



CLIMATE
POLICY
INITIATIVE

Using Tax Incentives to Support Thermal Retrofits in Germany

CPI Report

Karsten Neuhoff
Hermann Amecke
Alexandra Novikova
Kateryna Stelmakh
Jeff Deason
Andrew Hobbs

Climate Policy Initiative Office

July|2011

Descriptors

Sector	Buildings
Region	Germany
Keywords	thermal retrofit, tax credits
Related CPI reports	Meeting Energy Concept Targets for Residential Retrofits in Germany
Contact	karsten.neuhoff@cpiberlin.org

About CPI

Climate Policy Initiative (CPI) is a policy effectiveness analysis and advisory organization whose mission is to assess, diagnose, and support the efforts of key governments around the world to achieve low-carbon growth.

CPI is headquartered in San Francisco and has offices around the world, which are affiliated with distinguished research institutions. Offices include: CPI at Tsinghua, affiliated with the School of Public Policy and Management at Tsinghua University; CPI Berlin, affiliated with the Department for Energy, Transportation, and the Environment at DIW Berlin; CPI Rio, affiliated with Pontifical Catholic University of Rio (PUC-Rio); and CPI Venice, affiliated with Fondazione Eni Enrico Mattei (FEEM). CPI is an independent, not-for-profit organization that receives long-term funding from George Soros.

Executive Summary

The German government has committed to reducing the primary energy demand of buildings by 80% by 2050 and to attaining a thermal retrofit rate of 2%. Achieving both goals will require deep thermal retrofits across the existing building stock. To meet this challenge, the government is exploring **what role tax support options could play in encouraging thermal retrofits and ensuring that they deliver the necessary energy performance.**

The following options are being discussed:

- Allow for the accelerated depreciation of investments in the thermal energy efficiency of buildings (further development of § 82a EStDV). For commercial owners and landlords, the net present value and the visibility of tax benefits would increase, thus increasing incentives for improving energy efficiency and compensating for the difficulties involved in passing investment costs to users. For private households, thermal retrofit costs could be made deductible as “special expenditures” and tax benefits would increase with the marginal income tax rate.
- Offer tax credits. Currently, 20% of up to 6000 Euro in labor costs can be deducted from tax liability (35a German Income Tax Act, EStG). Expanding the volume and the types of qualifying deductions to cover material costs, and increasing the deductible share of the retrofit costs, could support thermal retrofits of owner-occupied buildings.

In this paper, we evaluate international (Italy, Netherlands, and U.S.) experiences with tax benefits supporting thermal retrofits and draw upon the experience of the German KfW loans and grants program.¹

Key Findings

Highlights and observations from our review include the following:

1. **Building owners are making use of tax credit schemes.**

From the start of their implementation, tax credit programs have had high utilization by commercial and residential building owners. However, it is difficult to establish how many thermal retrofits would have been pursued in the absence of the support schemes (i.e. how high the free-rider rate is). The Dutch and U.S. studies of tax incentives that support individual retrofit measures suggest potentially high free-rider rates.

¹ KfW supports the full costs of thermal retrofits with loan reductions and loan reliefs or with grants under the program “Energieeffizient Sanieren” (Nos.151,152, 430). The support for the loan based programs are, for a building that reaches 85% (55%) of the of the energy requirement, 14% (19%) of the full costs (CPI calculations). By basing its support on a percentage of full costs, KfW avoids the difficult allocation of energy-related incremental costs, which on median comprise about one third of the full costs. Each dwelling unit can obtain loans based on a maximum of 75.000 € of full retrofit costs.

