

Air Pollution Series

Actions on Air Quality in Asia and the Pacific

Executive Summary

Context

Air pollution is one of the key environmental crises in Asia and the Pacific, with 92 per cent of those living in the region (or 4 billion people) exposed to unhealthy levels of air pollution. While it affects everyone, the most vulnerable people include women, children, the elderly and the poor, who have limited access to health care services. Air pollution also has an impact on the environment, food and agriculture, and contributes to climate change, resulting in significant economic costs of between 0.29 per cent and 1.22 per cent of gross domestic product (GDP) in the East Asia and Pacific and South Asia subregions (Lange et al. 2018). Without policy interventions, exposure to fine particulate matter (PM_{2.5}) would increase by a further 50 per cent by 2030 compared with 2015. This would severely threaten lives and the quality of life of the population.

Solutions exist, but strong and urgent action is needed to substantially reduce emissions and improve air quality. In 2018, the Air Pollution in Asia and the Pacific: Science-based Solutions report (UNEP 2018) identified 25 policy and technology clean air measures that could reduce the number of people exposed to PM_{2.5} levels that exceed the World Health Organization Interim Target by 80 per cent.

Status and trends

This report summarizes the “measures of progress” of countries against the air quality policies identified in the UNEP 2018 and 2016 Actions on Air Quality reports. It highlights where good progress has been made in different sectors and identifies opportunities to accelerate further actions that countries in Asia and the Pacific may wish to consider. The report contributes to the Actions on Air Quality: A Global Summary of Policies and Programmes to Reduce Air Pollution report presented at the Fifth Session of the United Nations Environment Assembly in February 2021.

The report makes the following key findings:

- **There has been encouraging progress in reducing air pollution, but there is still much work to be done.** Between 2015 and 2020, air pollutant emissions have dropped slightly in the region, with improvements in nitrogen oxide and sulphur dioxide emissions observed in parts of East Asia. Population-weighted PM_{2.5} concentrations reduced in half of the countries in the region between 2015 and 2019 (Health Effects Institute 2020). However, PM_{2.5} and nitrogen oxide emissions were estimated to have increased in some parts of South-East Asia and South Asia in the same period.



Girl child traveler alone sitting relaxing on rock in calm green rain forest far from the city away from pollution, Kerala, India. Taking deep breath with open hands in yoga pose inhale fresh air .
Photo credit: © Shutterstock/ Santhosh Varghese

- In the first few months of 2020, the implementation of restrictions to curb the spread of COVID-19 resulted in a short-term **reduction in emissions of some air pollutants**. There is an opportunity for countries to consider and prioritize transformative measures in their **COVID-19** recovery plans.

Sectoral measures

Since 2015, many countries in the region have strengthened policies to control industrial emissions from power plants, cement, iron and steel, brick kilns and other major sources

Most countries in the region have also adopted renewable energy policies to support the achievement of Sustainable Development Goal (SDG) 7.

