

WHAT IS
aocems





**“We don’t have to
Sacrifice a Strong Economy
for a healthy environment.”
– Dennis Weaver**





AOCEMS
Towards A
Resilient
Africa

Africa
Online
Continuous
Emission
Monitoring
System

AOCEMS

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Towards A Resilient Africa

The Africa Online Continuous Emission Monitoring System [AOCEMS] is an environmental emission monitoring product made for Africa. It is designed by United Platform Solutions to further equip environmental agencies in their pursuit of achieving their carbon reduction targets.

This product is made to provide maximum value to governments in the area of carbon emission reduction by overcoming the socio-economic, political, and technological challenges that once impeded previous efforts.

HOW DOES IT WORK

The solution employs makes use of sensors that measure the concentration of gaseous emission and/or particulate matter, emission rates using analytical measurements to provide results in units of the applicable emission limits or standards.

COLLECTION DATA CAPTURE SITE

Sensors are installed at the data capture sites. The data that is collected by the sensors are then sent to the Data Acquisition Servers [DAS]

DATA PROCESSING AT DATA ACQUISITION SERVER [DAS]

The Data is then processed and presented in the Control Room of the Ministry of Environment/environmental. The data is processed using Artificial Intelligence [AI], Machine Learning [ML], IoT Technology, and Environmental Data Analytics [EDA] in real time and with end-to-end encryption.

CONTROL ROOM

At the control room, government agencies can view the processed data and make further analysis, which could also be made available on the websites of all concerned government agencies for further dissemination.





BENEFITS OF AOCEMS

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I. CONTINUOUS MONITORING: AOCEMS provides agencies with the capacity to continuously measure emission for a longer period of time consistently. This will ensure that they obtain critical emission data without having to physically send an official to the site.

II. AOCEMS will enable countries to take major steps beyond traditional analysis like sample collection, transportation and conditioning, Calibration and analysis procedures, including quality checks which are automated without the need for skilled staff while reducing the likelihood of errors.

III. ACCURATE MEASUREMENTS: AOCEMS offers more accurate and up to standards solution for effluent or emission management when compared to the traditional laboratory-based portable field methods. It is easily scalable and can be integrated across various sites and locations.

IV. REDUCED SPENDING: Reporting entities usually spend to secure the services of individual consultants to measure and report emissions, mostly done irregularly, and encouraging noncompliance. AOCEMS significantly reduces the cost of enforcing compliance, saving funds which could be channeled into other pressing needs.

V. ENHANCED ENVIRONMENTAL PROTECTION: Real-time monitoring of emissions enables proactive environmental management and timely intervention to address potential risks. By identifying pollution sources promptly, it helps guardians of the climate to effectively and efficiently protect ecosystems, air quality, and public health.

VI. IMPROVED REGULATORY EFFECTIVENESS: AOCEMS equip governments with accurate, up-to-date emissions data to support evidence-based decision-making. This enhances the ability of governments to formulate and implement effective policies, regulations, and standards, fostering a sustainable and environmentally conscious industrial sector.

VII. PUBLIC CONFIDENCE AND STAKEHOLDER ENGAGEMENT: Transparent reporting of emissions data fosters public trust and engagement. By actively involving stakeholders, including industries, communities, and civil society, in the monitoring process. AOCEMS encourages collaboration, communication, and shared responsibility for environmental stewardship.

VIII. INCREASED CARBON CAPITAL: Finally, governments will be able to scientifically assess their real [backed with scientific data] yearly carbon emission and could open the opportunity for carbon trading, which could in turn be channeled into green energy investment to further reduce their carbon emissions.





