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**THE STATE
OF GLOBAL
AIR QUALITY
FUNDING
2024
METHODOLOGY**

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1. INTRODUCTION

This background document provides an overview of the methodology used for the analysis presented in The State of Global Air Quality Funding 2024 report. Jointly developed by Clean Air Fund and Climate Policy Initiative (CPI), the report presents a comprehensive overview of trends in international development funding going to air quality, breaking down financial flows by region, sector, type of investor, and financial instrument. The report also provides leading analysis on the state of air quality funding in relation to international development funders' investments in both climate and fossil fuels.

This document outlines the methodology used to track funding flows analysed in the main report, specifically:

- **Air quality funding** during 2018-2022, including (i) outdoor air quality funding, (ii) funding with outdoor air quality co-benefits, and (iii) funding that targets both air quality and climate; and
- **Fossil fuel-prolonging funding** during 2018-2022.

The 2024 report follows the methodological approach established in the 2023 iteration of The State of Global Air Quality Funding. This approach was developed to clearly define and expand the scope of the report, expanding the list of keywords used to identify relevant projects and clarifying definitions for the categories of outdoor air quality funding and funding with outdoor air quality co-benefits. The development of the 2023 methodology incorporated the views of the Advisory group, including key international development funders.

The 2024 report makes some key improvements on the 2023 methodology, most notably on black carbon:

Black carbon: The 2024 report provides deeper and sharper analysis on black carbon (using a new classification framework and new keywords), highlighting the potential dual benefits for climate and air quality associated with reducing emissions of this pollutant. Further details are provided in Section 2.

Database improvements: To improve the accuracy and reach of the data collection, we have updated processes for manual checks of the data and introduced a small number of new keywords.

This methodology is to be considered an iterative document, subject to regular updates and improvements. Clean Air Fund and CPI aim to continue to improve this methodology to ensure that the analysis in future reports accurately captures air quality funding trends. Additional feedback and suggestions can be sent to info@cleanairfund.org.

2. CHANGES IN THE 2024 METHODOLOGY

2.1 BLACK CARBON FUNDING METHODOLOGY

The 2024 iteration of The State of Global Air Quality Funding report includes a deeper and sharper focus on black carbon. Black carbon is a key component of particulate matter air pollution consisting of carbonaceous light-absorbing particles which are generally emitted from incomplete combustion. The major sources of black carbon emissions include household energy (cooking, lighting, and heating), wildfires, transport, agricultural residue burning, industry, gas flaring and waste burning.

Depending on the geography, sources of black carbon vary significantly from region to region. For example, in Asia and Africa, the primary sources of black carbon are residential solid fuels, whereas in Europe and North America, diesel vehicle engines contribute the majority of black carbon emissions. Industrial sources such as brick kilns and coal power plants also contribute substantially in regions such as the Indo-Gangetic Plain. In the Arctic, emissions from ships and gas flaring are major local sources of black carbon and are fuelling Arctic amplification.

2.2 BLACK CARBON FUNDING DEFINITIONS

To track black carbon funding, as defined in Table 2.1, we have tagged projects as either primary or secondary funding. This categorisation differentiates between outdoor air quality projects that are specifically tackling black carbon emissions (primary funding/black carbon finance) and projects that are indirectly targeting black carbon emissions through efforts focused on sources that are likely to be rich in black carbon (secondary funding/finance addressing black carbon-rich sources). The full list of keywords is detailed in Tables 5.1, 5.2, and 5.4.

TABLE 2.1 DEFINITIONS OF FINANCE RELATING TO BLACK CARBON

Funding category	Funding type	Definition	Examples
Black Carbon Funding	Black Carbon Finance	Finance committed to projects where black carbon emissions reduction is a primary objective of the project (usually explicitly mentions black carbon or soot in project description or title). This also includes funding to black carbon monitoring and modelling projects.	Black carbon monitoring, soot reduction program.
	Finance addressing black carbon-rich sources	Finance committed to projects where improvements to black carbon-rich sources are a primary objective (usually black carbon-rich sources, such as brick kilns or diesel vehicles, are explicitly mentioned in the project description). This category also includes projects targeting pollutants that are often co-emitted with black carbon (such as carbon monoxide) in the project description, or that collectively tackle short-lived climate pollutants.	Mitigation of black carbon-rich sources such as brick kilns, wildfire, solid fuel, power plants, waste burning, cleaner transport, and agro-residue burning.

2.3 DATABASE IMPROVEMENTS

To improve the accuracy and reach of the database, an improved data-checking process has been implemented, and a small number of keywords have been added to the search (highlighted in Tables 5.1, 5.2, 5.4, and 5.6).

Some manual checks of the data have been conducted to ensure that the keyword search is only identifying projects that meet the criteria outlined in this methodology. The 2024 process incorporated a comprehensive assessment of all keywords to identify an expanded list of those keywords most likely to generate false positives in the database. Entries generated by keywords in this list were manually checked to ensure that they met the criteria outlined in this methodology, and were removed from the dataset if these criteria were not met. High-value projects were also manually checked given the ability of large projects to skew the outcomes of the data. Identifying the entries that need to be manually checked and removing out-of-scope datapoints is an iterative process that will continue to improve over the coming years.

3. SCOPE OF THE ANALYSIS

3.1 DEFINITIONS

The State of Global Air Quality Funding 2024 report shares our analysis of funding for projects that tackle ambient (outdoor) air pollution between 2018 and 2022, and compares these flows with funding to projects that may work against the clean air agenda by prolonging the use of polluting fossil fuels. The report also analyses the overlap between air quality funding and climate finance.

Table 3.1 includes all the definitions used in the report for air quality funding, fossil fuel prolonging funding and climate finance analysed in The State of Global Air Quality Funding 2024 report.

Table 3.1 Definitions of funding categories analysed

Funding flow		Definition	Examples
Overall air quality funding	Outdoor air quality funding	Finance committed to projects where improvements to outdoor/ambient air quality are an explicit benefit and objective (usually stated in the project description). Projects can include those relating to the transport, energy and health sectors.	Air pollution prevention programmes, such as a multi-strand project to address air quality in a specific city through improving monitoring, funding interventions and raising awareness.
	Funding with air quality co-benefits	Finance committed to projects where improvements to outdoor/ambient air quality are a co-benefit to the investment but are not explicitly mentioned in the project description. This also includes indoor air quality projects, which improve outdoor air quality indirectly.	Electric vehicle incentive programmes for commercial fleets.

	Air quality and climate funding	Funding for projects that deliver dual benefits across air quality and climate (including both mitigation and adaptation). This covers both (a) outdoor air quality funding that addresses climate change and (b) funding with air quality co-benefits that addresses climate change. This funding category represents the subset of air quality funding flows that simultaneously address climate change.	Bus rapid transit projects to reduce urban air pollution and greenhouse gas (GHG) emissions.
Fossil fuel prolonging funding		Finance committed to projects or interventions (a) involving the construction of assets and infrastructure that directly cause air pollution; or (b) leading to the creation of, or promoting, air polluting activities.	Development or expansion of a coal power plant.
Climate finance¹	Mitigation finance	Resources directed to activities (i) contributing to reducing or avoiding GHG emissions, including gases regulated by the Montreal Protocol; or (ii) maintaining or enhancing GHG sinks and reservoirs.	Greenfield or brownfield projects that reduce methane or nitrous oxide emissions through wastewater.
	Adaptation finance	Resources directed to activities aimed at reducing the vulnerability of human or natural systems to the impacts of climate change and climate-related risks, by maintaining or increasing adaptive capacity and resilience.	Development of highly efficient and climate resilient irrigation networks.
	Dual benefits finance	Resources directed to activities contributing to both “climate change mitigation” and “climate change adaptation” and meeting the respective criteria for each category.	Afforestation project preventing slope erosion bringing significant adaptation benefits, while also making a positive contribution to mitigation.