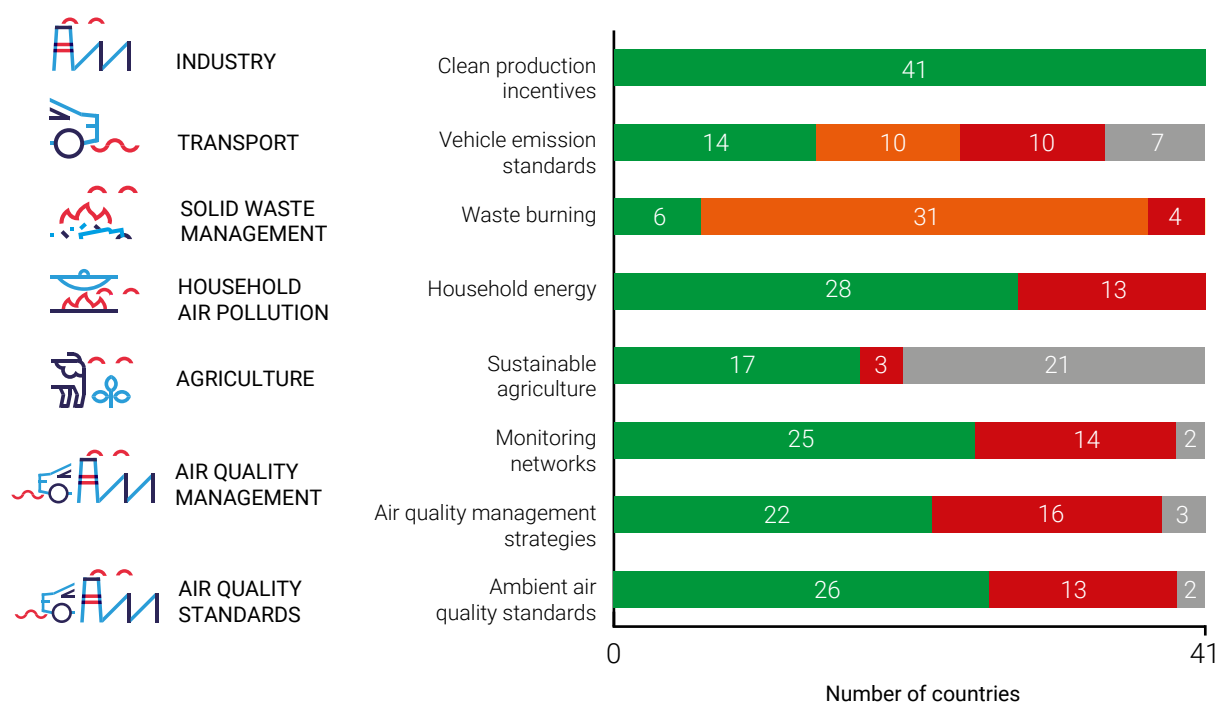
Energy production in Asia and the Pacific changed dramatically between 2015 and 2020 thanks to substantial progress in energy efficiency and renewable energy policies. There has been a structural fall in coal demand that may not return to pre-crisis levels as older and less efficient production facilities have been retired. This fall in coal demand is also accompanied by a reduction in investment in fossil fuels. The impact that this transformation will have on emissions of air pollutants and climate-warming pollutants is not yet clear but a structural change from coal to renewables would reduce them.

Since 2016, there has been significant progress in Asia and the Pacific in adopting conventional measures to reduce vehicle emissions

By 2020, about 23 of the 41 countries in the region had set vehicle emission standards. In addition, 14 countries had light-duty vehicle emission standards at the Euro 4

Figure 1. Progress towards adoption of key actions that can significantly improve air quality

Where is the Asia Pacific region in taking action to improve air quality?



Source: UNEP survey data¹

level or equivalent, compared to only eight countries in 2016 (Figure 3). There are encouraging developments in addressing emissions from heavy-duty vehicles, with India's adoption of new fuel economy standards in April 2018 and China's implementation of its Stage III standards in July 2019 expected to influence the heavy-duty vehicle market. There are now at least 13 countries in the region using diesel fuel with a sulphur content of 50 parts per million or less.

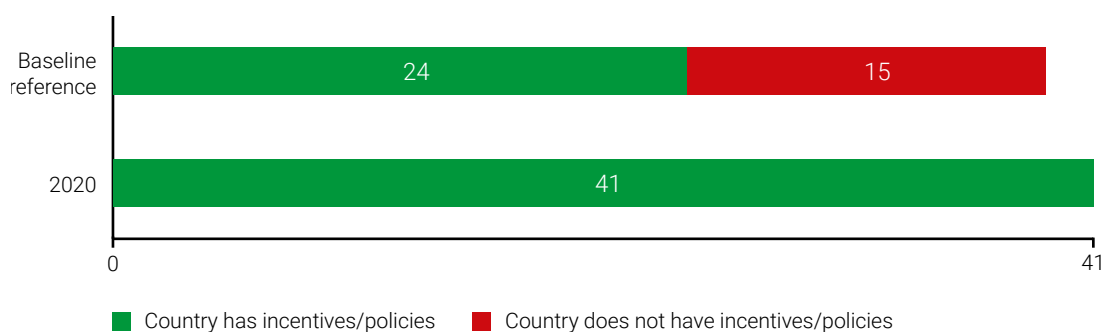
There has only been moderate progress in adopting transformative transportation policies. Half of the countries in the region have now adopted policies and measures to mainstream regular inspection and

maintenance of vehicles. In addition, most countries in Asia and the Pacific have also adopted policies to promote and mainstream electric mobility.

