Air Pollution Footprint Partnership

Networking Event

20th February 2025

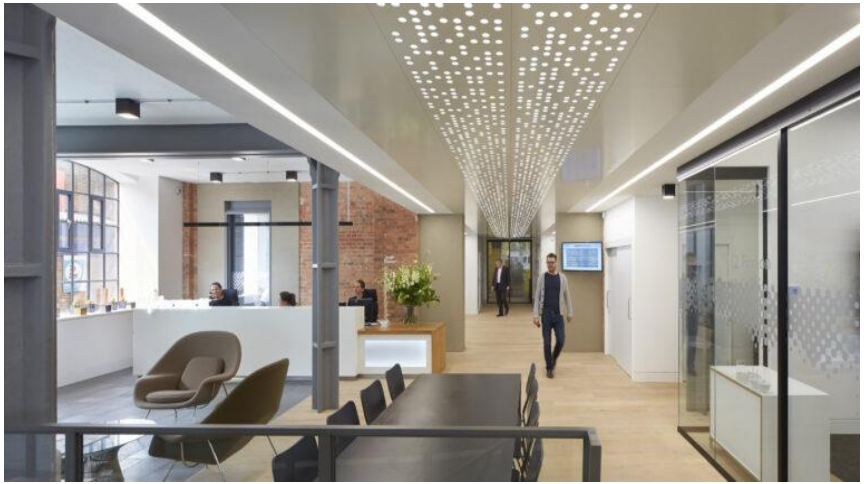
Air Pollution Footprint Partnership

Welcome

Poppy Newton & Christopher Webb, Sustainability, tp bennett

Welcome!

- We have this space until 6:30pm – please enjoy it and make it your own
- No planned fire alarms – if needed please leave through one of our two ground floor exits
- Toilets are towards the back of the building, to your right as you exit the room



About us…

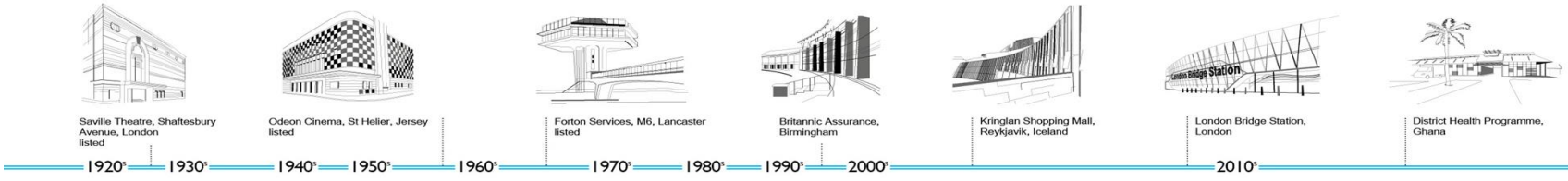
100-year-old, independent architectural, design, sustainability and planning practice, based in the UK, with a strong international presence.

Key Sectors:

- Offices
- Hospitality
- Mixed Use & Retail
- Justice
- Health
- Planning
- Education
- Master planning
- Civil/Public
- Strategy

Residential
- Student
- Affordable
- Private
- Mixed

What we do:
- Investor, developer & occupier clients
- New build, fit out & refurbishment
- Listed building & conservation
- Sustainable solutions



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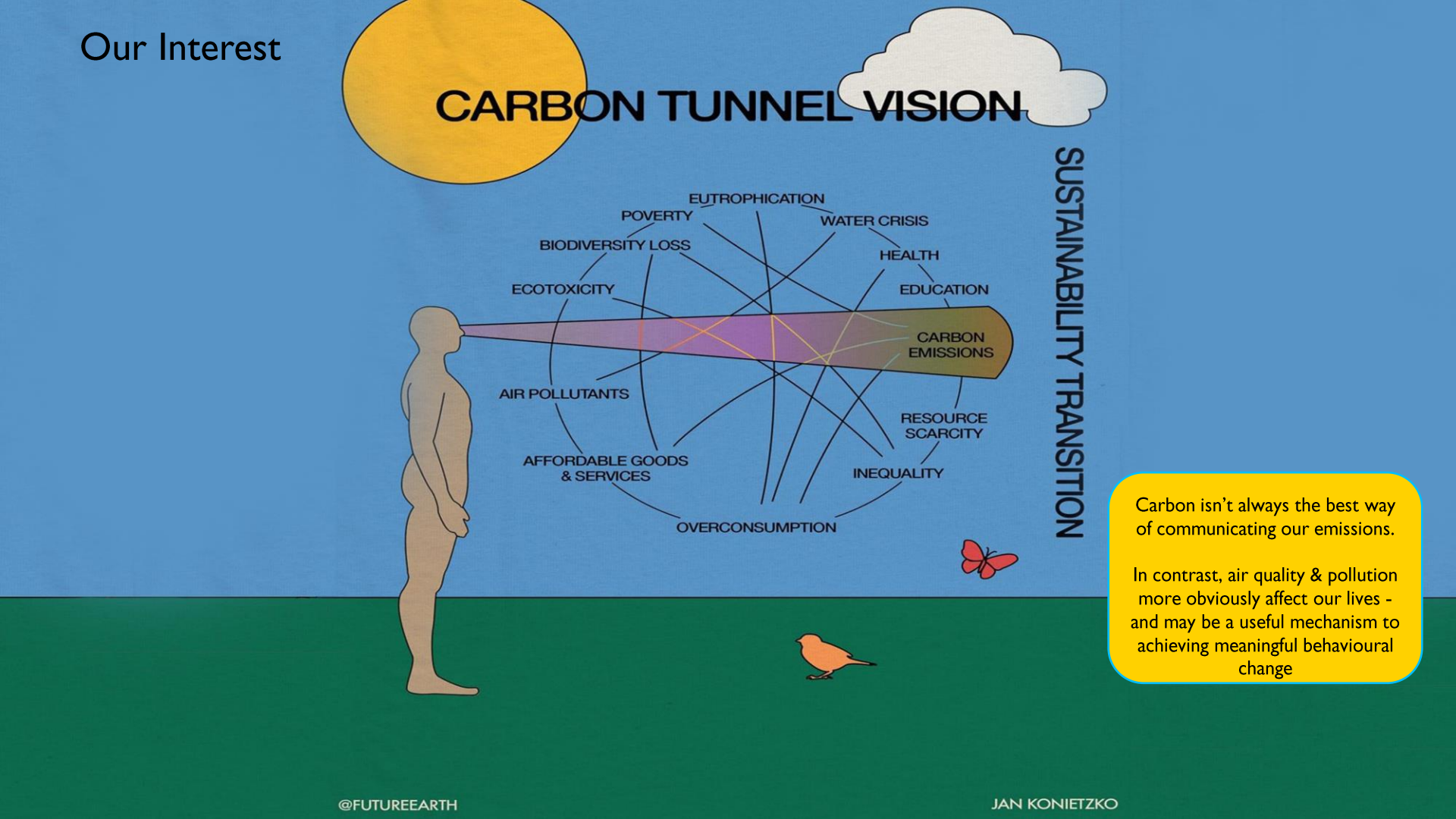
Our Interest



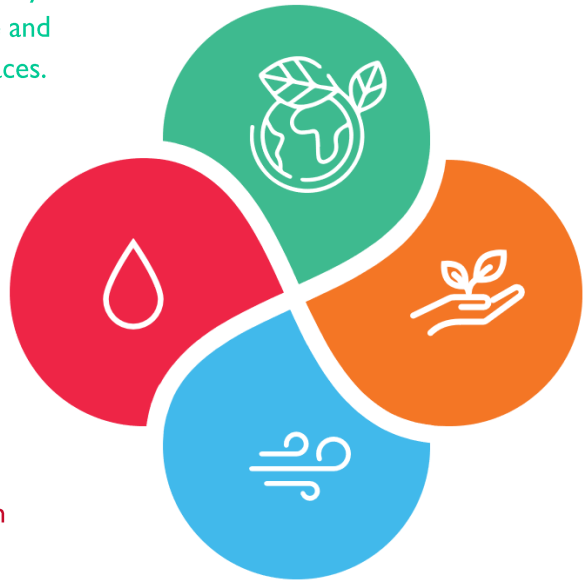
Carbon isn't always the best way of communicating our emissions.

