



INTRODUCTION:
**INTEGRATED ASSESSMENT OF AIR
POLLUTION AND CLIMATE CHANGE FOR
SUSTAINABLE DEVELOPMENT IN AFRICA**



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ISBN: 978-92-807-3989-3

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SUGGESTED CITATION

United Nations Environment Programme (2023). Integrated Assessment of Air Pollution and Climate Change for Sustainable Development in Africa. Nairobi.

PRODUCTION

Climate and Clean Air Coalition (CCAC) convened by United Nations Environment Programme (UNEP), African Union Commission, Stockholm Environment Institute (SEI)

ACKNOWLEDGMENTS

The United Nations Environment Programme (UNEP) would like to thank the authors, reviewers and the secretariat for their contribution to the preparation of this assessment report. Authors and reviewers have contributed to the report in their individual capacities. Their affiliations are only mentioned for identification purposes. The preparation of this assessment has been supported by the Swedish International Development Cooperation Agency (Sida) through funding to the Stockholm Environment Institute (SEI) that coordinated the process and publication of the assessment report.

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SPECIAL THANKS

The Climate and Clean Air Coalition and partners appreciate the leadership and support from the H.E. Ambassador Josefa Leonel Correia Sacko, Commissioner for Agriculture, Rural Development, Blue Economy and Sustainable Environment, African Union Commission, and the entire team of officers for supporting and providing policy guidance to the assessment. We express gratitude to Dr. Harsen Nyambe, for Co-Chairing the International Advisory Group, Ms. Olushola Oyalide and Ms. Leah Naess Wanambwa for their policy support to the assessment coordination team. We would also like to express our gratitude to Frank Turyatunga (Regional Director) and Charles Sebukeera, UNEP Regional Office for Africa, David Ombisi and Julie Kaibe at the African Ministerial Conference on the Environment (AMCEN) Secretariat for their support of the Assessment and especially the policy engagement process. Special thanks also go to Andrea Hinwood, UNEP Chief Scientist, the head of the CCAC Secretariat, Martina Otto, and the Co-Chairs and Science Advisory Panel of the CCAC for advice and comments.

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INTRODUCTION

CONTEXT AND POLITICAL MANDATE

Africa confronts, and will be confronted by, wide-scale adverse effects of human-induced environmental change including climate change (Intergovernmental Panel on Climate Change [IPCC] 2021; IPCC 2022a) and air pollution (Babatola 2018). Over 1 million people each year are estimated to die prematurely in Africa from exposure to indoor and outdoor air pollution (Fisher et al. 2021). Development in many parts of Africa is also particularly vulnerable to climate change (IPCC 2022a). However, Africa has enormous potential for development, culture, and peace as well as in establishing flourishing, inclusive and prosperous societies. It also has the capability to realise all these aspirations (African Union Commission [AUC] 2015). The challenge is - can this be done at the same time as addressing air pollution and climate change?

The Integrated Assessment of Air Pollution and Climate Change for Sustainable Development in Africa is the result of a scientifically underpinned process, with a political mandate (Box 1.1), that will ideally result in change by catalyzing and supporting change for goal-oriented action and transformative development. It examines the role and potential of Short-Lived Climate Pollutants (SLCPs) (Box 1.2), greenhouse gases (GHGs) and polluting emission mitigation strategies, policies, and measures. The Assessment supports sustainable, greener economic development, and the restoration of ecological and human health and wellbeing in Africa as the continent adapts to climate change over the next four decades.

BOX 1.1 POLITICAL MANDATE OF THE INTEGRATED ASSESSMENT OF AIR POLLUTION AND CLIMATE CHANGE FOR SUSTAINABLE DEVELOPMENT IN AFRICA

In 2019, during the Seventeenth Session of the African Ministerial Conference on the Environment (AMCEN-17) ministers agreed to support mitigation of SLCPs and the elaboration of an Africa Integrated Assessment of Air Pollution and Climate Change, as follows:

“to emphasize the benefits of improving air quality, including through managing, and as nationally appropriate, reducing short-lived climate pollutants in the environment, agriculture, health and forest conservation, while responding to the aspirations of Agenda 2063 of the African Union and the Sustainable Development Goals (hereafter called Agenda 2030), noting the need for an assessment with linkage between policies to address air pollution and policies to address climate change.” (African Ministerial Conference on the Environment [AMCEN] 2019).

