West Africa

Actions taken by governments to improve air quality

1.0 Introduction

In June 2014 the United Nations Environment Assembly (UNEA) adopted resolution 1/7 S*trengthening the Role of the United Nations Environment Programme in Promoting Air Quality*. As requested in paragraph 4 and 7 of the resolution, which requested UNEP to develop a report detailing actions taken by governments to promote air quality, this report details some of the major actions being undertaken by governments in the West Africa sub-region to improve air quality.

This report summarises ten actions being undertaken in the sub-region to improve air quality. In selecting these ten actions, consideration was given to their replicability, global appropriateness to address particular air pollution challenges and potential impact.

These actions are: *For Industrial activities:* 1) Establishing incentives that promote investments in renewable energy, pollution control technologies, energy efficiency and clean production mechanism; and 2) Increasing industrial energy efficiency. *For road transport:* 3) Reducing fuel sulphur content; 4) Tightening vehicle emission standards to at least Euro 4 or its equivalent; and 5) Increasing investments in public and non-motorized transport systems. *For open waste burning:* 6) Reducing open burning of both agricultural and municipal waste through provision of legislation, monitoring, enforcement and municipal waste management systems. *For Indoor air pollution:* 7) Improving access to clean cooking and heating fuels; and 8) Improving access to clean and efficient cook/space heating stoves. *For general legislative efforts:* 9) Establishing and continuously tightening ambient air quality standards to meet WHO recommendations; and 10) Establishing laws and regulations to support efforts to meet ambient air quality standards, and strengthen monitoring and enforcement.

