Divide et impera:

How to leverage energy efficiency programmes in Swiss Small and Medium sized Enterprises (SMEs)

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Schweizerische Eidgenossenschaft
Confédération suisse
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Bundesamt für Energie BFE
Swiss Federal Office of Energy SFOE

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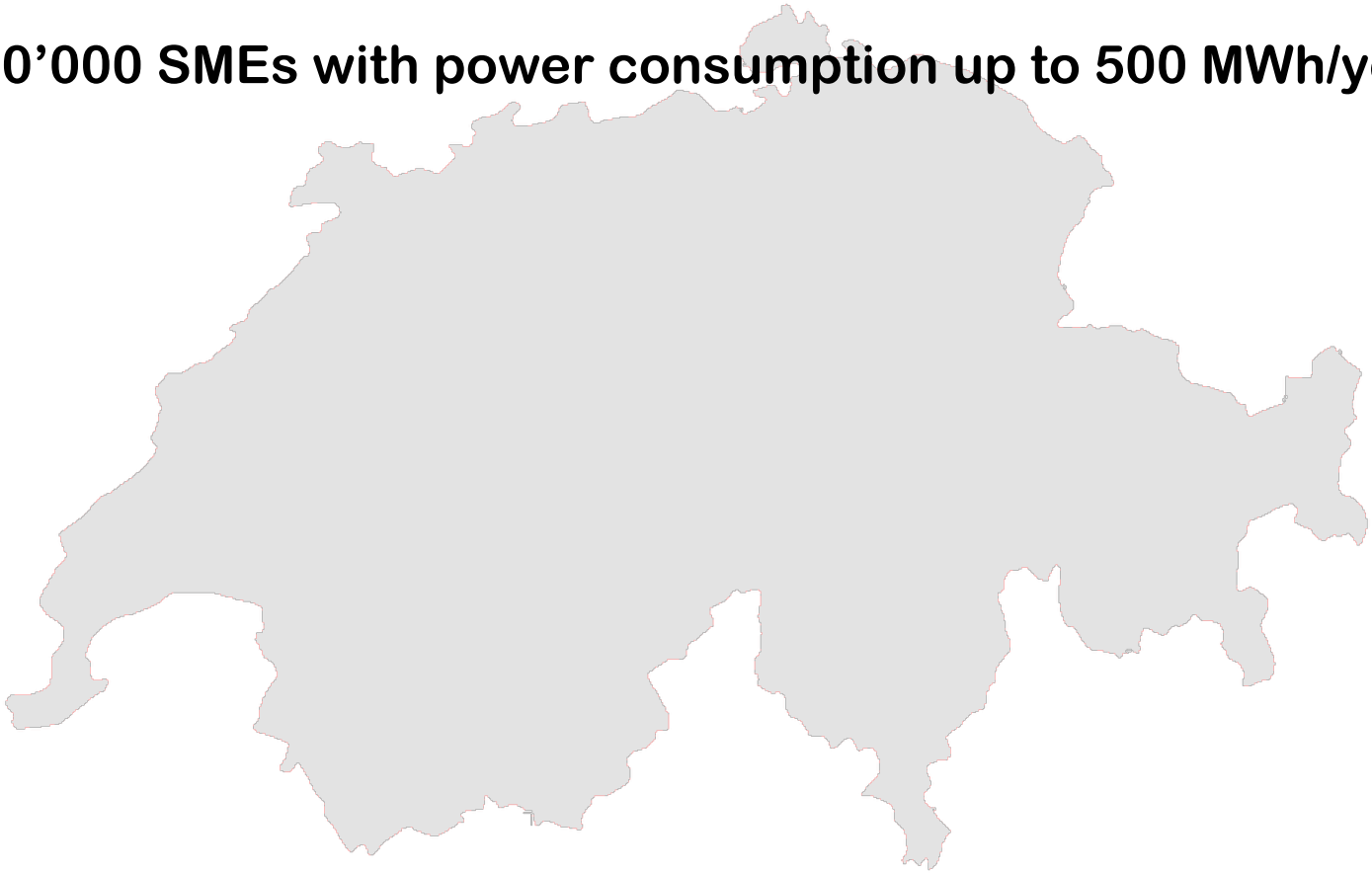
Switzerland and SMEs

