

Managing air quality and pollution environmental sciences essay

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API or Air Pollutant Index is the index used to specify air quality. Malaysia used API system which follows Pollutant Standard Index (PSI) which developed by United States Environmental Protection Agency or US-EPA.

Air quality issues are really planetary issue today. The haze phenomena which happened in the twelvemonth 1983, 1984, 1991, 1994 and 1997 has opened our eyes and increased consciousness that air quality issues must be treated earnestly and an effectual plan must be developed in order to supervise, prevent and control air quality. Furthermore, Severe Acute Respiratory Syndrome (SARS) late detected in April 2004 besides has addition consciousness on how of import clean and healthy air we needs. Malaya has growing for major transmutation from agricultural to fabricating based state since decennaries ago. Realized on this, the authorities of Malaysia has enacted The Environmental Quality Act (EQA) in 1974. By the twelvemonth 1977, authorities has enacted Motor Vehicle (Control of Smoke and Gas Emissions) to command black fume which emitted from Diesel vehicles (Heng 2002) .

In Malaysia, Department of Environment(DOE) is responsible to supervise state air quality via 51 Stationss which located in strategic topographic points either in residential and industrial countries.

The increasing Numberss of industrial activities and increasing vehicles contributed significantly to air pollution. Harmonizing to DOE, motor vehicles contributed 82 % to air pollution in Malaysia. How about the vehicles statistics? Statistic by Road Transport section of Malaysia (until March 2010) shows registered autos in Malaysia is 8, 506 080 units, bike with 8,

940230 units and public conveyance with 162309 units. This immense Numberss of motor vehicles contribute significantly to air pollution.

Therefore, risky impact of air pollution must be monitored, control and prevented as it is about impossible to unclutter it to zero degree but we can work together to cut down the impact and pollution.

1. 1 The Vision

The vision of the program is to command on nomadic beginnings (motor vehicles) and stationary beginnings (industrial production procedure) in Malaysia.

1. 2 Objective of Plan and Goals

Achieving desired air quality degree of control for nomadic beginnings and installations which emits pollutants

1. 3 Beginnings of Air Pollution in Malaysia

Motor vehicles are the major subscribers to air pollution with 82 % and this is followed by stationary beginnings. The beginnings which categorized in stationary are including industrial installations such as chemical workss, steel Millss, oil refineries and power workss. Generally, stationary contribute emanations about 20 % - 25 % (DOE cited in Yahya 2006) . Attempts are taken by Malayan authorities to advancing sustainable environment where Malaysia has been ranked 38 from 146 states worldwide in environment sustainability.

1. 4 Developing control schemes

The first measure to develop control schemes is finding precedence pollutants which are air pollutants. In Malaysia, industrial country and busy metropoliss such as Kuala Lumpur are largely affected with pollutants. Among identified countries are Shah Alam (with 44 recorded unhealthy yearss per 350 yearss) , Kuala Lumpur (with 24 recorded unhealthy yearss) and etc. The following measure is to look into side effects of the schemes selected. However, the development of control schemes must affect multi stakeholders working squad such as the authorities organic structures, private sectors, Non-Government organic structures (NGO) and the public engagement.

1. 5 Control Schemes

There are practical schemes in get the better ofing the issue which are:

Air Quality Management scheme

This scheme consists of developing and implementing air quality criterions which contains elements of:

Optimum control scheme

Abatement steps

Cost-benefit or cost-effectiveness analyses

Air quality appraisal

Environmental harm appraisal and

Abatement options of appraisal

Emission control scheme

Emission beginnings are determined by instance by instance footing.

Fiscal inducement scheme

By this scheme, inducements such as gross revenues revenue enhancement are given for those who are commanding air pollution.

Cost benefit scheme

This scheme determines rationally how much harm should accept from air pollution compared to be in cut down the harm.

2. 0 Engineering Control Concepts

By and large, there are four technology constructs that can be applied to command emanation of air pollutants which is:

Changing or modifying design of procedure

Changing or modifying running status of the procedure

Change of natural stuffs and fuel

Installing appropriate pollution removal devices or system

3. 0 Long Term Plan

Using the right schemes for long term program are important as the job arising must be identified and analyzed foremost. As illustration, an instance happens of commanding industrial pollution at Sao Paulo, Brazil. They are

concentrating at particulate affair emanations which produced by industries. In other manus, dust emanations caused by traffics or Mobiles really were the major jobs and had been overlooked. Therefore, side effects, root causes and beginnings must be identified to choose incorporate and suited attacks.