Regulations on open burning are increasing, but enforcement needs to be strengthened

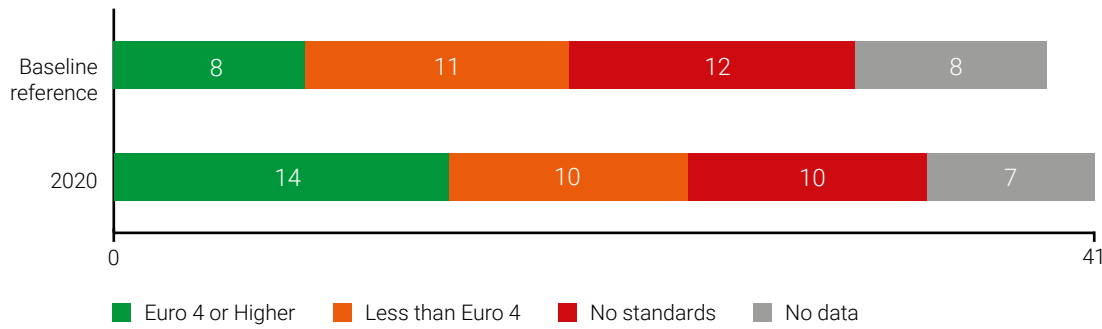
In 2020, there were 37 countries in the region with regulations to prohibit open burning of household waste, compared to 2016, when more than half of the countries in the region did not have any restrictions on open waste burning (Figure 4). However, some countries still face challenges when it comes to enforcing these regulations and still encounter stakeholder opposition.

Figure 2. Countries with incentives or policies promoting cleaner production, energy efficiency and pollution abatement for industries



Source: UNEP survey data

¹ From the analysis of UNEP data, a set of key policy actions were identified that, if adopted, would significantly improve air quality. The figure indicates how many countries have adopted these policies (green), are on their way to adopting them (orange/yellow) or have yet to adopt or implement them (red). Grey indicates that no data were available.

Figure 3. Countries meeting Euro 4/IV vehicle emission standard

Source: UNEP survey data

Regulations to ban waste burning need to be complemented by improved solid waste management. Promoting centralized waste collection with source separation and treatment can help to reduce direct emissions of PM_{2.5} and ground-level ozone by reducing the emissions of its precursors, such as methane.

There has been a significant increase in access to clean cooking, which has drastically reduced exposure and the number of attributable deaths in the region

More than 500 million people have benefited from clean cooking and heating programmes adopted across 28 countries since 2016. In China and India alone, improved access to clean fuels has led to the number of deaths attributable to household air pollution falling by an estimated 440,000 over the past decade, and in South Asia, total deaths attributable to household air pollution fell by 10 per cent between 2015 and 2019. Similar drops were also observed in South-East and East Asia, where the estimated number of deaths associated with household air pollution has dropped by 5 per cent over the last five years.

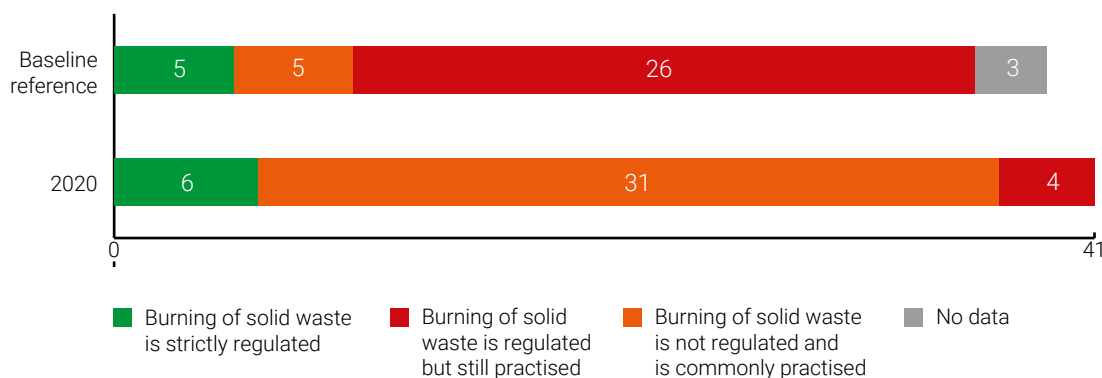
Existing policies on clean cooking and heating are not yet sufficient for Asia and the Pacific to achieve universal access by 2030, as set out in SDG 7. It is projected that the existing policy scenario and the impact of COVID-19

will still leave around 1.3 billion people in Asia and the Pacific without access to clean cooking and heating. Countries in the region may customize approaches that take into account the underlying social behaviour and roles of men and women to scale up existing solutions and support the implementation of clean cooking programmes.

