

IS CONSTRUCTION GOOD AT INNOVATION?

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**Women
in Property**
Aspire • Succeed • Inspire

The Innovation Challenge

Vince Ruane

January 22nd 2025

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airifi





Vince Ruane

Vince is a Chartered Engineer, CIBSE Fellow and Founder with over 15 years of engineering experience. Vince founded RCDC, a successful engineering design consultancy, in 2019 following stints at large, multinational consultancies.

Vince is also the Founder of Airifi, an innovative ventilation solution start-up and Co-chair of the Alliance of Construction Networks.

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CHALLENGES: CLIMATE CHANGE

CO₂ has been rising exponentially at a rate of about 0.17% per year

2-4°C rise in temperatures is expected by 2100

Paris agreement is targeting less than 2°C with 1.5°C preferred by the end of the century

Last year we hit 1.5°C above pre-industrial levels.



THE REALITY OF TODAY'S WORLD

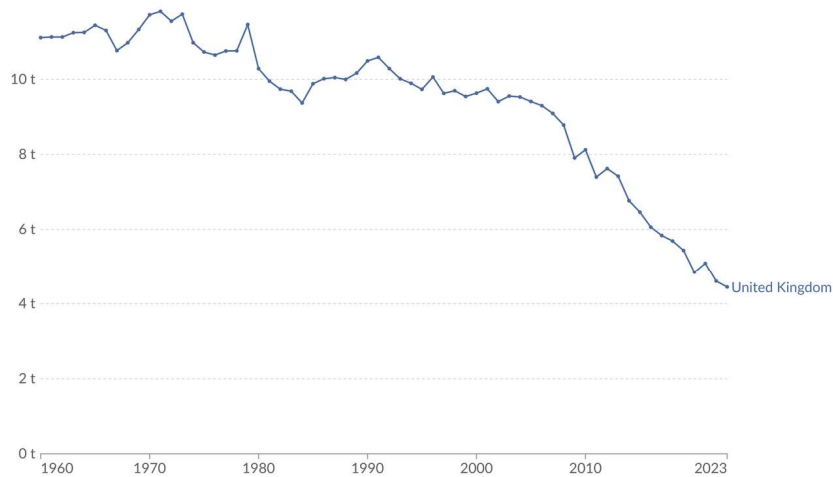


SOME POSITIVE PROGRESS

Per capita CO₂ emissions

Carbon dioxide (CO₂) emissions from fossil fuels and industry¹. Land-use change is not included.

Our World in Data

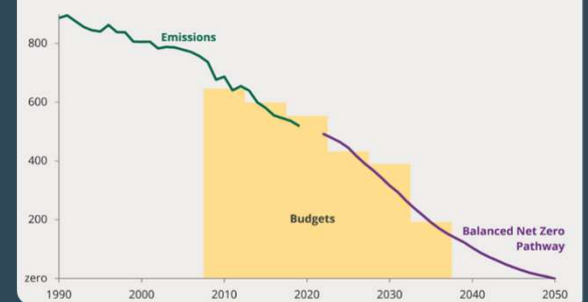


Data source: Global Carbon Budget (2024); Population based on various sources (2024)
OurWorldinData.org/co2-and-greenhouse-gas-emissions | CC BY

1. Fossil emissions: Fossil emissions measure the quantity of carbon dioxide (CO₂) emitted from the burning of fossil fuels, and directly from industrial processes such as cement and steel production. Fossil CO₂ includes emissions from coal, oil, gas, flaring, cement, steel, and other industrial processes. Fossil emissions do not include land use change, deforestation, soils, or vegetation.

UK emissions, budgets and the Balanced Pathway

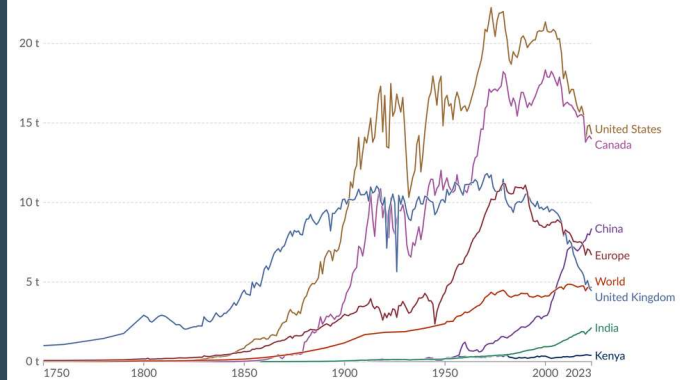
million tonnes of CO₂ equivalent



Per capita CO₂ emissions

Carbon dioxide (CO₂) emissions from fossil fuels and industry². Land-use change is not included.