3. 1: Emission Tax Fee

For long term Air Quality direction program, Malaysia may larn and implement as what had been implemented in Taiwan. Taiwan has introduced and implementing emanation revenue enhancement fee in 1995 for defilers. The scenario is about same as Malaysia where stationary beginnings and nomadic beginning are the chief subscribers for pollution in Taiwan. Harmonizing to Chung-Hsing National University research, 50 % of SO₂ emanation has been reduced since 1997 to the twelvemonth 2000. How did they make this? They used TEDS or Taiwan Emission Database as stock lists for this research. This research has shows consequences where pollutants are being connected closely with their emanation distributions. For Malayan, local universities may take portion and contribute to research that may take to high engineering invention in order to bring forth healthy air quality. There a tonss of universities that is capable in carry oning researches in Malaysia such as Universiti Sains Malaysia (USM) , Universiti Kebangsaan Malaysia (UKM) , Universiti Malaya (UM) and etc.

These stairss in my sentiment are a good measure as the research can be continues for long term besides bring forthing high quality and Numberss of station alumnus pupils in Malaysia.

3. 2: Government Engagement

In order to accomplish developed state vision and at the same clip stay its environment sustainability, Malaysia must continuously better air quality direction which has begun in 2002. Two old ages subsequently in 2004, Ministry of Natural Resources and Environment was formed which consists of 10 environment and natural resources bureaus. Happening of haze phenomena late in Muar, Johor on 19th October 2010 has opened our eyes how serious air quality and the impacts are to us. Schools were advised to shut temporarily by Deputy Prime Minister as countermeasures to forestall the state of affairs from acquiring worse. Therefore, countermeasures such as implementing rigorous Torahs should be done where compound should be implemented to those who are involved in industries which produce pollution, unfastened combustion, over limit emanations or fumes from nomadic and etc.

3. 3: Rigorous Environment Quality Regulations

Chart 1: Registered Vehicles in Malaysia (by twelvemonth)

Mobile beginnings remain as the biggest subscribers of pollutants in term of C monoxide and N oxide emanations. Harmonizing to Road Transport Department, Numberss of vehicles and Mobiles in Malaysia were increasing every twelvemonth as is Chart 1.

In 2004, Environment Quality Regulation (Control of Emission from Motorcycles) has been gazette. This nevertheless, need to be updated from clip to clip as our state are turning even though universe economic system

climate is about to retrieve. Table 3. 3 (a) as per below shows the statistics of increasing registered Numberss of vehicles in Malaya:

Year / Types of Registered vehicles

2005

2006

2007

2008

2009

Cars

537900

458294

468512

537092

513954

Motorcycles

422255

448751

484598

543122

441545

Public vehicles

9981

9090

7692

9713

8209

Table 3. 3 (a) : Registered Vehicles in Malaysia as recorded by Road
Transport

Department (by Year)

Large Numberss of vehicles besides means big sum of emanation. Therefore, enforcement and reappraisal of air quality ordinance must be done often and accommodate the latest demand. Department of Environment (DOE) Malaysia must play major functions in implementing rigorous ordinances. DOE may patterns periodic audit to premises harmonizing to Environment Quality Act 1974. Besides that, other actions that suggested to be performed are fastening new application for licensing (as subdivision 11) .

3. 4: Public Engagement

Public engagement may guarantee that community and other parties working together in the development procedure. Populaces may involved by describing any unfastened combustion or improper industries activities in their country to the governments bureaus. Malayan may larn from US citizens civilization where persons are responsible and develop their ain program which called State Implementation Plan or SIP which related to air quality issues. Harmonizing to the program, each province must hold ain SIP. Each province in US is required to hold SIP which contains schemes and control steps to get the better of pollution issues.

4. 0 Mobile Source Control Strategy

Proposed action on commanding nomadic beginnings is:

Plan 4. 1 New Vehicles Design

Emission from Mobiles can be controlled by assorted methods. One of the methods is utilizing catalytic convertors. Catalytic convertor was a device introduced by a Gallic mechanical applied scientist whom is Eugene Houdry. The catalytic are functioned to diminish toxic emanations from internal burning engine. Nowadays, autos are equipped with this device which maps to cut down C monoxide, VOCs and NO_x emanations.

Vehicles are besides can plan to accommodate environment friendly and at the same clip utilizing less polluting fuels. Therefore, less emanation and pollutants are produced.

