Pakistan National Workshop on Cleaner Fuels and Vehicles

WORKSHOP REPORT

INTERNATIONAL UNION FOR CONSERVATION OF NATURE

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About CAI-Asia

The Clean Air Initiative for Asian Cities (CAI-Asia) promotes better air quality and livable cities by translating knowledge to policies and actions that reduce air pollution and greenhouse gas emissions from transport, energy and other sectors. CAI-Asia was established in 2001 by the Asian Development Bank, the World Bank and USAID, and is part of a global initiative that includes CAI-LAC (Latin American Cities) and CAI-SSA (Sub-Saharan Africa).

Since 2007, this multi-stakeholder initiative is a registered UN Type II Partnership with over 170 organizational members, eight Country Networks (China, India, Indonesia, Nepal, Pakistan, Philippines, Sri Lanka, and Vietnam) and the CAI-Asia Center as its secretariat. Individuals can join CAI-Asia by registering at the Clean Air Portal: www.cleanairinitiative.org. Its flagship event, the Better Air Quality conference, brings together over 700 air quality stakeholders.

About IUCN Pakistan

In 1982, an exploratory mission from the IUCN Headquarters laid the foundation for the IUCN Programme in Pakistan. In 1985, a one person IUCN Country Office was established in Karachi to initiate the implementation of the National Conservation Strategy. Since then IUCN Pakistan has grown into the largest country programme with five programme offices and a number of offices in the field.

IUCN's mission is to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable. To ensure sustainable development of Pakistan's natural resources, IUCN Pakistan aims at:

- Integration of environment and development;
- Support to institutional and human resource development for environment;
- Facilitation for the creation of a supportive policy and legal framework; and
- Increasing popular support for the environment.

About PCFV

The Partnership for Clean Fuels and Vehicles (PCFV) assists developing countries to reduce vehicular air pollution through the promotion of lead-free, low sulphur fuels and cleaner vehicle standards and technologies.

The Partnership aims to support developing countries in their efforts to improve fuel and vehicle technologies that reduce air pollution. The Partnership builds on current trends and efforts in the development of fuel and vehicle technologies. Constant improvements in these technologies have been introduced and diffused for decades.

The Partnership for Clean Fuels and Vehicles was launched at the WSSD in Johannesburg in 2002. The Partners met for the first time in New York on 14 and 15 November 2002 to discuss and develop the implementation arrangements for the Partnership. There are over 90 partners of the PCFV, which include Governments, Civil Societies, International Organisations and Institutions of Higher learning.

Ministry of Environment

The Ministry is the focal point on the subjects of Environment, Ecology, Human Settlement and Forests in Pakistan.

Ministry of Environment is headed by a Federal Minister while the Federal Secretary holds the administrative charge. It comprises five wings namely Administration, Development, Environment, International Cooperation and Forestry. Each of the Wings is responsible for its respective functions. Moreover, the Ministry controls the specialized departments such as the Energy Conservation Center (ENERCON), Pakistan Forest Institute (PFI), National Council for Conservation of Wildlife (NCCW) and Zoological Survey Department (ZSD). The Ministry is responsible for implementation of National Environment Policy, planning and international environment coordination. A National Conservation Strategy Unit set up in the Ministry is responsible for coordination of the implementation of the country's National Conservation Strategy. A UNDP funded NEAP Support Programme has been established in the Ministry with a view to strengthen its capacity in various operational areas.

Ministry of Petroleum and Natural Resources

The Ministry is responsible for dealing with all matter relating to petroleum, gas and mineral affairs. It endeavors to ensure availability and security of sustainable supply of oil and gas for economic development and strategic requirements of the country and to coordinate development of natural resources of energy and minerals.

1. INTRODUCTION

The National Workshop on Cleaner Fuels and Vehicles was held on May 19, 2010 in Islamabad, Pakistan. It was organized by IUCN Pakistan in collaboration with the Ministries of Petroleum and Environment, Partnership for Clean Fuels and Vehicles (PCFV) of UNEP and Clean Air Initiative for Asian Cities center (CAI-Asia). This Workshop brought together representatives from Government agencies, academe and researchers, private industry, and non-governmental organizations to help develop a national roadmap and work plan for fuel quality improvements and stricter vehicle emission standards.

International and local experts gave presentations during the Workshop that demonstrated policy options and strategies for fuel quality and vehicle emissions improvements. Participants engaged in discussions for the draft road map for improving fuel quality and vehicle emissions in Pakistan.

2. BACKGROUND

Pakistan is strategically located at the junction of Middle East and South Asia with a population of around 160 million people. The rate of urbanization is 33.5% in Pakistan, highest in the South Asia region. Economic development in Pakistan has been accompanied by environmental problems such as urban air pollution. Pakistan lost Rs. 365 billion or nearly 6% of the GDP in FY 2006 due to environmental degradation and over 22,000 deaths per year are caused by urban air pollution in the country. Cost of urban air pollution was about Rs. 65 billion in 2006, according to the World Bank.