In contrast, air quality & pollution more obviously affect our lives - and may be a useful mechanism to achieving meaningful behavioural change

Making it happen on projects

Land

Regenerate ecosystems and promote biodiversity. Minimise primary resource use. Reduce waste and create synergies between natural and built spaces. Provide inclusive spaces for all.



People

Land, Water, and Atmosphere come together under a holistic approach that reconnects people with a healthy environment.

Biophilia fosters spaces that are regenerative, inspiring, and aligned with human wellbeing.

Water

Achieve efficiency and resilience and align with natural water cycles. Rainwater harvesting, greywater recycling, and integrating water into design to support wellbeing.

Atmosphere

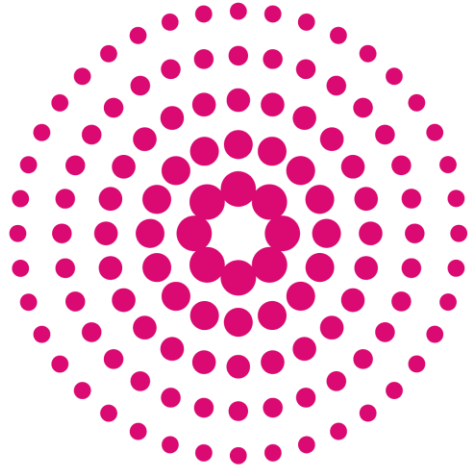
Minimise contribution to climate change. Mitigate impacts. Healthier indoor & outdoor life via improved air quality, minimising emissions, and fostering natural ventilation.

Our History With APFP

- Strong link between our design work and air quality (outdoor and indoor)
- First sponsored Clear Air Day in June 2019
- ‘Found’ Ricardo and joined Air Pollution Footprint Partnership in 2021
- Ricardo provided advice and supported air quality footprint reporting for period 2018 – 2023

    * (2024 underway)

- Easy, highly-engaging process – gives new perspective
- We will continue process and begin reporting externally



Progress

Don’t Panic! Your emissions aren’t increasing, you're just getting better at monitoring

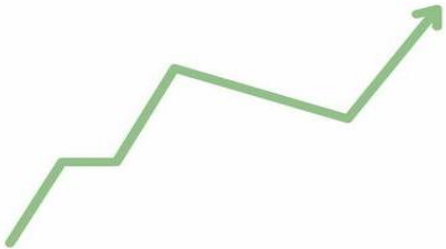
Our improved monitoring process

	Calendar year					
	2018	2019	2020	2021	2022	2023
electricity - London	Included	Included	Included	Included	Included	Included
electricity - Manchester	Included	Included	Included	Included	Included	Included
electricity - Leeds	x	x	x	x	Included	Included
gas - London	x	Included	Included	Included	Included	Included
expensed mileage - Cars	Included	Included	Included	Included	(assumed same as 2021)	Included
Rail	x	x	x	x	Included	Included
taxi	x	Included	Included	Included	x	Included
courier	x	Included	Included	Included	x	Included
staff commute	x	x	x	x	x	Included

As scope and detail of emissions reporting increases it is important to accept it may look emissions are increasing.

The monitoring allows you to be aware of what is being emitting and therefore how to address impacts.

“It looks like I'm getting worse”

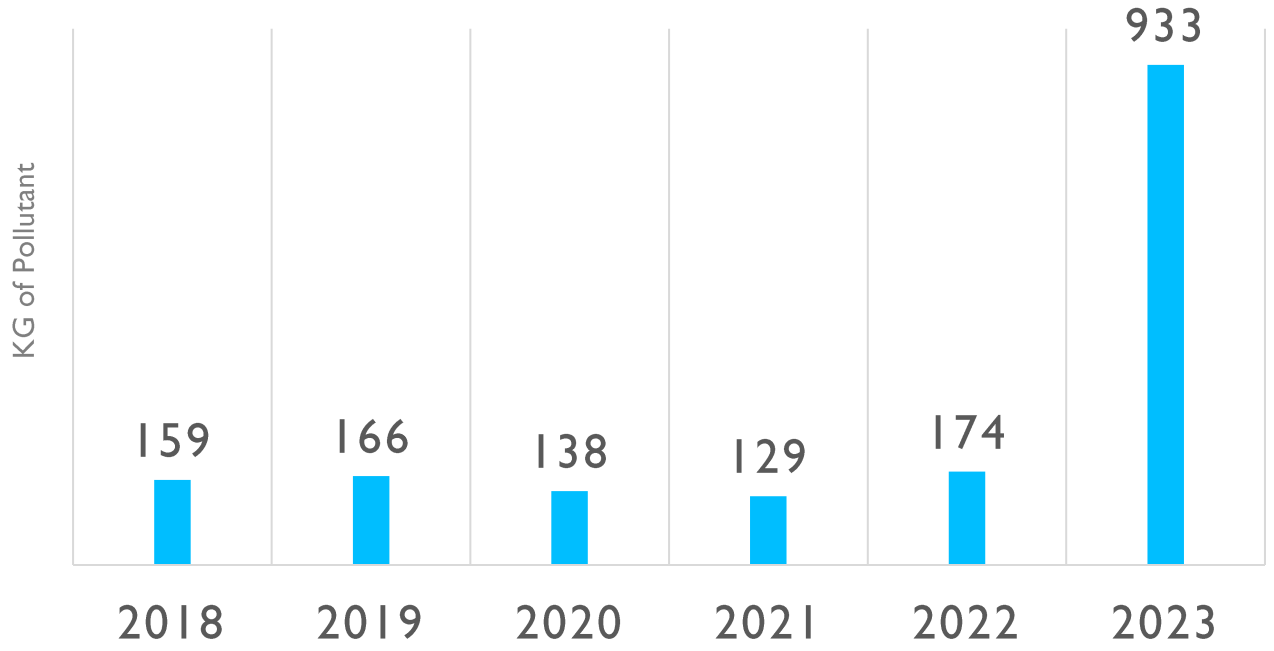


“No, I'm just getting better and smarter at it!”

Our Air Quality Footprint – Nitrous Oxide

Forms when fossil fuels are burned at high temperatures.

Increases susceptibility to respiratory infections and can exacerbate the symptoms of lung or heart conditions.