1 As defined in CPI’s Global Landscape of Climate Finance.

3.2 SOURCES OF FUNDING

The analysis in the report covers funding from international development funders. These include multilateral development banks, bilateral development agencies, and governments providing international funding to developing and emerging countries in the form of development aid, concessional and non-concessional loans, as well as grants, for development purposes, including air quality.

Specifically, international development finance includes:

- a. Official development assistance (ODA);
- b. Other official flows; and
- c. Flows from other public development funders that are not OECD-DAC members (e.g., the Islamic Development Bank).

A share of the finance provided by these funders is directed to climate mitigation and adaptation projects contributing to the goals of the Paris Agreement; we refer to this share of international development funding as international public climate finance.

The analysis in the report does not currently include funding coming from local governments' domestic resources (e.g. from national budgets), philanthropic funding or private sector funding. This is due to data and scope limitations and in no way should suggest that these sources play a small role in funding air quality projects; rather, we recognise the important contribution they make to the overall air quality funding landscape.

3.3 FINANCIAL INSTRUMENTS

The analysis in the report captures funding made through the following financial instruments

- **Grants:** Transfers made in cash, goods or services for which no repayment is required.
- **Project-level debt:** Debt relying on a project's cash flow for repayment.
 - *Low-cost debt* refers to loans extended at terms preferable to those prevailing on the market. We count the full amount of the loan, not the grant equivalent. This type of financing is also referred to in the report as concessional loans or concessional debt.
 - *Market-rate debt* refers to loans extended at regular market conditions.
- **Project-level equity:** Equity investment relying on the project's cash flow for repayment.
- **Balance sheet financing:** Direct debt or equity investment by a company or financial institution. Unlike with project-level financing where only the specific project's assets are held as security, with balance sheet financing the investors have a legal claim on the overall company assets in case of a payment default.

We acknowledge the importance of risk management instruments like guarantees and insurance in enabling increased private climate flows, in particular to areas and sectors with low risk appetites for private investment. However, following the principle of conservatism, we exclude these instruments from the total climate finance figure because actual disbursements from these instruments are contingent upon uncertain future events. Guarantees are only exercised in particular circumstances, and there is a chance of there never being any financial outflow from the guarantor.

4. BUILDING THE DATABASE

4.1 METHODOLOGICAL STEPS

The following methodological steps were followed to build the air quality funding and fossil fuel prolonging funding databases.

Step 1: Data collection

International development funding for 2018–2022 was initially collected from data sources detailed in section 4.2.

Step 2: Data processing

The keyword search was applied on project names and descriptions, using the lists of keywords included in section 5.

Step 3: Data standardisation and cleaning

Manual cleaning processes were applied to remove false positives.

STEP 1: DATA COLLECTION

Data on international development funding for 2018–2022 was initially collected from relevant data sources (see Section 4.2).

STEP 2: DATA PROCESSING (IDENTIFYING RELEVANT DATA)

As not all development projects collected were relevant to the scope of the analysis, the next step was to identify air quality and fossil fuel prolonging projects within the broader database. This was carried out by applying a keyword search on project names and descriptions implemented in Python, using the lists of keywords developed for air quality, and fossil fuel-prolonging projects— included in Tables 5.1, 5.2, 5.4, and 5.6. These projects were categorised according to the criteria in Table 3.1.

Projects that claim to have air quality benefits but have weak impact evidence were not targeted by the keyword search. This includes, for example, new buses that use [compressed natural gas](#), for which some evidence suggests that despite the claim of being a clean solution, the technology emits high levels of toxic pollutants. These were excluded in cases where better alternatives (e.g., electric vehicles) are available.

Additional processing and checks were done using project names, descriptions, and project IDs to ensure there was no double counting between projects extracted from data sources.

STEP 3: DATA STANDARDISATION AND CLEANING

Once all relevant projects were extracted, the data was standardised and cleaned as follows:

- All projects were further categorised based on economic sectors (e.g., transport) which were further broken down by solutions (e.g., electric and hybrid road vehicles).
- Applying CPI's categorisation used in the Global Landscape of Climate Finance (GLCF) database, international development funders were categorised as bilateral development finance institutions, multilateral development finance institutions, national development finance institutions, governments and government agencies, export credit agencies, multilateral climate funds, and public funds (see Section 3.2).
- Funding instruments were categorised as grants, market-rate debt and low-cost debt (i.e., below market rate or concessional debt), and equity (see Section 3.3).
- Air quality projects with climate finance co-benefits were tagged based on their climate use (mitigation, adaptation, or multiple objectives), cross-checking against CPI's GLCF database.
- Countries of origin of multilateral development banks were split according to the share of subscribed capital (or ownership) by the country stakeholders. For example, if Country A has a subscribed capital representing 2% of the multilateral development bank's total shares, then 2% of the total project's value is assigned to Country A as the country of origin.
- Amounts reported in currencies other than USD, we converted using a consistent exchange rate (World Bank or European Central Bank annual average rate).
- Data that was shared with CPI under data licensing or confidentiality agreement were anonymised.

A subset of these data entries was then manually checked to ensure that they met project criteria set out in the methodology. The subset of projects that were manually checked included the projects with the largest funding values (covering over 75% of overall funding) and projects selected by keywords pre-determined to have a high probability of generating false positives. Tables 5.1, 5.2, 5.4, and 5.6 set out the keywords that have been flagged for their false positive risk. High risk of generating a false positive can stem from a number of reasons, including words having multiple meanings (e.g., 'train' can refer to both funding for rail transport and funding for training projects) or projects only being eligible in a specific context (i.e., projects identified through the 'cleaner vehicles' keyword being excluded if they are exclusively funding increased take-up of biofuels). Projects that did not meet the methodology's criteria were then removed from the dataset.

4.2 DATA SOURCES

The analysis is based on project-level data drawn from a range of primary and secondary sources. The main data source for both air quality and fossil fuel prolonging data is the OECD Creditor Reporting System (Table 4.1).

As not all international development funders are members of and report to the OECD (e.g., the Islamic Development Bank), we integrate data from the OECR Creditor Reporting System with other relevant sources used in CPI's GLCF database, namely, CPI's proprietary survey data as well as publicly available data reported by development finance institutions.

TABLE 4.1 DATA SOURCES USED FOR THE ANALYSIS

Database	Data sources
Air quality funding	<p>Development funding flows</p> <ul style="list-style-type: none"> • OECD Creditor Reporting System for 2015–2022² <p>International public climate finance flows</p> <ul style="list-style-type: none"> • CPI's proprietary survey data for 2015–2022 • Climate Funds Update database maintained by ODI • Publicly available data reported by development finance institutions
Fossil fuel prolonging	<p>Development funding flows</p> <ul style="list-style-type: none"> • OECD Creditor Reporting System for 2015–2022

4.3 PRINCIPLES APPLIED IN DATA COLLECTION AND REPORTING

Track primary investment

The analysis captures total primary financial transactions and investment costs and components of activities that directly contribute to air quality, climate mitigation/adaptation, and prolong the use of fossil fuels. Secondary market transactions (e.g., reselling of stakes or public trading in financial markets) are not tracked, as they do not represent new investment targeting new assets, but rather capital being exchanged for existing assets.

