



HOME RENOVATION ROADMAPS TO ADDRESS
ENERGY POVERTY IN VULNERABLE RURAL
DISTRICTS

BEST PRACTICE RENOVATION CASE STUDIES



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List of Arguments



**TECHNICAL AND FINANCIAL
RE-ENGINEERING OF THE
RENOVATION CHALLENGE**



**LARGE-SCALE NATIONAL
PROGRAMME INCENTIVISING
DEEPER RENOVATION**

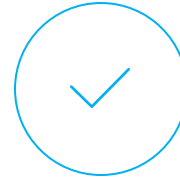


**REVOLVING LOAN
LEVERAGING EU FUNDS**



The Netherlands: Zero Energy Homes at Zero Upfront Cost - Stroomversnelling

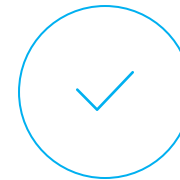
**CASE STUDY 1 TECHNICAL AND
FINANCIAL RE-ENGINEERING OF THE
RENOVATION CHALLENGE**



In 2013, the Netherlands committed to a sustainable energy system by 2050.



Objective to reduce CO2 emissions by 80-95% by 2050 and achieve 16% generation from renewable sources by 2023



The Dutch environmental agreement aims to achieve a neutral energy supply by 2050 for the built environment.



It is planned to renovate 80 per cent of the 7.5 million dwellings within 35 years, equivalent to 6 million houses or 170,000 dwellings per year.



Renovation of Social Housing in the Netherlands



- Old and inefficient social housing in the Netherlands is the subject of an ambitious renovation plan;
- The 'Stroomversnelling' initiative aims to transform 111,000 rental houses into energy-neutral housing by 2020;
- This project offers fast renovations, unchanged costs for tenants and long-term energy performance guarantees;
- The aim is to improve living comfort and reduce energy costs for tenants by transforming the dwellings with modern solutions such as solar panels and new kitchen and bathroom installations.



Technical Features of Stroomversnelling Renovation

- ① The main difference between stroomversnelling and traditional renovation is the almost total production in the factory, minimising work on the installation site.
- ② To achieve a zero-energy renovation, a complete solution is required that minimises heat and energy loss, produces energy efficiently, and utilises renewable sources to meet residual demand.
- ③ A typical installation includes a highly insulated triple-glazed façade and roof with solar panels, efficient ventilation system, air or geothermal heat pump, energy-efficient appliances, power supply from renewable sources and external modules for HVAC systems.



Financial Aspects

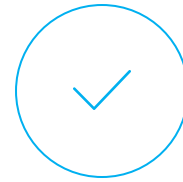
- Stroomversnelling offers zero-energy renovations at no extra cost for tenants;
- The financing comes from the social bank WSW, which has allocated approximately €6.6 billion to finance government loans to housing associations;
- Housing associations invest €40-70k per building and tenants pay a fixed monthly fee of about €650 for 'rent + energy plan';
- This plan replaces previous energy bills, ensuring that tenants pay no more than before for rent and energy bills combined;
- The financial model also includes a monthly payment to construction companies for building maintenance and a 30-year energy performance guarantee.





Estonia: KredEx

CASE STUDY 2 REVOLVING LOAN LEVERAGING EU FUNDS



Estonia has one the highest per capita energy consumptions among EU Member States, but also one of the highest energy saving potentials.



The government has established a National Energy Sector Development Plan (until 2020) as the main programme to address energy-saving issues.



Energy Inefficiency of Buildings in Estonia: Overview of the KredEx Programme



- Most buildings in Estonia date from before 1980, with little attention paid to energy efficiency and performance requirements. Before 2008, there were no legal requirements for building insulation or efficient technical systems such as heating;
- Estonian buildings show high energy inefficiency, with the average energy demand for heating varying between 200 and 400 kWh/m² per year;
- Most of the population lives in cities, in apartment blocks, which is why the Estonian government established the KredEx Foundation in 2001 to improve the energy performance of buildings.



Energy Inefficiency of Buildings in Estonia: Overview of the KredEx Programme



- Initially based on grants, in 2009 KredEx financing became a revolving loan fund, managed by the Foundation to provide low-interest loans to housing associations and municipalities;
- The financing mechanism allows the reuse of funds for building renovation. Commercial banks manage the risks of the loans, housing associations coordinate the flat owners and KredEx coordinates the operational aspects of the fund;
- In 2010, KredEx introduced subsidies to cover up to 35 per cent of building renovation costs, complementing the loan programme. The KredEx model is a comprehensive package with information campaigns and training to ensure the success and expansion of energy renovations in Estonia.



Technical Features of the Restructuring Programme

To qualify for financing and renovate an apartment building through the loan plan, it must have been built before 1993. Beneficiaries follow a mandatory 5-step process:



Energy Audit:

At the beginning of the application process, an energy audit (conducted by a licensed, accredited and independent auditing company) is carried out. The auditor collects data, takes measurements and provides a technical overview of the state of the building in order to identify the baseline energy consumption and propose energy efficiency measures that will lead to a 20% reduction in consumption.



