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*A voluntary network of European energy agencies*



**BEHAVE**  
2020-2021 6th European Conference on  
Behaviour and Energy Efficiency

# Session 1b: Hard-to-reach energy users in residential and non-residential sectors and financing



**COPENHAGEN CENTRE  
ON ENERGY EFFICIENCY**  
SEforALL EE HUB



## House-keeping rules

- **Audio**
  - For Moderators/speakers. Everyone should be muted unless is their turn to speak;
  - Participants. All participants will be muted once they join the conference;
- **Camera**
  - It should be turned on only when is the moderator/speaker turn to talk;
- **Share-screen function**
  - Moderators/speakers can individually share their screen, through the <share screen> bottom;
  - This function will be only used by the moderators/speakers when they want to give their presentations;
- **Q&A**
  - Participants will use the chat function to share Qs for the Q&A session;
  - It would be better if participants can target the questions (only) to moderators;
- **Break out rooms**
  - To join the different sessions, everyone can individually assign to the breakout room of their preference, through the <Breakout room> bottom, once the breakout rooms are activated;
  - Breakout rooms will be activated around 15-30 minutes before each session start;
- **Download the latest zoom version ([here](#))**
  - Zoom version 5.6.;
  - This version allows to have all functionalities needed for the conference;
- **Recording**
  - The Conference will be recorded and uploaded in the conference webpage.

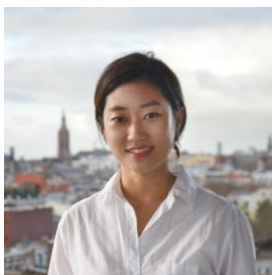




## Session 1b: Hard-to-reach energy users in residential and non-residential sectors and financing



**1. Sea Rotmann:** An In-Depth Review Of The Literature On 'Hard-To-Reach' Energy Users



**2. Minyoung Kwon:** Stimulating homeowner energy-saving behaviour through local authorities' actions



**3. Steven März:** Are tenants willing to pay for energy efficiency? Evidence from a small-scale spatial analysis in Germany.



**4. Kimberley O'Sullivan:** To What Extent Has COVID-19 Impacted Hard-to-Reach Energy Audiences?



**5. Paolo Bertoldi:** Effective Policies Promoting Energy Conservation and Sufficiency in Line with the Paris Agreement Goals



**6. Stratos Keranidis & Filippos Anagnostopoulos :** NUDGE project



Hard-to-  
Reach Energy  
Users

## Session 1b

Paper #418: A review of the literature on HTR energy users in residential & non-residential sectors

BEHAVE Conference, April 21, 2021

Dr. Sea Rotmann (NZ)

Task Leader HTR Task and CEO of  
SEA – Sustainable Energy Advice Ltd





UsersTCP

# UsersTCP and the International Energy Agency (IEA)

- The **International Energy Agency (IEA)** is an intergovernmental organisation that works to shape a secure and sustainable future for all, through a focus on all fuels and all technologies, and analysis and policy advice to governments and industry around the world.
- To facilitate global cooperation on energy technology, the IEA created the **Technology Collaboration Programme (TCP)**. Today, the **UsersTCP** is one of 38 TCPs each focused on a different topic. Together, they connect thousands of experts across government, academia and industry in 55 countries dedicated to advancing energy technology research and application.
- The UsersTCP is **functionally and legally autonomous** from the IEA. Views and findings of the UsersTCP do not necessarily reflect those of the IEA.



# Hard-to-Reach Energy Users Task

This international research collaboration focuses on a very distinctive and important audience segment - the hard-to-reach (HTR) energy users in the residential and non-residential sectors. It will determine who, and how many they are, where they are, and how to better motivate and engage them in energy efficiency and demand-side interventions geared at changing their energy-using behaviours.