In 2022, at AMCEN-18, African ministers restated their support of the Assessment and of measures to mitigate SLCPs:

“Note the completion of the Integrated Assessment of Air Pollution and Climate Change for Sustainable Development in Africa and its report, in response to AMCEN decision 17/2. Urge African countries to support further development and implementation of the 37 recommended measures as a continent-wide Africa Clean Air Program, coordinated by strong country-led initiatives, cascaded to the Regional Economic Communities and higher levels of policy.” (AMCEN 2022).

BOX 1.2 WHAT ARE SHORT-LIVED CLIMATE POLLUTANTS?

Short-lived climate pollutants (SLCPs) are powerful climate forcers that remain in the atmosphere for a much shorter period than carbon dioxide (CO₂). They can be in the atmosphere for a few weeks to up to two decades; yet their potential to warm the atmosphere can be many times greater than CO₂. Certain SLCPs are also dangerous air pollutants that have harmful effects on human health, ecosystems, and agricultural productivity.

The SLCPs methane (CH₄), black carbon (BC), tropospheric ozone (O₃), and hydrofluorocarbons (HFCs) are the most important contributors to the human-made global greenhouse effect after CO₂ and are responsible for up to 45 per cent of current global warming. If no action to reduce emissions of these pollutants is taken in the coming decades, they are expected to account for as much as half of the warming caused by human activity.

Source: Climate and Clean Air Coalition (CCAC): <https://www.ccacoalition.org/>

The Assessment responds to the African Union's 'Agenda 2063' goal on environmentally sustainable and climate resilient economies and communities in the context of sustainable development, in which a key priority is *"to develop / facilitate the implementation of Africa Quality Standards for air and other forms of pollution"* (AUC 2015).

In addition, it responds to global commitments and actions to mitigate air pollution that are based on the scientifically established links between air pollution, climate change and the associated adverse health and environmental impacts, including:

The United Nations Environment Assembly (UNEA) Resolutions:

- 1/7: "Strengthening the role of the United Nations Environment Programme in promoting air quality" (United Nations Environment Programme [UNEP] 2014);
- 3/8 "Preventing and reducing air pollution to improve air quality globally" (UNEP 2017a);
- "Environment and health" (UNEP 2017b);
- 4/21 "Implementation plan towards a pollution-free planet" (UNEP 2019a); and

The World Health Assembly (WHA) Resolutions:

- 68.8 "Health and the environment: addressing the health impact of air pollution" (World Health Organization [WHO] 2015); and
- 69.11 "Health in the 2030 Agenda for Sustainable Development" (WHO 2016).

The Assessment process brought together more than 150 researchers, practitioners and professionals working across Africa and internationally to address the growing human-induced air pollution and climate change threats and demonstrate the development pathways that can reach the Agenda 2063 aspirations. This was done by building on the growing knowledge, linking with international expertise and at the same time promoting the building of capacity for scientific assessment in Africa. All these activities are promoting action across Africa to reduce atmospheric emissions that cause air pollution and climate change. The focus is on SLCP strategies, as well as other air pollutants and GHG mitigation strategies. The SLCP strategies are

important as they provide the opportunity to reduce the rate of warming in the near term, that is within two decades, as well as addressing longer term air pollution and climate change. This Assessment is one example of the type of integrated air pollution and climate change strategies that are important in the goal of realizing development of “the Africa we want”.

GOALS, OBJECTIVES AND OUTCOMES

In Agenda 2063, there is clear articulation of the prospect of Africa’s development providing “the Africa we want”. The question is how this development will occur in a rapidly industrializing, urbanizing, digitizing and motorizing society with growing adverse impacts associated with deteriorating air quality, degrading ecosystem services and biodiversity loss. There are societal choices to be made to tackle these challenges.

