



Grantham Research Institute on  
Climate Change and  
the Environment



# POLICIES TO FINANCE ENERGY EFFICIENCY: AN APPLIED WELFARE ASSESSMENT

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# Context

- **Ambitious EU target of reducing primary energy demand by 20% in 2020**
- **Energy efficiency is the most consensual option to meet energy saving targets**
- **Energy Efficiency Gap (Jaffe and Stavins, 1994):**
  - Profitable investments not performed by firms and households.
- **Why this could happen?**
  - Lack of information on energy savings
  - Consumer not paying attention to savings
  - The person that makes the investment is not directly benefitting from it.
  - Credit constraints.

# Our project – Objectives and structure

- Look at policies able to tackle some of the market failures that lead to the energy efficiency gap.
- Focus on one market failure: credit constraints.
- Considerations about policy implementation and cost-effectiveness: importance of free-ridership on subsidies.

Structure of project: three main research axes:

1. Provide a (theoretical) framework to analyse energy efficiency investments
2. Look at the banking sector and energy efficiency loans
3. Relaxing constraints with subsidies: is it cost-effective?

# WP1: Produce an evaluation framework

- Various failures means that a set of policies is required.

Table 2 Commonly cited market and behavioral failures relevant to energy efficiency along with potential policy responses

Potential market failures	Potential policy options
<i>Energy market failures</i>	
Environmental externalities	Emissions pricing (tax, cap and trade)
Average-cost electricity pricing	Real-time pricing, market pricing
Energy security	Energy taxation, strategic reserves
<i>Capital market failures</i>	
Liquidity constraints	Financing/loan programs
<i>Innovation market failures</i>	
R&D spillovers <sup>a</sup>	R&D tax credits, public funding
Learning-by-doing spillovers	Incentives for early market adoption
<i>Information problems</i>	
Lack of information, asymmetric information	Information programs
Principal-agent problems	Information programs
Learning by using	Information programs
Potential behavioral failures	Potential policy options
Prospect theory	Education, information, product standards
Bounded rationality	Education, information, product standards
Heuristic decision making	Education, information, product standards

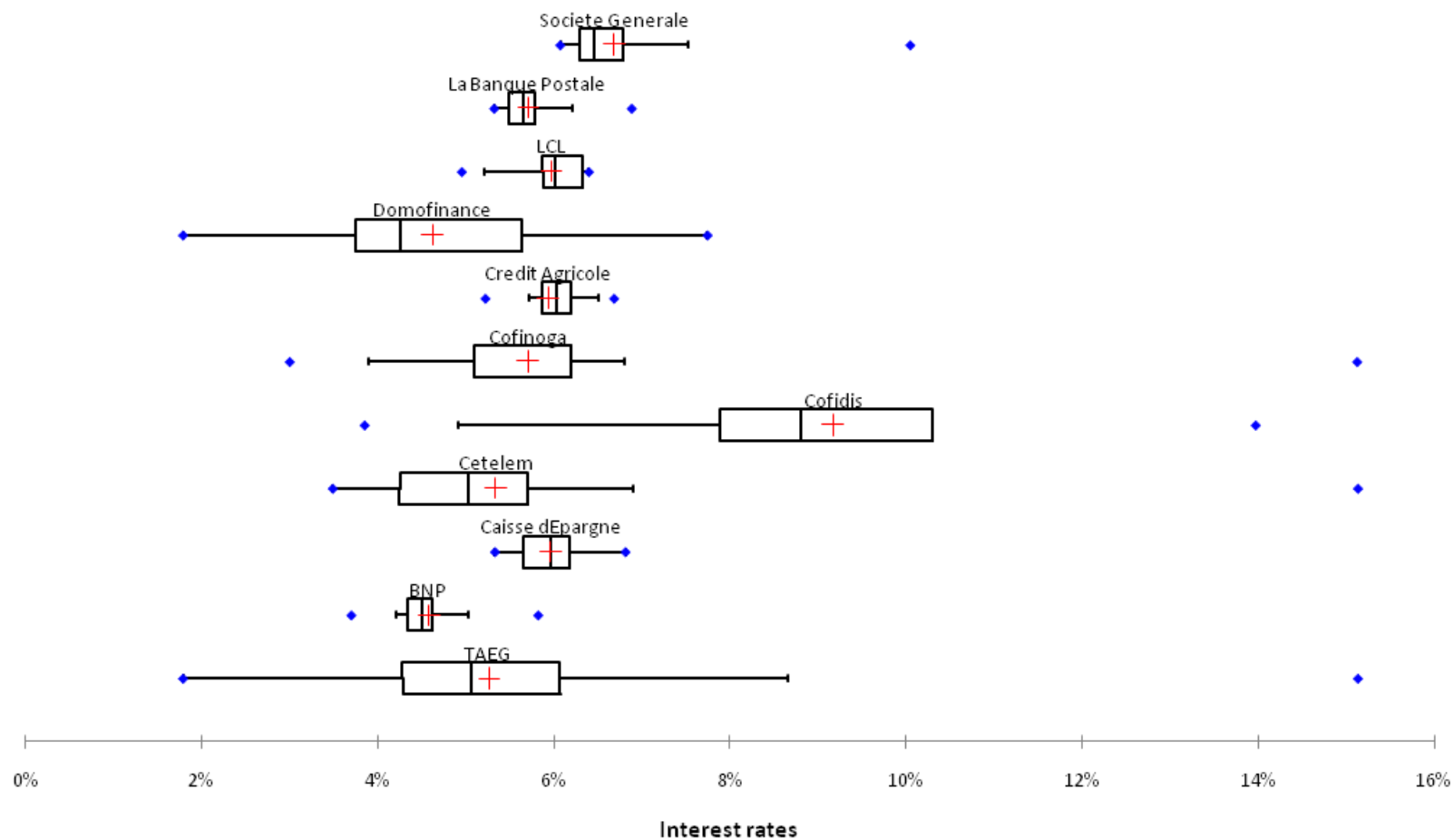
<sup>a</sup>R&D, research and development.

**State of the art:  
Gillingham et al. (2009)**

# WP2: Energy efficiency loans

- Look at different types of loans. In particular, energy retrofit vs. Car loans
- Classic information asymmetries story (Stiglitz and Weiss, 1981):
  - Collateral: lower for renovation than for vehicle → higher interest rate
  - Return: higher for energy-efficient than standard products → lower interest rate
  - Trade-off for efficient renovation versus standard vehicle?
- Tied credit (Iossa and Palumbo, 2004): lower interest rates when lender guarantees the quality of the underlying product

# Information collected on Online French Bank Loan Simulators



# WP3: Energy efficiency subsidies

- An alternative to loans consist in providing subsidies.
- Pros: usually strong political acceptance, possibly positive effect on technology spill-overs.
- Cons: it is costly.
- Be careful: subsidies have redistributive properties and there is a risk of pure windfall effects.
  
- WP3: focus on UK policies to perform an econometric assessment of energy savings and cost effectiveness.

# Methodology for WP3

- We have gathered data from the British Housing Survey and are looking at how to exploit some key variables in the dataset:
  - Investments in energy efficiency: amounts invested, presence/absence of cavity wall insulation, double-glazed windows, etc.
  - Availability and use of policies to finance such improvements.
- Challenges:
  - The data is a pseudo-panel and the information is not always gathered for all questions. We are tracking and identifying the gaps in the data.
  - We currently do not have the post code information for the observations and aim to formulate a demand to the UK Data Archive as soon as we have identified the data gaps.

Our aim is to look at the “additionality” of energy efficiency investments. Focus on the energy poor: do policies target the right people?



# Thanks!

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