

# Oceania

## 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 Oceania 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.

## OCEANIA POLICIES AND ACTIONS TO IMPROVE AIR QUALITY

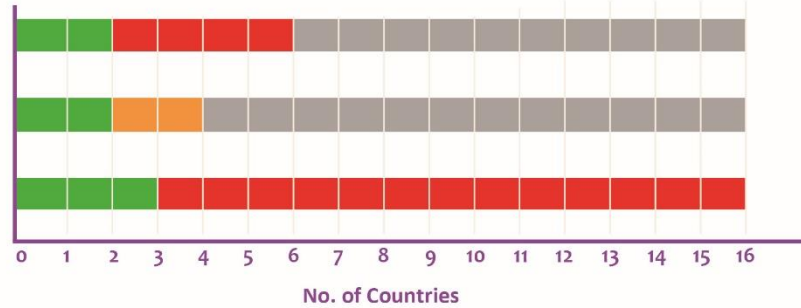
### TRANSPORT



Vehicle emission standards

Fuel sulphur content

Public transport

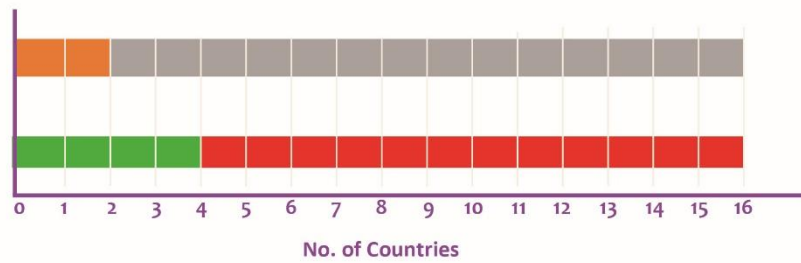


### INDUSTRIES



Industrial energy efficiency

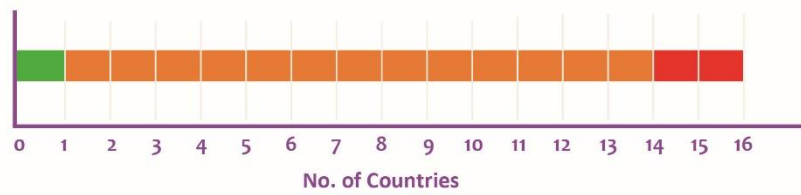
Clean production Incentives



### OPEN BURNING



Waste burning

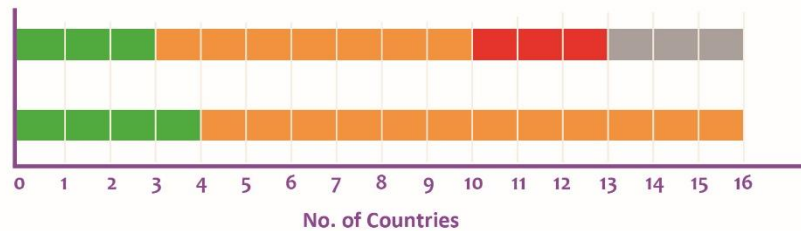


### INDOOR AIR POLLUTION



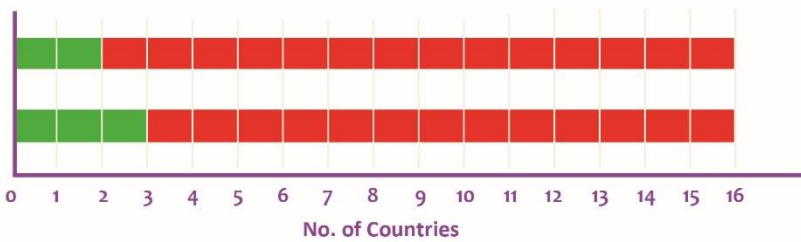
Non-solid fuels access

Efficient cookstoves



Laws & regulations

Air quality standards



**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 Oceania sub-region includes 14 countries: Australia, Kiribati, Marshall Islands, Micronesia (Fed. States), Nauru, New Zealand, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. Governments in this sub-region have enacted laws and regulations on air pollution which are at different stages of implementation. Two out of the sixteen countries in the sub-region have a comprehensive ambient air quality standard with accompanying nationwide air quality policies, laws and regulations. The World Health Organisation (WHO) estimates that air pollution causes approximately 4,800 premature deaths annually. Out of this approximately 4,000 deaths are as a result of indoor air pollution and approximately 800 are as a result of ambient air pollution.

