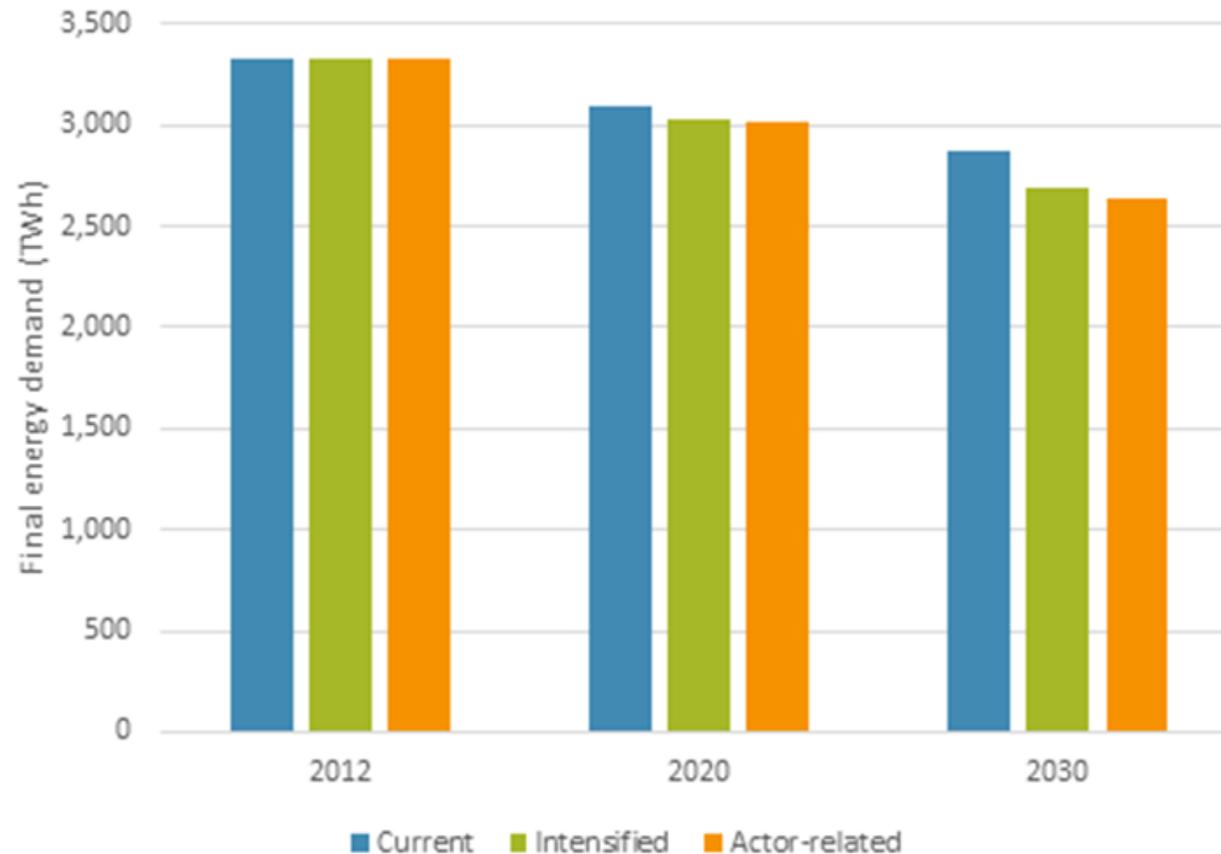
# Results Micro Analysis energy efficiency technology adoption decisions - implications for policy (2)

