

What is a Deep Retrofit?

A deep retrofit refers to a comprehensive and holistic approach to upgrading existing residential buildings to significantly improve their energy efficiency, thermal performance, and overall sustainability.

Unlike shallow retrofits, which focus on individual measures (e.g., loft insulation or boiler replacement), deep retrofits involve a coordinated set of interventions that address the entire building fabric and systems. This approach aims to reduce energy consumption, lower carbon emissions, and enhance occupant comfort while aligning with the UK's climate targets and Building Regulations.

Synonym(s): Whole-house retrofit, comprehensive home retrofit.

Deep retrofitting is increasingly critical in the UK's residential sector, where much of the housing stock is older and less energy-efficient. It typically involves a combination of measures such as:

1. **Fabric Improvements:** Enhancing insulation levels in walls, roofs, and floors, improving airtightness, and upgrading windows and doors to reduce heat loss.
2. **Heating Systems:** Replacing outdated boilers with high-efficiency models or integrating renewable technologies like heat pumps.
3. **Ventilation:** Installing mechanical ventilation with heat recovery (MVHR) systems to maintain indoor air quality while minimising heat loss.
4. **Renewable Energy Integration:** Adding solar panels or other renewable energy sources to reduce reliance on grid electricity.
5. **Monitoring and Controls:** Implementing smart heating controls and energy monitoring systems to optimise energy use.

Deep retrofits are often guided by the UK's Building Regulations, particularly Approved Document L (Conservation of Fuel and Power), which sets standards for energy efficiency in new and existing buildings. Additionally, the UK government's Future Homes Standard and the Energy Company Obligation (ECO) scheme provide frameworks and incentives for deep retrofitting.

Practical Examples:

1. A Victorian terraced house in London undergoes a deep retrofit, including external wall insulation, triple-glazed windows, an air-source heat pump, and an MVHR system, reducing its energy consumption by 60%.
2. A 1970s semi-detached house in Manchester is retrofitted with loft and cavity wall insulation, a new condensing boiler, and solar panels, achieving an EPC rating of B.

Related Terms:

1. **Fabric-First Approach:** Prioritising improvements to the building envelope (walls, roof, floors, windows) before addressing heating systems or renewables.
2. **Airtightness:** Minimising uncontrolled air leakage through the building fabric to reduce heat loss and improve energy efficiency.
3. **Thermal Bridging:** Addressing areas in the building fabric where heat can escape, such as

junctions between walls and roofs.

4. **Mechanical Ventilation with Heat Recovery (MVHR):** A system that extracts stale air while recovering heat to warm incoming fresh air.
5. **Energy Performance Certificate (EPC):** A document that rates a building's energy efficiency on a scale from A (most efficient) to G (least efficient).