An important contributing factor to the problems of urban air pollution, and associated impacts on climate change, as well as poor road safety and congestion is the rapid growth in vehicles and poor fuel quality in Pakistan. The vehicle emission is a serious public health and environmental problem in Pakistan, particularly in urban areas. Vehicle emissions tend to be concentrated in the big cities like Karachi, Lahore, Peshawar, Quetta and Islamabad/Rawalpindi where vehicle fleets are growing at a rapid pace. Every day, around 400 plus vehicles are being added to the roads of Karachi alone. According to the Government of Pakistan records, there are 6.167 million registered vehicles in Pakistan. Out of the total registered vehicles 2 million vehicles are running on CNG while the rest, which includes buses, trucks, and two wheelers, three wheelers etc, are using gasoline and diesel.

The emission of air pollutants is directly related to fuel consumption. Pakistan's consumption of petroleum products is growing at an annual rate of about 6%, almost half of which is consumed by the transport sector. Pakistan’s sectoral oil consumption during the year 2007-08 was power (39.2%), transport (51.9%), agriculture (0.6%), industry (5.9%), domestic (0.7%) and government (1.7%). Pakistan has seven medium to large scale refineries.

In Pakistan, the maximum allowable limit of sulphur in High Speed Diesel (HSD) is 1.0%, which is the highest in the region. The combination of HSD with obsolete vehicle technology leads to unsafe levels of emission of smoke, soot, and Particulate Matter (PM). PM from vehicles is mostly fine and ultra-fine in size, and can be inhaled deep into the lungs resulting in respiratory and cardiovascular diseases, increased risk of lung cancer and premature death. The detail of health impacts caused by PM in 2006 is given below:

Table 5: Annual Costs of Health Impacts of Ambient Particulate Air Pollution (Billion Rs.)

Health End-Points	Attributed Total Cases	Total Annual Costs
Premature mortality adults	21,791	58-61
Mortality children under 5 yrs	658	0.83
Chronic Bronchitis	7,825	0.06
Hospital Admissions	81,312	0.28
Emergency room visits/ outpatient hospital visits	1,595,080	0.80
Restricted activity days	81,541,893	2.06
Lower respiratory illness in children	4,924,148	0.84
Respiratory symptoms	706,808,732	0.00
Total		**62-65 Rs.**

Source: Country Strategic Environment Assessment Report, 2006 by the World Bank

These air pollutants can be reduced significantly by using clean (unleaded and low-sulphur) fuels, improved engine technology and after-treatment devices.

Lowering sulphur in fuels also contributes directly to the reduction of air pollutants, such as sulphur dioxide (SO2) and sulphate PM from all vehicles, and decreases maintenance costs, as high sulphur levels cause corrosion of fuel injector and piston rings, oil acidification and overall engine wear. Cleaner fuels also promote the introduction and increased effectiveness of vehicle emission control technologies, resulting in less vehicle emissions of carbon monoxide, hydrocarbon, nitrogen oxide and PM. As fuel quality and vehicle emission standards become more stringent, a variety of engine modifications (direct injection, high-pressure injection, computer controls, multiple injections, exhaust gas recirculation, and after-cooling, etc.) and emission control technologies (diesel oxidation catalyst, diesel particulate filter, advanced catalytic converters, flow-through filter, NOx absorbers, selective catalytic reduction, etc.) can be applied.

Government of Pakistan has taken a number of initiatives to gradually improve the specifications of petroleum products. Mono grade 87 Research Octane Number (RON) gasoline was introduced in the country with effect from 1 October 2000. 90 RON, unleaded gasoline is being produced and marketed in the country since March 2003, which is three years ahead of the targets given by the World Bank. Unleaded gasoline has brought tremendous benefits to the public, as lead is highly injurious to health especially to children. Diesel Hydrodesulphurization Project (DHDS) has been initiated, and by the end of 2010, one of the refineries would set up Diesel Hydro-desulphurization unit which will reduce sulphur content from Diesel and meet the revised country specifications of 500 ppm or (0.05%) for sulphur. The Standing Committee on Petroleum and Natural Resources of Pakistan's Senate - the apex legislative body of the country, in October 2007 expressed its deep concern over the fact that higher sulphur content in diesel is worsening the problem of vehicular emissions, which poses a serious threat to the public health and environment.

Government also notified on 22 October 2008 the adoption of following Euro standards:

- Introduction of Euro II compliant petrol vehicles by 1 July 2009, and
- Euro II compliant diesel vehicles to be introduced by 1 July 2012.

For this, Ministry of Petroleum and Natural Resources will ensure availability of Euro II compliant diesel with low sulphur i.e. 500 ppm by July 2012.

In order to respond effectively to the challenges of ensuring the availability of low sulphur fuel in market, a road map needs to be devised and incorporated into the development agenda of the country. As a consequence, a National Workshop on Cleaner Fuels and Vehicles was organized on 19 May 2010 in Islamabad by the Ministry of Petroleum & Natural Resources (MoPNR) and Ministry of Environment of Government of Pakistan, with support from the United Nations Environment Programme's (UNEP) initiative Partnership for Cleaner Fuels and Vehicles (PCFV), International Union for Conservation of Nature (IUCN) and Clean Air Initiative for Asian Cities (CAI-Asia) Center. The Workshop brought together around 70 relevant stakeholders from public sector, private sector, civil society and academia. A list of participants is provided in **Annex - I**.

The Workshop helped in identifying the issues concerning both the sectors (public and private). It also provided the unique opportunity to the stakeholders to discuss integrated measures to address the issues posed by the existing fuel quality and vehicular technology.