Use of solid fuel to meet household energy demand is a significant driver of deteriorating air quality. Therefore to effectively manage air quality, governments and their partners have to enact policies and regulations that promote access to clean energy for both rural and urban households. Three countries in the sub-region have both electrification and non-solid fuels access rate greater than 85%.

Over the years, air quality in this sub-region has been considered relatively clean compared to other regions of the world, mainly because the sub-region is made up of small island states where large industries are rare and vehicle numbers are still low. However, there are areas where air quality has been compromised, such as in large cities. Some of the major drivers of ambient air pollution in these regions include vehicular emissions, industrial emissions and to some extent the occasional forest fires.

Open burning of waste is also an important source of air pollution in the region. Open burning of agricultural and / or municipal wastes occurs in all sixteen countries to some extent.

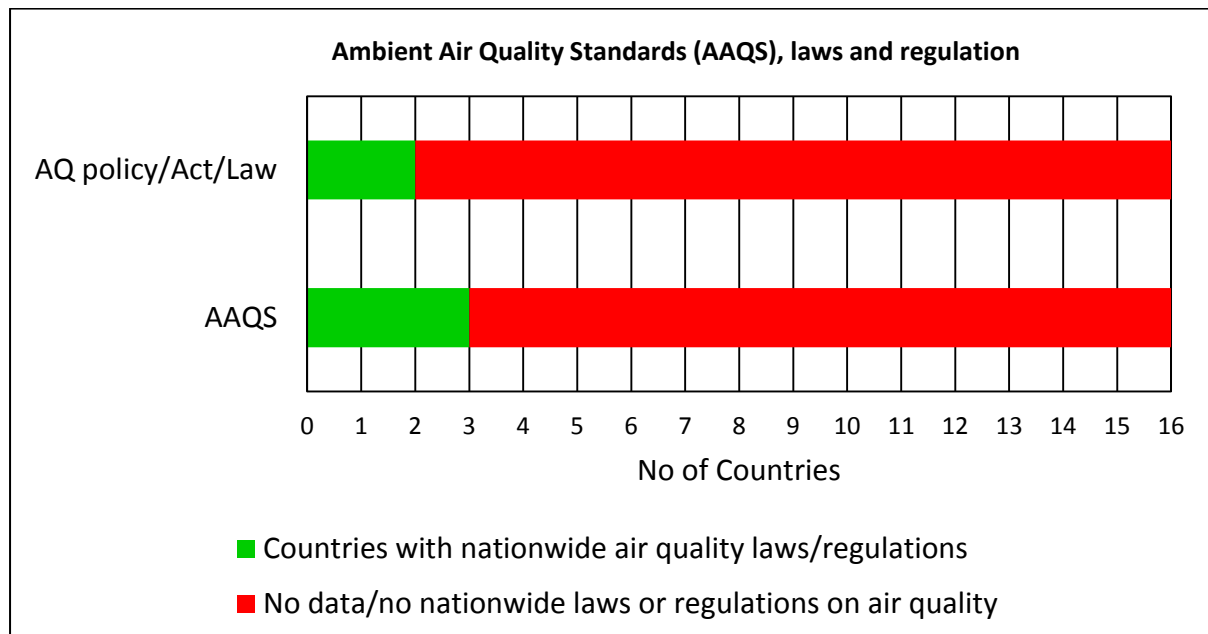
Progress has been made in different areas in different countries, and there are several positive case studies to be found across the sub-region. There are however specific areas in

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, three (19%) out of thirteen (81%) countries in this sub-region have ambient air quality standards, although Australia is the only country having PM2.5 standards. Further analysis of the policy catalogue shows that out of the three countries that have Ambient Air Quality Standards, two countries, Australia and New Zealand, have some nationwide legislation, law, policy or act specifically for air quality (see Figure 2).



**Figure 2:** Number of countries in the sub-region that have enacted some nationwide form of air quality laws and regulations, and also the number of countries that have enacted and promulgated Ambient Air Quality Standards (AAQS).

Australia has a comprehensive air quality standard and regulations to implement the standard. Ambient air quality standards are set at the national level, whereas the emissions standards necessary to achieve the ambient air quality standards are set by local governments. Air quality monitoring stations are required for regions with a population of 25,000 people or more, although additional monitoring of smaller population centres is also undertaken by state governments. Ambient air quality monitoring data is reported annually. Emissions from industrial facilities are also reported annually against an inventory of 93 substances. Work is underway for strengthening the PM, NO<sub>2</sub>, SO<sub>2</sub> and O<sub>3</sub> standards.