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## Our definition of HTR energy users

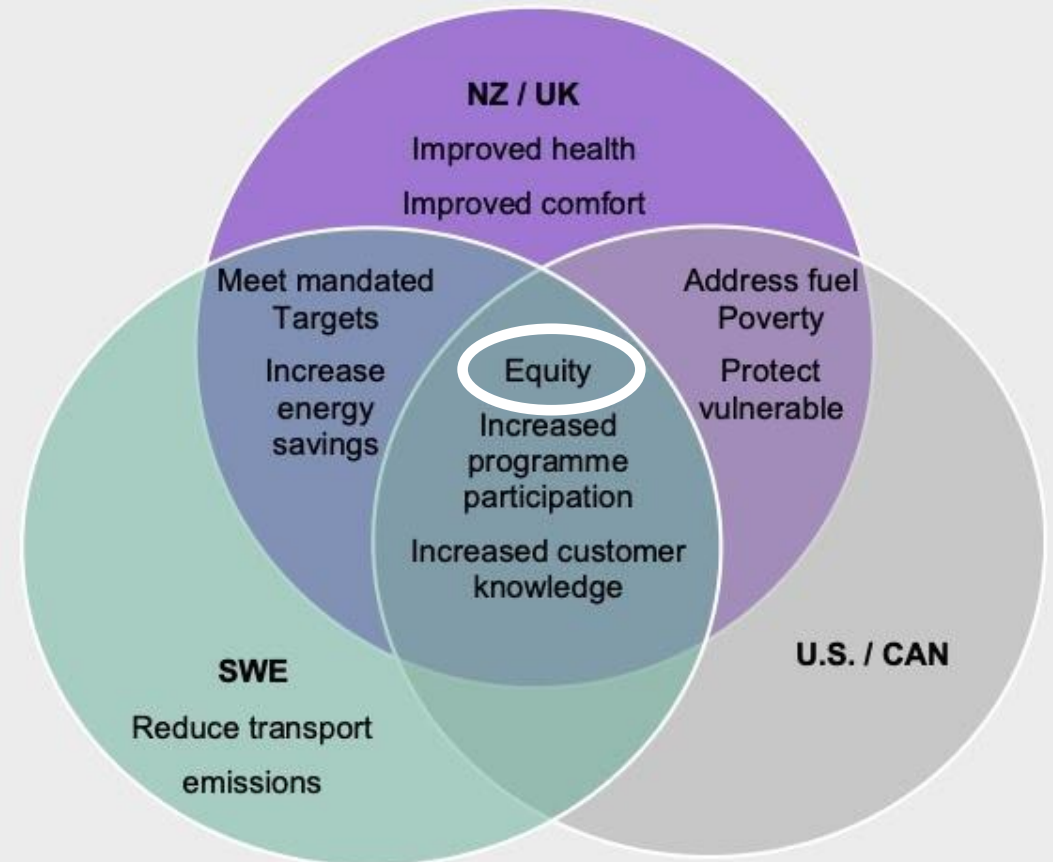
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*“In this Task, a hard-to-reach energy user is an energy user from the residential or commercial sectors who uses any type of energy or fuel, and who is typically either hard-to-reach physically, underserved, or hard to engage or motivate in behaviour change, energy efficiency and demand response interventions that are intended to serve our mutual needs.”*



# Our shared goal

*“Our shared goal is to identify, define, and prioritise HTR audiences; and design, measure and share effective strategies to engage those audiences to achieve energy, demand response and climate targets while meeting access, equity, and energy service needs.”*