About 41 per cent of countries in the region had implemented policies and programmes to promote sustainable agricultural practices that reduce air pollution in 2020

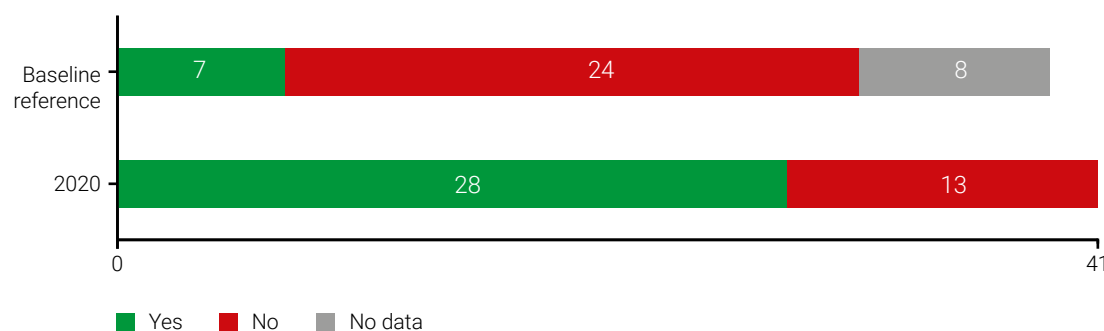
These include the management of agricultural residues and livestock manure in Bangladesh, China and Japan, for example. Several countries have also adopted policies to prohibit the burning of agricultural residues by issuing fines, providing incentives and promoting alternative uses for residues, among other measures.

The contribution of agriculture to air pollution is becoming increasingly significant, with ammonia and methane emissions contributing to PM_{2.5} and ozone emissions. Crop residue burning leads to elevated levels of PM_{2.5} in some parts of the region on a seasonal basis.

Figure 4. Countries with solid waste burning regulations

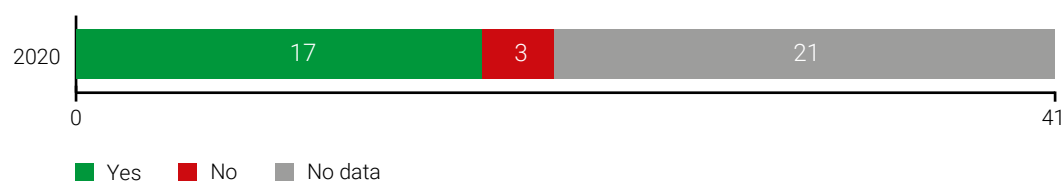
Source: UNEP survey data

Figure 5. Countries with national clean residential energy programmes



Source: UNEP survey data

Figure 6. Countries with incentives promoting sustainable agriculture practices (such as livestock manure management and use of organic fertilizers)



Source: UNEP survey data

Non-sectoral air quality management actions

Many countries have adopted or are planning to adopt national and subnational laws and strategies to achieve their air quality targets

This includes India's National Clean Air Programme, launched in 2019, which aims to reduce $PM_{2.5}$ pollution by 20–30 per cent by 2024, as compared to 2017 levels. Other countries that have adopted or updated strategies or action plans to address air pollution include Afghanistan, China, Japan, Maldives, Mongolia and Vietnam, among others.

In 2020, 63 per cent of countries in Asia and the Pacific had ambient air quality standards in place

Roughly the same percentage of countries (60 per cent) conducted official air quality monitoring of criteria air pollutants such as $PM_{2.5}$, PM_{10} , ozone, nitrogen dioxide, sulphur dioxide and carbon monoxide. While a few countries, such as China, Malaysia, Philippines and Singapore, have revised their air quality standards or adopted road maps to align them more closely with

the World Health Organization's air quality guidelines or interim targets, over half of the countries in the region still do not have standards in place for $PM_{2.5}$.