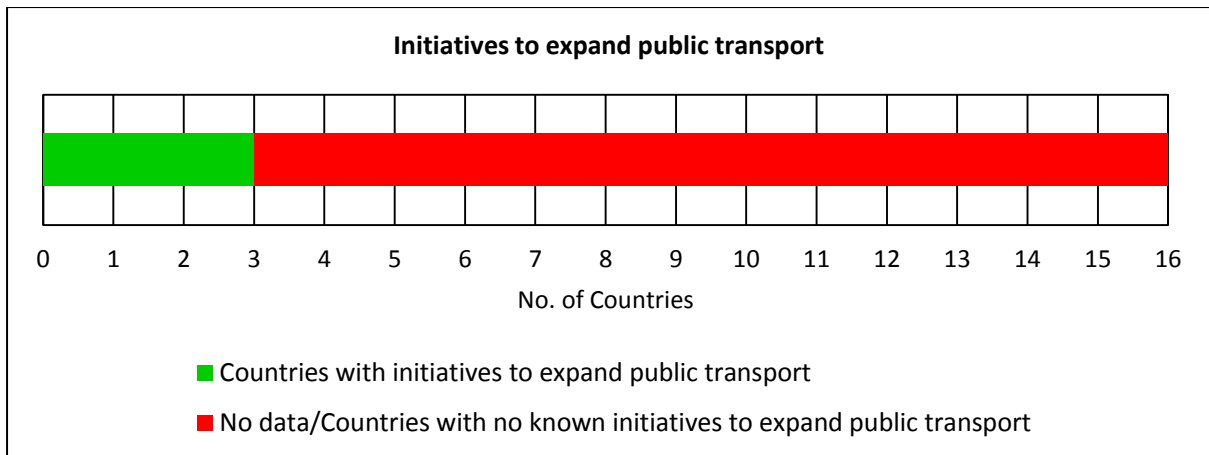
### **3.2 Transport**

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. Three countries (Australia, New Zealand and Fiji) have programmes to expand public transport (Figure 3).

Australia has established a new portfolio - Ministry for Cities and Built Infrastructure - that will work with State governments to improve urban design and public transport in major cities.

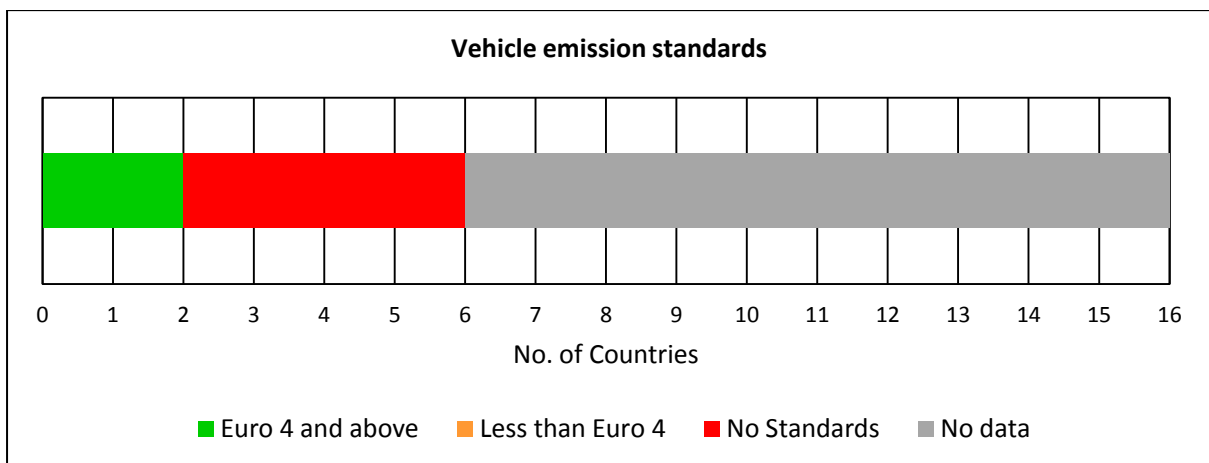
Auckland, New Zealand is developing a new public transport network with integrated bus and electric train lines and increased frequency of service. Large-scale bus and rail projects have resulted in an increased use of public transport, increasing the modal share to 1950s numbers with an associated improvement in subsidy efficiency: subsidies rose 14% in 2008-2009, but resulted in a 39% increase in distance travelled.