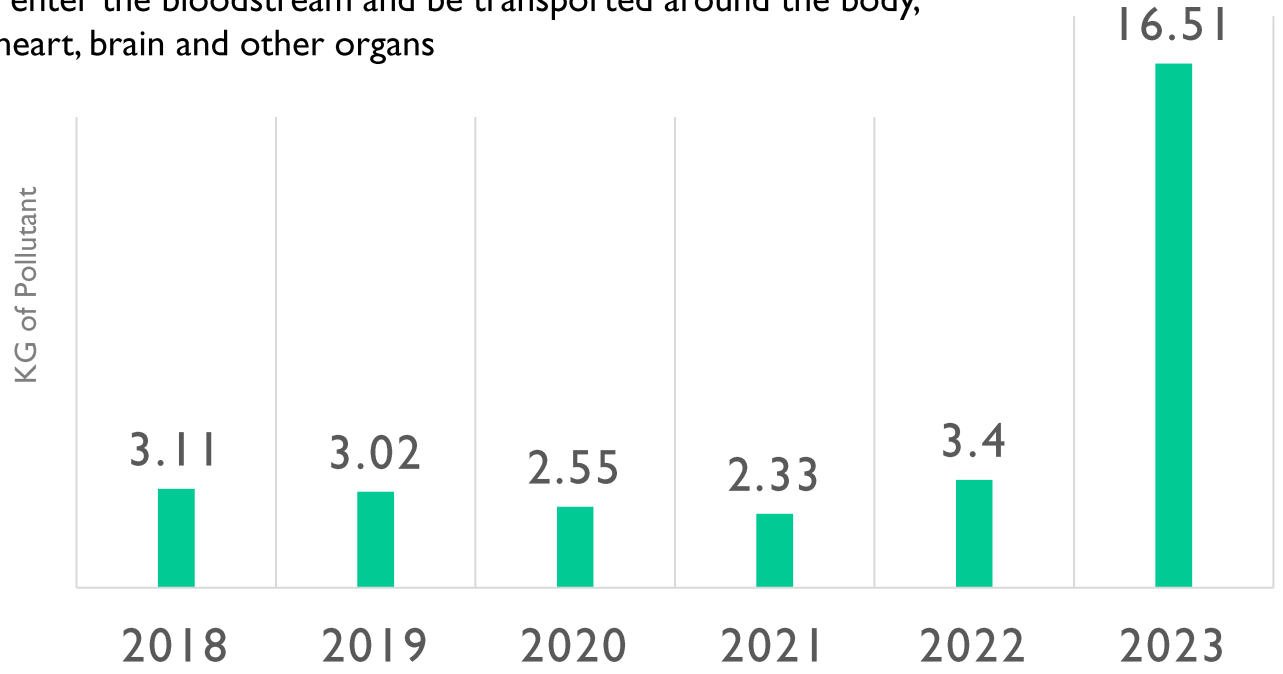


Our Air Quality Footprint – PM2.5

Particulate Matter: Everything in the air that's not a gas. These minor particles can travel long distances.

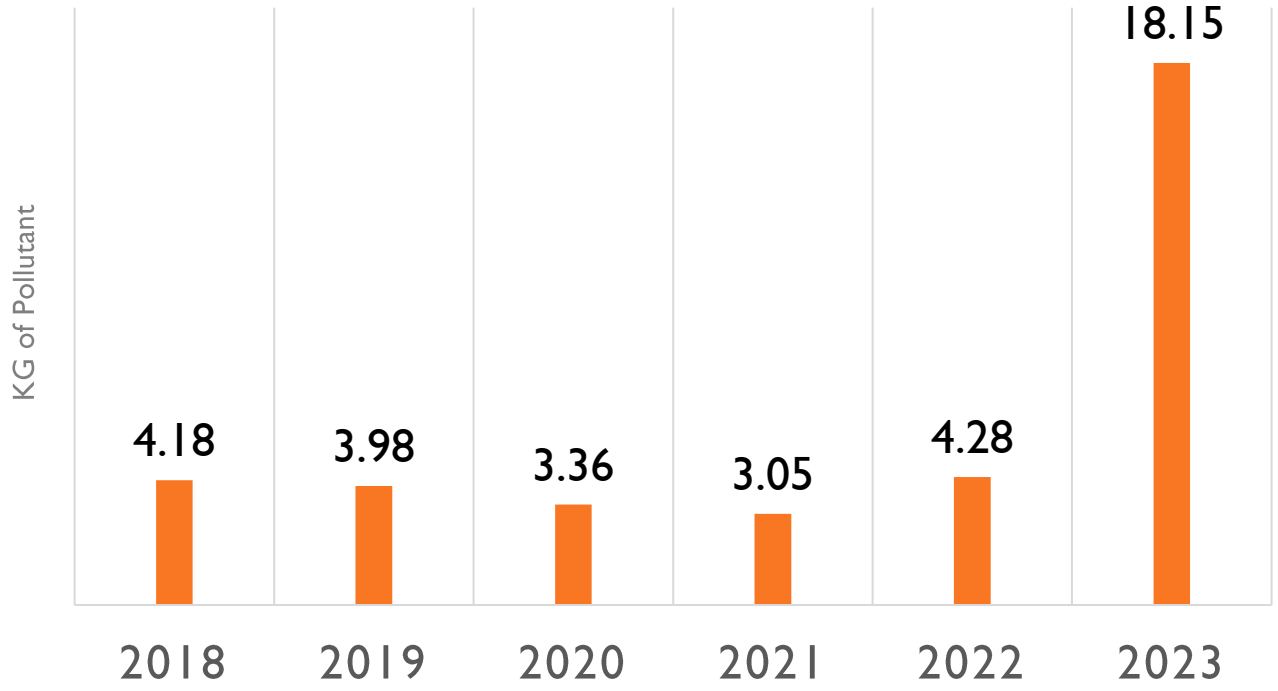
~50% is anthropogenic – e.g. domestic wood burning / vehicle tyre & brake wear

PM toxins may enter the bloodstream and be transported around the body, lodging in the heart, brain and other organs



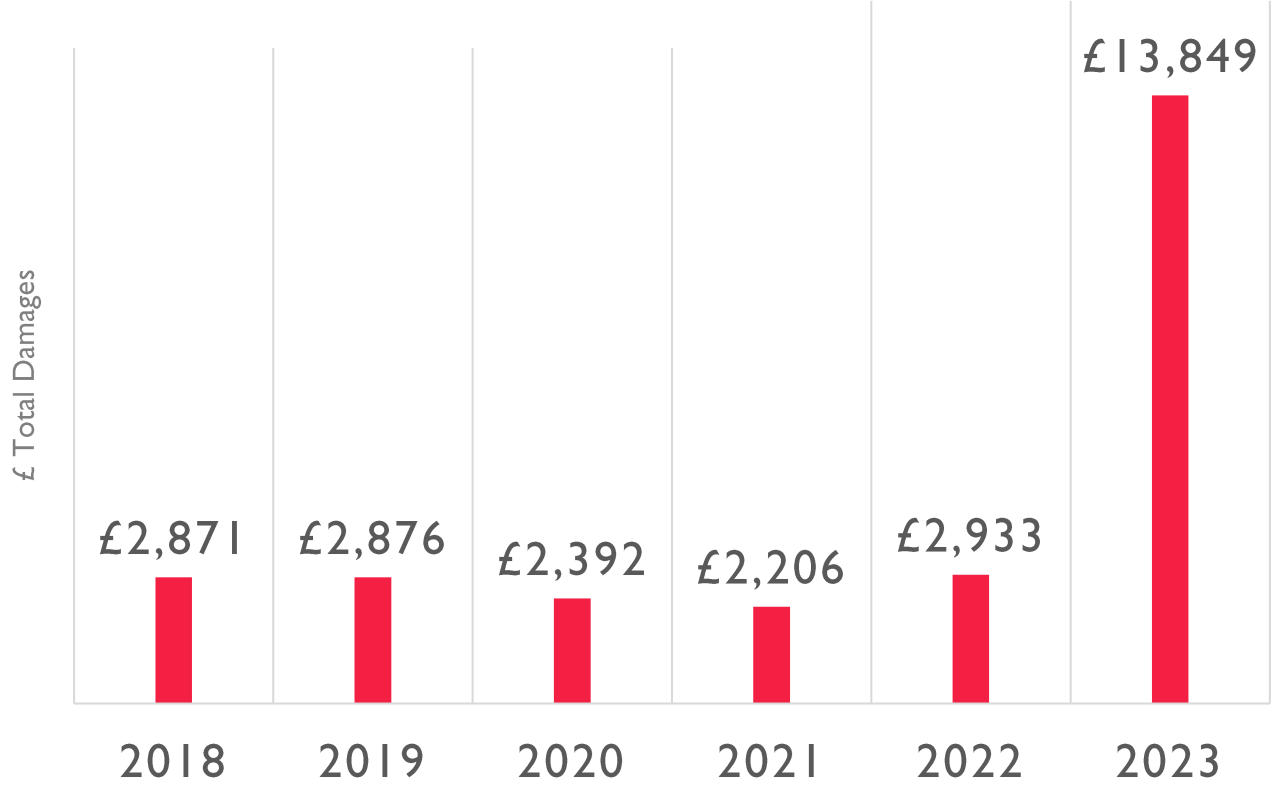
Our Air Quality Footprint – PM10

PM10



Our Air Quality Footprint – Total Damages

Damage costs are a set of impact values which estimate the societal costs of – in this case - increases in target air pollutants.



We've enjoyed being part of this Partnership

– it's pushed us to think more about our work.

Looking forward to learning more today!

