

## Coping with Climate Change through Air Pollution Control: Some Legal Initiatives from Malaysia

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**Abstract.** Malaysia is committed to addressing climate change and has taken various initiatives in dealing with the matter. At the policy level, the policy makers are charged with identifying possible national response strategies to climate change and implementing them through various tools. One of the focus areas is the regulation of the green house gasses emissions from various sources, including that of industries and motor vehicles. During the past years, Malaysia has introduced a number of emission control measures to deal with air pollution, particularly through the enforcement of environmental law. This paper sets out a range of existing legal strategies on the control of air pollution from both stationary and mobile sources. The objective is to identify how air pollution law in Malaysia helps protect air quality as well as contributes to efforts to deal with climate change.

**Keywords:** Climate change, Air pollution, Environmental law.

### 1. Introduction

Global climate change refers to changes in the climate of the earth as a whole, caused by human activities releasing an overabundance of greenhouse gases (GHG) and warming the earth's atmosphere. There are various activities that contribute towards climate change including that of air pollution which releases various harmful gases to the atmosphere. While closely related, air pollution and climate change have mostly been treated as separate problems. This is because, in the context of environmental quality protection and pollution control, poor air quality and climate change are very different phenomena. However, there is an increasing awareness of the importance of addressing the linkages between the traditional air pollutants and greenhouse gases. Many air pollutants and greenhouse gases have not only common sources, but also their emissions interact in the atmosphere, and may join to cause a variety of environmental impacts on the local, regional and global scales. Among activities common to both air pollution and climate change are fossil fuel burning, and various industrial practices. These activities emit pollutants such as particulate matter and ground-level ozone, along with nitrogen oxides, sulphur oxides, volatile organic compounds, and carbon monoxide. The same activities also release greenhouse gases, mainly carbon dioxide, methane and nitrous oxide, which are linked to global climate change.

For the policy makers, addressing the issues of air pollution and climate change may be a challenging task. However, considering that they come from the same sources, many of the actions that reduce air pollution can also reduce greenhouse gas emissions. As for Malaysia, its involvement in the climate change process began when it became a signatory to the United Nations Framework Convention on Climate Change (UNFCCC) in 1993 and ratified it in 1994. In 1997, the Conference of Parties adopted the Kyoto Protocol to the UNFCCC. This Protocol is an amendment to the international treaty signed in 1992 on climate change, assigning mandatory emission limitations for the reduction of greenhouse gas emissions to the signatory nations. The objective of the protocol is the stabilization of greenhouse gas concentrations in the atmosphere

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at a level that would prevent dangerous anthropogenic interference with the climate system. Industrialised countries that are signatories to the Kyoto Protocol are required to reduce the emissions for six GHG namely carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride to on average 5.2 percent below their 1990 levels, by 2008 to 2012.

Malaysia is a party to the UNFCCC and has ratified the Kyoto Protocol in 2002. As a developing country Malaysia is not subjected to any commitments towards reducing GHG emissions under the Kyoto Protocol at present. However, together with all other countries, Malaysia is already committed under the UNFCCC to formulate and implement various strategies containing measures to mitigate climate change. While only recently has climate change become a priority for Malaysia, national initiatives relevant to climate change have already existed even much earlier. Since the 1970s, Malaysia has enacted laws and adopted policies and measures to control pollution and protect the environment. The main legislation in Malaysia that deals with air pollution control is the Environmental Quality Act 1974. When this Act was passed, it was meant to be a legislation designed to deal with emerging and future environmental issues while targeting at achieving the objectives of national environmental policy. Administratively, the agency responsible for the enforcement of the Act is the Department of Environment which is under the Ministry of Natural Resources and Environment Malaysia. For the Act, any strategy formulated therein must take into account the extent of environmental issues facing Malaysia at any given time. At the same time, such strategy must also be in tandem with the objectives of the national environmental policy, namely that of sustainable development. Although sectoral in nature, this environmental law also contributes both directly and indirectly to addressing climate change. The review of the Environmental Quality Act 1974 below, particularly in addressing air pollution from mobile and industrial sources seeks to reveal strategies that directly address or indirectly contribute to managing issues of climate change mitigation.