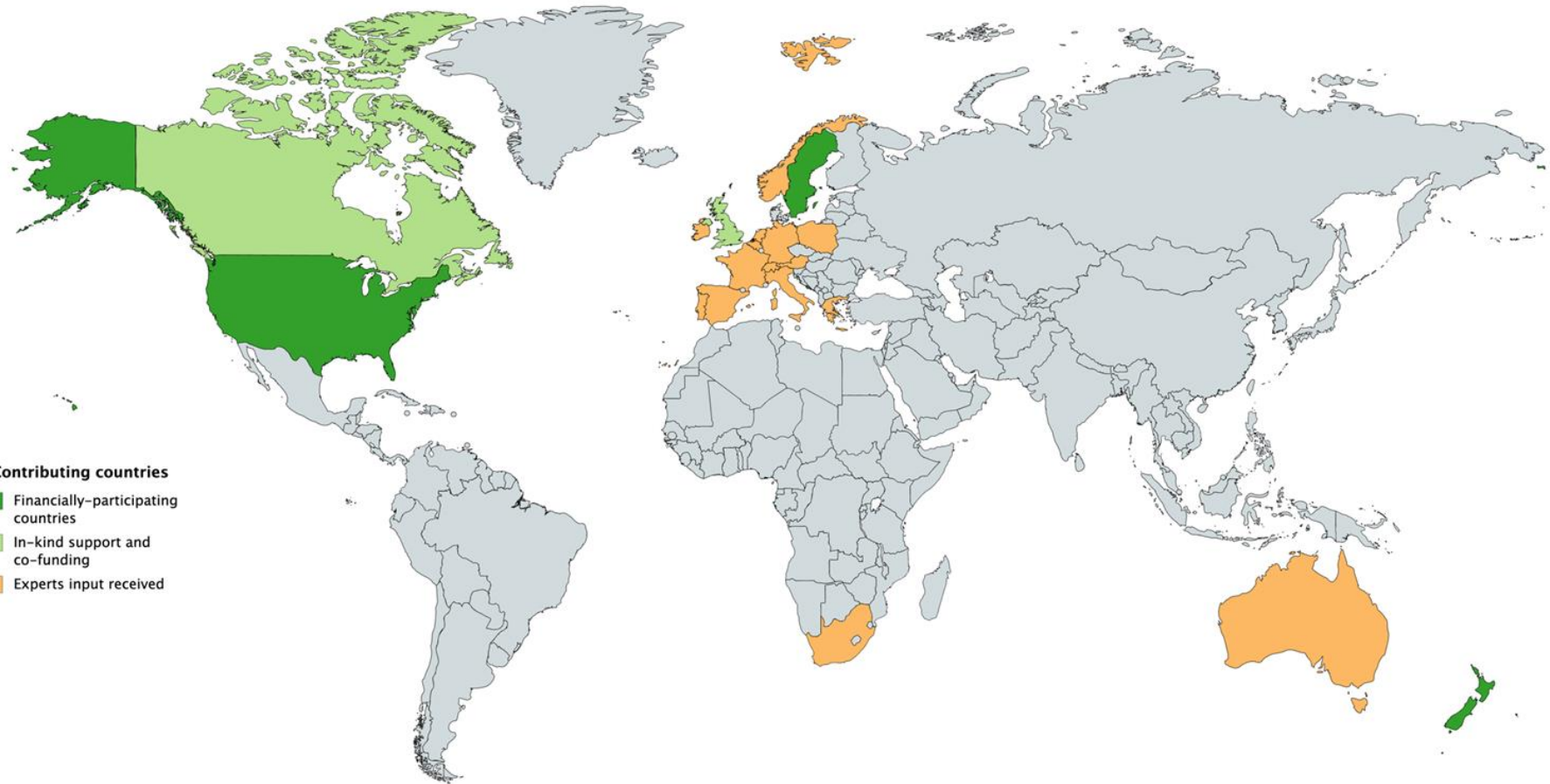
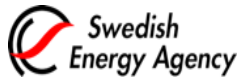