Air Pollution Footprint Partnership

Introduction

Guy Hitchcock, Technical Director, Ricardo

Now is the time for action on air quality

- Air pollution is **the leading environmental cause of premature death** around the world
- Every day, 2000 children die as a result of poor air quality
- 99% of the world experiences air quality which does not meet the WHO standards
- **Widescale, cross-cutting action is needed** to address this issue, and we all need to play a part
- Businesses can play a central role in improving the air we breathe
- The first step is developing a **robust evidence base** to understand the sources of emissions and how these can be improved
- The APFP is here to help you develop this evidence and take action

AGENDA

Welcome and Introduction – TP Bennet and Ricardo

CSRD and the future of air pollution reporting

Guest speakers and discussion session

- Hannah Wakelin, Chronos Sustainability - *The role of investors in tackling corporate air pollution through company benchmarking*
- Roshni Mehta, Clean Air Fund – *The World Economic Forum and the Alliance for Clean Air*
- Oli Bleeker, Ricardo – *Our experience of calculating and reporting air pollutant emissions*
- Yasmine Yau, Clean Air Fund - *Air pollution as an issue of health equity*
- Q&A

Next steps on the APFP and Evaluation Survey

Networking and drinks

Air Pollution Footprint Partnership

CSRD and the future of air pollution reporting

Susanna Arus, EU Public Affairs Manager, Frank Bold

Air Pollution Footprint Partnership

CHRONOS
INTELLIGENT SUSTAINABILITY

Air Pollution Footprint Partnership

Hannah Wakelin

The role of investors in tackling corporate air pollution through company benchmarking: CCLA Investment Management and Guy's & St Thomas' Foundation collaboration

20.02.2025

CCLA
GOOD INVESTMENT

Guy's &
St Thomas'
Foundation

Shared commitment to building healthier communities to support healthier investment markets

Corporate air pollution benchmark

- Geographical scope: global
- Sector scope: reliant on road transportation in urban areas
- Activity scope: owned and leased road transportation fleets

"[…] air pollution is now recognized as the single biggest environmental threat to human health."

WHO global air quality guidelines (2021)

Health

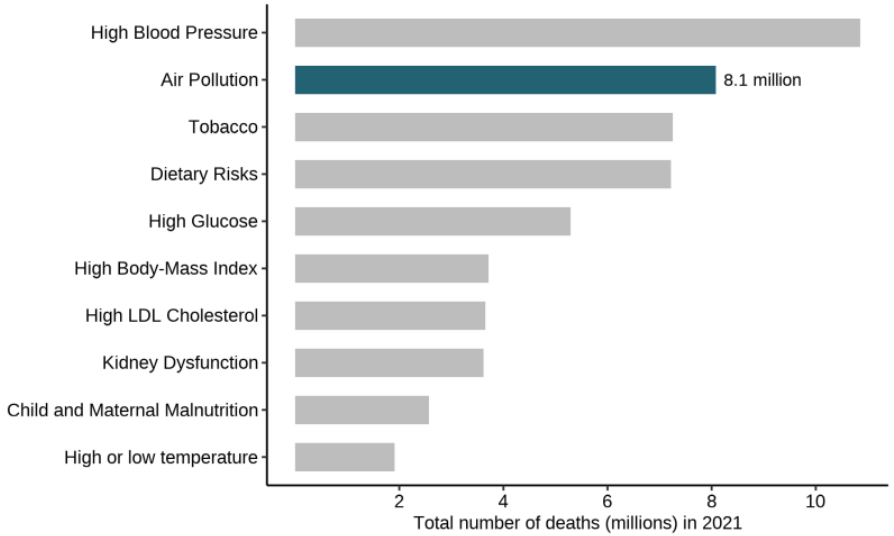
- Major risk factor for non-communicable diseases
- Strong socioeconomic differentials in health effect

Economy

- Health damages from exposure to PM2.5 in 2019 est. US$8.1 trillion (6.1% global GDP)

Environment

- Damages ecosystems
- Contributes to acidification
- Reduces forest and agricultural yields



Health Effects Institute. State of Global Air 2024.

A large portion of air pollution is attributable to commercial activities

Companies, and therefore investors, are exposed to risks and opportunities

Risks

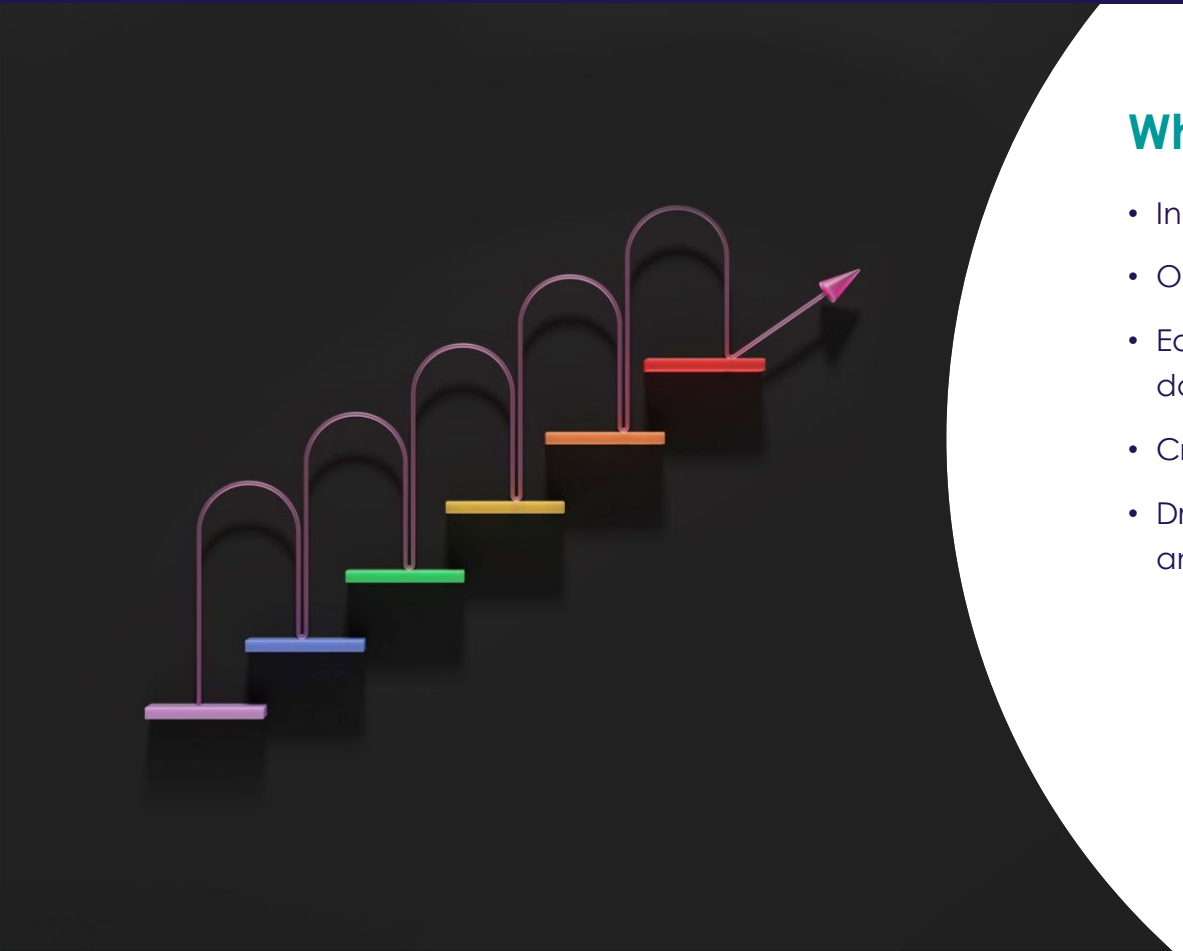
- Evolving legal norms and ESG standards
- Labour force exposure
- Litigation from public actors
- Social licence to operate

Opportunities

- Operational efficiency gains
- Addressing climate risk
- Workforce productivity improvements
- Reputation and brand value enhancements
- Multi-stakeholder collaboration

