

Irish Green Bond - Commercial Property

AIB Bank

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1.0 Introduction : Commercial Buildings in Ireland: Approach to selecting the top 15% energy efficient buildings. An approach to demonstrating greater than 30% energy efficiency improvement in existing buildings.

This memo serves as an executive summary to identify the energy efficiency of commercial buildings in Ireland so that the following two classifications can be categorised accurately and clearly:

- Identifies a suitable threshold criteria to select the top 15% of energy efficient commercial buildings in Ireland for Green Bonds
- Identifies a methodology to select building improvement projects showing 30% or more improvement in energy efficiency in Ireland for Green Bonds

This document is derived from an analysis completed by KSN and provided to AIB.

2.0 Definitions/clarifications:

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

Non-domestic 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. The methods reflect the relative complexity of the two building types. Residential buildings includes houses and apartments but does not include nursing homes or other institutional residential buildings such as prisons. Non-domestic buildings includes all other building types such as hotels, offices, retail buildings, warehouses, schools etc. A non-domestic BER can cover part or all of a building. For example, a retail unit within a shopping mall may have its own BER.

National Representativeness – The Central Statistics Office report that there were about 57,000 unique non-domestic BERs completed in the period 2009 to the end of June 2019¹, including public sector and industrial buildings. This compares with 109,000 commercial buildings² estimated by SEAI to be in existence in 2015. Data on the grade of BER rating was provided by the CSO for approximately 54,000 BERs. No other data is readily available to categorise buildings by their energy efficiency. Therefore BER is used as the criteria to qualify a building as being in the top 15% of performers from an energy point of view.

¹ <https://www.cso.ie/en/releasesandpublications/er/ndber/non-domesticbuildingenergyratingsq32018/> available on 6 August 2019.

² *Extensive survey of the commercial buildings stock in the Republic of Ireland, November 2015, SEAI.* <https://www.seai.ie/resources/publications/Extensive-Survey-of-Commercial-Buildings-Stock-in-the-Republic-of-Ireland.pdf> available on 2 August 2019.

3.0 Part 1 – Approach to selecting the top 15% energy efficient buildings.

Building Type	Energy Rating (% of row)													Total
	A	B1	B2	B3	C1	C2	C3	D1	D2	E1	E2	F	G	
Retail	0	1	4	9	17	15	10	11	7	5	4	6	12	20,603
Office	1	1	2	5	8	11	12	14	12	7	6	8	13	12,084
Restaurant/public house	0	1	2	4	8	10	11	19	17	11	7	6	4	5,101
Hotel	1	2	7	8	14	15	14	15	10	5	3	4	3	788
Warehouses	0	2	6	9	12	12	9	11	8	5	5	6	14	7,501
Workshops/maintenance depot	0	1	3	6	7	7	8	13	9	8	5	10	22	2,297
Industrial process building	2	13	13	10	11	9	6	10	5	5	4	3	8	1,135
Hospitals and primary health care	6	4	6	5	8	9	8	11	9	7	7	9	11	947
Community/day centre	4	3	12	12	13	10	7	9	7	5	4	5	8	906
Nursing residential homes and hostels	7	7	13	18	15	11	6	7	8	3	1	1	3	475
Schools and colleges	24	8	9	11	9	7	6	10	7	3	2	2	3	815
Sports facilities	3	6	11	13	12	10	8	10	8	5	2	6	8	493
Other	2	5	6	6	10	7	6	11	7	5	6	8	20	953
Total	1	2	4	8	12	12	10	12	9	6	5	6	12	54,098

Table 1 CSO Data on BER by Type of Building 2009-2019 (Non-Domestic)

The CSO publish data approximately every quarter on non-domestic BERs. Using the most recent CSO data shown in *Table 1*, the top 15% of the 54,000 BER ratings would result in 8,100 BERs as target BERs.