The goal of this Assessment is to support decision-making for development that can improve the health and wellbeing of Africa’s people and at the same time avoid exacerbating air pollution and increasing GHGs and SLCPs emissions that were typical of Asia, Europe and North America as they industrialized.

Achieving the goal of identifying the benefits of more integrated air pollution prevention and climate change strategies requires several specific objectives to be met through the Assessment process, namely:

- better understanding and articulation of problems, challenges and opportunities in Africa;
- identifying the benefits of more integrated air quality and climate change strategies in Africa;
- identifying data, knowledge and policy gaps;
- providing access to the best available scientific knowledge and where possible local knowledge to inform governance and support national development objectives aligned with the delivery of Agenda 2063, that aims to achieve the Agenda 2030, sustainable development goals (SDGs) and the Paris Climate Agreement;
- facilitating the interaction between science and policy communities through a multi-scaled, multi-dimensional, multi-disciplinary, multi-stakeholder, participatory, consultative assessment process and products of high legitimacy, scientific credibility and policy relevance;
- building a community of practice integrating and enhancing existing science-policy networks and platforms; and
- promoting geographic-, gender- and discipline-balanced partnerships, South-South, South-North and triangular cooperation, technology transfer and capacity building for assessments in the region.

To meet these objectives the following principles were followed in implementing the Assessment process:

- engaging the best available scientific and policy expertise;
- ensuring scientific credibility, policy relevance, and legitimacy of the Assessment by engaging a wide range of stakeholders from across Africa as well as from the international scientific and Assessment communities;

- constituting multidisciplinary groups of experts using a transparent process;
- establishing advisory groups to provide guidance to experts and to ensure the scientific credibility of the process;
- subjecting the Assessment to scientific expert peer-review and government review processes;
- capacity building by engaging developing country experts;
- communicating key messages and findings to target audiences in an accessible and applicable manner; and
- establishing partnerships and collaboration.

The outcomes of the Assessment process include:

1. improved awareness of the potential air pollution and climate consequences of current development trajectories and the multiple benefits of development that also limit air pollution and climate change;
2. identification of possible policies and measures that can successfully address the air pollution, climate change and related development challenges and also help achieve the air quality aspirations of Agenda 2063;
3. increasing the availability of the tools, methodologies and approaches that can help countries to address their air pollution and climate challenges; and
4. the provision of an outlook for the future including the benefits of action and the implications of inaction.

Results from the Assessment can inform action in Africa by providing solutions to limit the exposure of its people to outdoor and household air pollution and anthropogenic emissions associated with climate change; and manage adaptation to the impacts of projected changes on health, agriculture, forests, and the environment.

The outcomes of the Assessment can guide multilateral donors, parties to the United Nations Framework Convention on Climate Change (UNFCCC), the Intergovernmental Panel on Climate Change (IPCC), other United Nations (UN) entities and initiatives, and multiple donors, as well as relevant global processes about recent scientific findings, related concerns, and potential solutions to these issues in Africa.

SCOPE

The *Integrated Assessment of Air Pollution and Climate Change for Sustainable Development in Africa* provides an analysis of the state, trends, and outlook relevant to thematic areas prioritized by countries under the UNFCCC and regional air quality agreements. It is also relevant to regionally agreed development goals (AUC 2015a) and suggests regionally tailored means of delivering those goals that have implications for air pollution and climate change impacts. The Assessment is made up of five distinct but closely linked chapters.

Chapter 1 - Africa's development in the context of air pollution and climate change: sets the stage for a coherent analysis that is developed in subsequent chapters. Based on published national and regional analyses and datasets, it assesses the state and trends in Africa's development, drivers of development, challenges, and aspirations in relation to internationally agreed goals such as the

Sustainable Development Goals (SDGs) of Agenda 2030 (United Nations [UN] 2015), those established in Agenda 2063 (AUC 2015), the Paris Agreement (United Nations Framework Convention on Climate Change [UNFCCC] 2015), and those established in sub-regional development integration processes by the Regional Economic Communities (RECs) in Africa. The analysis was carried out through the lens of near-term trends in air pollution and climate change and their impacts on air quality, human health, agricultural productivity, and ecosystems management.