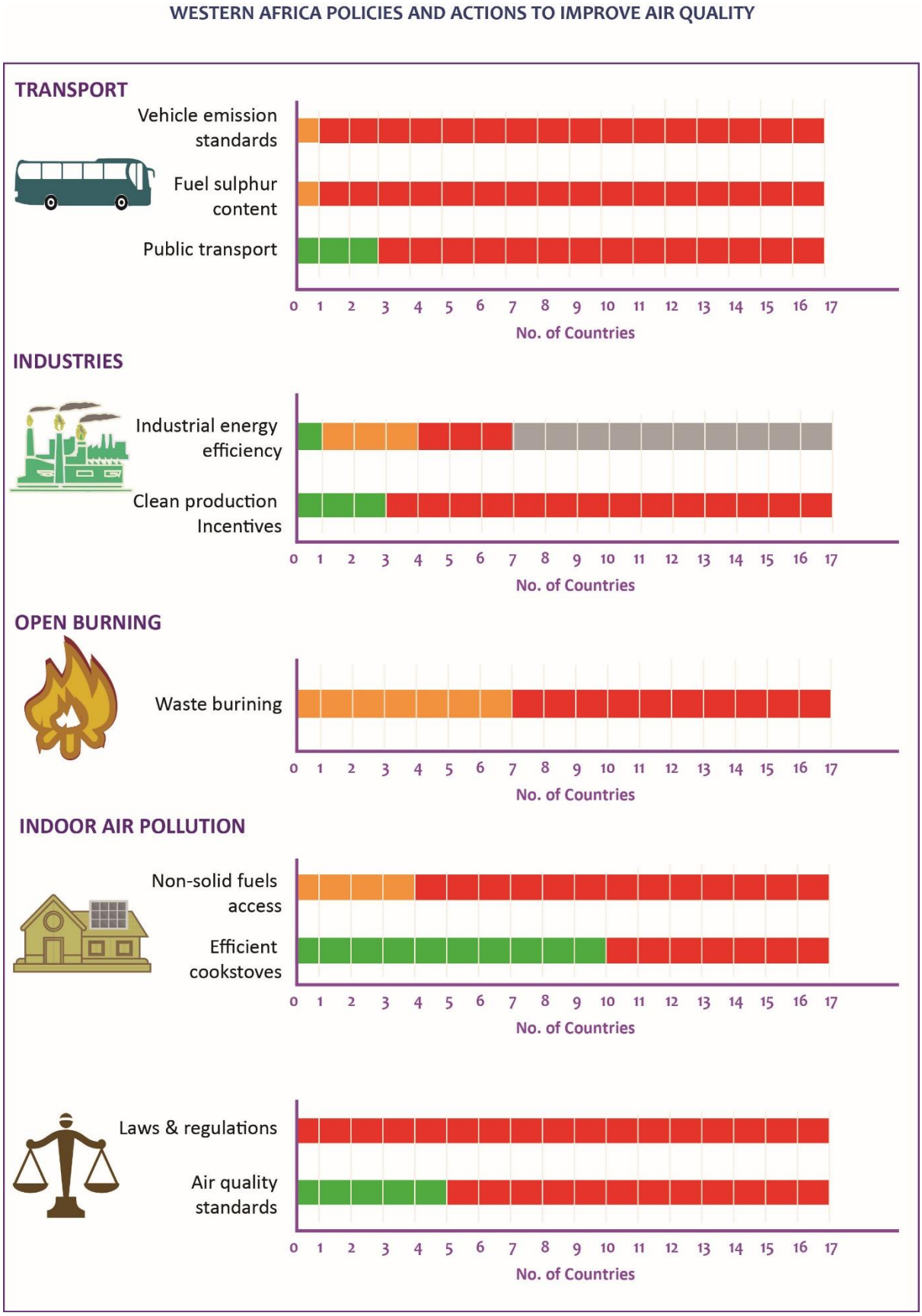

Figure 1: *A summary of actions, programmes, policies, laws and regulations undertaken by governments in the sub-region to improve air quality (green = progressing to best practice; red = action still required)*

2.0 Regional Overview

West Africa consists of seventeen countries: Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Togo. Ambient air pollution has become a major issue of concern as countries in the sub-region grow in both population and economic output. Indoor air pollution poses the greatest challenge for the sub-region. The World Health Organisation (WHO) estimates that indoor air pollution is responsible for approximately 248,000 premature deaths annually, while ambient air pollution is responsible for approximately 120,000 premature deaths.

The use of solid fuel to meet household energy demand is the most important driver of deteriorating air quality and it is responsible for two thirds of all premature deaths linked to air pollution in the sub-region. Even though solid fuel is responsible for the biggest portion of indoor air pollution, it is also a considerable contributor to outdoor air pollution. Therefore to effectively manage air quality in the sub-region, governments have to ensure access to clean energy for both rural and urban households.

Four countries out of the seventeen in West Africa have non-solid fuel access rates greater than 35%. The highest rate can be found in Gabon where approximately 78% of the total population have access to cleaner, non-solid fuels.

The importance of other emissions sources such as transport and industry are on the rise especially in urban areas. The current contribution of vehicular emissions to the overall level of ambient air pollution within the sub-region is relatively low compared to indoor air pollution. However, due to the projected increased rate of economic growth, transport is projected to grow significantly in the foreseeable future, as more people will be able to afford vehicles. These countries therefore have an opportunity to ensure that the projected growth in vehicle numbers will not compromise air quality significantly. This can be achieved by enacting laws that will ensure vehicles (both new and second hand) being imported into the sub-region have at least Euro 4 emission standards, and that fuel quality is improved.

Open burning of waste, both municipal and agricultural, is another major source of air pollution in the sub-region, with at least fifteen out of the seventeen countries in the sub-region still practicing open burning of agricultural and / or municipal waste.

Progress has been made in different areas in different countries, and there are several positive case studies to be found across the sub-region. There are however specific areas in each country that can be improved, while standards need to be established and continuously tightened, public transport expanded, the use of best practice increased etc. For policies and legislation to lower air pollution, countries must also improve implementation and enforcement, without which actions to improve air quality will not achieve their potential impact.

3.0 Actions Taken to Improve Air Quality

3.1 National air quality standards & regulations

Based on the UNEP Air Quality Policy Catalogue, five out of the seventeen countries (Benin, Burkina Faso, Gambia, Ghana and Senegal) in the sub-region have established ambient air quality standards; however, most of these standards do not meet WHO guidelines and they do not have standards for PM2.5 (Figure 2). None of the countries have specific air quality protection laws or regulation, although there are several sector-specific regulations, whose implementation would aid in improving air quality.