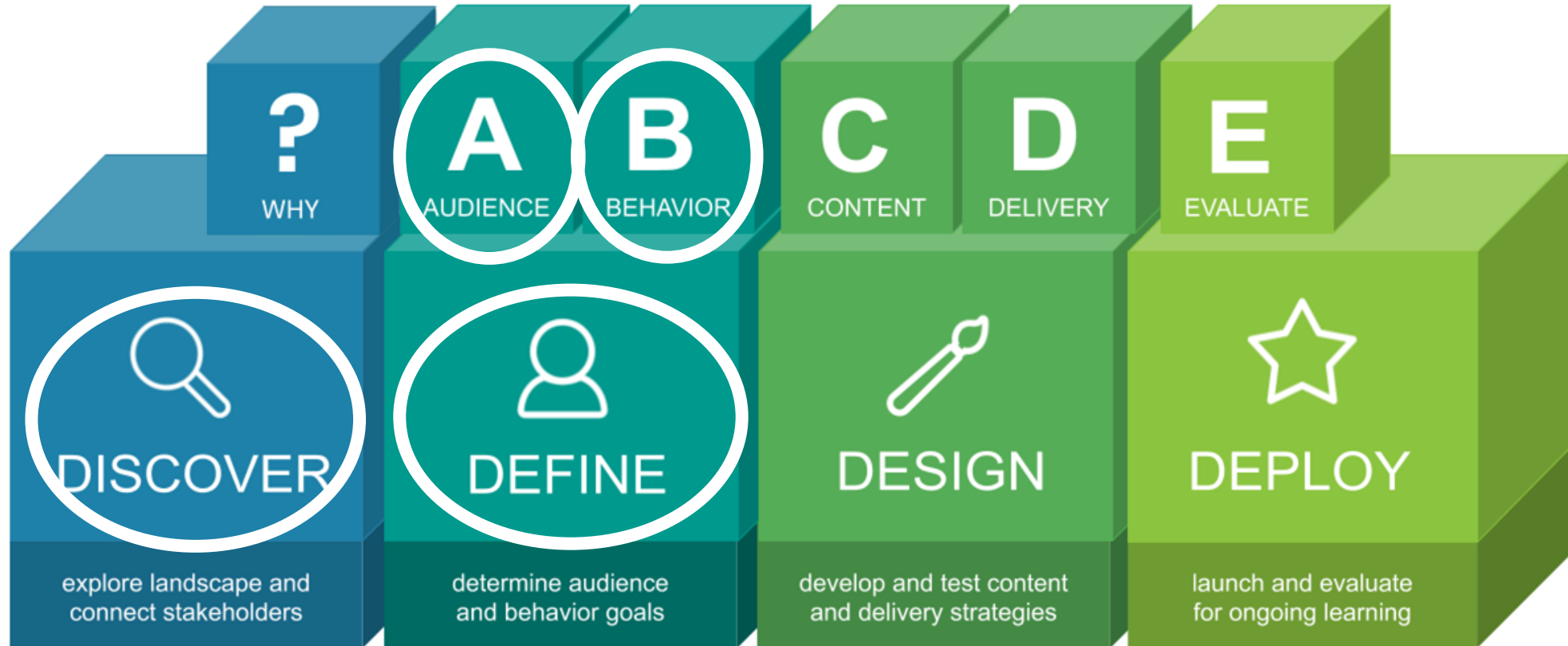


Hard-to-Reach Energy Users

# Our Participants and Collaborators



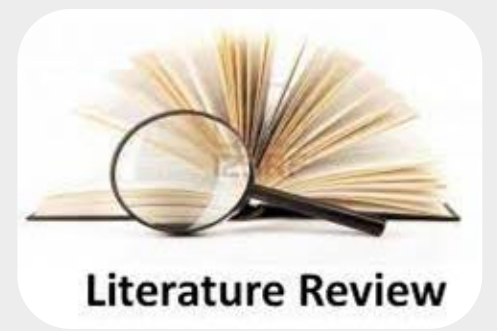
# HTR Annex Research Process “ABCDE Building Blocks of Behaviour Change”





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# “The Beast”



Rotmann, S., Mundaca, L., Castaño-Rosa, R., O’Sullivan, K., Ambrose, A., Marchand, R., Chester, M., Karlin, B., Butler, D. and K. Ashby (2021). *Hard-to-Reach Energy Users: A critical review of audience characteristics and target behaviours*. User-Centred Energy Systems TCP - HTR Annex: Wellington. 255pp.





