# News
# The launch of the first-ever Integrated Assessment of Air Pollution and Climate Change for Sustainable Development in Africa

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November 2022 saw the release of the "Integrated Assessment of Air Pollution and Climate Change for Sustainable Development in Africa - the Summary for Decision Makers Report" (UNEP, 2022), by the African Union Commission (AUC), the Climate and Clean Air Coalition (CCAC), and the UN Environment Programme (UNEP) at Climate COP27 (Figure 1). Developed by African scientists and supported by the Stockholm Environment Institute (SEI), the report unpacks how short-lived climate pollutants (SLCPs), greenhouse gases and other polluting emissions play a role in sustainable development in Africa. It also considers strategies, policies, and measures to mitigate these pollutants, while supporting development and human health and wellbeing in Africa on a warming planet. This is the first time that such detailed and harmonized Pan-African assessment on air quality and climate change has happened. Not only will the results of the Assessment provide a critical evidence base for decision-makers across the continent, but the underlying emissions data and tools will be open access to support further studies, and policy measures. In 2022 at the Eighteenth Ordinary Session of the African Ministerial Conference on the Environment (AMCEN-18), African Ministers stated their support of the Assessment and of measures to mitigate SLCPs and ''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" (UNEP and AMCEN, 2022).

Using harmonized emission inventories and projections, climate chemistry model (GISS-E2.1-G model; Kelley et al., 2020) simulations were driven to estimate the impact of these emission on climate and air quality on the African continent. These future projections of climate and air pollution under the three scenarios were then used to quantify the impacts of a changing climate and of air pollution on societal issues, such as food production and human health.



*Figure 1:* *The Assessment Summary for Decision Makers Report launched at Climate COP 27 in November 2022 (photo courtesy of Lawrence Nzuve, SEI Comms officer at SEI Africa).*

Ultimately, the report puts forward 37 recommended measures which have the potential to greatly reduce emissions causing air pollution and climate change, as energy consumption increases in Africa to meet socio-economic development objectives. The 37 recommendations span across the five key areas of 1) Transport 2) Residential energy 3) Energy generation and Industry 4) Agriculture and 5) Waste management (Table 1). If the emission reductions are achieved from these measures, it is estimated to prevent 180 000 premature deaths attributable to ambient air pollution per year by 2030 and 800 000 premature deaths attributable to ambient air pollution per year by 2063. Indoor air pollution would also be substantially improved. Gains in crop yield across Africa would result from decreased warming, changes in precipitation and reduced ambient ozone concentrations. For more on the Integrated Assessment of Air Pollution and Climate

*Table 1:* . Overview of the five areas and 37 measures modelled by the Africa Assessment

| Transport | Residential | Energy | Agriculture | Waste |
|---|---|---|---|---|
| 1. Cleaner existing transport | 9. Clean lighting | 14. Efficient charcoal making | 25. Efficiency of livestock production | 32. Landfill to reduce waste burning and capture methane |
| 2. Better and more public transport Options | 10. Clean cooking | 15. Emission control in industry | 26. Improved livestock feed to reduce emissions | 33. Methane capture at wastewater plants |
| 3. More electric vehicles | 11. Efficient air conditioning | 16. Coal mining methane capture | 27. Improved manure management | 34. Waste collection and new sanitary landfills |
| 4. More hybrid vehicles | 12. Efficient refrigeration | 17. Oil and gas methane loss reduction | 28. Alternate wet and drying for rice production | 35. Organic waste to compost and biogas generation |
| 5. More cycling and walking | 13. Household energy efficiency | 18. Implementing the Kigali amendment | 29. Eliminate burning of crop residues | 36. Reduce organic waste |
| 6. Freight from road to rail | | 19. Reduce electricity transmission and distribution losses | 30. Reduce food waste | 37. Improved water and sanitation services |
| 7. Rail electrification | | 20. Industrial energy efficiency | 31. Healthier diets | |
| 8. Road freight electrification | | 21. Service sector energy efficiency | | |
| | | 22. Cement making energy efficiency | | |
| | | 23. Carbon capture and storage | | |
| | | 24. Shift to renewable energy | | |

Change for Sustainable Development in Africa and for more details about the 37 measures go to: https://wedocs.unep.org/handle/20.500.11822/41223;jsessionid=D6416F58EE121485F5A03D2E5E2610AF

## Practical guide on data availability and tips for access

The emissions modelling output for the Assessment was at the national scale. SEI is making the underlying modelling freely accessible via an open-source distribution model. The modelling has been developed within SEI's LEAP energy modelling software, and people wishing to view the model will need to have LEAP installed on a Windows computer. The model will be freely available for download from the LEAP website and will also be accessible from within LEAP itself. The Africa-wide model is quite large, as it contains detailed data and results for all African countries. Thus, it requires the use of a fairly powerful computer. A modern PC with a fast CPU and at least 8 GB of RAM are recommended as a minimum specification.

The Africa-wide model will also be "sliced-up" to create individual national-scale models, which will be useful to countries as they work to develop their own climate and air pollution plans. These national-scale models will be distributed in the same fashion as the main African model.

The evaluation version of LEAP is freely available to download and install and can be used without a license to view all the data and results in the Africa assessment model (https://leap.sei.org). If users wish to further develop the Africa model (i.e. make changes to it) they will need to obtain a license for LEAP from SEI. These licenses are available at no cost to governments, NGOS, and academic organizations in low-income and lower-middle-income countries,

and to students worldwide. Special low-cost licenses are also available to these types of users in upper-middle-income countries. All other users will need to purchase a standard license from SEI.

## References

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