

Middle East & North 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 *Strengthening 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 Middle East and North Africa 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. For more details, please refer to the methodology document.

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 sulphur content in diesel and petrol; 4) tightening vehicle emission standards to at least Euro 4/IV-equivalent; and 5) increasing investments in public and non-motorized transport infrastructure and 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 cleaner cooking and heating fuels; and 8) improving access to cleaner, more 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 provides a summary of these actions for the sub-region.

NORTH AFRICA & MIDDLE EAST POLICIES AND ACTIONS TO IMPROVE AIR QUALITY

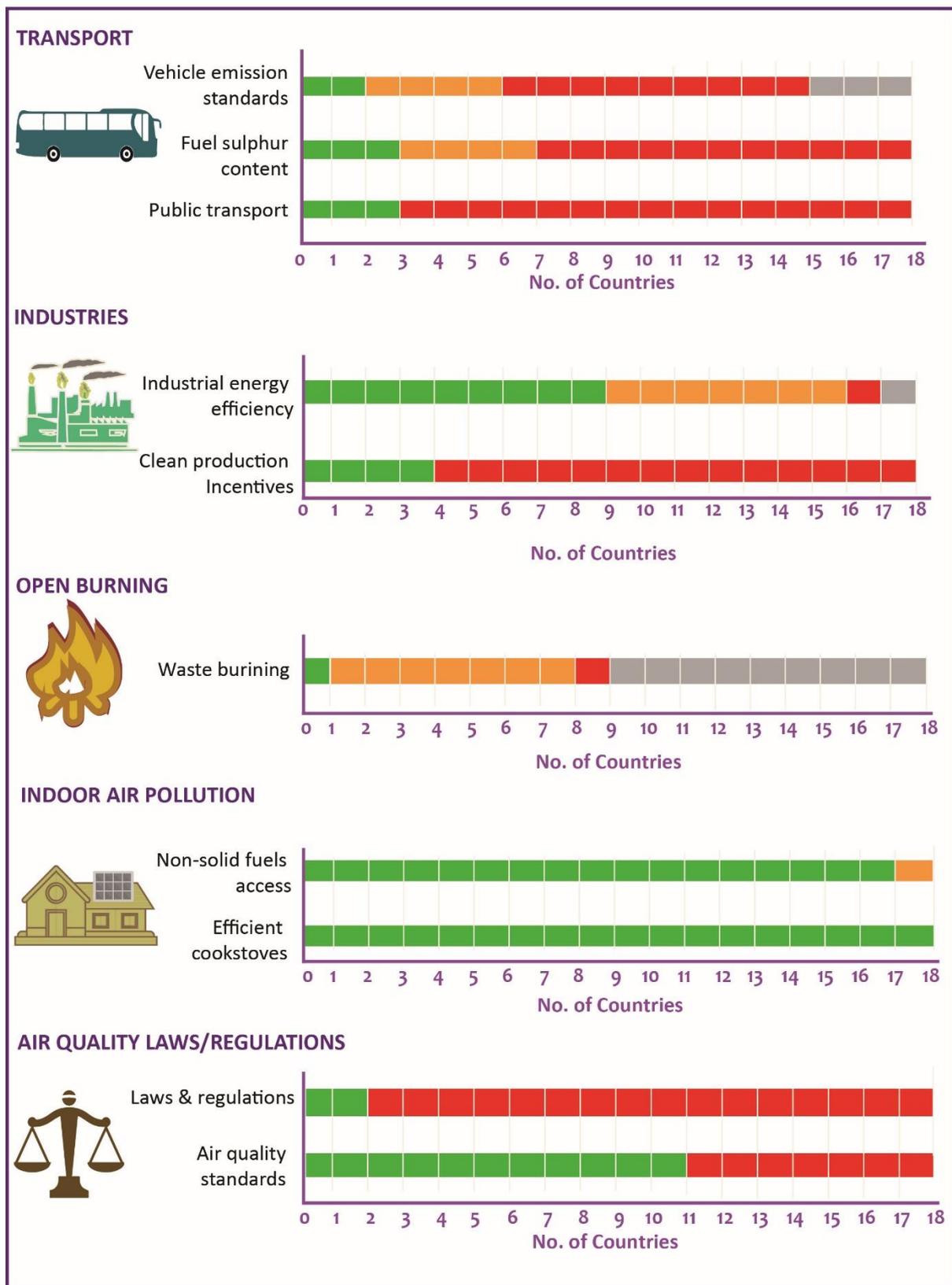


Figure 1: A summary of actions, programmes, policies, laws and regulations undertaken by governments in the sub-region to improve air quality (green = progressing to best practice; red = action still required).