Include tangible financial commitments

In the analysis, “funding” generally refers to financial commitments – as opposed to disbursements – represented by a firm obligation by means of a board's decision on investment programmes, the closure of financing contracts, or similar actions. Such commitments are backed by the necessary funds to provide the specified financing to a project.

Commitments record the amount of an expected transfer at the time when the corresponding contract was closed, irrespective of the time required to complete the disbursement. This approach can yield results that differ from those of approaches that consider investment based on disbursements. For

² While the majority of The State of Global Air Quality Funding 2024 report analysis was conducted on data covering 2018–2022, data for 2015–2017 was also collected for the purpose of comparison with the previous year's report.

example, under the approach adopted in this analysis, a project which reaches financial close in 2017 but becomes operational in 2018 will be recorded as a 2017 investment, regardless of when construction starts and ends. By contrast, an approach that records investment when an asset becomes operational would treat the same investment as having occurred in 2018.

Disbursement information would provide a more accurate picture of the actual volume of financial resources devoted to air quality projects in a given year. However, consistent data on disbursements are not universally made available by all donors that report to OECD-DAC. Data gaps in disbursements are particularly high among multilateral development finance institutions. As such, to avoid information bias due to partial data, the analysis continues to use commitments data (at least until data quality on disbursements improve). Furthermore, commitment data provides a better view of the trends of funding decisions and priorities by donors, who are the main target audience for the report.

Err on the conservative side

In case of insufficient details, a conservative approach is taken, and under-reporting of funding flows is preferred to over-reporting. Based on this principle, the analysis excludes risk-mitigation instruments, such as guarantees and insurance products, since actual disbursements from these instruments are contingent upon uncertain future events.

Avoid double counting

The analysis tracks only investments in new projects. Investments in private research and development which might be relevant for air quality are excluded, since the costs to develop new technologies are capitalised and factored into the investment amounts of new projects implementing these technologies. Including R&D investments would, therefore, increase the risk of double counting.

Similarly, policy-induced revenue-support mechanisms and other public subsidies whose primary function is to pay back investment costs are not tracked. Revenue-support mechanisms, such as feed-in tariffs, pay back investment costs, so including the investments made for their implementation would constitute double counting.

5. KEYWORDS

5.1 KEYWORDS FOR AIR QUALITY PROJECTS

Keywords to extract air quality projects from the database were developed by Clean Air Fund and CPI, building on the Clean Air Fund’s Methodology “Rule Book” for The State of Global Air Quality Funding 2023. As in 2023, the keywords were separated into three groups to capture respectively:

- a. Explicit air quality improvements
- b. Pollutants and their effects
- c. Air quality sector solutions

To make sure all relevant projects are captured, the lists of keywords include both US and UK English spelling. In addition, wherever project descriptions were in a language different than English, these were translated before running the keywords search. The keyword search was applied to a combination of project descriptions and project titles. For the purposes of the search, both the project strings and the keywords to be searched for were converted to lower case and singularised programmatically to most efficiently and accurately perform the search. This removes the need to create multiple versions of words to search for in their singular and plural form.

The three lists of keywords – in Tables 5.1, 5.2, and 5.4, respectively – indicate whether the project captured would be categorised as outdoor air quality funding or as funding with outdoor air quality co-benefits, and flag whether projects captured should be double checked for false positives. Whenever more than one set of keywords are captured in a project description, which would result in conflicting air quality categorisation, the project is categorised as outdoor air quality funding.

EXPLICIT AIR QUALITY IMPROVEMENTS

This group of keywords extracts projects where the explicit intent is to improve outdoor/ambient air quality. This list (included in Table 5.1) was developed via coordination between Clean Air Fund and CPI, building on Clean Air Fund’s Methodology that was used in previous State of Global Air Quality Funding reports.

All explicit air quality improvements projects are categorised as outdoor air quality funding, with the sole exception where any of these keywords are found with a clear mention of indoor air pollution, in which case projects are classified as funding with outdoor air quality co-benefits.

TABLE 5.1 LIST OF KEYWORDS FOR EXPLICIT AIR QUALITY IMPROVEMENTS

Keywords	Air quality funding type	Risk of false positive	Black carbon finance	Finance addressing black carbon-rich sources
air + management	Outdoor air quality	Yes		
air + measurement	Outdoor air quality	Yes		
air + measure	Outdoor air quality	Yes		
air + modelling	Outdoor air quality			
air + modelling	Outdoor air quality			
air + monitor	Outdoor air quality	Yes		
air + monitoring	Outdoor air quality			
air + pollutant	Outdoor air quality			
air + pollution	Outdoor air quality			
air + sensor	Outdoor air quality	Yes		
air + action	Outdoor air quality	Yes		
air + policy	Outdoor air quality	Yes		
air + reduce	Outdoor air quality	Yes		
air + mitigate	Outdoor air quality	Yes		
air + co-benefit	Outdoor air quality	Yes		
exhaust + measurement	Outdoor air quality	Yes		
air + emissions	Outdoor air quality	Yes		
air + quality	Outdoor air quality			
clean air	Outdoor air quality			
healthy air	Outdoor air quality	Yes		
health + air	Outdoor air quality	Yes		
exposure + air	Outdoor air quality			
Acid Deposition Monitoring Network	Outdoor air quality			
Atmospheric chemistry	Outdoor air quality			
Climate and clean air coalition	Outdoor air quality			x
CCAC	Outdoor air quality			x
Aethalometer	Outdoor air quality		x	

Note: Pink-shaded cells represent new keywords for the 2024 State of Global Air Quality Funding report, '+' separated words appear in any order in the descriptive data; words separated by a space appear in this precise order in the descriptive data. An 'x' in the 'Black carbon finance' column indicates that the keyword extracts projects that have a primary objective of addressing black carbon emissions.

POLLUTANTS AND THEIR EFFECTS

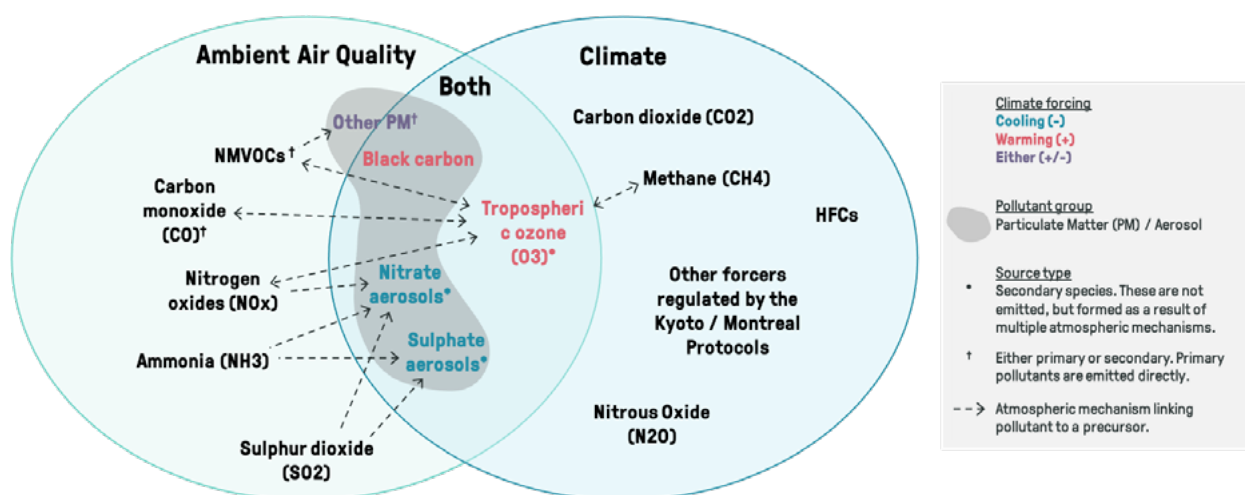
This group of keywords extracts projects mentioning outdoor/ambient air quality-related pollutants and their effects (e.g. acid rain).

