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Smart Buildings SHOW

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The essential role of Smart buildings in the journey to Net Zero

19th October 2023

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CARBON TRUST

OUR MISSION

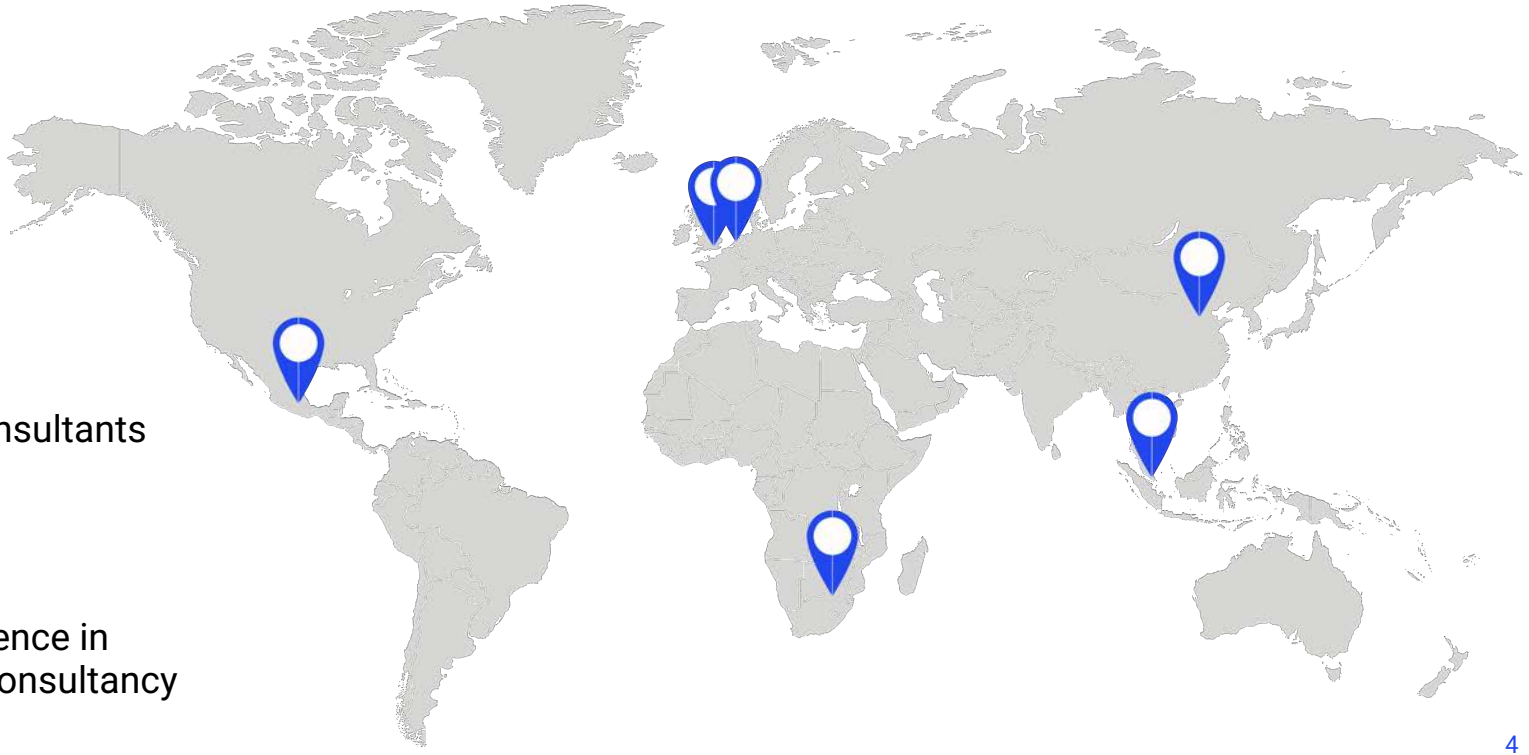
To accelerate the move to a decarbonised future.

Our mission is to accelerate the move to a decarbonised future.

