

**Crossing the Energy Efficiency Chasm:  
*An Assessment of the  
Barriers to Institutional Investment at  
Scale***

Martin Parker

University of Sussex

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Crossing the Energy Efficiency Chasm: *An Assessment of the Barriers to Institutional Investment at Scale*

## Profile

- Civil Engineer
- Employed by Assured Guaranty in Infrastructure/Project Finance
- Financing the East Slope Student Accommodation project
- Recently completed doctoral research into Energy Efficiency Finance (for non-domestic buildings)

Crossing the Energy Efficiency Chasm: *An Assessment of the Barriers to Institutional Investment at Scale*

- **Why reduce energy consumption & carbon emissions?**
- What is energy efficiency?
- Where are the funds going to come from?
- How do we finance energy efficiency at the scale required?

# Why reduce energy consumption & carbon emissions?

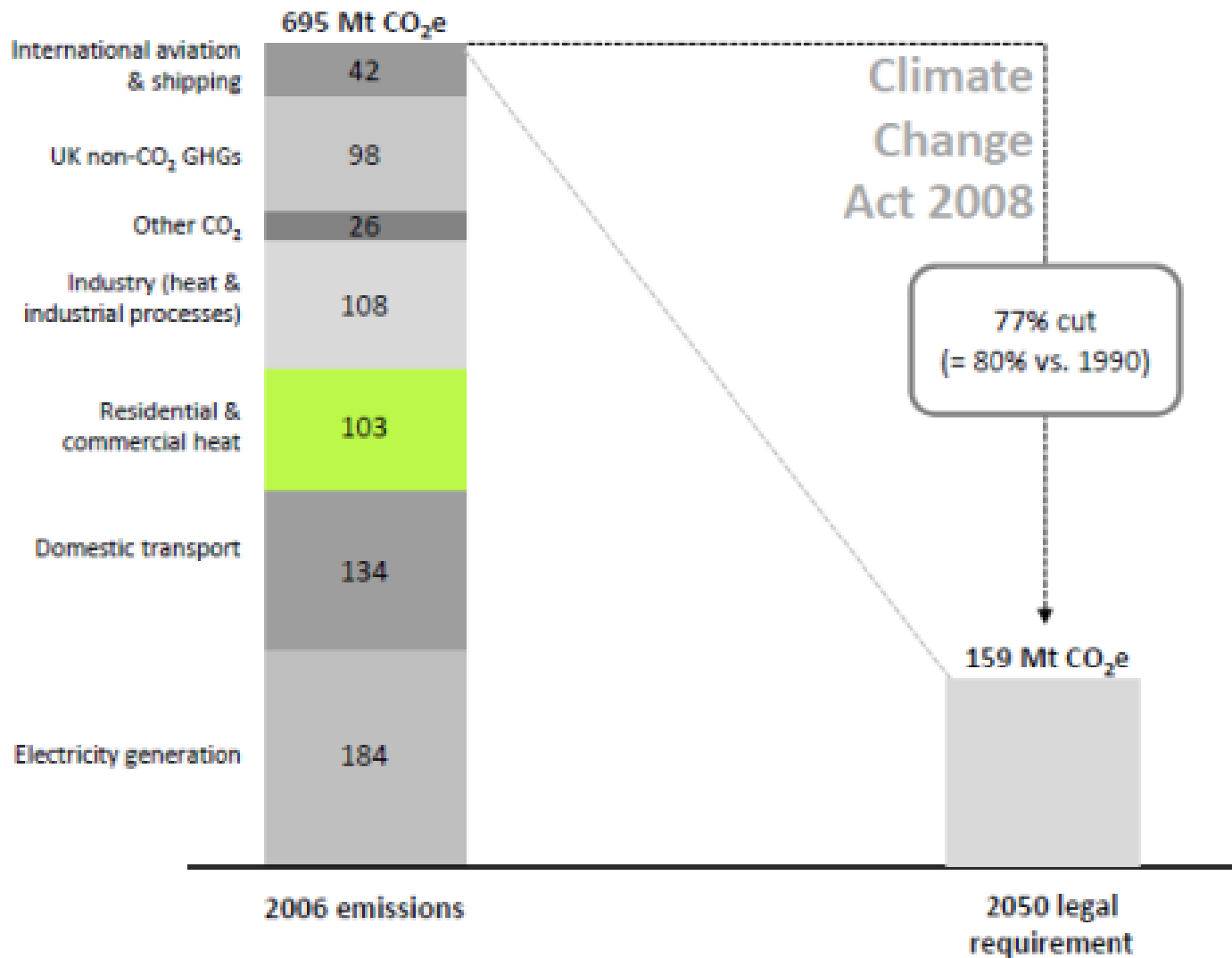
Save the planet from global warming!