2.0 Regional Overview

The Middle East and North Africa sub-region consist of eighteen countries: Algeria, Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates (UAE) and Yemen. This sub-region faces considerable air quality challenges especially from natural sources. The World Health Organisation (WHO) estimates that air pollution is responsible for approximately 133,000 premature deaths annually, with natural sources of air pollution, mainly windblown desert dust, being the most important cause of premature deaths estimated at more than 60,000.

Although natural sources of air pollution, such as windblown dust, are the most important sources of air pollutants in the sub-region, several anthropogenic emission sources also play a major role in driving air quality. Industrial emissions are the most important anthropogenic source of air pollution which results from the high number of petroleum refineries and fossil fuel powered power plants in the sub-region.

Vehicular emissions are also an important driver of air pollution in the sub-region. The lack of vehicle emission standards and fuel quality are some of the reasons cited for the high emissions rate from this sector. Low investment in public transport also contributes to emissions as the preferred mode of transport is usually private vehicles. Emissions from fuels used to meet household energy demand contribute to air pollutants emissions.

Open burning of waste is another major source of air pollution in the sub-region, with at least fifteen out of the seventeen countries still practicing open burning of agricultural and / or municipal waste. None of the countries in the sub-region have effectively managed to reduce open waste burning of both agricultural and 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. In addition, 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

Eleven out of eighteen countries in the sub-region have established ambient air quality standards, although not all meet WHO guidelines or interim targets, and none of the countries have PM_{2.5} standards. Two countries – Iran and Israel – have established some legislation, law, policy or act specifically for air quality (see figure 2 below). All the other countries do not have specific legislations on air quality, although issues relating to air quality are captured in other sector specific legislations.

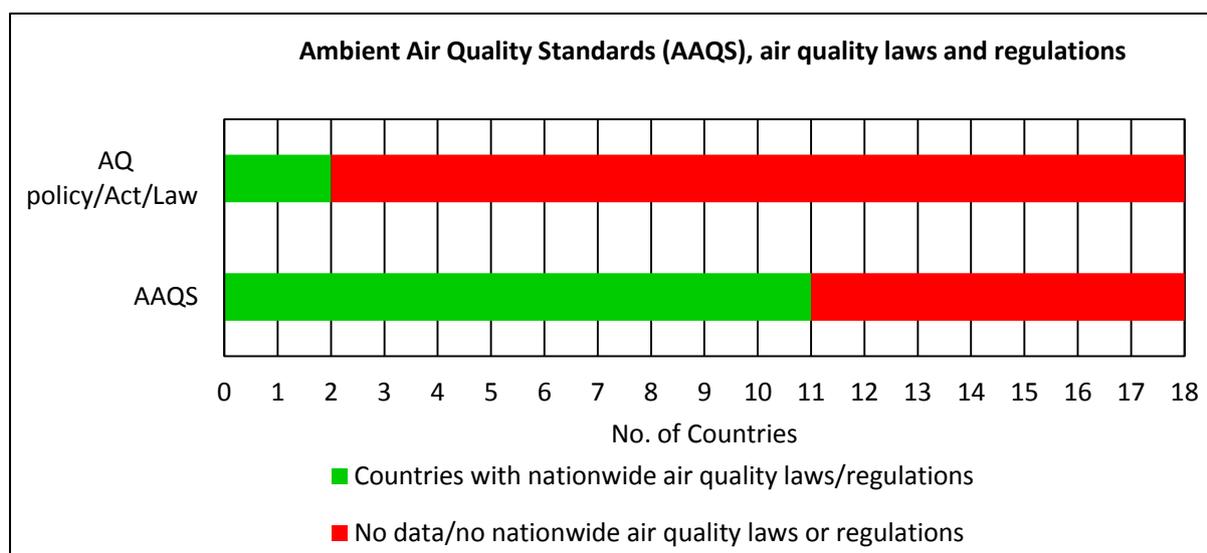


Figure 2: Number of countries in the sub-region that have enacted ambient air quality standards (AAQS), and air quality laws and regulations.