Our World in Data



Data source: Global Carbon Budget (2024); Population based on various sources (2024)
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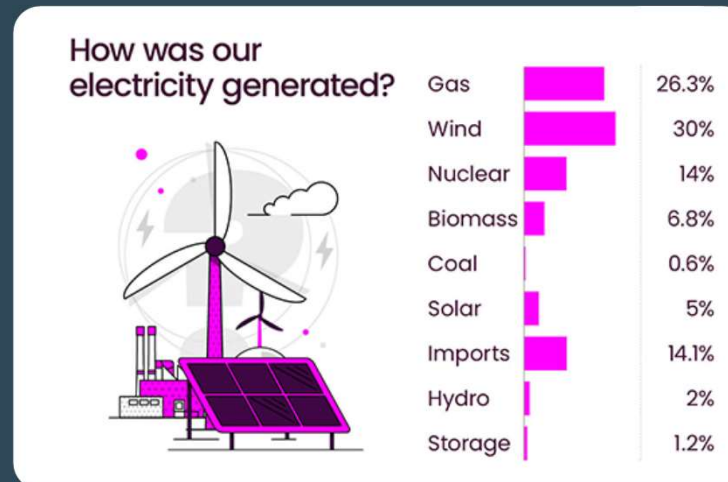
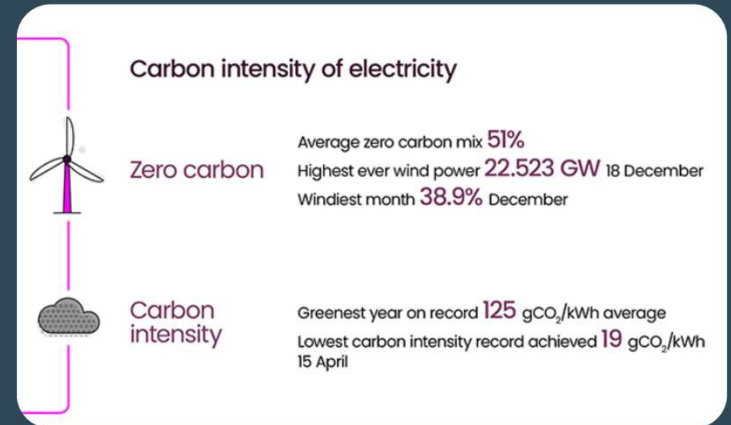


THE UK'S 2024 ENERGY MAKE-UP

Lowest carbon intensity year, averaging at 125 CO₂/kWh

Highest yearly zero carbon generation at 51%

Minimum carbon intensity record of 19g CO₂/kWh on 15 April 2024



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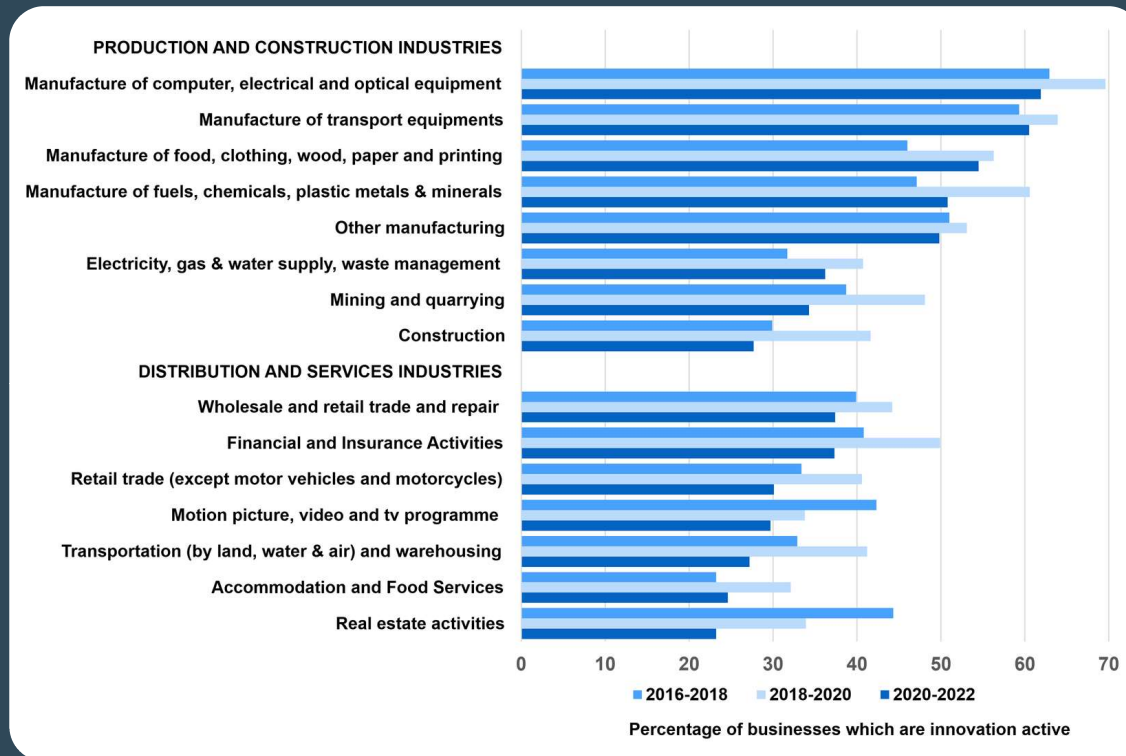
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Is Construction Good at Innovation?

 Start presenting to display the poll results on this slide.

INNOVATION IN UK



THE PROBLEM

We need to change the way we do things.

Change involves risk.

