Campaign Briefing Paper

We need to talk about

Indoor Air Pollution and Occupational Health

20 August 2024

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TUCAN Indoor Air Pollution Briefing Paper

1. Background

The Trade Union Clean Air Network (TUCAN) was set up in 2019 by the Greener Jobs Alliance and Hazards Campaign. TUCAN | Greener Jobs Alliance

Its role is to support trade union action on air pollution. We publish newsletters, a guide for union reps, and a Clean Air Charter. The Charter has been signed by 14 of the largest unions in the UK and other campaign groups. The opening statement of the Charter reads:

'Trade unions need a response to the public health emergency and also the occupational health emergency of air pollution. Over 40,000 people die each year in the UK where the outdoor air that they breathe is a major contributory factor. Thousands of people will also die because of occupational diseases caused by air pollution at work. Pollution arising from work and travel to work are health issues for which employers take little responsibility. There is hardly any recognition of this in national and local authority strategies.' GJA-TU-Clean-Air-CharterEMAIL.pdf (greenerjobsalliance.co.uk) March 2019.

Over 5 years on and the situation has not improved. That is why we have published this briefing paper to lobby the Government, political parties, and regulatory bodies.

Air pollution has severe health impacts in cities around the globe and the World Health Organisation (WHO) now recognises it as the single biggest environmental threat to human health. Every year, exposure to air pollution is estimated to cause 7 million premature deaths. WHO Air Quality Guidelines (c40knowledgehub.org)

There are many different pollutants that workers can be exposed to at work, on their way to work, and in their communities. TUCAN has published a 'Workers Guide to Air Pollution'. This is a practical guide to the hazards and provides advice on how unions can organise to protect the workforce. Workers-Guide-to-action-on-indoor-workplace-air-pollution-WEBSITE.pdf (greenerjobsalliance.co.uk)

Particulate Matter (PM) In this paper we have focused on the hazards of Particulate Matter . Research shows this poses a significant risk and yet the standards currently in place to control it are totally inadequate. Airborne PM is not a single pollutant, but a mixture of many substances. It can consist of solids and aerosols composed of small droplets of liquid, dry solid fragments, and solid cores with liquid coatings. PM is measured by particle size. Particles of 100 microns (μm) and below are inhalable, while those that are 10 microns or less are also respirable. This means they can travel further into the lungs and cause more damage. The extent and type of damage will depend on the chemical composition of the particulate and its size.

Both PM2.5 and PM10 can be inhaled, with some depositing throughout the airways, though the locations of particle deposition in the lung depend on particle size. PM2.5 is more likely to travel into and deposit on the surface of the deeper parts of the lung, while PM10 is more likely to deposit on the surfaces of the larger airways of the upper region of the lung. Particles deposited on the lung surface can induce tissue damage, and lung inflammation.

Most importantly as PM 2.5 can be absorbed through the lungs into the blood system and travel around the body affecting every cell and organ including the brain and the developing foetus, causing widespread damage and long-term harm.

This view is confirmed by the Committee on the Medical Effects of Air Pollution (COMEAP), the UK's independent Government advice service: *'WHO's revised Air Quality Guideline for PM2.5 confirms our previously expressed view that PM2.5 pollution can have harmful effects on people's health at lower concentrations than had been studied previously. It also indicates that reducing concentrations to 5 µg/m3 would have* ***public health*** *benefits.'* (COMEAP Jan 2022)
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1060744/COMEAP_WHO_AQG_-_Defra_PM2.5_targets_advice__2_.pdf

The COMEAP quote does also reveal a problem with the way that air pollution is perceived and addressed in the UK. This is reflected in two ways. Firstly, the focus in the national debate has been on **public** health. While this is crucial it has resulted in very little attention being paid to the **occupational** health aspects. Secondly, the emphasis has been on **outdoor** (ambient) air pollution, with very few references to i**ndoor** air pollution. This briefing paper is designed to redress this by focusing on **indoor, occupational** air pollution.