5
continents

400+
experts and consultants

20
years of experience in sustainability consultancy



What we do

Strategy, delivery and reporting

We advise businesses, governments and the public sector on strategy, risks and opportunities, target setting, carbon reduction plans and transitioning to a low carbon world.

Target setting

Footprinting and reporting

Climate action and Net Zero planning

Assurance and labelling

We provide independent certification and assurance services that recognise real achievements in sustainability, enhance reputation and build trust with customers, investors and stakeholders.

Product carbon footprint label

Route to Net Zero Standard

Carbon neutral certification

Market transformation

We help design, implement and evaluate policies, business models and large-scale projects to meet ambitious carbon reduction targets.

Offshore wind

Green finance

Energy transition

We are members and supporters of a wide range of net zero carbon initiatives

Members of:

ICMA International Capital Market Association

Advisory Council member
Working groups – Impact reporting; Climate transition finance; Sustainability-linked bonds; Sustainable/ESG indices

FAST-Infra Platform

Working group 1 - Label

SCIENCE BASED TARGETS

Technical Advisory Group

UK GBC Member

TNFD Taskforce on Nature-related Financial Disclosures

TNFD Forum member

WORLD RESOURCES INSTITUTE | ROSS CENTER

GHG Removal Working Group

Members of the Technical Steering Group
Chairing the Reporting, Disclosure & Verification Task Group
Members of the Carbon Accounting Task Group

The Institution of StructuralEngineers · LETI · RIBA Architecture.com · RICS · UK GBC · BBP Better Buildings Partnership · bre · Carbon Trust · CIBSE

Low Carbon Workplace Programme

- Commercial real estate partnership since 2010
- Sustainable refurbishment mandate – avoid more embodied carbon
- Passive energy conservation and high efficiency operation
- Data-rich – comprehensive submetering platform, smart building systems
- Building user engagement – drive and maintain efficiency, continual improvement

Innovation Award for Built Environment Category
- Guardian Sustainable Business Awards 2015

Refurbishment of the Year Award
- CIBSE Building Performance Awards 2015

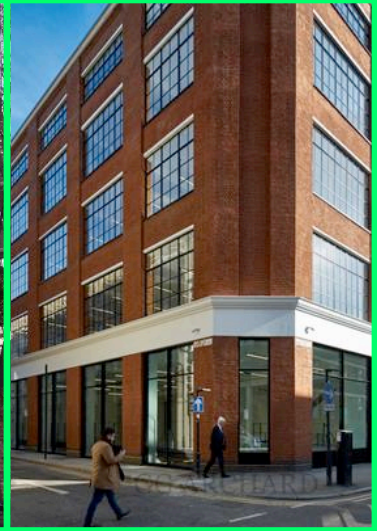
From:

- Old, inefficient
- Unappealing, dark spaces
- Obsolescence and stranding risk

To this:

- Super-efficient buildings
- Bright, inspiring environments
- People focused


PREMIER
HOUSE
Waitrose

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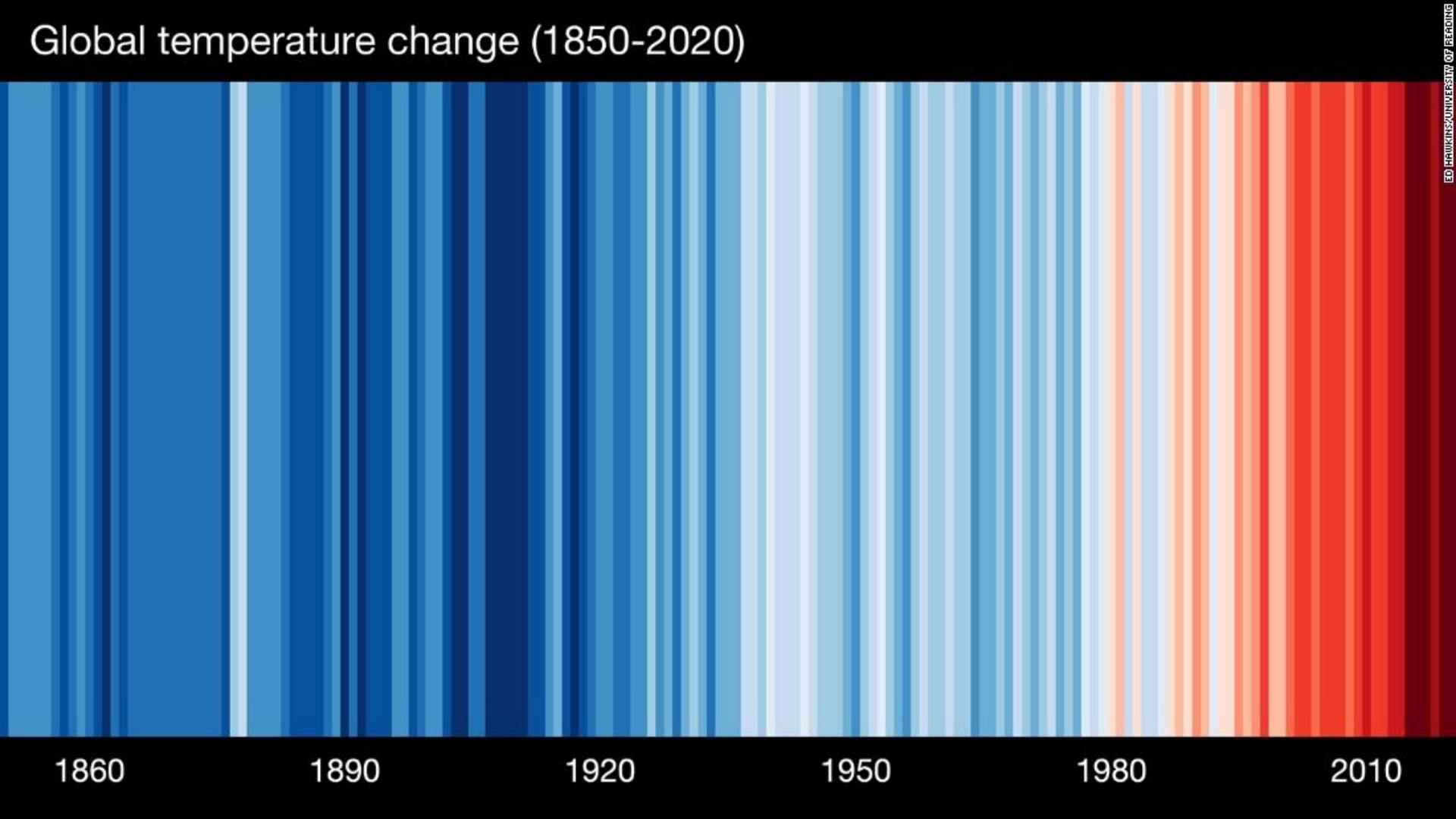
What is Net Zero?


Global temperature change (1850-2020)
1860
1890
1920
1950
1980
2010
ED HAWKINS/UNIVERSITY OF READING

What is Net Zero?

- Net Zero is ***the most comprehensive approach there is to securing a liveable planet.***
- **Achieving Net Zero involves rapid, deep reductions in greenhouse gas emissions to get as close to zero as possible, and then actively removing from the atmosphere any emissions that really cannot be avoided.**
- Once we achieve this balance of emissions and removals, global warming **stops worsening**.
- The goal is to limit warming to below 1.5ºC to prevent the most catastrophic effects of climate change.
- The pathways developed to limit global temperature rise have a common thread: **halving our emissions this decade** and reaching Net Zero by around 2050

What is Net Zero?