<i>External barriers</i> □		□	□	□
<i>Renting</i> □	-□	-□	-□	Retrofit: labelling/building certificates; facilitate pass through of retrofit investment costs; highlight not only the energy performance in the EPC but also more directly the energy costs related to an apartment; □
<i>Likely move</i> □	-□	-□	-□	Energy contracting independent of building occupants (passing on contracts to next tenants); promote energy performance certificates for buildings;□
<i>Own meter</i> □	+□	+□	+□	Make metering of individual dwellings mandatory via regulation; promote the distribution of smart thermostats for heating and cooling;□
<i>Access to capital</i> □	+□	+□	+□	Low-interest loans, rebates; energy performance contracting; ¶ Target group: younger, female, low income, low educated households without children□
		□	□	□
<i>Socio-demographic characteristics</i> □		□	□	□
<i>Age</i> □	-□	+□	□	□
<i>Gender</i> □	+□	□	□	□
<i>Income</i> □	+□	+□	+□	For parts of the population, low-interest loans will not work as they are reluctant to take any kind of loan even at zero interest rates – special programmes (e.g. contracting, subsidies for building renovation) for low-income groups could be an option, □
<i>Education</i> □	+□	□	-)a□	□
<i>Household size</i> □		□	□	□
		□	□	□
<i>Dwelling characteristics</i> □		□	□	□