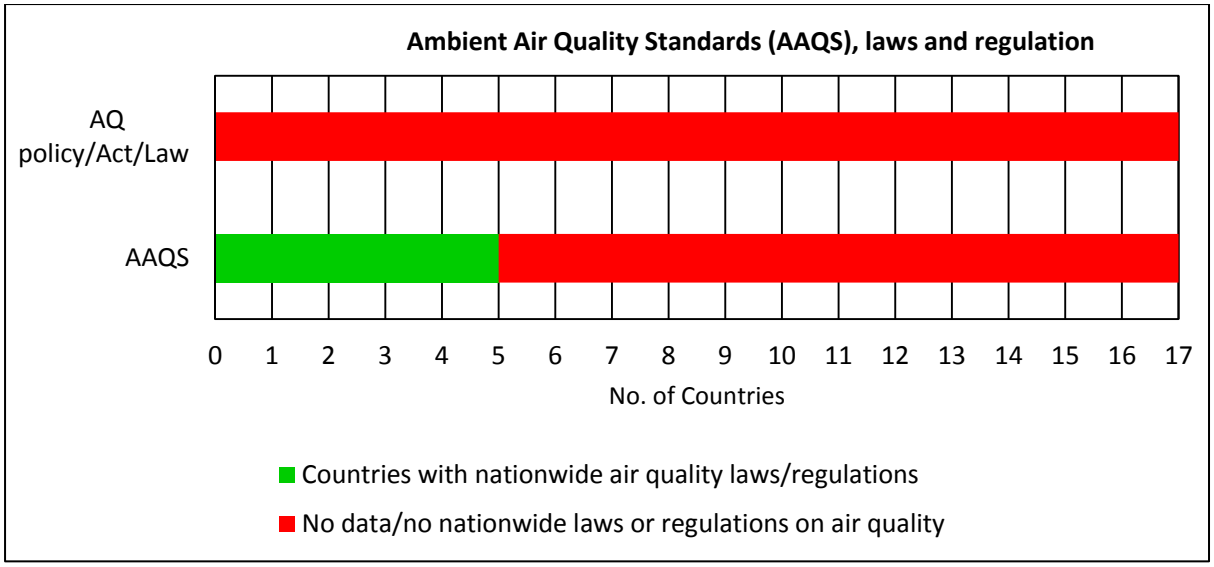

Figure 2: *Number of countries in the sub-region that have enacted ambient air quality standards (AAQS), and air quality laws and regulations.*

3.2 Transport

The rapid growth in the number of vehicles in major cities within this sub-region has put substantial pressure on urban transport systems, increasing traffic congestion and emissions. In Nigeria, for example, vehicle ownership is increasing by approximately 7% a year in urban centres. Actions and policies being implemented in the sub-region to reduce vehicular emission should include the expansion of public and non-motorised transport. Given the increased congestion experienced in many urban areas, maintaining and increasing the modal share of public transport is essential to increase mobility while decreasing transport emissions.

Figure 3 below shows the number of countries in the sub-region where investments to expand public transport have been made in recent years. Nigeria is one of three countries that have invested in expanding systems, and has developed a Bus Rapid Transit system for Lagos; the government is currently developing light rails in some of the major cities.

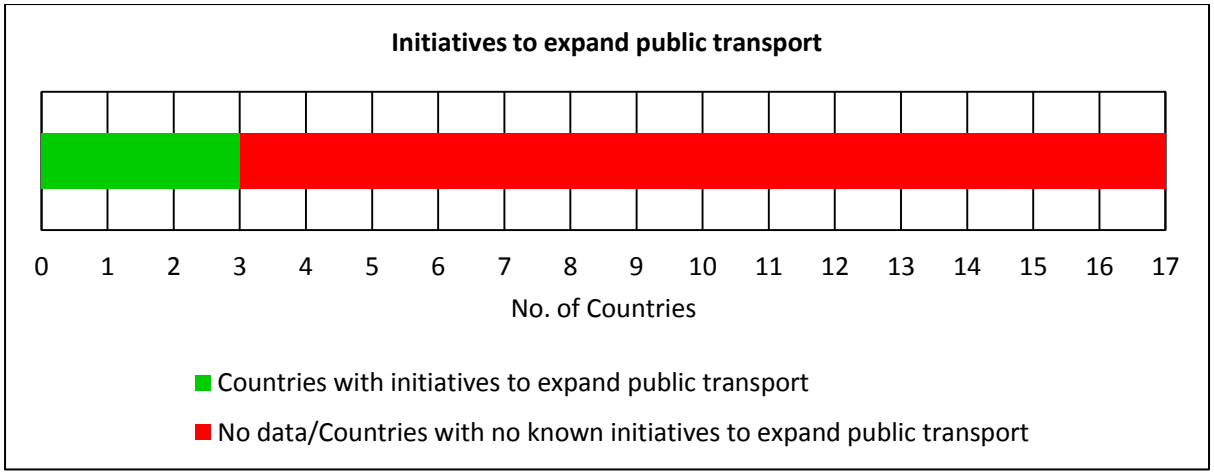

Figure 3: *Number of countries in the sub-region that have invested in the expansion of public transport.*

In all the countries in the sub-region, use of public and non-motorised transport is high although more needs to be done to improve the safety and overall condition of walking and biking facilities, especially in the large urban centres. Otherwise, these countries could see a modal shift toward private vehicles.