To make sure this list of keywords (in Table 5.2) captured a comprehensive and widely accepted list of air quality-related pollutants, the following frameworks and guidelines were consulted:

- UNECE [Guidelines for Reporting Emissions and Projections Data under the Convention on Long-range Transboundary Air Pollution](#);
- WHO's [list of pollutants](#);
- Air pollutants [tracked by EU member states](#) (NECDs);
- EMEP/EEA [Air Pollutant Emission Inventory Guidebook](#);
- CCAC's [A Practical Guide For Business: Air Pollutant Emission Assessment](#).

Pollutants (and related keywords) are categorised based on whether they have a direct effect on outdoor/ambient air quality (outdoor air quality funding) or they have mainly an impact on climate change (funding with outdoor air quality co-benefits). This categorisation was based on the Venn diagram in Figure 5.1, which shows the overlap and interlinkages between pollutants that impact air quality and climate change.

FIGURE 5.1 OVERLAP AND INTERLINKAGES BETWEEN POLLUTANTS THAT IMPACT AIR QUALITY AND CLIMATE CHANGE



Note: Pollutants shown in red have a positive climate forcing effect (warming), while those in blue have a negative climate forcing effect (cooling); those shown in purple can be either warming or cooling.

‘*’ denotes pollutants that are secondary species – these are not emitted but formed as a result of multiple atmospheric mechanisms.

‘†’ denotes pollutants that can be directly emitted (primary) AND are also formed as secondary pollutants. Dashed arrows show atmospheric mechanism that link primary species to secondary species. Pollutants included in grey are components of PM_{2.5} aerosols.

In Table 5.2, pollutants that primarily have an impact on climate change (such as methane and short-lived climate pollutants) are categorised as funding with outdoor air quality co-benefits unless they are found in combination with words such as “air” and “health”, which thus suggests that tackling air pollution is a primary objective of the project.

In addition, pollutants mainly contributing to indoor air pollution (such as formaldehyde or carbon monoxide) are always categorised as funding with outdoor air quality co-benefits as per our definitions in Table 3.1.

TABLE 5.2 LIST OF PROPOSED KEYWORDS FOR POLLUTANTS AND THEIR EFFECTS

Keywords	Air quality funding type	Risk of false positive	Black carbon finance	Finance addressing black carbon-rich sources
sulphur dioxide	Outdoor air quality			
sulfur dioxide	Outdoor air quality			
Sox	Outdoor air quality	Yes		
SO2 + emissions	Outdoor air quality	Yes		
SO2 + reduce	Outdoor air quality	Yes		
SO2 + remove	Outdoor air quality	Yes		
so2 + abatement	Outdoor air quality	Yes		
sulphur oxides	Outdoor air quality	Yes		
sulfur oxides	Outdoor air quality			
nitrogen oxides	Outdoor air quality	Yes		
nitrogen dioxide	Outdoor air quality	Yes		
NOx	Outdoor air quality	Yes		
NO2	Outdoor air quality	Yes		
Ammonia + emission	Outdoor air quality	Yes		
Ammonia + air	Outdoor air quality	Yes		
NH3	Outdoor air quality	Yes		
Non-methane volatile organic compounds	Outdoor air quality	Yes		
Non methane volatile organic compounds	Outdoor air quality	Yes		
NM VOC	Outdoor air quality	Yes		
particulate matter	Outdoor air quality			
particulate emissions	Outdoor air quality			
PM1	Outdoor air quality			x
PM 1	Outdoor air quality			x
PM2.5	Outdoor air quality			
PM 2.5	Outdoor air quality			
PM7	Outdoor air quality			
PM 7	Outdoor air quality			

Keywords	Air quality funding type	Risk of false positive	Black carbon finance	Finance addressing black carbon-rich sources
PM10	Outdoor air quality			
PM 10	Outdoor air quality			
ultrafine particles	Outdoor air quality			x
UFP	Outdoor air quality	Yes		x
total suspended particulate matter	Outdoor air quality			
black carbon	Outdoor air quality		x	
BC	Outdoor air quality	Yes	x	
Soot	Outdoor air quality	Yes	x	
elemental carbon + air	Outdoor air quality		x	
organic carbon + air	Outdoor air quality	Yes		x
carbon monoxide***	Outdoor air quality co-benefits			x
carbon monoxide + ambient	Outdoor air quality			x
CO + ambient	Outdoor air quality			x
carbon monoxide + outdoor	Outdoor air quality			x
ground-level ozone	Outdoor air quality			
ground level ozone	Outdoor air quality	Yes		
ground-level O3	Outdoor air quality	Yes		
ground level O3	Outdoor air quality	Yes		
tropospheric ozone	Outdoor air quality	Yes		
tropospheric O3	Outdoor air quality	Yes		
Ozone + precursor	Outdoor air quality	Yes		
methane + health*	Outdoor air quality	Yes		
CH4 + health*	Outdoor air quality	Yes		
Methane**	Outdoor air quality co-benefits	Yes		
CH4**	Outdoor air quality co-benefits	Yes		
short-lived climate pollutants**	Outdoor air quality co-benefits			x
short lived climate pollutants**	Outdoor air quality co-benefits			x
SLCP**	Outdoor air quality co-benefits	Yes		x
super pollutants**	Outdoor air quality co-benefits			x
short-lived climate pollutants + health*	Outdoor air quality			x
short lived climate pollutants + health*	Outdoor air quality			x
SLCP + health*	Outdoor air quality			x
super pollutants + health*	Outdoor air quality			x
heavy metals + air	Outdoor air quality	Yes		
formaldehyde + air***	Outdoor air quality co-benefits	Yes		

Keywords	Air quality funding type	Risk of false positive	Black carbon finance	Finance addressing black carbon-rich sources
lead + air	Outdoor air quality	Yes		
mercury + air	Outdoor air quality	Yes		
cadmium + air	Outdoor air quality	Yes		
persistent organic pollutants + air	Outdoor air quality	Yes		
POPs + air	Outdoor air quality	Yes		
radon + air	Outdoor air quality	Yes		
arsenic + air	Outdoor air quality	Yes		
chromium + air	Outdoor air quality	Yes		
copper + air	Outdoor air quality	Yes		
nickel + air	Outdoor air quality	Yes		
selenium + air	Outdoor air quality	Yes		
zinc + air	Outdoor air quality	Yes		
construction dust	Outdoor air quality			
Smog	Outdoor air quality			x
Smoke	Outdoor air quality	Yes		
acid rain	Outdoor air quality			
volatile organic compounds	Outdoor air quality	Yes		
VOC	Outdoor air quality	Yes		
sulphur trioxide	Outdoor air quality co-benefits	Yes		
sulfur trioxide	Outdoor air quality co-benefits	Yes		
SO3	Outdoor air quality co-benefits	Yes		
sulphuric acid	Outdoor air quality co-benefits	Yes		
sulfuric acid	Outdoor air quality co-benefits	Yes		
H2SO4	Outdoor air quality co-benefits	Yes		
hydrogen sulphide	Outdoor air quality co-benefits	Yes		
hydrogen sulfide	Outdoor air quality co-benefits	Yes		
Mercaptans	Outdoor air quality co-benefits	Yes		
dimethyl sulphides	Outdoor air quality co-benefits	Yes		

Note: Pink-shaded entries represent new keywords for the 2024 State of Global Air Quality Funding report, grey-shaded entries represent keywords that have been newly identified as having high risk of generating false positives, '+' separated words appear in any order in the descriptive data; words separated by a space appear in this precise order in the descriptive data. An 'x' in the 'Black carbon finance' column indicates that the keyword extracts projects that have a primary objective of addressing black carbon emissions.