Why reduce energy consumption & carbon emissions?

## UK Carbon Reduction Targets

Climate Change Act 2008 set the UK's CO<sub>2</sub> emission reduction target as a reduction of 80% of 1990 levels by 2050 and 34% by 2020.



| Budget                           | Carbon budget level       | Reduction below 1990 levels |
|----------------------------------|---------------------------|-----------------------------|
| 1st carbon budget (2008 to 2012) | 3,018 MtCO <sub>2</sub> e | 25%                         |
| 2nd carbon budget (2013 to 2017) | 2,782 MtCO <sub>2</sub> e | 31%                         |
| 3rd carbon budget (2018 to 2022) | 2,544 MtCO <sub>2</sub> e | 37% by 2020                 |
| 4th carbon budget (2023 to 2027) | 1,950 MtCO <sub>2</sub> e | 51% by 2025                 |
| 5th carbon budget (2028 to 2032) | 1,725 MtCO <sub>2</sub> e | 57% by 2030                 |

# Why reduce energy consumption & carbon emissions?

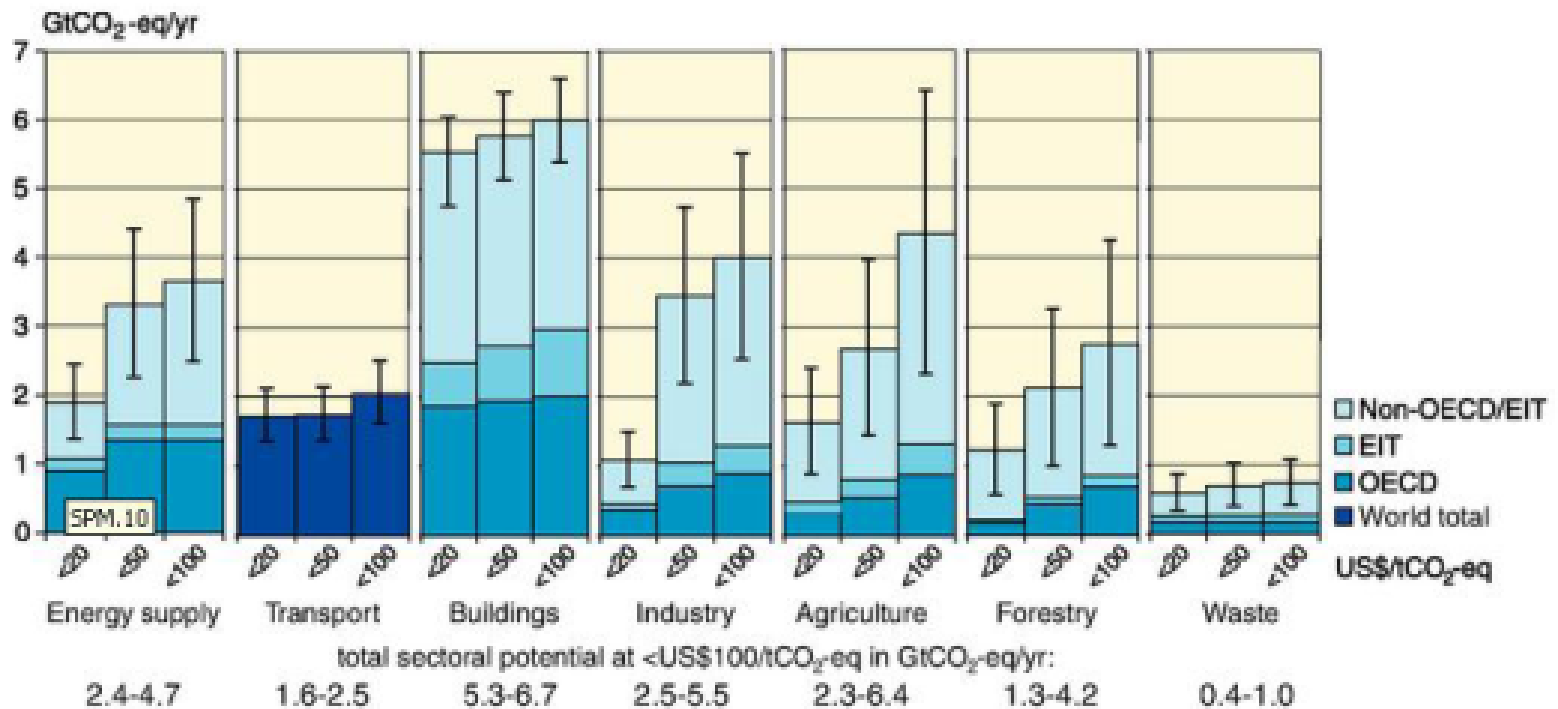
**UK emissions were 42% below 1990 levels in 2016.** The first carbon budget (2008 to 2012) was met and the UK is currently on track to outperform on the second (2013 to 2017) and third (2018 to 2022). However, it is not on track to meet the fourth (2023 to 2027).