Some countries in the sub-region have also developed air pollution prevention programmes that aim at addressing the air quality challenge comprehensively. In Israel, a National Air Pollution Reduction and Prevention Program was adopted in 2013. This programme focuses on reducing emissions from transportation, industry, energy and households. It includes components such as; encouraging carpooling and public transportation, promoting a program to use natural gas for public transportation, incentivizing plants to use less polluting fuels, switching to a “smart electric network,” among others.

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. Actions and policies being implemented in the sub-region to reduce vehicular emission 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.

Expansion of public transport is a major area of interest that a few governments in the sub-region are focusing on to minimise emissions from the transport sector while decreasing congestion and improving mobility. Israel for instance has developed an inter-urban rail system that has experienced a 35% increase in the number of passengers since 2010. A fast lane to Tel Aviv from other urban areas is reserved for public transport, carpooling and paying customers. Iran also plans to expand Tehran Metro from its current 152km to 430km by 2028. Figure 3 below shows the number of countries in the sub-region that have initiatives to significantly expand public and non-motorised transport.

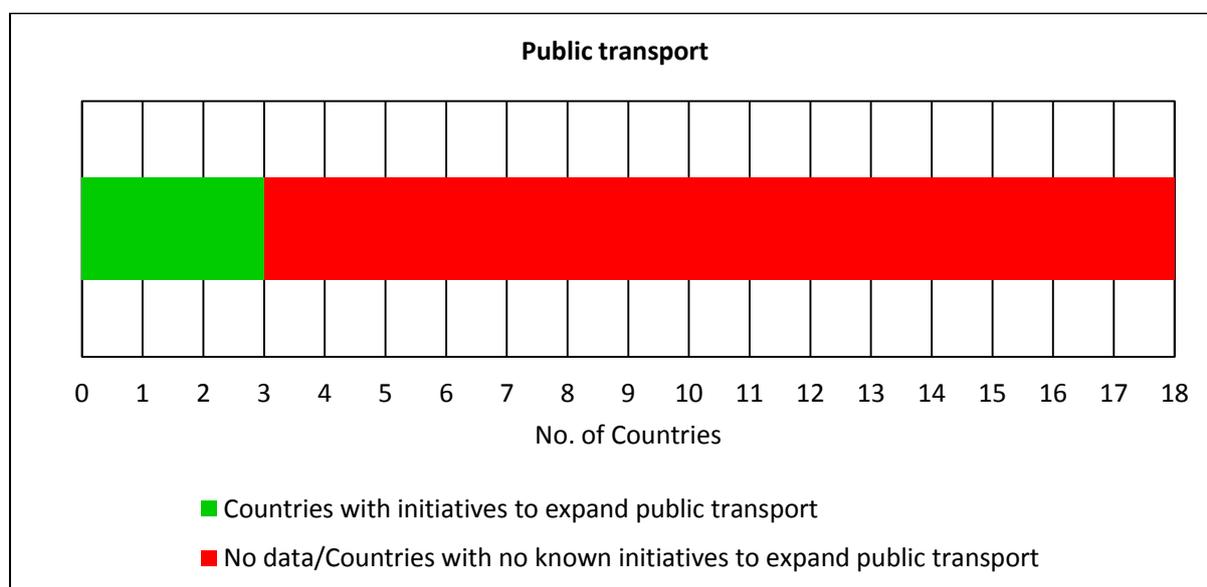


Figure 3: Number of countries in the sub-region that have initiated programmes and initiatives to significantly expand public transport.

Improved fuel quality and implementation of vehicle emission standards are also required to minimise emissions from the transport sector. In the sub-region, Iran and Israel have established vehicle emission standards equivalent to Euro 4. Four other countries have vehicle emissions standards below Euro 4 while the rest do not regulate vehicle emission standards. Figure 4 below show a summary of vehicle emission standards as established in the sub-region.