Improved fuel quality and implementation of vehicle emission standards are also required to minimise emissions created from transport. There is a lack of vehicle emission standards for sixteen countries out of the seventeen. To mitigate against vehicle emissions, some countries have imposed an age limit for second-hand car importation. For instance, the age limit is set at 10 years in Nigeria. This policy may help reduce vehicle emissions, as newer vehicles tend to have higher standards; however, the impacts of this approach may be counteracted by the increasing vehicle numbers over time. Nigeria is the only country in the sub-region that has established vehicle emission standards, set to Euro 3 (Figure 4).

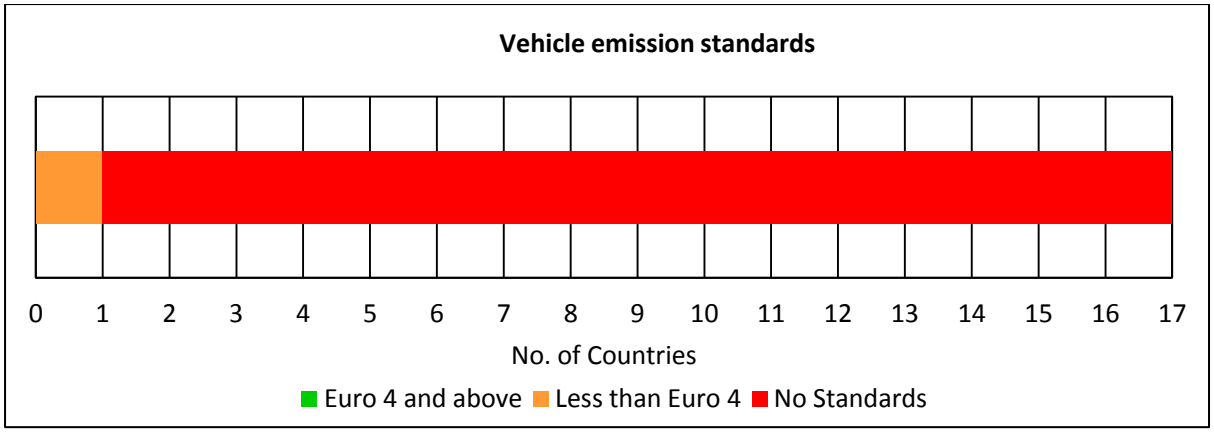

Figure 4: *The number of countries in the sub-region that regulate vehicle emission to Euro 4 (or equivalent) standards.*

With respect to fuel quality, none of the countries in the sub-region have low sulphur (50ppm) fuel standard. Niger has a 500ppm sulphur standard, which is the lowest in West Africa. All the other sixteen countries have national standards that allow more than 500ppm fuel sulphur content (Figure 5).

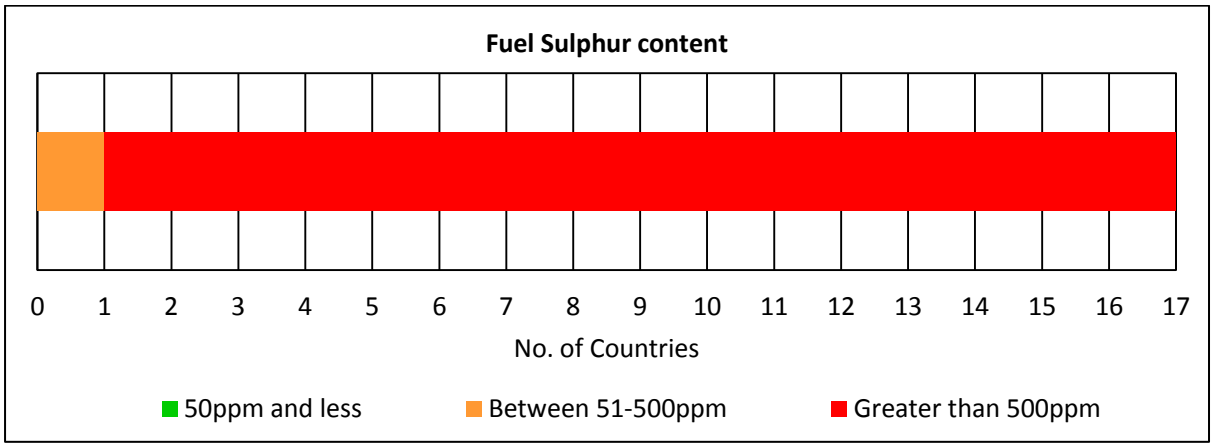

Figure 5: *Number of countries in the sub-region that regulate sulphur levels in fuel*