Implementation of Measures:

The measures recommended by the audit are included in the building design documents.



Technical Features of the Restructuring Programme



Application for Loans and Grants:

The building association applies for loans and grants from banks for building renovation.



Call for Tenders:

A call for tenders is prepared for the renovation of the building.

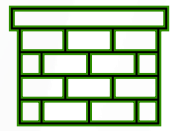


Execution of Renovation:

The selected contractor completes the renovation supported by loan and grant payments.



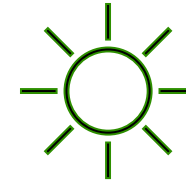
The technical specifications of each project will vary according to the needs of the building and the results of the audit. Typically, improvement works include:



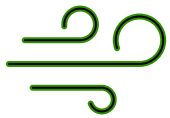
Thermal insulation of the roof, walls/facades, cellar/roof



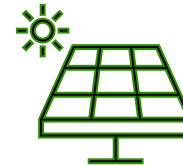
New windows and external doors



New or renovated heating system



New or renovated ventilation system;



Installation of renewable energy devices.

To ensure that renovations have effectively reduced energy consumption, KredEx requires regular reporting of monitored and verified energy data. This requirement requires the annual collection of measured energy consumption data for heating and hot water in kWh/year. KredEx performs random checks on about 5 per cent of the beneficiaries by verifying the heating companies' invoices.



Financial Aspects

- Sources of Financing: The revolving fund of €72M comes from the European Regional Development Fund (€17M equity ERDF), the Council of Europe Development Bank (€28.8M loan from CEB), the State (€16M loan) and KredEx (€10.1M investment);
- Loan Requirements: Apartment associations and condominium communities with at least 3 units can apply for loans. Financing is for energy improvements of 20% for buildings up to 2,000 m² or 30% for larger ones, subject to a mandatory energy audit;





Financial Aspects

- Repay Through Savings: Repayment is made through the energy savings achieved. The minimum loan is €6,400 per flat, with a maturity period of up to 20 years;
- Interest Rates and Co-participation: In 2012, average interest rates were between 3.5% and 4%, fixed for 10 years. At least 15% of the total loan must be covered by the final recipients. The KredEx grant can be combined with the loan;
- Granting of Subsidies: Subsidies vary from 15% to 35% depending on the expected energy savings and the energy label achieved.





Impact and Replicability

- Key Findings: Between 2009 and 2013, 533 condominium building renovations were financed through the revolving fund, generating average energy savings of 39%. Over the same period, the grant programme influenced 553 buildings, leading to average energy savings of 40%;
- Energy and Social Benefits: Benefits include improvements in the energy efficiency and appearance of buildings, reduced carbon footprint, increased energy security and added value for buildings. In addition, there is improved local air quality and an opportunity for job growth in the construction sector;



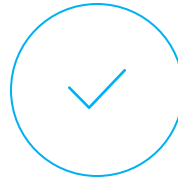
Impact and Replicability

- Lessons Learned: The programme requires careful governance and flexibility to adapt to market needs. Loan management through banks has reduced administrative costs. It is crucial to consider the economic impact on participant involvement;
- Future Perspectives: The experience of KredEx can be a model for similar programmes in other European countries, especially in the new 2014-2020 Structural Funds period, paving the way for more efficient and effective energy refurbishment initiatives.



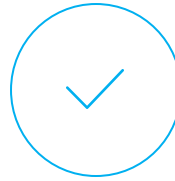
Germany: KfW

CASE STUDY 3 LARGE-SCALE NATIONAL PROGRAMME INCENTIVISING DEEPER RENOVATION



Long-term Goal:

Germany's energy and climate policy aims to make its buildings nearly climate neutral by 2050.



Financial Promotion of Energy Efficiency:

This promotion complements legal requirements and information campaigns by supporting the energy transition goal ('Energiewende') towards renewable energies and energy efficiency, which includes the phasing out of nuclear energy⁵⁵.



Targets by 2020:

These include a 40 per cent reduction in greenhouse gas emissions and an overall 20 per cent reduction in heating demand in residential buildings.



Energy Efficiency Support Programmes - KfW Development Bank



- **Mandate and Role of the KfW Development Bank:** The KfW Development Bank, on behalf of the German government and its federal states, offers a set of programmes including grants and low-interest loans. These programmes aim to promote the energy refurbishment of buildings and the construction of new buildings with very low energy requirements.



Energy Efficiency Support Programmes - KfW Development Bank



- **Sources of Financing and Distribution:** KfW obtains financing from the capital markets, benefiting from an AAA credit rating and a 100 per cent guarantee from the German government. Products are distributed through private banks and insurance companies. KfW's business model is competitively neutral. Customers benefit from a transparent system with clear conditions. Moreover, as private banks manage the risk assessment, this is distributed and limited as much as possible within a national financial system.



