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On the added value of utility-sponsored energy efficiency subsidies: Insights from the French White Certificates program, Phase III

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Context



● Utility-sponsored subsidies for energy retrofits

Since 2006. Part of a white certificate obligation tradable

● Designed to complement public programs

E.g. Tax credits, VAT cuts, zero-interest loans

● Today overlapping with public programs

Targeting the same retrofits

Budget €3B in 2023, matching public effort

Context: French White Certificates program - CEE

Why involve energy suppliers
in subsidy programs?

Allocative rationale:

They might target cost-effective
energy savings better

Practical rationale:

Less burden on
government budgets



Evidence from early phases shows freeriding

Research question

Did the **CEE program**, past its experimental phase, lead to **additional and better-targeted** home energy renovations compared to public subsidies?



Contribution

Causal estimates of home energy renovation takeup
with CEE

Assess both quantitative additionality (more renovations)
and qualitative targeting (cost-effective measures)

Setting and empirical strategy

Regression discontinuity design (RDD)

Exogenous variation in subsidy amount

Outcome: number or volume of subsidies delivered

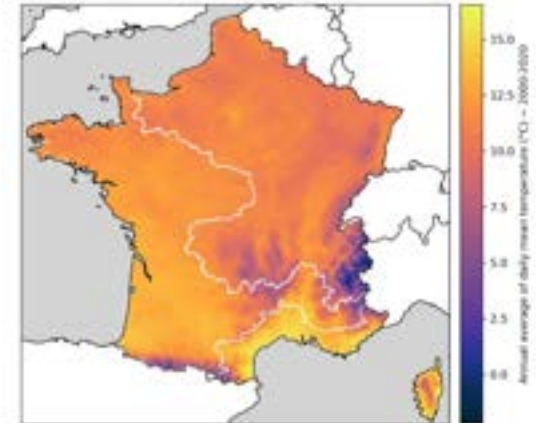
On municipality level

Three climate zones H1, H2, H3

Climate zone borders serve as geographical discontinuities



(b) Administrative borders of France



(a) Mean temperature across municipalities in France

Setting and empirical strategy

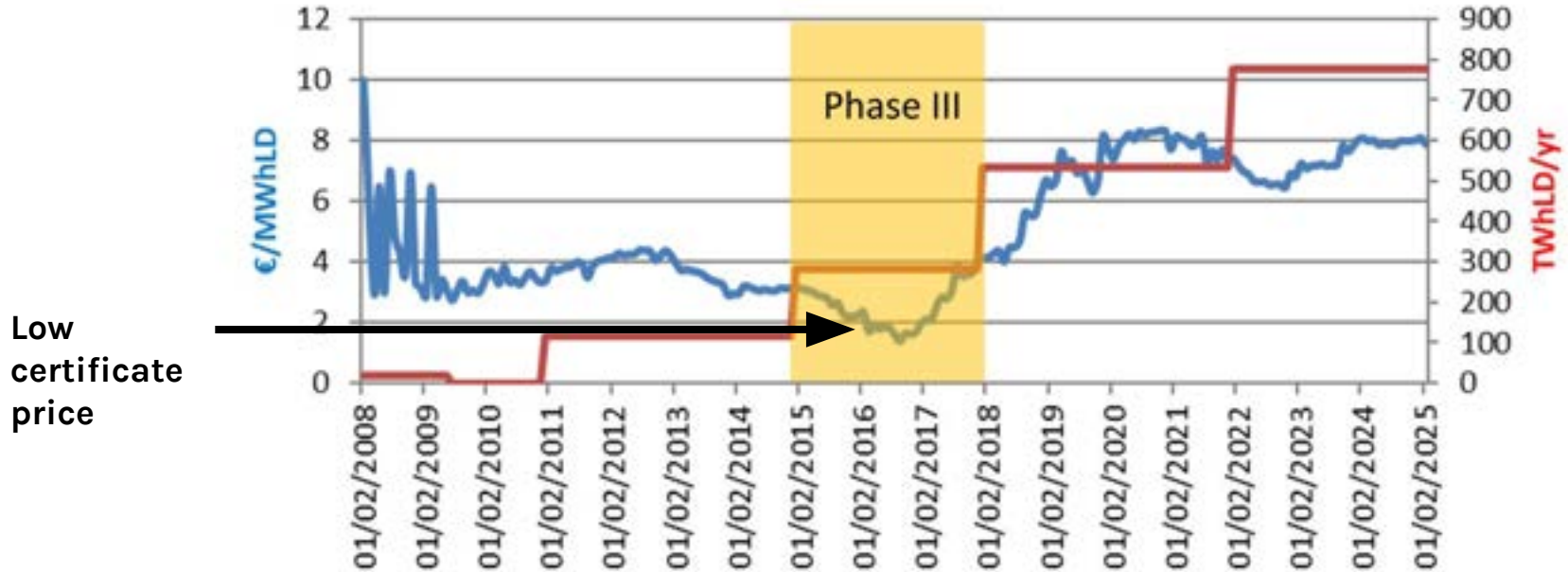


Figure 1: Coevolution of the market price (left axis) and the annual target (right axis)

Data



Outcome:
of renovations

132k obs. across
33k municipalities



CEE measures

Source: Ministère de la Transition Écologique (via CASD)

Variables: **all CEE certificates delivered, measure category, dwelling type (house/apartment), income level, municipality identifier**



Household and dwelling characteristics

Source: FILOCOM (File of Housing by Municipalities) database
Ministry of Ecological Transition (SDES office) and
the Ministry of Economics and Finance (DGFIP office)

Variables: **Household income distribution, dwelling characteristics (age, type, heating system), occupancy status**