## **2. Fossil Fuel Burning and Industrial Activities as Major Air Pollution Source**

Malaysia, which is divided into West Malaysia and East Malaysia, covers an area of about 330000 square kilometres with a population of over 28.7 million<sup>3</sup>. Being a country rich in natural resources, Malaysia's economy is inevitably linked to, among others, land, water, marine and biodiversity. For West Malaysia, its main industries are rubber and palm oil processing and manufacturing; light manufacturing industry, electronics; tin mining and smelting; and logging and processing timber. For East Malaysia, the state of Sabah's main industries are logging and petroleum production; whereas the East Malaysia state of Sarawak has agriculture processing, petroleum production and refining, and logging.

Over the years, Malaysia continues to face various issues relating to environmental pollution and natural resources degradation including that of air pollution. Until relatively recently, air pollution was not regarded as a significant problem in Malaysia. However, following rapid urban and industrial expansion, the quality of air has become a major concern. The quality of air in Malaysia is very much dependant on the level and pace of urban development. At present, main sources of air pollution include emissions from traffic and industrial activities that discharge GHG into the environment. For Malaysia as a whole, major industries affecting air quality are the iron and steel industry, nonferrous metal industry, nonmetallic (mineral) industry, oil and gas industry, petrochemical industry, pulp and paper, power plants, and waste incineration sector.

Apart from industrial emissions, emission from mobile sources also causes air pollution, contributing to at least 70 percent of the total air pollution. Various factors contribute to this issue, including the continuous increase in the number of registered road vehicles. According to the Road Transport Department of Malaysia, the number of registered road vehicles had increased from more than 6.8 million in 1995 to over 12.2 million in March 2003. Whereas in 2009, there were more than 19 million registered motor vehicles on the road, an increase of over 6 percent compared to the year 2008. Out of over 1 million new vehicles registered in 2009, motorcars made up the highest number with over 50 percent, followed by motorcycles of about 43 percents. The remaining 6 percent were from other vehicle types such as lorries, busses, vans and others. In terms of air pollutant emission loads from various sources, a comparison of the combined load in 2008 and 2009 shows an increase on 11 percent in carbon monoxide emissions due to an increase in the number of in-use or

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<sup>3</sup> Department of Statistic Malaysia, 2012, <http://www.statistics.gov.my/portal/>.

active motor vehicles in 2009. According to the Department of Environment Malaysia, in 2009, it was estimated that the combined air pollutant emission load was over 1.6 million metric tonnes of carbon monoxide; 756,359 metric tonnes of nitrogen dioxide; 171,916 metric tonnes of sulphur dioxide; and 27,727 metric tonnes of particulate matter.

### 3. Air Pollution Monitoring and Control

In Malaysia, the air quality status is determined and disseminated according to the Air Pollution Index (API). This index, which is comparable to the corresponding air quality standards recommended by the World Health Organisation, was developed by the Department of Environment in 1993. This Index is being monitored by this Department for the purpose of continuous monitoring of air quality throughout Malaysia using 52 air quality monitoring stations. Pollutants monitored by the index include ozone, carbon monoxide, nitrogen dioxide, sulphur dioxide and suspended particulate matter less than 10 microns in size. The API transforms the air quality data measured at monitoring stations into a single number ranging from 0 to 500, with higher values indicating higher levels of pollution. The information about the air pollution level throughout the country is released daily through the Department's website<sup>4</sup>.

Apart from monitoring of air quality, the Department of Environment also has the power to enforce provisions under the Environmental Quality Act 1974, including that of air pollution. Various strategies have been introduced under this Act in dealing with various sources of air pollution. In general, section 22 provides for the restrictions on the pollution of the atmosphere from various sources. A licence is required in order to emit pollutants exceeding the prescribed limits in accordance with the procedures specified in the Environmental Quality (Licensing) Regulations 1977.

Specifically, ambient standards for gaseous emission from factories and other stationary sources are provided under the Environmental Quality (Clean Air) Regulations 1978 and apply to the following situations, namely: any premises used for any industrial or trade purposes, or on which matter is burnt in connection with any industrial or trade purposes including burning of waste; any facility or process that discharges or is capable of discharging air impurities into open air; every chimney; every industrial plant; and every fuel burning equipment. The Regulations 1978 adopt best practical means requirement in order to prevent the emission of noxious or offensive substances and to render them harmless and inoffensive. Under reg. 32 occupier of any industrial or trade premises is required to use the best practicable means on the following purposes, namely the size, design and inherent operation characteristics of the plant or process; the provision if necessary, and appropriate use of mist eliminator, dust arrestor, as absorber and control instrumentation; the use of suitable raw material or suitable fuel; the alternative process within the capacity and design capability of the plant; the alternative manner of operation or procedures within the capacity and design capability of the plant or process; the proper conduct and adequate supervision of operations; and regular and efficient maintenance of plant and control equipment.