To meet future carbon budgets and the 80% target for 2050, the UK will need to reduce emissions by at least 3% a year, from now on. This will require the government to apply more challenging measures.



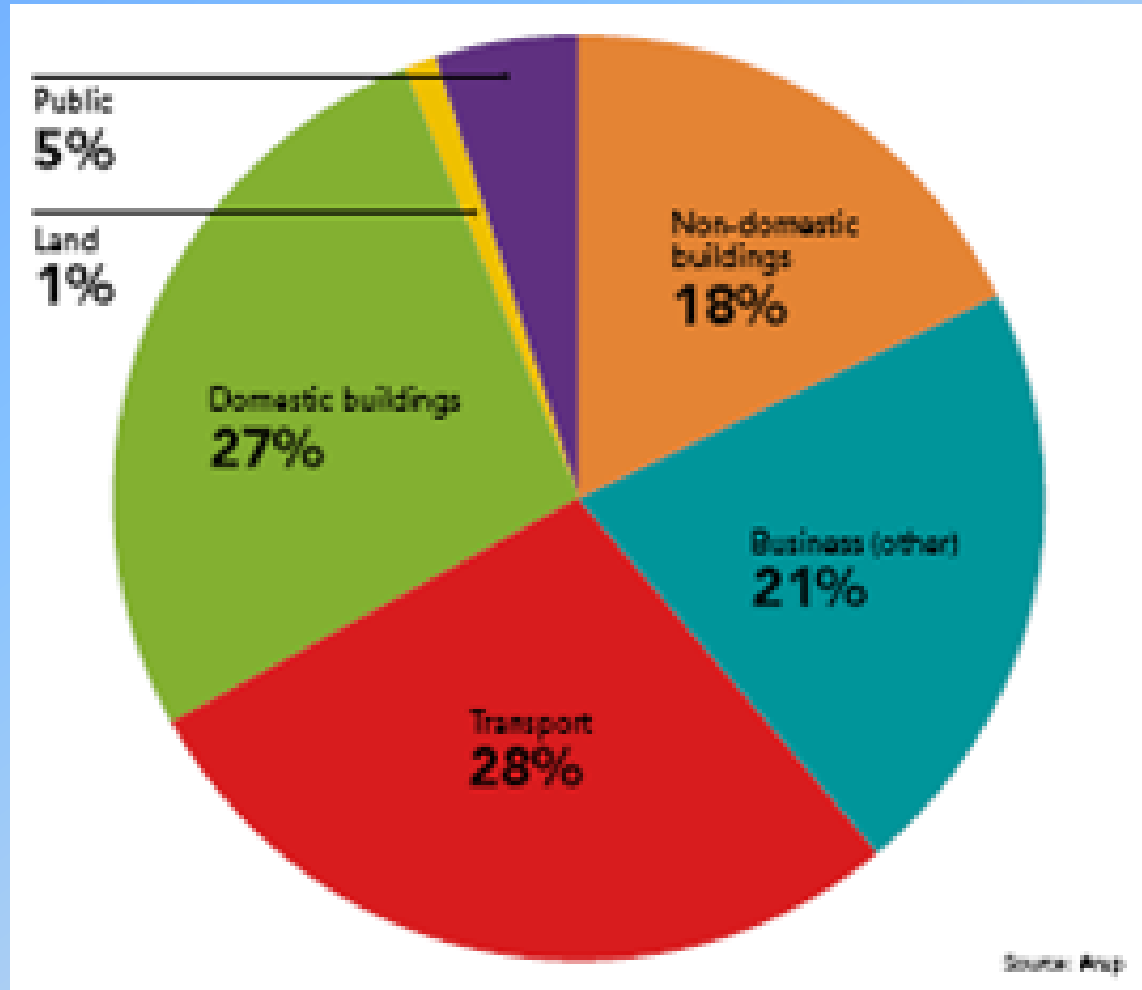
# Why reduce energy consumption & carbon emissions?

Economic mitigation potentials by sector in 2030 estimated from bottom-up studies



Source: Intergovernmental Panel on Climate Change, 2007

# Why reduce energy consumption & carbon emissions?



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What is energy efficiency?