The chapter examines how the aspirations articulated in Agenda 2030 and Agenda 2063 can be met without compromising air quality and human health, and in a way that is compatible with the Paris Agreement, limiting the increase in temperature and damage associated with climate change. Of importance is the analysis of implications of current and projected policies and measures with respect to human vulnerability to environmental degradation, climate change and intergenerational, gender and youth aspects of development.

Chapter 2 - Africa's future under a current policy trajectory: looks into the future. To this end, a “baseline story” is first established and an approach to scenario development is substantiated. To elaborate scenarios for the future, modelling techniques are introduced as follows:

- The Low Emissions Analysis Platform (LEAP) (Heaps 2021) to calculate emissions;
- The National Aeronautics and Space Administration (NASA)/Goddard Institute for Space Studies (GISS <https://www.giss.nasa.gov/>) model to obtain data on fine particulate matter (PM_{2.5}), tropospheric O₃, temperatures, and precipitation; and
- The GEOS-Chem Adjoint model coefficients that are included in the Integrated Benefits Calculator (IBC) to determine sensitivities of PM_{2.5} concentrations (Kuylenstierna *et al.* 2020).

The Baseline Scenario largely reflects a continuation of past trends in the evolution of fuel shares and energy intensities by sector. For example, in the household sector, the baseline shows a slow but incomplete transition from polluting fuels like wood, dung, and charcoal to cleaner alternatives like electricity, LPG, biogas, and solar.

Chapter 3 - Developing “the Africa we want”: achieving Agenda 2063 while also improving air quality and addressing climate change: focuses on the policies and measures with potential of scalability that would help deliver Agenda 2063 while improving air quality and contributing to climate change mitigation. Scenarios were developed through to 2030 and 2063 and therefore quantify certain benefits of actions that will help to achieve the SDGs (Agenda 2030) and Agenda 2063 goals. The relevant SDGs affected by the policies and measures are SDG 3 Good health and wellbeing; SDG 7 Affordable and Clean Energy; SDG 8 Decent Work and Economic Growth; SDG 9 Industry, Innovation and Infrastructure; SDG 10 Reduced Inequality; SDG 11 Sustainable Cities and Communities; SDG 12 Responsible Consumption and Production; SDG 13 Climate action; SDG 16 Peace, Justice, and Strong Institutions; and SDG 17 a key pillar for implementation through partnerships and communities of practice. Two mitigation scenarios were developed, one focusing on SLCP mitigation measures, building on experience of working on SLCP national action planning with the programme in African countries of the UNEP-convened CCAC (Climate and Clean Air Coalition [CCAC])

2022), and the other starting with the SLCP measures from the first scenario but adding mitigation options in line with the priorities of Agenda 2063 (African Union [AU] 2013; AUC 2015). The results of modelling the impact of these two mitigation scenarios on emissions are presented and the benefits for human health, crop yields and climate change discussed. Finally, the implications of the Agenda 2063 scenario for Africa's Development Priorities are assessed.

Chapter 4 - An assessment of the situation in Northern, Southern, Central, West and East Africa: provides an assessment of air pollution and climate change issues and drivers in North, South, Central, East and West Africa. For each region, the story is developed by analyzing regional development priorities, emissions, mitigation potential and benefits of implementing the measures developed in chapter 3. The analysis is done by GHG and pollutant, also addressing differences among regions, considering commitments and aspirations under the Agenda 2063, Agenda 2030 and the Paris Agreement.

Chapter 5 - Aligning air quality, climate change and development objectives to promote action in Africa: builds on the findings of previous chapters and integrates air quality, climate, and development objectives in the whole of Africa. It synthesizes global and regional perspectives, priorities, and their links to key multilateral agreements. Different funding sources and mechanisms are discussed. Finally, a road map towards achieving the low emission Agenda 2063 is outlined.

Key sectoral policies, and the recommended measures emerging from chapter 3 are analysed considering their potential for transformative change, best practices on the ground, regionally specific opportunities to fast track development, innovation, and cost-effectiveness as well as the social implications of the implementation of the recommended measures.

