

nuveen

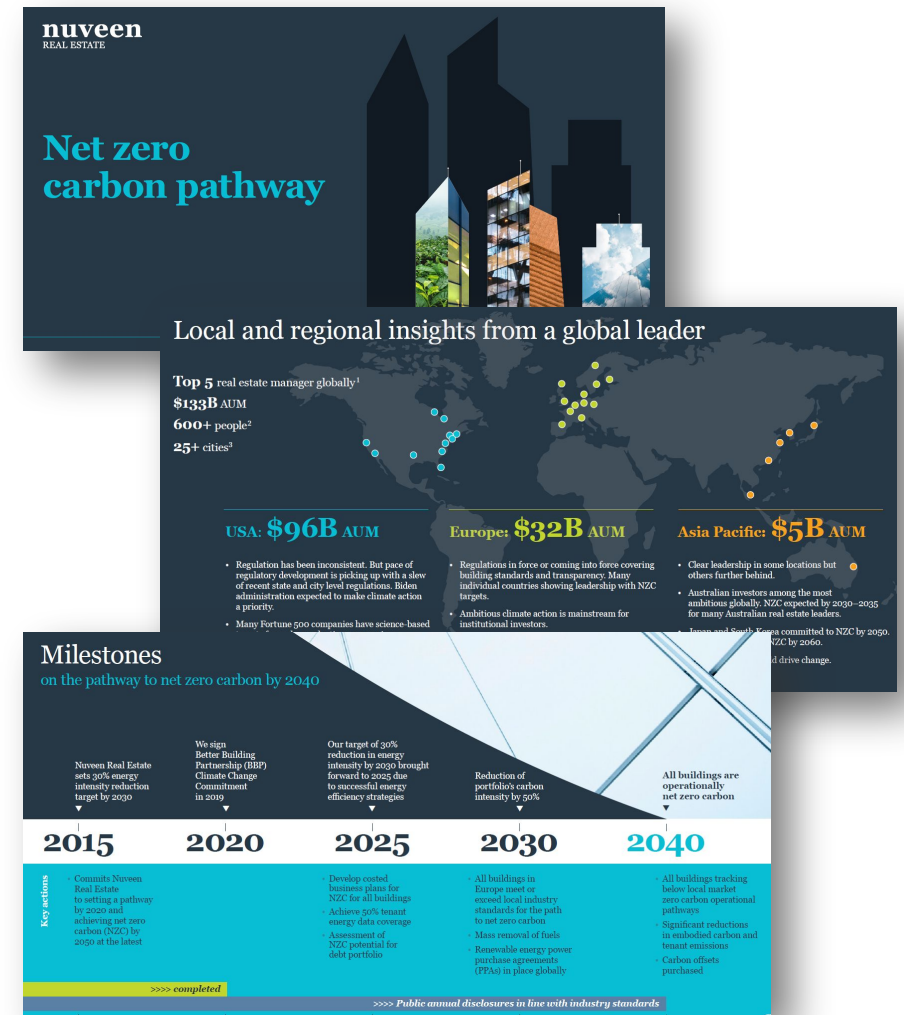
A TIAA Company

Buildings at the intersection of carbon and energy



Intro: Investing in real estate in tomorrow's world

- Broadening focus from cyclical change to take account of the more fundamental threat of **structural change and disruption**.
- Structural changes create significant **opportunities to create value**. A deep understanding of these disruptors and their impacts is critical.
- **Tomorrow's world** philosophy that sits at the core of investment process, delivering **enduring benefit to both clients and society**.