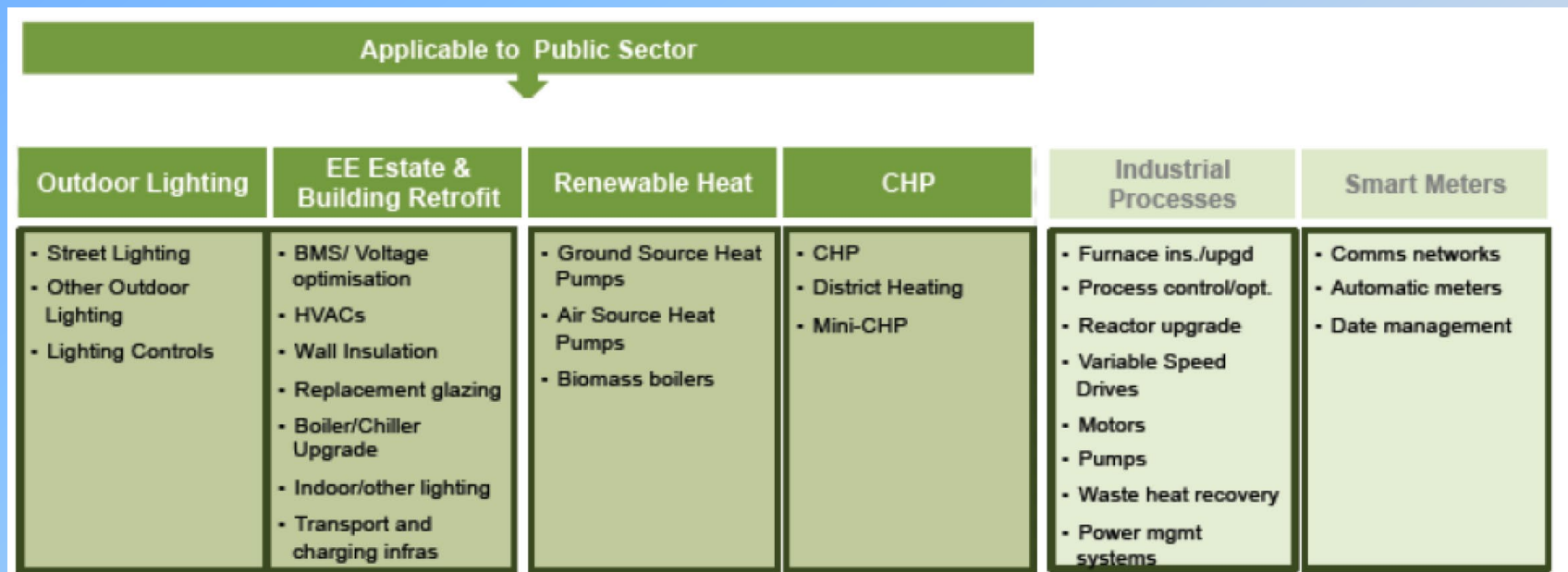
Whereas renewable energy creates a return from producing energy, energy efficiency creates its cash flow from energy conservation and therefore through costs being saved.

# What is energy efficiency?

- In 2012, the UK government set up the Green Investment Bank with an initial £3bn of funds to invest in Green projects. The priority areas for investment were:
  - Offshore wind generation
  - Commercial and industrial waste processing and recycling
  - Energy from waste generation
  - Non-domestic energy efficiency
  - Support for the Green Deal

# What is energy efficiency?

- The Green Investment Bank view of non-domestic energy efficiency.



Source: Watson, 2013

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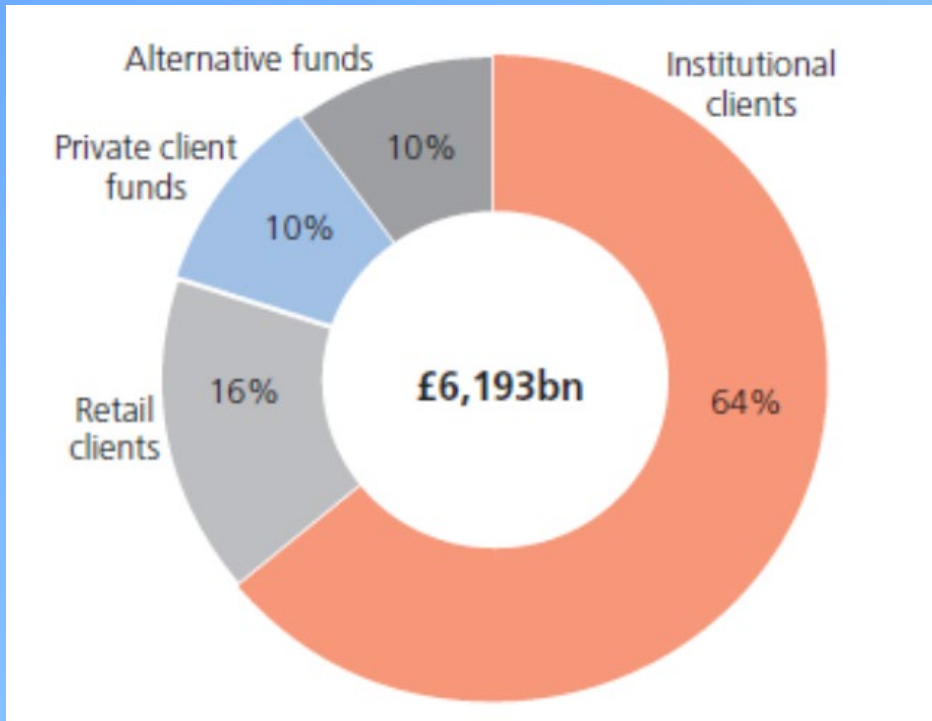
Where are the funds going to come from?

