

Session 9  
Thursday 20<sup>th</sup> of October 2022

SIMUL 2022

**OPTIMAL USAGE OF MARKETING AND SALES**

**TO PUSH RESIDENTIAL REFURBISHMENT**

*Mart Verhoog*

## ABOUT MART VERHOOG



Mart Verhoog worked as an independent market researcher and marketing consultant after his bachelor studies (1994) in the Netherlands. He moved to Germany in 1999 and worked in different positions (Product Management, Marketing Management, Member of the Board) in the construction industry (i.e. Knauf). He holds an MBA in General Management (2009) and a doctorate in Marketing (2017) from HHL Leipzig Graduate School of Management. During the last years he was Head of the Research Center for Local Energy Management at Leipzig University. In 2019 he joined IU lecturer's team. Mart Verhoog is married and father of two children.

# OPTIMAL USAGE OF MARKETING AND SALES TO PUSH RESIDENTIAL REFURBISHMENT

- 1** Introduction
- 2** Key concepts used in this idea contribution
- 3** Agent-based model for refurbishment
- 4** Future work

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## MOTIVATION FOR THIS STUDY

- ✓ Heating residential buildings consumes roughly one third of total energy consumption
- ✓ Residential refurbishment is important to reduce energy consumption
- ✓ Governments have tried to push homeowners' decision making towards refurbishment by campaigning in mass communications - unsuccessfully ("mass communication" or marketing)
- ✓ More recently, sales-like activities have been offered for this purpose ("personal communications" or sales)
- ✓ This idea contribution addresses the research question what mix of marketing and sales measures is optimal by agent-based modeling

- ✓ Agent-based modeling (ABM) has been used in energy transition studies regularly (Du et al. 2022):
  - ✓ Most ABM has been done in the field of solar energy diffusion
  - ✓ Du et al. conclude “Future studies can also evaluate the effectiveness of market-based policies [...]”
  
- ✓ Marketing could benefit from social simulation like ABM (Jager 2007):
  - ✓ Work has been done to formalize the “4 Ps” of Marketing in ABMs
  - ✓ Delre et al. (2007) worked in promotional activities
  - ✓ ABM literature has not differentiated between marketing and sales measure until now.

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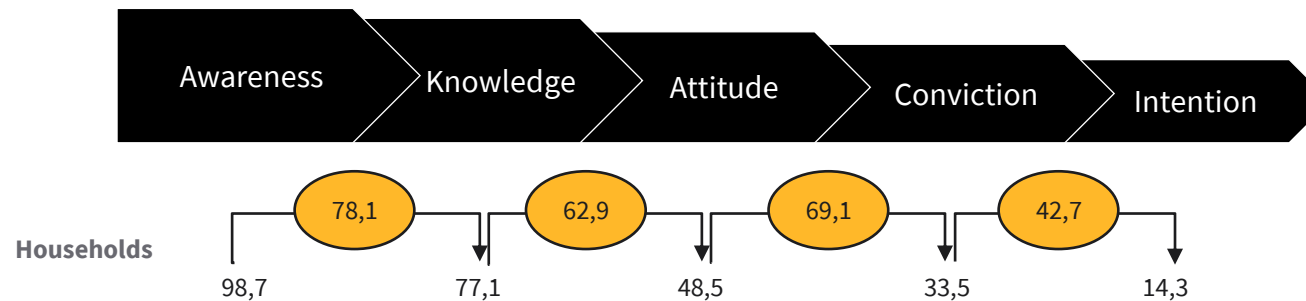
## KEY CONCEPTS USED IN THIS IDEA CONTRIBUTION

- ✓ Hierarchy of effects models (HOE)
- ✓ Lifestyle typology by SINUS Institute
- ✓ Agent-based modeling



