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Deep Retrofit Models: a global perspective

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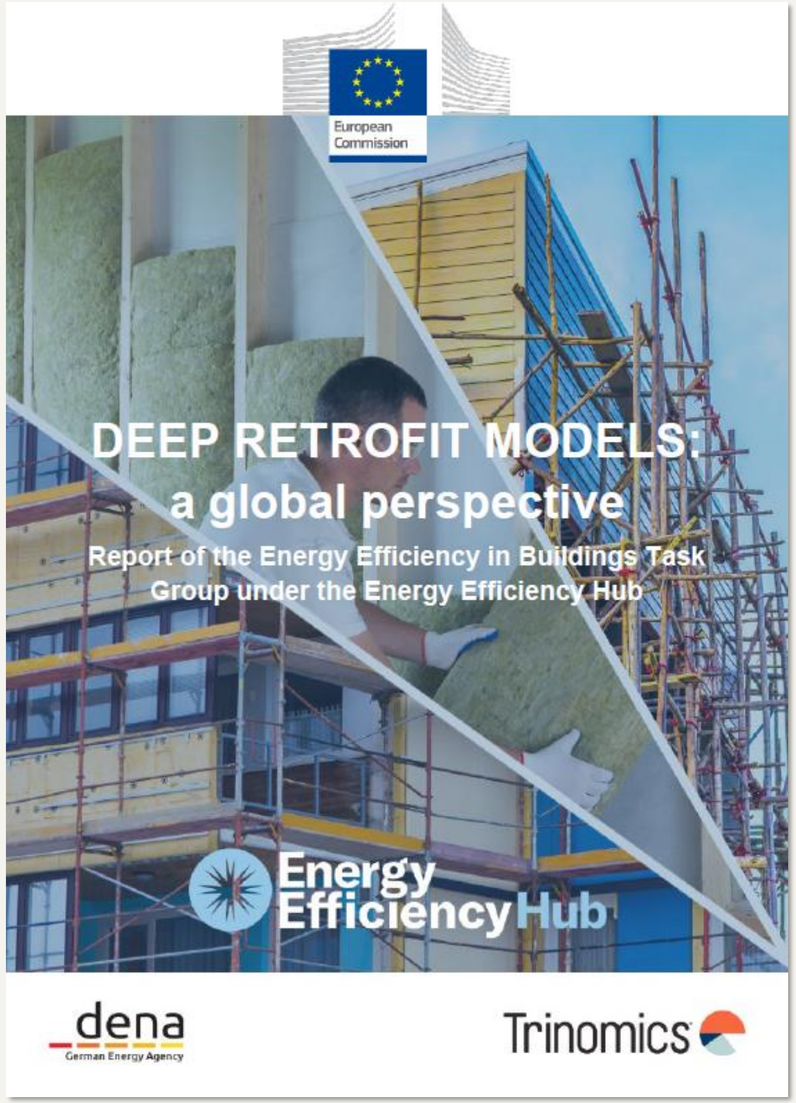

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Deep Retrofit Models

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Keynote Speaker

Dechen Tsering
Director of Climate Change Division, UNEP

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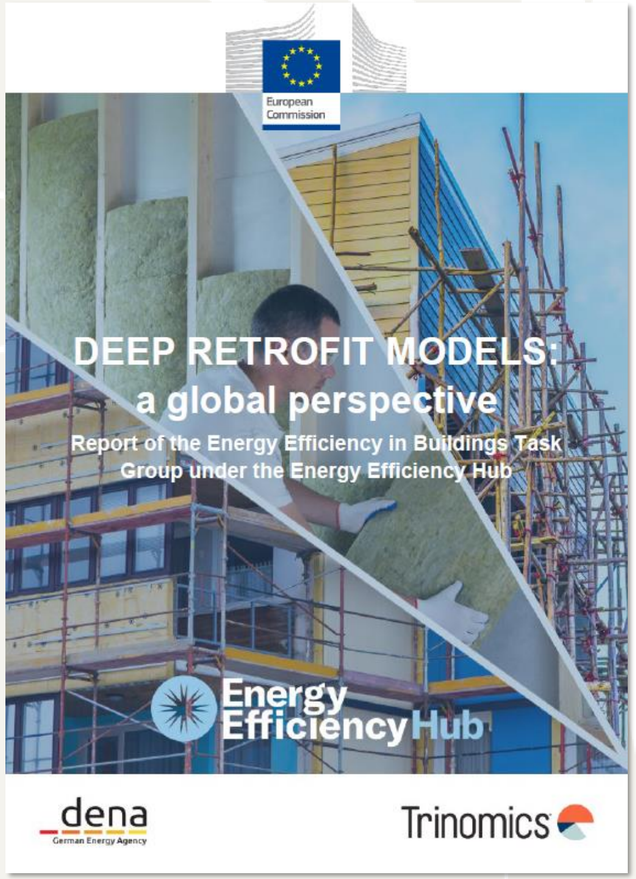
Deep Retrofit Models: A global perspective report background