Fiji's Greater Suva Transportation Strategy outlines a Staging Plan and an Action Plan for implementing road projects, traffic management measures, public transport initiatives, walking and cycling initiatives and road safety initiatives from 2015 to 2030. It includes dedicated bus lanes, improved footpaths and enforcement of road rules.



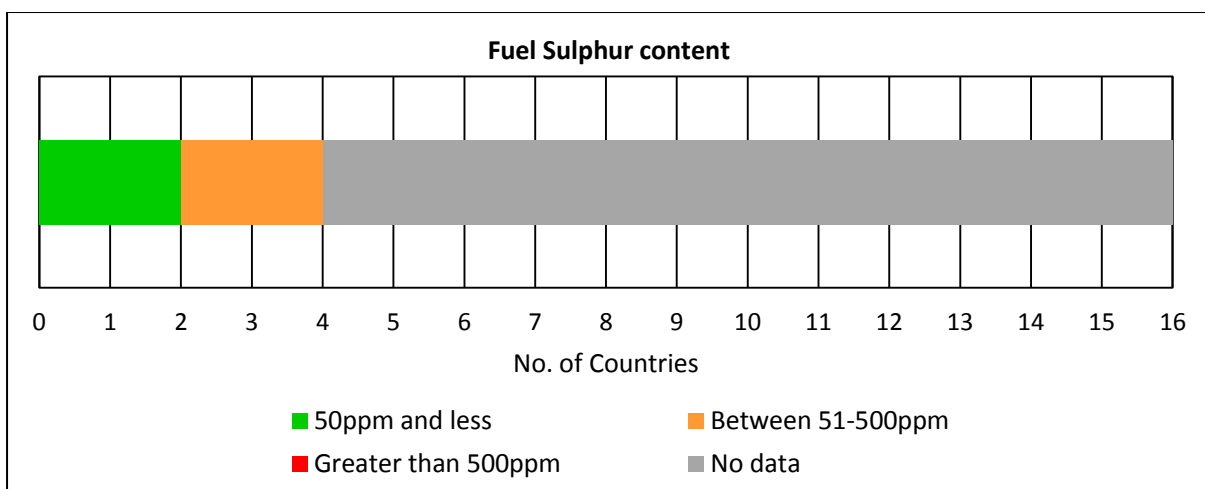
**Figure 3:** Number of countries in the sub-region that have initiated programmes and initiatives to expand public transport.

Some of the other actions undertaken by governments in the sub-region to reduce emissions from the transport sector include the enactment of vehicle emission standards. Two countries (Australia and New Zealand) out of the sixteen in the Oceania sub-region have in place vehicle emission standards greater than or equal to Euro 4. Four of the other countries do not have a vehicle emission standard; data was unavailable for the other ten countries (Figure 4). In Australia, vehicle emission limit is set at Euro 5, and there are plans to implement Euro 6 emission standards in 2017/2018.



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

Other policy actions taken in the sub-region to limit vehicle emissions is the regulation of fuel sulphur content. In Australia, fuels sulphur content is regulated at 10 ppm for diesel, 50 ppm in premium petrol and 150 ppm in regular petrol. In New Zealand, fuel Sulphur content is set at a maximum of 10 ppm. In Fiji and Marshall Islands, fuels sulphur content is regulated at 500ppm. Data on fuel and vehicle standards for twelve of the smaller island states was lacking.