ANALYTICAL AND MODELLING FRAMEWORK OF THE ASSESSMENT

The Assessment loosely uses the 'Drivers, Pressures, State, Impacts and Responses' (DPSIR) framework:

- **Drivers** - fundamental processes in society, which drive activities with a direct impact on the environment. Key drivers may include demographics; consumption and production patterns; scientific and technological innovation; Gross Domestic Product (GDP) growth, markets and trade; distribution patterns; institutional and social-political frameworks and value systems.
- **Pressures** - emissions of substances which may take the form of pollutants or waste; external inputs such as fertilizers and chemicals; land use.
- **State** - for example, concentrations; temperatures; precipitation.
- **Impacts** - e.g. human health; crop yield; ecosystem services.
- **Responses** - e.g. policies; measures; institutions.

The DPSIR framework has been extensively used in many integrated assessments such as UNEP's Global Environment Outlook 6 (UNEP 2019b) and the Integrated Assessment of Black Carbon and Tropospheric Ozone (UNEP and WMO 2011). The modelling approach for the Assessment builds on the CCAC funded Supporting National Action and Planning on Short-Lived Climate Pollutants (SNAP) project in Africa which is using the Low Emission Analysis Platform – Integrated Benefits

Calculator (LEAP-IBC) tool to develop emission inventories, mitigation scenarios with associated mitigation measures, analyses and impact assessment of human health to show the potential benefits of implementing recommended measures. The Assessment also builds on the global modelling that supported the *Integrated Assessment of Black Carbon and Tropospheric Ozone* (UNEP and WMO 2011) assessment, the other regional assessments of Latin America and the Caribbean (UNEP and CCAC 2016), Asia Pacific (UNEP 2019c) and the recent Global Methane Assessment (UNEP and CCAC 2021).

Countries developing or that have developed integrated emission inventories of SLCPs, including black carbon, air pollutants and GHGs using the LEAP-IBC tool in Africa include: Benin, Chad, Central African Republic, Côte d'Ivoire, Democratic Republic of Congo, Eswatini, Ethiopia, Ghana, Guinea, Kenya, Liberia, Mali, Morocco, Nigeria, Togo, and Zimbabwe. Some countries have used the tool to inform work on their revised Nationally Determined Contributions (NDCs). These are Benin, Côte d'Ivoire, Eswatini, Ghana, Liberia, Mali, Nigeria, Togo, and Zimbabwe. This Assessment aims to enhance capacity for long-term national planning across Africa for integrated air pollution and climate change strategies, policies, and action plans. The modelling did not determine the best path but aimed to guide and facilitate discussions of this topic. It is hoped that the modelling in this assessment can underpin the development of an Africa Clean Air Program, bringing together countries and all concerned stakeholders to develop a continent-wide platform for the collection and sharing of data to drive effective policy delivery.

TARGET AUDIENCES AND OUTREACH

The findings of this Assessment are intended to be primarily used by senior policy advisors, professionals and practitioners in national governments, international and civil society organizations, donors and philanthropic agencies, and the private sector to support policy development, decision-making and action in the areas of air pollution, climate change and development. To promote ownership of the process in Africa, the development of emission inventories and scenarios in the Assessment, using the Low Emission Analysis Platform (LEAP), was carried out in close consultation with key stakeholders across the continent. Academia and a broader expert community also benefited, not only by using Assessment findings and resources, but also through direct participation in the Assessment's development and outreach activities.

An outreach strategy has been developed for the Assessment in collaboration with communication officers of the African Union Commission, UNEP Regional Office for Africa (UNEP ROA), CCAC and the Stockholm Environment Institute (SEI). This entailed regular reporting to the Department of Agriculture, Rural Development, Blue Economy, and Sustainable Environment (ARBE) of the African Union and the Secretariat of AMCEN, that mandated the Assessment process at its 17th Session in Durban, South Africa, in 2019.