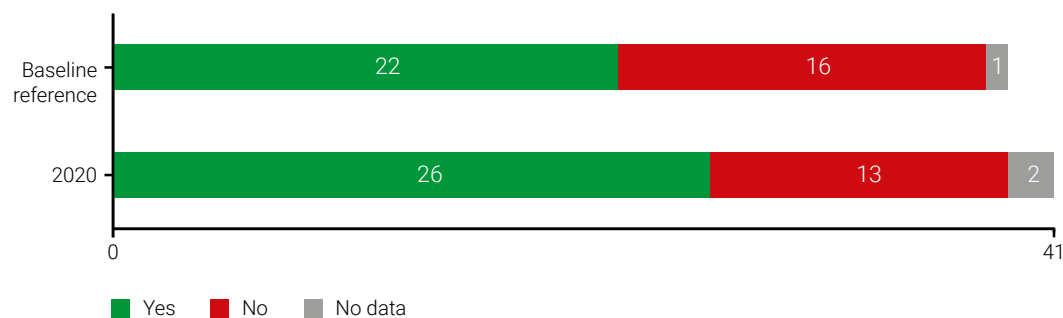
There have been promising developments in air quality monitoring systems

Based on the 2020 survey, around 60 per cent of countries in Asia and the Pacific conduct official air quality monitoring (Figure 9), covering criteria air pollutants such as $PM_{2.5}$, PM_{10} , ozone, nitrogen dioxide, sulphur dioxide and carbon monoxide. There have also been cooperation efforts in the region, such as the Acid Deposition Monitoring Network in East Asia, which has been helping countries to monitor acid deposition species. In addition, recent developments, such as the launch of a geostationary satellite with a Geostationary Environment Monitoring Spectrometer and the increased use of low-cost sensors to complement regulatory monitoring networks, further serve to increase the frequency and resolution of measurements of the concentrations and transport of air pollutants such as particulate matter, which may travel long distances.

Figure 7. Countries with a national air quality management strategy, framework or plan of action in place



Source: UNEP survey data

Figure 8. Countries with ambient air quality standards

Source: UNEP survey data

Figure 9. Countries with national ambient air quality monitoring networks

Source: UNEP survey data

Conclusions

The countries that have been most successful effectively implementing comprehensive measures are those that have been able to formulate and effectively implement plans with stakeholder support. These plans involve clear quantitative targets and responsibilities, science-based research, monitoring and strong political will to support their enforcement. In some circumstances, they require local support and implementation and alignment with local and national plans.

Inter-agency collaboration and comprehensive national development policies that integrate solutions to air quality challenges are required. These policies must focus on modernizing energy infrastructure, energy efficiency, reduced fossil fuel consumption, the electrification of transport, advanced mass transport options and industrial structure upgrades, and sustainable agricultural practices. These policies have multiple benefits and converge with other policies for the climate and national development. However, they will require new ways for environmental agencies to work together with other government agencies, the private sector and civil society.

Regional and subregional cooperation efforts can assist countries in strengthening their air pollution management frameworks. Global and regional funds can help increase country expenditure, especially in the areas of research, monitoring and policy development.

Implementing clean air actions will benefit efforts to mitigate climate change and vice versa. Clean air measures could reduce carbon dioxide emissions and potentially decrease the expected level of warming. This would represent a significant contribution towards achieving the Paris Agreement target of limiting the global temperature increase in this century to 2°C above pre-industrial levels. Greenhouse gas reduction measures especially for methane can also help to reduce ground-level ozone and secondary PM_{2.5}.

Actions to reduce air pollution will aid countries in their efforts to achieve the SDGs. Implementing them will improve air quality and mitigate climate change, directly contributing to the achievement of SDG 3: Good Health and Well-being; SDG 11: Sustainable Cities and Communities; SDG 12: Responsible Consumption and Production; and SDG 13: Climate Action. Measures applied individually or collectively will also directly or indirectly contribute to the achievement of the other 13 SDGs and their respective targets.



Aswaraopeta, Bhadradi Kothagudem, Telangana, December 03, 2019, A farmer burns the remains of his Sugar Cane crop causing heavy smoke and air pollution, Stubble Burning.
Photo credit: Shutterstock/ Abdul Munaff