2.1 Objectives

The National Workshop aimed to bring together stakeholders to:

(i) draft a roadmap for the introduction of Euro IV fuel and vehicular technology in Pakistan with mutual consultation,

(ii) update them on the actions taken and planned by the Government of Pakistan vis-à-vis implementation of the Euro II vehicle emission standards and fuel specifications in Pakistan,

(iii) encourage the participation and secure the buy-in of other sectors in the implementation of these standards, and

(iv) share information with stakeholders on the trends in fuel and vehicle quality in Asia and other regions of the world.

2.2 Design

The Workshop design consisted of an inaugural session including a key note address, context setting session, and two technical sessions to have public and private sectors perspectives. This was followed by a concluding session including an open discussion and a plenary to present the recommendations as discussed during the course of the Workshop.

The presentations made during the technical sessions focused on the necessity of cleaner fuels and cleaner vehicular technologies by coupling their significance with the economics, social, environmental and health sectors.

For the recommendations and the way forward, the floor was opened for the participants in the concluding session for their input in framing recommendations on the introduction of cleaner fuels and vehicles in Pakistan.

The agenda is provided in **Annex - II**.

3. PROCEEDINGS

Presentations were made by national and international resource persons followed by facilitated discussions on technical, policy, and financing issues in the move to cleaner fuels and vehicles.

3.1 Opening

The workshop commenced with the opening remarks of Mr. Mahmood Akhtar Cheema, Manager, IUCN Islamabad Programme Office, which was followed by the inaugural speech by Mr. Muhammad Javed Malik, Federal Secretary, Ministry of Environment, Government of Pakistan and the keynote address by Mr. Kamran Lashari, Federal Secretary, Ministry of Petroleum and Natural Resources, Government of Pakistan.

In his opening remarks, Mr. Cheema welcomed the resource persons and Workshop participants. He commended the role of the Ministry of Petroleum and Natural Resources and the Ministry of Environment in addressing the issue of air pollution and environmental degradation vis-à-vis fuel and vehicular technology. He specially thanked both the Secretaries of the Ministries of Petroleum and Environment for attending the inaugural session and providing their very valuable advice in the development of the roadmap towards Euro IV compliant fuels and vehicles in the country. Their participation was a clear reflection of Government's commitment towards the seriousness of the issue, he said. He said that the Government of Pakistan is cognizant of the issue of fuel quality. By organizing this National Workshop the Government of Pakistan has clearly honored its pledge to move towards cleaner fuels and vehicles with the aim of achieving sustainable development in the country.

Mr. Cheema informed the participants that air pollution has emerged as one of the major environmental issues in Pakistan. The maximum allowable limit of sulphur in High Speed Diesel (HSD) is 1.0%, which is the highest in the region. The combination of HSD, with obsolete vehicle technology leads to the emission of unsafe levels of smoke, soot, and Particulate Matter (PM) and this phenomenon is very dangerous for human health. He said that cleaner fuels are essential to ensure good health for all the citizens. He further said that there is need to benefit from the regional and international expertise in this avenue. He welcomed and thanked UNEP-PCFV and CAI-Asia for bringing in the international experience for the benefit of the Government of Pakistan to help in developing a roadmap that will eventually pave the way for cleaner fuels and vehicles in Pakistan.

Mr. Muhammad Javed Malik, Federal Secretary Ministry of Environment in his inaugural address said that the issues on the environmental horizon at national level are much more serious and they need due attention from every individual. The pollution is not confined to one area, he said. Environmental problems can be traced everywhere such as in air, water, and marine environment. He informed the participants that the cost of environmental degradation is Rs. 365 billion per year as estimated by the World Bank (World Bank 2007). He also expressed his concern that for saving on the cost of production the industries do not make necessary investments in pollution control, thus shifting the cost to the government in the form of higher health budgets.

Mr. Malik said that the environmental degradation is the natural outcome of the growth. If we are going to increase the number of vehicles, it will have an impact on our environment in the form of poor air quality. Larger fleet of vehicles means the emission would also be higher. We have to

curtail emissions by improving our vehicular technologies and curb the nuisance of air pollution by introducing cleaner fuels. He further said that the pace of degradation is very high and to meet these challenges, very effective and prompt actions are needed. He envisaged that gathering of all the stakeholders on a single platform is a very important milestone and it will help focus on certain key areas and in the development of a mitigation plan. He hoped that deliberations of the sessions would crystallize into recommendations, which the government will be pleased to take forward both at the federal and provincial levels. He said that environment is the area where awareness is of paramount importance and significance. He insisted that the key to achieving sustainable development is in bringing in a behavioral change in ourselves, which does not come under any regulatory mechanism rather it is a personal discretion and commitment.

Mr. Kamran Lashari, Federal Secretary Ministry of Petroleum and Natural Resources in his keynote address said that clean air is one of the most important prerequisite of livability. Therefore, polluted air's impact on people is much higher as compared to other pollutants mainly because it does not discriminate between rich and poor, men and women. He said that, Pakistan's consumption of petroleum products is growing at the annual rate of approximately 6%, almost half of which is consumed by the transport sector. He said that a number of initiatives have been taken to gradually improve the specifications of petroleum products. He shared the details of such initiatives like introduction of Euro-II compliant diesel vehicles by 1 July 2012 and introduction of 5,000 CNG Buses in major urban areas of Pakistan. Lead has been completely phased out from gasoline in Pakistan since 2001.

