

Energy efficiency of community buildings across England: A descriptive analysis

An investigation into energy efficiency in the social sector in England.



Social Investment Business Research

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Executive Summary

This research report, conducted by the Social Investment Business, examines the energy efficiency of over 13,000 community buildings in England.

Key findings reveal:

- 7,375 community buildings do not meet a basic energy efficiency standard of EPC rating C, commonly suggested as the minimum required for sale or let.
- Just 18 buildings have achieved the top-tier EPC rating of A+, meaning that they are ready for Net Zero. Meanwhile, a staggering 790 buildings languish at the G rating, the lowest band available.

England's most deprived neighbourhoods have community buildings that are less energy efficient.

- 3 in 5 community buildings in England's most deprived areas across the Index of Multiple Deprivation (IMD) do not meet basic levels of energy efficiency. The data showed that in neighbourhoods with higher levels of deprivation, the community buildings are more energy inefficient.

The North of England has fewer energy efficient community buildings than the South

- The data showed that Northern regions of England have the highest proportion of inefficient community buildings, with 60% having an EPC rating of D or less.
- The North of England also has fewer energy efficient buildings, and more that are very inefficient (EPC rated F and G).

The research was carried out using data from the publicly available Non-Domestic EPC register.



Introduction

Community centres lie at the heart of towns, cities, and local areas right across England. Whether a local village hall, a church hall, or a public nursery, they help build a sense of community belonging and provide vital space for events, meetings, and get-togethers. As the focus of energy efficiency efforts has largely been on the residential sector, we know very little about just how energy efficient these buildings are.

Our research adds to the developing picture of energy performance in the social sector by examining the energy efficiency of community-related buildings across England.

This is critical to understand as we work towards meeting the law set in 2019 to reach Net Zero by 2050. To deliver on Net Zero there are likely to be incremental rule changes for Energy Performance Certificate (EPC) ratings, a measure of how efficiently a building uses energy. A 'C' rating is commonly suggested as the minimum required for sale or let in proposed legislation of domestic properties by 2035, whilst a minimum of 'B' has been suggested for renting non-domestic properties by 2030¹.

The data used in this paper comes from the Non-Domestic EPC register² and has been filtered to include only community-related property types³. Our research shows that just 18 such buildings have achieved the top-tier EPC rating of A+ (i.e. ready for Net Zero), while 790 buildings are rated G, the lowest band available. It shows that over 7,300 community buildings in England do not meet a basic EPC rating of C, and over 10,000 do not meet an EPC rating of B (see Figure 1).

By looking at EPC ratings across the nine regions, and across the Index of Multiple Deprivation (IMD) we can see progress on energy efficiency is not equitable across England. IMD is a measure of deprivation which places an area into deciles, that is 10% bands, of deprivation based on seven factors including income deprivation and living environment deprivation⁴. Our findings show that the most deprived areas hold only half the proportion of very efficient buildings compared to their less deprived counterparts. There are also significant differences in energy efficiency between Northern and Southern regions. The methodology for this analysis can be found in Appendix 1.

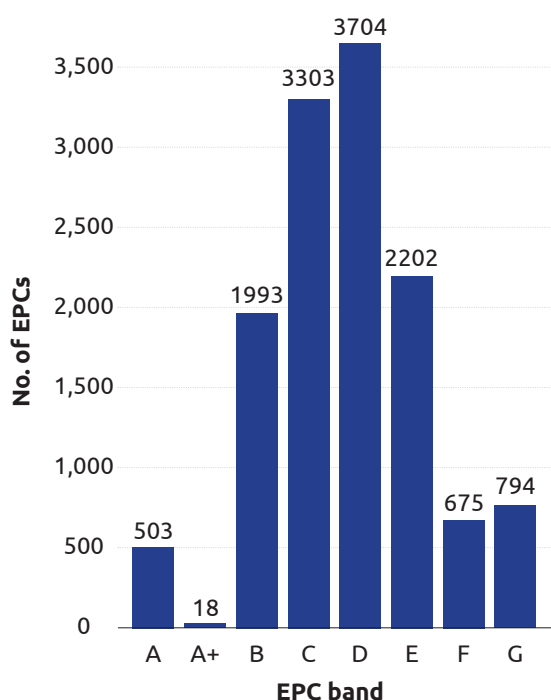


Figure 1

¹ <https://bills.parliament.uk/bills/3036>

² <https://epc.opendatacommunities.org/non-domestic/search>

³ See Appendix 2 for list of property types included.