Construction projects are large & bespoke with mistakes extremely costly. Construction is therefore highly risk averse.

It is difficult to convince people that something different is worth doing with the business case not often adding up.



TIME FOR CHANGE



DEFINITIONS WITHIN NZC **CONTEXT**



Operational carbon

- NZC operational (NZC_{Op}) involves no on-site fossil fuels – buildings are fully electric,
- Balance can be achieved by designing buildings to produce and consume equal amounts of energy,
- Carbon-negative buildings produce more energy than they use but DO NOT remove carbon from the air – they just prevent extra emissions,
- Achieving this energy balance is challenging and depends on building typology and form,
- Use of offsets and buying of 'green' electricity are sometimes used support this energy balance and meet carbon goals.

Gas Emissions



Remove

Electrical Energy Use



Balance with PV
Generation

Carbon Credits



Minimise and Offset

NZC_{Op} IS HARD

Often the numbers do not stack up,

High initial capital expenditure,

We not only have to solve the technical problems,
we must solve the people problem too,

Often high in time cost,

We must stay positive.





DEFINITIONS WITHIN NZC **CONTEXT**

Embodied carbon

- Carbon capital for the building,
- NZC Embodied (NZC_{EM}) is technically not possible without offsets,
- Construction materials are high in carbon,
- There is no way to fully remove carbon during construction – only to reduce it,
- Setting 'low' embodied carbon targets is challenging due to inconsistent industry data.

NEXT ZERO

Net Zero pursuit requires system-wide thinking to avoid creating new problems while solving existing ones,

Resource scarcity, political implications, and societal impacts must be considered in the transition,

Complex ecosystem changes are challenging, especially without consensus on the problem definition, though AI can aid individual understanding.





RCDC



INNOVATIVE



SUSTAINABLE



DIGITAL

THE FUTURE

Stay as a small boutique consultancy,
offering agile work,

Support for those within the team that
have reached their potential, to set up
sister companies,

Advocate for fairness and transparency;

- Team-wide salary transparency
- Consistent salary banding
- Blind recruitment
- Profit share





TECHNICAL INCUBATOR

We want to be driving the required changes within construction & betterment for a sustainable future,

We want to use our expertise to develop, guide and support those looking to make a difference,

We aim to do this via a 'Technical Incubator', with our first Spin-out;

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airifi™

Smart building technology to
disrupt the ventilation market

Ventilation, **Smarter**

The Problem



1 Mil healthy years lost and
12,000 premature deaths
annually due to noise pollution
globally

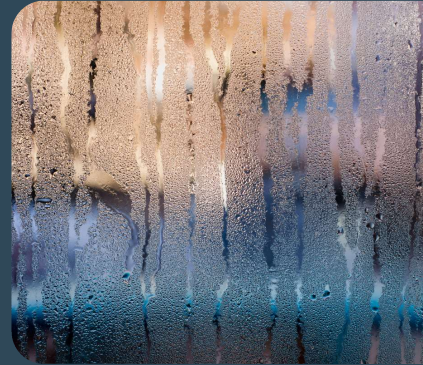


9 Mil premature deaths are
caused by air pollution annually-
99% of global population are
exposed



Heating buildings is responsible
for 23% of UK Carbon
Emissions- openable windows
are responsible for 5%

Windows are a reaction to poor comfort



Opened

because it is...

Hot
Stuffy
Smelly
Humid

Closed

because it is...

Cold
Noisy
Smelly
Polluted



Smart Windows™

A smart window control system, protecting
& optimising the internal environment in
real-time



Protects From
Noise Pollution



Prevents Heat
Energy Waste



Improves
Security



Enables Passive
Buildings



Protects From
Air Pollution



Reduced Risk
of Mould

£150k of Grant Funding

Letters of Support:

- Portakabin
- L'boro University
- Ali Systems
- Noise Abatement Soc. + others



Jan 2023

£50k Innovation Grant
MVP Developed

Apr 2024

Airifi Spun-Out

May 2024

£100k SBRI Contract
*Real World Installations
Validated by L'boro Uni*

Sept 2024

In-Situ Testing
Installed with Portakabin

Dec 2024

A4I Grant App. Successful

Jan 2025

**Public School Pilot w/
Birmingham City Council**

PROGRESS TO DATE

Smart Windows™



The Team



Vince Ruane

Founder & CTO

Chartered engineer, CIBSE Fellow and inventor of Smart Windows. Vince is also the founder of RCDC, a successful engineering design consultancy.



Al Robinson

CEO

With 25+ years of leadership experience in engineering and property, Al has vast experience in delivering solutions to challenging problems.



Paul Clark

Chair

40+ years' in product management and marketing, with a tech engineering background. Most recently Paul was a board member of Plantronics \$1.1 billion non-US business.



Lesley

Rubenstein-Pessok

Lesley supports Airifi as a Innovate UK Business Growth Senior Innovation & Growth Specialist, providing industry backed expertise & guidance.

Next Steps

We are progressing with a funding round and further trail projects. We're interested in:

Angel investors

VC's interested in early stage prop tech

Letters of interest

Small scale pilot projects

To Summarise...

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Thank you!



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