He further said that ensuring air quality is not just responsibility of a single institution, rather it is a responsibility of each and every individual. He asked all the stakeholders to join hands for the sake of future generations. He expressed support for the development of a workable, practical and clear-cut road map specially tailored in the local context for achieving Euro-III and IV fuel standards in the country.

3.2 Setting the Context

This session set the overall context of the Workshop. The session was chaired by Mr. Mahmood Akhtar Cheema, Manager IUCN Islamabad Programme Office. Two presentations were made during this session.

3.2.1 Presentation: Experience of Pakistan in Moving towards Cleaner Fuels and Vehicles, *Mr. Hilal A. Raza, Director General and Chief Executive, Hydrocarbon Development Institute of Pakistan*

Mr. Hilal Raza gave a detailed account of the evolution of cleaner fuels and vehicles in Pakistan. He said that Pakistan's major achievement in clean transport fuels has been the introduction of CNG to replace liquid fuels. The prime motive of introducing CNG was to move towards energy security, however the introduction of CNG as a vehicle fuel also co-benefited by improving the ambient air quality. CNG, he said is sulphur and lead free fuel. He also shared interesting statistics regarding Natural Gas Vehicles (NGVs). According to him, there are about 10 million NGVs worldwide (in around 70 countries). The growth of these NGVs stands at 30% per year. The International Association of Natural Gas Vehicles (IANGV) envisions 50 million NGVs by the year 2020. Pakistan has emerged as a global leader in CNG use, leaving behind Argentina and Brazil. However, he also expressed his concern that this growth is unsustainable, keeping in view the availability of

natural gas in the country. He said that Government's policy initiatives reflect strong commitment and institutional support for the introduction and promotion of cleaner fuels and vehicles. Government is introducing flexible rules and liberal licensing in this regard. He also mentioned that the Ministry of Petroleum notified E-10 fuel (a blend of Ethanol/Gasoline) as a petroleum product and feels that E-10 is the fuel of the future.

3.2.2 Presentation: Vehicle Emissions and Fuel Quality Standards in Asia and Objectives, *Mr. Herbert Fabian, Transport Programmme Manager, Clean Air Initiative for Asian Cities Center, Manila, Philippines*

Mr. Fabian gave a brief background of the Partnership for Cleaner Fuels and Vehicles (PCFV) programme of UNEP and the Clean Air Initiative for Asian Cities (CAI-Asia). He informed the Workshop participants that CAI-Asia and partner organizations with the support of Asian Development Bank's (ADB) have proposed a road map for cleaner fuels and vehicles in Asia. Apart from Pakistan, he said CAI-Asia is assisting Philippines and Vietnam in developing a road map for cleaner fuels and vehicles under PCFV initiative. He apprised the participants regarding the latest trends in fuel quality and vehicle technologies in the Asian cities and other regions of the world. There is a need to develop realistic fuel quality road maps in Asian countries depending on their capability to achieve the assigned milestone, he said. He further added that it is important to involve all stakeholders in the decision-making and action planning process for the introduction of cleaner fuels and vehicles. He shared that vehicle numbers are growing exponentially in Asia. The issue can be resolved if we do not depend on vehicles for our daily commutation. It is better to walk or travel by bicycle for short trips, he added. He stressed on the need of improving non-motorized mode of transportation. In one of CAI Asia's recent studies, it was discovered that trucks and freight handling are also major contributors of air pollution and carbon dioxide emissions. The trucks are usually running on old engine technology and are highly inefficient in terms of oil consumption. Since most of these trucks consume diesel, therefore, the level of emissions from aging truck fleet have considerable environmental implications. As the country progresses a lot of freight movement takes place which results in an increased emission, which needs to be look into. Only a few countries have set fuel economy and fuel efficiency standards. In Asia only Singapore, South Korea, China and Japan have implemented fuel efficiency standards. Several of the countries in Asia region have initiated plans for 50 parts per million (ppm) in terms of sulphur content in diesel which is Euro 4 vehicle emission equivalent standard. If we have stricter Euro fuel standards, restriction will need to be imposed on all the new vehicles being imported into the country. The vehicles will be required to have advance emission devices and other equipment to comply with the standards. It would be important to have matching quality of fuel for the vehicles with advanced devices. If the lower quality of fuel is used in these vehicles, the equipment will fail to deliver in terms of fuel consumption and emissions. Therefore, we need to ensure that the vehicles have equivalent quality fuel.

Mr. Fabian said that, the need of the hour is to set a timeframe as to when we can move to higher vehicle standards. It is fortunate that Pakistan has a major clean fuel i.e. CNG, which complies with Euro 4 standard. It only needs to address certain sectors in the motor industry e.g. diesel vehicles and heavy duty diesel trucks. He presented the case study of Thailand. They have introduced oil price stabilization fund including a environment conservation fund as part of the oil tax. Through this fund, they pay a portion of the money for environmental improvements. They also use this fund for subsidizing the

oil price. If Pakistan moves towards cleaner fuels and vehicles, it will need to assess the subsequent economic impacts, he advised. He suggested that it would be economically more beneficial for the refineries if they directly move from Euro 2 to Euro4.

3.2.3 Question and Answer Session

After having both of the sessions' presentations, the chair, Mr. Cheema opened the floor for discussion.