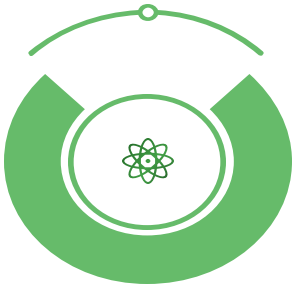
Energy Efficiency Support Programmes - KfW Development Bank



- **Focus of the Financing Programmes:** KfW's financing programmes focus on residential, municipal and social buildings. They offer long-term, low-interest loans for both complete renovations and individual measures, provided they meet the minimum technical requirements. Financing is also available for the acquisition of newly renovated buildings.

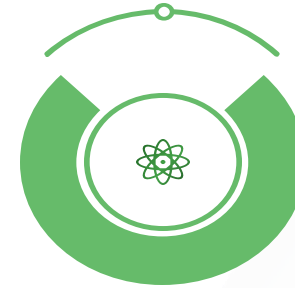


Technical features and Subsidiary Energy Consultation



Gradual Approach and Preference for Single Measures:

The step-by-step financing strategy and subsidised energy consultation aim to encourage owners to optimise the entire building in one go. However, most homeowners in Germany (82% in 2013) do not start with a complete renovation; they prefer single measures instead.

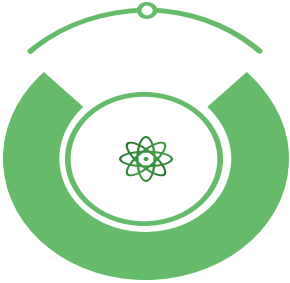


Supports Single Measures:

In 2014, the replacement of heating systems was the most frequently supported single measure, as highlighted by the German Energy Agency (dena) based on KfW statistics.

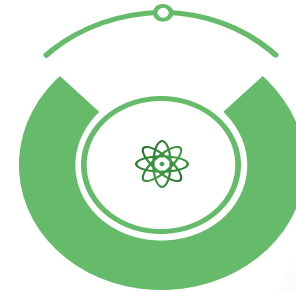


Technical features and Subsidiary Energy Consultation



Focus on Quality Assurance:

The KfW's initiative aims to ensure absolute quality and trust in construction by supporting the energy consulting and planning phase. This translates into improving the qualifications of market players and ultimately ensuring compliance with the standards provided.



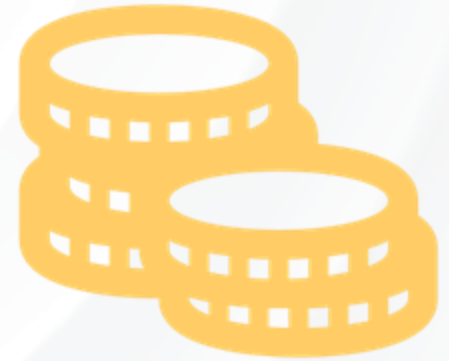
Contribution to Standard Setting:

The KfW initiative contributes significantly to the setting of strict technical standards, also acting as a stimulus for the further development of the standards of the Energy Saving Ordinance.



Financial Aspects

- **Guiding Motto:** KfW initiatives are designed to specifically promote deep restructuring according to the motto: 'The deeper the restructuring, the greater the incentives'.
- **Incentive Ranking:** An incentive of 25% is offered if the renovation reaches the more ambitious KfW Efficiency House 55 standard, while the slightly less ambitious KfW Efficiency House 70 level attracts a 20% lower incentive.
- **Loan Incentives:** The encyclical for obtaining loans is supported by a repayment bonus above the subsidy option. In addition, loans are subsidised through a subsidised interest rate (currently 0.75%) with a term of up to 30 years. This includes up to 5 years of start-up without payment and a fixed rate period of up to 10 years.





Financial Aspects

- **Loan Coverage:** The loan can cover up to 100% of the eligible costs, up to a maximum of €100,000 per housing unit for a KfW Efficiency House and up to €50,000 for individual measures.
- **Support for Planning and Supervision:** KfW also supports planning of integrated concepts and supervision by independent experts. The 'Construction Supervision' programme can complement a financed energy refurbishment operation by offering subsidies of up to 50% of the costs for construction supervision, up to a maximum of €4,000.





Impact and Replicability

- **Strategic Objective:** KfW aims to generate a significant impact on private investment through public funding.
- **Effectiveness of Public Funds:** Every €1 of public support generates €12 of private investment, supporting Germany's building renewal strategy.
- **Monitoring and Key Results:** Annual independent evaluation ensures appropriate use of public funding. Savings of €200M/year in heating costs from renovations 2013. 4.5 million homes financed reduce 800,000 tonnes of CO2 annually.



Impact and Replicability

- **Main Success Factors:** Far-sightedness in financing and stability of conditions. 100% government guarantee for capital at favourable rates. Simplicity in the application and approval process. Incorporation of independent experts to ensure reliability.
- **Adaptability and Potential:** The KfW model can be adapted to other EU countries, as demonstrated by the success of the Czech Republic's energy saving programme based on similar principles.



HOME RENOVATION ROADMAPS TO ADDRESS ENERGY POVERTY IN VULNERABLE RURAL DISTRICTS

Thank you for your attention

