

Please note, the content of this guidance document was current at the time of publication. Given the evolving nature of research on net zero carbon buildings, some information may have since been superseded. Please visit the following page to access the latest UKGBC guidance on net zero carbon buildings: <https://www.ukgbc.org/ukgbc-work/net-zero-carbon-buildings-framework>



Net zero carbon: energy performance targets for offices

JANUARY 2020

(Updated August 2022 - see item in red)

To achieve the Paris Climate Agreement and meet the UK's net zero emissions target, all sectors of the economy must rapidly decarbonise by 2050. UKGBC published its Net Zero Carbon Buildings Framework¹ in April 2019 and this paper offers further guidance on levels of energy performance that offices should target to achieve net zero.

'Paris Proof' methodology

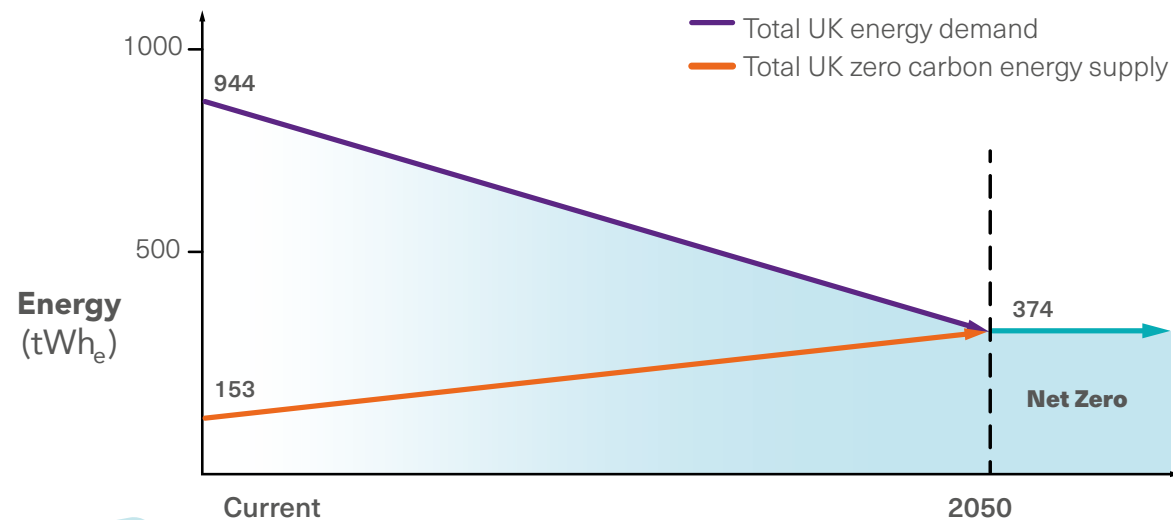
The energy performance targets in this paper have been developed using the 'Paris Proof' methodology first pioneered by the Dutch GBC.² This approach determines the amount of energy demand reduction required in order for the UK's economy to be fully-powered by zero carbon energy in 2050.

Figure 1 illustrates that steep cuts in energy demand are required today to achieve a net zero economy by 2050 and that simply relying on decarbonisation of the electricity grid is not a viable solution for the office sector.

Through consultation and direct engagement with stakeholders, UKGBC identified that the office sector will need to achieve an overall 60% reduction in energy use, which translates to the Paris Proof targets outlined in [Table 1](#) on page 4.

The calculations undertaken are inherently variable and based on numerous assumptions so they will be revised over time as more information becomes available. For further detail on the methodology, please refer to the *Summary of Consultation Responses to Energy Performance Targets for Offices*.³

Figure 1: UK trajectory to a net zero economy



Net zero trajectory for offices

For offices looking to achieve net zero carbon for operational energy, the Paris Proof targets offer an outcome-based approach to setting energy performance targets. Figure 2 sets out a trajectory for tightening performance targets over the next fifteen years for offices targeting net zero.

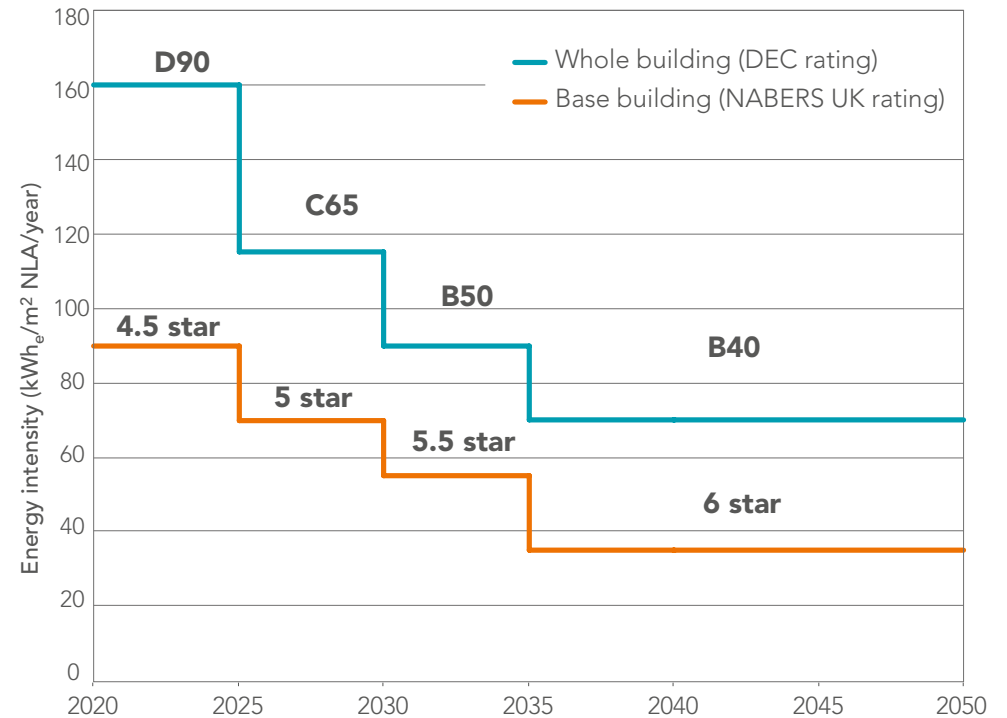
The trajectory is based upon meeting current best practice performance over the next five years, with ambitious steps down towards the Paris Proof targets by 2035.

