

Capturing the Multiple Benefits of Energy Efficiency
Roundtable on Macroeconomic and Employment Impacts

Impact of the German Government's Building Rehabilitation Program on Public Budgets

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Models to analyse energy efficiency (measures, instruments, policies)

➤ **Building Stock Simulation Model:**

- Bottom-up sector model
- Germany, EU MS

➤ **Energy System Model (IKARUS):**

- Bottom-up energy system model
- Sectors: PE, conversion, energy transport, demand sectors (industry, transport, households, small-scale consumers)
- Germany

➤ **Economic Model:**

- IO model, Germany
- Distribution approach for additional taxes and SSC over administrative levels and social security systems

Scope of the Evaluation of KfW Programs for CO₂ Emissions Reduction in Buildings

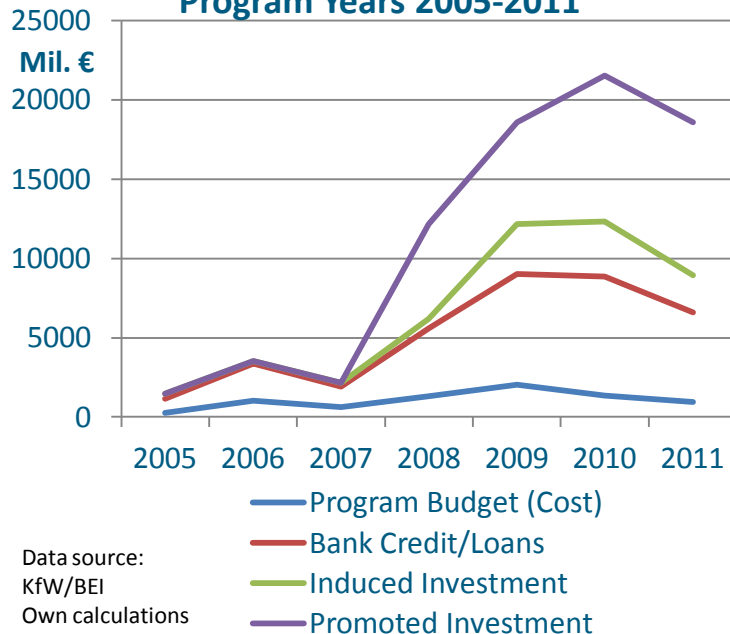
Table source: Ryan, Campbell 2012		Time frame for effect		Level at which outcome takes effect			Rebound effect
		Short	Long	Individual	National	International	
Social	Health						
	Energy affordability						
	Energy access						
	Development						
	Job creation				BEI		-
Economic	Asset values						
	Disposable income						
	Industrial productivity						
	Energy provider benefits and infrastructure						
	Energy prices						
	Public budgets				IEK-STE		-
	Energy security						
	Macro-economic effects						
Environment	GHG emissions				BEI		
	Resource management						
	Air/water pollutants						