3.3 Open burning of waste

Uncontrolled open burning of agricultural and municipal waste is a common practice in almost all countries in West Africa, contributing to deteriorating air quality. At least fifteen out of seventeen countries in West Africa practice agricultural and / or municipal waste burning (Figure 6). Cote d'Ivoire has developed legislation prohibiting open burning of

wastes and vegetable residue; however there are no specific actions governing this legislation to ensure compliance. While policies and legislation for municipal waste collection and management exist in most countries, these aren't widely implemented and not all waste streams are covered. Some households therefore resort to burning their solid waste.

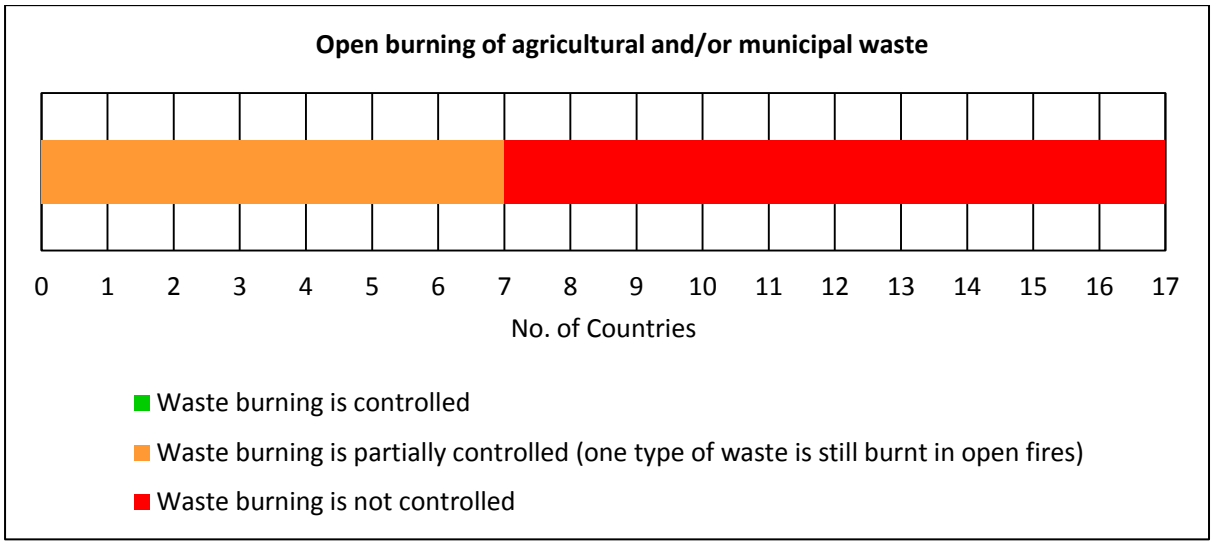

Figure 6: *Number of countries where laws, regulations and actions have been implemented to prevent open burning of agriculture and municipal waste.*

3.4 Indoor air pollution

The traditional use of solid fuels for cooking in households poses a significant threat to health in West Africa. Currently, less than 50% of households in fifteen out of the seventeen countries in the sub-region use non-solid fuels for cooking (Figure 7).