Possible Savings

550’000 SMEs in Switzerland

250’000 SMEs with power consumption up to 500 MWh/year



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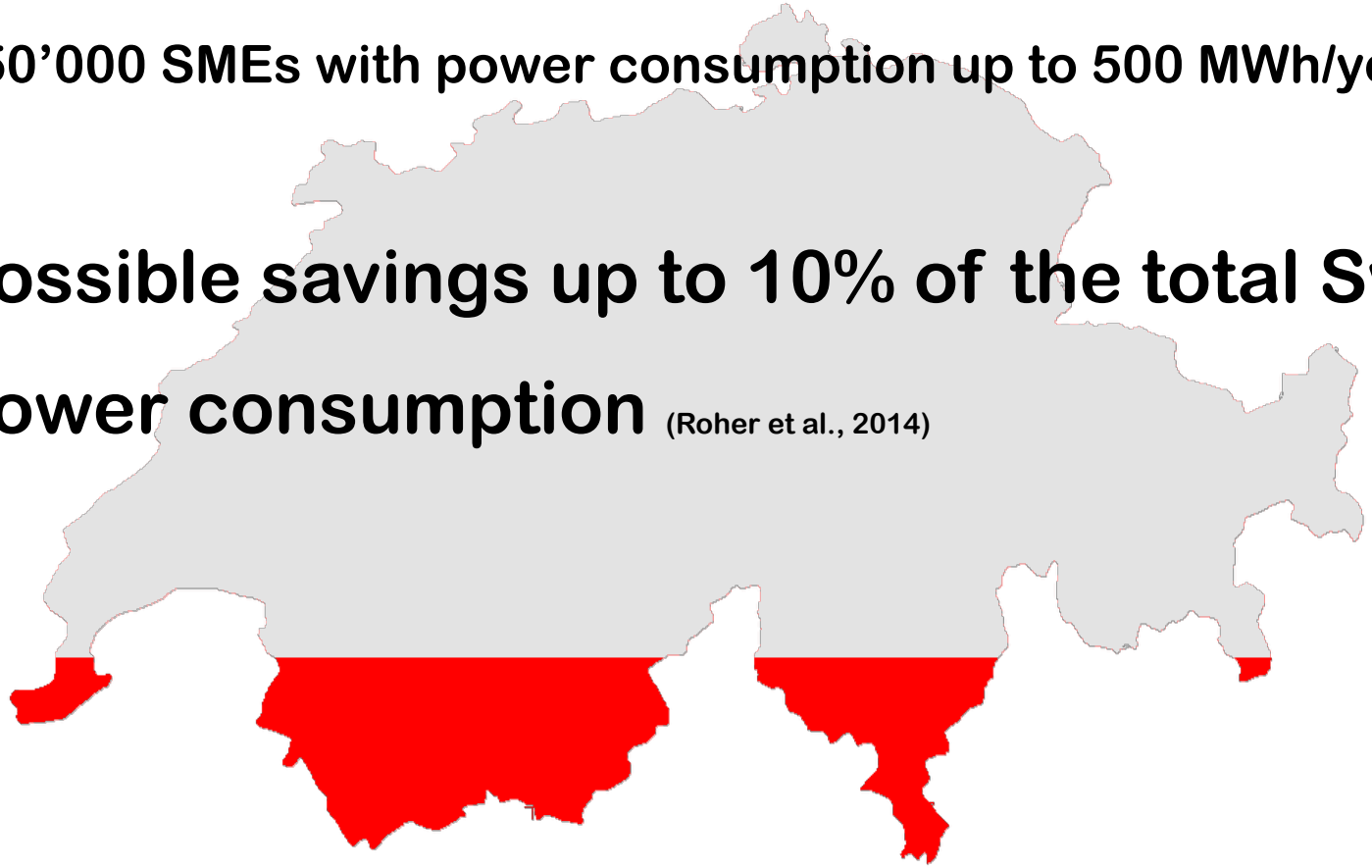
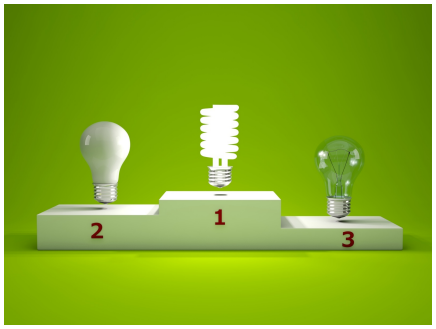