How much is required?

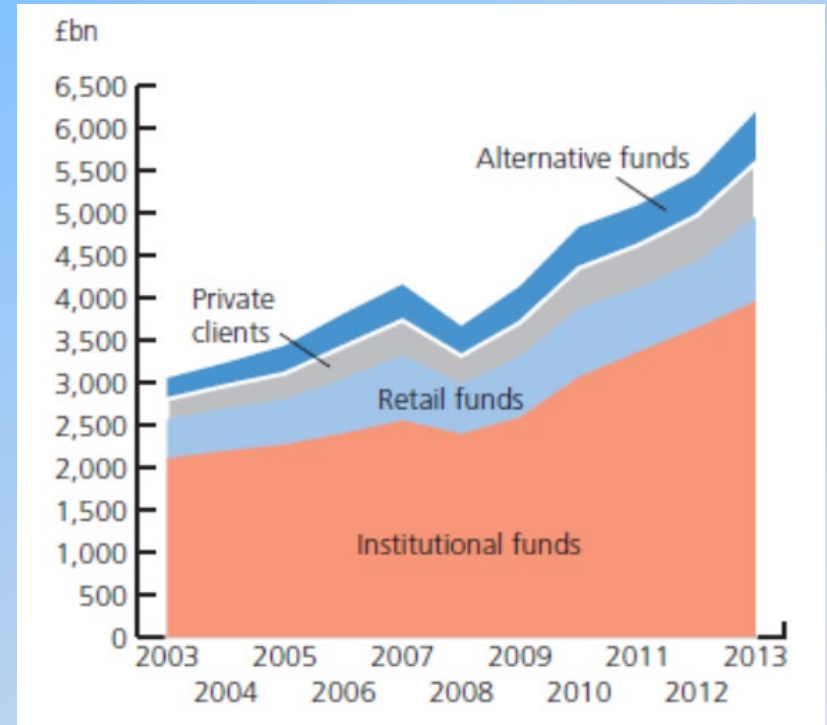
A 2011 report by Accenture estimated that €77bn of investment was required in building energy efficiency retrofitting (in the UK, €600bn across Europe), albeit across the whole sector not just non-domestic, in order to realise its potential.



# Where are the funds going to come from?



*% share of funds under management in the UK, end of 2013*



*Growth of funds under management in the UK*

Where are the funds going to come from?



Source: Maslakovic, 2012

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- Why reduce energy consumption & carbon emissions?
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- **How do we finance energy efficiency at the scale required?**

# How do we finance energy efficiency at the scale required?

- Just a quick look at Domestic properties
  - 24% of CO2 emissions.
  - UK government introduced the 'Green Deal' in January 2013.
  - Loans for energy saving measures for properties in the UK. The measures were designed to enable consumers to benefit from energy efficient improvements to their home. The loans were to be repaid through energy bills and transfer with the property rather than stay with those who took out the loan.
  - July 2015, the UK government scrapped the Green Deal due to lack of demand and take-up.

How do we finance energy efficiency at the scale required?



How do we finance energy efficiency at the scale required?

