

Residential Buildings in Ireland: Approach to selecting the top 15% energy efficient buildings (derived from the Central Statistics Office methodology publications¹)

This document is sourced completely from the latest Central Statistics Office (CSO) publication: *'Domestic Building Energy Ratings'*, released on 10 July 2019¹, unless otherwise stated.

This memo serves as an executive summary of the publication in the context of identifying a suitable threshold to select the top 15% of energy efficient residential buildings in Ireland and should be read alongside the full publication itself.

This document also includes conclusions, which are made to provide clarity, explanation and context for its purpose. The conclusions are not part of the publication.

Definitions/clarifications:

BER (Building Energy Rating) – An Energy Performance Certificate for a building in Ireland

Domestic building BER – residential building BER

Non-domestic building BER – commercial building BER

Domestic vs. non-domestic BER – The SEAI (Sustainable Energy Authority of Ireland) uses two different methodologies to compute BER ratings depending on the type of building. A more detailed explainer on the difference can be found in the commissioned report on non-domestic BERs by technical building consultant KSN (published on AIB's green bond webpage).

National Representativeness – There were 835,483 unique domestic BERs (one per dwelling) completed in the period 2009 to the end of June 2019. This compares with around 1.66 million occupied private households enumerated in the 2011 Census of Population. The 2011 Census of Population included questions on county of location of the dwelling, the period when the dwelling was built, and the type of dwelling. These questions can be used to weight the BER data to national level. Table 15 presents an initial weighting of BERs up to national level of non-vacant households using the 2011 Census of Population. The weights were calculated by dividing the number of non-vacant households in the Census by the number of unique BER households. In cases where a household had more than one BER carried out in the period 2009-2019 only the most recent BER was used. Around 7% of Census households were excluded because there were no BER households in the particular stratum e.g. detached houses in Dublin 1 that were constructed in the period 1919-1945. A stratum was classified as a unique combination of County (52 categories - Dublin postal districts were distinguished), period of construction (nine categories) and dwelling type (four categories). The BER contains more disaggregated dwelling types, e.g. mid-terrace house, but these had to be aggregated to correspond to the Census classification.

Year of construction – when the dwelling was originally built

¹ <https://www.cso.ie/en/releasesandpublications/er/dber/domesticbuildingenergyratingsquarter22019/>
https://pdf.cso.ie/www/pdf/20190710083729_Domestic_Building_Energy_Ratings_Quarter_2_2019_full.pdf

Part 1 – BER eligibility criteria

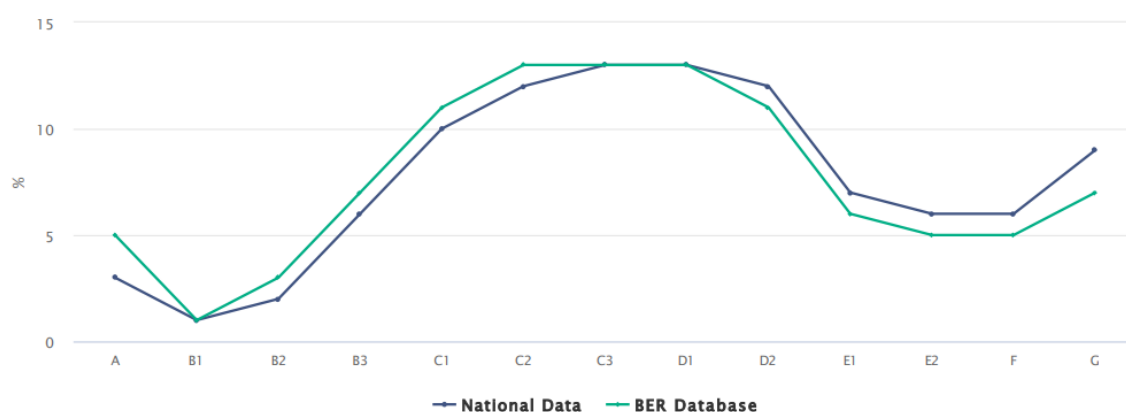
Tables & Figures:

Table 15 BER Ratings Weighted to National Level (2009-2019)

Dwelling Type	Energy Rating												Total	
	A	B1	B2	B3	C1	C2	C3	D1	D2	E1	E2	F		G
Apartment	4	2	6	9	11	11	10	11	11	7	5	5	8	164,512
Detached house	2	1	2	7	10	12	12	12	11	6	5	6	11	675,604
Semi-detached house	3	1	1	5	10	14	15	15	12	7	6	6	5	434,389
Terraced house	2	1	1	6	11	12	12	12	12	8	7	7	9	262,562
Total	3	1	2	6	10	12	13	13	12	7	6	6	9	1,537,067

Figure 3 Dwellings with BERs compared with All Dwellings (2009-2019)

Figure 3: Dwellings with BERs compared with All Dwellings (2009-2019) – data from Table 15¹



Source: CSO Ireland

¹Dwellings with BERs have been weighted using Census of Population 2011 data to estimate a BER profile for All Dwellings at National level (see Background Notes).