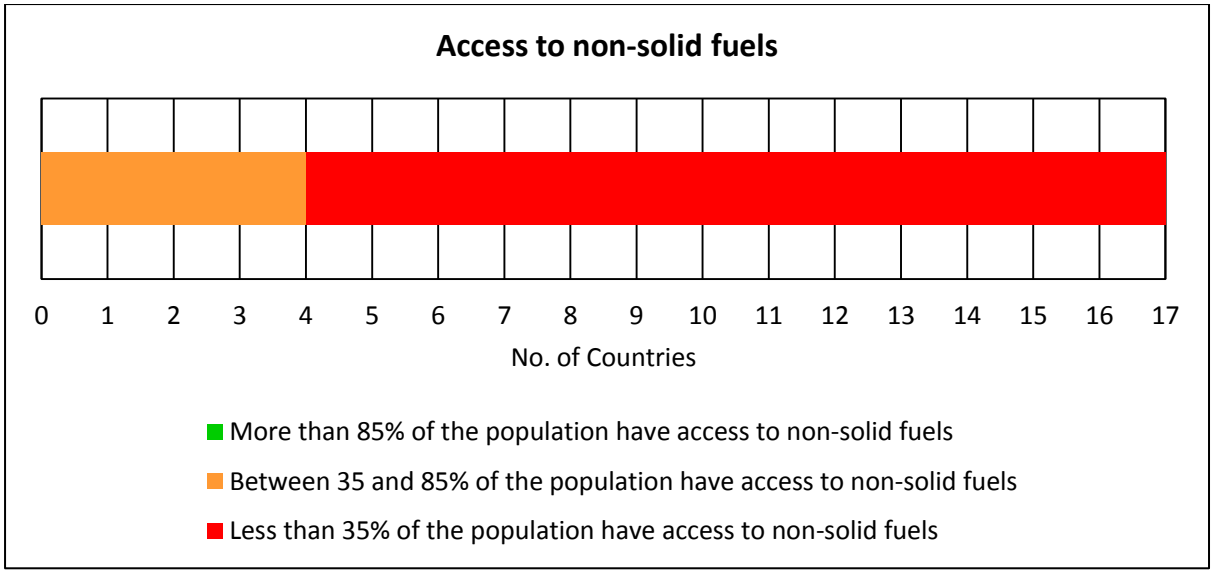

Figure 7: *Number of countries in the sub-region that have implemented programmes and policies to improve non-solid fuels access rate, as indicated by percentage of households with access to non-solid fuels.*

Some countries have programmes and action plans that are aimed at promoting cleaner, more efficient cook stoves (Figure 8)[1]. In Burkina Faso, the construction and sale of energy-efficient stoves for cooking has been successful in reducing biomass demand.

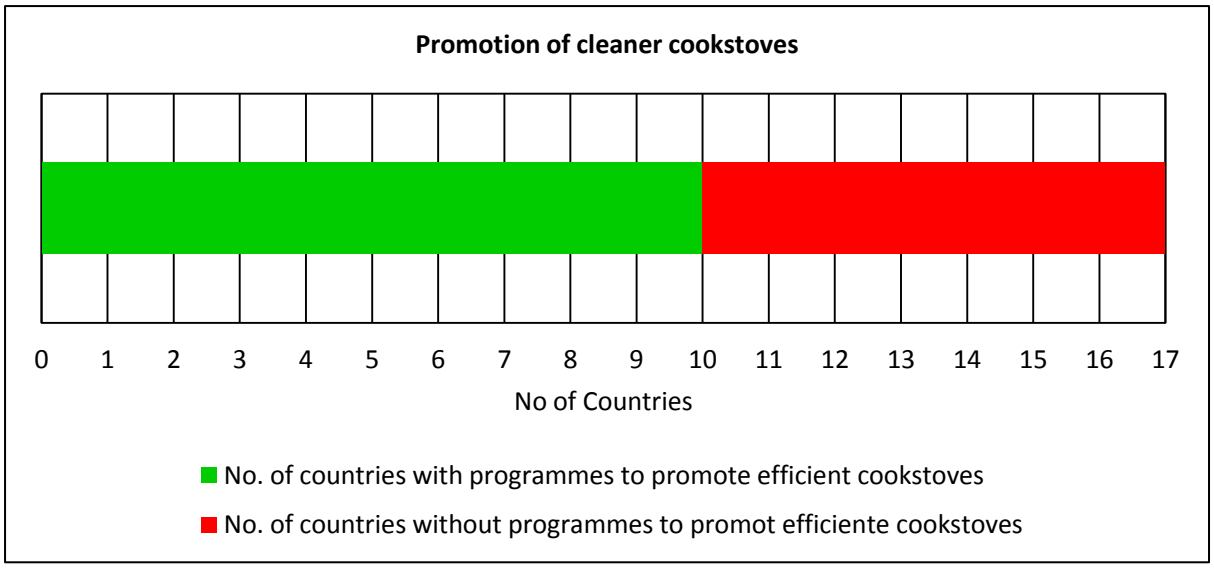

Figure 8: *Number of countries in the sub-region that have programmes to promote use of efficient cook stoves. Due to lack of reliable data on clean cook stove, only programmes aimed at promoting cook stoves that also qualify for carbon trading schemes are represented here.*

[1] Due to the different definitions of efficient cook stoves, Figure 8 only shows countries with programmes to promote efficient cook stoves that also qualify for carbon trading schemes.