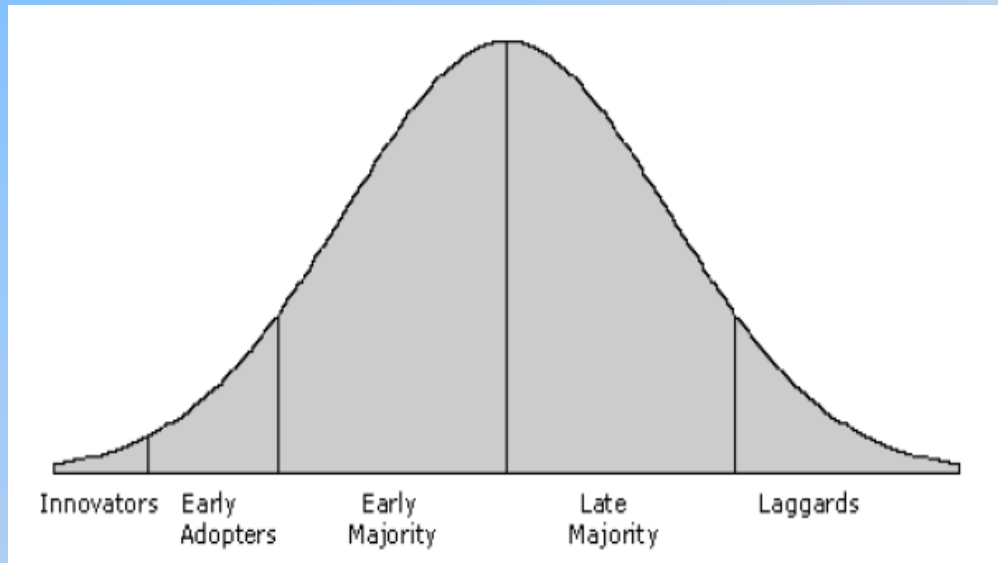


# How do we finance energy efficiency at the scale required?

- Non-domestic properties
  - Green Investment Bank approach to non-domestic energy efficiency
    - Difficult to directly invest as most investments were small and unstructured.
    - Set up three energy efficiency funds with £50m invested in each with the requirement that the fund managers raise matching funds of at least a further £50m. Ran a competition for fund managers.
      1. Equitix – established infrastructure fund managers. Focused on biomass installations making use of government subsidies as part of the deal income.
      2. Sustainable Development Capital Limited (SDCL) – extensive experience of energy efficiency finance advisory. Focused on building retrofits using ESCOs and Energy Performance Contracting.
      3. Aviva Investors - Focused on NHS energy centres with low risk and low return.

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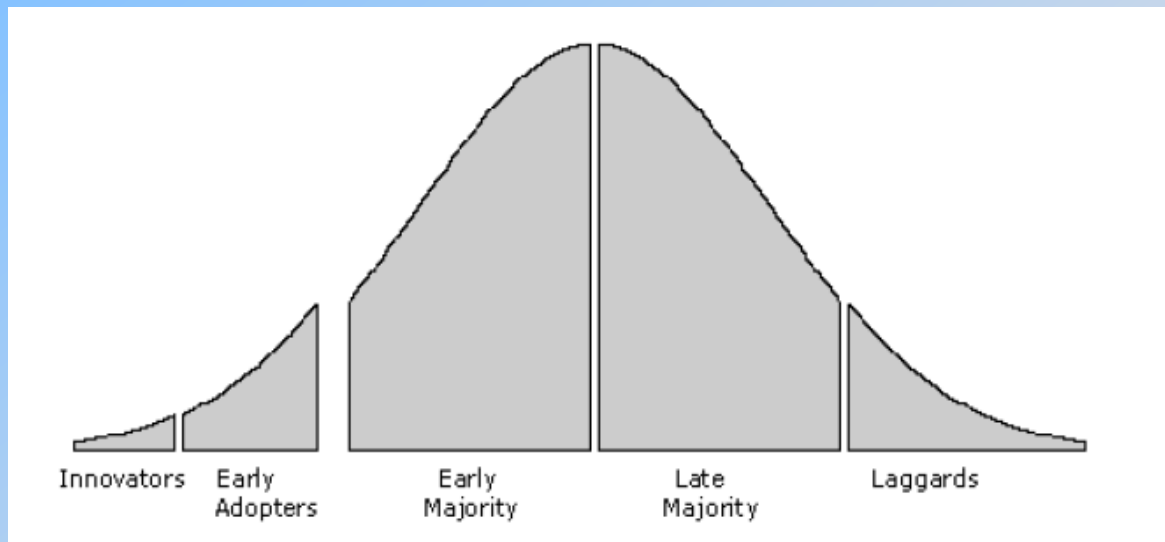
- Incentivising investors in new innovative sectors can be likened to marketing new technology products to mainstream customers, a concept developed by American Marketing executive Geoffrey Moore.
- Moore references the Technology Adoption Life Cycle Curve where the area under the curve is divided into classifications of buyers according to their attitude to risk.





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- Moore asserts that the original curve is not an accurate reflection of the transition between classifications of buyer.
- He suggests that a more accurate curve would be one where 'cracks' exist between buyer classifications representing enabling conditions for the technology to be fully adopted by the next classification of buyer.
- Moore also suggests that the most difficult transition to achieve is between the early adopters and the early majority, representing it as a much wider crack and labelling it as a 'chasm'.