Temperature and geographical data

Heating Degree Days (HDD) (Météo France),

Geolocation: Data.gouv for municipal coordinates

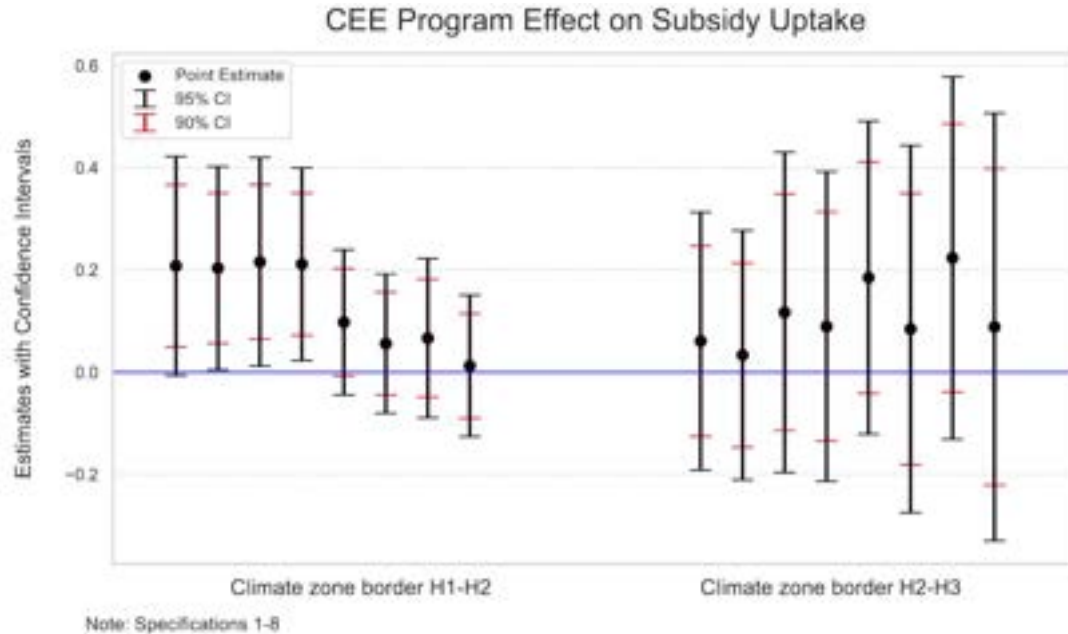
Model specifications

Table 2: Parameters of specifications: Number of subsidies

Specification	Outcome variable	Sample	Geo-difference control	Scope
1	Number of subsidies	Imputation 1	HDD	55km bandwidth, 5km binwidth
2		Imputation 2		
3		Imputation 1	Border segments	
4		Imputation 2		
5		Imputation 1	HDD	Cattaneo and Vazquez-Bare (2017)'s bandwidth and binwidth
6		Imputation 2		
7		Imputation 1	Border segments	
8		Imputation 2		

Note: The options in blue are our preferred specification (specification 1)
Details regarding imputation 1 and imputation 2 are available in the annex
Optimal bins were determined using the ES setting

Global results: number of subsidies delivered



Takeaway: limited but positive impact at climate zone border H1-H2

Results: heterogeneity of measures

Table 3: Comparison of CEE program's effect size and incentives: number of subsidies