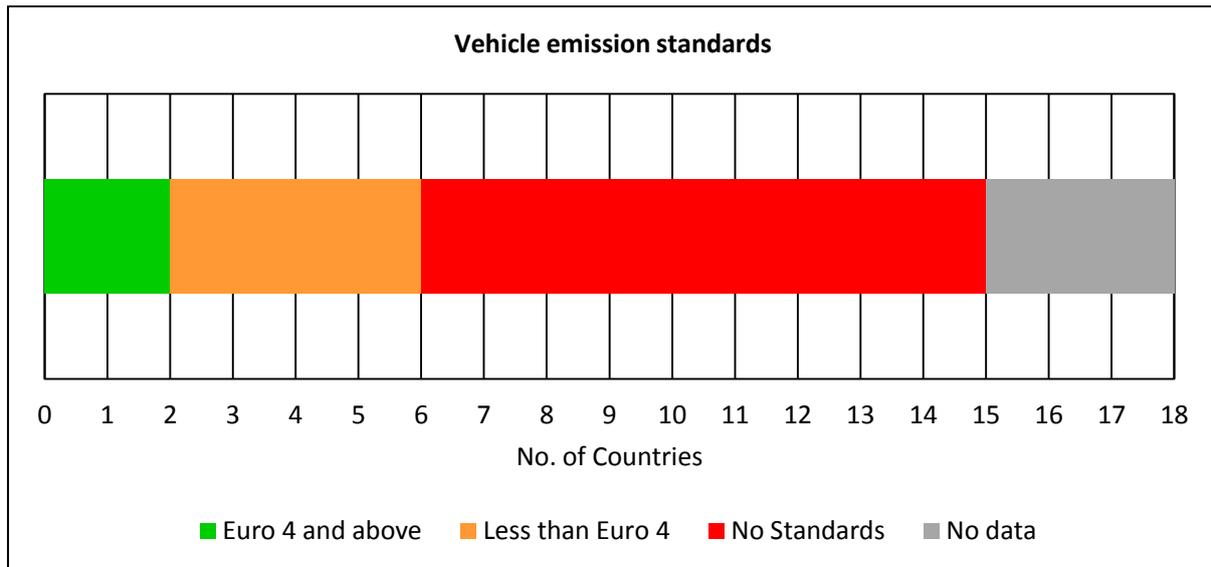


Figure 4: The number of countries in the sub-region that regulate vehicle emission to Euro 4 (or equivalent) standards.

Fuels and vehicles work as a system; in order to benefit from improved vehicle standards, low sulphur fuels are needed as these allow the advanced pollution control devices to work optimally. With respect to fuel quality, three countries in the sub-region - Morocco, Israel and Tunisia - have established a maximum fuel sulphur standard of 50ppm. Israel is the only country in the sub-region to have implemented both vehicle emission and fuel quality standards. In United Arab Emirates and Kuwait, diesel sulphur content is regulated at 5000ppm, but in reality most of the fuel in the market has a sulphur content of 500ppm or less. Israel regulates diesel and gasoline sulphur content at 10ppm. Bahrain sulphur content for diesel is regulated at 500ppm, but the country produces diesel at 10ppm for export. Figure 5 below shows how fuel quality is regulated in the sub-region.