THE WAKEUP CALL

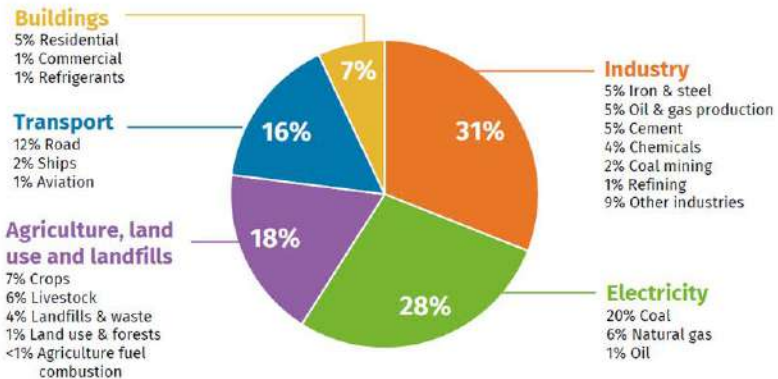
THE WAKEUP CALL

The 12 December 2015 Paris Accord ignited the fire for the adoption of climate change mitigation measures across the globe, and in Africa for that matter. Its main goal is to hold “the increase in the global average temperature to well below 2°C above pre-industrial levels” and pursue efforts “to limit the temperature increase to 1.5°C above pre-industrial levels.” [UNFCCC.2016]. It is not by chance that the reference point of the goal is the pre-industrialization era.

In fact, a 2020 research by Rhodium Group on GHG emissions put the combined [industry and energy use in industry] contribution of the industrial sector at 31%, making it the biggest contributor to GHG emissions across the globe

Global emissions by sector

Percent share of 2020 net GHG emissions



Source: Rhodium Group

These facts only imply that if GHG mitigating actions are going to be successful, the industrial sector could not be ignored. Unfortunately, the situation has not changed much over the years. This is owing to the fact that pressure has been focused on the most industrialized nations to reduce their emissions while the less industrialized nations are left unmonitored.

INDUSTRIALIZATION, AFRICA, AND EMISSION MONITORING CHALLENGES.

Despite the fact that Africa accounts for only 4% of the world's GHG emissions, making it one of the regions that remain largely unmonitored when it comes to industrial emissions, we cannot lose sight of the fact that the continent is industrializing at an increasing rate as governments seek to develop capacity in order to develop a value chain for their raw materials by processing them before ultimately exporting them.

As such, Industrialization is considered as major pathway for African countries to catch up with their western counterparts in terms of economic development, and the stimulus given to efforts aimed at setting up industries remains unfettered and understandably so.

There is a growing sector of medium and small industries in Africa, a continent known for its economic diversity and development issues. But Africa has a different emissions landscape with peculiar challenges with fossil fuel acting as a major source of energy for many African industries.

This dependence results in considerable emissions because of infrastructure restrictions, a lack of access to green technology, and financial limits. The informal sector makes up a sizable percentage of industrial activity in Africa and because the sector frequently employs antiquated and inefficient technology, their emissions per unit of output are higher.

As leaders aim to create jobs for their young and budding population, the resulting emissions remain an afterthought, not to talk of initiatives towards the measurement of the emissions to keep them low. As earlier implied, Africa's emission contribution will continue to increase with the growth of the industrial sector.

In fact, the economy, and by far the industrial sector of most African countries depend on the use of fossil fuels. And the relationship between the energy and industrial sectors of African economies is one that will remain inseparable for quite some time. But then, how do these factors affect Africa?

Africa remains the very vulnerable to climate change impacts, yet contributing very little to global warming. The impacts pose exponential dangers to agriculture, health, transport and water; threatening to regress the impact of the modest gains made in industry. The reasons are simple;

- Africa's agricultural system is ninety-five percent [95%] dependent on the rainfall.
- GDP of African countries is largely agriculture based.

The above-mentioned factors reveal that climate change impacts like extreme weather conditions of flood and drought remain a threat to African economies and achieving sustainable development goals. UNEP-commissioned research estimates that the cost of adapting to climate change across Africa could reach \$50 billion a year by 2050, if the global temperature increase is kept within 2°C above preindustrial levels [AFDB.2023]. Already, between 2008 and 2011, drought caused economic losses equivalent to 3.9 percent of Djibouti's GDP per annum [AFDB.2023]

It is therefore not debatable that Africa must be leading the crusade to reduce global temperatures; solutions to the challenges in the fight against climate change must be found. Consequently, all the fifty-four [54] countries in Africa have ratified the Paris Agreement and have made constitutional amendments to ensure enforcement in the implementation of climate-change-mitigation actions.

A lot has been done already and the progress has been nothing short of inspiring but there remains much more to be done. Many governments' commitments to the cause are conditional upon receiving adequate financial, technical and capacity building support. The Relative pressures on available capital and lack of technical know-how are key challenges to African governments.