Mr. Raza replying to a question regarding the use of LNG in place of CNG as a vehicle fuel and its impacts on the environment said "When we talk about LNG, we are not talking about any other type of fuel. LNG is actually a natural gas but in a liquefied form. There is no difference between LNG and CNG. When it comes to a delivery point, it is re-gasified and injected into the system. It is a question of availability".

One of the participants drew panel's attention towards few CNG stations in the province of Balochistan as compared to other parts of the country. It is considered the main air pollution trigger in Balochistan especially in its capital city, Quetta. On this, Mr. Raza replied that Government's CNG policy is uniform for all provinces. He further added that promotion of CNG in every province is a priority of the federal government and it is facilitating the investors in setting up CNG stations. However, the main issue in Balochistan is the easy availability of cheap smuggled fuel which is a major hindrance in the promotion of CNG. He added that, the government is determined to promote CNG in Balochistan, but support is needed from the private sector to counter market forces which are creating obstacles in the promotion of CNG.

Replying to a question about the difference in quality and level of emissions between the CNG cars and Euro 2cars, Mr. Fabian responded that, "most of the gas fuels comply with Euro 4 standards. However, this entirely depends on the quality of the conversion. It needs to be ensured that there are no leakages or fugitive emissions in case of a CNG vehicle. CNG is methane and it is 21 times more potent than carbon dioxide".

An important question was asked regarding the economics of producing Euro2 compliant diesel. Who will pay for the costs incurred during the production of clean fuels and is any effort being made to carry out research to assess the benefits of having environment friendly fuels and vehicles? In reply to this, Mr. Raza said that, it has always been a challenge to maintain the balance amongst environment, economics and development. All of the environmental initiatives carry a cost. How and who is to bear this cost, is the underlying concern. Mr. Asif Shuja Khan, Director General Pak-EPA added to this by saying that this was one of the main issues, which came under discussions during the preliminary meetings for introducing cleaner fuels in the country. He further said that Government is working with the refineries to upgrade their facilities.

A question regarding the absence of pedestrian facilities and bi-cycling tracks in the country was raised. Mr. Fabian said that this aspect of commute falls under non-motorized mode of transportation, which is very important for emission free and green society. Advanced and developed nations have given it due importance and they are promoting it as a healthier alternative whereas we are not doing enough in this regard.

One participant mentioned that the promotion and use of bio-fuels is not only destroying forests, but also resulting in hike in the food prices. In view of this scenario, he enquired about Government's stance on the use of bio-fuels like Ethanol as a vehicle fuel. Mr. Raza said that in Pakistan we would like to see a major contribution of bio-fuels in meeting our energy demands. There are different types of bio-fuels, and in our case, we are looking at the production of ethanol through molasses that is a by-product of sugar industry, which is a low value product.

Summing up the session, chair Mr. Cheema said that we ought to have diversified initiatives and an integrated approach to address the issue of cleaner fuels and vehicles. He gave an example of mass transit system, which needs to be planned for major urban areas. The best example exists is of Bogotá, Colombia in this regard. The other area that requires attention is the energy conservation. We are not very efficient in energy usage. The natural and other resources need to be mapped for the long term planning.

3.3 Technical Session: I

First technical session was chaired by Dr. Badar Ghauri, Deputy Chief Manager of Pakistan Space and Upper Atmosphere Research Commission (SUPARCO). Two presentations were delivered during this session.

3.3.1 Presentation: Fuel Quality, Air Pollution and Health Effects, *Dr. Zafar Fatmi, Head, Division of Environmental Health Sciences, Department, of Community Health Sciences, Aga Khan University, Karachi*

The focus of his presentation was health effects of air pollution. He briefed about the major air pollutants in the world and mentioned that around 20-30% of all the respiratory diseases in the Asian mega-cities such as Beijing, Jakarta, Karachi, Kolkata and New Delhi are caused due to air pollution. He mentioned that due to outdoor air pollution 487,000 premature deaths are recorded in Asia alone.

Air pollution has negative effects on the health of people, crops, natural resources and archeological sites. An inefficient burning causes more pollution, therefore, in the advanced countries combustion sources are controlled, he said. He informed that Lead in the blood causes decline in the IQ level in the children. He referred to a study conducted in Karachi regarding association of PM2.5, which enters into blood stream and causes cardiovascular and respiratory diseases. He also shared the effects of diesel emissions on human health, which can exacerbate asthma and trigger cancer.

3.3.2 Presentation: Current Situation, Trends and Policies on Vehicle Emission Standards in Pakistan, *Asif Shuja Khan, Director General, Pakistan Environmental Protection Agency*

Mr. Asif Shuja Khan started his presentation by sharing the details of major air pollution sources in the country. He informed that the level of Suspended Particulate Matter (SPM) in many cities is higher than the average World Health Organization (WHO) guidelines. He presented the statistics on the air quality index of the three major cities reflecting Islamabad as unhealthy, Karachi as severe and Lahore as hazardous. Around 21,791 per annum premature mortalities are attributed to air pollution in Pakistan, he said.