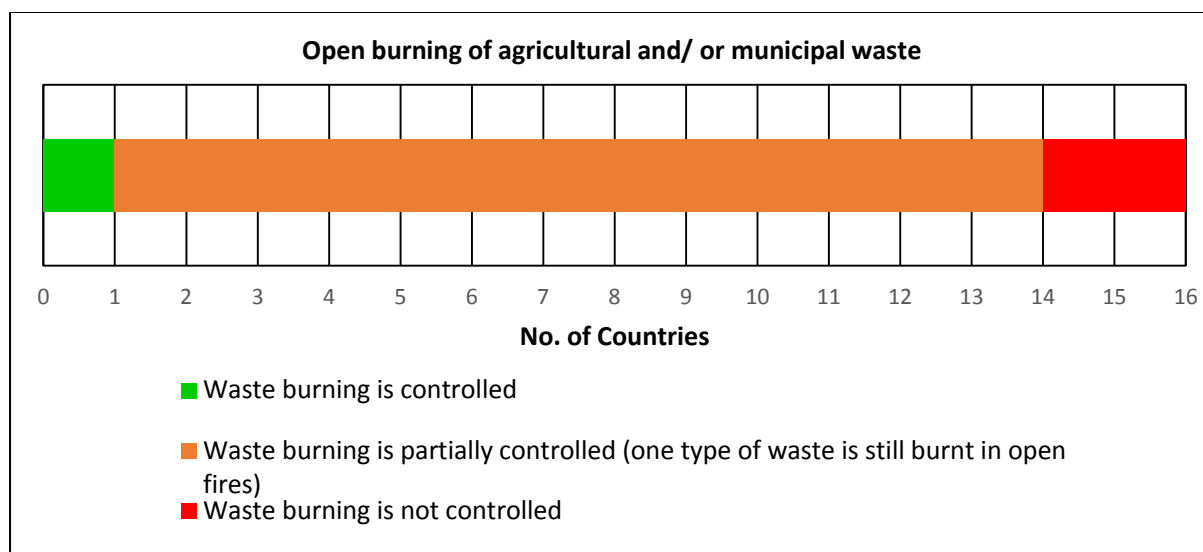


**Figure 5:** Number of countries in the North Asia sub-region that regulate fuel quality. Fuels Sulphur content is used as a proxy of fuel quality.

### 3.3 Open burning of waste

Open burning of municipal and agricultural waste materials is one of the main sources of air pollution in most of the countries within the Oceania sub-region in both urban and rural settings. A number of countries in the sub-region have instituted laws and regulation to minimize waste burning. However, there is a great disconnect between the laws and regulations and what is actually practiced. For instance, while Fiji has banned open burning of municipal and agricultural wastes, this practice still persists. Only one country in the region, New Zealand, has successfully managed to limit the burning of both agricultural and municipal waste. Figure 6 below shows the number of countries in the sub-region where

waste burning (agricultural and municipal) is controlled. In Australia, some open burning for agricultural purposes is permitted while burning of municipal waste is not permitted.



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

### 3.4 Indoor air pollution

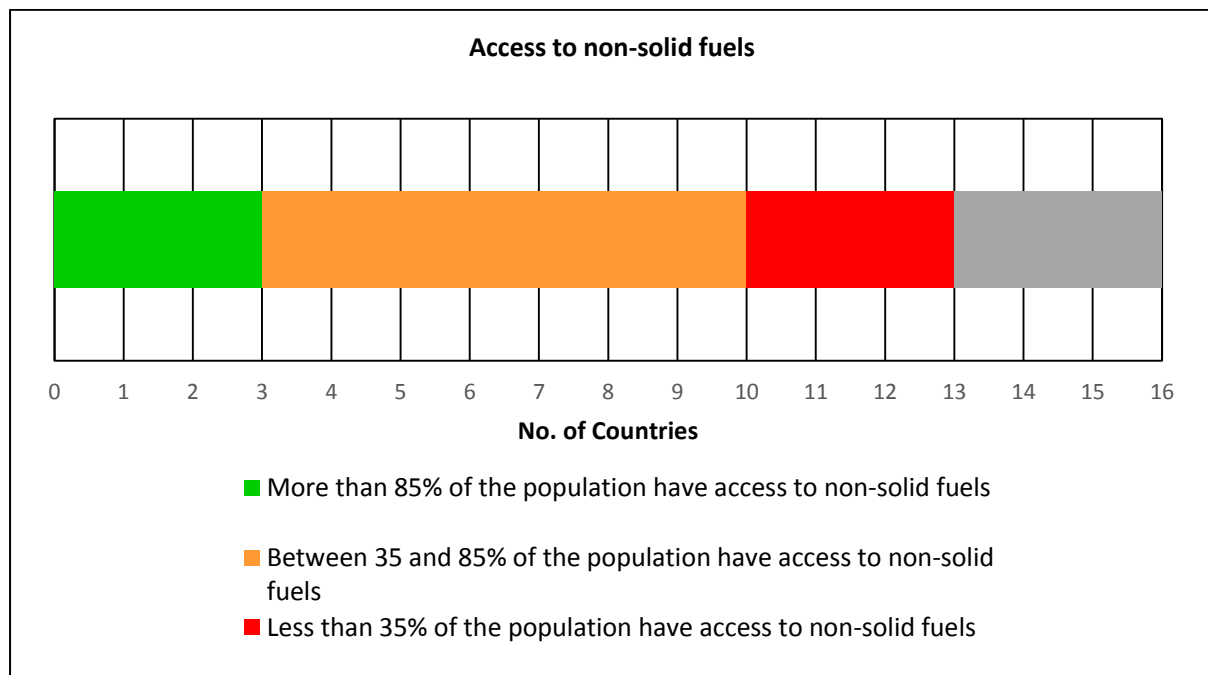
In this sub-region indoor air pollution is the main driver of air pollution related premature deaths and ailments. They also contribute to outdoor air pollution. Cooking with solid fuels - wood and other biomass - over open fires is one of the major drivers of indoor air pollution and its associated 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.