Energy Rating						
	A	B1	B2	B3	C1	C2 - G
Total	508	956	2,302	4,105	6,666	39,663
% of total with this rating	0.9%	1.8%	4.2%	7.6%	12.3%	73.2%
Cumulative total %	0.9%	2.7%	6.9%	14.5%	26.8%	100.0%

Table 2 BER Ratings Percentage by Grade

Table 2 was derived from *Table 1* and shows that to approach the 15% target, buildings highlighted in green with a rating of B3 or better would on average qualify, resulting in 14.5% of buildings being included. If C1 were used as the criteria, 26.8% of buildings would be included, almost double the 15% target. C1 is therefore not selected. Buildings with a BER rating of B3 to A1 are considered on average to be in the top 15% performers from an energy efficiency point of view.

Whilst the above is based on BERs published to date, future BERs will reflect recently introduced changes to Building Regulations and the above criteria will require periodic review to reflect these changes. More details on the impact of new Building Regulations are contained in wider analysis.

Other methods of classification were considered for this such as LEED rating, BREEAM rating, Irish Building Regulations, year of construction, Display Energy Certificates, M & V reporting, etc. These were however not brought forward due to insufficient data availability and consistency of energy usage within these. Whilst there is a coverage ratio of approximately 50% of the total estimated stock, using the BER database is still the most representative and hence best approach.

Complimentary eligibility criteria:

Statutory Instrument S.I. 426 of 2014 requires that “A public body shall not, from 1 January 2015, purchase or lease a building, or a portion of a building, for its own use, unless that building has a BER equal to or better than A3.” The requirement does not apply to buildings already occupied, plus some other exceptions. As this Statutory Instrument is binding in most cases, it is reasonable to assume that a building purchased or leased from 2015 by a public body will have an A3 BER rating or better.

The Building Regulations do not provide an explicit mechanism to identify the top 15% of buildings in terms of energy performance, because there is no available data on how many buildings were built in each year to a particular year’s regulations. However, it is reasonable to assume that a building built in compliance with Building Regulations 2017 will be in the top 15% at present (i.e. built from 2020).

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

For green bonds loans to the top 15% of energy performing commercial buildings a BER cut-off of B3 or better is used which captures about 14.5% of BERs. The criteria will require review at regular intervals to reflect continuing improvement in building energy efficiency and other changes.

To complement the B3 and better criteria recommendation, the following criteria also apply:

- All buildings built after 2020 will also fall inside our definition of the top 15%,
- All buildings purchased or leased from 2015 by a public body (will have an A3 rating or better).

4.0 Part 2 - Approach to demonstrating greater than 30% energy efficiency improvement in existing buildings.

Similar to Part 1 the most consistent and available data to consider this criteria is the Building Energy Rating of properties.

KSN performed an analysis of a sample of 159 office buildings to find an adequate threshold for BER grade improvements. The analysis suggests that grade changes of between 1 and 4 grades are necessary to guarantee at least 30% improvement in energy efficiency on every individual project, but that on average across this sample improving by 3 BER grades provides 35% savings in aggregate and improving by 2 BER grades provides 26% savings in aggregate based on the number of BER. To ensure that buildings after renovation are reasonably efficient, a minimum BER criteria of C3 should be introduced.

Taking into account the sample size used in making this recommendation, we therefore recommend that the improvement should be at least 3 grades and a C-3 rating should be achieved, which is a conservative approach. Buildings which are already B1, B2 or B3 are unlikely for the present to find it economic to upgrade, but the following may be accepted:

- C1 to B1 or better
- C2 to B2 or better
- C3 to B3 or better
- D1 to C1 or better
- D2 to C2 or better
- E1 to **C3** or better
- E2 to **C3** or better
- F to **C3** or better
- G to **C3** or better

This method requires two BER ratings be prepared, one of the building before improvement and one after the improvement measures are planned.

Another method is for two BER ratings to be prepared as stated in the previous section, but the performance improvement to be calculated based on the building's BER calculated carbon dioxide emissions in kg CO₂/m²/yr.