Essentially, there are two [2] main elements required by countries in order to effectively setup nationwide emission monitoring systems. One of them is capital, however, the first, and the most important element, is the constitutional framework required to enforce compliance to establish processes and parameters that ensure that set climate goals are achieved.

Unsurprisingly, most African countries have existing agencies that are mandated by law to monitor human environmental activities, and protect the environment from human activities that tend to degrade it. Countries like Nigeria, Ghana, Kenya and Congo have even gone on to set up specialized national committees to deal specifically with climate change issues. So, it can be concluded that when it comes legal backing, Africa is set to proceed. But that is only half of the twin element; capital is the other half.

Between 2019-2021, economies across the globe were hit hard by the COVID pandemic and four years on, governments are still grappling with attempts to recover from the setbacks. Lockdowns across the continent put businesses at bay for long periods and in most cases, governments had to spend from their already thin purses to provide necessary humanitarian interventions for their citizens so as to lessen the impact of the pandemic.

In essence, there is a lot of pressure on government purses and as such, a venture like emissions monitoring is not in the favorable parts of scale of preferences for limited capital to be invested into it.

However difficult its execution appears; emission monitoring cannot be sidestepped. The way out: Public Private Partnership [PPP]. with private sector funding, serves as a viable solution for African countries; as opposed to government borrowing, which will plunge government into more debt. Call it the zero-cost solution.



The WHY?



WHY PPP FOR CARBON EMISSION?

- The investment requirement for the project is significant and cannot therefore be a priority for the government in the face of budget challenges and ballooning of public debt due to the COVID pandemic.
- Traditionally, government IT projects have faced challenges when it comes to systems upgrades as funding will be required to be sourced from their finance ministries in order to ensure that critical upgrades and maintenance are carried out in a timely fashion. These releases often have been a challenge especially for agencies such as the CEA that are not autonomous and have very limited Internally Generated Funds (IGF). Procuring this project as a PPP offers governments a better opportunity to ensure that they remain operational, a responsibility that is believed can be performed efficiently by the private sector using its resources and skills.
- It is also believed that the private sector will be innovative in delivering the service more efficiently than the government agencies as they will deploy an integrated approach by ensuring that both design, development and delivery are integrated to ensure that whole life cost for the project is minimized, thus ensuring value for money for the government and all stakeholders.

The Public Private Partner route clearly provides governments with the right framework to navigate their economic challenges while bringing solutions that help sanitize the climate.

EMISSION MONITORING: THE TRADITIONAL WAY

It must be noted that a few countries have already began manually monitoring emissions from select industries, however, the means by which it is being executed is characterized with flaws. Usually supervised by the country's national agency responsible for protecting the environment, companies/factories are tasked with recording the emissions from their environment on paper and submitted to the agency for record keeping. Other challenges are;

- **Time:** It is impossible to make time-based analysis of the data collected because over time, personal or environmental factors hinder the data collector from recording the emission data at the same point in time over a period, thereby limiting the ability of data analysts to uncover trends or factors that are related.
- **Lack of validation:** The data analysts at the environmental/climate agencies have no access to the source of the data that is being recorded by the industries and as such, they are unable to validate the data that gets to them.
- **Limited to select industries:** Lastly, these measures are only limited to industries that are viewed to be the big players in carbon emission, consequently leaving out all the medium and small players who actually constitute a larger volume in terms of sheer numbers and may be bigger emitters because of the crude means by which they manufacture their produce.

Although it is a cheaper means of executing emission monitoring, the highlighted flaws make it difficult for the countries who practice it to effectively monitor and control emission, and to reduce the real cost of climate change on the lives and livelihoods of citizens. The consequences swallow up any savings that may have been made by running it manually.



**AOCEMS:
THE WAY
TO GO**





To catch-up with the world on mitigating climate change, Africa must simply begin from efficient and wholistic measurement of its industrial emissions output. In the famous words of the British physicist and mathematician, William Thomson Kelvin, "What is not defined cannot be measured.