Table 1. Retrofit investments supported by tax incentives and KfW programs, 2010

	Number of retrofit investments through tax incentives, 2009			Number of retrofit investments through KfW programs (excluding heating), 2010	
	Italy	Netherlands	USA (2007)	Loans + grants	Grants
Number of measures	238 947	5 503	4 292 000	81 939	64 009
Total support	1 427 Mio €	145 Mio €	-	-	97 Mio €
Total investment	2 595 Mio €	330 Mio €	955 Mio \$	4 665 Mio €	-

Note: KfW support volumes for heating are: a) for loans 17,600 measures, 277 Mio € total KfW support, 15,739 € support per measure; b) for grants 213,789 measures, 50 Mio € total KfW support, 234 € per measure supported

2. Tax credit schemes, as currently designed, don't deliver comprehensive retrofits.

As the chart below indicates, the rate of comprehensive retrofits resulting from tax credit schemes is low (2% of Italy's tax incentives program and 3% of the Netherlands' are used for comprehensive retrofits). In Italy, the maximum absolute support values are higher for comprehensive measures than for single ones, but the relative shares of tax rebates in both the Italian and Dutch schemes are not differentiated between the single and comprehensive retrofit. This could explain the low usage rate of tax credit support for comprehensive measures.

While it remains to be seen whether tax incentives are more or less effective than the same level of support delivered in a different form, the German KfW experience with loans and grants suggests that the level of support offered (whether through tax incentives or otherwise) is critical. KfW has set the support for comprehensive measures significantly higher than for single measures. Comprehensive deep retrofits to the standard of 85% of the primary energy use required for new buildings, for example, receive a grant equivalent value of up to €10500, but single measures receive a maximum of €3500 (CPI calculations). This more significant support for comprehensive retrofits could explain why they account for 70% of total investment support from the loan program.

A second reason for the higher share of comprehensive retrofits in Germany could be that building owners are better informed about energy efficient options during the retrofit planning process, as they are required to engage a certified expert² to review the retrofit plans prior to project approval and implementation.

Table 2. Comprehensive thermal retrofits using tax incentives and KfW programmes, 2010

	Number of comprehensive retrofit investments through tax incentives, 2009			Number of comprehensive retrofits through KfW programs (excluding heating), 2010	
	Italy	Netherlands	USA (2007)	Loans	Grants
Number of measures	5 622 (2%)	177 (3%)	not supported	18 591 (23%)	3 962 (6%)
Total support	42 Mio € (3%)	4 Mio € (3%)	not supported	-	45 Mio € (46%)
Total investment	76 Mio € (3%)	9 Mio € (3%)	not supported	3 248 Mio € (70%)	-

² A certified expert is an energy advisor authorized by the program "Vor-Ort-Beratung" or by the German consumer association (vzbv). This person is also allowed to issue energy performance certificates defined under §21 EnEV.