Plan 4. 2 Conduct Awareness plan and run

Using media, public run, seminars and uninterrupted plan on may increase consciousness on emanations produced by Mobiles or stationary beginnings. Media plays large influences in our life daily particularly in presenting information. Educating people particularly at school and universities may implement from now on to 'born ' the earlier consciousness. In guaranting the run works efficaciously, internet web can be selected as a medium to present messages such as 'Green Technology ' run in TV3 channel.

Plan 4. 3 Amendment and presenting consecutive regulations and ordinances

Government organic structures such as Road Transport Department (JPJ) could play of import map such as carry oning on a regular basis and scheduled vehicles review. Inspection and care is a best manner to guarantee emanations are controlled right and efficaciously. In United States, rider autos and trucks are required to run into rigorous pollution criterions before it can be sold to market. Malaysia besides can implement and better this method better particularly for vehicles which has been used for more than 5 old ages. In other words, rigorous pollution criterions are reviewed and implemented on a regular basis.

Besides that, higher compound can be introduced to do certain the ordinances are effected efficaciously.

Plan 4. 4 Introducing and advancing Green Technology Mobiles in Malaya

Presents, intercrossed engine and electric autos has been get downing to developed and marketed. Toyota, Honda, Mitsubishi and other elephantine automotive companies are viing with each other to bring forth environment friendly autos. In order to command Mobiles emanations in Malaysia, why non PROTON, PERODUA and MODENAS working together to develop loanblend and electric based engines which involved motorcycles, autos, trucks and MPV 's. This measure may guarantee that our hereafters are cleaner where less fumes and emanations are produced. Malaysia still used gasoline based and so far, no loanblend or to the full electric based engines can be found on the route.

By taking action today, who knows, possibly all vehicles in the hereafter are 90 % utilizing electric and intercrossed engines. This issue has been raised by Deputy Prime Minister, Tan Sri Muhyiddin Yassin whom urged Malayan companies to put in developing green and clean engineering for future vehicles. Collaboration with local universities, sellers and makers could recognize this program as Malaysia had more than 690 maker of constituents and 110 of bikes makers.

Plan 4. 5 Applying technology control constructs

Let 's take an illustration from India as something we could larn and adapted. In India, 70 % of air pollution is caused by motor vehicles, two shot engines as the major subscriber, use of old autos which is more than 20 old ages and uses of low quality fuel with high S contents (in Diesel) . Therefore, the

countermeasures taken are bettering fuel quality ; strengthen care and review and decrease of benzine from 3 % to merely 1 % .

The constructs of alteration of natural stuffs and fuels are efficaciously solved this issue. In Malaysia, we could see vehicles which are 5 old ages and sometime ages up to 10 old ages are still traveling on the route. This civilization is wholly different in Japan where they will alter to new autos after it achieve five old ages of use. Why non in Malaysia, we strengthen review and care policy for vehicles for every 5 old ages or less? This could guarantee that vehicles on the route are safe and lone bring forth little per centum of emanations.

Plan 4. 6 Bettering Fuel Quality

Most underdeveloped states are working on cut downing contents of S and lead. By bettering fuel quality, it is indirectly presenting Compressed Natural Gas (CNG) which free of S and lead. PETRONAS nevertheless has done fuel quality betterment by being the first oil company in Malaysia whom offer 'SL' service categorization of American Petroleum Institute (API) . Now, PETRONAS is perchance the first in the universe which offer engine oil with new API 'SM' categorization. Therefore, support from authorities and uninterrupted researches are required to better fuels quality from clip to clip. Universities and private sectors should works together in this scheme as engineering can be portion and being improved from clip to clip.

5. 0 Stationary Beginnings Control Strategy

Power works, smelters, cement workss, refineries and other industrial procedures are categorized as stationary beginnings. The factors that must be considered to choose appropriate scheme are:

Stationary beginning status

Control of efficiency required and

Pollutant collected

Therefore, suggested program to command stationary beginnings in Malaysia are:

Plan: 5. 1 Interstates coordination and cooperation

Natural gas are widely use in power generating sectors. Due to that, interstate plan can be introduced to command letter papers particularly in identified country with high possible pollution such as industries country and extremely development or building country. Harmonizing to Country Synthesis Report on Urban Air Quality Management (2006) , major industries which impacting air quality in Malaysia are:

Iron and steel industry

Oil and gas industry

Petrochemical sectors

Pulp and paper

Power workss and

Waste incineration sector

Therefore, attempts are taken to cut down dependence on the use of natural gas since Eight Malaysia Plan and it is expected to cut down to 56 % in the twelvemonth 2010. Government should work hard on this continuously as we could non depend 100 % on natural gas and crude oil beginnings as the costs are acquiring higher for the exploring costs. Systematic informations and constitution of informations centre which portions information between provinces may roll up all information demands, analysis intent and looking for the countermeasures based on instance by instance.