The performance improvement is best calculated based on the carbon dioxide emissions in kg CO₂/m²/yr. shown on the building's BER both before renovation and with the proposed renovations i.e. a comparison of two BERs. Figure 1 shows a clip from a BER certificate indicating kg CO₂/m²/yr.

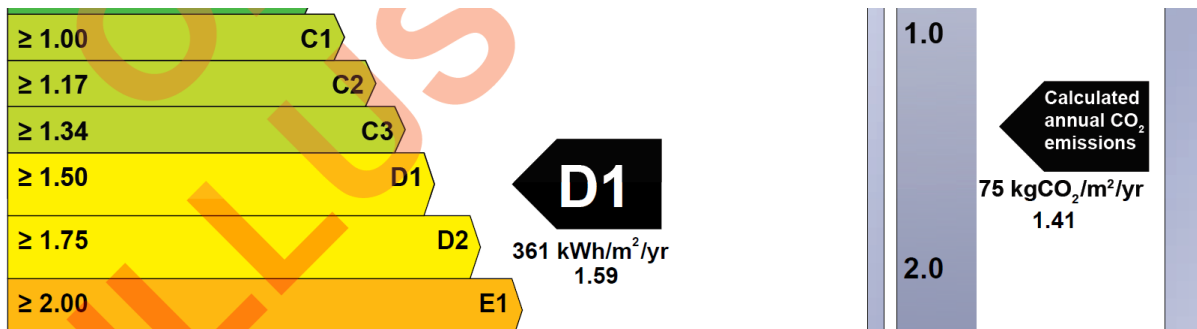


Figure 1 Clip from BER Certificate

For example, a building with emissions of 75 CO₂kg/m²/yr. before improvement with anticipated emissions of 52.5 CO₂kg/m²/yr. after renovation, an improvement of exactly 30%, could be considered eligible. Once the measures have been implemented, the improved BER can be confirmed.

Conclusion 2: Approach to demonstrating greater than 30% energy efficiency improvement in existing buildings

The criteria for 30% improvement is to be determined based on BERs calculated on the building as it exits and as proposed with improvements, and confirmed once the proposals are implemented. The 30% improvement will be in terms of CO₂kg/m₂/yr. which is readily available on the BER certificate. Alternatively, if a three step improvement in BER is witnessed then this may also be used to select a renovated building with at least a 30% improvement.

5.0 Final Conclusions

We have found that the only satisfactory data available on commercial buildings in Ireland is aggregate BER data. There is a dearth of other data.

For green bond loans to the top 15% of energy performing commercial buildings we recommend a BER cut-off of B3 or better for existing buildings which captures about 14.5% of BERs.

We note that BERs have only been published for a representative of 50% of the total commercial building stock and hence there are some buildings without a BER label that should be included, however this is still the best approach given the non-conformity of BER label with buildings regulations/ year of construction. Buildings without a BER would have to obtain one.

Due to a change in BER methodology due to come on line in September, buildings assessed to the new methodology will have to be assessed with an adjusted criteria. The adjusted criteria cannot be determined until sufficient data is available which may not be until as late as spring 2021. In the interim, we recommend buildings assessed using the new methodology (iSBEMie v5.5.h) be considered green bond compliant if they are C3 rated or better.

Additionally, all buildings built after 2020 will also fall inside the top 15%, given much stronger 2017 building regulations, as well as all buildings purchased or leased from 2015 by a public body, given the statutory requirements of an A3 BER rating or better.

Concerning renovations, we recommend that a BER be prepared of the building under consideration as it exists, and with the proposed improvements. If the change in predicted carbon emissions is reduced by 30% or a three step improvement in BER is witnessed, then the building should be regarded as compliant. The compliance could be confirmed after improvements are made.

All referenced BERs should be formally published on SEAI's website, not informal draft BERs.

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