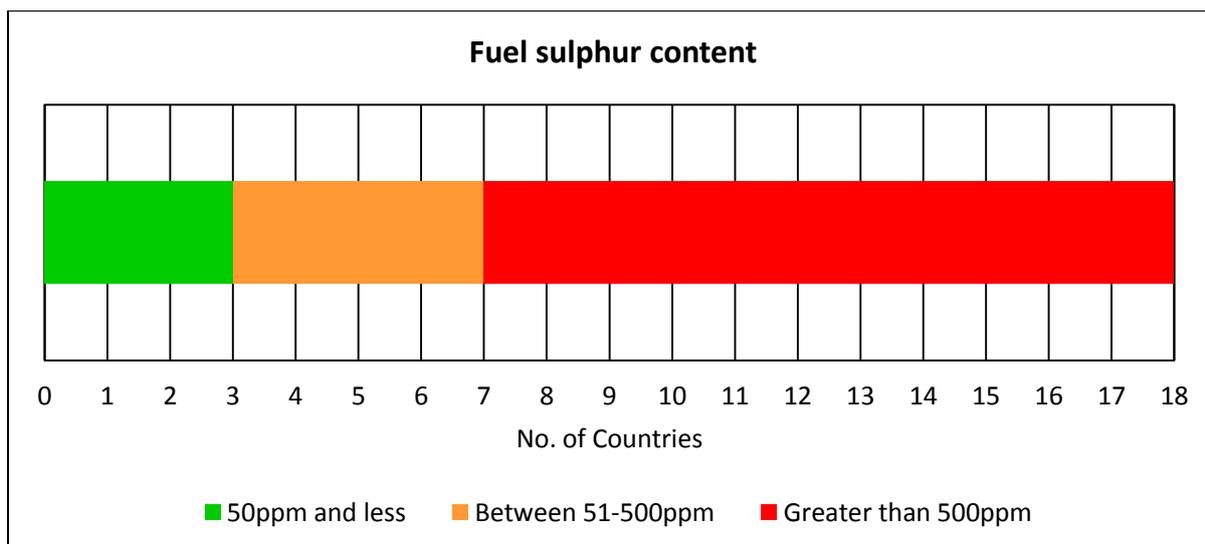


Figure 5: Number of countries in the sub-region that regulate fuel quality using Sulphur content as a proxy for fuel quality

3.3 Open burning of waste

Open burning of municipal waste is a common practice in at least seven out of the eighteen countries in the sub-region. Municipal waste generation has been on the rise due to changing consumption patterns and urbanisation, however, waste management systems have not kept pace in many cities, making waste disposal a major challenge. Figure 6 below shows number of countries in the sub-region that regulate waste burning for both agricultural and municipal waste.

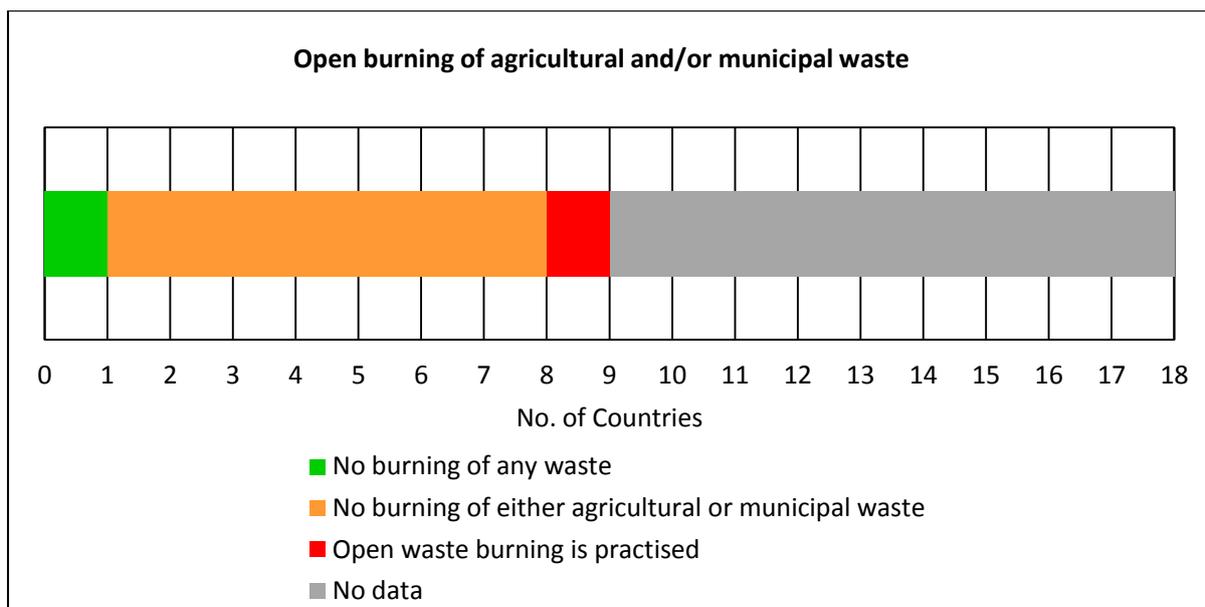


Figure 6: Number of countries where laws, regulations and actions have been implemented to prevent open burning of agriculture and municipal waste.