Plan: 5. 2 Application of Nano-technology

Nowadays, we can hear everybody speaking about Nano-technology development. What is meant by Nano-technology? Harmonizing to Merriam-Webster Dictionary (1987) , it is define as `` an art of pull stringsing stuffs on an atomic or molecule particularly to develop microscopic devices '' . Construction stuffs, merchandises such as skate board and etc and place applications merchandise can be produce by this method. As an illustration, air conditioner are developed utilizing this new engineering. For air conditioner, Nano Carbon, Nano Silver and NanoPhotocatalyst are some of the illustrations that have been marketed. Therefore, authorities may give support by cut downing revenue enhancement and monetary values to Malaysians in order to promote them to purchase these types of merchandises.

Plan 5. 3 Applying control engineering

Stationary beginnings can be control by using technology control concepts every bit mentioned above (publish 2. 0) such as use of low Sulfur fuels. As an illustration, TNB power Stationss in Jana Manjung as reported in TV3 is utilizing low Ss and low bitumen coal as its chief beginnings in bring forthin electric power and at the same clip cut down pollution. The works was equipped with waste H₂O intervention to handle its wastewater before released into the sea. The works can be the best samples as it meet higher emanation criterions in ASEAN as it operates to particulate degrees of merely 50 mg/NmA? compared to expected ASEAN degree which is 400 mg/NmA? . Even though the cost is high, this application is seems benefit us and at the same clip control and cut down pollution.

The other method is through fuel pricing where cleaner fuels should included in economic inducements. Due to this, cleaner fuels may gazette as control monetary value points in Malaysia. This has been announced on 10th June 2010 by Malayan Prime Minister, Dato ' Sri Mohd Najib Bin Tun Haji Abdul Razak on RMK 10 where he stressed that the monetary value of those points are guaranteed will non to increased dramatically.

Plan 5. 4 Adapting International Standard Organization (ISO)

ISO is a widely known organisation which formed connexion between public sectors and authorities. In order to accomplish desired degree of control, implementing ISO criterions may one of effectual schemes as the criterions

are compiled in inside informations. The illustrations of criterions which can be applied are:

No.

Standard

Aims

1.

ISO8573-1: 2010

Specify pureness of tight air at peculiar point

2.

ISO8573 Parts 2 to 9

To prove air tight system for specific contaminations

3.

ISO8573-4: 2001

Test method for solid atom content

4.

ISO8573-6: 2003

Test method for gaseous contamination content

Modern installations which required by ISO already included effectual attacks which the ends are to accomplish stringent air quality degrees.

Plan 5. 5 Promoting cleaner productions

This means, effectual and procedure were running with high efficiency to forestall or cut down pollution of air, H₂O and air. By proper direction of production, stuffs, energy and cost can be salvage a batch. Besides that, presenting licence or particular license for extremely pollutant procedures can be done in productions.

Plan 5. 6 Industrial Zoning Planning

Basically, industries country should turn up far from residential or sensitive countries. Resettlement of bing industries zone besides can be considered but that depends on economical factors. For sensitive country, monitoring can be done by turn uping proper instruments to supervise and command emanations. Resettlement of major beginning of pollution besides can be considered as had been done for cement works in Haiphong, Vietnam. The works has identified by Vietnam Environmental Management Strategy as major subscribers of suspended particulates. As solutions, the authorities of Vietnam has agreed to relocate the works as the best countermeasure.

6. 0 Factors should considered during development of control schemes

Consideration must be taken before developing and implementing control schemes efficaciously. The factors which must be review are:

Economic factors

Economic factors that must be considered are capital, running cost, life span of equipments and care. The chief inquiries here will be who will bear the cost? Ideally, the authorities must put for the installations and latest engineering must be updated particularly for high engineering equipments, the operating cost and care occupation to keep it. Therefore, those who are involved and caused pollution should pay or compounded or utilizing the 'Polluter Pays Principles'.

This is besides a manner to bring forth and obtain support. This can be used for environmental intent, care of equipments such as monitoring devices, running cost and as a fund for implementing schemes. This has been implemented in Taiwan where the finances are used for financing advanced thoughts and besides backing up research on air quality issues.