Four of the countries in the sub-region have an electricity access rate of 85% (percentage of population with access to electricity) and above. However nine countries have less than 85% of households connected to the grid, and among these three countries have less than a third of their households connected. These households depend on other sources of energy to provide lighting and cooking energy, which can potentially impact indoor air quality.

Governments have put in place several policies and actions to minimise emissions of air pollutants from this source. Among these actions includes: increased electrification rate,



introduction of efficient stoves for both space heating and cooking, and also increased access to non-solid fuels for domestic energy provision. Two countries have increased the access to non-solid fuels to more than 85% of their population. Seven others have a rate between 35% and 85% and in three countries, less than a third of the population have access to non-solid fuels (Figure 7).



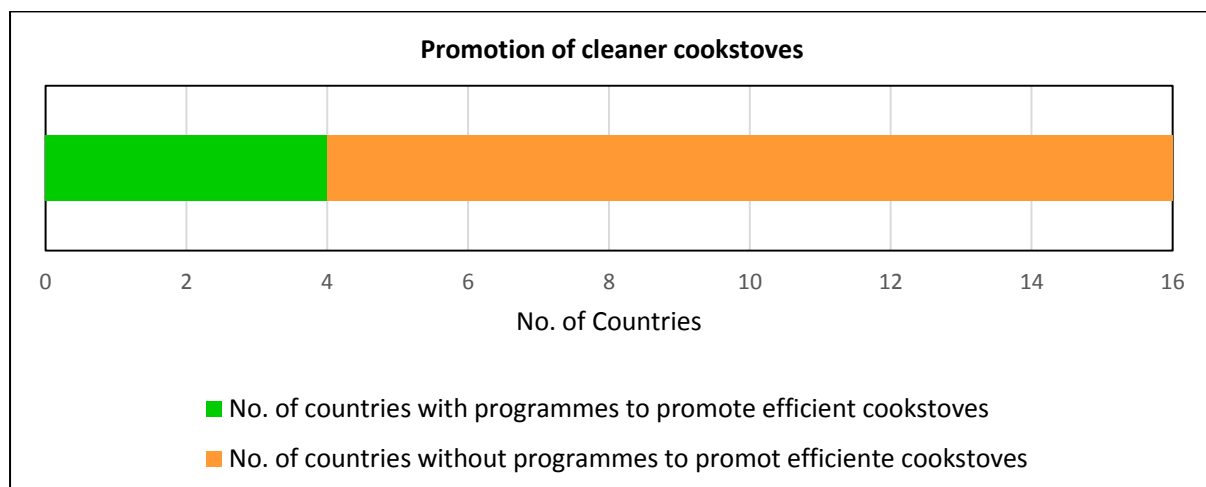
**Figure 7:** Number of countries in the sub-region that have implemented programmes and policies to improve non-solid fuels access rate, as indicated by percentage of households with access to non-solid fuels.

Other efforts towards reducing indoor air pollution include the introduction of alternative energy sources. For instance in Niue, solar water heating systems and LPG cook stoves were installed for 70% of the population in the Renewable Energy Programme (REP-5 Programme, 2006-2010). In New Zealand, there are design and efficiency standards for wood burners installed in urban areas after September 2005.