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2. Summary of policy asks

This paper argues for a fundamentally new approach that recognises the hazards of indoor air pollution, particularly as it impacts workers. The reasoning behind each policy change is covered in more detail in the paper but in summary the following changes are required:

Government

1. Ensure that indoor air pollution is given a much higher priority in line with the Chief Medical Officer (CMO) report. The ownership of indoor air quality policy within government also needs to be clarified, as recommended by the CMO report.
2. Regulations made under the Health and Safety at Work Act 1974 must be amended to include climate risks for workers. The Workplace (Health, Safety and Welfare) Regs 1992 and the Control of Substances Hazardous to Health Regs 2002, need to include enforceable higher health-based standards and duties on employers to conduct and act on indoor air pollution occupational risk assessments
3. The Environmental Act 2021 must be amended to allow for regulations to include indoor air pollution standards in all workplaces and public and commercial spaces.
4. The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 must be amended. The Regulations should include a 24-hour Time Weighted Average (TWA) for PM2.5 in the same way that there is a 24-hour TWA for PM10. COMEAP should conduct a consultation, that includes trade union participation, to help determine what this level should be set at and how many times per year it can be exceeded.
5. The government must set the target date for compliance with WHO standards for 2030 rather than 2040.
6. The government must instruct the Health and Safety Executive (HSE) to update the Workplace Exposure Limits (WELs) in EH40 to include specific standards for PM2.5 and PM10, that are in line with WHO standards for ambient air.
7. Provide sufficient funding to statutory bodies to implement indoor air pollution policies.

Other Statutory Authorities

8. Air Quality Action Plans (AQAPs) must include assessments of indoor air quality standards for workplaces and residential buildings.
9. Employers must be advised to carry out air pollution risk assessments in conjunction with the workforce and recognised trades unions.
10. Ensure AQAPs include assessments of vulnerable groups.
11. Work with employers to carry out air pollution risk assessments in conjunction with the workforce and recognised trades unions.
12. Include indoor air pollution in climate adaptation/resilience strategies and ensure retrofitting does not increase risk of indoor air pollution

Enforcement bodies – HSE and Local Authorities

13. Organisations with responsibly for monitoring and enforcing indoor air pollution standards must be adequately resourced to carry out their statutory duties and engage effectively with employers, unions, and community organisations.

Worker's rights

14. The government must introduce regulations that allow for the appointment of union green representatives. These reps or existing safety reps must have rights to monitor pollution levels and raise concerns with the employer.
15. The government must introduce meaningful consultation rights that provide for union involvement on standard setting covering WELs
16. Introduce meaningful consultation rights on air pollution impacts relating to policies covering inequalities, Covid, and climate change.

Research and planning bodies

17. Ensure that research on the effectiveness and cost benefit of air filtration is collated with development of criteria for selection of best value for effective Clean Air Delivery Rate at lowest sound level. Funding should be made available for most effective best value CADR air filters in all schools and health care.

18. People spend large periods of time indoors and many indoor places are public, where individuals have little control over the quality of air they breathe. These two factors should be recognised in the planning and development of public indoor spaces, as recommended by the CMO.
19. Effective ventilation, while minimising energy use and heat loss, is a priority for reducing air pollution, respiratory infections and achieving Net Zero. This is a major engineering challenge which needs solving, as recommended by the CMO.
20. Research organisations should develop the evidence that will support government, local authorities and businesses to adopt science-based UK standards for indoor air quality, to reduce emissions, exposure and harms.

3. The hazards of indoor air pollution.

Indoor air pollution has not received the same attention as outdoor pollution, even though it may contribute to almost as many deaths globally — 3.2 million in 2020, according to the World Health Organization (WHO), compared to around 3.5 million linked to polluted outdoor air. Household air pollution (who.int)

The **CMO's Annual Report** highlighted both the problem of the lack of research on indoor air pollution and the need to prioritise it.