# Hard-to-Reach Lit Review Purpose

1. Identify priority HTR audiences (following **HTR Characterisation**)
2. Characterise and **describe** these HTR audiences
3. Understand the **wider contexts** and dimensions
4. Identify specific **energy-saving behaviours**
5. Estimate the **size** of these audiences
6. Undertake a **gap analysis** of the research



# “The Beast” in numbers



months



chapters



Co-authors



pages



publications

131000 in **Words**  
is  
One hundred thirty-one thousand



# Development of The Beast

**HTR Characterisation**

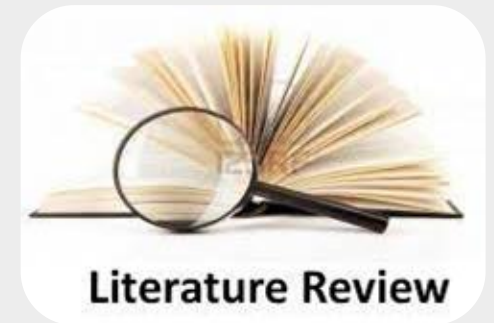
**Survey Data**

**Outreach to networks**

**Stakeholder Interviews**  
(N=50)

(N=130)

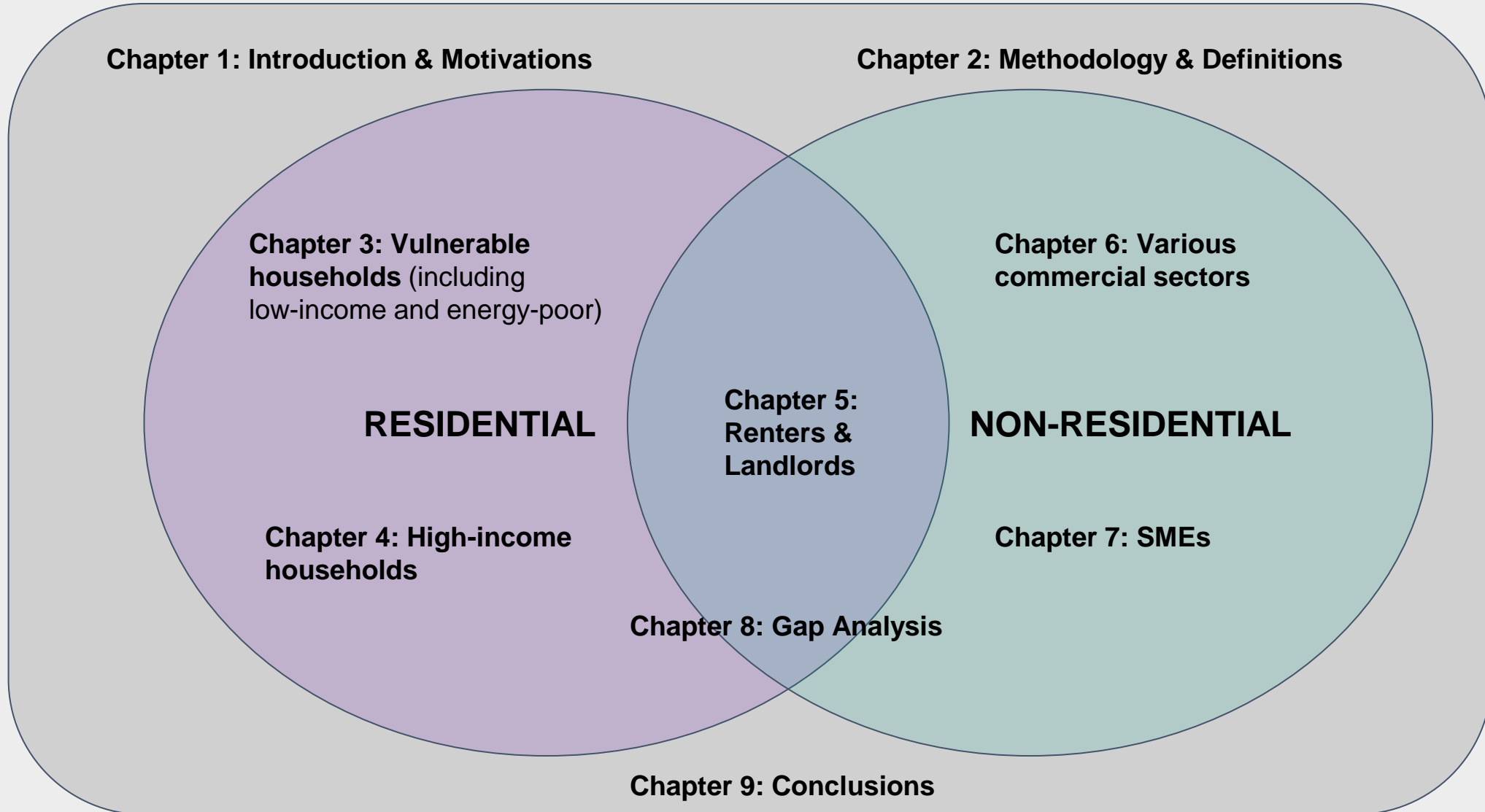
**Keyword, backwards & forwards searches**  
(1000+ publications)