In some of the isolated island, governments and their partners are promoting alternative sources of clean energy to provide household energy. Such is the case in Marshal Islands where residents on 19 outer islands were provided with lighting systems. Samoa’s Photovoltaic Rural Electrification Programme aims to provide electricity to the 5% of households that aren’t connected. In 2012 the Government of Solomon Islands launched a

pilot project to install solar home systems for households that were without electricity. These solar home systems were subsidized and households were required to pay a nominal amount and make upfront payment to cover repair and maintenance for a period of 2 years

Some countries in the sub-region are also taking steps to promote the use of efficiency cook stoves. Figure 8 below shows the number of countries in the sub-region that are promoting the use of efficient cookstoves. Cleaner cookstoves are more efficient compared to traditional open fires; this translates to less biomass use and less emissions. Due to the numerous varieties of cookstoves available in the market, analysis of all the programmes at a national level would be resource and time consuming. Therefore, an analysis of countries promoting one type of cookstove<sup>1</sup> is presented in Figure 8. Additionally, consideration was only given to biomass-based cookstoves as the Global Cookstove Alliance considers them the most appropriate transitional cookstove for the more than 3 billion people who cook and heat their homes using solid fuels and open fires.



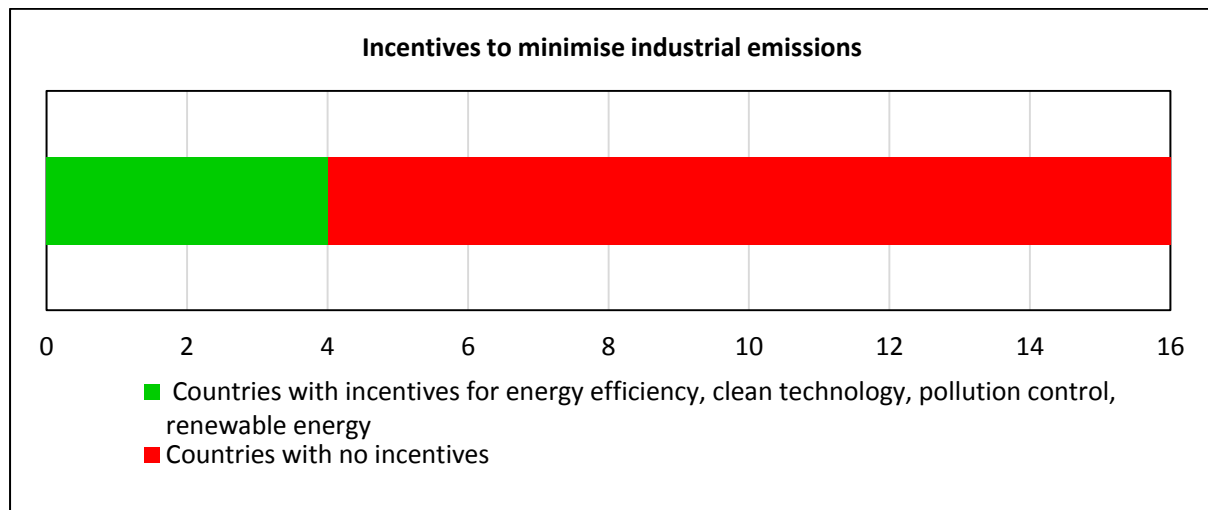
<sup>1</sup> Due to the different definitions of efficient cook stoves, Figure 8 only shows countries with programmes to promote efficient cook stoves that also qualify for carbon trading schemes. Cookstoves that qualify for Certified Emission Reductions (CERs) under the Clean Development Mechanism are considered efficient as they are estimated to reduce emissions by 1 to 3 tCO<sub>2</sub>e (carbon dioxide equivalent) per year, which also translates to reduced emissions of other air pollutants. Therefore, Figure 8 does not necessarily represent all countries that are implementing programmes aimed at promoting clean and efficient cookstoves. As such the number of countries promoting the use of clean and efficient cookstoves might be higher than indicated in the figure.

**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 stoves, only programmes aimed at promoting cook stoves that also qualify for carbon trading schemes are represented here.

### 3.5 Industries

Power generation and mining are some of the most significant sources of air pollution from the industrial sector. Despite the importance of these sources, only three out of sixteen countries (Australia, Fiji and New Zealand) have emission regulations in place. The main source of electricity for twelve countries in the sub-region is diesel run generators, which explains the high emissions from the energy generating sector.

However, there is a growing trend in investments to promote the use of renewable energy and increase end user energy efficiency. The use of incentives for promoting investment in energy efficiency, clean technology, renewable energy and / or pollution control can be found in four out of the thirteen countries: Australia, Fiji, New Zealand and Vanuatu. Figure 9 shows the number of countries in the sub-region that use incentives to stimulate cleaner production.