The expectation is that individual offices targeting net zero should seek to meet and exceed the performance targets set out by the trajectory before the procurement of renewable energy or offsets. The principles from UKGBC's [Net Zero Carbon Buildings Framework](#) should then be followed to demonstrate how net zero for operational energy has been achieved.

Where the energy performance targets are not achieved, this should be publicly disclosed with an action plan setting out how the target will be met in subsequent years.

The trajectory does not differentiate between new and existing offices, but it is expected that new offices should aim to achieve the Paris Proof targets as soon as possible. The upgrading of existing offices should also consider the embodied carbon impacts from retrofit and any concessions for heritage buildings.

Figure 2: Trajectory for offices targeting net zero carbon



Using the targets

These targets are intended to highlight to stakeholders from across the office sector the magnitude of energy reductions required to achieve net zero by 2050. They will challenge the construction and property sector to reimagine the way offices are designed, constructed and operated, including moving towards in-use performance as the verifiable metric for energy.

Some examples of how the targets can be used are:

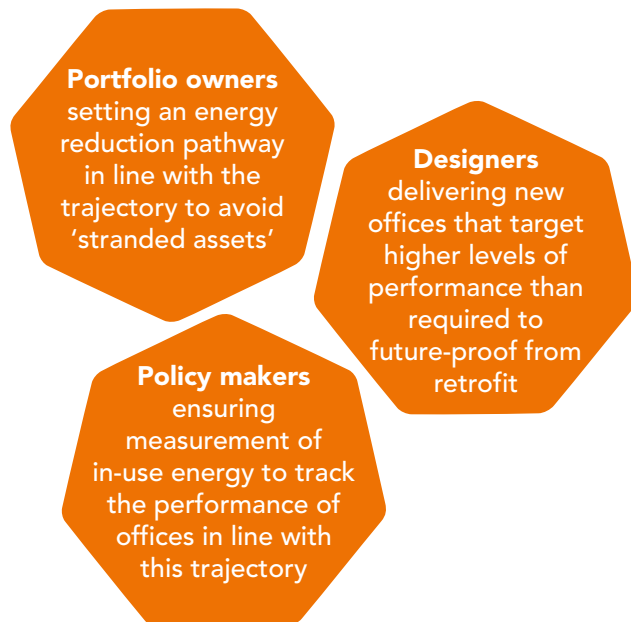


Table 1: Energy performance targets for buildings targeting net zero carbon for operational energy

Scope	Metric	Interim Targets			Paris Proof Target
		2020-2025	2025-2030	2030-2035	2035-2050
Whole building energy	kWh _e /m ² (NLA) / year	160	115	90	70
	kWh _e /m ² (GIA) / year	130	90	70	55
	DEC rating	D90	C65	B50	B40
Base building energy	kWh _e /m ² (NLA) / year	90	70	55	35
	kWh _e /m ² (GIA) / year	70	55	45	30
	NABERS UK star rating	4.5	5	5.5	6
Tenant energy	kWh _e /m ² (NLA) / year	70	45	35	35

NLA = net lettable area GIA = gross internal area

The energy use intensity values represent the net import of energy (i.e. net of on-site renewables) and assume an all-electric office. For buildings where other fuel types are used, the weighting factors in BBP's Real Estate Environmental Benchmark⁴ should be applied to convert to kWh electricity equivalent (kWh_e)

Please note, the energy use intensity targets are indicative as they are based on standard hours of use and operation, with kWh_e values rounded. The DEC and NABERS UK ratings would allow for extended hours of use and for special uses, offering a more tailored approach to individual offices.

With special thanks to

Developed in
collaboration with:



Contributors:



ANZ Programme
Lead Partner:



ANZ Programme
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References

1. UKGBC (2019), Net Zero Carbon Buildings: A Framework Definition [online], available at: <https://www.ukgbc.org/ukgbc-work/net-zero-carbon-buildings-a-framework-definition/>
2. Dutch Green Building Council (2019), Paris Proof [online], available at: <https://www.dgbc.nl/themas/paris-proof>
3. For further detail on the methodology, please refer to the Summary of Consultation Responses to Energy Performance Targets for Offices, available at: <https://www.ukgbc.org/ukgbc-work/advancing-net-zero/>
4. Better Buildings Partnership (2019), Real Estate Environmental Benchmark [online], available at: www.betterbuildingspartnership.co.uk/real-estate-environmental-benchmark



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