Investors can play a key role in driving systemic change

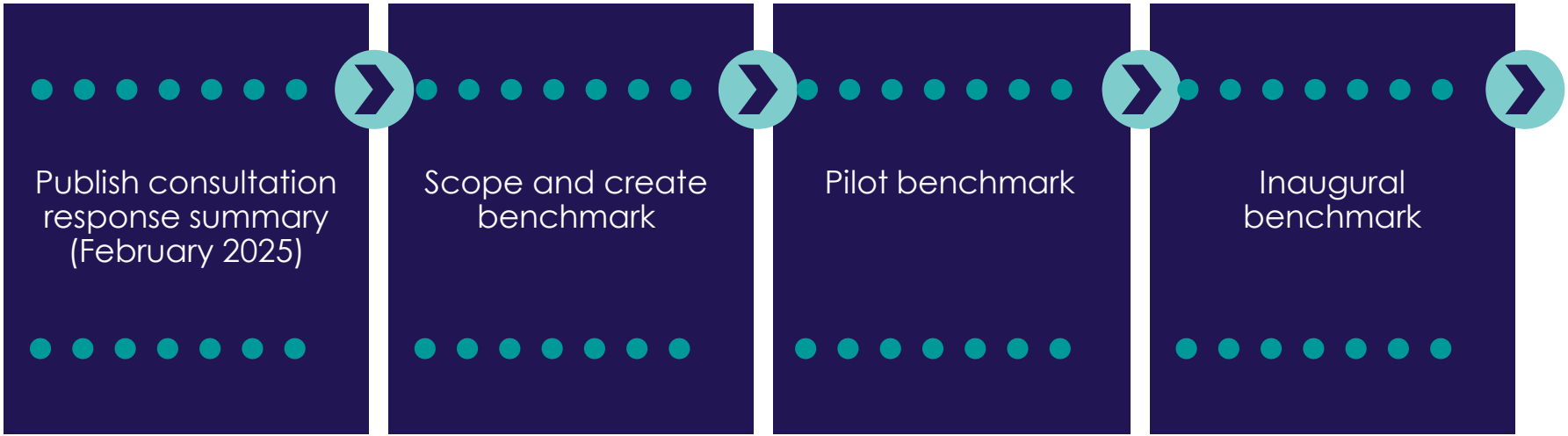
- Increase internal and sector understanding of air pollution
- Consider air pollution-related risks and opportunities in decision-making
- Engage with companies
- Outline clear expectations of companies
- Invest in new technologies and identify innovators
- Lobby policymakers
- Engage with industry groups and support research, tools and initiatives



Why a benchmark?

- Increase awareness
- Outline investor expectations
- Equip investors with comparative data to support decision-making
- Create level playing field for companies
- Drive corporate transparency and accountability

Proposed next steps



For more information

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Hannah Wakelin
Chronos Sustainability
Programme Manager (Health)
hannah@chronossustainability.com

Roshni Mehta,

Private Sector Engagement Manager, Clean Air Fund

Covering for:

Sarah McDonald

Vice-President of Sustainability, Haleon

HALEON

Emissions measurement and reduction

Air quality emissions measured and disclosed…

HALEON

Environmental, Social and Governance (ESG) Databook
2023

Issued March 2024

…used to inform and tailor our decarbonisation approach

Raising awareness among core stakeholders

Employees

Health professionals

The Clean Breathing Institute

Policymakers

Citizens

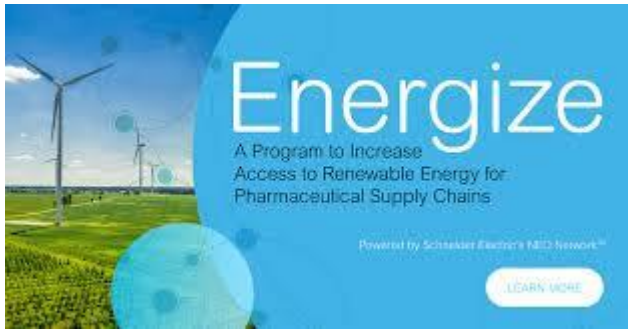
Action within our supply chain

Industry groups

The Consumer Goods FORUM

Collaborative initiatives

SCOPE 3 PEER GROUP



Setting leading standards with our suppliers

1.	2.	3.	4.	5.
Assess & disclose emissions	Develop & submit plan to SBTi	Make the move to renewables	Create a roadmap with us	Cascade to your supply chain

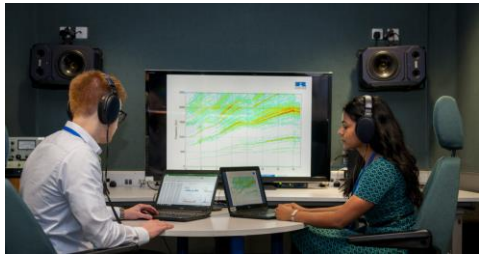
Ricardo PLC Air Pollution

Oli Bleeker, Principal Consultant

CONTENTS

INTRODUCTION TO RICARDO






A GLOBAL STRATEGIC, ENVIRONMENTAL AND ENGINEERING CONSULTING COMPANY

Our teams of consultants, environmental specialists, engineers and scientists support customers in solving the most complex and dynamic challenges to help achieve a safe and sustainable world, operating across the following industries:

- Transport, maritime and rail
- Energy, utilities and waste
- Aerospace and defence
- Industrial and manufacturing
- Government and public sector

Deep heritage of **108** years of innovation

We are located in **23** countries worldwide

We have over **3000** colleagues worldwide

We have over **2500** live projects

METHODOLOGY

- Currently, the tool allows users to calculate emissions from 3 key sources, each using 1 of 2 possible methods:

Transport

E.g. fleet vehicles and staff travel

Tier 1

Fleet type – own/leased vehicles, staff commute

Vehicle type – cars, buses, motorcycles

Fuel type – diesel, petrol, BEV

Powertrain technology – conventional, HEV, BEV etc.

Fuel consumption (litres) or distance (km)

Heat and Power

E.g. from boilers, furnaces and related to electricity use

Tier 1

Fuel group and type – gases (natural gas, biogas, LPG), liquids (kerosene, petrol, biofuels), solid (coal, coke, biomass), electricity

Fuel consumption – kWh, MJ, tonnes, m^3, litres

Non-Road Mobile Machinery

E.g. engineering, construction and materials handling equipment

Tier 1

Machinery type – automotive engine test beds

Fuel type – diesel, petrol, HVO etc.

Fuel consumption (calculated from fuel use, annual energy use or from machines' net power rating and load factor)

- Tier 2 methods include additional inputs to increase the accuracy of the calculations.

OUTPUTS

- The tool calculates emissions of NO_X, PM_{10} and $PM_{2.5}$ – in addition to estimates for damage cost attributed to NO_X and $PM_{2.5}$ emissions across societal impacts to areas such as human health, productivity, ecosystems, buildings and materials:

Emissions

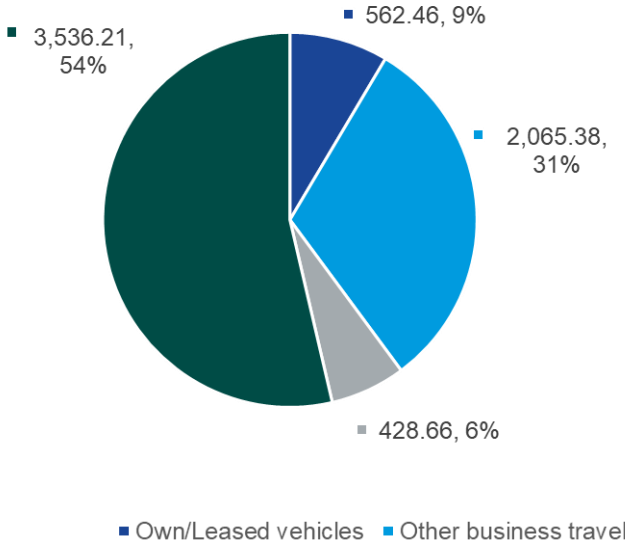
Category	Emissions Source	NO_x (kg)	PM_{10} (kg)	$PM_{2.5}$ (kg)
Transport	Own/leased vehicles	562.46	7.48	7.48
	Other business travel	2,065.38	27.95	27.95
Heat and Power	Combustion fuels	428.66	4.52	4.52
NRMM	Testing fuels	3,536.21	206.14	206.14
Total		6,592.71	246.09	246.09