'Indoor air pollution is important because over 80% of a typical adult day is spent indoors. Despite this we have much less knowledge about the sources and people's exposure to indoor air pollution, and a less well-developed plan for reducing it. As outdoor air pollution decreases in many environments, ***indoor air pollution will become the more important opportunity to improve health****.'*

Chief Medical Officer's Annual Report 2022 (publishing.service.gov.uk) December 2022 (340 pages)

Indoor air pollution is a mixture of pollution from activities taking place inside a building and outdoors. Some of the particulate matter found indoors originates from the outdoors, especially microscopic particles of Particulate Matter (PM). These particles enter indoor spaces through doors, windows, "leakiness" in building structures, and unfiltered/inadequately filtered air inlets. In workplaces there will often be a cocktail of different pollutants depending on the work activity. For the purposes of this briefing paper, we will focus on PM. Workers-Guide-to-action-on-indoor-workplace-air-pollution-WEBSITE.pdf (greenerjobsalliance.co.uk)

Why is PM2.5 so dangerous? – According to the WHO, when PM2.5 gets deep into the lungs it can enter the bloodstream causing cardiovascular (ischaemic heart disease), cerebrovascular (stroke) and respiratory impacts. Both long-term and short-term exposure to particulate matter is associated with morbidity and mortality from cardiovascular and respiratory diseases. Long-term exposure has been further linked to adverse perinatal outcomes and lung cancer. In 2013, it was classified as a cause of lung cancer by WHO's International Agency for Research on Cancer (IARC). It is also the most widely used indicator for assessing the health effects of exposure to air pollution. Air quality, energy and health (who.int) As PM 2.5 can travel all-round the body in the bloodstream they can affect every cell and organ including the brain and the developing foetus, causing widespread damage and long-term harm.

4. Government policy

It is vital that the Government elected in 2024 seizes the opportunity to make fundamental changes to the way that indoor air pollution is addressed in the UK. Previous governments have been taken to court over their failures to implement legally binding requirements.

We call on the government to implement policy asks 1-7:

1. Ensure that indoor air pollution is given a much higher priority in line with the Chief Medical Officer (CMO) report. The ownership of indoor air quality policy within government also needs to be clarified, as recommended by the CMO report.

2. Regulations made under the Health and Safety at Work Act 1974 must be amended to include climate risks for workers. The Workplace (Health, Safety and Welfare) Regs 1992 and the Control of Substances Hazardous to Health Regs 2002, need to include enforceable higher health-based standards and duties on employers to conduct and act on indoor air pollution occupational risk assessments
3. The Environmental Act 2021 must be amended to allow for regulations to include indoor air pollution standards in all workplaces and public and commercial spaces.
4. The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 must be amended. The Regulations should include a 24-hour Time Weighted Average (TWA) for PM2.5 in the same way that there is a 24-hour TWA for PM10. COMEAP should conduct a consultation, that includes trade union participation, to help determine what this level should be set at and how many times per year it can be exceeded.
5. The government must set the target date for compliance with WHO standards for 2030 rather than 2040.
6. The government must instruct the Health and Safety Executive (HSE) to update the Workplace Exposure Limits (WELs) in EH40 to include specific standards for PM2.5 and PM10, that are in line with WHO standards for ambient air.
7. Provide sufficient funding to statutory bodies to implement indoor air pollution policies.

5. Other statutory bodies – Regional and local authorities

The Government has delegated responsibility for the implementation of clean air plans to regional and local organisations. We recognise that regional and local authorities are under serious financial pressure which is why we have called for sufficient central government funding in Policy Ask 9.

TUCAN is concerned that many current plans do not appear to address the issue of indoor air pollution, and occupational exposure. Annual reviews need to be conducted in conjunction with union and community organisations to ensure that Air Quality Action Plans (AQAPs) deal with these gaps.