Possible savings up to 10% of the total Swiss power consumption (Roher et al., 2014)

Exploitation of Possible Savings

Energy Efficiency Programs

"…programs supported by external funding bodies that promote energy saving measures and measures to improve energy efficiency by providing, for example, advice or financial incentives"



Low Level Energy Efficiency Programs

How to leverage Energy Efficiency Programs in SMEs?

Segmentation of SMEs?
Practical Implications?

Method

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Psychology

Online-Survey

N = 334 SMEs

- **Structural business factors** (e.g. number of employees, annual turnover, industry classification)
- **Energy consumption in business** (e.g. energy consumption, saving potentials, knowledge)
- **Psychological factors** (e.g. motivation, attitude, self-efficacy, expectations, barriers)
- **Participation Rate** (i.e. planned participation, realized participation, no participation)

Segmentation of SMEs

Participation Rate

	No Participation N = 172	Planned Participation N = 42	Realized Participation N = 92
Industrial Sector	Non-Productive	Non-Productive	Industry
Number Employees	Up to 9	Up to 49	Up to 250
Business Premises	Tenant	Owner	Owner
Annual turnover	Lowest		Highest
Energy Consumption	Lowest		Highest
Energy Manager	No	Yes	Yes

Results and Implications

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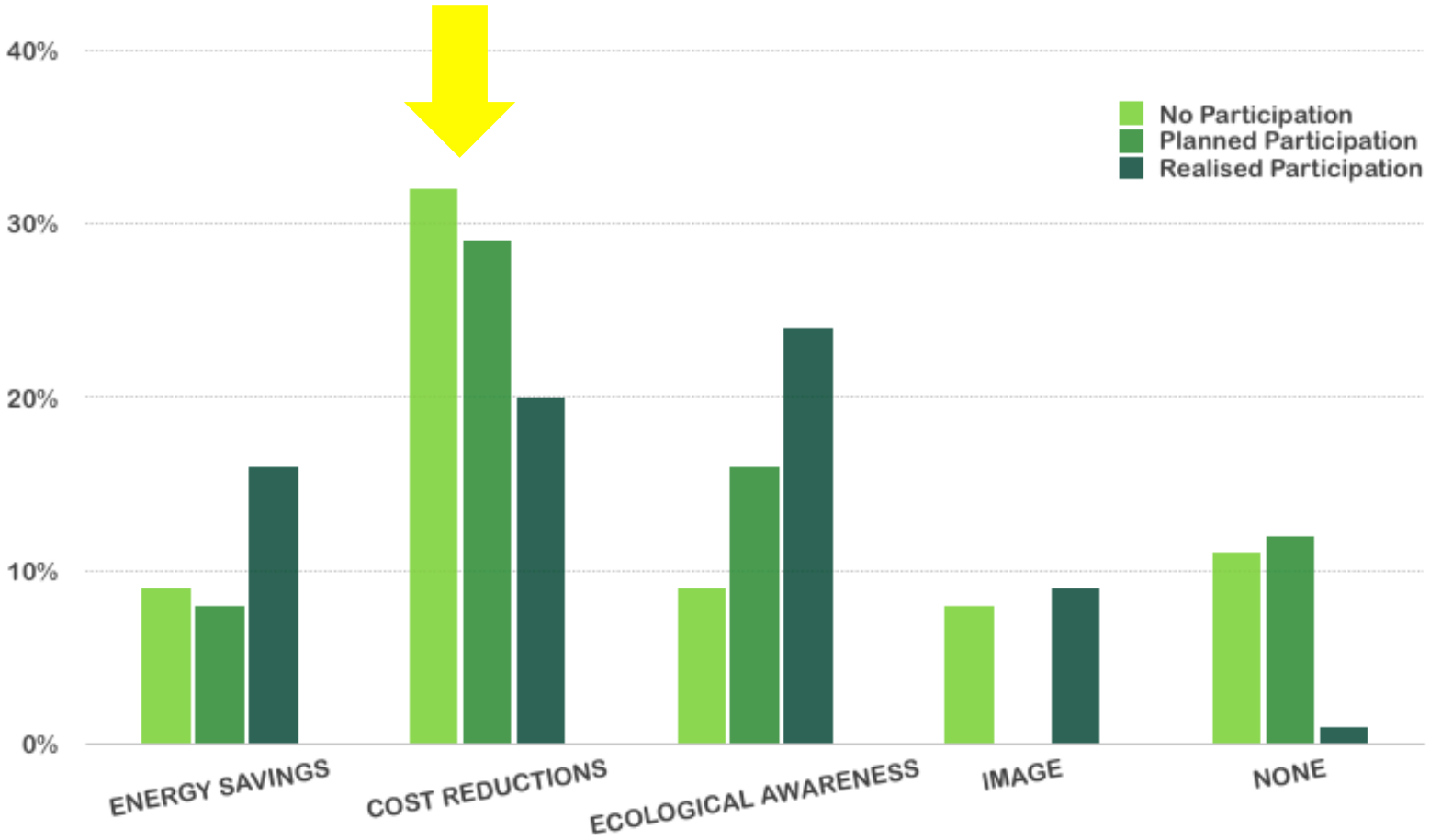
1. Motivation and Benefits