Other programmes being implemented in the sub-region to reduce indoor air pollution include the electrification of households. Eleven out of seventeen countries in the sub-region have put in place programmes and policies to increase electricity connections: Benin, Burkina Faso, the Gambia, Ghana, Mali, Niger, Nigeria, Togo, Mauritius, Sierra Leon and Senegal. According to the Sierra Leon's second-generation Poverty Reduction Strategy Paper for 2009-2011, a key government objective is the provision of reliable power supply in the country and moving toward a low carbon energy economy through use of the country's significant hydropower potential. Senegal's Rural Electrification Emergency Program (PNUER) aims at increasing rural electrification from 29% in 2013 to 60% in 2017, with a decentralized electrification component using solar mini-grids PV or hybrids (solar/ diesel group) for rural villages. The Gambia granted a zero-import tax status for all solar photovoltaic panels, solar water heaters and energy efficient light bulbs (compact fluorescent lamps).

3.5 Industries

The use of incentives to increase investment in energy efficiency, clean technology, renewable energy and pollution control is found in three countries (Gambia, Ghana and Nigeria - Figure 9). The Gambia adopted a policy in March 2008 to encourage the use of renewable energy and energy efficiency by granting a zero-import tax status to all solar photovoltaic panels and wind energy equipment. Ghana provides feed-in tariffs to encourage power generation from renewable sources. In Nigeria, legislative framework, licensing arrangements for private-sector operators, Feed-in Tariffs and clarifying market rules for renewable energy services and products are some of the initiative started by the government to encourage investment in the sector.

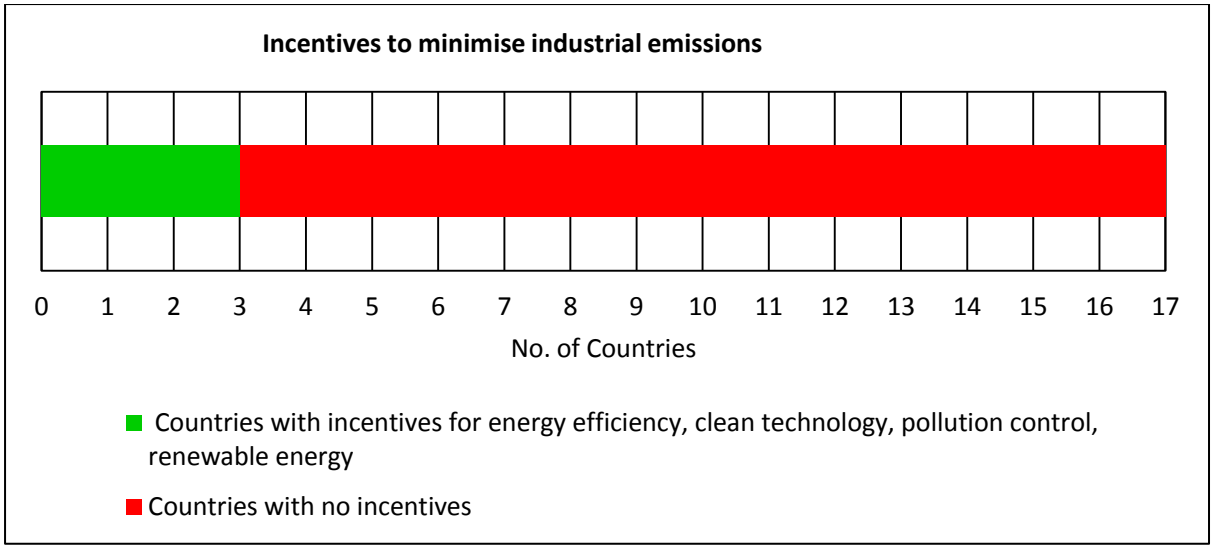

Figure 9: *Number of countries in the sub-region that use economic incentives to stimulate cleaner production in the industrial sector.*

Currently, the main industries contributing to poor air quality in West Africa are oil refinery, petrochemical, liquefied natural gas, chemical fertilizer, food processors, paper, construction, flour, rubber, wood, battery and textile industries. Seven countries - Sierra Leon, Senegal, Niger, Mauritius, Liberia, Ghana, and Gabon - have established industrial emission regulations covering some of the pollutants. Lack of consistent enforcement is an issue across the sub-region. Ghana uses a novel approach to strengthen its enforcement efforts: the Akoben Rating system[2] which names and shames non-compliant undertakings/companies to encourage compliance with the regulations.