Challenge: Building energy standards for a low-carbon economy

Advancing Net Zero
A World Green Building Council global project

WorldGBC definition:
A net zero carbon building is highly energy efficient with all remaining energy from on-site and/or off-site renewable sources

100% of buildings must operate at net zero carbon (2050)

All new buildings must operate at net zero carbon (2030)

Key Principles

- 1. Measure and disclose carbon**
Carbon is the ultimate metric to track, and buildings must achieve an annual operational net zero carbon emissions balance based on metered data
- 2. Reduce energy demand**
Prioritise energy efficiency to ensure that buildings are performing as efficiently as possible, and not wasting energy
- 3. Generate balance from renewables**
Supply remaining demand from renewable energy sources, preferably on-site followed by off-site, or from offsets
- 4. Improve verification and rigour**
Over time, progress to include embodied carbon and other impact areas such as zero water and zero waste

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While there is an accepted understanding in the buildings role in meeting carbon reduction goals and a framework and energy hierarchy for net zero carbon buildings, **there is still a lack of clarity about the actual energy use per square meter/foot that constitutes a net zero carbon building and the level of embodied carbon that is permissible.**

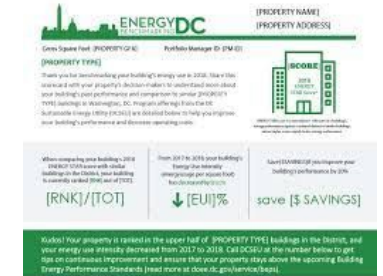
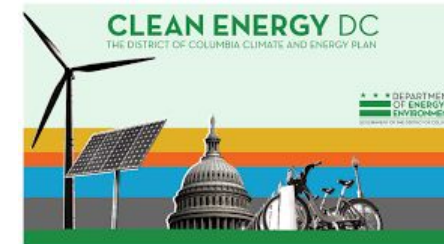
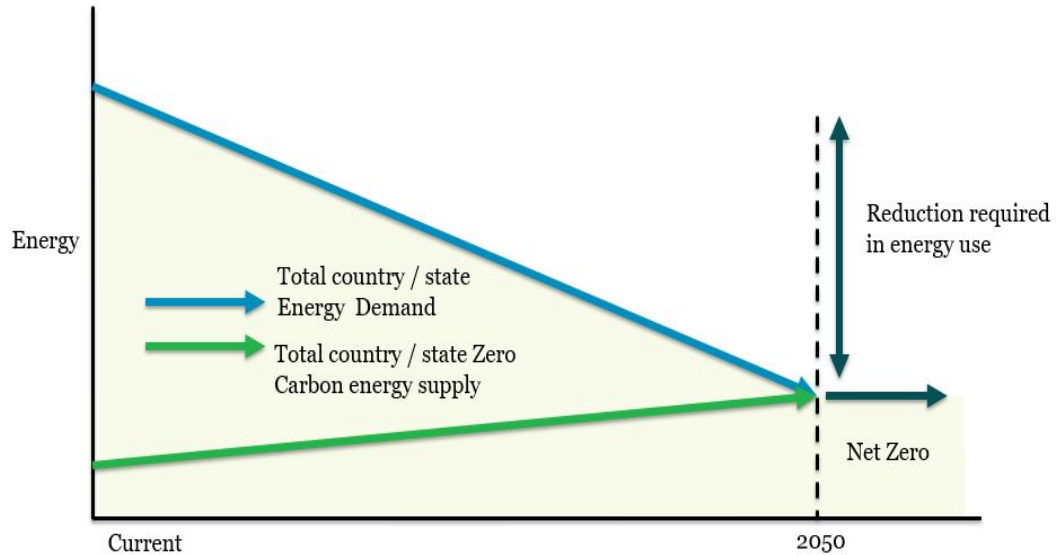
Nuveen Real Estate's NZC definition:

- Meets regionally defined energy use intensity standard
- Uses 100% renewable energy from on- and off-site sources
- Includes both landlord and tenant procured energy use
- No on-site fossil fuel use. Off-setting of residual emissions
- Embodied carbon in development or refurbishment is minimised and remaining carbon emissions are offset

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Key obstacle: how should we determine standard?