⁴ <https://www.gov.uk/government/publications/english-indices-of-deprivation-2019-technical-report>

Key Terms Used Throughout the Paper

EPC (Energy Performance Certificate)⁵

- A certificate issued to a building by an accredited assessor, rating the building’s energy efficiency from A+ (most efficient) to G (least efficient) (for the full bandings, see Appendix 2).
- EPC bands are calculated based on the EPC score given to a building. They are usually scored from 0 to 150, the bands go up in 25-point intervals, 1 – 25 = A, 26 – 50 = B, etc. Buildings can be scored above 150 if their building is especially inefficient.
- Valid for 10 years.
- Required by a building to be bought, sold, or let.
- Used by the Government to keep track of energy efficiency in England and the current means of creating legislative standards.⁶

IMD (Index of Multiple Deprivation)⁷

- Small area (LSOA – Lower Layer Super Output Areas) measure of relative deprivation (published by the Ministry of Housing, Communities & Local Government) ranked from 1 (most deprived) to 32,844 (least deprived).
- Rankings are condensed into deciles, with IMD 1 being the most deprived 10%, and IMD 10 being the least deprived 10%.

Northern Regions

- When referring to ‘Northern Regions’, this includes North East, North West, and Yorkshire & The Humber.

Very Inefficient

- Refers to EPC ratings of F and G.

Average Efficiency

- Refers to EPC ratings C, D and E, which are the most common ratings based on our data.

Very Efficient

- Refers to EPC ratings A+, A and B.

Net Zero ready

- Refers to EPC rating A+ (an EPC score of 0 and below).

Buildings/Community Centres/Community Buildings

- Refers to the buildings in our data, based on property type classifications (see Appendix 3).

Charity Commission Data

- A public database containing all charities registered in the UK⁸.

| Region | Population | % of Population in England | Community Buildings with EPC | % of all Community Building EPCs |
|--------------------------|------------|----------------------------|------------------------------|----------------------------------|
| London | 8,796,628 | 15.6% | 2187 | 16.6% |
| South East | 9,294,023 | 16.4% | 2159 | 16.4% |
| East of England | 6,348,096 | 11.2% | 1568 | 11.9% |
| North West | 7,422,295 | 13.1% | 1472 | 11.2% |
| South West | 5,712,840 | 10.1% | 1383 | 10.5% |
| West Midlands | 5,954,240 | 10.5% | 1378 | 10.5% |
| East Midlands | 4,880,094 | 8.6% | 1269 | 9.6% |
| Yorkshire and The Humber | 5,481,431 | 9.7% | 1135 | 8.6% |
| North East | 2,646,772 | 4.7% | 620 | 4.7% |
| Total | 56,536,419 | 100% | 13,171 | 100% |

Figure 2

⁵ Data available at: <https://epc.opendatacommunities.org/>

⁶ Minimum energy performance bill, available at: <https://bills.parliament.uk/bills/3036>

⁷ Data available at: <https://www.gov.uk/government/collections/english-indices-of-deprivation>

⁸ Data available at: <https://www.gov.uk/government/organisations/charity-commission>

Regional Analysis

Breaking down the number of community building certificates⁹ across the country we see that they are broadly proportional to 2021 population of the given area¹⁰ (see Figure 2). The North East has the fewest buildings at 4.7%, but also has the lowest proportion of the population at 4.7%. In fact, the largest deviation was in the North West, which has a 1.9 percentage point difference between the population percentage and the percentage of community building EPCs.

Despite a fairly equal distribution of community building EPCs in relation to the population, the actual efficiency of those EPCs is more varied. In all regions around 70% of EPCs fall into bands C, D, or E. However, the Northern regions have both fewer very efficient buildings that are rated B and above and more that are very inefficient, rated F or G.

Put simply, across the North of England, community focussed buildings have lower energy efficiency. This is despite the North of England tending to have cooler, wetter and more windy weather than the South of England. This is notable when looking at the most energy inefficient buildings. In London, the East of England, and the South East, 9% of buildings are rated F or G, which is over 30% better than the rest of the country (at 13%). Across all regions, the figure is 11.2%, of which there is

over a 40% difference between Yorkshire and the Humber (the highest) and London (the lowest), highlighting the large differences between regions (see Figure 3).

These discrepancies show that certain parts of the UK could face a much tougher challenge improving energy efficiency and reaching Net Zero. Buildings that are rated F or G are buildings that require the most significant upgrades to achieve average efficiency. This means that targeted support will be needed to ensure these areas can achieve improved energy efficiency.