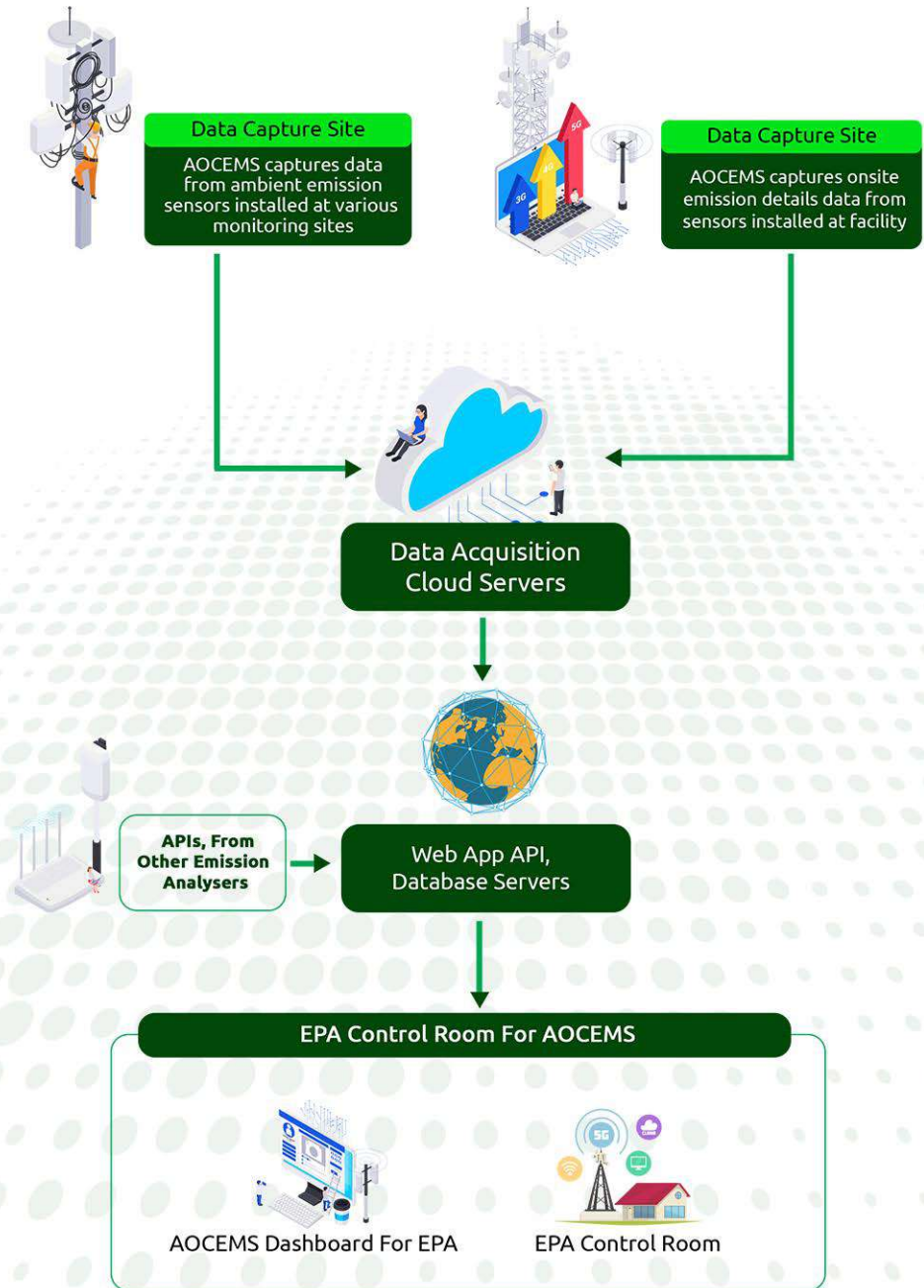
What is not measured, cannot be improved. What is not improved, is always degraded".

The climate change goals are already defined, the next line of action will be to measure emissions across all industry in order to have a realistic insight into how much our industries in Africa harm the environment.

Once that insight is gotten, progressive standards, regulations and climate change policies can be made to improve our environmental sustainability and we can curtail environmental degradation.



SYSTEM ARCHITECTURE





Contact Info

+971 5282 15799

uniteplatformsolutions.com

info@uniteplatformsolutions.com