* Health indicates primary air pollution focus.

** Categorised as funding with outdoor air quality co-benefits because predominantly climate motivated.

*** Categorised as funding with outdoor air quality co-benefits because predominantly related to indoor air quality.

AIR QUALITY SECTOR SOLUTIONS

This group of keywords is aimed at capturing activities which – even in the absence of specific intentional air quality objectives – would still lead to air quality improvements and are therefore categorised as funding with outdoor air quality co-benefits.

The list of keywords was based on the taxonomy for air quality sector solutions developed by Clean Air Fund and CPI (depicted in Table 5.3). The taxonomy aims to capture all solutions identified in the following sources:

- EU Policies to improve AQ
- UNEP/CCAC’s Africa Integrated Assessment
- UNEP/CCAC’s Global Methane Assessment
- CCAC SLCP Solutions
- World Bank’s working paper Integrating AQ Management and Climate Change Mitigation

TABLE 5.3 TAXONOMY FOR AIR QUALITY SECTOR SOLUTIONS

Sector	Solution	Description
TRANSPORT	Cleaner road vehicles and modal shift	The adoption of cleaner vehicle technologies, such as low-emission vehicles and alternative fuels, combined with a shift towards more sustainable transportation modes, like public transit, cycling, and walking. This contributes to improved air quality by reducing tailpipe emissions from road transport.
	More public transport and railways	Expansion and increased use of public transportation systems, including buses, trams, and trains, which tend to have lower per-passenger emissions than personal vehicles. This reduces overall transportation-related emissions and improves air quality.
	Electric and hybrid road vehicles	Promotion and adoption of electric and hybrid-electric vehicles that produce fewer or zero tailpipe emissions. These vehicles contribute to improved air quality by reducing transportation-related emissions, particularly in urban areas.
	Cleaner fuels and vehicles for shipping	A targeted approach to mitigating air pollution by implementing low-sulfur fuels, alternative propulsion systems, and advanced exhaust treatment technologies within the maritime sector. This strategy addresses the shipping industry’s contribution to airborne emissions, such as sulfur oxides (SO _x), nitrogen oxides (NO _x), and particulate matter (PM), ultimately enhancing air quality and promoting environmental sustainability for a more ecologically responsible global transportation network.

Sector	Solution	Description
TRANSPORT	More cycling and walking	Fostering non-motorised transportation modes, such as cycling and walking, which produce zero emissions. This ameliorates air quality by minimising dependence on motorised transportation and its associated emissions.
	Traffic planning and management	The implementation of intelligent transportation systems, congestion pricing, and other measures to optimise traffic flow and minimise idling. These strategies ameliorate air quality by curtailing emissions from vehicles in congested traffic.
	Lower petrol and diesel vehicles emissions	Imposition of more stringent emissions standards for internal combustion engine vehicles, as well as regular inspection and maintenance programmes, to reduce tailpipe emissions. This ameliorates air quality by ensuring vehicles operate with minimal emissions.
RESIDENTIAL SECTOR/ BUILDINGS	Reduce indoor air pollution	<p>The adoption of cleaner residential energy sources and appliances, such as improved cookstoves and efficient heating systems, to minimise indoor air pollution. This ameliorates air quality by curtailing emissions from residential sources.</p> <p>Note: LPG projects are included in the analysis as, while they do not represent solution for climate mitigation, they have a positive impact on indoor air pollution.</p>
	Using waste heat from industry and clean energy sources for district heating	The capture and utilisation of waste heat from industrial processes, and the integration of clean energy sources for district heating systems, to reduce fossil fuel combustion for heating purposes. This ameliorates air quality by minimising heating-related emissions.
	Efficiency in buildings	The application of energy-efficient building designs, materials, and technologies, as well as retrofitting existing buildings to boost energy efficiency, which curtails energy consumption and associated emissions. This ameliorates air quality by reducing emissions from energy generation and usage in buildings.
ENERGY GENERATION + INDUSTRY	Phasing out and replacement of fossil fuel plants	The decommissioning of coal, oil, and gas-fired power plants, and their explicit substitution with clean and renewable energy sources. This ameliorates air quality by curtailing emissions from power generation.

Sector	Solution	Description
<p style="text-align: center;">ENERGY GENERATION + INDUSTRY</p>	<p>Clean and renewable energy</p>	<p>A pivotal strategy in air quality management that entails explicit transitioning from fossil fuel-based power generation to sustainable, low-emission energy sources, such as solar, wind, hydro, and geothermal. This shift mitigates the release GHGs, PM, and other harmful pollutants associated with conventional energy production, thereby improving air quality.</p> <p>Renewable energy projects either (i) reduce present air pollution when they are built to replace fossil fuel plants, or (ii) avoid future air pollution when they are built to respond to the growing energy demand in a country. The analysis in the report focuses only on the first category (i)(renewable energy projects which directly replace fossil fuel plants) as these projects are the only ones that have a clear positive impact on air quality.</p> <p>Note: all biofuels with the exception of biogas were excluded as it is debatable whether they have an overall positive impact on air pollution.</p>
	<p>Emission and pollution control in mining</p>	<p>This solution focuses on implementing advanced pollution control measures and technologies in mining operations, such as PM suppression, fugitive gas capture, and wastewater treatment, to minimise emissions and pollutant release. This ameliorates air quality by mitigating the environmental impact of mining activities.</p>
	<p>Pollution control and energy increased efficiency in energy and industrial processes</p>	<p>This solution focuses on implementing advanced pollution control technologies and enhancing energy efficiency in both energy generation and industrial processes. By reducing emissions from these sectors, this strategy contributes to improved air quality. Pollution control technologies, such as flue gas desulfurisation, selective catalytic reduction, and electrostatic precipitators, can significantly reduce emissions of PM, sulfur dioxide, and nitrogen oxides.</p>
<p style="text-align: center;">AGRICULTURE</p>	<p>Improvements in livestock production to reduce emissions</p>	<p>This solution aims to optimise livestock production practices to minimise emissions of air pollutants, particularly ammonia (NH₃) and methane (CH₄), which contribute to air quality degradation and climate change. By implementing targeted strategies, such as adjusting animal diets, improving manure management, and enhancing grazing systems, emissions from livestock production can be substantially reduced. For instance, the use of dietary additives in animal feed can decrease methane emissions from enteric fermentation and ammonia emissions from excretion. Furthermore, better manure storage and treatment methods can reduce ammonia volatilisation and methane emissions.</p>