Investment
Jobs

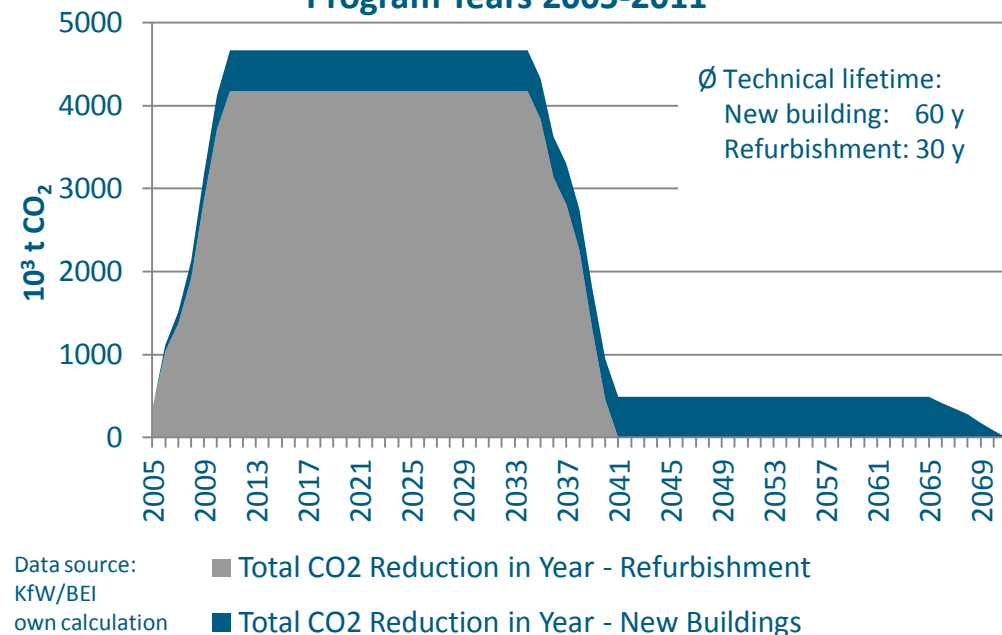
GHG emissions reduction

Previous Program Evaluations by KfW/BEI

**Programs Key Data
(New Buildings + Refurbishment):
Program Years 2005-2011**

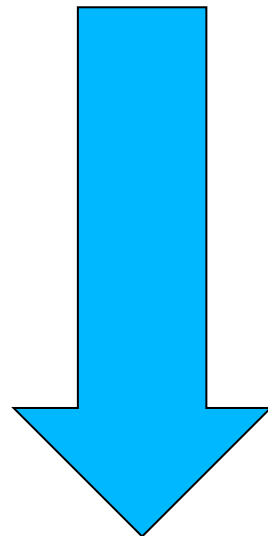


**Total CO₂ Reduction
(New Buildings + Refurbishment):
Program Years 2005-2011**



- after 2007 KfW aimed at new buildings (50,000 €)
- KfW interpretation: Full investment assigned to prom. inv.
- Own interpretation: limited inv. assigned to induced inv.
- Ø program budget 1,081 Mil. €, peak in 2009 due to Economic Recovery Program, decline afterwards due to fiscal consolidation
- Ø bank credit 5,214 Mil. €, peak 2009/2010
- Ø induced inv. 11,148 Mil. €, peak 2009/2010

KfW/BEI: Demand impulse
Investment in construction and refurbishment



Approach

- Input-output Model
- Employment scenario
 - OS: Overtime
 - AS: Jobs
- Avoided cost of unemployment: BAI approach
- Tax allocation approach

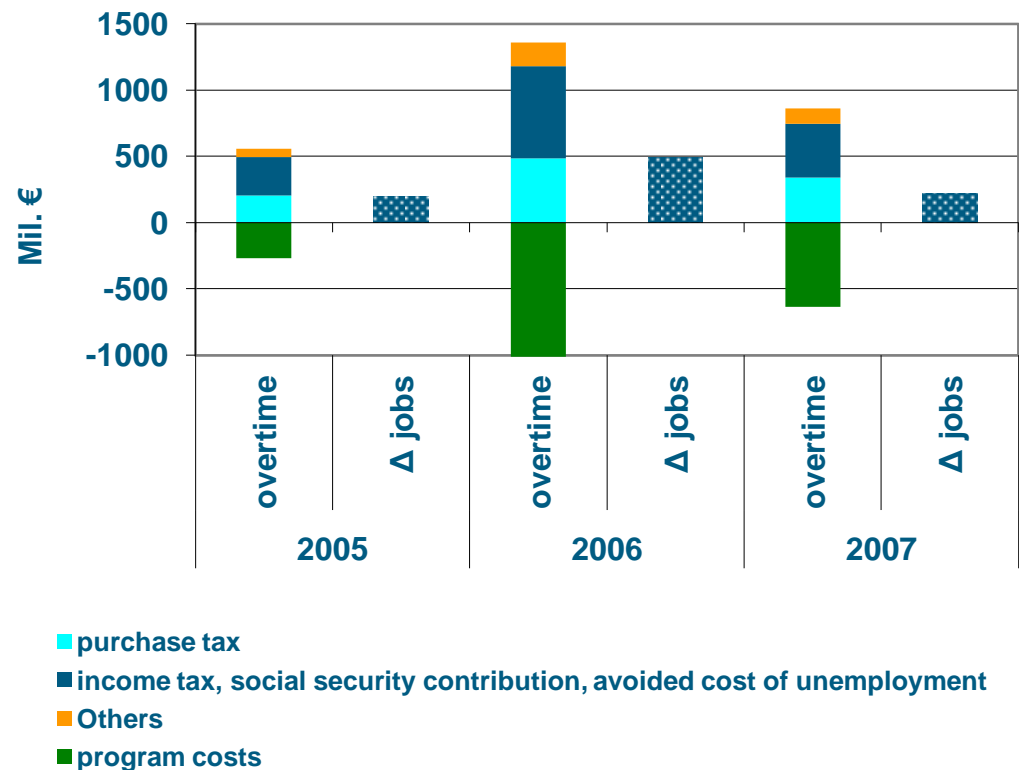
IEK-STE: Research questions: Effects on public budgets
Additional revenue from taxes and SSC
Avoided cost of unemployment

CO₂-Refurbishment 2005 - 2007

- Program cost:
1.9 Bil. € (KfW)
- BEI study
 - Investment: 7.3 Bil. €
 - Labour demand: 127,000 py
(Ø 42,000 py/y)
- Scenario OS (Overtime)
 - VAT: significant return flow
 - Income tax, SSC:
highest return flow
- Scenario AS (Additional staff)
 - Avoided cost of unemployment

