

Aim of the Project

The aim of this dissertation is to conduct research on what is required to upgrade a low energy home to achieve a higher energy efficient home and costings of improvements involved.

Background

The dissertation looks at, BER ratings as used to give the maximum energy rating of a residential or commercial building. Any building sold or rented must have a BER rating certificate & advisory report. The value of your home increases by 1% for every level you go up on the BER scale. A software called DEAP (Dwelling Energy Assessment Procedure) is used to produce energy performance certificates for the Building Energy Ratings (BER). The dissertation is based on a domestic home which is my granny's house which was purchased in 2020 to downgrade to a smaller space, the house was built in 1960 so the overall home energy performance was very low with a BER rating of D1.

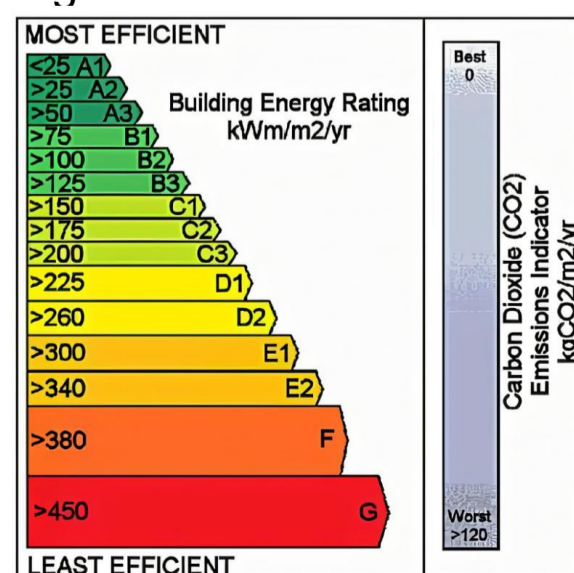


Figure 1 BER rating scale

Objectives

- Challengers associated with improving BER rating from D1 rating to overcome to B1 rating.
- The most recommended BER rating from retrofit is B1 rating why not A1 rating.
- Establish the cost between building a new home to a high BER rating and retrofitting an old building to that higher rating.
- Review the changes that can be made to the building and show the main improvements that will increase the maximum energy rating.
- The materials and methods following the green environment requirements to upgrade the infrastructure of the building.
- Using 3D printing to wrap house to increase BER rating.

Overview of the BER assessment



Figure 2 SEAI National BER register

This National BER register is accessed through the SEAI website, by entering in the MPRN, it can be used to find the exact property dwelling BER Certificate report and advisory report completed by a BER assessor for the home.

Room Improvements Needed



Figure 3 The garage of home

The garage in this property had non insulated floors, aluminium garage door and had no radiators throughout area, which caused dampness to occur on the floors.

Improvements for BER rating

As the house was D1 BER rating and didn't provide a great energy value and c02 emissions there was some drastic need of improvements . With introducing additional energy upgrades such as Photovoltaic (PV) panels, external and internal insulation and triple glazed windows.



Figure 4 Sheep wool Insulation in attic

Sheep wool insulation produces thermal and acoustic insulation products made from 100% natural sheep's wool used in attic insulation.

Conclusion

This dissertation has met its objectives, providing an understanding of the benefits of improving BER in older buildings, to conclude one the objectives is the cost breakdown of components needed with The total cost of these retrofitting improvements, of €89,402.81 the cost of constructing a new home with high energy efficiency is a total of €283,800 which is significantly higher. This comparison highlights retrofitting as an alternative to new construction for achieving high energy efficiency. Implicating these retrofitting improvements to the BER assessment within the software shows a summary of performance with a BER of B1 rating.

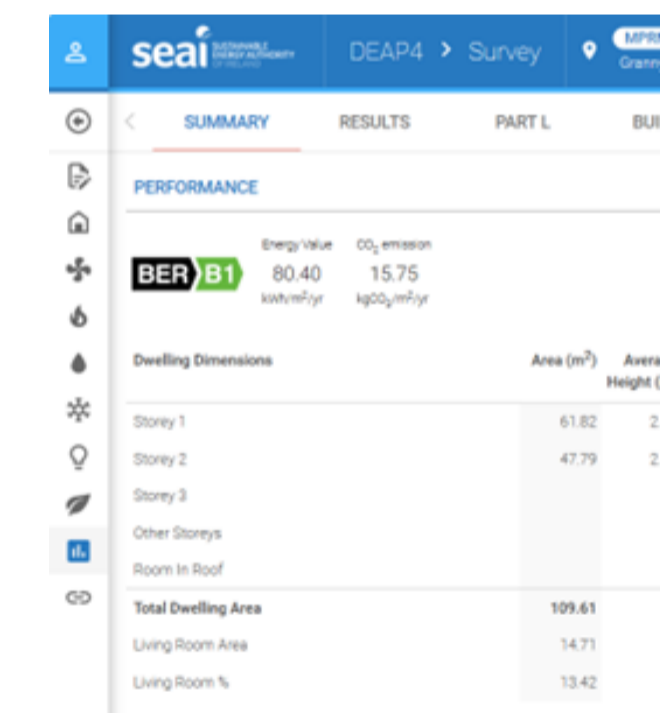


Figure 5 BER B1 Summary of performance from DEAP

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