Cost Reduction as a main motivator

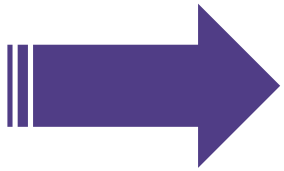


$\chi 2\ (14) = 38{,}269,\ p \leq .001$

1. Motivation and Benefits

Cost Reduction as a main motivator

Problem: SMEs do not have substantial energy costs and therefore no substantial cost reductions possible (e.g. Bachmann et al., 2014)

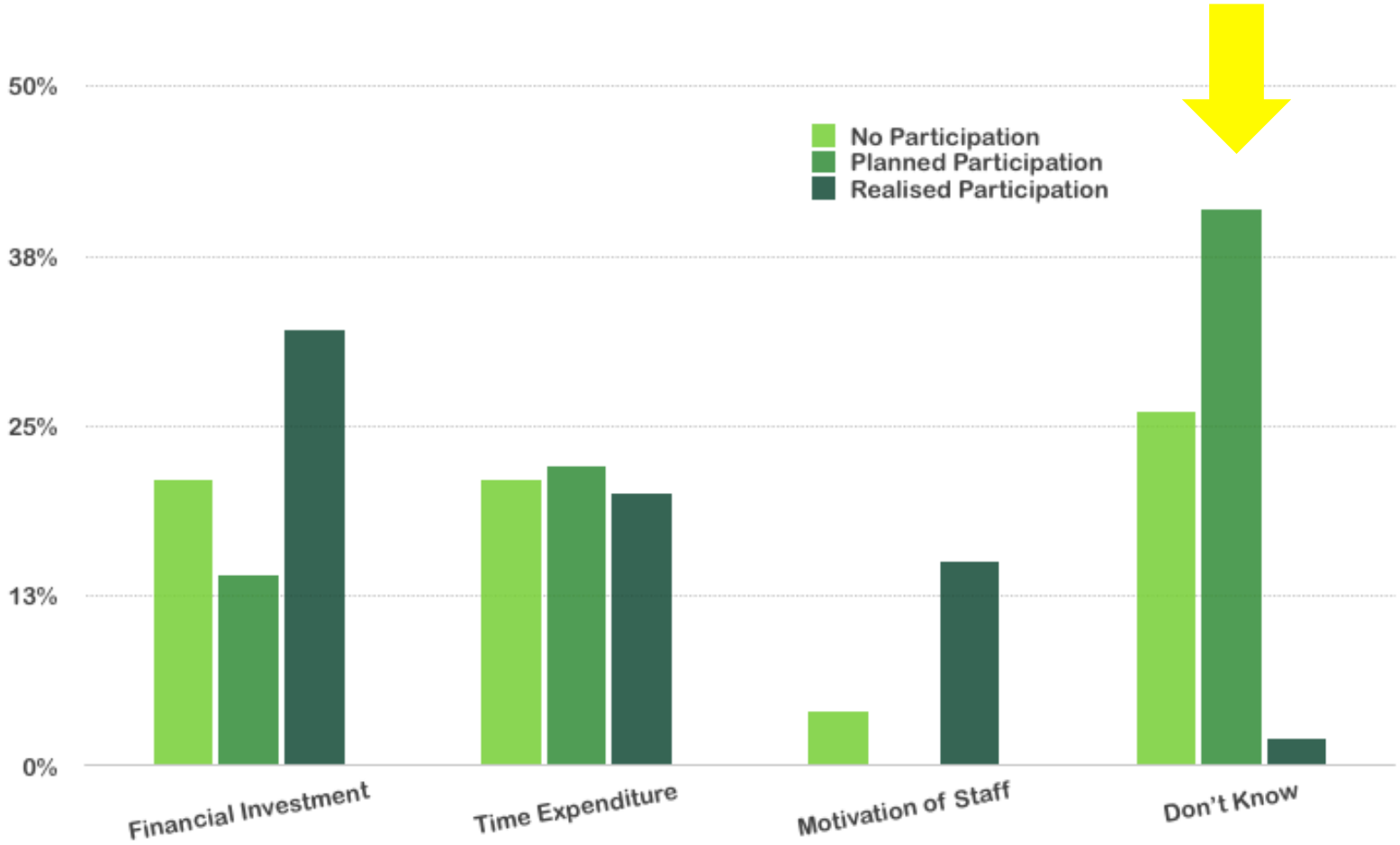


Non-energy related benefits

e.g. Replacing the light enhances productivity