Several countries in the sub-region have established legal framework under which both municipal and agricultural waste is managed. One such country is Oman, which is among the few countries that have a legal framework specifically banning the burning of organic or agricultural waste in the open. Israel's Abatement of Nuisances Regulations (Prevention of Unreasonable Air and Odour Pollution from Waste Disposal Sites) prohibits emissions of smoke, gas, fumes and dust that are released from waste burning in waste disposal sites. In Morocco, Law 28-00 on waste management and disposal governs and provides the general framework for the sector. Egypt has started implementing the national strategy for Integrated Solid Waste Management at the governorate level.

Other efforts carried out by governments within the sub-region to reduce waste burning, include the establishment of waste management programmes. In Algeria for instance, the Municipal Solid Waste Management National Programme (PROGDEM) facilitates the development of waste management projects; the Industrial and Special Waste Management National Program oversees the control and disposal of special industrial waste and potentially infectious healthcare waste.

3.4 Indoor air pollution

Currently, all but one of the eighteen countries in the sub-region has less than 10% of the population using solid fuels for cooking. All the other countries have more than 97% of their population with access to clean non-solid fuels for their domestic energy needs. Figure 7 shows solid fuels access rate in the sub-region.

Cooking with solid fuels - wood and other biomass - over open fires is one of the major drivers of indoor air pollution and its associated health impacts. Access to non-solid fuels can reduce indoor air pollution, depending on the quality of the fuel and stove. For instance, the use of kerosene can increase indoor air pollution, especially if it is used with leaky and inefficient stoves. Therefore, in promoting the access to non-solid fuels, consideration should be given to the fuel quality and also availability of efficient stoves to be used with this fuel.

Despite having majority of the population with access to clean non-solid fuels Tunisia and Syria have some programs or policies that are aimed at attaining universal access to non-solid fuels. In Tunisia LPG is sold at subsidized prices while Syria has set up and operates solar stoves in some village.

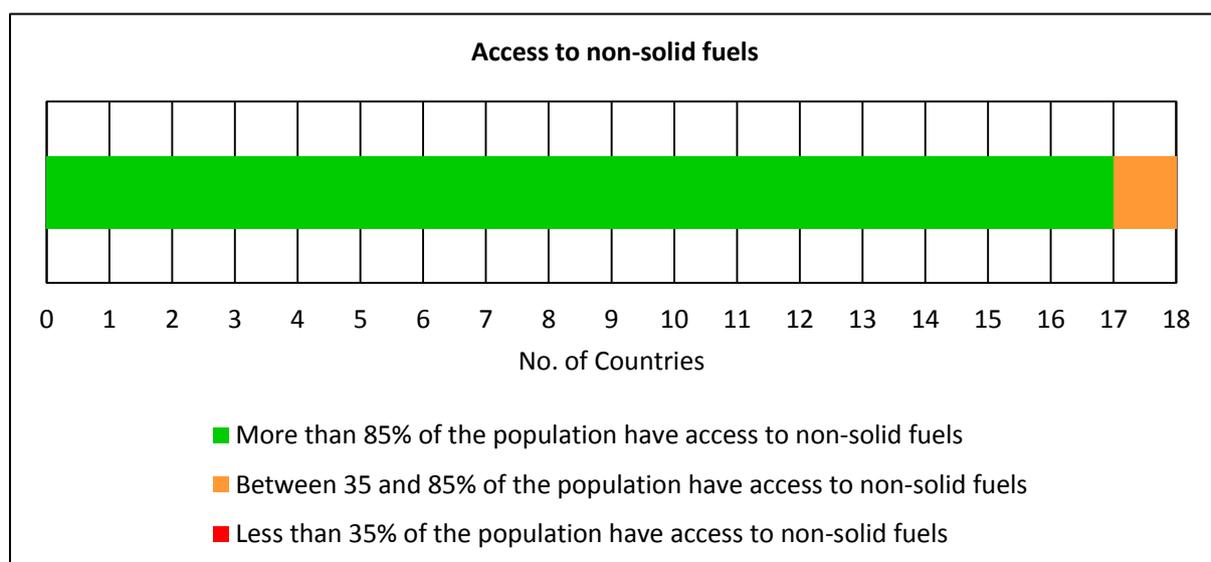


Figure 7: Number of countries in the sub-region that have implemented programmes and policies to improve non-solid fuels access rate, as indicated by percentage of households with access to non-solid fuels.