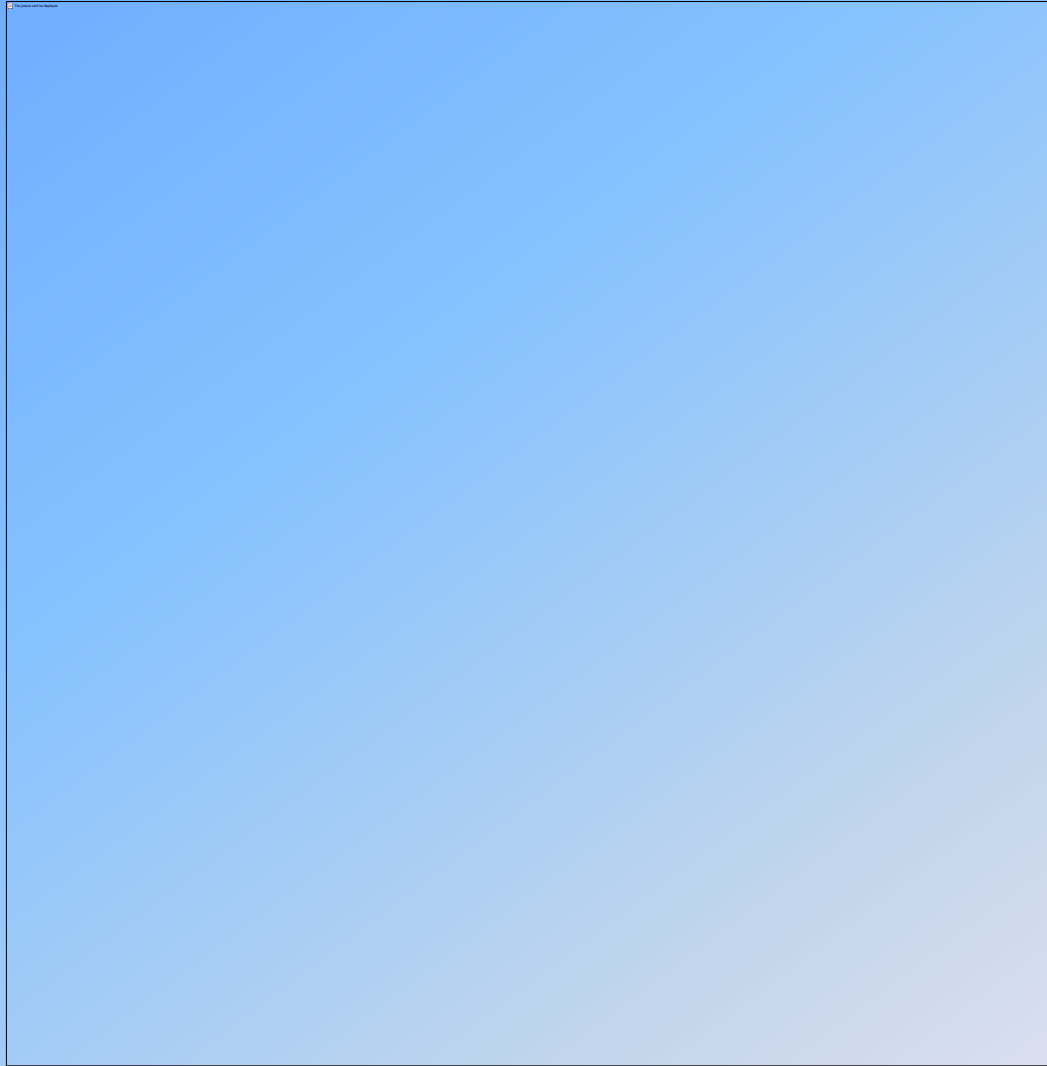


# Research

- What are the barriers to attracting capital investment at scale for energy efficiency in the context of institutional and pension fund investment?
- 1. How do institutional investors decide whether to invest in energy efficiency?
- 2. Why, when environmental social and economic benefits are apparent, have institutional investors not invested in energy efficiency at scale?
- 3. What are the enabling conditions that would facilitate institutional investors investing in energy efficiency at scale?