2. Perceived Efforts and Costs

Uncertainty about costs and efforts

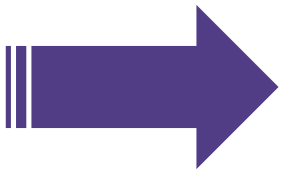


Fisher-Yates, p < -ß01

2. Perceived Efforts and Costs

Uncertainty about costs and efforts

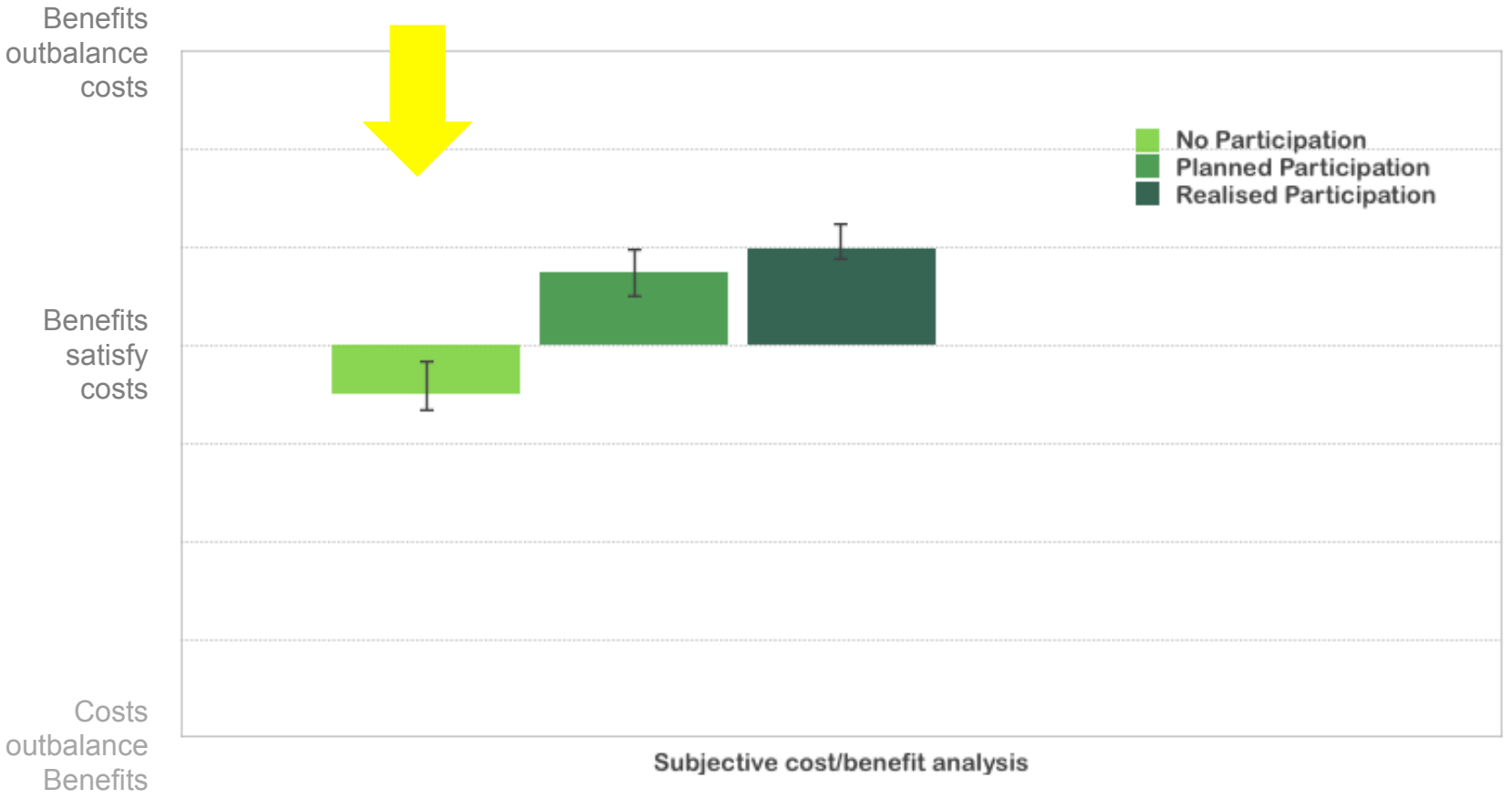
Problem: Humans are loss-averse, uncertainty about costs (financial, personnel resources etc.) reduces probability to act (e.g. Kahneman, 2011).



