

Socioeconomic evaluation of a retrofitting obligation for rental housing in France

Lucas Vivier and Louis-Gaëtan Giraudet
CIRED, ENPC, France

EXTENDED ABSTRACT

Retrofit obligations are gaining traction with policymakers to overcome the slow pace of residential energy efficiency improvement and the low effectiveness of most incentive programmes to change that. For example, the Citizens' Convention for Climate (CCC) to the French government put forward a minimum energy-efficiency for rental housing. What are the costs and benefits of this little-studied measure? We investigate this question using Res-IRF, a model of the French housing stock with endogenous retrofit dynamics. We conclude that a retrofit obligation is essential to achieve a net zero energy target in the residential sector.

Introduction

The European commission recently set the target of cutting greenhouse gas (GHG) emissions by 55% by 2030 compared to their 1990 levels.¹ The residential sector, which contributes 30% of total CO₂ emissions, is expected to be a key contributor in achieving this goal. Yet despite a widely shared belief that the sector is replete with cost-effective abatement opportunities (McKinsey, 2009), the myriad incentive programmes aimed to tap them have proved ineffective since their implementation in the mid-2000s.

The question therefore arises as to what measures are “fit for 55”? Putting a retrofitting obligation in sync with housing turnover has early been invoked to overcome the shortfall of extant policies (Giraudet et al. 2011). In this paper, we assess the effectiveness and socio-economic benefits of this little-studied policy option.

Modelling framework

Res-IRF models energy demand for heating in main residences in France.² Building on a rich description of the dwelling stock, it features endogenous renovation processes that take into account several barriers at the source of the so-called “energy efficiency gap” (Jaffe and Stavins 1994). The equations of the model are fully detailed in (Giraudet et al. 2021). The reference scenario includes the main policies currently in place in the residential sector as specified in (Giraudet et al. 2021).

We design a retrofitting obligation policy that forces landlords to retrofit their dwelling when a new lease occurs if the dwelling falls below a minimum Energy performance certificate (EPC) threshold (2023 for G, 2025 for F, 2030 for E and 2040 for D). The CCC proposed to differentiate the entitled amount by income as follows: 90% of upfront cost covered for the very low-income category, 70% for the low-income category and 30% for other households. This is quite a difference compared to the prevailing scheme, covering only up to 35% of upfront cost, with no income differentiation. These scenarios are labelled “Subsidy”.

¹ https://ec.europa.eu/commission/presscorner/detail/en/IP_21_3541

² The Python code has recently been made available at < <https://github.com/CIRED/Res-IRF> >. The documentation is available at <<https://cired.github.io/Res-IRF>>.

The socioeconomic net present value (NPV) indicator allows the positive and negative social impacts of the retrofit obligation to be put into perspective. Our analysis considers the main market and non-market marginal effects of the retrofit obligation, relying on the following variables: (i) the incremental retrofit costs, (ii) the reduction in energy expenditures, (iii) the social benefits of avoided CO₂ emissions (Quinet, 2019)³, and (iv) the health benefits, including avoided mortality and morbidity due to cold indoor conditions, as estimated in (Dervaux and Rochaix, 2022).

Results

Our results suggest that a retrofitting obligation forcing landlords to reach at least an EPC performance level B has positive socio-economic returns (Figure 1). The energy savings induced and the reduction in CO₂ emissions make up for increased capital expenditure. Health improvement among tenants provides substantial extra benefits. It also shows that the retrofitting obligation coupled with the CCC subsidy programme provides net benefits. This is potentially a key enabler to implementing the retrofitting obligation. The results also show that the proposed subsidy programme could be counterproductive without the retrofitting obligation.

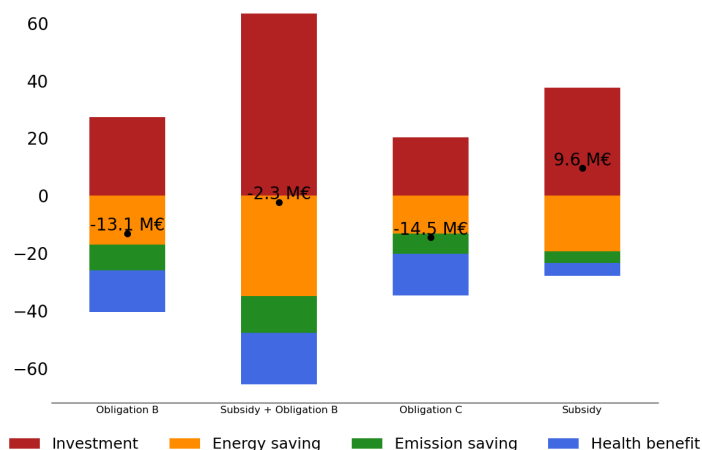


Figure 1. Socioeconomic net present cost comparison for different retrofitting obligation. Negative net present costs mean that the policy has a positive socioeconomic balance. *Source:* Model results.

Conclusion

This paper suggests that a retrofitting obligation imposed on French dwellings would generate net socio-economic benefits. Compared to existing policies, it is particularly effective at triggering investment among landlords, which is instrumental in eliminating the least efficient dwellings by 2040. Finally, we find that the progressive subsidy programme proposed by the CCC, covering 30% to 90% of upfront cost depending on the beneficiary's income, could provide the much-needed support to make the obligation politically acceptable.

References

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³ 250 €/tCO₂ in 2030 to 775 €/tCO₂ in 2050

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