Northern regions have the highest proportion of inefficient community buildings with 60% of them having an EPC rating of D or less (see Figure 4). In comparison to the rest of the country which is slightly better at 54%. Our data shows that over 7,000 community buildings across the country are not meeting a basic level of energy efficiency. This does not account for any buildings which do not currently have an EPC certificate. As EPC certificates are not compulsory for all buildings, only in a pre-determined set of circumstances, the number of EPC certificates will be lower than the actual number of buildings. We therefore expect the real number of very inefficient buildings be much higher, not least because they are likely to be older and have received less investment.

% of EPC ratings by Region and EPC group

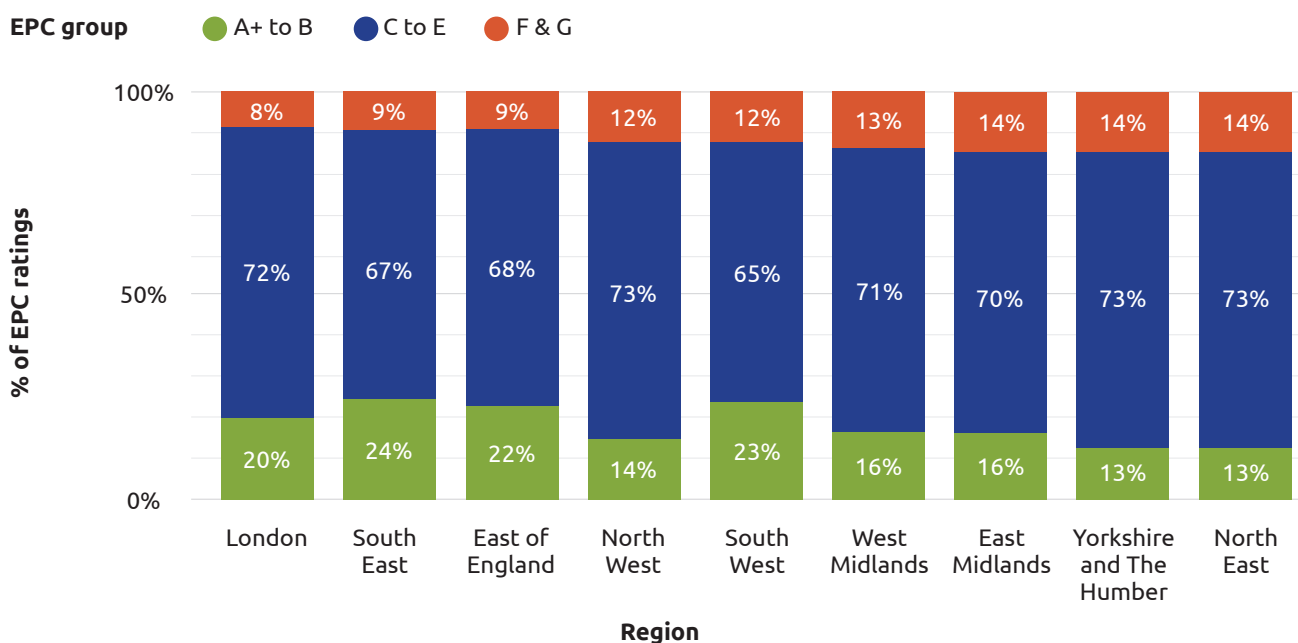


Figure 3 - note EPC totals may differ slightly if address fields could not be successfully matched to IMD or region.

⁹ As seen in the Appendix 1, we removed buildings with multiple EPC certificates keeping only the newest one. As such, we use number of EPC certificates as a proxy to the number of buildings in our dataset.