Transparent communication of actual costs and benefits

3. Subjective Cost/Benefit Analysis

Negative Cost/Benefit Analysis

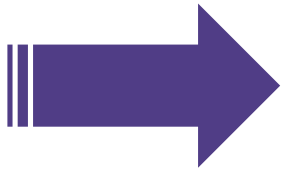


MKT=-0.27; MGT=0.94; MRT=1.05; $F(2,259) = 8.924$, $p \leq .001$, $\eta 2 = .065$

3. Subjective Cost/Benefit Analysis

Negative Cost/Benefit Analysis

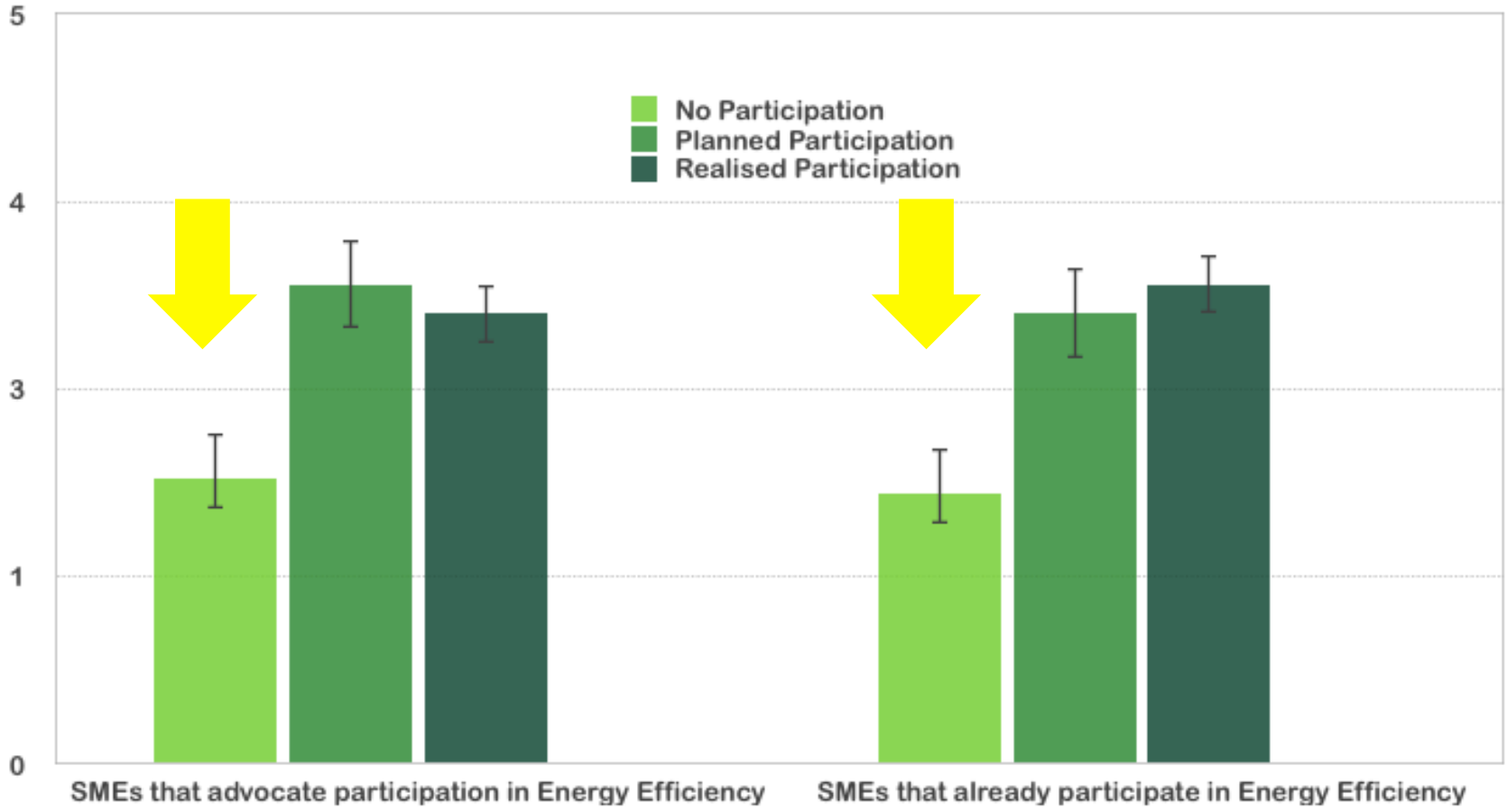
Problem: Only positive cost/benefit analysis are action-guiding.



Perceived benefits must be increased, perceived costs must be reduced. e.g. NEBs, low-level programs

4. Social Norm

Fewer Knowledge of other SMEs



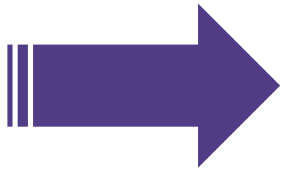
MNP = 1.98; MPP = 3.23; MRP = 3:09; F (2,174) = 25,559, p ≤. 001, η 2 = .283

