



CARBON BITES

From the CIBSE ENERGY PERFORMANCE GROUP

How to Enhance Building Energy and Environmental Assessment Certification (BEEAC)

On 14th November 2018, Emeka Efe Osaji delivered a CIBSE ASHRAE Group webinar, entitled “Enhancing Building Energy and Environmental Assessment Certification (BEEAC)”. It is available at: <https://www.cibseashrae.org/presentations/Osaji141118.pdf>

The importance of 13 of 55 global BEEAC tools was determined based on 78 to 140 countries where they are (or have been) used. Half of the top four of these tools are UK tools such as CEEQUAL and BREEAM. The UK also uses more BEEAC tools than other countries.

BEEAC tools share an underlying principle to facilitate: **(1)** Transparency; **(2)** Certification; **(3)** Rating; and **(4)** Efficiency in the energy performance of buildings. BEEAC tools also include Energy Performance Certificates (EPCs) such as the Display Energy Certificate (DEC) and its Advisory Report (AR) that also share this underlying principle. The DEC was introduced by the UK Government in response to the Energy Performance of Buildings Directive (EPBD) and transposed into regulations in 2007. The DEC is unique since it is based on actual energy use data and issued for non-domestic buildings: **(1)** Greater than 250m²; **(2)** Occupied by public authorities; **(3)** Providing public services; and **(4)** Frequently visited by the public.

However, in practice, the DEC and AR processes have been plagued with the issue of non-compliance. Although their process-flow involves seven phases, four of these appear to be when and where process-flaws occur. These are the 2nd Phase (Pre-Commission Phase), 3rd Phase (New Commission Phase), 4th Phase (Lodgement Phase), and 7th Phase (Renewal Commission Phase). An analysis of Central and Local Government DEC and AR non-compliance in England and Wales was undertaken to determine the extent of the issue.

The findings indicate that 104 Central Government buildings had DEC ratings, although 510 DEC ratings were expected to have been lodged. This implies a non-compliance of about 80%. There was a spread of performance, although it is notable that no DEC ‘A’ rating and very few DEC ‘B’ ratings were achieved. A clustering around the lower middle DEC ‘D’ and ‘E’ ratings, and lowest DEC ‘G’ rating was also apparent. These made up around three quarters of all the DEC ratings available. A comparison of Central Government DEC ratings to building type showed that: **(1)** Agencies and Other Public Bodies were mostly, but not exclusively, ‘D’ rated; **(2)** High Profile Groups were mostly, but not exclusively, ‘G’ rated; **(3)** Ministerial Departments were mostly, but not exclusively, ‘E’ rated; **(4)** Non-Ministerial Departments were mostly, but not exclusively, ‘G’ rated; **(5)** The Prime Minister’s Office was mostly, and exclusively, ‘D’ rated; and **(6)** Public Corporations were mostly, but not exclusively, ‘E’ and ‘F’ rated. Unfortunately, about 58% of the Central Government DEC ratings would not have complied with a Government Property Unit (GPU) target of attainment of ‘A’ to ‘D’ ratings by 2018. This is despite AR energy saving recommendations that are produced in line with approved Government methodology. Although a ‘fabric first’ approach is endorsed by experts, this does not appear to have been prioritised in AR recommendations for Central Government DEC ratings with ‘G’ ratings.

Additional findings indicate that 7.2% of the 375 Local Government Authorities (LGAs) in England and Wales appeared to have DEC and AR non-lodgement. While it appeared none of the 22 Wales LGAs had non-lodgement, 27 of the 353 England LGAs appeared to have non-lodgement. Percentages of non-lodgement for Northern England’s North East, North West, and Yorkshire and Humber would be about 87%, 89%, and 88% respectively, if benchmarked against the Valuation Office Agency (VOA) number of rateable properties per region. Majority of DEC ratings for these regions were rated ‘D’ with about 37%, 38%, and 35% respectively. However, about 32%, 37%, and 39% of total DEC ratings for Northern England’s North

East, North West, and Yorkshire and Humber respectively would not have complied with the GPU target of 'A' to 'D' ratings. This again is despite AR energy saving recommendations that are produced in line with approved Government methodology.

Although further research will be undertaken, so far, how can BEEAC likely be enhanced?

BEEAC can likely be enhanced by: **(1)** Addressing process-flaws; **(2)** Addressing principle versus practice issues; and **(3)** Considering a process-compliance re-engineering protocol whereby process-compliance is rethought and restructured based on rigorous process-flow and process-flaw data capture and analyses.

The expectation is that an enhanced BEEAC will support an effective response to climate change, CO₂ emissions, and the 'Performance Gap'.