Damage Costs

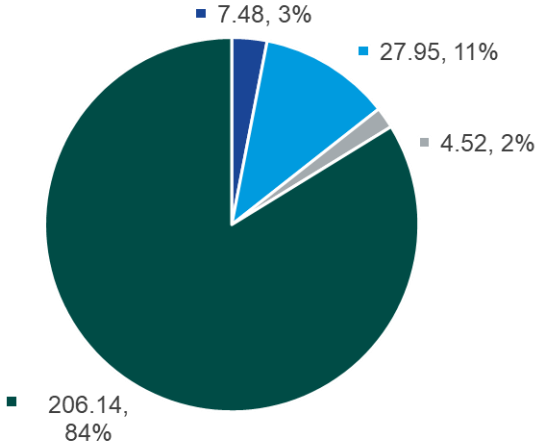
Category	NO_x Damage Costs (£)	$PM_{2.5}$ Damage Costs (£)	Total Damage Costs (£)
Transport	30,700	2,995	33,695
Heat and Power	7,108	269	7,377
NRMM	27,869	10,929	38,797
Total	65,677	14,192	79,869

OUTPUTS

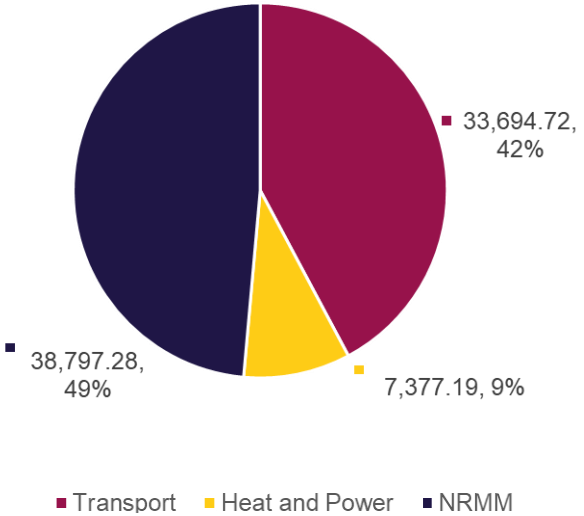
NO_x Emissions (kg)



PM_{10} and $PM_{2.5}$ Emissions (kg)*



Total Damage Costs (£)



** Results for PM_{10} and $PM_{2.5}$ emissions are identical in this case.*

USING THE TOOL

User Experience

- Easy to use, Logical input and simple to interpret results.
- Opportunities for Ricardo to breakout data into more categories for more specific results

Data availability

- Tier 1 data is easily available for Ricardo.
- Tier 2 would require significant additional data collection

Opportunities

- New fuels, CNG or Kerosene
- Time based calculations, keep record over time to monitor changes.

NEXT STEPS

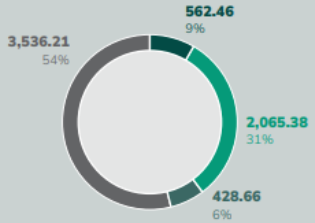
Ricardo Annual Report 2024

Transport
covering fuel consumption (litres), distance (km) and transport type, including fleet (own/leased) and staff vehicles (such as cars, buses, motorcycles) across all fuel types (diesel, petrol, BEV); powertrain technology, including conventional, HEV, BEV; and travel

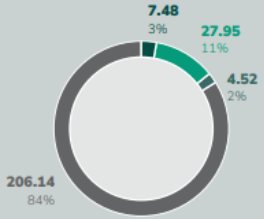
Heat and power
from boilers, furnaces and related to electricity use, covering fuel group and type – gases (natural gas, biogas, LPG), liquids (kerosene, petrol, biofuels), solid (coal, coke, biomass), electricity; fuel consumption – kWh, MJ, tonnes, m^3, litres

Non-road mobile machinery
covering engineering, construction and materials handling equipment, including machinery type, automotive engine test beds; fuel type – diesel, petrol, HVO etc; and fuel consumption (calculated from fuel use, annual energy use or from machines' net power rating and load factor)

NO_x emissions (kg)



PM_{10} and $PM_{2.5}$ emissions (kg)[1]



Own/leased vehicles | Other business travel | Combustion fuels | Testing fuels

(1) Results for PM_{10} and $PM_{2.5}$ emissions are identical in this case.

Next steps
Assessment showed the areas where Ricardo has the highest air pollution, which was focused to manufacturing and test locations and business travel. Ricardo continues to participate in the pilot, and as we continue to gather data and information we will begin to take affirmative actions to air pollution emissions wherever possible.

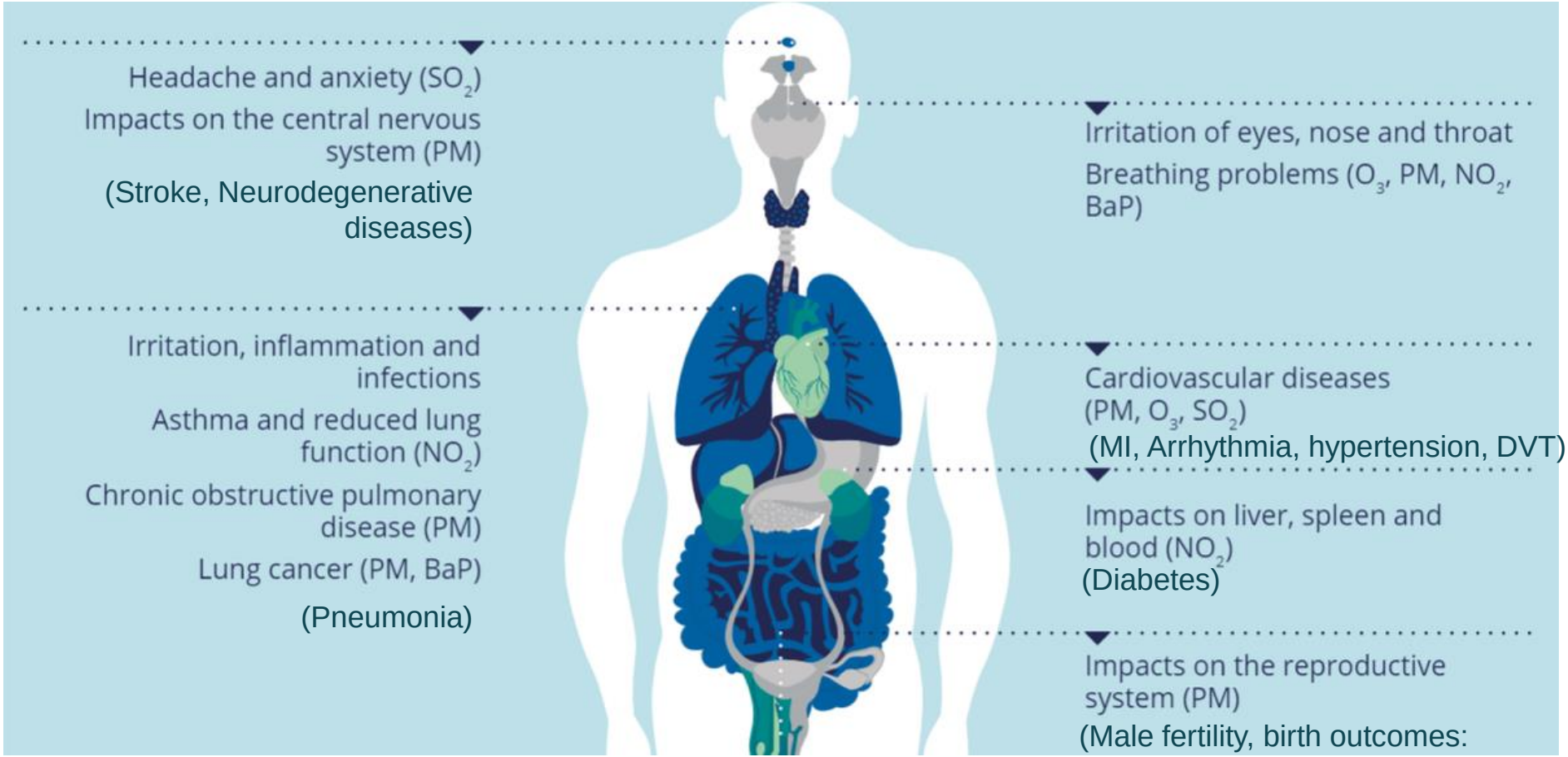
Air Pollution as an Issue of Health Equity