- Rapid reduction and taking action now is vital

Climate crisis costing $16m an hour in extreme weather damage, study estimates

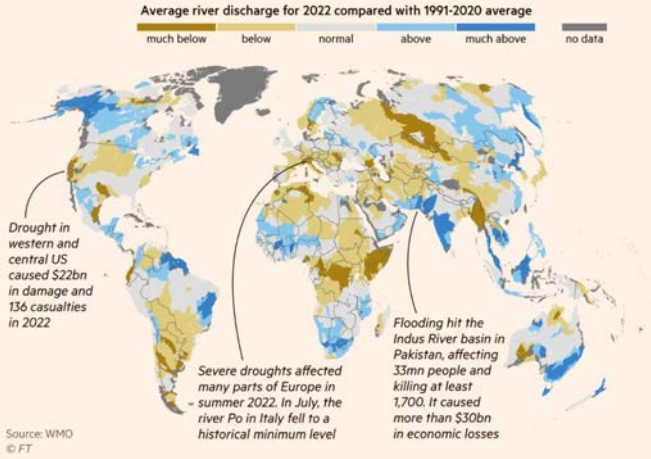
Analysis shows at least $2.8tn in damage from 2000 to 2019 through worsened storms, floods and heatwaves

People watch the McDougall Creek wildfire in West Kelowna, British Columbia, Canada, in August 2023. Photograph: Darren Hull/AFP/Getty Images

Global water cycles are 'spinning out of balance', weather agency reports

World Meteorological Organization forecasts new patterns of both extreme flooding and drought across the globe

Climate change driving erratic water patterns around the world



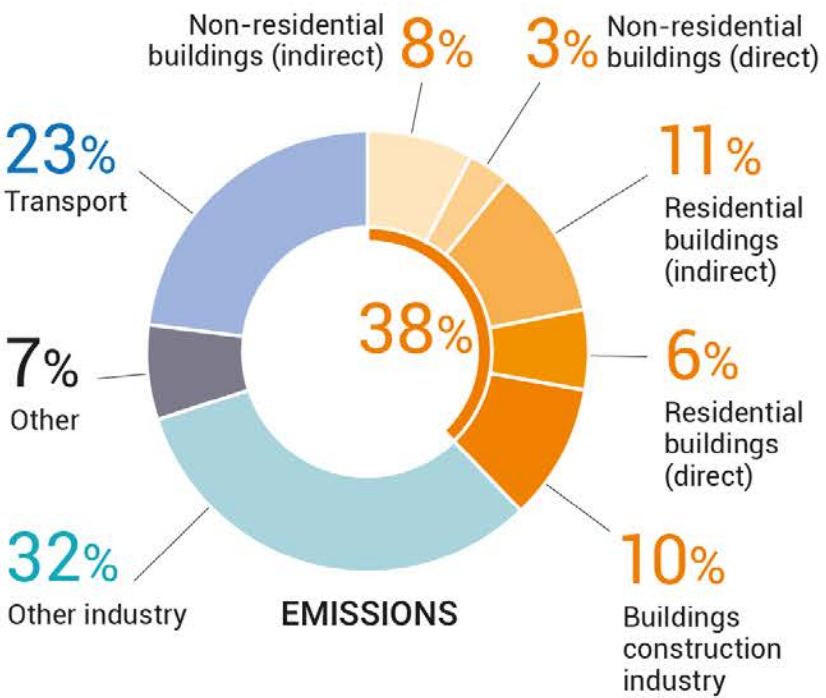
Record surge in days over key 1.5C warming limit

The BBC finds that there have been a record number of days in 2023 that breached the 1.5C temperature limit.

Warmest September as global temperatures soar

This year is on track to be the warmest on record after September temperatures alarm scientists.

Net Zero in the built environment – the performance challenge



- The role of buildings in net zero is huge
- Buildings must also rapidly decarbonise – avoidance and efficiency first
- Balance operational reductions with embodied carbon input
- Cannot build our way out – existing buildings need help
  - Design and planning constraints
  - Decarbonisation of heat
  - High building fabric standards necessary
  - Availability of clean, renewable energy

What does a Net Zero building look like?