Among air pollutants emission regulated by the Regulations 1978 are emission of dark smoke emitting from any stationary sources, and air impurities. As regard the former, its regulation is based on shade No. 1 on the Ringelmann Chart<sup>5</sup>; or shade No. 2 on the Ringelmann for fuel burning equipment utilising solid fuel. The regulation of air impurities is by means of emission standards. Permissible limits of emission, discharge or deposit from the particular trade, industry or process is done according to three standards, Standards A, B and C. These Standards apply to the following air impurities, namely solid particles concentration in heating of metals; solid particles concentration in other operations; metal and metallic compound; gaseous substance; asphalt concrete plant; Portland cement plant; and Facilities discharging asbestos and free silica. At present, any new facilities have to meet the most stringent regulations, Standard C, from the outset.

In addition to stationary sources, the Environmental Quality Act 1974 also controls smoke and gaseous emissions such as carbon monoxide, hydrocarbons, oxides of nitrogen and particulate matters emitted from mobile sources that uses either diesel or petrol engine. Specifically, in 1996, two Regulations were introduced to control emissions from both diesel and petrol engines by means of emission standards. One of

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<sup>4</sup> See the latest Air Pollution Index for Malaysia at the Department of Environment's official website at <http://www.doe.gov.my/>.

<sup>5</sup> The definition of Ringelmann Chart is provided in reg. 2 of the Environmental Quality (Clean Air) Regulations 1978.

which is the Environmental Quality (Control of Emissions and Diesel Engines) Regulations 1996 which controls smoke emission from every motor vehicle irrespective of whether it is in use or stationary, or in any bus terminus, taxi stand or private premises or on any private road. Here, maximum concentration of smoke from vehicles is tested based on Ringelmann Smoke Chart No.2. Control and monitoring of excessive black smoke emission emitted from diesel vehicle exhausts is done by the Department of Environment which has the power to issue compound on the spot to vehicles that fail to comply to the stipulated smoke limit.

Other means of controlling emission from diesel engine under these Regulations are by restricting the installation or replacing of the engine system, and requiring the assembler or manufacturer to conduct tests to verify the prescribed emission of pollutants standards. Emission standards of pollutants for a diesel engine are provided in the First Schedule, whereas emission standard of pollutants for new models of motor vehicles on or after 1 January 1997 is provided in the Second Schedule. These standards can only be contravened through the grant of licence if the Director General of the Department of Environment is satisfied of the following: that the motor vehicle is to be used for the purpose of assessing the durability or emission performance of the motor vehicle, or the motor vehicle is to be used for rallying with his prior written approval; the motor vehicle has been indented from the manufacturer and consigned for assembly in Malaysia or is already assembled or manufactured prior to the date of coming into force of these Regulations and has not at any time been registered under the Road Transport Act 1987; the motor vehicle is intended for military, combat or tactical purposes; or the motor vehicle is on transit through Malaysia.

Apart from diesel engines, similar control is imposed on emissions from petrol engine as provided by the Environmental Quality (Control of Emission from Petrol Engines) Regulations 1996. Here, the Department of Environment is required to conduct tests on petrol powered vehicles using the idling test method. The Department reported in its 2009 Report that the overall percentage of the test compliance was over 98 percent. Apart from that, in order to further regulate the emission from petrol engines, an exhaust emission standard for new vehicles has been established in order to improve exhaust emission. The standard provides that any new model of motor vehicle that is commissioned on or after 1 January 2000 is required to comply with emission standards prescribed by the Environmental Quality (Control of Emission from Petrol Engines) Regulations 1996. The standard dictates that the mass carbon monoxide should not exceed 2.2 g/km while the combination of hydrocarbon and nitrogen oxides should not exceed 0.5 g/km.