He also enumerated major steps taken by the Government of Pakistan to address air pollution in the country such as the formulation of the National Environment Policy and National Conservation Strategy, establishment of emission and ambient air quality standards, installation of state-of-the-art air quality monitoring system in the federal and provincial capitals including the up-gradation of Environmental Protection Agency laboratories at Islamabad, reduction in the sulphur contents in diesel from 1% to 0.6% and adaptation of Euro-II standards by vehicle manufacturers for petrol vehicles by 1st July 2009 and diesel vehicles by 2012. He shared the details of Pak EPA's air quality monitoring programme. He informed the participants that seven continuous monitoring stations are working round the clock to monitor air quality in five major cities across Pakistan. He added that the work is under progress to couple vehicle examination with the vehicle registration system. He also informed the audience about the recent approval of Pakistan Clean Air Programme and National Ambient Air Quality Standards by Pakistan Environmental Protection Council the apex environmental body in the country.

3.3.3 Question and Answer Session

Technical Session – I: The chair, Dr. Badar Ghauri opened the floor for discussion after both of the sessions' presentations were delivered.

A question was asked that in Pakistan, we have host of policies on air pollution but their effective implementation seems a far cry. What are the major impediments that the Government is facing in effective handling of the situation? Mr. Khan singled out awareness as the main hindrance. He suggested that the civil society organizations should play a role in improving mass awareness to address the issue of ever increasing air pollution, which is taking its toll on human health.

One participant drew panel's attention towards pollen allergy and dust generated by the crushers in Islamabad. Mr. Khan agreed and informed the audience that the nuisance is caused by the pollen produced by non-indigenous tree species. Relevant agencies recognize gravity of the situation and taking necessary steps to address this important issue. With regard to the activity of crushers, the Government has banned illegal crushers to operate in the protected area of Margalla Hills.

One of the Workshop participants enquired about studying the effects of transboundary air pollution. Mr. Khan acknowledged the need of such study. Last June, he said a dust storm from Oman increased PM levels and lowered visibility in some parts of Balochistan and Karachi. He further said that he has proposed a study to examine the effect of Asian brown cloud and transboundary air pollution originating from Northern Indian states and affecting us especially during the winter season.

A question was asked regarding the reasons of having low Particulate Matter (PM) values in Karachi and what would be the role of private sector in motor vehicle examination system. Mr. Khan explained that since Karachi is a coastal city, therefore due to sea breeze there exists a flushing effect. The constant breeze helps in flushing out excessive pollutants from the ambient air in the city. With regard to the motor vehicle system, he said that Pak EPA is proposing, a viable public private partnership model. The earning will be ensured, as every vehicle is supposed to pay to get fitness certificate.

On a question relating to the number of monitoring stations, Mr. Khan said that there is a need to increase the number of stations. Since they are very costly, therefore Pak EPA plans to increase their numbers gradually.

3.4 Technical Session: II

The Second technical Session was chaired by Dr. Samina Khalil, Associate Professor of Economics at University of Karachi.

3.4.1 Presentation: Moving towards Cleaner Fuels and Vehicles, *Mr. Kamal Rasool, General Manager (Technical), Sigma Motors Private Limited*

Mr. Kamal Rasool presented the perspective of automobile manufacturers.

Mr. Rasool provided a history of Sigma Motors. He said that engines achieve improved performance and lower emissions with higher category fuels. He discussed various fuel properties vis-à-vis engine performance. It is important for diesel to be free from sediments and water for better engine performance, he added. Poor quality fuel, he said negatively affect fuel injection system, causes loss of power, emits smoke and make ignition difficult. He shared their company's experience regarding the type and quality of fuel being used in high altitude regions of Pakistan. He observed that due to non-availability of winterized fuel, people in the cold areas heat the fuel tanks or heat the fuel in the pots before pouring in the vehicle tanks, which is not only hazardous but affects' engine performance. He shared example of Australia where every month separate diesel fuel is available due to temperature variation. He suggested that in Pakistan there should be at least two types of fuel for every six months particularly for the cold areas.

3.4.2 Open Discussion

As there was only one presentation in the Technical Session-II, the chair Dr. Khalil combined the discussion session with the way forward. The Workshop participants actively took part in this open discussion and offered valuable suggestions on the way forward.

Representatives from automobile Industry stressed on the need to improve fuel quality and to introduce Euro standards, which will not only benefit environment and human health, but will also help in saving money otherwise spent on vehicles' maintenance. They also shared their industry's stance towards cleaner fuels vis-à-vis cleaner vehicles. The industry and the Ministry of Environment have worked for about two years over the development of emission standards, which led to the issuance of the notification in August 2009 that specifies emission standards for petrol and diesel vehicles. As far as petrol vehicles are, concerned most of them have already been converted to Euro2. Some are remaining and they will become compliant by Euro2 emission standards by 2012. However, the automotive industry feels that until diesel is not Euro compliant, it is not prudent to introduce vehicles, which are Euro. As shared by Sigma Motors, the vehicles supplied by them to Pakistan Army are Euro 4 compliant but the fuel supplied is not which is resulting in major issues with the vehicles maintenance. The automobile manufacturers demanded that the Government must ensure that the deadline given to refineries is met so that they can also meet their deadline.

Oil marketing company's representative stressed on the need of improved delivery network for the imported fuel that has low sulphur content (0.2%) as compared to the locally available blend (1%). It was further emphasized that if the same network is used, then there won't be any need to import low sulphur diesel.