¹⁰ <https://www.statista.com/statistics/294729/uk-population-by-region/>

Northern Regions compared with England

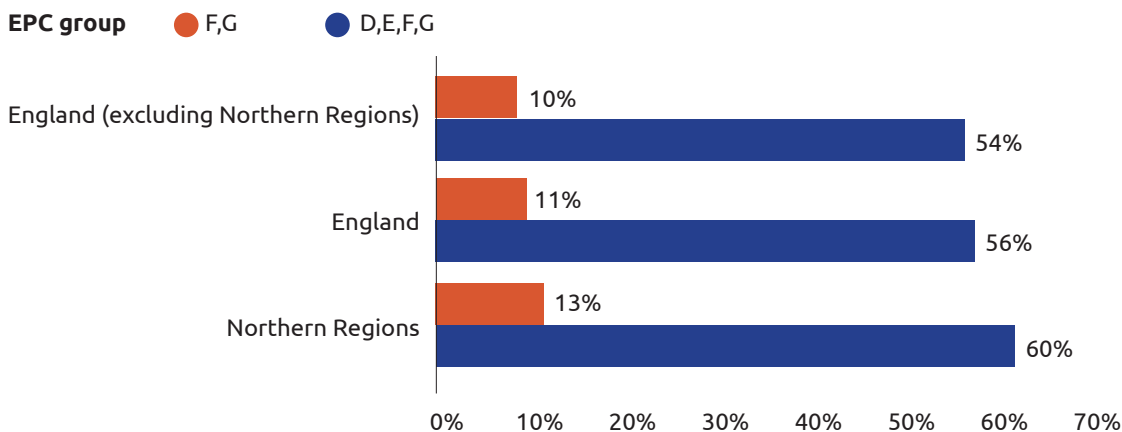


Figure 4

We can further see this broken down if we split out the regions, with a clear trend showing buildings in Southern regions being more efficient than Northern ones.

Northern regions have a higher percentage of very inefficient buildings alongside a larger average floor area for community buildings (Figure 5 and 10). This combination creates a regional challenge for community buildings in the North to reach Net Zero or meet any legislative changes to increase EPC ratings.

| Region Group | Very Efficient | Average Efficiency | Very Inefficient |
|--------------------------|----------------|--------------------|------------------|
| South East | 24% | 67% | 9% |
| East of England | 22% | 69% | 9% |
| South West | 22% | 66% | 12% |
| London | 20% | 72% | 8% |
| West Midlands | 16% | 71% | 13% |
| North West | 14% | 73% | 12% |
| East Midlands | 16% | 70% | 14% |
| Yorkshire and The Humber | 13% | 73% | 14% |
| North East | 13% | 73% | 14% |

Figure 5 - Regions ordered by percentage of community centres which are "Very Efficient"



Net Zero ready? – Evidence says the social sector is not.

When a building is given an A+ rating by an assessor it means that the building is Net Zero compliant. There are just 18 Net Zero community buildings in the UK (at the time of this analysis), with 11 of them being in South West and East of England and the rest of the country sharing the remaining 7. It is clear if the third sector is to move to Net Zero, work is needed to improve the energy efficiency of the community buildings used.

IMD

Looking into EPCs across the Index of Multiple Deprivation (IMD) we can see that the higher the deprivation level (the lower the IMD), the more energy inefficient the buildings are.

If we compare the very efficient buildings between the most and least deprived areas, IMD 1 and 10 respectively, the proportion of very efficient buildings in the most deprived areas in England is half that of the least deprived areas (see Figure 6). This trend is also linear; as deprivation increases, so too does energy inefficiency.

There could be many different reasons for this trend. As costs to renovate buildings are often large, more deprived areas are less likely to be able to absorb these costs at their own expense. They may also be less likely to have newer buildings and rely on existing old building stock in the social sector.

We can also see from Figure 7 that there are more community building EPCs in deprived areas. This means targeted resources will be required for deprived areas of England in order to ensure we meet our Net Zero ambitions.

There is also a difference between high and low deprivation areas when it comes to the quality of their newly constructed buildings (see Figure 8). In IMD 10 (the least deprived decile) over 40% of newly built buildings are a band A or above. This is in comparison to just over 20% of new buildings in IMD 1. This again suggests that the large cost burden of building highly efficient properties could be a barrier for deprived areas to enable them to have the same level of efficiency as their more affluent counterparts.