measure			H1-H2			H2-H3		
code	name	share (%)	Δ effect (%)	Δ incentive (%)	elasticity	Δ effect (%)	Δ incentive (%)	elasticity
BAR-EN-101	Attic or roof insulation	30.3	36.4	21.8	1.67	35.7**	47.1	0.76
BAR-EN-104	Window or patio door with glazed surface insulation	18.6	2.2	22.8	0.1	5.6	49.3	0.11
BAR-TH-106	High-efficiency boiler	13.5	-15.1	18.3	-0.83	-36.9	38.4	-0.96
BAR-TH-112	Independent wood heating appliance	8.7	5.8	22.3	0.26	2.8	50.3	0.06
BAR-EN-102	Wall insulation	5.1	40.4**	22.0	1.83	21.2	49.2	0.43
BAR-EN-103	Floor insulation	3.5	89.7	21.0	4.26	127.1**	51.6	2.46
total		100.0	25.0*	21.6	1.16	5.1	47.0	0.11

Note: Effect size and incentive are calculated within a 55 km bandwidth on each side of the border (specification 1).

"Δ effect in %" refers to the RDD effect size relative to the average number of subsidies in the control group (55km bandwidth).

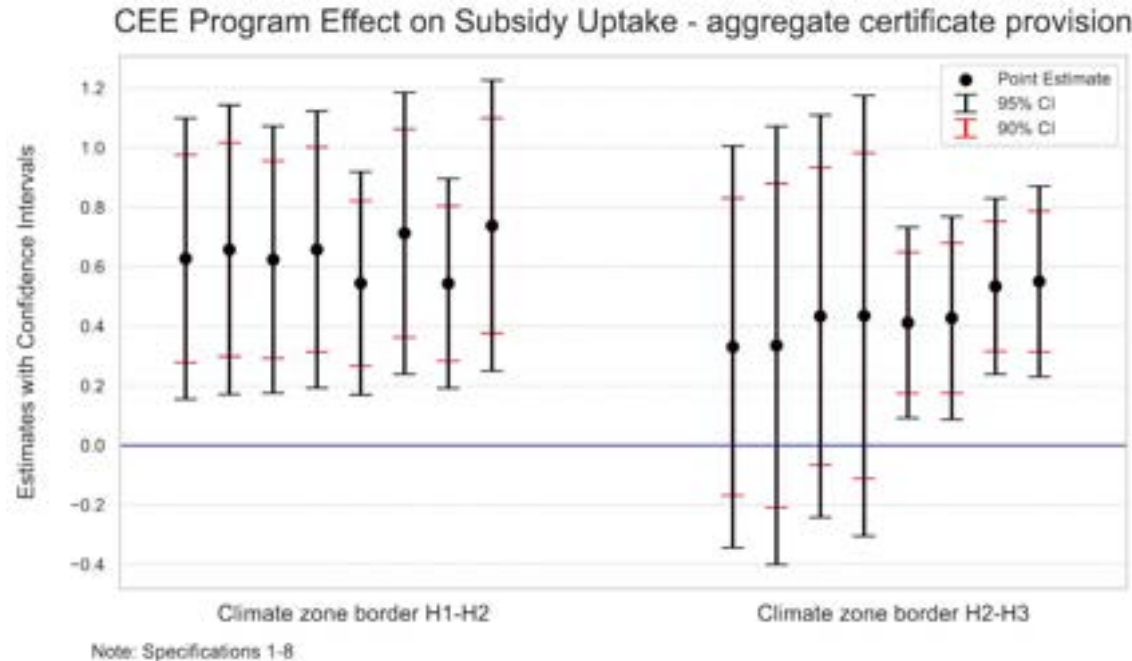
RDD effect size is reported with signif. codes: ***: 0.01, **: 0.05, *: 0.1