- **The Energy Efficiency in Buildings (EEB) is a Task Group of the Hub, established in 2022 is a platform to exchange policy information about improving energy efficiency in buildings.**

- The Task Group is co-led by Germany and the European Commission. Task Group Members include Argentina, Brazil, China, Korea and Saudi Arabia. The operating agent of the EEB Task Group is dena (Deutsche Energie-Agentur), the German Energy Agency.

- This report was funded by the European Commission's Directorate-General for Energy. The report was written by Jesse Glicker, Ling Ying Lee, Nora Cheikh, Frank Gérard of Trinomics B.V., a Brussels-based consultancy firm.

- The findings of report are based on the surveys conducted with the EEB Task Group Members and several other countries as well as a literature review of existing policies, practices and definitions.

Deep retrofit is one of several solutions needed to reach building decarbonisation by 2050

OBJECTIVE
To achieve building decarbonisation by 2050

PROBLEM
Buildings account for 26% of global GHG emissions due to low energy performance and use of fossil fuels

SOLUTIONS

DEEP RETROFIT

STAGED RETROFIT

RENEWABLE INTEGRATION

BARRIERS TO DEEP RETROFIT

	POLICY RECOMMENDATIONS
POLICY AND REGULATORY BARRIERS	STRENGTHENING POLICY, STANDARDS AND REGULATORY FRAMEWORKS
FINANCIAL BARRIERS	INCREASING FINANCIAL SUPPORT AND INCENTIVES
TECHNICAL BARRIERS	STRENGTHENING LABOUR MARKET AND CAPACITY BUILDING
SOCIAL BARRIERS	RAISING AWARENESS AND PROVIDING TECHNICAL SUPPORT

This framework aims to inform policy makers, industry stakeholders and practitioners to implement deep energy retrofits more effectively, ultimately contributing to global decarbonisation goals.

Source: Energy Efficiency in Buildings Task Group, 2024

What is a deep retrofit?

DEEP ENERGY RETROFIT IS A SOLUTION TO ACHIEVE SIGNIFICANT ENERGY SAVINGS AND REDUCE BUILDING EMISSIONS WHILE ACHIEVING HIGH ENERGY PERFORMANCE.

There is not one definition of deep retrofit, as it is determined by national context.

WHAT FACTORS DETERMINE THE DEFINITION OF A DEEP RETROFIT?

Climate
In colder climates, energy renovations that minimise heat loss are prioritized, such as insulation, windows and doors and heat systems. In warmer climates, emphasis may be put on ventilation and enhancing efficiency of air conditioning systems.

Building Age and Type
Relatively new building stock may not require deep energy retrofit, while older historical buildings would need a significant energy performance improvement. Multi-family buildings require different improvements compared to single-family homes.

Historical, Cultural and Economic Context
A government's priorities, whether it Is on the preservation of historical and cultural heritage or on affordability and accessibility, share how the concept of deep energy retrofit is perceived and articulated in policies.

Existing Legal and Political Framework
Domestic legal traditions and existing policy structures dictate how the term of deep retrofit can be defined.