# HIERARCHY OF EFFECTS MODEL

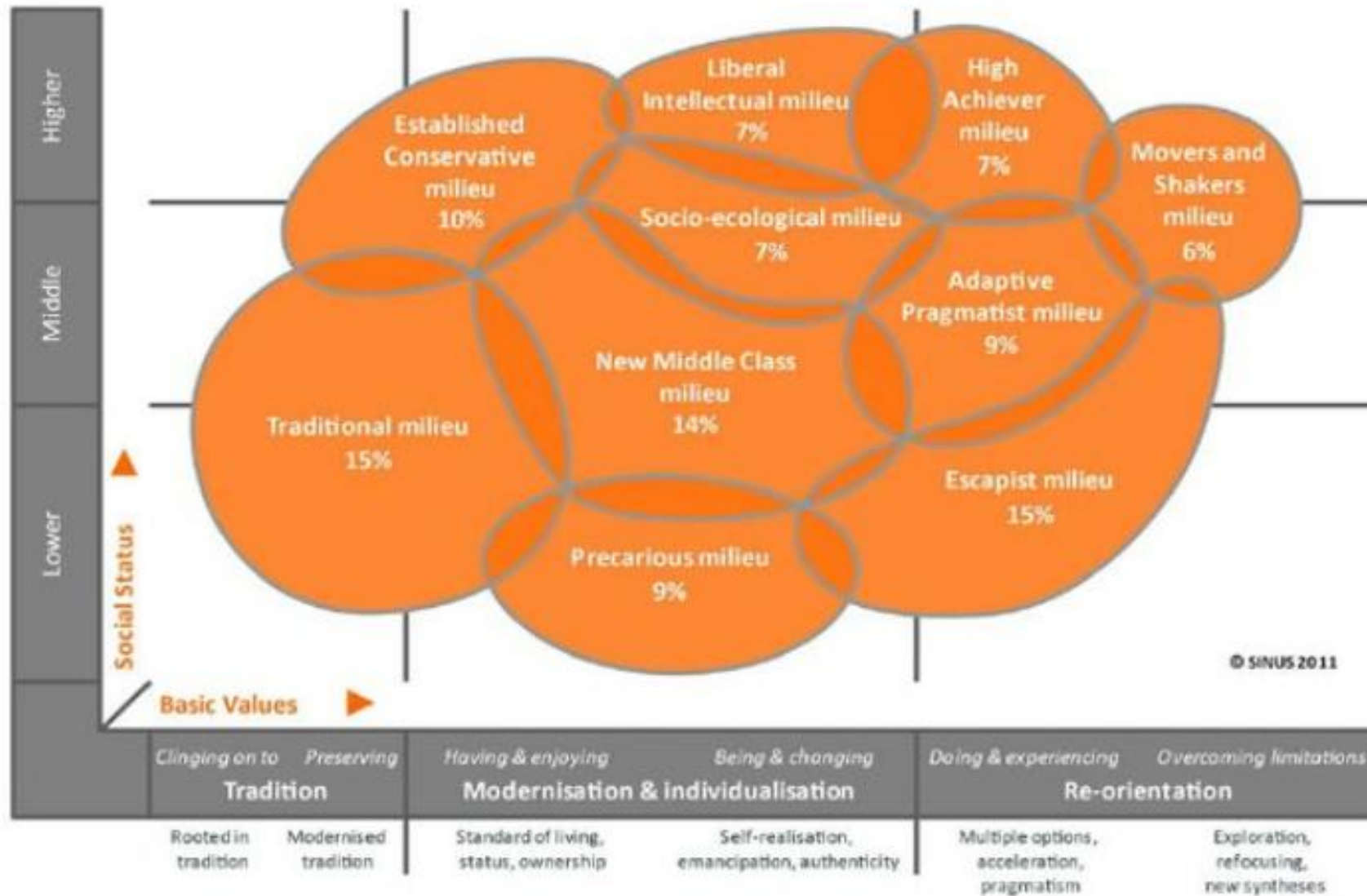
Transfer rates (“conversion”) of households with residential property in Germany:



As a result of the research design, survey results are representative for all households with residential property in Germany (Verhoog 2017).<sup>1)</sup>

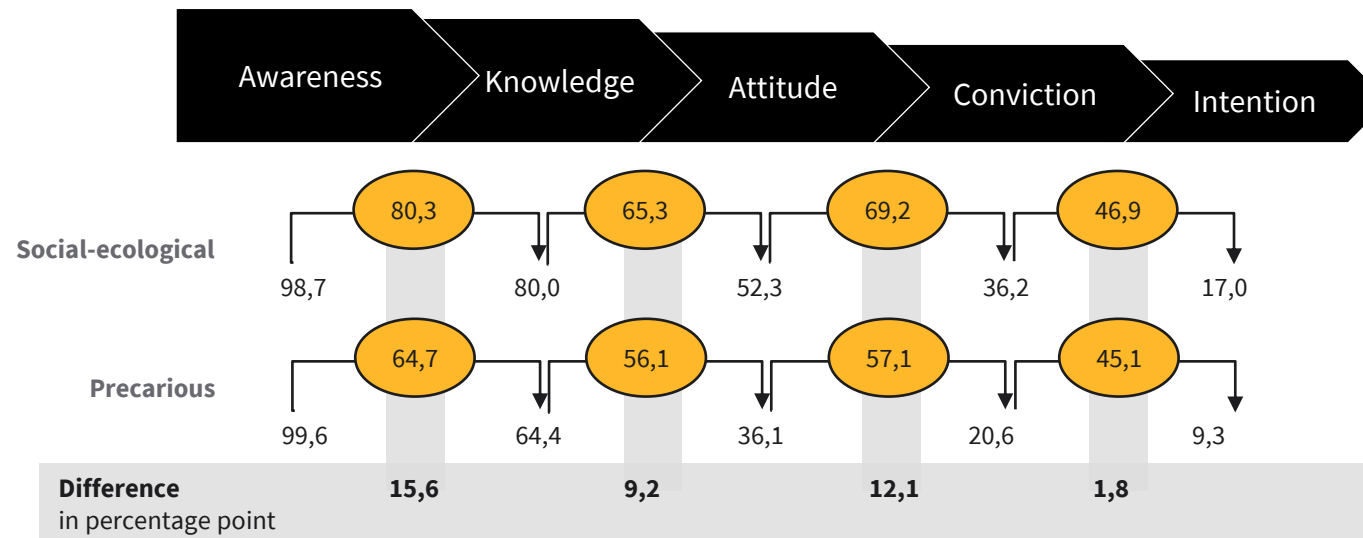
<sup>1)</sup> According to the Federal Statistics Office, 17,0 million households in 2010 own residential property (Destatis 2012)