Literature Review



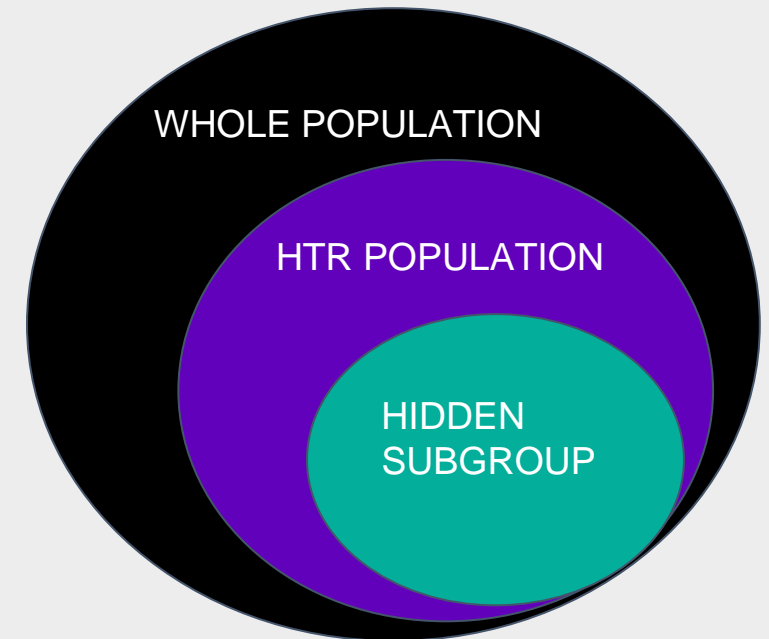
# Scope of The Beast



# Some major findings - Definitions

- HTR is commonly-used (in and out of energy sector) but rarely clearly defined and it has many critiques
- Many alternative, often overlapping definitions:
  - Underserved
  - Disadvantaged communities
  - Socially-disadvantaged
  - Socially-excluded
  - Hard-to-help
  - Hidden population / hard-to-hear
  - Seldom-heard
  - Illegalised, criminalised & stigmatised
  - Under-represented, invisible, service-resistant
  - Unchangeable
  - Hard-to-engage / motivate
  - Hard-to-count
  - Undercounted / under-explored

- Hard-to-treat
- Hard-to-heat / cool



⇒ Need to consider wider context and factors make these groups HTR





# Vulnerable households

- Vulnerability:
  - Location-based
  - Financial
  - Health & Capacity-related
- Energy burden / hardship / insecurity
- Energy vs Fuel poverty
- Low-income