"Δ incentive %" refers to the percentage difference in adjusted CEE values (in MWh CUMAC) delivered between the treatment and control groups.

Elasticity is calculated by dividing "Δ effect in %" by "Δ incentive %"

Takeaway: Significant effects for specific insulation measures – but not broadly across all types

Global results: volume of subsidies delivered



Takeaway: positive impact at climate zone border H1-H2

Results: heterogeneity of measures

Table 9: Comparison of CEE program's effect size and incentives: adjusted volume of CEE

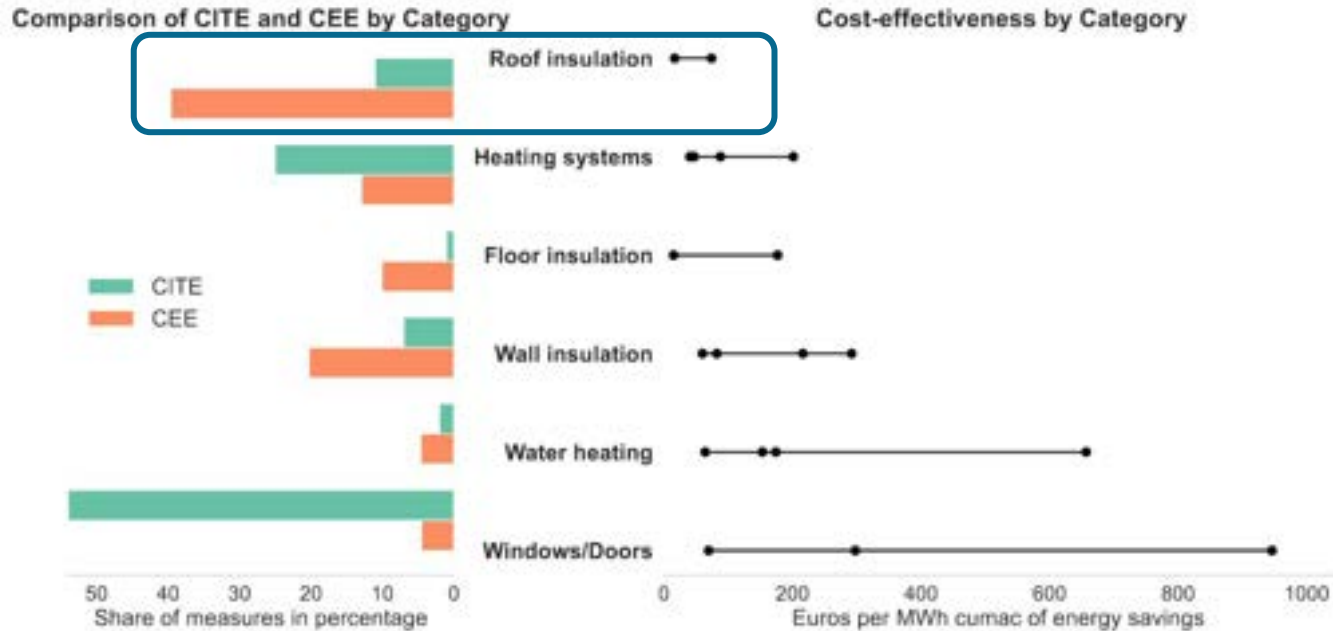
measure			H1-H2			H2-H3		
code	name	share (%)	Δ effect (%)	Δ incentive (%)	elasticity	Δ effect (%)	Δ incentive (%)	elasticity
BAR-EN-101	Attic or roof insulation	40.6	73.2**	21.8	3.35	44.4*	47.1	2.03
BAR-EN-104	Window or patio door insulation	4.7	55.1*	22.8	2.42	7.1	49.3	0.31
BAR-TH-106	High-efficiency boiler	4.4	17.2*	18.3	0.94	-2.2	38.4	-0.12
BAR-TH-112	Independent wood heating appliance	2.0	18.1	22.3	0.81	-6.6	50.3	-0.3
BAR-EN-102	Wall insulation	20.5	79.9*	22.0	3.62	36.4	49.2	1.65
BAR-EN-103	Floor insulation	9.6	86.1	21.0	4.09	42.2*	51.6	2.01
total		100.0	62.7**	21.6	2.91	33.1	47.0	1.54