One of the participants representing PAK ARAB REFINERY LTD (PARCO) said that they are investing heavily in the production of Euro 2 compliant diesel. He added that while the refineries are investing considerable amount of their own resources in the up-gradation of their facilities, the Government should provide necessary incentives or other measures, so that the refineries are adequately compensated for their investment.

3.5 Recommendations:

Following recommendations were made during the course of the Workshop:

3.5.1 Technical Recommendations

a) develop an integrated sustainable transport plan, putting cleaner fuels and vehicles into clear context,
b) prioritize public transport, travel demand management and non-motorized transport,
c) develop fuel quality monitoring system which can identify fuel adulteration and contamination,
d) study the whole fuel supply chain and identify key issues and how good quality fuel (e.g. Euro2 or higher) will affect the system and vice-versa,
e) review and develop new vehicle examination system including roadworthiness of the vehicles,
f) review safety standards, particularly for CNG vehicles and post monitoring mechanism of CNG cylinders needs to be properly implemented,
g) firm commitment by the Government as when the Euro2 compliant fuel would be available,
h) ensure availability of separate fuels for cold and hot weather regions,
i) restriction on the smuggled fuel, and
j) vehicle manufactures should be motivated to plant trees against the number of vehicles they produce each year.

3.5.2 Financial Recommendations

a) tax incentives for auto manufacturers and oil refineries on equipment necessary for meeting Euro 2 and Euro 4 implementation,
b) study innovative pricing mechanisms and other economic instruments for fuel (e.g. gasoline and diesel) that can be used for introducing better quality fuel,
c) explore development of transport fund,
d) study on refinery configuration including current production and costs, and
e) study on the implementation of Euro 4 in Pakistan.

3.6 Closing:

The workshop concluded with the closing remarks from Mr. Asif Shuja Khan, Director General of Pak-EPA. In his remarks, he appreciated the interest shown and the valuable contribution made by the participants. He observed that the Workshop had achieved its objective and the issues were crystallized followed by discussions and debate for setting the practical roadmap. He thanked the participants for pointing out very relevant and pertinent issues. He also felt the need for initiating more dialogues with the Ministry of Petroleum to reach to some extent for Euro 3 and beyond. He said that motor vehicle examination system needs revamping and the existing system should be totally scratched. He also suggested that the private sector should be involved in the development and running of vehicle inspection system.

Mr. Mahmood Akhtar Cheema, Manager IUCN Islamabad Programme Office thanked the federal secretaries, resource persons and the Workshop participants for taking part in the deliberations and sharing their ideas for moving towards cleaner fuels and vehicles.

Annexure I

LIST OF PARTICIPANTS

Sr. No	Name	Designation	Organization	Contact No	Email
1	Aqib Gulzar	Project Manager	Halcrow	0333-5577730	gulzara@halcrow.com
2	M. Usman Mahmood	Process Engineer	Pak-Arab Refinery (PARCO)	0300-4252123	parconian@gmail.com
3	Dr. Zafar Fatmi	Asst. Professor	Aga Khan University Hospital	0302-8289915	zafar.fatmi@aku.edu
4	Dr. Shafiq Uddin	Deputy Director	Sindh-EPA	0333-2379093	dr_shafiqahmed@yahoo.com
5	Masood Ahmed	Senior Engr	Pak-Arab Refinery (PARCO)	0333-2379093	masoodahmed@parco.com.pk
6	Dr. Samina Khalil	SRE	AERC Karachi University	0300-2236882	samina.khalil@gmail.com
7	Syed Safdar Zaheer	Chief Engr	Hydrocarbon Development Institute of Pakistan	051-9258313	safdar.zaheer@hotmail.com
8	S. Tariq Razvi	GM(Ops)	Pakistan State Oil		
9	Dr. Altaf Hussian	DGM(QA)	Pakistan State Oil	0345-8282930	
10	M. Kazim Idris	Chief	National Transport Research Center	051-9250442	kazimidris9@gmail.com
11	Dr. Badar Ghauri	Director	SUPARCO	0300-2731902	b_ghauri@yahoo.com
12	Munazza Naqvi	Prog. Officer	UNDP	0300-4273467	munazza.naqvi@undp.org
13	Nasreen Farach	PSO	Hydrocarbon Development Institute of Pakistan	0308-5039004	nasreenfarah@yahoo.co.nz
14	Haani Jamal Khan	Prog. Associate	IUCN		
15	Mr. Sohail	General Manager	Sigma Motors	0321-5371508	sohailaq2000@yahoo.com
16	Kaleem Anwar Mir	SO	Global Change Impact Study Center	0301-5465960	kaleemanwar.mir@gmail.com
17	Shahbaz Latif Mirza	Research Officer	National Transport Research Center	051-9250295	
18	Brig (R) Kamal Rasool	General Manager	Sigma Motors	0333-5190668	kamalr@sigmamotorspk.com
19	Muhammad Saeed. A	Manager Sales	HKF	0300-8484339	muhammad.saeed@ravimotorcycles.com