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ABBREVIATIONS AND ACRONYMS

| | |
|-----------------|--|
| AC | air conditioner |
| ACCP | African Clean Cities Platform |
| ADHD | attention deficit/hyperactivity disorder |
| AEC | African Economic Community |
| AERONET | Aerosol Robotic Network |
| AfDB | African Development Bank |
| AfCFTA | African Continental Free Trade Area |
| AFOLU | agriculture, forestry and other land use |
| AFR100 | African Forest Landscape Restoration Initiative |
| AGNES | African Group of Negotiators Expert Support |
| AMCEN | African Ministerial Conference on the Environment |
| AMCOMET | African Ministerial Conference on Meteorology |
| AMCOW | African Ministers' Council on Water |
| AMMA | African Monsoon Multidisciplinary Analysis |
| APINA | Air Pollution Information Network for Africa |
| AOD | aerosol optical depth |
| ARBE | Department of Agriculture, Rural Development, Blue Economy, and Sustainable Environment (of the African Union) |
| ARSO | African Regional Organization for Standardisation |
| ART | acute respiratory-tract infection |
| ASAP | A Systems Approach to Air Pollution |
| ASD | autism spectrum disorder |
| AU | African Union |
| AUC | African Union Commission |
| AUDA-NEPAD | African Union Development Agency |
| AWD | alternate wetting and drying |
| BC | black carbon |
| BSC | Barcelona Supercomputing Center |
| BSFL | black soldier fly larvae |
| C | carbon |
| °C | degrees Celsius |
| CAADP | Comprehensive Africa Agricultural Development Programme |
| CAMRE | Council of Arab Ministers Responsible for the Environment |
| CAMS | Copernicus Atmosphere Monitoring Service |
| CAN | Climat Action Network |
| CAR | Central African Republic |
| CArE-Cities | Clean Air Engineering projects – Clean Air Engineering for Cities |
| CArE-Homes | Clean Air Engineering projects – Clean Air Engineering for Homes |
| CCAC | Climate and Clean Air Coalition |
| CCAK | Clean Cooking Association of Kenya |
| CCS | carbon capture and storage |
| CEDS | Community Emissions Data System |
| CIESIN | Center for International Earth Science Information Network |
| CH ₄ | methane |

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| | |
|---------------------|--|
| CI | confidence interval |
| CMIP | Coupled Model Intercomparison Project |
| CMIP6 | Sixth Coupled Model Intercomparison Project |
| CO | carbon monoxide |
| CO ₂ | carbon dioxide |
| CO ₂ -eq | carbon dioxide equivalent |
| COMESA | Common Market for Eastern and Southern Africa |
| COP | Conference of the Parties |
| COPD | chronic obstructive pulmonary disease |
| CRS | Common Reporting Standard |
| CSIR | Council for Scientific and Industrial Research |
| CSO | civil society organization |
| CSP | concentrated solar power |
| 3D | three dimensional |
| DALY | disability-adjusted life years |
| DCHS | Drakenstein Child Health Study, Western Cape, South Africa |
| DICCIWA | Dynamics-aerosol-chemistry-cloud interactions in West Africa |
| DPSIR | drivers, pressures, state, impacts and responses |
| DRC | Democratic Republic of the Congo |
| EAC | East African Community |
| EASFCOM | Eastern Africa Standby Force Coordination Mechanism |
| ECCAS | Economic Community of Central African States |
| ECMWF | European Centre for Medium Range Weather Forecasting |
| ECOWAS | Economic Community for West African States |
| EDGAR | Emissions Database for Global Atmospheric Research |
| EEA | European Environment Agency |
| e.g. | exempli gratia (for example) |
| EIP | Eco-Industrial Park |
| EMEP | European Monitoring and Evaluation Programme |
| ERGP | Economic Recovery and Growth Plan |
| ETSAP | Energy Technology Systems Analysis Program |
| EV | electric vehicle |
| FAO | Food and Agricultural Organization of the United Nations |
| FDI | Foreign Direct Investment |
| FEER | Fire Energetics and Emissions Research |
| F-gas | fluorinated gas |
| FINN | Fire INventory from NCAR |
| FRM | Federal Reference Method |
| GBD | global burden and disease |
| GCF | Green Climate Fund |
| GCM | global circulation model |
| GDL | Global Data Labs |
| GDP | gross domestic product |
| GEDAP | Ghana Energy Development and Access Project |
| GEF | Global Environmental Facility |
| GEO | geostationary Earth orbit |