Emeka Efe Osaji, Leeds Sustainability Institute and University of Salford, June 2021

Key Issues

- In practice, the Display Energy Certificate (DEC) and Advisory Report (AR) processes have been plagued with the issue of non-compliance.
- Although the DEC and AR process-flow involves seven phases, four of these appear to be when and where process-flaws occur. These are the 2nd Phase (Pre-Commission Phase), 3rd Phase (New Commission Phase), 4th Phase (Lodgement Phase), and 7th Phase (Renewal Commission Phase).
- The findings indicate that 104 Central Government buildings had DEC ratings, although 510 DEC's were expected to have been lodged. This implies a non-compliance of about 80%.
- It is notable that no DEC 'A' rating and very few DEC 'B' ratings were achieved.
- About 58% of the Central Government DEC's would not have complied with a Government Property Unit (GPU) target of attainment of 'A' to 'D' ratings by 2018. This is despite AR energy saving recommendations that are produced in line with approved Government methodology.
- 7.2% of the 375 Local Government Authorities (LGAs) in England and Wales appeared to have DEC and AR non-lodgement.
- Percentages of non-lodgement for Northern England's North East, North West, and Yorkshire and Humber would be about 87%, 89%, and 88% respectively, if benchmarked against the Valuation Office Agency (VOA) number of rateable properties per region. Majority of DEC's for these regions were rated 'D' with about 37%, 38%, and 35% respectively.
- About 32%, 37%, and 39% of total DEC's for Northern England's North East, North West, and Yorkshire and Humber respectively would not have complied with the GPU target of 'A' to 'D' ratings. This again is despite AR energy saving recommendations that are produced in line with approved Government methodology.

Links

1. Osaji, E.E., Glew, D. and Johnston, D. (2017) Do Display Energy Certificates (DECs) Work? In: Gorse, C. (Ed.) **International Sustainable Ecological Engineering Design for Society (SEEDS) Conference 2017: Conference Proceedings, September 13-14, 2017, Leeds UK**. Leeds: LSI Publishing, pp. 532-553. ISBN 978-0-9955690-2-7. Retrieved from: <https://www.leedsbeckett.ac.uk/-/media/files/research/leeds-sustainability-institute/seeds-conference/seeds2017_proceedings.pdf>
2. Osaji, E.E., Glew, D. and Johnston, D. (2017) Public buildings fail on efficiency: Display Energy Certificate data reveals non-compliance in central government buildings. **CIBSE Journal**, November, p. 9. Retrieved from: <<https://www.cibsejournal.com/archive/PDFs/CIBSE-Journal-2017-11.pdf>>
3. Osaji, E.E., Glew, D. and Johnston, D. (2017) Setting an Example? **CIBSE Journal**, December, pp. 34-35. Retrieved from: <<https://www.cibsejournal.com/archive/PDFs/CIBSE-Journal-2017-12.pdf>>

4. Osaji, E.E. (2018) **Enhancing Building Energy and Environmental Assessment Certification (BEEAC)** [Keynote Speech Video Webinar]. CIBSE ASHRAE Group Webinar. 14 November. Retrieved from: <<https://www.youtube.com/watch?v=W6KC5k47YiY>>
5. Osaji, E.E., Johnston, D. and Glew, D. (2018) Display Energy Certificate and Advisory Report Local Government Compliance in Northern England. In: Scott, L. and Gorse, C. (Ed.) **International Sustainable Ecological Engineering Design for Society (SEEDS) Conference 2018: Conference Proceedings, September 6-7, 2018, Dublin Ireland**. Leeds: LSI Publishing, pp. 404-419. ISBN 978-0-9955690-3-4. Retrieved from: <<https://www.leedsbeckett.ac.uk/-/media/files/research/leeds-sustainability-institute/seeds-conference/seeds-conference-proceedings-2018.pdf>>
6. Osaji, E.E., Johnston, D. and Glew, D. (2018) Enhancing Building Energy and Environmental Assessment Certification (BEEAC). **Proceedings of the CIBSE ASHRAE Group Webinar, November 14, 2018, London, UK**. Retrieved from: <<https://www.cibseashrae.org/presentations/Osaji141118.pdf>>
7. Osaji, E.E. (2019) **Analysis of Energy Certification Compliance for Urban Sustainability of Public Buildings in England and Wales** [Research, Innovation, Sustainability, Enterprise (RISE) Awards 2019 Highly Commended Certificate for Knowledge Transfer]. Exhibited at 5th International Conference of Sustainable Ecological Engineering Design for Society (SEEDS), September 11-12, 2019, University of Suffolk, Ipswich, UK, pp. 44-45. Retrieved from: <<https://www.leedsbeckett.ac.uk/-/media/files/research/leeds-sustainability-institute/seeds-conference/rise2019postersv2.pdf>>
8. Osaji, E.E. (2021) How to Enhance Building Energy and Environmental Assessment Certification (BEEAC). **Carbon Bites**, June. Retrieved from: <[https://www.cibse.org/getattachment/Networks/Groups/Energy-Performance-Group/Carbon-Bites/53rd-CB_EE-Osaji_FINAL-\(4\).pdf.aspx?lang=en-GB](https://www.cibse.org/getattachment/Networks/Groups/Energy-Performance-Group/Carbon-Bites/53rd-CB_EE-Osaji_FINAL-(4).pdf.aspx?lang=en-GB)>

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