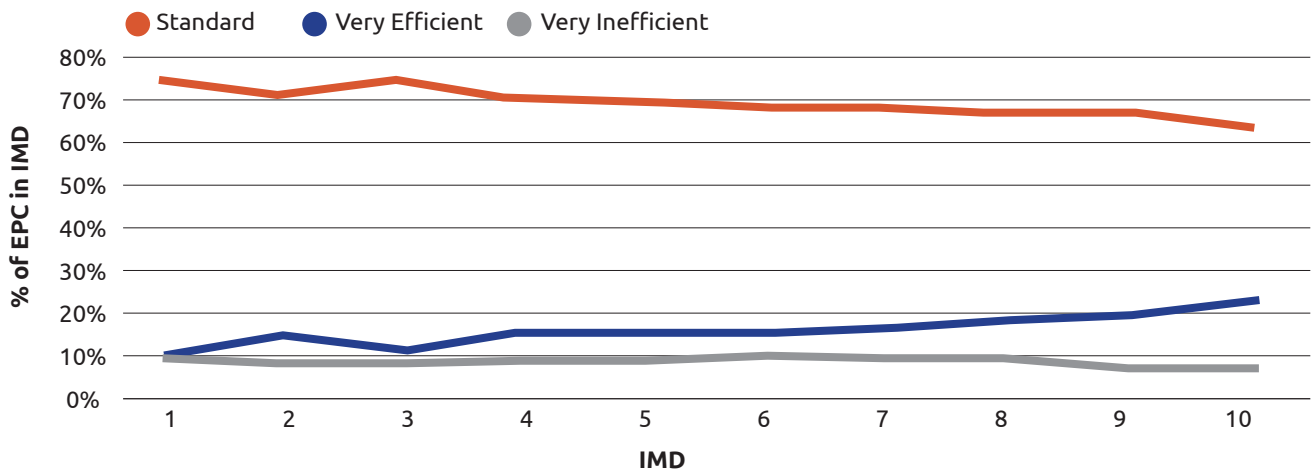


Figure 6

Community Building EPCs by IMD

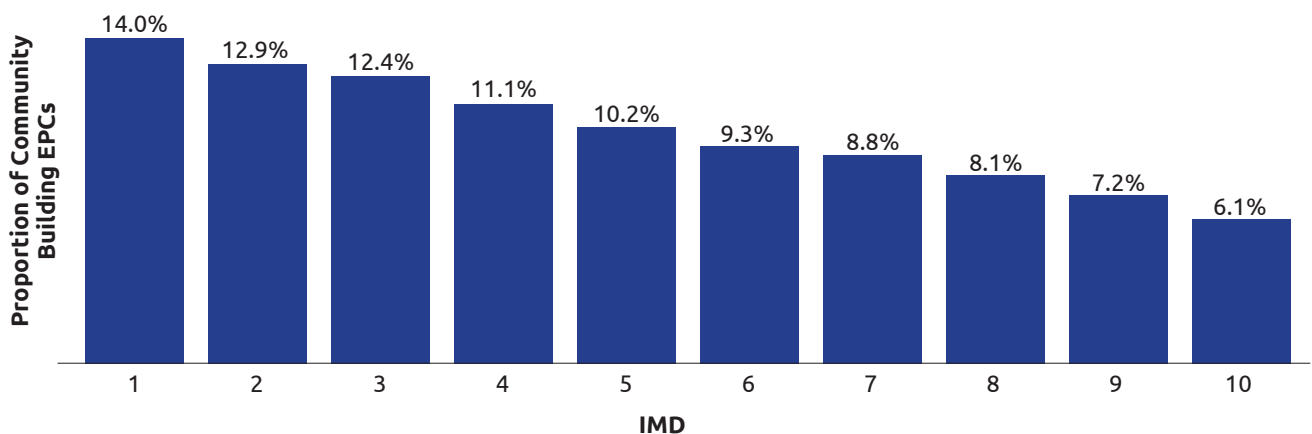


Figure 7

Breakdown of Newly Constructed Very Efficient Buildings by IMD & EPC band

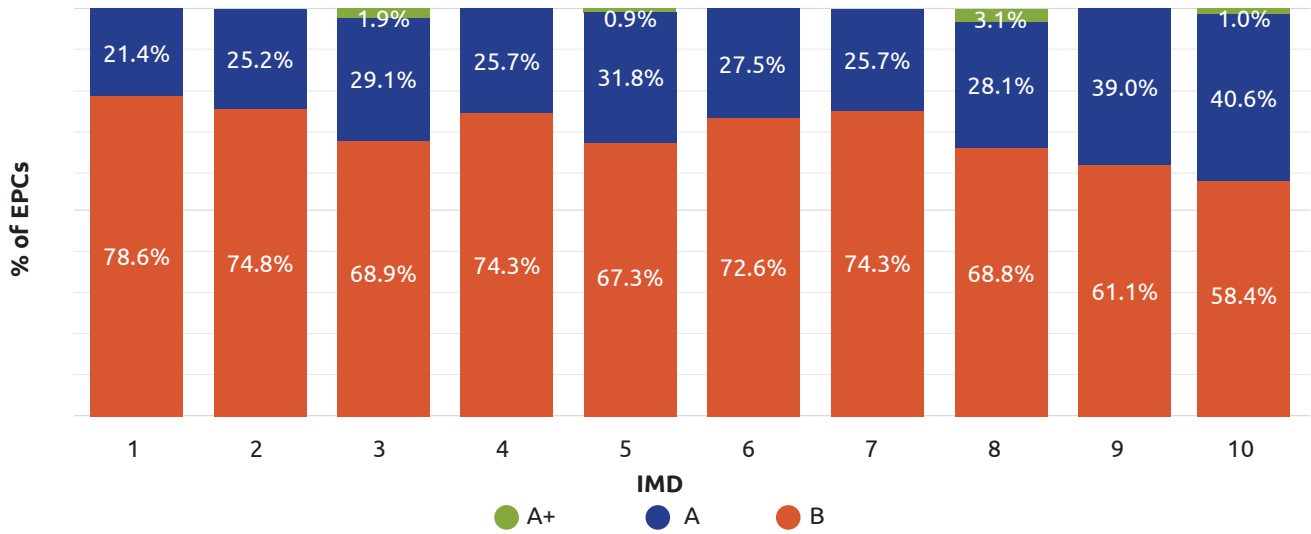


Figure 8

Is building size the reason?

It is worth exploring if the potential explanatory factor for EPC performance may be the variation in floor size within different IMDs and regions. We mapped building

size of our social sector buildings and did notice a regional difference with Northern regions having larger buildings. It is also true that more deprived areas tend to have larger buildings. Perhaps not a surprise as land is likely to be cheaper in more deprived areas.

Median Floor Area by IMD

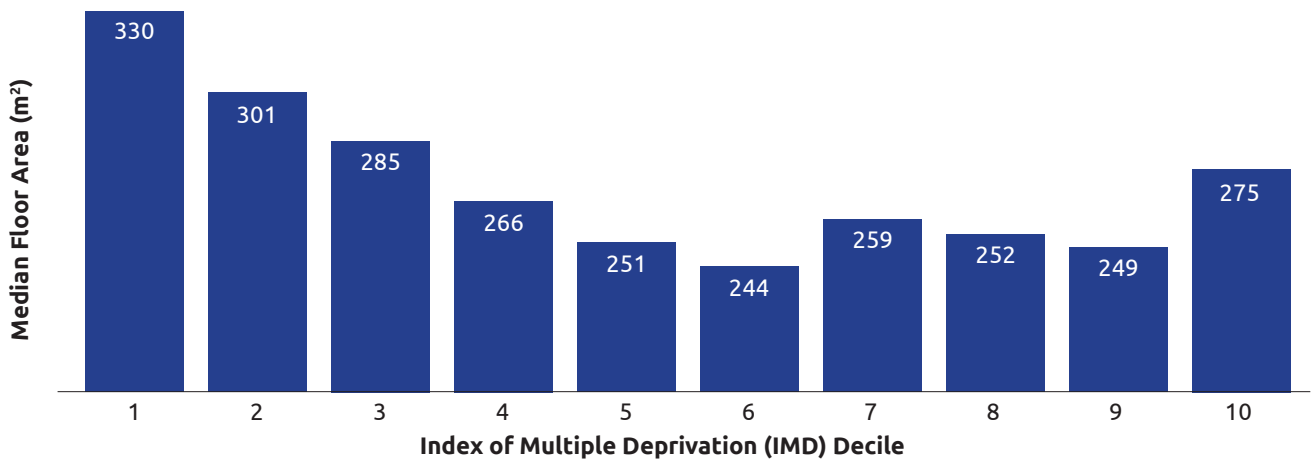


Figure 9

This may suggest that the issue is that larger buildings have lower energy efficiency and this would explain the regional and deprivation trends. However, when analysing the data the opposite is true; larger buildings tend to be more efficient, not less.

We completed a correlation coefficient for the entire dataset of size and EPC score, which resulted in a

correlation of -0.14, meaning as size increases EPC rank declines (which means a higher EPC band and better efficiency). We also ran a regression equation between EPC score (Y) and size of venue which resulted in a negative relationship. This means that there is an added burden for the poorest areas of the country, as building size is not the reason behind lower energy efficiency.

Median Floor Area by Region



Figure 10

Considering the proposed aims for all buildings to reach rating C or higher in the next 10 years, and the suggested Private Members' bill requiring the non-residential sector to reach B by 2030, there is still a huge way to go for the social sector to meet this target.

There is a large disparity between IMDs, with 61% of EPCs not meeting EPC C in the most deprived 10% of communities in England, a figure which drops to 45% in the least deprived 10% of communities. 3 in 5 community buildings in deprived areas do not meet basic levels of energy efficiency. Not only is this an issue for reaching Net Zero, but this could impact the useability of these buildings. If environmental regulations are implemented without addressing the deprivation and regional divide, it will disproportionately impact the resilience of the social sector and communities in the most deprived areas.