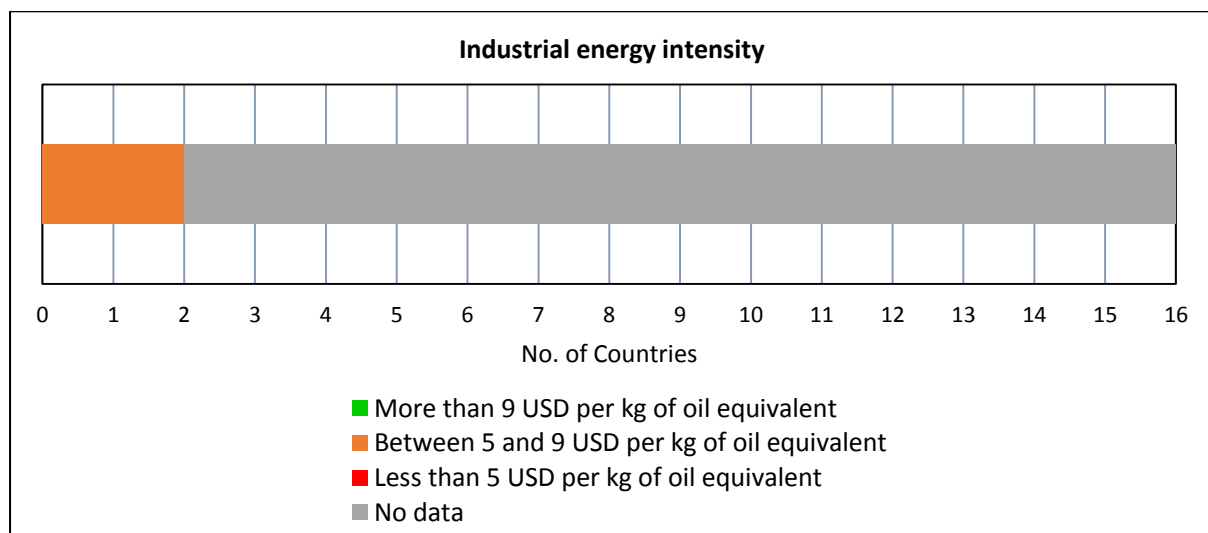


**Figure 9:** Number of countries in the sub-region that use incentives to encourage industrial investments in cleaner production and renewable energy generation.

Other governments in the sub-region have initiated policy frameworks that aim to increase the share of renewable electricity generation. For instance, according to Palau's National

Energy Policy, the country targets a 20% increase in the production of electricity from renewable sources by 2020 and 30% reduction in the consumption of non-renewable energy by 2020. In Nauru’s Energy Framework the country aims to increase by 10% the share of renewable energy in its electricity mix by 2020. Tuvalu plans to provide all electricity through renewable resources by 2020. New Zealand Aid Programme is assisting with the establishment of a Renewable Energy and Energy Efficiency Unit (REEEU) within the Tuvalu Electricity Corporation (TEC) to help Tuvalu reduce its dependence on imported diesel and to develop a plan for infrastructure development to increase the use of solar and wind based energy generation.

The use of incentives for promoting investment in energy efficiency, clean technology, renewable energy and / or pollution control can be found in four out of the thirteen countries: Australia, Fiji, New Zealand and Vanuatu. To increase energy efficiency the Australian governments requires large energy-using businesses to have an energy audit every 5 years. Figure 10 below indicates the effectiveness of current policies and actions aimed at increasing industrial energy efficiency. An industrial energy efficiency of USD 9 per unit of energy and above is used to indicate better energy efficiency.



**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/](http://www.who.int/quantifying_ehimpacts/national/countryprofile/en/)
- UNEP <http://www.unep.org/Transport/new/pcf/>
- Air Quality Catalogue <http://www.unep.org/transport/airquality/>
- Various government reports, websites
- Energypedia [https://energypedia.info/wiki/Main\\_Page](https://energypedia.info/wiki/Main_Page)
- Reegle <http://www.reegle.info/countries/>
- [www.BRTdata.org](http://www.BRTdata.org)
- Global Coalition for Clean Cookstoves <http://catalog.cleancookstoves.org/stoves>
- Global partnership on waste management  
<http://www.unep.org/gpwm/informationPlatform/WasteManagementDatabases/tabid/79590/Default.aspx>
- International energy agency  
<http://www.worldenergyoutlook.org/resources/energydevelopment/energyaccessdatabase/>
- Asian Development bank <http://www.adb.org/documents/maldives-outer-islands-electrification-sector-project>