There is a need to improve industrial energy efficiency, as more efficient industrial processes tend to be cleaner and use less energy. In the sub-region, industrial energy efficiency is low, and only Gabon has an efficiency greater than 9 GDP per unit of energy at constant 2011 PPP dollars per kg of oil equivalent, as shown in Figure 10.

[2] This is an environmental performance rating and disclosure initiative of Ghana's Environmental Protection Agency. The environmental performance of mining and manufacturing operations is assessed using a five-color rating scheme. The five colors are GOLD, GREEN, BLUE, ORANGE and RED, indicating environmental performance ranging from excellent to poor. These ratings are annually disclosed to the public and the general media, and it aims to strengthen public awareness and participation.

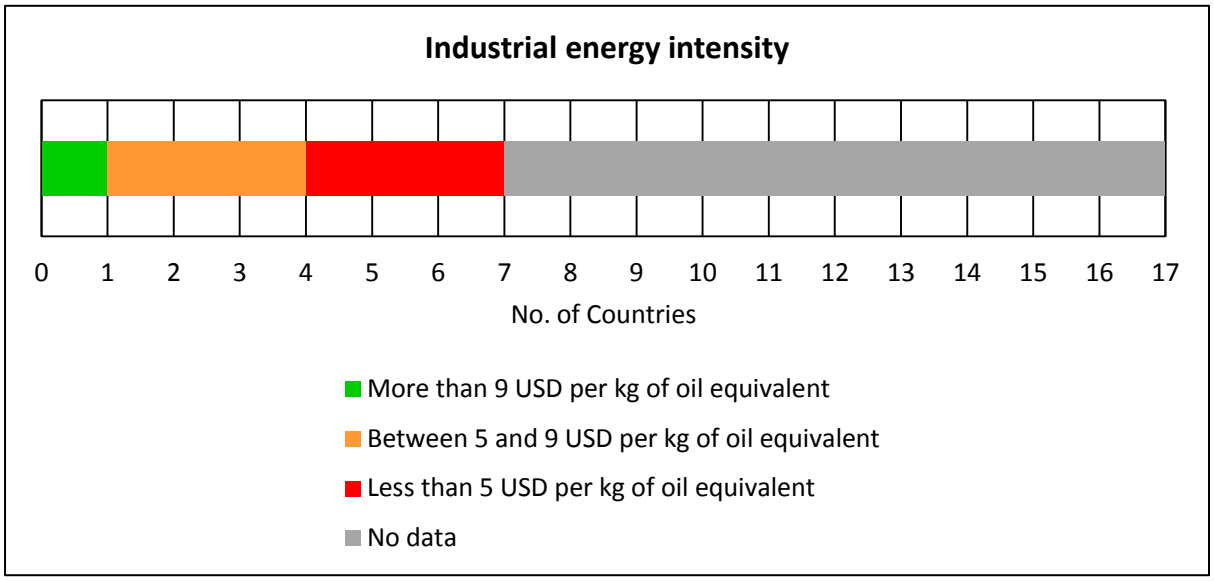

Figure 10: *Number of countries in the sub-region with their corresponding industrial energy efficiency. Energy efficiency is calculated as GDP per unit of energy use at constant 2011 PPP $ per kg of oil equivalent*

4.0 Data sources

Data indicating progress or current status of each of the top ten actions was obtained from various sources.

- Airlex http://airlex.web.ua.pt/
- World Bank http://data.worldbank.org
- World Health Organisation http://www.who.int/quantifying_ehimpacts/national/countryprofile/en/
- UNEP http://www.unep.org/Transport/new/pcfv/
- Various government reports, websites
- Energypedia https://energypedia.info/wiki/Main_Page
- Reegle http://www.reegle.info/countries/
- www.BRTdata.org
- Global Coalition for Clean Cookstoves http://catalog.cleancookstoves.org/stoves

- Air Quality Catalogue http://www.unep.org/transport/airquality/
- Ghana's EPA http://www.epaghanaakoben.org/