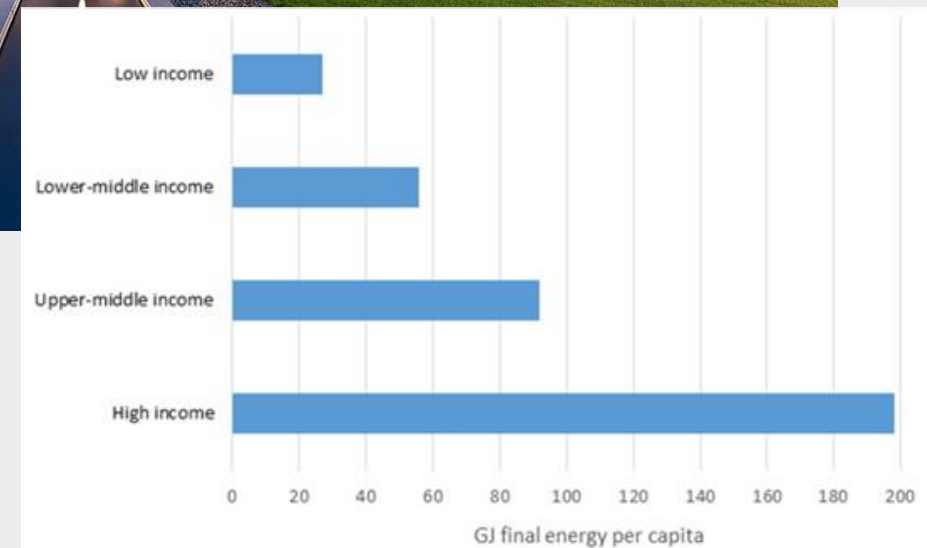


⇒ Join us in Session 4c tomorrow at 10.30am where I'll be discussing issues with defining vulnerable households in much more detail



# High-income households

- Top 10% of earners have been found to use 4x more energy than bottom 10%
- No clear definitions:
  - GNI per capita
  - Twice the median income
- Not much research but we know income disparities drive massive inequalities within and between countries





# Landlords and tenants (res & non-res)

- Renters generally consume less energy than owner-occupiers (especially in MFAs)
- But: they still account for >25% of energy use in residential sector and 40% of commercial sector
- 60% of residential and >50% of commercial buildings are occupied by renters
- Split-incentive issue one of the hardest to solve
- Both landlords and renters are very HTR but have very different barriers.



# Commercial sector & SMEs

- Massive research gaps in commercial sector literature
  - Over-generalisation of building types and uses
  - Most research on office buildings
  - Most research on technologies not behaviour

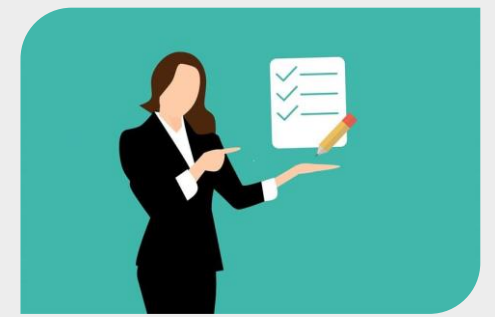
See Chester et al (2021). A Gap Analysis Of The Literature On Energy-saving Behaviours In The Commercial Sector. BEHAVE Session 2b at 1pm Wednesday

- SMEs make up >97% of all businesses in the world, are regarded as hardest-to-reach
- Huge impacts from COVID-19





# Key Findings Year 1



- **Most commonly-mentioned HTR audiences in the literature:** Low-income households, renters
- **HTR audiences with great energy-saving potential:** High-income, landlords, building operators
- **Least researched:** SMEs, commercial other than office sector
- **Audience size estimates:** >2/3 of energy users (e.g. >60% renters, 99% of all businesses)
- **COVID-19 impact:** Huge, particularly on most vulnerable households, renters and SMEs
- **Biggest research gaps:** Multiple benefits, certain demographics (age, gender, race), psychographics and audience needs assessments

⇒ *These audiences are not only hard-to-reach, they are also underserved and under-researched by Behaviour Changers in industry, government and academia. Energy justice, inequity, stigma are key themes that need to be addressed more urgently & on these target audiences.*



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# Questions?



<https://userstcp.org/annex/hard-to-reach-energy-users/>



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