Table 15 examines the representativeness of dwellings that have a BER rating. The data were weighted up to national level using Census of Population 2011 figures. The national level data shows that 6% of dwellings in Ireland would have received a rating of "F" compared with 5% of dwellings that have had a BER assessment (see also Figure 3). Similarly, 9% of dwellings would have received a rating of "G" compared with 7% of dwellings in the actual BER data. In contrast, 3% of dwellings would have received an "A" rating at the national level, whereas 5% of dwellings that have had a BER assessment were given an "A" rating.

Conclusion 1: Approach to select top 15% energy efficient residential buildings in Ireland by BER rating

The publication provides two relevant data samples in tabular format, namely table 2 and table 15. Table 2 (next page) provides the distribution of all outstanding BERs. Given that outstanding BERs only have a coverage ratio of c. 50% relative to the total building stock (835,483/1.66 million), this may not be representative of the entire residential building stock in Ireland. Table 15 extrapolates the BER database to estimate the expected distribution for the whole building stock. The difference

when comparing these two distributions is shown in Figure 3, which shows that the BER database is more skewed to newer and hence more energy efficient buildings.

Taking this into account, Table 15 provides the best and most representative data to construct the top 15% BER rating threshold. The threshold thus lies between B3 and C1, where the cumulative total for B3 rated buildings and better equals 12%, and C1 and better equals 22%. Given that all B3 rated buildings and better are comfortably inside the 15% level, this is a valid eligibility criteria.

Part 2 – Building year eligibility criteria

Tables & Figures:

Figure 1 BER Ratings by Period of Construction

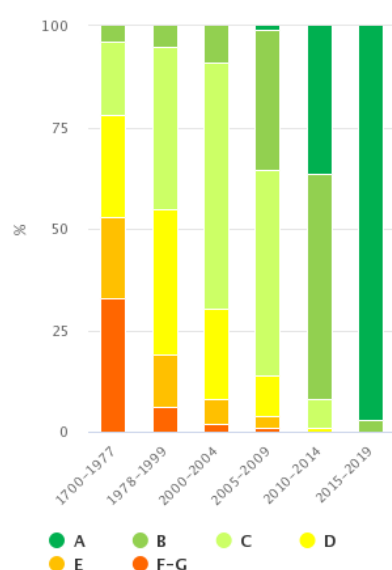


Table 2 BER Ratings by Period of Construction (2009-2019)

Period of Construction	Energy Rating													Total
	A	B1	B2	B3	C1	C2	C3	D1	D2	E1	E2	F	G	
1700-1899	0	0	1	2	2	3	4	7	10	9	10	14	38	21,697
1900-1929	0	0	1	2	2	3	4	7	10	9	10	14	37	46,641
1930-1949	0	0	1	3	4	5	7	9	12	10	10	13	25	40,717
1950-1966	0	0	1	3	5	6	8	11	14	11	11	13	17	63,442
1967-1977	0	0	1	3	6	9	11	15	17	11	9	9	8	82,005
1978-1982	0	0	1	4	8	13	15	18	18	10	6	4	3	53,761
1983-1993	0	0	1	4	9	13	16	19	18	8	5	4	3	89,661
1994-1999	0	0	1	5	11	15	19	20	14	6	4	3	1	97,086
2000-2004	0	0	2	8	17	22	21	14	8	4	2	2	1	151,528
2005-2009	1	3	10	21	24	18	9	6	4	2	1	1	0	142,533
2010-2014	36	29	17	10	4	2	1	1	1	0	0	0	0	10,892
2015-2019	97	2	1	0	0	0	0	0	0	0	0	0	0	35,520
Total	5	1	3	7	11	13	13	13	11	6	5	5	7	835,483

Conclusion 2: Approach to select top 15% energy efficient residential buildings in Ireland by building year

Part 1 proves that all BER ratings of B3 and better are within the top 15%. Figure 1 and Table 2 prove that almost all residential buildings built from 2015 will have an A label (97), and otherwise a B label (3%). Hence, a building year of ≥ 2015 can also be considered as a complementary criteria to selecting buildings within the top 15%.

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