For the purpose of the control of lead concentration in motor gasoline, the Environmental Quality (Control of Lead Concentration in Motor Gasoline) Regulations were introduced in 1985. These Regulations provide for restrictions on the following unless licenced: import or manufacture any motor gasoline which contains lead or lead compounds expressed as lead in excess of 0.40 gramme per litre; possession, offer or exhibit for sale, sell, deliver for use or exchange for use any motor gasoline which contains lead or lead compounds in excess of 0.40 gramme per litre; or import, manufacture, possess, offer or exhibit for sale, sell, deliver for use or exchange for use any motor gasoline which contains lead or lead compounds in excess of 0.15 gramme per litre. Apart from emissions from diesel, petrol and motor gasoline emissions, the Environmental Quality Act 1974 also regulates emissions from motorcycles. This is provided under the Environmental Quality (Control of Emission from Motorcycles) Regulations 2003. Gaseous emission limit for motorcycle is provided in the Second Schedule and their emissions standards adopted are as follows, namely: Type Approval Emission Standard for new motorcycles 97/24/EC; and Idling Emission Standard for In-Use Motorcycles 4.5 percent carbon monoxide. For the purpose of the Environmental Quality (Control of Emission from Motorcycles) Regulations 2003, motorcycle's emission standards would be based on specific categories<sup>6</sup>: whether it is imported or locally manufactured or assembled; a new model or a current model; and engine type. In according with these standards, motorcycle importers are required to comply with the new emission standards effective from 1 January 2005 for new models and 1 July 2005 for current models, while local manufacturers would have to comply with the new emission standards effective from 1 July 2005 for new models and 1 July 2006 for current models. It is the requirement under the Environmental Quality (Control of Emission from Motorcycles) Regulations 2003 that a manufacturer of any current or new model must ensure that the gaseous emission limit of such model in a type approval test comply with the gaseous

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<sup>6</sup> First Schedule of the Environmental Quality (Control of Emission from Motorcycles) Regulations 2003.

emission limit as prescribed in the Second Schedule. Any person who intends to import any current or new model is also required to submit a report to the Director General on the type approval test conducted on such model as prescribed in the Second Schedule. Any manufacturer who fails to comply with these requirements, or fabricates the test commits an offence and shall on convictions be liable to a fine not exceeding RM100000 or to imprisonment not exceeding five years or to both.

The Fourth and Fifth Schedules of the Environmental Quality (Control of Emission from Motorcycles) Regulations 2003 provide for idling gaseous emission limits, and test for motorcycle engines respectively. Any registered owner or rider of any motorcycle in use the engine type of which is as prescribed in the First Schedule shall ensure that such motorcycle in use does not emit gaseous pollutants exceeding the emission limit as prescribed in the Fourth Schedule. Any person who contravenes this provision commits an offence and shall on conviction be liable to a fine not exceeding RM5000. Where a person obstructs any authorized officer conducting idling gaseous emission test, he commits an offence and shall on conviction be liable to a fine not exceeding RM10000 or to imprisonment not exceeding two years or to both. Apart from compound and penalties imposed on air pollution emissions from the relevant Regulations, section 22 of the Environmental Quality Act 1974 also imposes strict penalty to actions that constitute air pollution. Under this section, there is a fine not exceeding MYR100000 or imprisonment for a period not exceeding five years or both. If the offence continues, there will be an additional fine of MYR1000 a day for every day that the offence is continued.

#### **4. Conclusion**

Malaysia is committed towards the control of air pollution and has sufficient capacity to manage air quality through various means, including that of the enforcement of environmental law. From the policy point of view, given their affiliated origins and purposes, it is uncertain to what extent environmental fields and the climate change initiatives share common policies and objectives. The Malaysian scenario dictates that both are functions within separate ministries and bureaucracies, and implementing different specialized statutes and mandates. However, in practice, it is still fair to assume the role of environmental law as a means to deal with climate change issues particularly through the control of pollutants and GHG that come from the same sources. As addressed in this paper, Malaysia has taken several measures to abate air pollution including implementing emissions standards, conducting inspection and maintenance standards, and enforcing stricter penalties for non compliance of the law. In the context of air quality protection, air quality in Malaysia is considered as fairly good as indicated by the Air Pollution Index. However, it is vital for Malaysia to look at the bigger picture of air pollution control which is cross-sectoral in nature, involving not only environmental issues, but also that of climate change, global warming, energy and others. It is argued that environmental law does play a role towards reducing the emission of GHG. However, mitigating climate change can only be successful if countries including Malaysia are willing to take radical changes, not only in methods of reducing air pollution, but also in other transformations, such as in the use of energy, and in the implementation of green growth strategies. For Malaysia, growing awareness and capacity to understand the link between air pollution and climate change will eventually helps this country to manifest a concerted holistic approach on the issues of climate protection and pollution control.

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