EFFICIENCY CAPITAL

Efficiency Capital is an SPV aiming to unlock the value of building efficiency with a novel low-risk mechanism that addresses the market failures by leveraging the value of the saved CO_2 and spreading risk.

Challenge

Energy efficiency retrofits promise CO_2 abatement at negative social cost, and energy demand reduction is an important part of a broader net-zero strategy. The energy crisis, particularly for Europe, has magnified the economic benefits of efficiency as gas prices have risen sharply.

Efficiency measure investments unlock inherent value, in a manner widely considered to be relatively low risk. However, market failures represent significant barriers, particularly in the residential rental sector. These include a lack of available upfront capital, hyperbolic discounting, and a split incentive, where the landlord is responsible for housing efficiency but the tenant benefits from lower bills. Rented accommodation has been found to be 20% less likely to install insulation.

The UK is particularly challenged, with one of the least efficient building stocks in Europe, and the regulatory environment yields a strong opportunity for a financial mechanism.

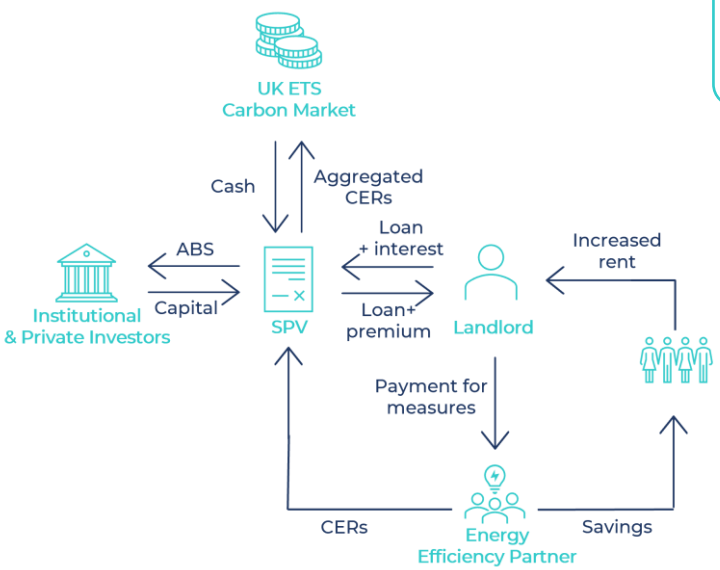
Solution

The mechanism builds on existing efficiency financing schemes and targets ongoing market failures. The SPV is the kick-starter, providing property-linked self-amortizing loan contracts to landlords, connecting them to our Energy Efficiency partner to recommend tailored measures. Upfront payments are provided to landlords based on the expected NPV of future carbon savings. The investment we seek covers the first two years of offering loans.

The fixed repayment is expected to be passed on to the tenant through higher rent, and the benefits in bill savings to the tenant exceed additional rent even in our worst-case scenario.

The loans are bundled into asset-backed securities and sold to institutional investors to fund years 3-5 of loans, and Emission Reductions (CERs), certified by partners, are sold to the UK ETS market and future compliance markets.

This solution provides upfront funding and an immediate incentive, overcoming the bias from hyperbolic discounting, and provides the landlord with some of the benefits from the energy efficiency measure therefore overcoming the split incentive.



Mechanism characteristics	
ROI (5% discount rate)	26-39%
Asset class	Fixed income
Target investment size (11% penetration)	£170m (93k houses)
UK Market size	£12.5bn (848k houses)
Time horizon	20 years

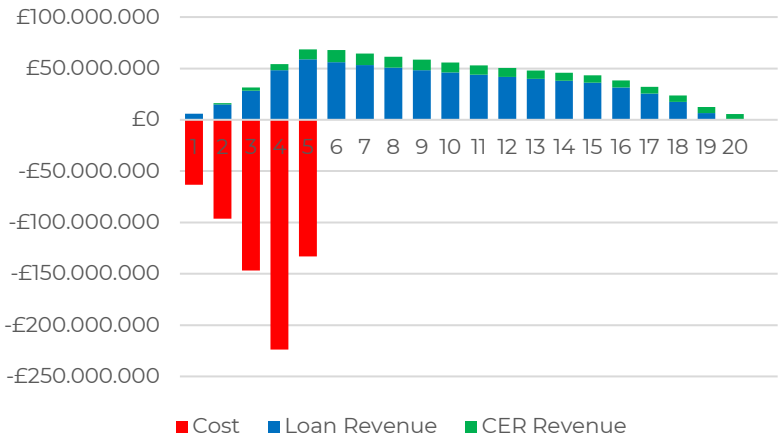
Environmental and social impact

Efficiency Capital contributes to SDGs 1 (No Poverty) & 7 (Affordable and Clean Energy). Bill savings for the average tenant range from £13,000-£28,000 across gas price scenarios, reducing fuel poverty. KPI: Savings verified by smart meters.