We call on Other Statutory Authorities to implement policy asks 8-12:

8. AQAPs must include assessments of indoor air quality standards for workplaces and residential buildings.
9. Employers must be advised to carry out air pollution risk assessments in conjunction with the workforce and recognised trades unions.
10. Ensure AQAPs include assessments of vulnerable groups.
11. Work with employers to carry out air pollution risk assessments in conjunction with the workforce and recognised trades unions.
12. Include indoor air pollution in climate adaptation/resilience strategies and ensure retrofitting does not increase risk of indoor air pollution

6. Indoor air pollution and occupational exposure

'There are no systematic long-term monitoring data available on indoor pollution trends in the UK. This is a major evidence gap that limits the formulation of policy, or advice on best practice' CMO report page 62) Chief Medical Officer's Annual Report 2022 (publishing.service.gov.uk)

If the data on indoor air pollution is poor generally, it is even more limited in relation to occupational exposure. There is a perception issue here. Outdoor pollution is often focused mainly on traffic and there is insufficient attention paid to other sources. Indoor pollution is often focused mainly on homes and there is insufficient attention paid to workplaces and other buildings. The CMO report does reference a study done on the London Underground:

Travel to work – *'A study of exposure in London Underground carriages found that the Victoria Line, which runs deep under the capital and has no open sections, had a mean PM2.5 concentration of 381 µg/m3.'* CMO Report Page 108) Chief Medical Officer's Annual Report 2022 (publishing.service.gov.uk). This is a high concentration of respirable dust. Exposure levels on the platforms and ticketing areas are high so this risk is even more acute for London Underground Limited (LUL) workers. It also means that workers using the tube to travel to and from work will be doubly exposed – on top of their own workplace exposures.

At risk occupations need to be identified and monitoring put in place. The absence of action from employers, local authorities and the government means that trade unions need to take action. TUCAN has provided a range of guidance to support this. TUCAN Air pollution - all in days work .pptx - Google Drive and TUCAN-Guidance-for-TU-Reps.pdf (greenerjobsalliance.co.uk) and Workers-Guide-to-action-on-indoor-workplace-air-pollution-WEBSITE.pdf (greenerjobsalliance.co.uk)

The lack of policy development and statutory support is a major drawback in achieving safer workplaces. Recent publications highlight this:

'Mandating Indoor Air Quality for Public Buildings' Explains the current status of indoor air quality standards (in short: bad or non-existent), the huge health benefits that would arise from them & proposing a path forward https://science.org/doi/10.1126/science.adl0677;

'Lessons from the COVID-19 pandemic for ventilation and indoor air quality Lessons from the COVID-19 pandemic for ventilation and indoor air quality | Science

For indoor air pollution, the CMO's recommendations include:

- addressing a major engineering challenge – ensuring effective ventilation while minimising energy use and heat loss. This is a priority for reducing indoor air pollution while achieving Net Zero.
- increased research into tackling indoor air pollution including finding ways to reduce sources of indoor air pollution. For example, there is nothing in the report on the benefits of filtration. Presentation to NEU 2023 https://tinyurl.com/bbt3bkau

The report does not cover the benefits of in-room filtration with HEPA and MERV filters to make immediate reductions in PM levels in all indoor workplaces including schools and hospitals while source reduction is still the long term aim. A growing body of evidence shows that filtration can reduce PM levels substantially which reduces the risk of illness including airborne infection and asthma, and increases concentration, learning and achievement of children and workers, and is cost effective. In areas of deprivation and high ambient air pollution, provision of air filtration in schools can reduce

inequality of education and health and this is currently the focus of a Mayor of London project to put air filters in school in worst polluted areas https://tinyurl.com/5yyypkup Presentation to NEU Fringe https://tinyurl.com/bbt3bkau

