AIR QUALITY
IN THE BUILT ENVIRONMENT

The World Green Building Council global network is targeting the specific impacts of the built environment on the crisis of air pollution across the world in order to reduce the impacts on human health and our natural environment.

Our specific goals are:

Reduce ambient outdoor emissions

Reduce operational emissions from the global building sector, limiting the sector's contribution to climate change

Lower embodied emissions of greenhouse gases from the full life cycle of a building, including material transport, demolition and waste across the supply chain

Mitigate sources of indoor air pollution

Promote sustainable, low emissions and air-purifying building materials to limit pollutants within

Prioritise building fabric and construction quality, and the role of retrofitting existing stock, to lower risk of damp and mould

Utilise appropriate strategies to achieve energy efficiency and health priorities

Radically improve sustainable operation of buildings

Prevent the emissions multiplier effect and endorse sustainable design, operation and retrofit of buildings to protect users

Present solutions to health and environmental threats of indoor air pollution

Increase global awareness

Develop recognition of the impact of the built environment on global air pollution

Promote calls to action for a range of stakeholders, including citizens, businesses and policy makers

Our actions will support the achievement of these SUSTAINABLE DEVELOPMENT GOALS

Find out more at: **worldgbc.org/clean-air-buildings**

BETTER PLACES FOR PEOPLE

In partnership with CLIMATE & CLEAN AIR COALITION TO REDUCE SHORT-LIVED CLIMATE POLLUTANTS

WORLD GREEN BUILDING COUNCIL

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Sources and solutions:

Sources

Ambient

Energy
39% of global energy-related carbon emissions are attributed to buildings

Materials
Most of the 1,500 billion bricks produced annually are using polluting kilns

Construction
Concrete production can release silica dust, a known carcinogen

Cooking
Traditional cookstoves cause 58% global black carbon emissions

Cooling
HFCs, potent climate forcers, are often found in AC systems

Indoor

Heating
Combustion of solid fuels causes indoor as well as outdoor pollution

Damp and mould
Caused by air infiltration through cracks in building fabric

Chemicals
VOCs, emitted from certain materials, have adverse health effects

Toxic materials
Construction materials, e.g. asbestos, can cause harmful airborne pollution

Outdoor infiltration
Most exposure to outdoor air pollution occurs inside buildings

Did you know? 91% of world's population, urban and rural, live in places with air that exceeds WHO guidelines for key pollutants[1].

Solutions

- **Plant a Sensor with WorldGBC**
- **Clean cooling and heating**
- **Clean construction**
- **Healthy materials**
- **Clean and efficient energy use**
- **Building retrofit**
- **Building management and ventilation**

[1] World Health Organisation. 2018. Ambient (outdoor) air quality and health. https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health.

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Polluted air causes problems for:

People

Air pollution is largest environmental killer, causing 1 in 9 deaths worldwide

7% lung cancer deaths

18% pulmonary disease deaths

20% Stroke deaths

34% heart disease deaths

Approximately 8 million deaths annually attributed to air pollution, predominantly in developing countries

Airborne particles of dust from construction cause severe health impacts including silicosis, asthma and heart disease

Poor indoor air quality is understood to reduce cognitive functioning, productivity and wellbeing

Planet

Carbon dioxide and other greenhouse gases responsible for the greenhouse effect

Short Lived Climate Pollutants (SLCPs) are responsible for **45% of current global warming**

Close to 40% of global energy-related carbon emissions being released from buildings

Airborne course and fine particulate matter (PM10) can directly alter the global balance of incoming solar radiation, distort the albedo effect and react with other pollutants

A global supply chain, including excavation, brick-making, transportation, and demolition can 'build in' embodied emissions to a building

Building materials and construction practices negatively affect natural habitats

Buildings

Polluted outdoor air reduces use of natural ventilation strategies

GHG

Emissions multiplier effect due to **increased filtration demand**

Further increasing urban heat island effect and cooling demand

Where outdoor air is polluted, natural or passive ventilation strategies are often unsuitable due to ingress of polluted air

Create local microclimatic warming impacts due to expulsion of hot air, exacerbating the urban heat island effect

Most of our exposure to outdoor air pollutants occurs when we are inside buildings, due to infiltration through windows, apertures or cracks in the building fabric

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Solutions for stakeholders:

Citizen

Choose clean energy for power and transportation, and improve energy efficiency as far as possible

Improve home building quality and avoid unhealthy chemicals in furnishings – choose low-VOC options

Ensure good ventilation strategy for fresh air access

Consider investing in an indoor air quality monitor

Engage your facilities management team and/or landlord to provide better air quality for tenants and occupiers

Business

Choose clean energy for power and transportation, and improve energy efficiency as far as possible

Maintain good indoor air quality with healthy materials, ventilation strategy and use realtime monitoring

Prioritise responsible sourcing for buildings – prioritise local, ethical and recycled materials with no (or low) VOC concentrations

Support sustainable finance initiatives for green buildings, particularly microfinancing schemes in developing nations

Government

Invest in clean energy, decarbonisation of national grid and support decentralised renewable energy networks in rural locations

Promote energy efficiency by raising building standards and support retrofit programmes

Monitor outdoor air quality, publicly disclose data and encourage monitoring in high occupancy areas

Incentivise safest and most sustainable methods of construction

Implement national standards for building ventilation and IAQ

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