Domestic

Energy use intensity	• New: <40kWh/m^2 • Existing: 60% reduction in kWh/m^2
Reduce heat demand	• New: <15kWh/m^2 • Existing: Phase out gas and oil, <50kWh/m^2
Decarbonise heat	• New: fossil fuel-free • Existing: Phase out gas and oil with heat pumps (and hydrogen)
Embodied Emissions	• >30% reduction from materials • >80% reduction from construction

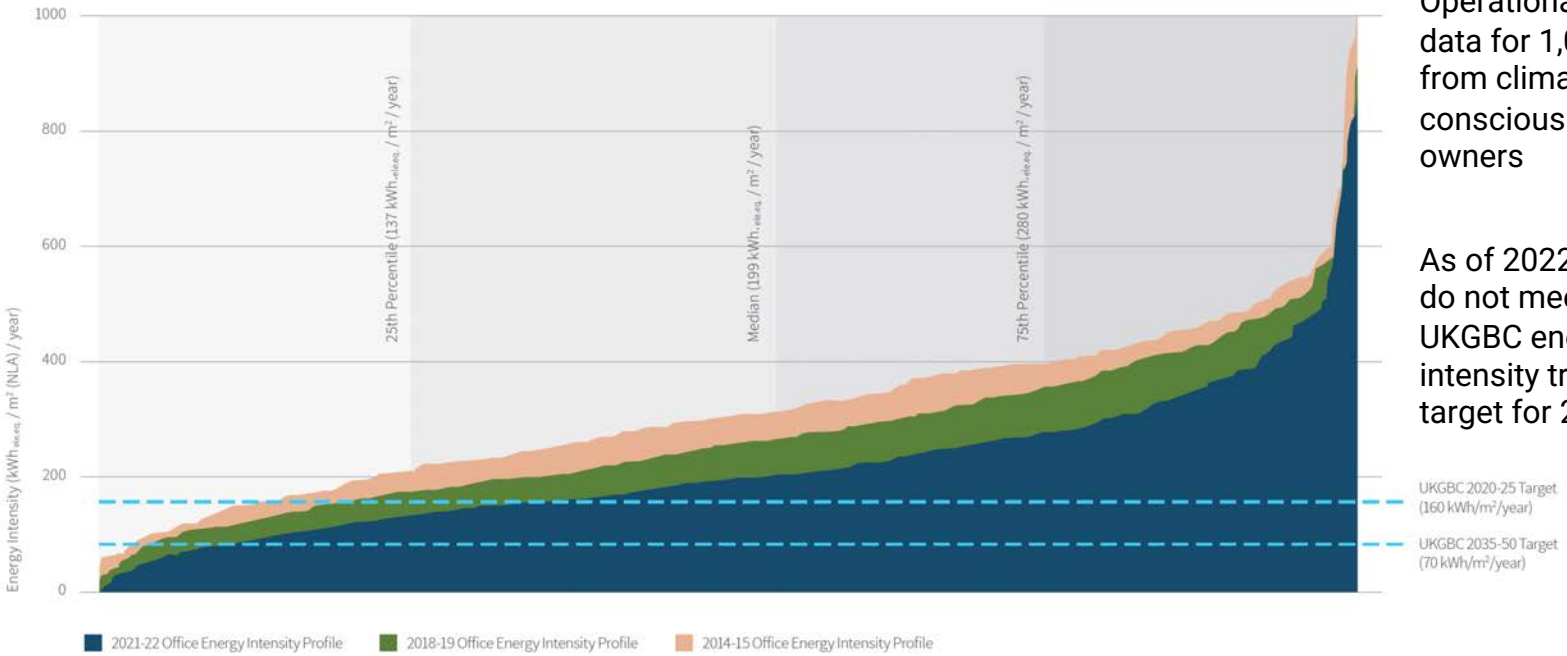
Non-Domestic

Energy use intensity	• New: <70kWh/m^2 (offices) • Existing: 49% reduction in kWh/m^2
Reduce heat demand	• New: <15kWh/m^2 • Existing: TBC
Decarbonise heat	• New: fossil fuel-free • Existing: Phase out gas and oil, 70% deployment of heat pumps
Embodied Emissions	• >30% reduction from materials • >80% reduction from construction