Professor Cath Noakes presented at the **f**irst WHO Europe Indoor Air Conference 2023 YouTube https://www.youtube.com/watch?v=Czqc02wbYd0 findings of the CLASS-ACT study into the use of air filters in schools in Bradford: "*Underlying illness absence in schools was reduced by more than 20% when air cleaners were used"* Child-of-the-North-Report-FINAL-1.pdf (thenhsa.co.uk) This has been followed by 'Coupled indoor air quality and dynamic thermal modelling to assess the potential impacts of standalone HEPA filter units in classrooms' which found '*the addition of HEPA filters reduces exposure to PM by 40-60% and viral RNA by 30-50% depending on the classroom design. Keeping window behaviours as normal means this only adds an energy cost around 1-2% of the heating costs.'*
https://www.sciencedirect.com/science/article/pii/S2950362024000316?via%3Dihub

7. Additional air pollution impacts

Inequalities

The WHO has noted that the burden of air pollution-related disease is unevenly distributed, and that vulnerable and susceptible populations are often disproportionately affected.

Poverty - The CMO Air Pollution Annual Report identified '*Areas of high deprivation frequently have higher levels of traffic or industrial activities, and these more heavily polluted areas may be more affordable to live in. People in lower socio-economic groups are more likely to have pre-existing health conditions earlier in life, and the higher exposures to air pollution may add to the greater burden of poor health. Studies of hospital admissions and mortality show increased health risks associated with exposure to air pollution among those living in areas of higher socio-economic deprivation'* Chief Medical Officer's Annual Report 2022 (publishing.service.gov.uk)

Much of the existing literature has focused on inequalities in exposure to outdoor air pollution, but a recent review by Ferguson and others considered indoor air pollution. This review found that households in more deprived areas experienced higher levels of indoor PM, NO2, and volatile organic compounds (VOCs) and environmental tobacco smoke, which has clear health harms (CMO report).

Ethnicity - Analysis of air pollution in London in 2019 found that communities with higher levels of deprivation, or a higher proportion of people from a non-white ethnic background, were more likely to be exposed to higher levels of air pollution.

'An analysis by the Office for National Statistics (ONS) found a positive association between increased long-term PM2.5 concentrations and communities with higher black and ethnic minority populations.' (CMO report)

Covid-19 – A link has been established between air pollution and Covid impacts. *'Poor air quality is an important risk factor for both acute (e.g. pneumonia) and chronic respiratory and cardiovascular diseases (such as chronic obstructive pulmonary disease or stroke). People with underlying medical conditions are thought to be at a greater risk of developing severe disease from COVID-19 infection; thus, air pollution is most likely a contributing factor to the health burden caused by COVID-19.'* (WHO Global Air Quality Guidelines 2021)

Climate change – There is a clear link between the burning of fossil fuels, that are accelerating climate change, and air pollution. **Of more than 8 million deaths worldwide from outdoor air pollution, 61% linked to fossil fuels, one study found** (British Medical Journal, November 2023 Air pollution deaths attributable to fossil fuels: observational and modelling study | The BMJ

'Climate change is likely to significantly affect the UK over the next 30 years, and this will inevitably have effects on air quality' (CMO report)

Air pollution and climate adaptation – Climate change risk assessments need to factor in the impact of air pollution. For example, responding to heatwaves requires an understanding of their effect on air pollution. Hot weather can lead to stagnant air conditions, trapping pollutants close to the ground and concentrating them. In built up areas, this is sometimes referred to as an 'urban heat island.' In turn this can affect the air quality inside workplaces. Hot weather also increases the risk of wildfires which have an adverse impact on air quality. Heat Waves and Their Impact on Air Quality? All You Have To Know - Scale Climate Action

Air pollution and climate mitigation – *'Action to mitigate the scale of climate change and its effects are essential for the health of the planet and the population, and net zero has a pivotal role in delivering the UK's contribution to that. It has the potential to also bring large co-benefits for other environmental issues, including air quality, resulting in even greater gains for public and environmental health.* (CMO report)