The Clean Air Fund Health Team

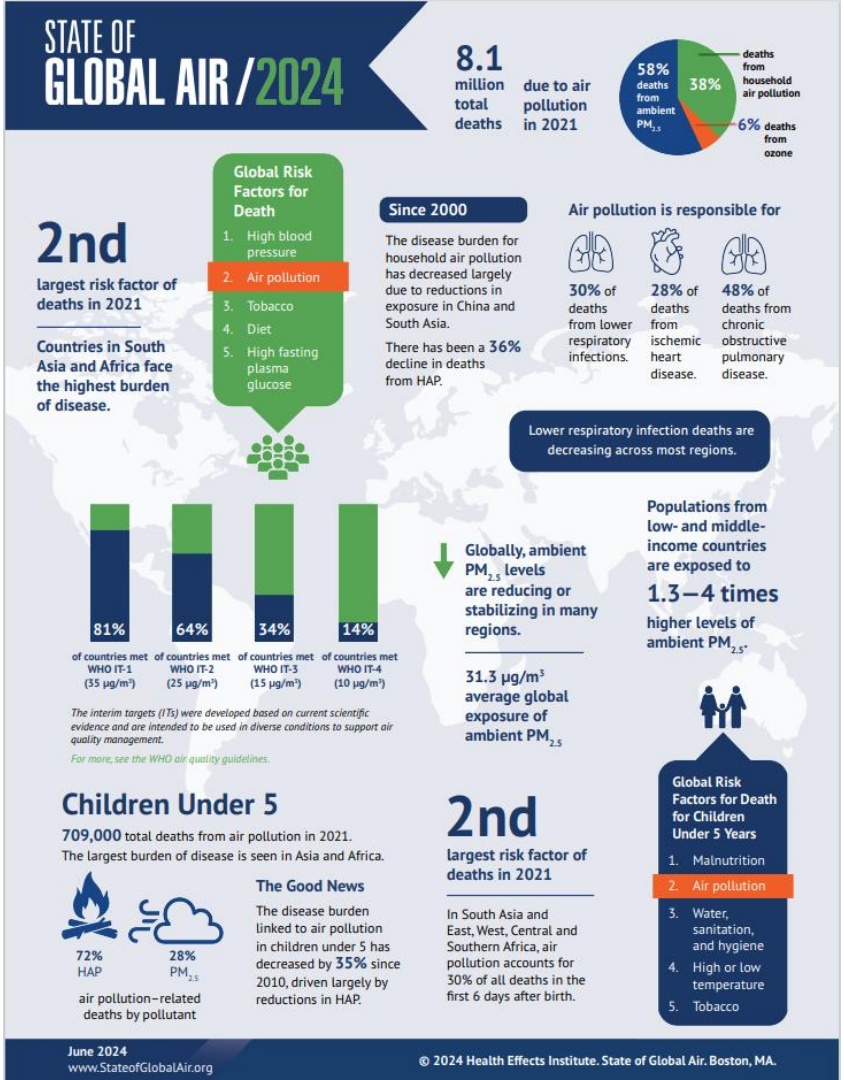
Yasmine Yau, Senior Health Specialist

February 2025


CLEAN
AIR
FUND



Source: European Environment Agency: How air pollution affects our health



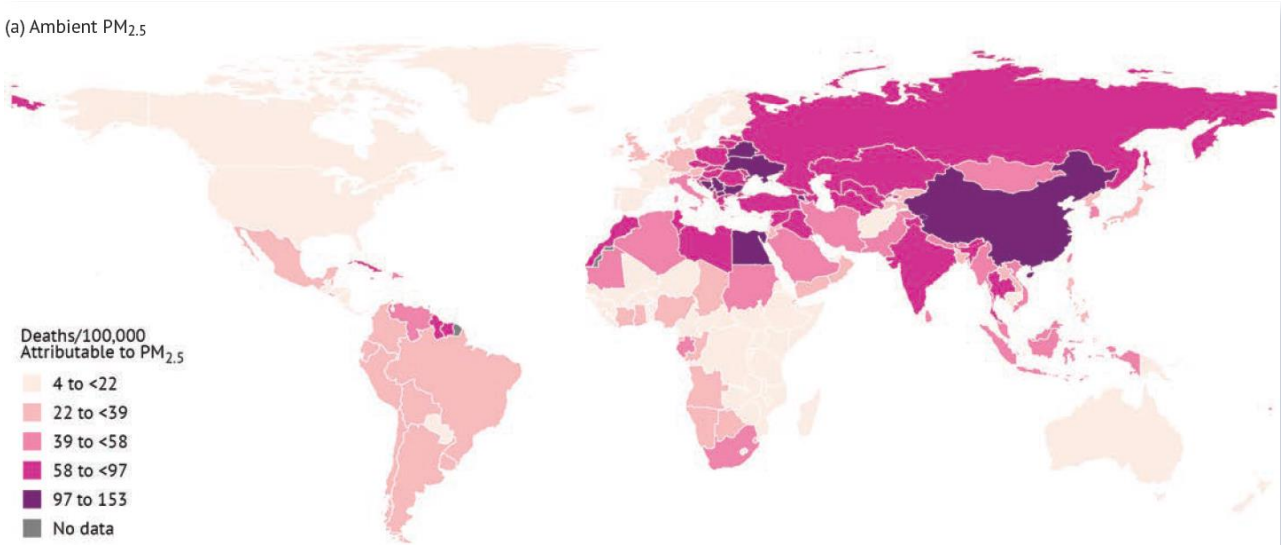
CLEAN AIR FUND

State of Global Air Report 2024

State of Global Air Data

Air pollution is a barrier to development

91% air pollution deaths are in LMICs



Impact of air pollution on life expectancy by region[2]

-5 years South Asia

4 out of the 5 most polluted countries are in S. Asia: Bangladesh, India, Nepal and Pakistan.

-5 years Central & West Africa

In the most polluted areas.

-3 years Southeast Asia

Up to 4 years around Jakarta and Hanoi.

-2.6 years China

Pollution fell by ~40% 2013-2020, adding 2yrs to avg life expectancy

Sources: 1 State of Global Air 2024; 2 AQLI – Air Quality Life Index, 2022

Children under 5 and older adults are particularly vulnerable

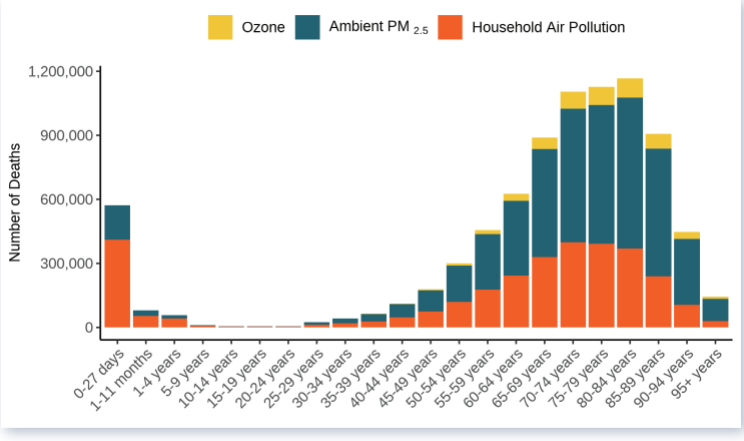


FIGURE 11. Distribution of global deaths in 2021 attributable to ambient $PM_{2.5}$, ozone, and household air pollution, by age. *Much of the disease burden of air pollution falls on older populations because aging is a risk factor for noncommunicable diseases.*

Inhaled air pollutants can be deposited into the lungs, where they alter lung defenses. Some enter directly into the bloodstream and deeper tissues, including the heart, brain and other organs.