In addition to increasing access to clean non-solid fuels, governments in the sub-region have also endeavoured to increase electricity connectivity. In the sub-region seventeen countries have over 95% of households connected to the electricity grid. Tunisia has established programmes and policies to increase grid electricity connection from renewable sources. The 2008 Renewable Energy Plan aims to develop renewable energy applications as a means for rural electrification and for use in the agricultural sector. Some of the specific goals of the plan are the electrification of: 1,000 rural households by hybrid systems; 1,700 rural households by photovoltaic (PV) systems; and 100 farms and tourist centres by hybrid systems.

3.5 Industries

The use of incentives to increase investment in energy efficiency, clean technology, renewable energy and pollution control is low in the sub-region with four countries (Algeria, Israel, Jordan, Syria) having such incentives (Figure 8).

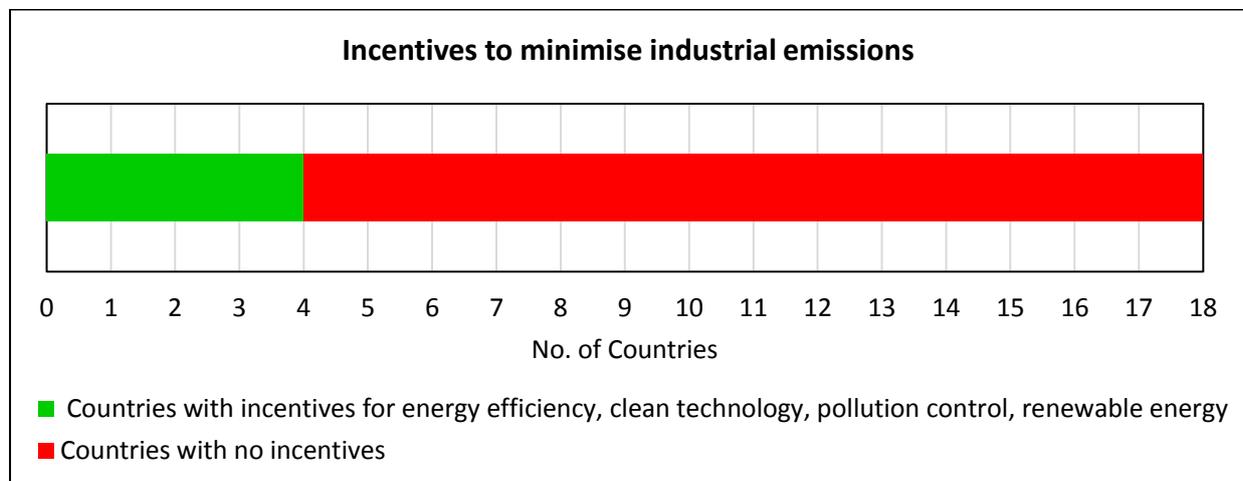


Figure 8: Number of countries in the sub-region that use economic incentives to stimulate cleaner production in the industrial sector.

Electricity production is one of the main industrial sources of air pollution in the sub-region. A number of countries in the sub-region have initiated programmes to increase the share of renewable electricity production in their countries. At present, three out of eighteen countries in the sub-region have between 11% and 30% of their electricity mix coming from

renewable energy sources, while the rest have less than 10%. There is still an ongoing and widespread reliance on fossil fuels for power generation. A number of countries have responded to this challenge. In Libya for example, the Renewable Energy Authority of Libya (REAOL) has created a Renewable Energy roadmap with a goal to have 25% of Libya’s energy supply from renewable energy sources by 2025, rising to 30% by 2030. To reach its renewable energy goals, Morocco has started to introduce a modern legal and regulatory framework for the energy sector.