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| | |
|------------------|---|
| GEOS | Goddard Earth Observing System |
| GFED | Global Fire Emissions Database |
| GFAS | Global Fire Assimilation System |
| GHAir | Ghana Urban Air Quality Project |
| GHG | greenhouse gas |
| GISS | Goddard Institute for Space Studies |
| GMAO | Global Modeling and Assimilation Office |
| GMP | Global Methane Pledge |
| GPI | genuine progress indicators |
| GPPDB | Global Power Plants Database |
| GPW | Gridded Population of the World |
| GRAP | Green Recovery Action Plan (of the African Union) |
| GSAT | global surface air temperature |
| GW | gigawatt (10 ⁹ watts) |
| GWh | gigawatt hours |
| GWP | Gridded Population of the World |
| HFC | hydrofluorocarbon |
| H ₂ O | water |
| hPa | hectopascal |
| IBC | Integrated Benefits Calculator |
| IBD | inflammatory bowel disease |
| IBS | irritable bowel syndrome |
| ICAO | International Civil Aviation Organisation |
| ICCT | International Council on Clean Transportation |
| ICE | internal combustion engine |
| ICLEI | Local Governments for Sustainability |
| i.e. | id est (that is) |
| IEA | International Energy Agency |
| IGAD | Intergovernmental Authority on Development |
| ICLEI | Local Governments for Sustainability |
| IGO | intergovernmental organizations |
| ILO | International Labour Organization |
| IMF | International Monetary Fund |
| IMO | International Maritime Organization |
| INDAAF | International Network to study Deposition and Atmospheric |
| IP | Industrial Park chemistry in Africa |
| IPCC | Intergovernmental Panel on Climate Change |
| IPPU | industrial processes and product use |
| IQ | intelligence quotient |
| IRENA | International Renewable Energy Agency |
| IWRM | integrated watershed resource management |
| JICA | Japan International Cooperation Agency |
| kg | kilogram |
| KJWA | Koronivia Joint Work on Agriculture |
| km | kilometre |

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| | |
|------------------|---|
| LEAP | Low Emissions Analysis Platform |
| LEAP-IBC | Low Emission Analysis Platform – Integrated Benefits Calculator |
| LED | light-emitting diode |
| LGV | Ligne à Grande Vitesse Maroc |
| LMIC | lower middle-income country |
| LPG | liquified petroleum gas |
| LRTAP | Convention on Long-Range Transboundary Air Pollution |
| LRTI | lower respiratory-tract infection |
| LULUCF | land use, land-use change and forestry |
| µg | microgram |
| m | metre |
| m ² | square metre |
| m ³ | cubic metre |
| mm | millimetre |
| MAFLD | metabolic dysfunction-associated fatty liver disease |
| MDB | multilateral development bank |
| MEA | multilateral environmental agreement |
| MEPS | minimum energy-performance standards |
| MODIS | moderate resolution imaging spectroradiometer |
| MOPITT | Measurement of Pollution in the Troposphere |
| MSMEs | micro, small and medium-sized enterprises |
| MVOC | microbial volatile organic compound |
| MSW | municipal solid waste |
| MVA | Manufacturing Value Added |
| MW | megawatt (10 ⁶ watts) |
| N | nitrogen |
| NAIPS | National Agricultural Investment Plans |
| NARC | North African Regional Capability |
| NASA | National Aeronautics and Space Administration |
| NCAR | US National Center for Atmospheric Research |
| NCD | non-communicable disease |
| NDC | Nationally Determined Contributions (to the Paris Agreement) |
| NEPAD | New Partnership for Africa's Development |
| NGO | non-governmental organization |
| NH ₃ | ammonia |
| NH ₄ | ammonium |
| NIR | New Industrial Revolution |
| NMT | non-motorised transport |
| NMVOC | non-methane volatile organic compound |
| NO | nitric oxide |
| N ₂ O | nitrous oxide |
| NO ₂ | nitrogen dioxide |
| NO _x | nitrogen oxides |
| NREL | National Renewable Energy Laboratory |
| NSB | national standards body |
| O _x | containing oxygen |