'Almost all efforts to improve air quality can enhance climate change mitigation, and climate change mitigation efforts can, in turn, improve air quality. Notably, reduction or phase-out of fossil and biomass fuel combustion will reduce greenhouse gas emissions as well as health relevant air pollutants. By promoting environmental sustainability hand in hand with public health protection, we can make large steps towards mitigating climate change and achieving the Sustainable Development Goals.' (WHO Global Quality Guidelines 2021) WHO Global Air Quality Guidelines

8. Case Study – Indoor Markets

Case Study - Indoor Markets
Indoor markets provide important spaces for jobs and leisure. They can also be the source of significant pollution levels. Over a 1-year period TUCAN and Battersea and Wandsworth TUC carried out monitoring of PM2.5 pollution levels in the two markets in Tooting, SW London.

The markets have become popular as an entertainment space in the evenings. There are many food outlets operating in buildings that were not designed for their current use. Testing was carried out using handheld PM2.5 measuring equipment. The results were alarming. Concentration levels of over 2,000 µg/m^3 were discovered in parts of both markets.

The London Borough of Wandsworth (LBW) was alerted to the findings and a series of joint inspections between the LBW Air Quality Team and TUCAN took place. The dangerous levels of pollution were confirmed. Contact was made with the owners of both markets to alert them to the hazard. A leaflet was distributed to stall holders.

While this is also a public health issue, the exposure levels are a particular risk for the workers employed in the markets. Their exposure time is significantly higher than the public using the market. A rally was held outside the markets with a 'Unions want clean air' banner. This received local radio and press coverage. WANDSWORTH UNIONS LAUNCHES CAMPAIGN FOR CLEAN AIR IN TOOTING MARKETS WITH PHOTOCALL ON 14thFEBRUARY AS PART OF TUC HEARTS UNION WEEK. (bwtuc.org.uk)

Meetings have been called with the owners to identify control measures that can be put in place. The situation highlights the problems with the legal standards identified in this paper. Even though 2,000 µg/m levels are significantly higher than the WHO 15 µg/m^3/24-hour TWA outdoor standard, there is no breach of the law. This because the only **indoor** standard is the EH40 exposure level for respirable dust of 4,000 µg/m^3 (see Section 7 below). In other words, the levels would have to be twice as high before enforcement action could even be considered, even though they can reach over 150 times the outside standard.
Discussions with the owners and the Council to find a solution are continuing.

9. Current exposure standards for Particulate Matter and their enforcement

The **Air Quality Standards Regulations 2010** only apply to outdoor air pollution and require that concentrations of PM in the UK must not exceed:

- An annual average of 40 µg/m^3 for PM10;
- A 24-hour average of 50 µg/m^3 more than 35 times in a single year for PM10;
- An annual average of 20 µg/m^3 for PM2.5.

The Environment Act 2021 enables regulations to be made, including air pollution. This has led to:

The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 for **ambient (outdoor)** air.

The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (legislation.gov.uk) require that in England by the end of 2040:

- An annual average of 10 µg/m3 for PM2.5 is not exceeded at any monitoring station.
- Population exposure to PM2.5 is at least 35% less than in 2018.

Target date for implementation

The current target date of implementation by 2040 is too long. Studies have shown that earlier adoption would considerably improve health. For example, studies covering London have shown that if the city is enabled to meet the WHO guideline for PM2.5 by 2030, the population in London would gain a 20% increase in life years saved over the next 20 years (london health burden of current air pollution and future health benefits of mayoral air quality policies january2020.pdf).

Ambient air v Indoor air

Ambient air refers to outdoor air and so these standards do not apply to indoor air.