Sector	Solution	Description
AGRICULTURE	Improved food production and consumption	This solution addresses the air quality impacts associated with the entire food production and consumption system, from agriculture to processing, distribution, and consumption behaviours. By implementing more sustainable and efficient agricultural practices, reducing food waste, and promoting dietary shifts towards lower-emission foods, this approach can significantly reduce emissions of air pollutants, particularly ammonia (NH ₃), nitrogen oxides (NO _x), and volatile organic compounds (VOCs).
WASTE	Solid waste management	Solid waste management refers to the systematic control of the generation, collection, storage, transport, processing, and disposal of solid waste materials. Proper solid waste management practices can help reduce air pollution by minimising the emissions of harmful substances, such as methane (CH ₄), volatile organic compounds (VOCs), and PM, which are released during waste decomposition and incineration processes. Techniques such as recycling, composting, waste-to-energy conversion, and sanitary landfilling can significantly contribute to improving air quality and mitigating the environmental impacts of solid waste.
	Improved waste water treatment and water sanitation	Improved wastewater treatment and water sanitation refer to the enhancement of processes and technologies employed in the treatment and management of wastewater and the provision of safe drinking water. These improvements can help mitigate air quality issues by reducing the emissions of GHGs, such as methane (CH ₄) and nitrous oxide (N ₂ O), and volatile organic compounds (VOCs) that are released during wastewater treatment and sanitation processes. Advanced treatment methods, such as membrane bioreactors, anaerobic digestion, and nutrient recovery systems, can minimise these emissions while also conserving energy and recovering valuable resources.
NATURAL SOURCES	Reduction of non-anthropogenic air pollution	Reduction of non-anthropogenic air pollution refers to the mitigation of air pollution sources that are not directly attributable to human activities. These sources can include natural events such as wildfires, and biogenic emissions from vegetation and soil. In the context of air quality management, strategies to reduce non-anthropogenic air pollution can involve monitoring and forecasting of forest fires and implementing land management practices to prevent wildfires.

Table 5.4 shows the list of keywords for air quality sector solutions. Projects captured by these keywords are categorised as funding with outdoor air quality co-benefits, unless keywords are found together with the words “air”, “health” or “exposure”, in which case they count as outdoor air quality funding (see example below).

Sector	Solution	Keywords for projects with outdoor air quality co-benefits	Keywords for outdoor air quality projects
TRANSPORT	Cleaner vehicles and modal shift	Cleaner transport	cleaner transport + air
			cleaner vehicle + health
			cleaner vehicle + exposure
		Cleaner vehicle	cleaner vehicle + air
			cleaner vehicle + health
			cleaner vehicle + exposure

The only exception to this rule are solutions to reduce indoor air pollution, which are always categorised as funding with outdoor air quality co-benefits as per definitions in Table 3.1.

TABLE 5.4 LIST OF KEYWORDS FOR AIR QUALITY SECTOR SOLUTIONS

Sector	Solution	Keywords for funding with outdoor air quality co-benefits	Risk of false positive	Funding targeting sources rich in black carbon
TRANSPORT	Cleaner road vehicles and modal shift	cleaner transport		x
		cleaner vehicle	Yes	x
		modal shift	Yes	x
		lorry + replace	Yes	x
		freight + transport + replace		x
		truck + replace	Yes	x
		Bus + retrofit + emissions		x
		Truck + retrofit + emissions		x
		HGV + retrofit + emissions		x
	More public transport and railways	public transport	Yes	
		public transportation	Yes	
		BRT	Yes	
		bus rapid transit		
		bus	Yes	
		public bus	Yes	
		rail	Yes	
		rolling stock	Yes	
		train	Yes	
		railway	Yes	
		Electric + train	Yes	
Electric + railway	Yes			
Electric and hybrid road vehicles	Electric Vehicle			

Sector	Solution	Keywords for funding with outdoor air quality co-benefits	Risk of false positive	Funding targeting sources rich in black carbon
TRANSPORT	Electric and hybrid road vehicles	EV	Yes	
		battery electric vehicle		
		BEV	Yes	
		plug-in hybrid electric		
		plugin hybrid electric		
		PHEV	Yes	
		electric car		
		electric bus		
		hybrid vehicle		
		HEV	Yes	
		hybrid bus		
		hybrid car		
		electric truck		
		electric lorry		
		electric + freight + transport		
	Cleaner fuels and vehicles for shipping	sulphur emission control area		
		SECA		
		shipping + emissions	Yes	x
		Shipping + health	Yes	x
		Green corridor + shipping		x
		zero-carbon shipping		x
		zero emission vessels		x
		Zero-emission vessels		x
		Roll-on/roll-off + electric		x
		Ro-ro ship + electric		x
Cargo ship + electric		x		
zero emission berth standard		x		

Sector	Solution	Keywords for funding with outdoor air quality co-benefits	Risk of false positive	Funding targeting sources rich in black carbon
TRANSPORT		continuous emissions monitoring systems	Yes	
		low-sulphur fuels	Yes	
		low-sulfur fuels	Yes	
		non-residual fuels		
		Scrubbers + ship		x
		water injection + ship		x
		Exhaust gas recirculation + ship		x
		Humid air motor + ship		x
		Selective catalytic reduction + ship		
	More cycling and walking	cycling	Yes	
		walking	Yes	
		bike		
		bicycle		
		pedestrian	Yes	
		active travel		
	Traffic planning and management	traffic planning	Yes	
		traffic management	Yes	
		car free days		
		clean air zones		x
		CAZ		x
		ultra low emissions zones		x
		ULEZ		x
		smoke control areas		x
congestion		Yes		
congestion charge			x	
limited traffic zone		Yes	x	
LTZ	Yes	x		

Sector	Solution	Keywords for funding with outdoor air quality co-benefits	Risk of false positive	Funding targeting sources rich in black carbon
TRANSPORT	Traffic planning and management	low-emission zone	Yes	x
		low emission zone	Yes	x
		LEZ	Yes	x
	Lower petrol and diesel vehicles emissions	emission standards	Yes	x
		diesel + filter	Yes	x
RESIDENTIAL SECTOR/ BUILDINGS	Reduce indoor air pollution	kerosene + lamp + replace		x
		kerosene + lamp + replacement		x
		clean light		x
		clean lighting		x
		solar lamp	Yes	x
		solar light	Yes	x
		clean cookstove		x
		clean cooking		x
		LPG + stove		x
		LPG + cook		x
		liquefied petroleum gas + stove		x
		liquefied petroleum gas + cook		x
	Using waste heat from industry and clean energy sources for district heating	waste heating	Yes	
		district heating	Yes	
		clean heat		
		Clean air conditioning	Yes	
		Clean cooling	Yes	
		Clean AC	Yes	

Sector	Solution	Keywords for funding with outdoor air quality co-benefits	Risk of false positive	Funding targeting sources rich in black carbon
RESIDENTIAL SECTOR/ BUILDINGS	Using waste heat from industry and clean energy sources for district heating	geothermal heat pump	Yes	
		ground source heat	Yes	
		solar water heater	Yes	
		SWH	Yes	
	Efficiency in buildings	insulation + building	Yes	
		building + insulate	Yes	
		energy + efficiency + household	Yes	
		efficient + appliance	Yes	
		efficient + boiler		x
		low-emission boiler		x
		low + emission + boiler		x
	eco + boiler		x	
	ENERGY GENERATION + INDUSTRY	Phasing out and replacement of fossil fuel plants	fossil + phase + out	
fossil + replace				x
coal + replace				x
gas + replace				x
oil + replace				x
diesel + replace				x
gasoline + replace				x
Clean and renewable energy		clean energy + replace		
		renewable energy + replace		
		Hydropower + replace		
		Hydro + replace	Yes	
		hydro power + replace		
		wind power + replace		
		wind energy + replace		
		onshore wind + replace		