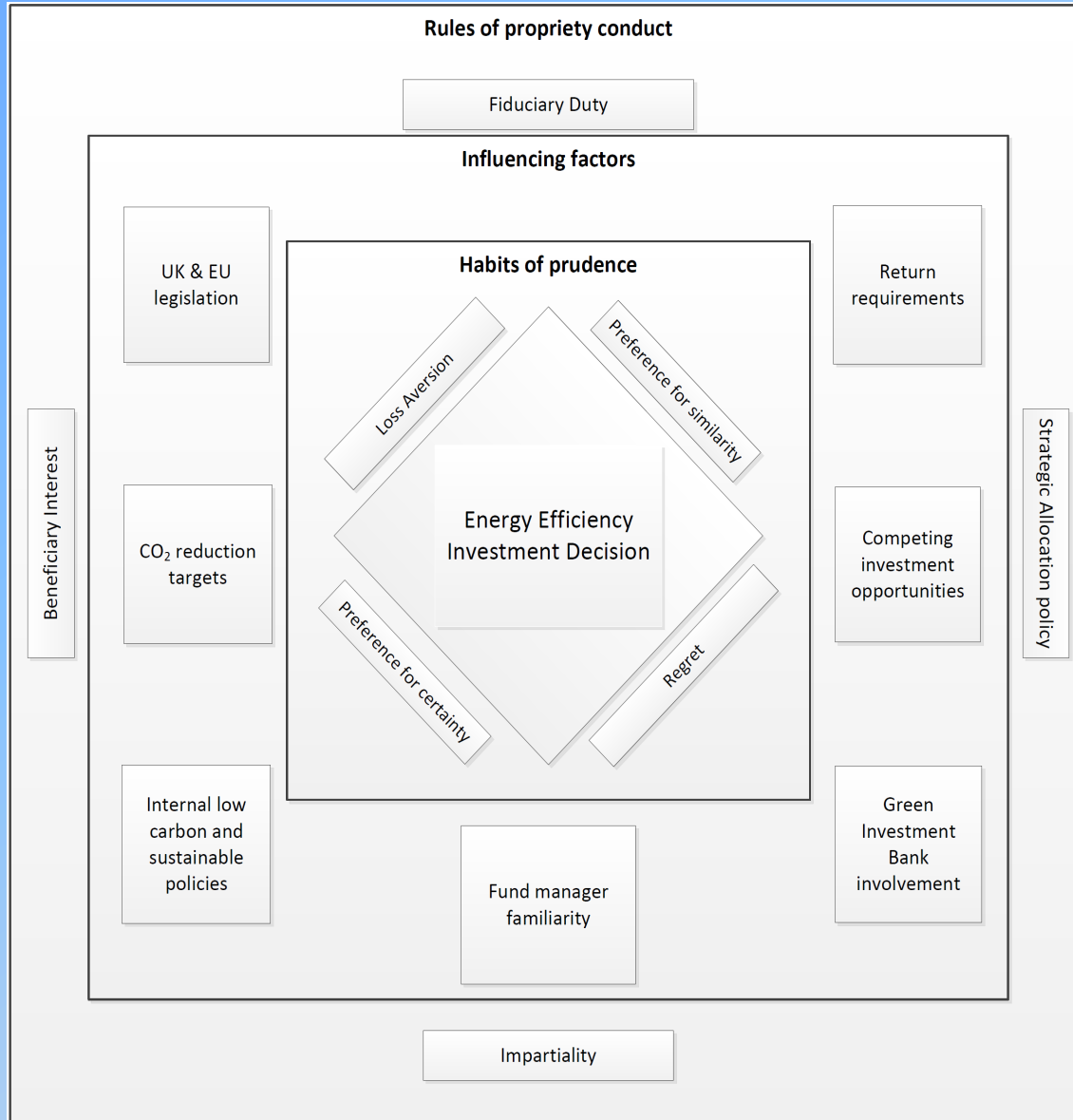
# Research



Source: Clark, 1998

- *Framing trustee decision-making*

# Research



# Research

- The questions in the research have centred on a number of key categories:
  - Asset allocation and return requirements
  - Low carbon investments
  - Decision to invest/not to invest
  - Fund Manager
  - UK government and EU polices
- Once the interviews were concluded a form of thematic analysis was used in a combined deductive and inductive way.
- The process was deductive by identifying the *a priori* constructs within the interview transcripts and documents and inductive by identifying new unexpected concepts that emerged from the data.

# Research



# Research

- Research outcomes.
  - Development of a distinct Asset Class or sub class of Infrastructure
    - Good level of confusion over how energy efficiency transactions are classified. Are they one of the following, each with it own expected level of risk and return.
      - Renewable Energy?
      - Infrastructure?
      - Real Estate?
      - Private Equity?



# Research

- Research outcomes.
  - Transaction Contractual Structure



# Research

- Research outcomes.
  - Fund Manager familiarity
    - Used them previously
    - Size
    - Strategy
    - Experience
    - Focus on energy efficiency

# Research

- Research outcomes.
  - Develop standardised approaches
    - Standardisation of processes and protocols underling the transactions
    - Standardisation of contractual transaction structures
    - Standardisation of processes and structures will also facilitate the development of larger transactions and in greater numbers.
    - This will encourage the development of a an asset class, more FM involvement in the sector and investor direct investing.
  - Government involvement. The Green Investment Bank was sold to Macquarie, an Australian Bank in 2017. The future of energy efficiency unclear. They should look to invest in other ways perhaps loan/investment guarantees.
  - Subsidies to encourage further building retrofit development.