# LIFESTYLE TYPOLOGY BY SINUS INSTITUTE



# HOE FOR ALL SINUS LIFESTYLES

As an example: Social-ecological and precarious lifestyles



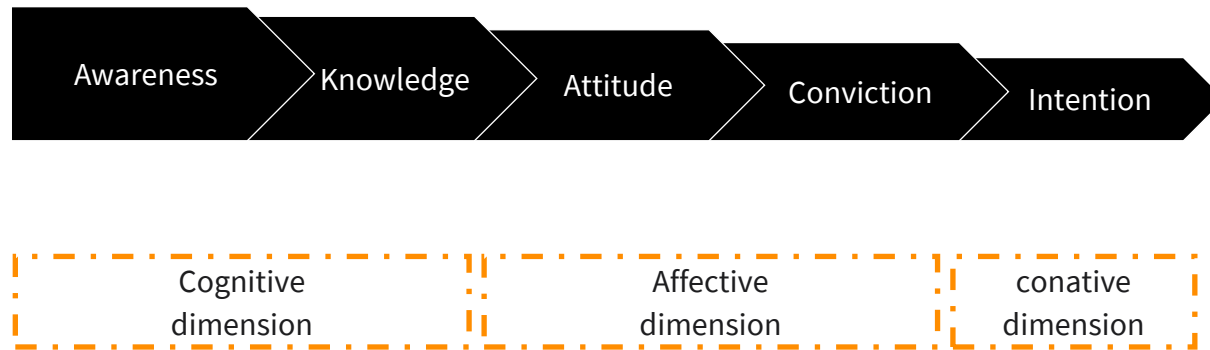
## AGENT-BASED MODELING (ABM)

- ✓ ABM deals with individual decisions and behavior (of different agents)
- ✓ It aggregates the decisions and behaviors on individuals in systems and reveals the aggregated system behavior
- ✓ By using different agent (based on Sinus Lifestyle) and the HOE, the refurbishment decision behavior of all Homeowners can be simulated