Takeaway: Significant effects for specific insulation measures – but not broadly across all types

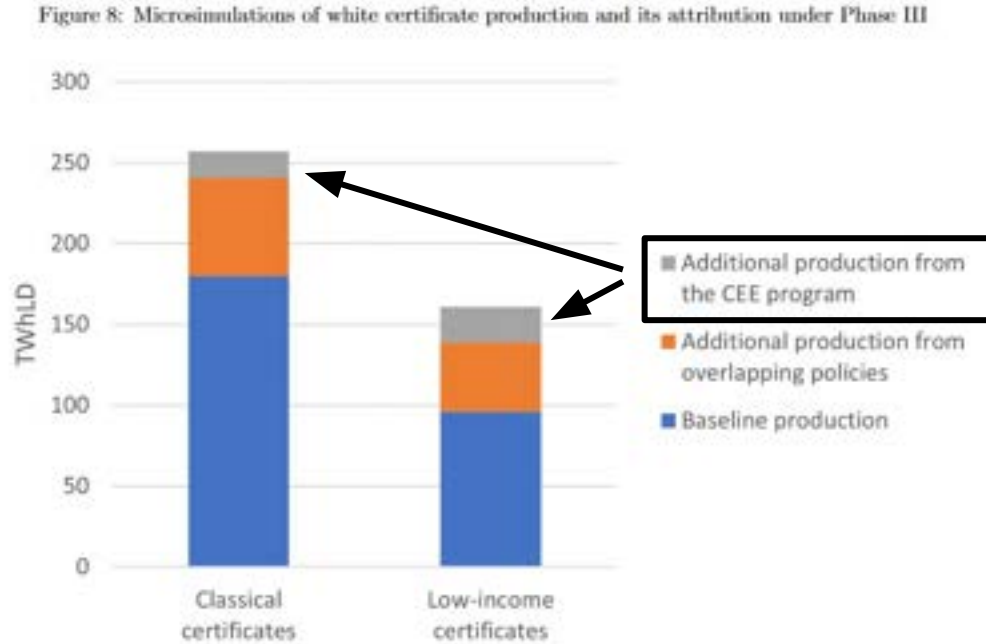
Results: Comparison with CITE* program

*Crédit d'Impôt pour la Transition Énergétique - Tax credit for energy transition

Figure 11: Subsidized measures of CITE vs CEE and their cost-effectiveness



Results: Testing the free-riding hypothesis



91% of the obligation could be met without subsidies, raises concerns about double-counting in EU compliance

Conclusion



What We Found

Low quantitative impact of the CEE Phase III program

Some qualitative value: alignment with cost-effective measures

Microsimulations support **free-riding hypothesis** → 91% of the obligation fulfilled at zero price



Policy Implications

Program is France's **main reporting tool** under EU directive → Risk of **double counting**



Future Directions

Merge systems? → Support for a **“one-stop shop”** subsidy model

Thank you

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Sources

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