

INNOVATIVE BUSINESS MODELS FOR DEEP ENERGY RENOVATION OF HOUSEHOLDS

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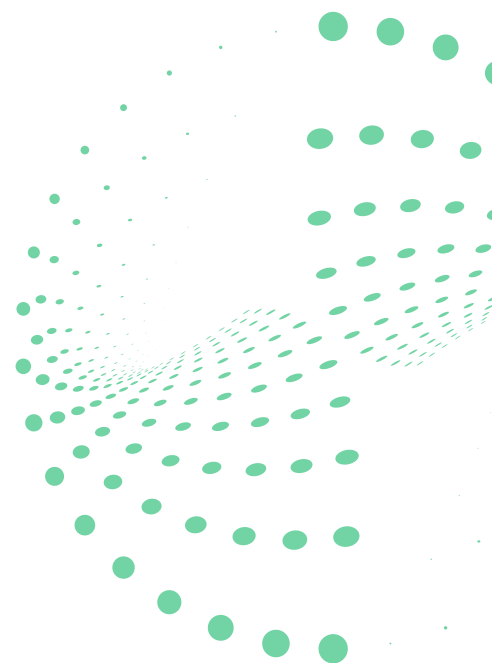




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Overview



Deep energy renovation is essential for reducing emissions, improving comfort, and modernising Europe's homes. Yet for many households, renovation remains financially difficult. This case study explores three innovative financing schemes designed to make renovation more accessible:

- On-bill / On-tax financing
- Energy Performance Contracting (EPC / ESCO models)
- Green Debt instruments (green loans, mortgages, bonds)

By comparing these models, the study highlights which approaches can help unlock private investment and support large-scale renovation across Europe's residential sector.

Why Renovation Matters

Europe's building stock is old and inefficient. Most buildings were constructed before modern energy regulations, meaning:

- 90% were built before 1990
- 75% are energy inefficient
- Buildings account for 40% of EU energy use and 36% of emissions

To meet the EU's climate targets, renovation rates must double, yet homeowners face major obstacles: high upfront costs, long payback periods, and limited financing options. Public grants help, but cannot meet the scale of the challenge.

This creates a clear need for better, more targeted financial tools.



Traditional vs. Innovative Financing

Traditional financing tools present both strengths and limitations.

Grants

- Lower costs and support vulnerable groups
- But depend on public budgets and may distort market prices

Loans

- Familiar and easy to access
- But often treated as “consumer loans” with higher interest rates
- Difficult to transfer to new owners

Because those tools alone cannot address all barriers, innovative solutions are emerging to fill the gap.

Innovative Financing Schemes



On-bill / On-tax Financing

Homeowners repay renovation costs through their existing utility bill or municipal tax bill.

Why it helps

- No upfront payment for the consumer
- Debt is linked to the property and transfers automatically when the home is sold
- Utilities can identify inefficient homes using consumption data
- Encourages long-term planning and reduces the rebound effect

Challenges

- Requires supportive national regulation
- Needs cooperation across public authorities, utilities, and financial institutions

A strong example is the FitHome programme in the Netherlands, which, using an on-tax scheme, has successfully renovated dozens of homes with plans for hundreds more.

Energy Performance Contracting (EPC / ESCO)

Under EPC, a specialised energy service company finances and carries out the renovation and is repaid through energy savings.

Benefits

- Homeowners only pay when savings are delivered
- Professional expertise ensures quality installation
- Works well for large buildings with high consumption

Limitations

- Savings may be too low in single-family homes
- Requires a minimum scale to be cost-effective
- ESCOs face higher risks in residential settings

EPC is promising for multi-family buildings but less suited to individual households.



Green Debt

These are financial products (loans, mortgages, bonds) specifically labelled for energy-efficient renovation.

Strengths

- Familiar to consumers
- May offer better interest rates or longer repayment periods

Remaining barriers

- Some banks still consider renovation risky
- Debt cannot be transferred to new homeowners
- Limited ability to address deeper structural barriers

Green debt is useful but not sufficient on its own to accelerate renovation rates.



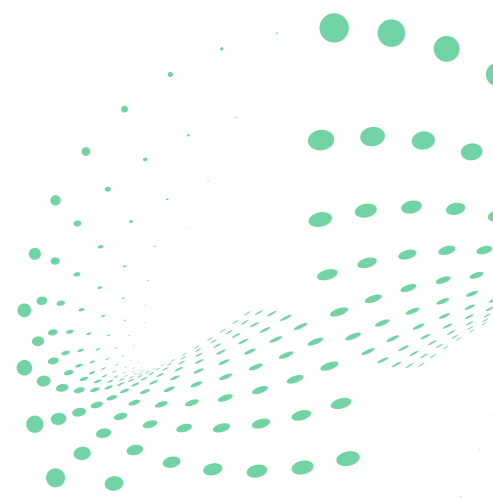
Which Approach Performs Best?

A qualitative assessment comparing affordability, suitability, market dynamics, and supplier availability shows:

- On-bill / On-tax financing scores 7.5/9
- EPC / ESCO models score 6/9
- Green Debt scores 4/9

Key insight

On-bill and on-tax financing stands out because it removes upfront costs, aligns repayment with the property, and adapts well to fragmented residential markets. However, it requires strong regulatory support to scale up.



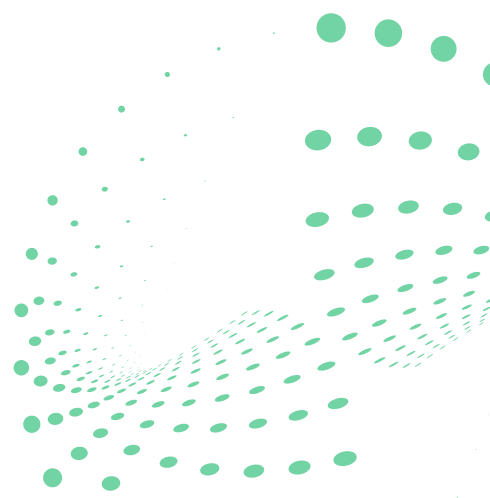
Final Remarks

The EU's climate and building directives introduce ambitious renovation objectives, but success depends on mobilising far more private investment. Innovative financial schemes can help homeowners overcome cost barriers and participate in the energy transition.

Among the models studied:

- On-bill/on-tax offers the highest potential for widespread adoption.
- EPC is effective in larger buildings or multi-family renovations.
- Green debt provides a useful complement but needs further evolution.

Together, these financial tools can play a pivotal role in helping households invest in energy efficiency, contributing to a cleaner, more resilient, and more sustainable European building stock.



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