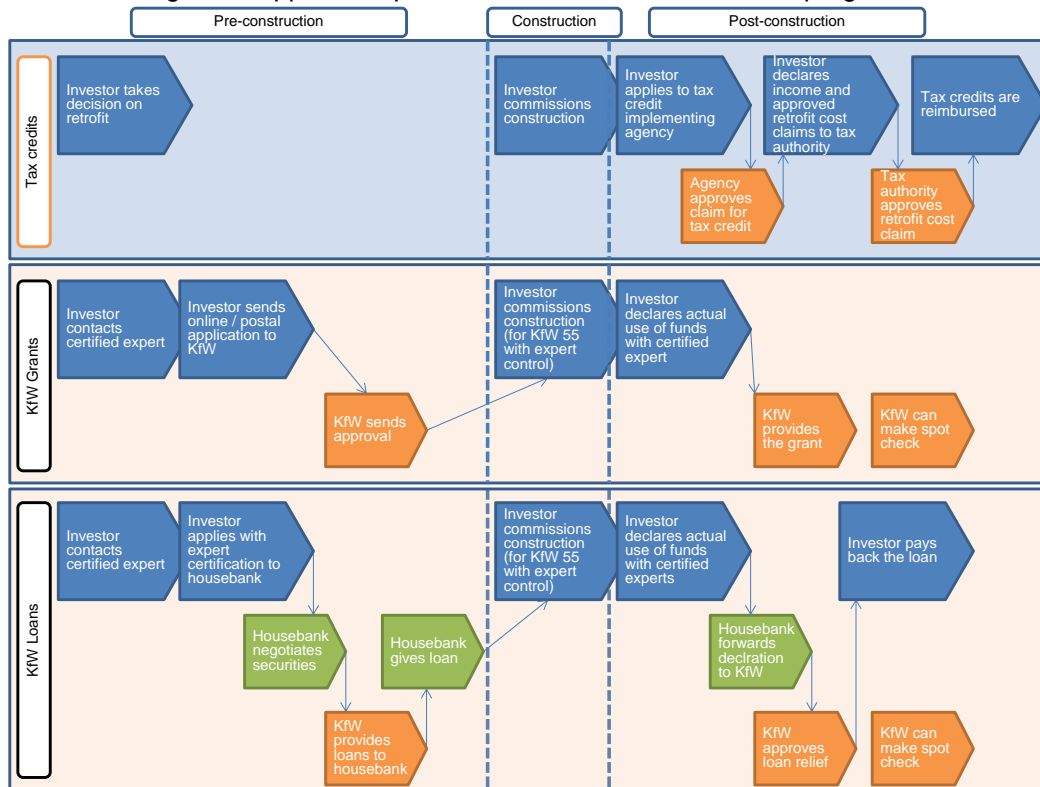
3. Positive experiences with simple schemes and clear compliance mechanisms.

Figure 1 illustrates the application and compliance procedures of the Dutch and Italian tax incentive schemes and German KfW programs. All are characterized by simple and clear processes that may have contributed to utilization of the program. Aligning a potential tax incentive scheme with existing KfW criteria and processes would avoid additional complexity and could thus increase its impact. Requiring the use of a certified expert and approval of plans prior to construction, for example, could build on existing practices and ameliorate free-rider concerns.

The multiple stages of an investment process point to the importance of investors' understanding of and trust in the continuation of a retrofit support policy. During the planning process, the investor, certified experts, and architects make decisions based on their expectations of future support, so uncertainty about that support or changing its criteria limit its relevance for planning choices. During the construction process, the investor incurs costs; hence, uncertainty about the continuation of a tax scheme creates risks. The more comprehensive the retrofit, the higher the investment costs, and the more important such certainty is. KfW circumvents uncertainty and risk with an up-front approval process.

Further study is required to investigate the relative advantages and disadvantages of tax benefits compared to other support mechanisms. It is likely that different support mechanisms will appeal to different types of building owners. Tax incentives are particularly attractive to building owners who place a high value on saving taxes or have limited interest in using and benefiting from low-interest loans. KfW programs will likely attract building owners who struggle to finance investments against future tax benefits or have lower income tax rates, which reduce the value of accelerated depreciation.

Figure 1. Application process of tax incentives and KfW programs



References

Aalbers R., Baarsma B., Berkhout P., Bremer S., Gerritsen M., Michiel de Nooij, Ex-post evaluatie Energie Investeringsaftrek, 2007, <https://zoek.officielebekendmakingen.nl/kst-31492-8-b1.pdf>

R. Gold, S. Nadel, Energy Efficiency Tax Incentives, 2005 – 2011: How have they performed?, ACEEE White Paper., June 2001, <http://www.aceee.org/files/pdf/white-paper/Tax%20incentive%20white%20paper.pdf>

ADEME Bâtiment - Énergie - Environnement - Édition 2010, <http://www2.ademe.fr/servlet/KBaseShow?sort=-1&cid=96&m=3&catid=14224&p1=00&p2=02>

Bertoldi, Paolo, Silvia Rezessy, Eoin Lees, Paul Baudry, Alexandre Jeandel, and Nicola Labanca. 2010. "Energy supplier obligations and white certificate schemes: Comparative analysis of experiences in the European Union." Energy Policy 38 (3) (March): 1455-1469. doi:doi: DOI: 10.1016/j.enpol.2009.11.027.