Children are not little adults. They have unique vulnerabilities.

Air pollution impacts developing bodies and brains.

Health impacts can last a lifetime.

Pregnancy

- Pregnant woman inhales increased amount of air per minute
- Some pollutants can cross placenta and reach the fetus; these include air pollution resulting from the use of inefficient, polluting fuels and technologies and/or from second-hand smoke

- Maternal changes due to air pollution exposure, such as inflammation and oxidative stress, indirectly affect fetus
- Negative impacts on development of respiratory, cardiovascular, immune, endocrine, and nervous systems

- **Maternal health:** Gestational diabetes, pre-eclampsia, gestational hypertension, and postpartum depression
- **Adverse birth outcomes:** Low birth weight, miscarriage, preterm birth, stillbirth
- **Impacts on lifelong child health:** Congenital heart defects, pneumonia in first year of life, neurodevelopmental disorders, stunting, development of asthma, eczema and allergic disease, and high blood pressure

Infancy and Childhood

- Inhale more air per kilogram of body weight and absorb more pollutants relative to adults
- Ineffectively filter pollutants in nasal passages
- Lack ability to control exposure, both indoors and outdoors
- Live closer to the ground, so may breathe in more ground-level pollution

- Lungs, brain and other organs still developing
- Inflammation in children's smaller airways causes proportionally more blockage and resistance to air flow

- Pneumonia
- Upper respiratory tract infections
- Ear infections
- Asthma, allergies and eczema
- Altered growth (stunting and obesity)
- High blood pressure
- Childhood leukemia
- Impaired cognitive development, including autism spectrum disorders

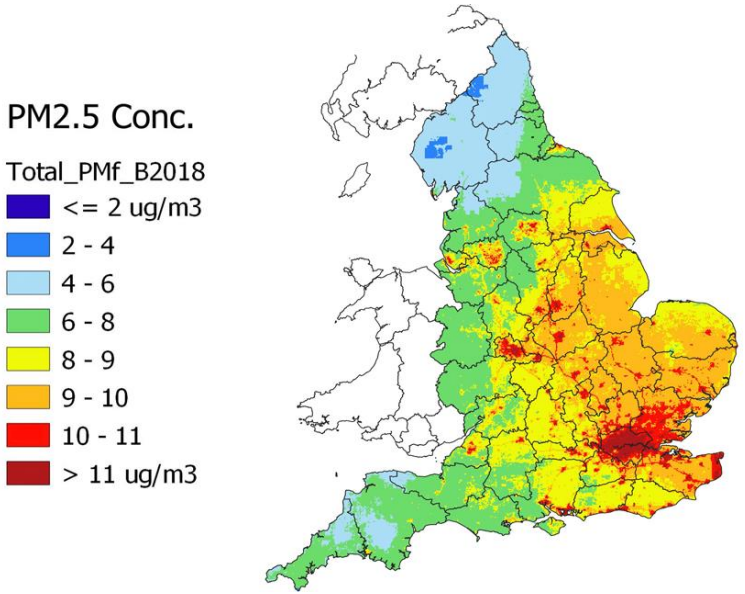
CLEAN AIR FUND

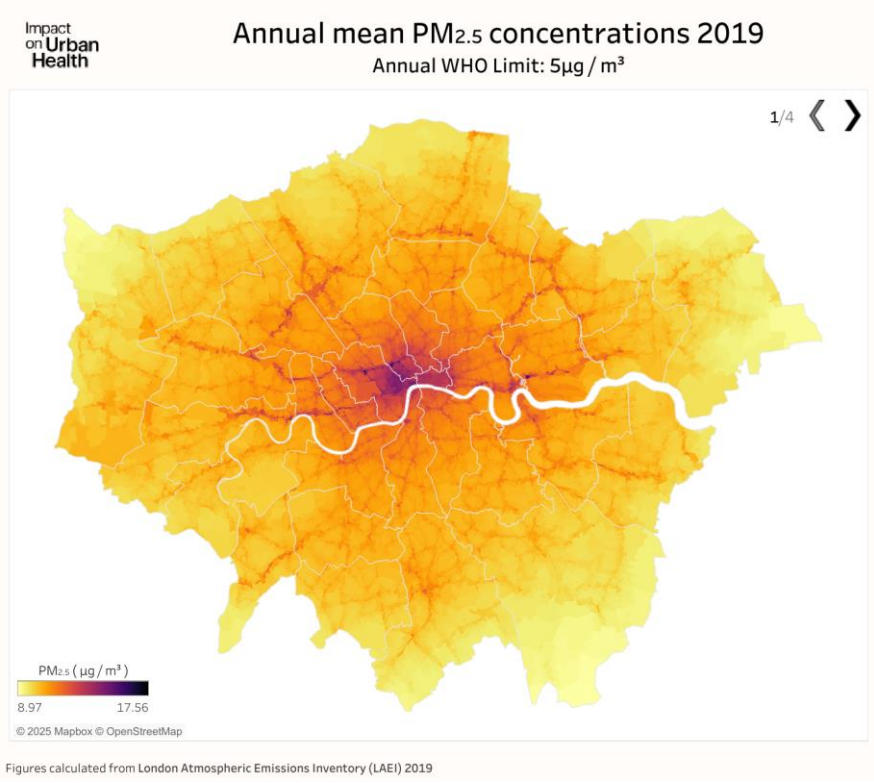
"A child who is exposed to unsafe levels of pollution early in life can suffer a life sentence of illness."

-World Health Organisation

Health inequity from Air Pollution in the UK

CLEAN AIR FUND





Sources: Air Quality Strategy: Framework for Local Authority Delivery, Gov.uk

Air Pollution Footprint Partnership

Q&A

Hannah Wakelin, Chronos Sustainability - *The role of investors in tackling corporate air pollution through company benchmarking*

Roshni Mehta, Clean Air Fund – *The World Economic Forum and the Alliance for Clean Air*

Oli Bleeker, Ricardo – *Our experience of calculating and reporting air pollutant emissions*

Yasmine Yau, Clean Air Fund - *Air pollution as an issue of health equity*

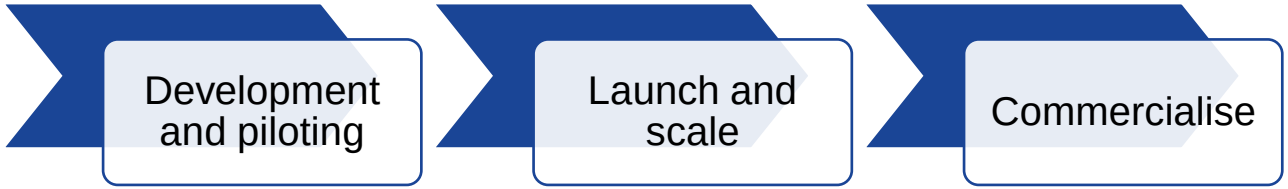
Evolving the Air Pollution Footprint Partnership

Our Mission – to support organisations on their journey to assess, report and manage their air pollutant emissions

Air Pollution Footprint Partnership

Supported by our funding partners (CAF and IoUH)
A big thank for that support

Now we have to stand on our own two feet and we can't do that without you



Evaluation Survey

- Please complete the Evaluation Survey to provide feedback on your experience of being involved in the initiative.
  - ➢ https://linktr.ee/apfp25
  - ➢ It should take 10-15 minutes.
  - ➢ Your feedback is essential for guiding the future of the Air Pollution Footprint Partnership

- Other resources:
  - ➢ Promote your involvement with APFP through promotional materials
  - ➢ Learn about Ricardo's air quality services

Air Pollution Footprint Partnership

Thank you for listening, now time for you to relax, have a drink and engage with colleagues

If you have any further questions, please contact the helpdesk: apfootprint@ricardo.com