6. 0. 2 Environmental factors

Air quality conditions in Malaysia are monitored by Department of Environment (DOE) through 51 Stations. In addition, 21 different sites utilizing High Volume Sampler were established to measure entire suspended particulate, particulate matter PM₁₀ and heavy metal. Therefore, possible industry country such as palm oil works, steel industries, cements and etc must aimed as precedence country to be monitored.

Presents, environment conditions are altering instantly. Why? Haze phenomena are something must be look at. It happens 1000s times from

Malaysia and all of a sudden we faced the effects here. In planing effectual control scheme, factor that must be considered includes:

Legal demands

Contribution of control system as pollutant

Ambient air quality conditions

Adequate public-service corporations such as H₂O scrubbers

Malayan Environment Quality Act 1974 is related to bar, sweetening to environment and control of pollution. As the clip maintain traveling on, these statute laws should be review as environment and pollution issues are being wider range now. One the issue is haze which has been faced by Malaysia late. Therefore, control scheme as rigorous statute laws is one of good method which can be applied in Malaysia.

In most underdeveloped states, rigorous criterions are set and applied for new imported autos as a manner to cut down bing job of pollution in a metropolis.

As DOE is the section whom supervising air quality conditions, they are responsible to turn up the monitoring devices. As to day of the month, strategic locations has been equipped with Continuous Air Quality Monitoring Station as per below image.

Photograph 6. 0. 2a: Continuous Air Quality Monitoring Station

(DOEPhotoLibrary)

Besides that, ambient air quality is monitored by 51 Stations which are located strategically. Therefore, these equipments must be maintained and new ones should be considered if air quality in that new country (such as industry or extremely polluted) is detected harmful to human wellness.

Engineering factors

Besides environment and economic factor, technology factors also play a role in import functions. Engineering factors should be considered in developing schemes. Factors such as gas watercourse characteristic, public presentation features of control system used, contaminant characteristic i. e. toxicity must be identified and analyzed. Therefore, this may assist a batch in developing the right approaches or schemes.

Besides that, it is of import to see all technology instruments available. This is because experience has shown that utilizing multiple is most effectual for peculiar air issue.

As an illustration, an beforehand analysis of the effectual analysis of a scheme implemented has been done in Chennai, India. Assessment was conducted and sulfur dioxide emanation has been emanating in populated country from thermic works. By engaging adept advisers, scrubbers and mechanical dust aggregators have been chosen as the most effectual pick to work out this issue. As the consequences, sulfur dioxide emanations from thermic works have been reduced to 90 % . From this scenario, we can state that thorough analysis must be conducted before placing and accommodate the best scheme to be adapted.

Today, tons of modern and sophisticated equipments or devices available for the intent of commanding pollution. It can be used as tools for monitoring, commanding, destructing contaminations from exhaust watercourse and to take them before it is emitted to atmosphere. Some of the devices that can be usage are bag houses, particulate scrubbers, electrostatic precipitators and mechanical aggregator such as dust cyclone. Therefore, using new engineerings for both of pollution beginnings should be considered in developing control schemes.

Decisions

Multiple pick of schemes are seems the better manner in battling Mobile and stationary beginnings of pollution. The selected attacks may non accommodate all instance at one clip. It may depend on the root cause or emanations produced. Due to that, depending on merely one method of attacks or schemes is non a good pattern.

The impact of side effects or pro and cons of a scheme being develop must be studied and good plan. Again, coaction with authorities organic structures, private sectors and local universities can be formed for these intents. This is due that to assorted establishments whether authorities or non authorities are responsible to pull off and keeping air quality in Malaysia. In short, cooperation is extremely required for preparation of effectual schemes.

Public sectors may affect in assisting authorities implementing control schemes. Therefore, squad work is indispensable in developing and implementing selected schemes.

In implementing a scheme whether in get the better ofing Mobile or stationary beginnings, the scheme itself should develop in cooperation with authorities, private sectors, and besides civil society. By this manner, it will advance sense of ownership particularly to guarantee the successful of 1 Malaysia non merely for development of our state, economic but including environment issues.

However, those developed schemes must be monitored. This is due to of import of showing clearly the different phases or stages of execution. Therefore, the advancement can be tracked and the scheme can be improved.

Media besides could play of import functions in scattering information and consciousness sing air quality plan. This is easier as cyberspace is one of the best options available. This scheme has been implemented in China as their authorization 's organic structures describing on pollutants in 42 metropoliss as an consciousness plan get downing from the twelvemonth of 1999.