<i>Dwelling size</i> □		+□	+□	□
<i>Building age</i> □	+□	+□	-)b□	□
<i>Detached housing</i> □		□	+□	Promote regulations that facilitate decision-making for refurbishment in multi-family dwellings; agreement among the majority of owners should be enough; facilitate pass through of retrofit investment costs; □

# Scenarios for appliances in FORECAST-Residential

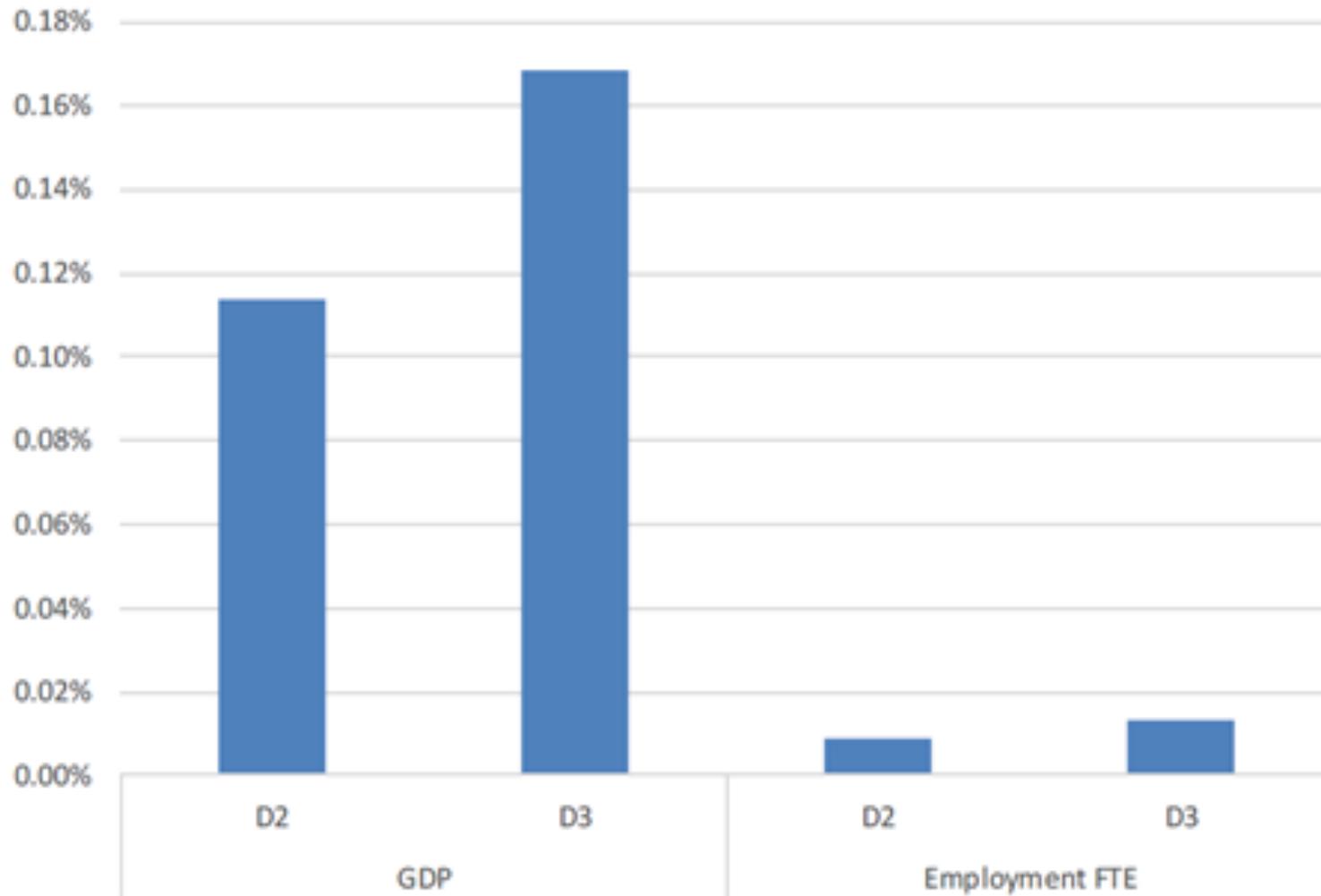
Scenario name	Explanation
Current-policy scenario	All Ecodesign and Labelling measures that are adopted are explicitly modeled for refrigerators, washing machines, freezers, dryers, dishwashers, stoves and lighting and are modelled as an average over technologies for televisions, set-top boxes, laptops, desktop computers, computer screens, modems/wifi-routers and air conditioning.
Intensified-measures scenario	Includes all measures implemented in the current-policy scenario and assumes that minimum standards are intensified and the label is rescaled. The rescaling of the energy label is assumed to increase its effectiveness affecting both consumers and suppliers so that more efficient appliances become available earlier.
New actor-related measures scenario	<b>New instruments affecting actors are implemented in the model (and existing actor-relevant policies increased) taking into account findings from survey.</b>