Sector	Solution	Keywords for funding with outdoor air quality co-benefits	Risk of false positive	Funding targeting sources rich in black carbon
ENERGY GENERATION + INDUSTRY	Clean and renewable energy	offshore wind + replace		
		on-shore wind + replace		
		off-shore wind + replace		
		solar power + replace		
		solar energy + replace		
		solar pv + replace		
		solar photovoltaic + replace		
		solar thermal + replace		
		concentrating solar power + replace		
		CSP + replace	Yes	
		concentrated solar power + replace		
		Geothermal + replace	Yes	
		waste to energy + replace	Yes	
		waste-to-energy + replace	Yes	
		Biogas + replace		x
		ocean energy + replace	Yes	
		tidal energy + replace	Yes	
		marine energy + replace	Yes	
	Emission and pollution control in mining	Gas leak detection		
		Repair + gas + pipeline		
		Repair + oil + pipeline		
		Blowdown capture		
		Pre-mining degasification		
		Flooding + mines		
		Air methane oxidation		
		vented gas + vapor recovery		
Gas flaring + phase out		Yes	x	
Gas flaring + phasing out		Yes	x	

Sector	Solution	Keywords for funding with outdoor air quality co-benefits	Risk of false positive	Funding targeting sources rich in black carbon
ENERGY GENERATION + INDUSTRY	Pollution control and energy increased efficiency in energy and industrial processes	pollution + control + industry	Yes	
		pollution + prevention + industry	Yes	
		emission + control + industry	Yes	x
		emission + abatement + industry	Yes	x
		End-of-pipe control system		x
		efficient charcoal production		x
		efficiency + industry		
		Energy efficiency	Yes	
		Boiler + replace		x
		brick kiln	Yes	x
		coke oven	Yes	x
AGRICULTURE	Improvements in livestock production to reduce emissions	livestock + emission	Yes	
		livestock + feeding	Yes	
		livestock + feed	Yes	
		manure management	Yes	
		closed manure storage		
	Improved food production and consumption	crop + burning + reduce	Yes	x
		agricultural burning	Yes	x
		fertilisers + emission	Yes	
		fertilisers + emission	Yes	
		Fertiliser + management	Yes	
		organic fertiliser	Yes	
		organic fertiliser	Yes	
		nitrogen-based fertiliser + reduce	Yes	
		nitrogen-based fertiliser + reduce	Yes	
		nitrogen based fertiliser + reduce	Yes	
nitrogen based fertiliser + reduce	Yes			
alternate wet and dry + rice	Yes			
phosphogypsum addition	Yes			

Sector	Solution	Keywords for funding with outdoor air quality co-benefits	Risk of false positive	Funding targeting sources rich in black carbon
AGRICULTURE	Improved food production and consumption	Rice straw + composting	Yes	
		sulfate addition	Yes	
		Direct wet seeding	Yes	
		alternative hybrid cultivars	Yes	
		Methane emissions + rice	Yes	
		crop loss + reduction	Yes	
		food waste + reduction	Yes	
		dietary change	Yes	
		diet + substitution	Yes	
WASTE	Solid waste management	waste burning	Yes	x
		open burning		x
		landfill + gas + collection		
		landfill + gas + flaring		x
		Closure + open dump		
		Close + open dump		
		waste collection		x
		sanitary landfill		
		organic waste + reduce	Yes	
	Improved waste water treatment and water sanitation	wastewater treatment plants		
		Methane collection + wastewater treatment		
water sanitation		Yes		
NATURAL SOURCES	Reduction of non-anthropogenic air pollution	wildfires + prevent		x
		wildfires + firefight		x
		forest fires + firefight		x
		forest fires + prevent		x
Mining/Minerals	Coal mining	Coal + methane	Yes	

Note: Pink-shaded entries represent new keywords, grey-shaded entries represent keywords that have been newly identified as having high risk of generating false positives.

5.2 KEYWORDS FOR FOSSIL FUEL-PROLONGING ACTIVITIES

This group of keywords is used to extract projects related to fossil fuel activities that impact air pollution either directly or indirectly.

TABLE 5.5 TAXONOMY FOR FOSSIL FUEL PROLONGING ACTIVITIES

Sector	Sub-sector	Project category	Pollution type	
	Power & Heat Generation	Coal-fired power plant	Direct	
		Natural gas-fired power plant	Direct	
		Oil-fired power plant	Direct	
		Dual fuel- or fossil fuel-fired of unknown type	Direct	
	Power & Heat Transmission & Distribution	Power lines to connect fossil fuel-fired power plant to the grid	Indirect	
	Policy & National Budget Support & Capacity Building	Support to fossil fuel sector (Up- mid- and downstream)	Indirect	
	Upstream	Coal mining & extraction	Direct & Indirect	
		Oil & Gas extraction, production, refinery, storage, transportation, distribution	Direct & Indirect	
		Private Road Transport	Road constructions and upgrades	Indirect
		Aviation	Aviation support (Airports, Aircrafts, etc.)	Direct & Indirect
Waterway		Fossil fuel-powered water transportation	Direct	
Policy & National Budget Support & Capacity Building		Support to fossil fuel-powered transport sector	Indirect	
	Industry & Manufacturing	Steel plant development or expansion	Indirect	
		Production of chemicals	Indirect	
		Production of ferrous metals	Indirect	

When building the list of keywords in Table 5.6, only projects leading to additional air pollution were considered. This excludes all business-as-usual projects such as the maintenance of transport infrastructure (e.g., roads, airports) or transmission and distribution networks.

TABLE 5.6 LIST OF KEYWORDS FOR FOSSIL FUEL PROLONGING ACTIVITIES

Keywords	Related fossil fuel prolonging activity
coal + power plant	Coal-fired power plant
coal + power-plant/plant/power	Coal-fired power plant
coal-fired/coal-powered	Coal-fired power plant
gas + power plant	Natural gas-fired power plant
gas + power-plant/plant/power	Natural gas-fired power plant
gas-fired/CCGT/gas-powered	Natural gas-fired power plant
gas fired	Natural gas-fired power plant
incineration/incinerator/combustion	Manual check
power plant	Manual check
oil + power plant	Oil-fired power plant
oil + power-plant/plant/power	Oil-fired power plant
oil-fired/oil-powered	Oil-fired power plant
oil fired	Oil-fired power plant
waste + incineration/incinerator/ combustion/burning	Waste incinerators
gas + pipeline/pipe/transport/ transportation/distribution	Upstream Oil & Gas
coal mining/mine/production/extraction/ transportation	Upstream Coal
gas/oil/petroleum/kerosene/lng + extraction/production/upstream/refinery	Upstream Oil & Gas
fossil/coal/oil/gas + policy/technical assistance/measure/capacity building/ support	Fossil fuel sector support
fossil/coal/oil/gas + capacity building	Fossil fuel sector support
fossil/coal/oil/gas + technical assistance	Fossil fuel sector support
transport/transportation + policy/measure/ support	Fossil fuel transport sector support
transport/transportation + capacity building	Fossil fuel transport sector support
transport/transportation + technical assistance	Fossil fuel transport sector support
airport/plane/aviation	Aviation support
waterway/boat	Fossil fuel-powered water transportation
van/bus/train/carriage/locomotive/engine/ motor + diesel/diesel-powered/diesel- fuelled/oil/coal/ice	Road transport
coal/gas/lng/methane	Manual check
(palm/olive/edible/vegetable) oil	Manual check
(greenhouse) gas	Manual check
passenger vehicle + diesel/ice/oil/gas	Road transport
passenger car + diesel/ice/oil/gas	Road transport
car/ldv/pldv + diesel/ice/oil/gas	Road transport