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# ABM FOR REFURBISHMENT



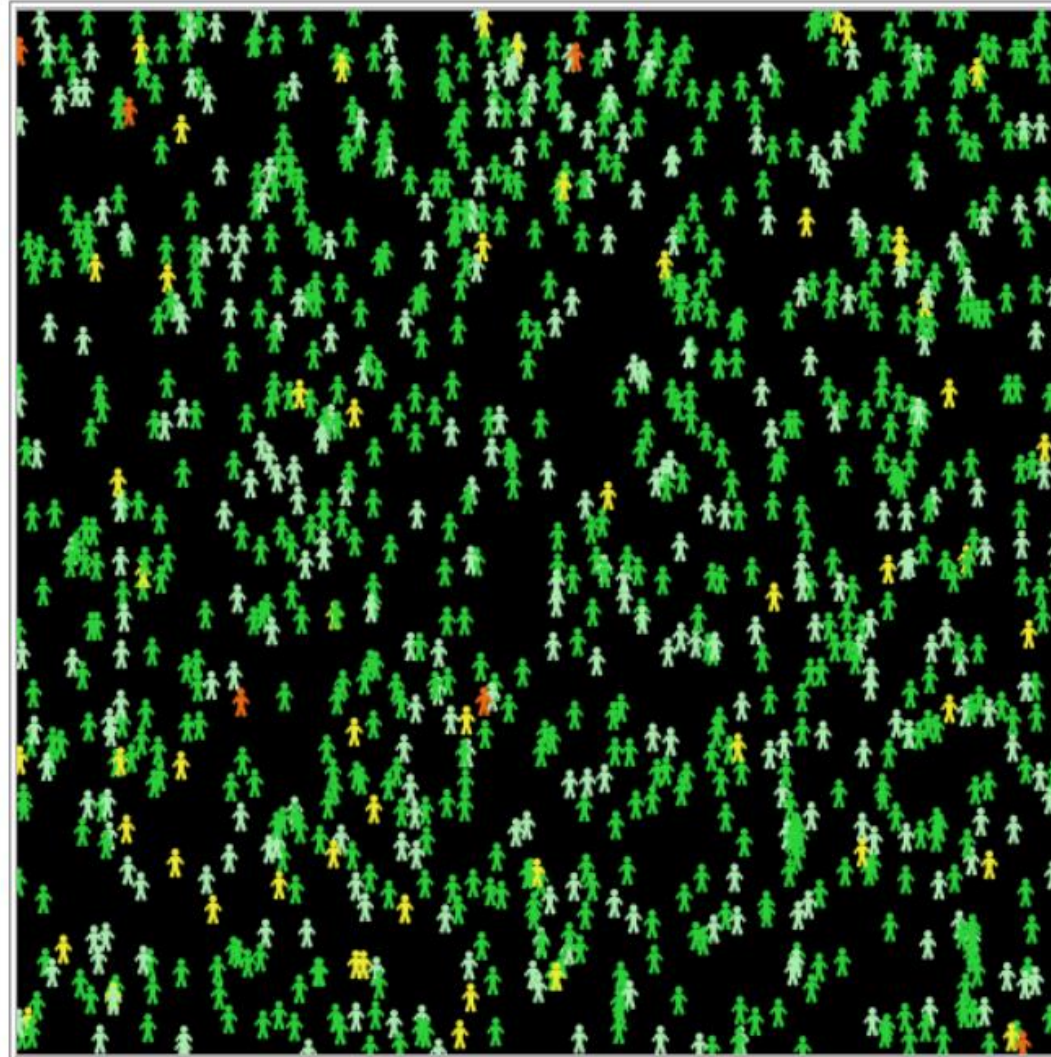
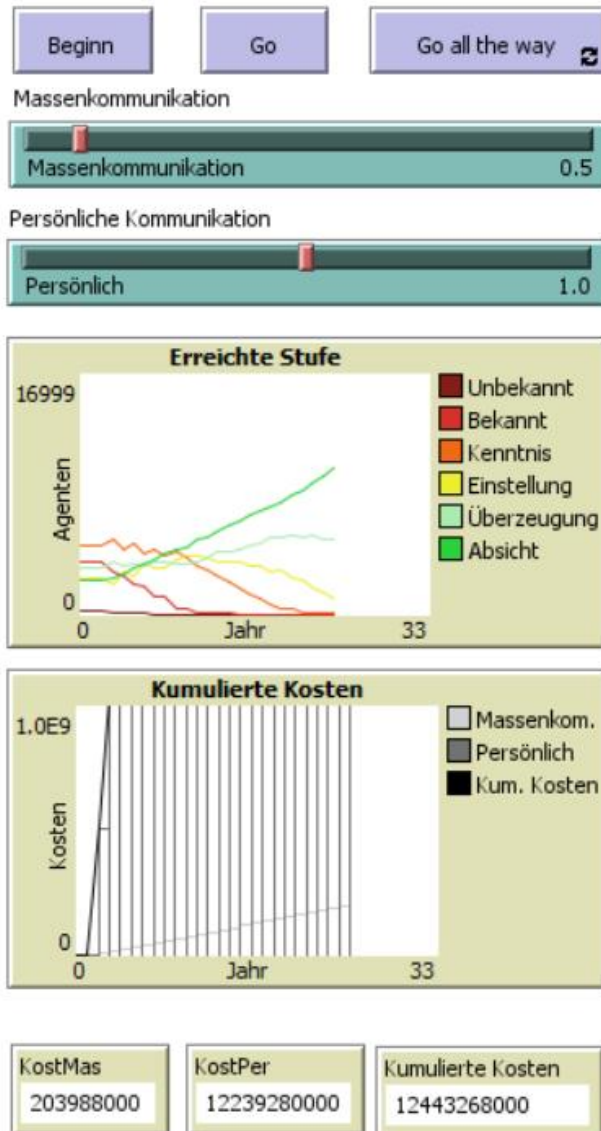
- ✓ Different mixes of mass and personal communication (“scenarios” for the system with 17,0 mi homeowners)
- ✓ The ABM simulates a threshold for every agent
- ✓ Transfer rates are used from Verhoog (2017), but corrected for their specific impact
- ✓ Costs of mixes are aggregated



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# FUTURE WORK – FIRST STUDY IN NETLOGO







### **Next steps in the development of the ABM for refurbishment:**

- ✓ Creation and coding of ABM
- ✓ Costs of mass and personal communication touchpoints
- ✓ Mixes of mass and personal communications (“Scenarios”)
- ✓ Development of budgeting approach in the ABM

# THANK YOU

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