Retro-Fitting an existing home to comply with Modern Building Regulations

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Aim of the Project

The Aim of the project is to take an existing home from the 1900's and to retrofit it to try maximise the Building Energy Rating of the home.

Background

- Part L Building Regulations would be the most important of the regulations to follow as it aims to limit energy usage and carbon emissions.
- BER Ratings are ranked on a scale from A1 to G however it is recommended that Irish homes have a minimum rating of B3.
- Approximately 40% of households are not aware of their homes BER.
- Important to know a buildings BER as it shows the energy value and carbon emissions of the building.

Objectives

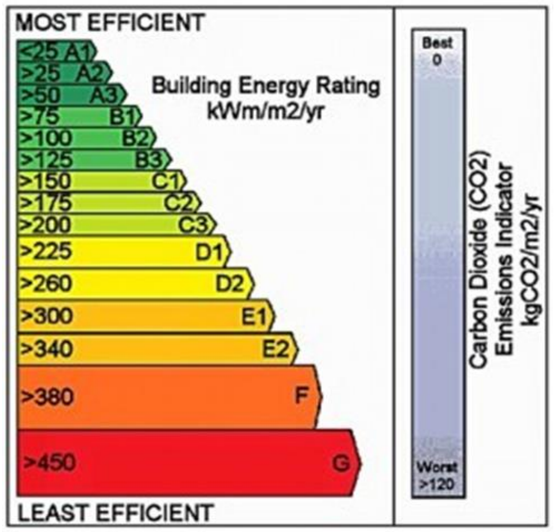
1.Carry out a Critical Literature Review to gain a full understanding on the background of the project.

2.Conduct a full BER Rating on the existing home, using the DEAP Calculation software.

3.Conduct a survey with people from relevant industries to gain more of an understanding on what changes should be made to the home.

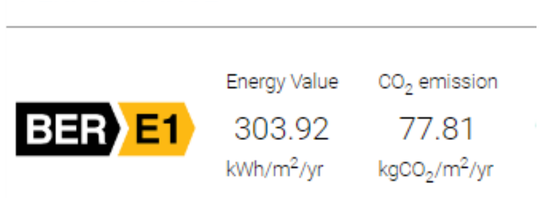
4.Using the advice from the people interviewed and my own research, make a list of changes that will be made to the home.

5.Re-do the full DEAP calculations on the upgraded house and get the new BER Rating for the house.



Initial DEAP Calculation

- Energy Value – 303.92 kWh/m^2/yr.
- CO2 Emissions – 77.81 kgCO2/m^2/yr.
- Carbon Performance Coefficient (CPC) – 2.631, largely above the maximum permitted 0.35.
- Energy Performance Coefficient (EPC) – 2.065, largely above the maximum permitted 0.3.
- Renewables – 0, largely below the minimum value of 0.2.
- Combined to give a BER of E1



Survey Results

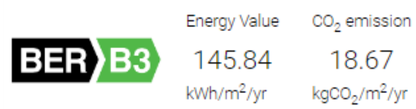
- In total, there was 21 responses to the 6-question survey.
- 11 respondents had heard of the Governments 'Climate Action Plan'
- The biggest recommendation for the home was adding Insulation throughout the home.
- 14 respondents said 'Yes' to having used the DEAP software provided by the SEAI and had an average rating of 3.29 stars out of 5.

Changes Made to Home

- PV Panels added to shed roof.
- Gas boiler replaced with Electric boiler to link with PV Panels
- All internal walls insulated and suspended ground floor insulated below.
- Demand Controlled Ventilation system installed.
- Windows upgraded to Triple glazing on the front and double glazing on the rear
- Lighting replaced with LED efficient bulbs.

Changes to BER

Measurement	Existing	Updated	% Change
Energy Value	303.92	145.84	52%
CO2 Emissions	77.81	18.67	76%
CPC	2.631	0.631	76%
EPC	2.065	0.991	52%
Renewables	0	0.219	-
BER Rating	E1	B3	-



Conclusion

- From gaining knowledge through the Literature Review and Surveys, the home was successfully upgraded from a BER of E1 to a B3, which is the minimum recommended rating.
- This meant the main aim of the project was a success

References

- SEAI Ireland
- Banking and Payments Federation Ireland
- Government of Ireland
- Irish Point of Single Contact