1 milligram per cubic metre (mg/m^3) is equivalent to 1,000 micrograms per cubic metre (µg/m^3)

These standards refer to respirable dust (Less than 10 microns in size)

Particulate Matter (PM)	**UK standard µg/m^3**	**WHO standard µg/m^3**
PM 2.5 (8 hour TWA) Indoor	None	None
PM2.5 (24 hour Mean) Outdoor	None	24-hour average exposures should not exceed 15 µg/m^3 (ambient air) more than 3 - 4 days per year.
PM 2.5 (24 hour Mean) Indoor	None	None
PM2.5 (Annual Mean) Outdoor	20 (ambient air) 10 by 2040	5 (ambient air)
PM 10 (8 hour TWA) Indoor	4,000 (indoor air – HSE Workplace Exposure Limits EH40)	None
PM10 (24 hour Mean) Outdoor	50 (ambient air) no more than 35 days per year	45 (ambient air)
PM10 (Annual Mean) Indoor	None	None
PM10 (Annual Mean) Outdoor	40 (ambient air)	15 (ambient air)

Workplace exposures – The standards for indoor workplace exposures are covered by the Control of Substances Hazardous to Health (COSHH) Regs 2002. The specific standards are contained in EH40 2005 (as amended in 2020). The relevant extract is:

Dust EH40/2005 Workplace exposure limits (hse.gov.uk)

43 The COSHH definition of a substance hazardous to health includes dust of any kind when present at a concentration in air equal to or greater than 10 mg.m-3 8-hour TWA of inhalable dust or 4 mg.m-3 8-hour TWA of respirable dust. This means that any dust will be subject to COSHH if people are exposed to dust above these levels. Some dusts have been assigned specific WELs and exposure to these must comply with the appropriate limits.

44 Most industrial dusts contain particles of a wide range of sizes. The behaviour, deposition and fate of any particular particle after entry into the human respiratory system, and the body response that it elicits, depend on the nature and size of the particle. HSE distinguishes two size fractions for limit-setting purposes termed 'inhalable' and 'respirable'.

45 Inhalable dust approximates to the fraction of airborne material that enters the nose and mouth during breathing and is therefore available for deposition in the respiratory tract. Respirable dust approximates to the fraction that penetrates to the gas exchange region of the lung.

Some dusts, like asbestos, have their own standards.

In EH40 there is a standard for:

- respirable dust (10 microns diameter and below) set at 4,000 $\mu g/m^3$
- inhalable dust (100 microns and below) set at 10,000 $\mu g/m^3$

This means that PM10 and 2.5 are both classed as respirable dust.

Urgent revisions needed – It makes no sense that an individual can be exposed **outdoors** to no more than an average of **15 $\mu g/m^3$** over a 24-hour average, for more than **3 days per year**, while **indoors** they can be exposed to **4,000 $\mu g/m^3$** averaged over an 8-hour period for up to **365 days per year.** This also makes no distinction between PM2.5 and PM10, despite PM2.5 being potentially far more hazardous.

10. **Enforcement**

Improved standards on their own are not sufficient. They require enforcement by the regulatory bodies. Both the HSE and local authorities are significantly underfunded to be able to effectively monitor compliance even with existing standards. The extent of this is laid bare in the report by Prospect 'HSE under pressure: A perfect storm'. This highlights the budget cuts which have resulted in a capacity and experience crisis within the principal safety regulator. For example, the numbers of inspectors has fallen by 41% over 20 years. 2023-00486-Leaflet-booklet-HSE-under-pressure_-A-perfect-storm-Version-24-04-2023 (1).pdf

The HSE and local authorities have lost funding of more than 50% over the past decade, with workplaces now likely to be proactively inspected only once every 250 years. Employment-Rights-Green-Paper.pdf (labour.org.uk)

Enforcement bodies – HSE and Local Authorities Policy

Organisations with responsibly for monitoring and enforcing indoor air pollution standards must be adequately resourced to engage effectively with employers, unions, and community organisations.

We call for the provision of adequate funding arrangements to enable enforcement bodies to implement policy ask 13:

13. Organisations with responsibly for monitoring and enforcing indoor air pollution standards must be adequately resourced to carry out their statutory duties and engage effectively with employers, unions, and community organisations.