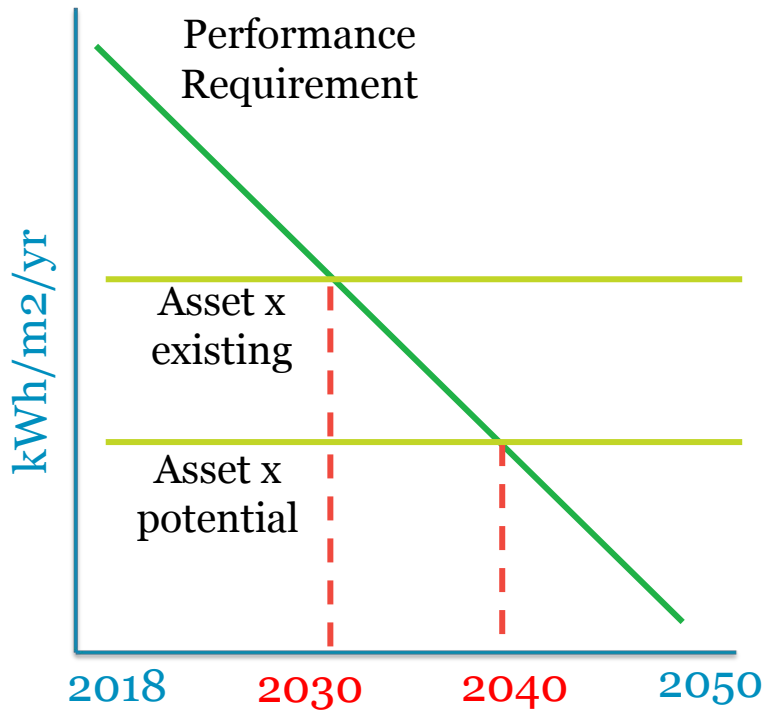
The amount of renewable energy available should determine the energy available for each building type/ end use. A greater supply of renewable energy for grid electricity will mean a more generous allowance for building energy use –therefore energy use standards will vary from market to market.



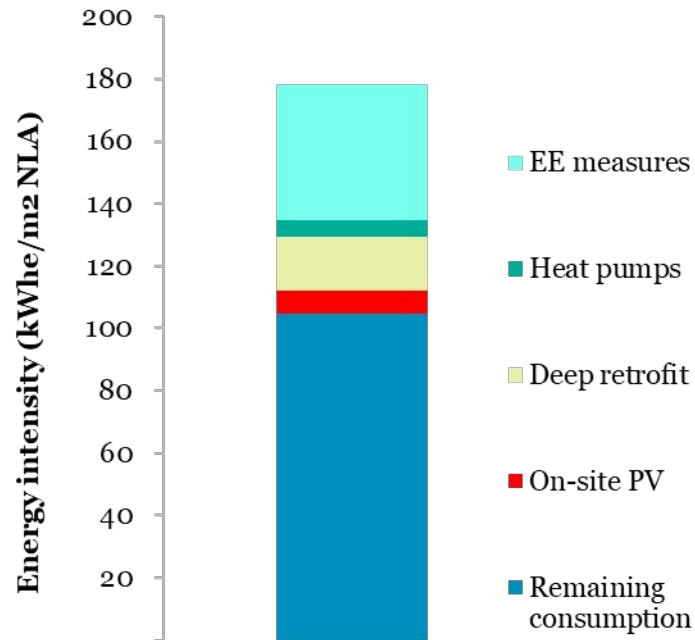
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Benefits: Shift from short term payback to long-term value

Takes into account investment potential and future transition risk.



Evaluate improvements based on contribution to target performance.



Anticipate market premium/discount for achieving/ not achieving target performance.

	Non-compliant	NZC
Liquidity	Discount	Premium
Cost of finance	Higher	Neutral
Re-letting periods	Longer	Shorter
Incentives (free rent)	Higher	Lower
Occupancy rate	Lower	Higher
Rental level	Discount	Neutral
Rental depreciation	Higher	Neutral

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Regarding Buildings & Construction, to achieve Washington D.C.'s Carbon & Equity goals, the most critical obstacle for commercial building owners to overcome is aligning target energy use with available renewable energy to achieve net zero carbon building status.



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