This demonstrates the need to focus spending on areas of higher deprivation first where the need is greater and the return higher – in service improvement as well as carbon reduction.

Conclusion

Our exploration of energy efficiency illuminates a difficult reality; there is an uneven playing field for the social sector. Poorer and more Northern areas have worse EPC ratings. The deprivation difference is also notable with the most deprived areas only having half the proportion of highly efficient buildings as the wealthiest.

If we are to meet our Net Zero targets and support a just transition away from carbon then funding will need to be directed to areas where fewer buildings are energy efficient and needs are greater. This could also mean the payoff will be larger with targeted support of these areas.

But numbers don't tell the whole story. Many of these buildings are larger in size and located in more deprived areas which are often financially constrained. These structures predominantly serve community and charitable purposes and unlike their for-profit counterparts, they operate without substantial financial reserves. The organisations that run these buildings often do not have the additional funding available for these urgent renovations.

These buildings are at the centre of local communities and improving their energy efficiency could ensure the future viability of these hubs. Investing in this transformation ensures that community-focused organisations can continue serving without being unduly burdened.

If we want to meet our Net Zero ambitions, and we want to allow community groups to thrive, there must be additional work to address this discrepancy and improve energy efficiency in community facilities.

Appendix 1

Methodology

Utilising public access to national data, we took the 1.29 million non-domestic EPCs available to us in December of 2023, with an EPC registered before the 1st July 2023 (our dataset ranges from 24/12/2007 to 30/06/2023), we applied filtering to the listed 'Property Type' so that it included only those that are community related. Please note this data does not include every community building in England. Buildings are not obligated to get an EPC assessment if they are not planning to market that building, meaning a community organisation that has owned a building since before 2008 would not appear on the EPC register. We filtered our data to include only the most recent EPCs for each building, this is so we have as current a view of the state of the sector as we can.

To increase our confidence that we were focussing on the social sector, we completed a manual check of a random sample of 301 organisations to check whether they are community-led or private. The sample shows a low proportion of private businesses and is sufficiently large a sample to conclude that there is a low prevalence throughout the dataset, whilst all other businesses have a clear social purpose. We then merged this data with the publicly accessible IMD data on postcode. Our resulting dataset has 13,187 community and day centre buildings, offering a comprehensive look at energy efficiency trends.

Then to ensure this data is representative of the not-for-profit sector, we conducted a word search inspection in Python which showed common buildings including churches, community centres, nurseries, day centres, etc. A full breakdown of named centres is found in the Appendix.





Appendix 2

Property Type is a field in the EPC Non-Domestic dataset. It is a description of the type of building being inspected, and is based on planning use class. The property types used in our sample are:

- D1 Non-residential Institutions - Community/day centre
- Community/Day Centre
- Non-residential Institutions: Community/Day centre

These buildings can be further sub divided into various categories below. These categories are a word search of the address name and are indicative only.

| Category | Proportion of Community Building Certificates |
|--------------------------|---|
| Community | 15% |
| Church | 8% |
| Nursery | 5% |
| Children | 4% |
| Village Hall | 4% |
| Youth | 2% |
| Day Centre | 2% |
| Play | 1% |
| Social | 1% |
| Sport | 1% |
| Recreation | 0% |
| The Royal British Legion | 0% |
| Clubs | 0% |
| Scouts | 0% |
| Islamic | 0% |
| Museum | 0% |
| Cinema | 0% |
| Not-categorised further | 57% |

Appendix 3

These tables show the summary data for analysis in this report:

| ASSET RATING BAND | A | A+ | B | C | D | E | F | G | Total | | | | | | | |
|--|------------|--------------|-------------|---------------|-------------|---------------|-------------|---------------|-------------|---------------|------------|--------------|------------|--------------|--------------|-------------|
| Index of Multiple Deprivation (IMD) Decile | % | % | % | % | % | % | % | % | % | | | | | | | |
| 1 | 31 | 1.74% | 201 | 11.28% | 460 | 25.81% | 539 | 30.25% | 338 | 18.97% | 103 | 5.78% | 110 | 6.17% | 1782 | 100% |
| 2 | 55 | 3.35% | 239 | 14.54% | 419 | 25.49% | 476 | 28.95% | 280 | 17.03% | 93 | 5.66% | 82 | 4.99% | 1644 | 100% |
| 3 | 42 | 2.67% | 190 | 12.09% | 415 | 26.42% | 453 | 28.84% | 303 | 19.29% | 79 | 5.03% | 87 | 5.54% | 1571 | 100% |
| 4 | 39 | 2.74% | 218 | 15.34% | 335 | 23.57% | 430 | 30.26% | 234 | 16.47% | 71 | 5.00% | 91 | 6.40% | 1421 | 100% |
| 5 | 54 | 4.16% | 187 | 14.40% | 346 | 26.64% | 376 | 28.95% | 190 | 14.63% | 68 | 5.23% | 76 | 5.85% | 1299 | 100% |
| 6 | 44 | 3.73% | 176 | 14.92% | 306 | 25.93% | 328 | 27.80% | 178 | 15.08% | 67 | 5.68% | 79 | 6.69% | 1180 | 100% |
| 7 | 41 | 3.64% | 185 | 16.44% | 255 | 22.67% | 305 | 27.11% | 207 | 18.40% | 58 | 5.16% | 72 | 6.40% | 1125 | 100% |
| 8 | 54 | 5.24% | 163 | 15.83% | 225 | 21.84% | 294 | 28.54% | 165 | 16.02% | 54 | 5.24% | 70 | 6.80% | 1030 | 100% |
| 9 | 51 | 5.59% | 160 | 17.52% | 219 | 23.99% | 248 | 27.16% | 144 | 15.77% | 41 | 4.49% | 49 | 5.37% | 913 | 100% |
| 10 | 57 | 7.30% | 150 | 19.21% | 224 | 28.68% | 176 | 22.54% | 97 | 12.42% | 33 | 4.23% | 43 | 5.51% | 781 | 100% |
| Total | 468 | 3.67% | 1869 | 14.66% | 3205 | 25.14% | 3625 | 28.44% | 2136 | 16.76% | 667 | 5.23% | 759 | 5.95% | 12746 | 100% |

| ASSET RATING BAND | A | A+ | B | C | D | E | F | G | Total | | | | | | | |
|--------------------------|------------|--------------|-------------|---------------|-------------|---------------|-------------|---------------|-------------|---------------|------------|--------------|------------|--------------|--------------|-------------|
| Region | % | % | % | % | % | % | % | % | % | | | | | | | |
| East Midlands | 46 | 3.63% | 161 | 12.70% | 300 | 23.66% | 359 | 28.31% | 226 | 17.82% | 77 | 6.07% | 98 | 7.73% | 1268 | 100% |
| East of England | 83 | 5.29% | 262 | 16.71% | 393 | 25.06% | 428 | 27.30% | 252 | 16.07% | 71 | 4.53% | 75 | 4.78% | 1568 | 100% |
| London | 92 | 4.21% | 349 | 15.96% | 569 | 26.02% | 649 | 29.68% | 350 | 16.00% | 77 | 3.52% | 99 | 4.53% | 2187 | 100% |
| North East | 16 | 2.58% | 66 | 10.65% | 164 | 26.45% | 184 | 29.68% | 104 | 16.77% | 41 | 6.61% | 44 | 7.10% | 620 | 100% |
| North West | 26 | 1.77% | 187 | 12.70% | 385 | 26.15% | 431 | 29.28% | 264 | 17.93% | 78 | 5.30% | 101 | 6.86% | 1472 | 100% |
| South East | 118 | 5.47% | 397 | 18.39% | 530 | 24.55% | 555 | 25.71% | 354 | 16.40% | 103 | 4.77% | 100 | 4.63% | 2159 | 100% |
| South West | 63 | 4.56% | 242 | 17.50% | 313 | 22.63% | 381 | 27.55% | 209 | 15.11% | 77 | 5.57% | 91 | 6.58% | 1383 | 100% |
| West Midlands | 32 | 2.32% | 195 | 14.16% | 368 | 26.72% | 402 | 29.19% | 205 | 14.89% | 73 | 5.30% | 102 | 7.41% | 1377 | 100% |
| Yorkshire and The Humber | 24 | 2.11% | 128 | 11.28% | 278 | 24.49% | 311 | 27.40% | 235 | 20.70% | 79 | 6.96% | 79 | 6.96% | 1135 | 100% |
| Total | 500 | 3.80% | 1887 | 15.09% | 3300 | 25.06% | 3700 | 28.10% | 2199 | 16.70% | 676 | 5.13% | 789 | 5.99% | 13169 | 100% |

Note: Totals may differ slightly if address fields could not be matched to IMD or region