11. **Workers' rights**

No worker should be exposed to unsafe levels of air pollution. As the hazards of particulate matter and other pollutants become better understood it is vital that the law keeps pace. It is essential that workplace exposure levels, WELs, are health-based and agreed with workers representatives. Even if standards are improved it will still require workplace organisation to ensure they are complied with. That is why any improvement in air pollution policies must be accompanied by additional rights for unions to protect the health of the workforce. Over 12 years ago, Hazards magazine pointed out that what is being classified as 'nuisance dust' is a killer and that urgent action is required Dust up! - Hazards issue 116 October-December 2011

We call on the Government to implement policy asks 14-16:

14. Introduce regulations that allow for the appointment of union green representatives. These reps or existing safety reps must have rights to monitor pollution levels and raise concerns with the employer.
15. Introduce meaningful consultation rights that provide for union involvement on standard setting covering WELs.
16. Introduce meaningful consultation rights on air pollution impacts relating to policies covering inequalities, Covid, and climate change.

12. Research organisations and planning bodies

Evidence is accumulating to show that exposure to PM2.5 in air pollution can be very harmful to many organs, systems and processes within our bodies, severely affecting short and long term health and life expectancy. For example:

PM2.5 and dementia – A study in 2023 found that higher environmental exposure to fine particulate pollution - particulate matter of less than 2.5 microns in diameter ($PM_{2.5}$) - was associated with an increased risk of dementia. For every 2 $\mu g/m^3$ increase in average annual $PM_{2.5}$ concentration, overall risk of dementia rose by 4% Air pollution and dementia | The BMJ

PM2.5 and hospital admissions– A paper published in the British Medical Journal in February 2024 highlighted the link between exposure to PM and hospital admissions. It concluded '*The findings of this study suggest that no safe threshold exists for the chronic effect of PM2.5 on overall cardiovascular*

health. Substantial benefits could be attained through adherence to the WHO air quality guideline'. Exposure-response associations between chronic exposure to fine particulate matter and risks of hospital admission for major cardiovascular diseases: population based cohort study | The BMJ

We call on research organisations and planning bodies to implement policy asks 17-20:

17. Ensure that research on the effectiveness and cost benefit of air filtration is collated with development of criteria for selection of best value for effective Clean Air Delivery Rate at lowest sound level. Funding should be made available for most effective best value CADR air filters in all schools and health care.
18. Invest in the planning and development of public spaces. People spend large periods of time indoors and many indoor places are public, where individuals have little control over the quality of air they breathe. These two factors should be recognised as recommended by the Chief Medical Officer.
19. Improve effective ventilation, while minimising energy use and heat loss. This is a priority for reducing air pollution, respiratory infections and achieving Net Zero. It is a major engineering challenge which needs solving, as recommended by the CMO.
20. Develop the evidence base that will support government, local authorities, and businesses to adopt science-based UK standards for indoor air quality, to reduce emissions, exposure, and harms in relation to occupational air pollution. Such research to include the impact of filtration as a control measure.

13. Conclusions

A recognition of the importance of occupational health in the policy framework of air pollution is long overdue. Adopting the policy asks in this paper will contribute to a better understanding of the problem and the control measures needed to tackle it.

There has been a steady erosion of health and safety at work standards in the UK. This is highlighted in a recent publication to mark the 50th anniversary of the Robens Report:

'The role of work in the creation of poor health outcomes and their unequal distribution in UK society, forces a reappraisal of the tradition of regarding health and safety at work as somehow separate from wider public health issues. Following on from this, it is obvious that solutions to current problems lie in wider reforms than simply those that tinker with standards for the regulation of occupational health and safety management.' Work and Health 50 years of regulatory failure.pdf

The reforms proposed in this briefing paper should be seen as part of a wider campaign to challenge the deregulation agenda that has compromised both occupational and public health in the UK.

14. Sources of information

Section 1 - Background

TUCAN | Greener Jobs Alliance

GJA-TU-Clean-Air-CharterEMAIL.pdf (greenerjobsalliance.co.uk)

WHO Air Quality Guidelines (c40knowledgehub.org)

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