LETI, UKGBC, WGBC

Net Zero in the built environment – the performance challenge

Chart 18: REEB Office Energy Intensity by Asset vs UKGBC Energy Targets for Offices



Operational energy data for 1,000+ assets from climate conscious property owners

As of 2022, over 64% do not meet the UKGBC energy intensity transition target for 2020-2025

Better Buildings Partnership Real Estate Environmental Benchmark: 2022 Insights Report

Net Zero in the built environment – the data challenge

- Recent global surveys show **basic data is still lacking** in buildings
- Actual coverage is likely lower and lower accuracy
- Improvements in operational data, and the wider supply chain, is crucial for Net Zero progress

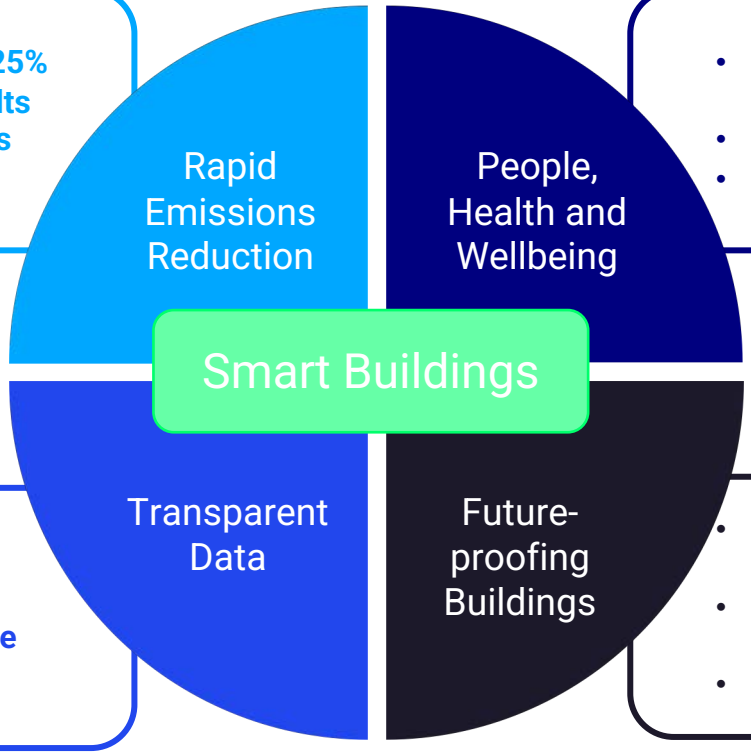
GRESB 2022 Real Estate Assessment Results

Smart Buildings will unlock Net Zero

CARBON TRUST

How Smart Buildings can deliver

- Reduction potential: 10%-25%
- Low disruption, quick results
- Lower embodied emissions



- Track and control environmental health factors
- Healthier, safer spaces
- Engage, inform, motivate

- Clear and actionable information
- Data sharing and disclosure
- Improve future design

- Performance ratings and regulatory compliance
- Build the case for further investment
- Adaptable and expandable

Rapid Emissions Reduction

Reduction potential: 10%-25%	• Significant reductions, kick starts the journey to Net Zero • Continual improvement, new opportunities • Detailed monitoring capability = persistent reductions • Effective even in isolation
Low disruption, quick results	• Impact on in-situ occupants is low • Potential for immediate savings • Intelligent algorithms automate action on energy savings
Lower embodied emissions	• Less equipment and materials • Adaptation of existing systems and equipment • Enablement of lower equipment run-times and maintenance efficiencies

People, Health and Wellbeing

Track and control environmental health factors	• More data on air quality and internal environment • Detect and automatically mitigate harmful air quality elements • Data drives wider sector improvements
Healthier, safer spaces	• Support the just transition to Net Zero, protect the vulnerable • Occupants feel secure, wellbeing improved • Lower health related absence and long term illness
Engage, inform, motivate	• Wealth of data can target individual interests and needs • Informed occupants = better choices and demand change • Engaged occupiers are a necessity for Net Zero success