Bipartisan Policy Center, Reassessing Renewable Energy Subsidies, Issue Brief, 2011.

BMWi 2010, Energiekonzept. Für eine umweltschonende, zuverlässige und bezahlbare Energieversorgung. Berlin.

Bolinger M., Wiser R., Darghouth N., Preliminary Evaluation of the Impact of the Section 1603 Treasury Grant Program on Renewable Energy Deployment in 2009, <http://eetd.lbl.gov/ea/emp>, 2010.

Carpenter, E.H. ; Chester, S.T. Jr., Are federal energy tax credits effective: a Western United States survey, Energy J.; (1994); Vol.: 5:2.

Clausnitzer, K. D., Fette, M., Gabriel, J., Diefenbach, N., Loga, T. & Wosniok, W. Effekte der Förderfälle des Jahres 2009 des CO₂-Gebäudesanierungsprogramms und des Programms Energieeffizient Sanieren“ Bremen: Bremer Energieinstitut, 2010.

DEFRA. 2005. A review of the Energy Efficiency Commitment 2002 – 2005.

dena/IWU 2010, dena-Sanierungsstudie. Teil 1: Wirtschaftlichkeit energetischer Modernisierung im Mietwohnungsbestand. Berlin.

ENEA Annual Report 2009, Le detrazioni fiscali del 55% per la riqualificazione energetica del patrimonio edilizio esistente nel 2009, http://efficienzaenergetica.acs.enea.it/doc/rapporto_2009.pdf

ENEA, CRESME Ricerche, Analisi sull'impatto socio-economico delle detrazioni fiscali del 55% per la riqualificazione energetica del patrimonio edilizio esistente, 2010.

Energy Charter Secretariat. 2010. Market trading mechanisms for delivering energy efficiency. Energy Charter Secretariat: Brussels.

GAO, Government Accountability Office. 2010. Status of Residential Energy Credits IRC 25 (C). Briefing for Requestors' Staff October 29, 2010. Washington, D.C.

Gillingham K., Newell R., Palmer K., Energy Efficiency Policies: A Retrospective Examination, Annual Review of Environment and Resources, Vol. 31: 161-192.

Hassett K. A., Metcalf G. E., Energy tax credits and residential conservation investment: Evidence from panel data, *Journal of Public Economics* 57 (1995) 201-217.

Itron, Inc., 2003-2004 Home Energy Savings Program Residential Impact Evaluation.

IWU for BSI 2008, Wirtschaftlichkeit energiesparender Maßnahmen für die selbst genutzte Wohnimmobilie und den vermieteten Bestand. Darmstadt.

IWU/BEI 2010 Datenbasis Gebäudebestand. Datenerhebung zur energetischen Qualität und zu den Modernisierungstrends im deutschen Wohngebäudebestand. Darmstadt.

KfW-Bankengruppe 2011, Förderreport 2010 KfW-Bankengruppe. Frankfurt.

NL Agency Annual Report 2009, Jaarverslag EIA 2009,
<http://www.agentschapnl.nl/sites/default/files/bijlagen/Jaarverslag%20EIA%202009.pdf>

Ofgem. 2010. A review of the Energy Efficiency Commitment 2005-2008. Document type: Report to the Secretary of State for Environment, Food and Rural Affairs. Ref: 109/08

Viser E., Harmsen R., Harmelink M., Evaluation of the energy investment deduction scheme in the Netherlands, <http://www.aid-ee.org/documents/010EIA-Netherlands.PDF>.

i This excludes a 22,336 million € loan granted to the Greek government.
ii KfW also provides incentives for large renewable energy components under the umbrella of the program Erneuerbare Energien Standard (Renewable Energies Standard) and Erneuerbare Energien Premium (Renewable Energies Premium). These programs, however, concern the partial feedback of gained heat into the heating market and therefore go beyond the scope of this review, which focuses on investments into buildings as such.