Israel established a research and development centre for renewable energy technologies, and set a target for the generation of 10% of Israel’s electricity needs from renewable energy sources by 2020 and 17% by 2030. Jordan implemented a National Energy Efficiency Strategy for 2005-2020, which includes a renewable energy target of 7% by 2015 and 10% by 2020. Similarly Yemen has a target of 15% by 2025. However, while a number of countries have set targets, only two countries (Israel and Jordan) are reported to have tax incentives to spur investment in renewable energy technologies.

Within the sub-region, industrial energy efficiency is relatively low (see, figure 9). This is indicative of a need to improve industrial energy efficiency, as more efficient industrial processes tend to be cleaner and use less energy.

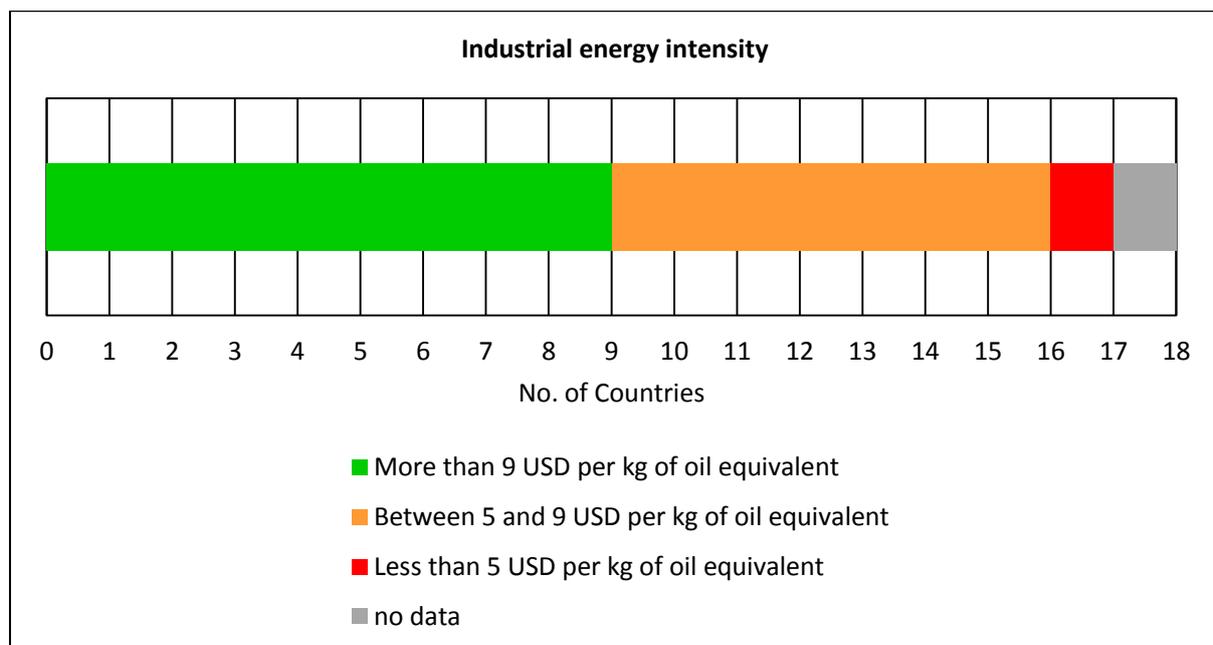


Figure 9: Number of countries in the sub-region with their corresponding industrial energy efficiency. Energy efficiency is calculated as GDP per unit of energy use at constant 2011 PPP \$ per kg of oil equivalent

While emissions from the industrial installations remain a significant source of air pollution, eight countries have established emission regulations for industries. For instance, Israel's Clean Air Law of 2008 is the principal legislative instrument for controlling air pollution in the country. It sets requirements for emission permits from major industrial polluters. Emissions Permit regulations, which came into force in 2010, require applications for emissions permits to be prepared according to specific guidelines based on reference documents on Best Available Techniques. To improve enforcement of laws and regulations, the Ministry of Environmental Protection implements spot checks. Violations of emission standards lead to any of a number of penalties, including temporary or permanent shutdown of a business, clean up and remediation orders, permit revocation, fines and / or possible imprisonment. Industries are also required to report on the results of their self-monitoring once a year.

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/pcfvt/>
- 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/>