Further, the mechanism contributes to SDG 8 (Decent Work and Economic Growth) through job creation in the energy efficiency industry. KPI: No. of properties upgraded.

Finally, the mechanism contributes to SDG 13 (Climate Action). We estimate the total CO2 saved to be 5MtCO_2e. KPI: volume of CERs.

SPV Discounted Cash Flow



Assumptions

1. Baseline for CERs: efficiency improves at current UK trend
2. Rebound effect 10%
3. 30% of NPV of CERs to landlord for participation
4. £100 property survey cost borne by SPV
5. Loan payback period: 15 years
6. Interest on loan: 6%
7. Low carbon price scenario: £50 per tonne CO2
8. 11% market penetration (uptake modelled on previous UK schemes)
9. Management fee: 2% of discounted return

Regulatory Framework

Efficiency Capital aims to leverage the existing regulatory framework in the UK sector, accelerating and deepening the potential for efficiency upgrades that are incentivised by policy.

Privately rented homes in the UK must meet a minimum energy performance rating of EPC Band E. This is rising to C in 2028, at which point we stop issuing new loans. This legislation includes a cost-cap of £3,500, significantly below our average modelled package of £8,800, meaning greater carbon and energy bill savings from the SPV. Furthermore, the SPV deal offers landlords an attractive path to meeting upcoming regulation.

Building Regulations have minimum energy efficiency standards which must be adhered to when constructing, extending, or renovating UK homes. Fabric insulation standards - our target intervention - were most recently uplifted in 2021, with effect as of July 2022.

Risk / Probability	KRI	Mitigation Strategy
Quality carbon offsets	Regular measurement of actual energy usage against modelled reduction.	Use smart meters (currently installed in 50% of UK households, and uptake rising rapidly) to measure actual consumption change against modelled change; partner with third-parties for carbon credit verification; build CER discount to ensure additionality into modelling based on trends in past energy efficiency improvements; loan revenue covers costs plus discount rate regardless of CER sales.
Rebound in energy consumption	Regular measurement of actual energy usage against earlier energy usage.	Tenant consumption remains sensitive to prices; 10% rebound rate built into discounted financial modelling; discounted loan revenue already covers costs therefore limiting the possible impact of rebounding consumption on returns through CER volumes.
Carbon market volatility	Use third-party modelling of future carbon prices across voluntary and compliance markets; monitor price floors.	Aggregate and sell carbon offsets with medium-risk hedging practices, with only annual payouts to investors, allowing targeting of high-market prices; protected by price floors in UK and EU compliance carbon markets; modelling based on £50 per tonne of carbon, which is a low assumption.
Scheme competition	Competition analysis of relative total costs of finance.	Currently no existing Government support; few innovative financing schemes; scope to improve interest rate and green premium while ensuring modest discounted return on investment.
Loan default	% of loans by tiered credit score; default rates	Pre-loan credit score checks; low size of loans; loan costs expected to be passed to tenants; impact on investors limited as derivative value based on aggregated loans; diversified income from CER sales; while investors aren't exposed to gas prices, a low gas price was used in modelling to ensure tenant savings exceed loan repayments even in the worst-case scenario.

Global Market Potential

The mechanism is also suitable for owner-occupied households, though is best suited for countries with many renters and a poor building stock. Potential markets outside of the UK include Italy and Poland due to their aging building stock and lower energy efficiency (compared to UK) as measured by ACEEE.

The mechanism has potential to be extended to other sectors such as heat pumps, however existing prices imply long payback periods. As policy regimes evolve the mechanism may become more suited.

Potential Partners

ICE · Triodos Bank · Furbnow · Aviva Investors · nesta · generation · Morgan Stanley