# Comparison of actor-specific modelling and assumptions in the residential sector (1)



Comparison of final energy for the residential sector (sum of buildings and appliances) in the BRISKEE

# Relative GDP and FTE employment development in D2 and D3 scenarios with respect to the current-policy scenario



# Conclusions Micro-Level

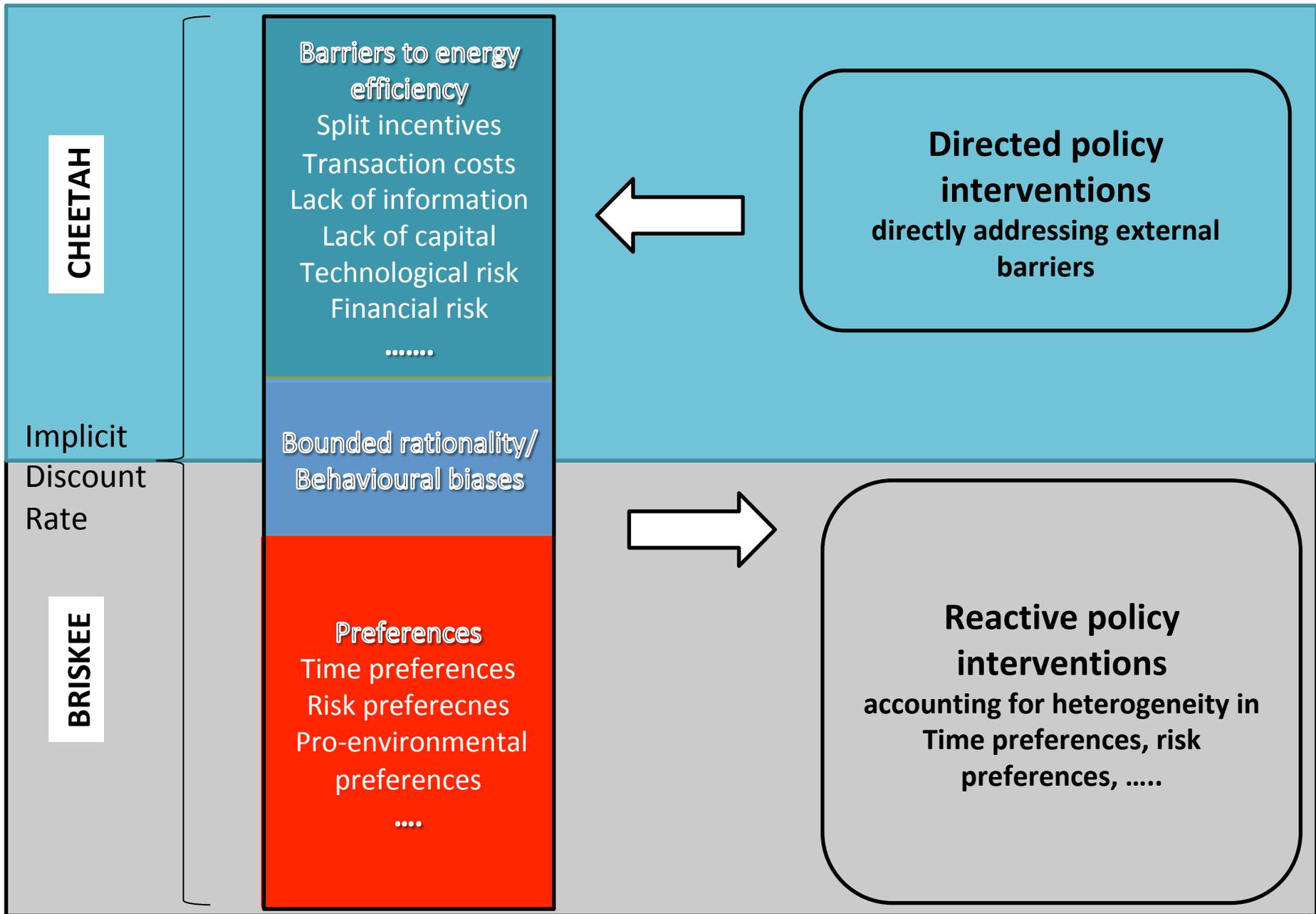
- BRISKEE has shown on an empirical basis which factors impact in different manner on the IDR, in particular in the components related to (time and risk) preferences.
- We found smaller differences for the following attributes: Gender, age, education, time preferences. Larger differences occurred between different income groups (especially low income households) and between participants with different environmental identity (elicited in the survey on a four-item scale).
- Thus the results from the micro-level provide indications, how reactive policies could be designed to take into account the characteristics of different groups, e.g low-income households.

# Conclusions Meso-Level

- On the meso-level, the observations suggest that taking into account specific factors impacting on the IDR leads to the realization of additional economic energy saving potentials in the New Actor-Related Scenario NAMS.
- Compared to the Intensified Measures Scenario IMS, this presents a further improvement both with respect to energy efficiency and the penetration of renewable options in the building sector.
- In combination the difference would be largest when expressed in avoided CO<sub>2</sub> emissions.
- In these results it has to be taken into account that only certain parts of the findings from the survey were implemented in the NAMS (low-income agents) and that quite some of the difference in impacts arises after 2030.

# Conclusions Macro-Level

- At the macro-level structural shifts are at first observable which - through compensating impulses that reduce positive impacts on economic growth and employment - first lead to relatively modest increases in the impacts when moving on to the New Actor-related Measure Scenario.
- It is important to look at the long-term dynamic impacts that would arise after investments are paid off.
- Future research: focusing on the question whether the survey findings have implications for example for the compensating impulses, i.e. the investment behavior.



---

For more information please visit our website

[www.briskee-cheetah.eu/briskee/](http://www.briskee-cheetah.eu/briskee/)



Behavioural response to investment  
risks in energy efficiency