MNP = 1.87; MPP= 3:04; MRP = 3.24; F (2, 176) = 34,697, p ≤ .001, η 2 = .227

4. Social Norm

Fewer Knowledge of other SMEs

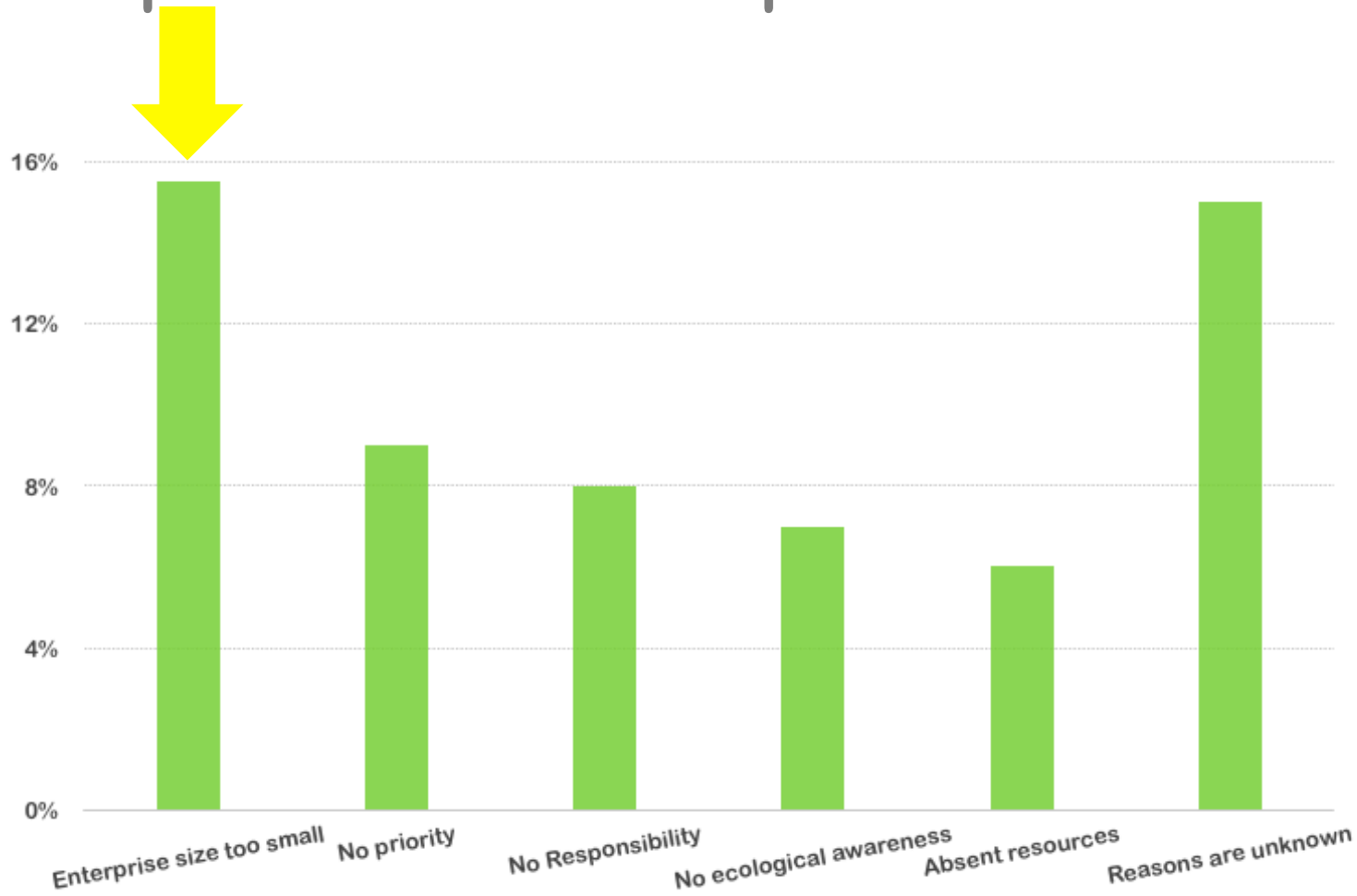
Problem: Investing in Energy Efficiency is perceived as something exceptional.



Introduction of a new status quo "investing in energy efficiency is state of the art" e.g. in a commune

5. Perceived Barriers

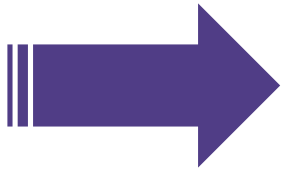
Enterprise Size as an important barrier



5. Perceived Barriers

Enterprise Size as an important barrier

Problem: Small enterprises perceive existing programs as unsuitable



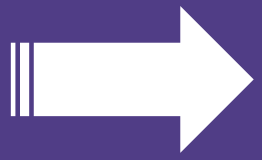
Make clear that small enterprises are part of the target group.

e.g. specific energy efficiency programs for small enterprises

Summary
Practical Implications

1. Expand cost reductions with NEBs
2. Reduce uncertainty about possible costs and efforts
3. Try to enhance perceived cost/benefit ratio
4. Define “Investments in Energy Efficiency” as the status quo
5. Emphasize that no SME is too small to participate

Implications as basis for designing specific approaches



Project 2

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*School of Applied Psychology
*Institute of Natural Resource Sciences
*School of Management and Law
*School of Engineering

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