Keywords	Related fossil fuel prolonging activity
Primary steel plant development/expansion	Industry
Ferrous metals + production	Industry
Chemicals + production	Industry
manufacturing + Industry	Manual check
Gas/oil boiler subsidy	Residential

Note: Pink-shaded entries represent new keywords for The State of Global Air Quality Funding 2024 report, '+' separated words appear in any order in the descriptive data; words separated by a space appear in this precise order in the descriptive data; '/' separated words were searched separately; words in parentheses were used as discriminants to exclude projects.

6. METHODOLOGY LIMITATIONS

This methodology represents a leading effort to identify and analyse international development funding flows for air quality. There are, however, some limitations should be taken into account:

Tracking of commitments. As mentioned in Section 4.3, the analysis in the report is based on financial commitments rather than disbursements. Commitments record the total amount of a transaction in the year when it is closed, irrespective of the time required to complete the disbursement. The result is that with relatively small funding volumes such as for outdoor air quality funding, single large transactions can significantly skew investment in specific years, making it hard to identify long-term trends. To overcome this limitation, we focus the analysis on cumulative funding for the most recent five years for which data is available (2018–2022) to smooth the possible impact of single large transactions. Using disbursement data would provide a more accurate picture of the actual funding volume flowing air quality projects in a given year; however, current data gaps in disbursement data make it difficult to use this information.

Use of keywords. As mentioned in Section 4.1, once the data is collected, we run a keyword search to identify air quality and fossil fuel-prolonging projects within the broader database. The keyword list has been extensively reviewed and iterative improvements are made each year. However, it is possible that the keywords used may not capture all relevant projects for the analysis. The keyword search approach is also dependent on the quality and level of detail provided in the project descriptions; in cases where project descriptions are not very exhaustive, we might have failed to capture air quality or fossil fuel-prolonging projects. Furthermore, because the keyword search only works with project-level data, investors and sectors for which data is only available in an aggregate format cannot be included in the analysis, leading to potentially considerable data gaps. In the absence of an air quality tag or taxonomy to more accurately identify relevant projects, the use of keywords seems to be the only way to extract projects for the analysis. Clean Air Fund and CPI will continue to refine the list of keywords to make sure the accuracy of our methodology improves over time.

Scope of analysis. As mentioned in Section 3.2, the analysis does not currently include funding provided by the private sector, national governments (e.g. through domestic budgets) or philanthropies, which nevertheless play a key role in funding air quality and fossil fuel-prolonging projects. The analysis also focuses on direct investment into projects and excludes any funding that may go towards policies in support of either air quality or fossil fuel projects (e.g., subsidies, tax credits, etc.). This is due to the focus of the analysis (i.e., on international flows of public development finance to low- and middle-income countries) and in no way seeks to suggest that these do not play an important role in the air quality funding landscape.

Definitions. The distinction between outdoor air quality funding and funding with outdoor air quality co-benefits (Table 3.1) can sometimes be unclear or confusing. In many cases, the categorisation of a project under one funding flow or the other will depend on the interpretation of the project description and on whether outdoor air quality seems to be a key objective of the project or just a co-benefit. In some cases, funders may not provide a lot of detail about project objectives or expected impacts in the descriptions. Due to the size of the database, it is not possible to go over detailed documentation for each project

to check project details that may help to interpret project descriptions and/or gather additional detail on specific objectives and impacts.

Instruments. The OECD Creditor Reporting System database does not have a marker or reporting column that indicates whether debt financing has been provided on concessional terms, and proxies have therefore been used in this analysis. Where loans are marked as ‘ODA loans’ in the database, they are categorised in our methodology as ‘low-cost debt’. Loans that do not meet ODA criteria are instead marked as ‘Other Official Flows’ in the database, and are categorised in our methodology as ‘market rate debt’. This assumption is made on the basis that ‘Other Official Flows’ often includes funding that does not meet the ODA requirements on concessionality. It is possible that some loans in this category are provided on concessional terms but do not meet ODA criteria for other reasons; this methodology cannot capture these loans in its analysis of concessional finance, and therefore numbers on concessional finance should be seen as conservative estimates.

7. GEOGRAPHIC CLASSIFICATION

Table 7.1 shows the regional grouping used in The State of Global Air Quality Funding 2024. The designations employed do not imply the expression of any opinion on the part of Clean Air Fund or CPI concerning the legal status of any region, country, territory, city or area or of its authorities, or concerning the delimitation of frontiers or boundaries. Flows are classified as “transregional” when resources are channelled to more than one region.

TABLE 7.1 REGIONAL GROUPING USED FOR THE ANALYSIS OF AIR QUALITY FUNDING

Region	Country or territory
Central Asia & Eastern Europe	Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Estonia, Georgia, Hungary, Kazakhstan, Kosovo ³ , Kyrgyz Republic, Latvia, Lithuania, North Macedonia, Montenegro, Poland, Slovakia, Republic of Moldova, Romania, Russian Federation, Serbia, Tajikistan, Türkiye, Turkmenistan, Ukraine, Uzbekistan
East Asia & Pacific	American Samoa, Brunei, Cambodia, China, Cook Islands, Democratic People’s Republic of Korea, Fiji, Indonesia, Kiribati, Lao PDR, Malaysia, Marshall Islands, Micronesia (Federated States of), Mongolia, Myanmar, Nauru, Niue, Palau, Papua New Guinea, Philippines, Republic of Korea, Samoa, Singapore, Solomon Islands, Thailand, Timor-Leste, Tonga, Tuvalu, Vanuatu, Viet Nam
Latin America & Caribbean	Anguilla, Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia (Plurinational State of), Bonaire, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St. Barthélemy, Sint Eustatius and Saba, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela (Bolivarian Republic of), West Indies
Middle East & North Africa	Algeria, Bahrain, Egypt, Islamic Republic of Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, State of Palestine, Syrian Arab Republic, Tunisia, United Arab Emirates, Yemen
Other Oceania	Australia, New Zealand, Tokelau

³ This designation is without prejudice to positions on status, and is in line with United Nations Security Council resolution 1244 and the International Court of Justice Opinion on the Kosovo Declaration of Independence.

Region	Country or territory
Sub-Saharan Africa	Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cabo Verde, Central African Republic, Chad, Comoros, Republic of Congo, Democratic Republic of the Congo, Côte d'Ivoire, Djibouti, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mayotte, Mozambique, Namibia, Niger, Nigeria, Réunion, Rwanda, São Tomé and Príncipe, Saint Helena, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, United Republic of Tanzania, Togo, Uganda, Zambia, Zimbabwe
South Asia	Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka
US & Canada	Canada, United States of America
Western Europe	Andorra, Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Malta, Monaco, Netherlands, Norway, Portugal, San Marino, Slovenia, Spain, Sweden, Switzerland, United Kingdom, Vatican City

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