IEK-STE study

Short-term Impacts on Public Budget

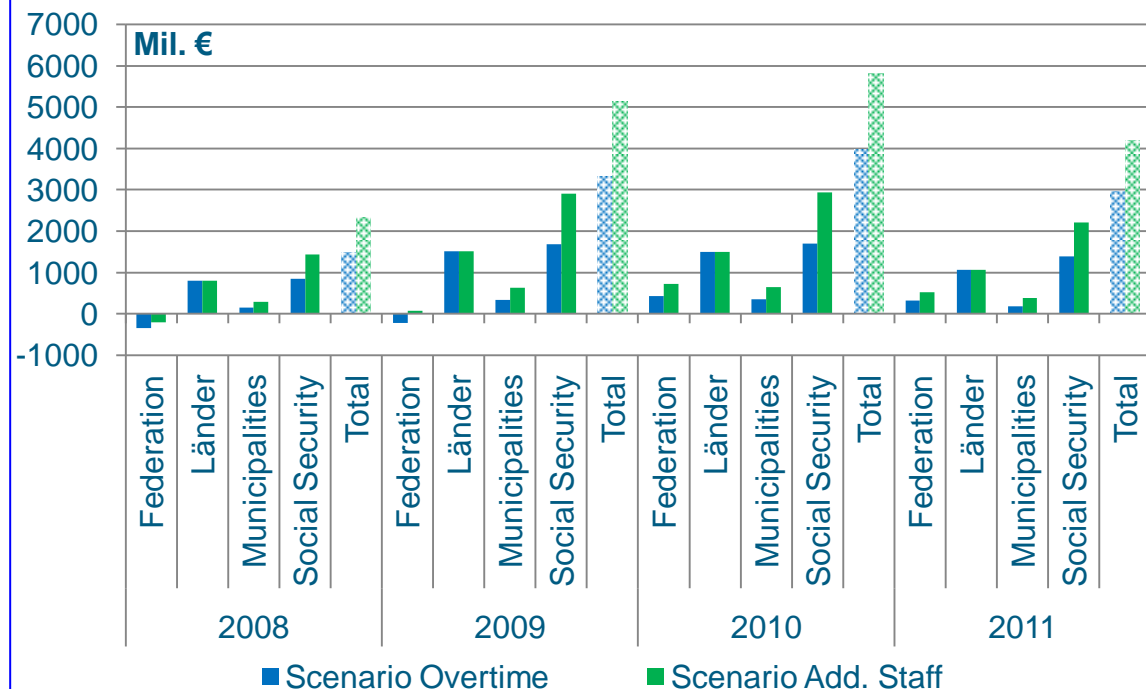


CO₂-Refurbishment and New Buildings 2008 - 2011

- Program cost:
5.6 Bil. € (KfW)
- KfW study
 - Ind. investment: 39.6 Bil. €
 - Ind. labour demand:
606,000 py (Ø 152,000 py/y)
- In both scenarios
 - Significant budget credits
 - Significant return flows due to VAT, income tax
 - Federation bears cost
 - Credits mainly with Länder and Social Security
- Scenario Add. Staff
 - Increased return flows due to avoided cost of unemployment
 - Credits mainly with Federation, Länder, and Social Security

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Impact on Public Budgets: Induced Investment



Summary

- KfW programs „Energy-efficient Construction and Refurbishment“:
Financial support to invest in energy efficiency and CO₂ reduction in buildings
- Scope of evaluations; Short-term impacts on public budgets
- Refurbishment 2005-2007
 - Investment impulse: 7.3 Bil. €
 - Total impact on public budgets: Credits
 - Significant return flows due to VAT, income tax, SSC
 - Credits higher in scenario Add. Staff due to avoided cost of unemployment
- Construction and Refurbishment 2008-2011:
 - Investment impulse: 30.7 Bil. €
 - Total impact on public budgets: Credits
 - Significant return flows due to VAT, income tax, SSC
 - Credits higher in scenario Add. Staff due to avoided cost of unemployment
 - Credits mainly with Länder, and Social Security, Federation bears program cost
- But similar results likely if governmental spending is directed towards other activities
(depending on labour intensities, domestic production, ...)
- KfW programs unique, as energy efficiency increase, job creation and public budget benefits are in line with GHG reductions

Thank you for your attention!

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KfW Promotional Programs for CO₂ Emissions Reduction in Buildings

	New buildings: Energy-efficient construction	Existing buildings: Energy-efficient refurbishment
Federal funding: Loans and grants	<ul style="list-style-type: none"> • KfW efficiency buildings 70, 55 and 40 • Investment grants (max. 10%) • Max. 50,000 € per unit 	<ul style="list-style-type: none"> • KfW efficiency buildings 115, 100, 85, 70, 55 • Single measures: up to 50,000 € per unit • Complete refurbishment: up to 75,000 € per unit • Investment grants (max. 12.5%) or direct grants (SFH/TFH) (max. 17.5%)
Federal funding: Loans		Energy-efficient refurbishment – municipalities Social investment – energetic building refurbishment <ul style="list-style-type: none"> • Single measures / complete refurbishment

Source: KfW information