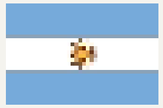
Source: Energy Efficiency in Buildings Task Group, 2024

Summary of national contexts

	Climate	Building Stock	Typical Year Of Construction	Cultural/ Economic	Legal/ Political/ Language
ARGENTINA	Warm, Arid - cold	European-influenced architecture	1971-1975	Inflation & economic conditions	PRONEV (labeling)
BRAZIL	Tropical	Diverse building stock, Informal housing	1980-1983	Housing deficit	PBE Edifica (labeling)
EUROPEAN UNION	Varies	Predominantly old building stock	n/a	Diverse cultural/ economic conditions	Existing EU policy (EPBD, EED)
GERMANY	Temperate	Predominantly old building stock	1952-1964	Strong investment in efficient technologies	Existing EU/DE policy (EPBD, EED, GEG)
KOREA	Temperate	Rapid urbanisation	1993-1994	Increasing innovation and regulation for energy-efficient buildings	Green remodeling; Green New Deal 2.0
SAUDI ARABIA	Desert	Rapid urbanisation	1988-1989	Rapid growth and new construction	Vision 2030

Source: Energy Efficiency in Buildings Task Group, 2024

Deep retrofit concept in legislation of selected countries



Argentina

Deep retrofit is defined as holistic energy improvements to buildings that reflect a reduction of energy consumption by ≥60%, considering environmental factors, behaviour patterns and comfort levels

Belgium - Flanders

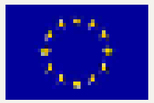
Deep retrofit refers to the implementation of energy efficiency measures resulting in a Level A Energy Performance Certificate (EPC) label, corresponding to 100kWh/m2/year.

Canada

Deep retrofit is defined as a holistic approach to upgrading buildings and optimising energy and carbon performance with energy savings of ≥50%, and/or GHG emissions reduction of ≥80%, and may include measures to improve climate resiliency.

China

Deep retrofit is set out in ‘Regulations on Energy Conservation in Civil Buildings (2008)’ within comprehensive energy-saving measures for buildings.



European Union

Deep retrofit is defined as a renovation in line with the ‘energy efficiency first’ principle and efforts to reduce whole life-cycle GHGs generated during the renovation. Such renovations focus on essential building items, such as wall insulation, ventilation and heating, etc. to ensure the necessary comfort of the occupants or to reduce at least 60% primary energy demand for worst-performing buildings.

Ireland

Deep retrofit is defined as a renovation carrying out multiple energy upgrades at once to achieve a Building Energy Rating (BER) rating of A.

United States

Deep retrofit undertakes a whole-building and integrative approach to maximise energy efficiency and emissions reductions. Additionally, deep retrofits aim to reduce energy use intensity by ≥40% from a pre-renovation FY2019 baseline.

Barriers to achieving deep retrofit are not fully addressed by current policies

POLICY AND REGULATORY

Insufficient building retrofit ambitions

Lack of definition and policies addressing deep retrofit

Lack of integration between renewable energy policies

Frequent changes in political priorities

FINANCIAL

High up-front costs and long-term payback period

Lack of affordable financing options and subsidies for low-income households

Hindrance in investment due to the landlord-tenant dilemma

TECHNICAL

Skilled labour shortage and instability of labour supply

Constraints on the availability of construction materials due to international supply chain issues

SOCIAL

Lack of awareness of benefits of deep energy retrofits among owners and tenants

Lack of expertise and technical advice

Source: Energy Efficiency in Buildings Task Group, 2024

Recommendations and best practices to address key barriers

RECOMMENDATIONS

Strengthen policy, standards and regulatory frameworks

Increasing incentives and financial support

Strengthening lebour market and capacity building

Raising awareness and providing technical support

BEST PRACTICES

Designing comprehensive policy and regulatory frameworks and clear definitions of deep retrofit

Financial schemes addressing attractiveness and affordability of deep retrofit and innovative de-risking schemes

Knowledge sharing platforms and investment programmes for upskilling and reskilling

Technical assistance and awareness raising programmes

Source: Energy Efficiency in Buildings Task Group, 2024

Featured Best Practice Case Studies

Argentina
Weatherization Without Borders (pilot project in Buenos Aires)

Canada
Deep Retrofit Accelerator Initiative (funding to organisations for deep retrofit of multi-unit residential and commercial buildings)

France
MaPrimeRénov (grant based on income and energy savings)

Germany
Building Renovation Passport (publicly funded energy audit instrument)

Korea
Green Remodelling Support Project (for public and private buildings

Saudi Arabia
High Efficiency Air Conditioning Initiative (aims at motivating citizens to replace AC)

https://energyefficiencyhub.org//

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