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| | |
|-------------------|---|
| O ₃ | ozone |
| OC | organic carbon |
| ODA | overseas development assistance |
| OECD | Organisation for Economic Co-operation and Development |
| OICA | International Organisation of Motor Vehicle Manufacturers (Organisation internationale des constructeurs automobiles) |
| OMI | ozone (O ₃) monitoring instrument |
| PCFV | Partnership for Clean Fuels and Vehicles |
| PIDA | Programme for Infrastructure Development in Africa |
| PIQ | performance intelligence quotient |
| PM | particulate matter |
| PM ₁ | very fine particulate matter (with a diameter of less than 1 micron) |
| PM _{2.5} | fine particulate matter (with a diameter of less than 2.5 microns) |
| PM ₁₀ | large particulate matter (with a diameter of 10 microns or less) |
| POLCA | Pollution de Capitales Africaines |
| ppb | parts per billion |
| ppbv | parts per billion by volume |
| ppm | parts per million |
| PPP | purchasing power parity |
| PREFIA | Air Quality Prediction and Forecasting Improvement for Africa |
| PV | photovoltaic |
| QFED | Quick Fire Emissions Dataset |
| R-COOL | Rwanda Cooling Initiative |
| REC | Regional Economic Community |
| ReCATH | Regional Climate Action Transparency Hub for Central Africa |
| RFA | regional framework agreements |
| RLP | Rural LPG Promotion Programme |
| 3Rs | reuse, reduce and recycle |
| S | sulphur |
| SAAQIS | South African Air Quality Information System |
| SADC | Southern African Development Community |
| SDG | Sustainable Development Goal |
| SEI | Stockholm Environment Institute |
| SEZ | Special Economic Zone |
| SLCF | short-lived climate forcer |
| SLCP | short-lived climate pollutant |
| SNAP | Supporting National Action and Planning on Short-Lived Climate Pollutants |
| SNAQ | Sensor Network for Air Quality |
| SO ₂ | sulphur dioxide |
| SSP | shared socioeconomic pathway |
| TAREA | Tanzania Renewable Energy Association |
| TROPOMI | Tropospheric Monitoring Instrument |
| TSP | total suspended particulates |
| TW | terawatt (10 ¹² watts) |
| TWh | terawatt hour |
| U4E | United for Efficiency |

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| | |
|------------|---|
| UHI | urban heat island |
| UIC | International Union of Railways (Union internationale des chemins de fer) |
| UMA | Arab Maghreb Union (Union du Maghreb Arabe) |
| UN | United Nations |
| UNCTAD | United Nations Conference on Trade and Development |
| UN DESA | United Nations Department of Economic and Social Affairs |
| UNDP | United Nations Development Programme |
| UNEA | United Nations Environment Assembly |
| UNECA | United Nations Economic Commission for Africa |
| UNECE | United Nations Economic Commission for Europe |
| UNEP | United Nations Environment Programme |
| UNEP ROA | United Nations Environment Programme Regional Office for Africa |
| UNFCCC | United Nations Framework Convention on Climate Change |
| UN-Habitat | United Nations Human Settlement Programme |
| UNIDO | United Nations Industrial Development Organization |
| UN WPP | UN World Population Prospects |
| US | United States of America |
| VAT | value-added tax |
| VNR | Voluntary National Review |
| VOC | volatile organic compound |
| W | watt |
| WAGP | West African Gas Pipeline |
| WAPP | West African Power Pool |
| WDI | World Development Indicators |
| WEC | World Energy Council |
| WEPP | World Electric Power Plants Database |
| WEO | World Economic Outlook |
| WHA | World Health Assembly |
| WHO | World Health Organization |
| WMO | World Meteorological Organization |
| WRF | Weather and Research Forecasting |