Transparent Data

Clear and actionable information

- Complex data distilled to informative figures and visuals
- Supporting data from controls, IAQ and condition monitoring pin-points actions
- Verification of automated and active savings measures

Data sharing and disclosure

- Transparent, verifiable, granular data
- Support corporate sustainability requirements
- Compliance with Net Zero framework evidencing

Improve future design

- Digital twins verify design performance
- Facilitates better quality post occupancy evaluation
- Valuable practical insight

Future-proofing Buildings

Performance ratings & regulatory compliance

- De-risks commercial and domestic buildings
- Get ahead of tightening regulations
- Provable performance for tenants and investors
- Burden of proof for Net Zero frameworks

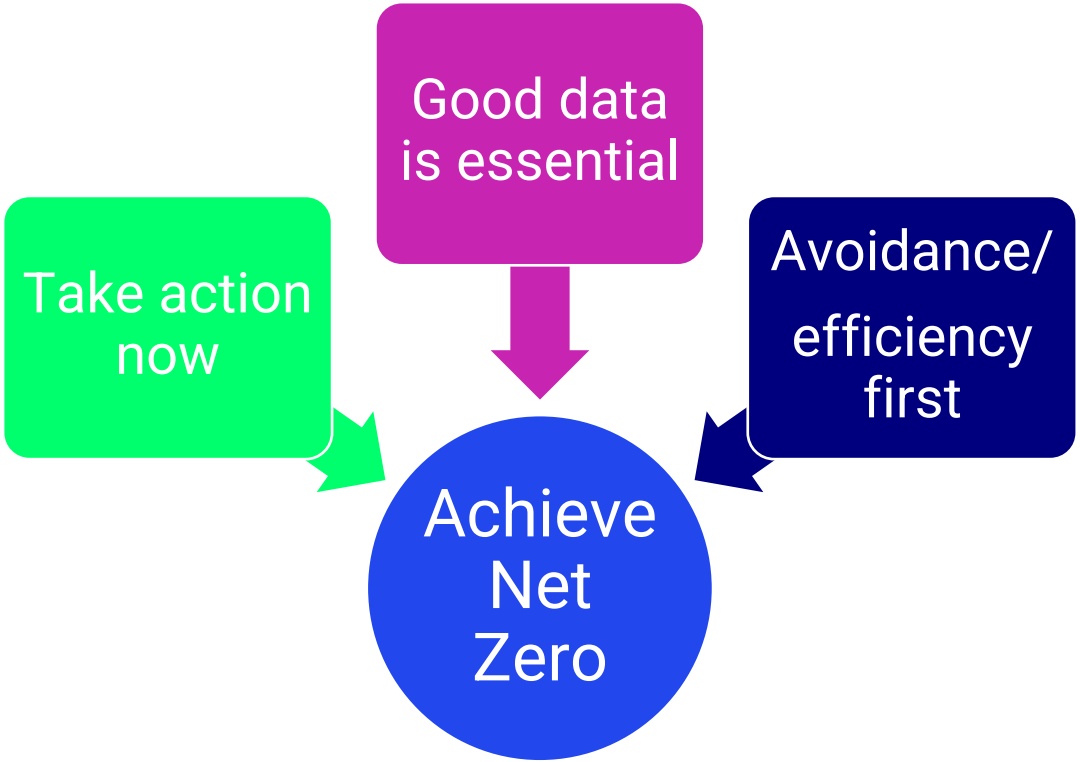
Build the case for further investment

- Demonstrate optimisation success and savings made
- Benchmarking energy by end-use to identify best capex opportunities
- Accurately predict energy, carbon and cost savings
- Transparent data to prove outcomes

Adaptable and expandable

- Compatibility and modularity, adapt to new systems
- Scalability to accommodate building use, size and complexity
- Breadth of products available, constantly evolving

Key points


Good data is essential
Take action now
Avoidance/ efficiency first
Achieve Net Zero

Q&A

Thanks for listening

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Smart Buildings SHOW

9-10 October 2024 • ExCeL London

We look forward to seeing you in 2024