20	M. Asif Mehmood	Manager Service	HKF	0300-4002437	asif.mehmood@ravimotorcycles.com
21	Hilal A. Raza	Director General	Hydrocarbon Development Institute of Pakistan	051-9258301	hdip@apollo.net.pk
22	Asrar Ali Khan	Liaison Officer	IUCN		
23	M. Yamin Khan	Commandant	Central ITD Laboratories	0321-2604038	mykwaleed@yahoo.com
24	Arshad J.		Central ITD Laboratories		
25	Tahira Munir	SO	Global Change Impact Study Center	0321-5892730	
26	George Sadiq	Prog. Assistant	IUCN		
27	Dr. Sajidin Hussain	Tech Advisor	World Food Programme	0300-5320558	Sajidin.hussain@gmail.com
28	Z. Khan Bangash	Manager	IUCN Quetta Office		-
29	Sabir Hussain	DG (Oil)	Ministry of Petroleum		-
30	Muhammad Azam	Director (Oil)	Ministry of Petroleum	0333-5977713	-
31	Dr. Jawad Chisti	CEO	Subh-e-Nau	0321-8212249	jac161@gmail.com
32	Abdul Aleem Ch.	Coordinator	Subh-e-Nau	051-4432194	aleem1899@gmail.com
33	Sohail Qureshi	CEO	SHV Energy	0300-8548066	squraishi@shvpk.com
34	Sibghatullah Virk	Reporter	The Post	0332-8119189	virk662@gmail.com
35	Sadia Riaz	Chemist Air	Pak EPA	0345-5899726	gulmrl@yahoo.co.in
36	Ijaz Kakakhel	Reporter	Daily Times	0321-5021169	ijazkakakhel@gmail.com
37	Kashif Siddiqui	Manager	SHV Energy		-
38	Mohsin	Manager	SHV Energy		-
39	Mnnzer Ullah	Chemist	Pak EPA	0334-5258223	mnnzer83@yahoo.com
40	Ambreen Tariq	Deputy Director	Pak EPA	0331-5573632	beenapakb@gmail.com
41	Sadia	Chemist	Pak EPA	051-9240240	-
42	Aden Khan	Prog. Assistant	Pak EPA	0345-9703066	aden.khan@yahoo.com
43	Amjad Qureshi	Editor	Daily Kashish	0300-8822001	
44	Dr. Aurangzeb Khan	Chief Env.	Planning Commission	0300-5812419	aurangzeb_nrm@yahoo.com
45	Maryam Rehman	Finance (Intern)	IUCN		

46	Ahmed Sajeel	Regional GM	Dewan Motors (BMW)	0300-8563773	asajeel@dewanmotor.com
47	Sohaib Nizam	Reporter	Geo (Media Group)	0300-8502001	
48	Faisal Hakim	Reporter	ARY News	0321-5626006	faisalmughal39@gmail.com
49	Maqsood A Basra	CEO	Atlas Honda Ltd	0300-8400675	maqbas@atlas.com.pk
50	Dr. Qayyum	Project Manager	Aga Khan Foundation		
51	Dr. Saadia	SPO	Aga Khan Foundation	0300-956516	saadia.shabbir@akfp.org
52	Engr. Rizwan Aslam	Lecturer	Institute of Env. Scs.& Engg.	051-90854355	rizwan_nust@hotmail.com
53	Abdul Waheed Khan	DG	Pakistan Automotive Manufacturers Association	0300-2027442	awkhan_369@hotmail.com
54	Asad Ullah Faiz	Director	Pak-EPA		
55	Salim Khan	Reporter	APP	0333-5232591	salimkhan_77@yahoo.com
56	Bilal Akram	Corporate Executive	Tourism Pakistan Services	0300-8505100	bilal@serena.com.pk
57	Usman Cheema	Cameraman	Dunya TV		
58	Shahid Afraz	Producer	Radio Pakistan	0333-5734734	
59	Munir Hussain	Engr	Radio Pakistan		
60	Sadullah Ejaz	Manager	Atlas Honda	0300-8414130	saadullahejaz@lhr.atlashonda.com.pk
61	Omar Malik	CEO	CAMI	0300-8555234	osmalik@yahoo.com
62	Khalid Mushtaq	GM (Technical)	Sigma Motors	0333-5282451	kmsk482004@yahoo.com
63	Lokhaze Ali	Monitoring Engr.	Sachal Engineering	0344-4444994	lokhaze@hotmail.com
64	Tamkin Ahmed	GM (Production)	Indus Motors (Toyota)		tamkin.ahmed@toyota-indus.com
65	M. Bashir Khan	Director	Azad Kashmir EPA	0345-9486631	directorajkepa@gmail.com
66	Zain-ul-Abedian	Advisor	Ministry of Science & Technology	0300-5301645	asahrd@yahoo.com
67	Moin Uddin		Tourism Pakistan Services		
68	Ahmad Saeed	Project Manager	IUCN		
69	Mohammad Aqib	Deputy Project Manager/Focal Person CAI-Asia Pakistan	IUCN	0345-2007447	Mohammad.aqib@iucn.org

70	Mahmmod Akhtar Cheema	Manager	IUCN Islamabad Programme Office		
71	Kamran Lashari	Federal Secretary	Ministry of Petroleum & Natural Resources		
72	Muhammad Javed Malik	Federal Secretary	Ministry of Environment		
73	Herbert Fabian	Transport Program Manager	CAI-Asia		
74	Hammad Saeed	Coordinator (IT)	IUCN		
75	Azhar Saeed	Coordinator Publications	IUCN		

Annexure II

AGENDA

National Workshop on Cleaner Fuels and Vehicles

Marriot Hotel, Islamabad

19 May 2010

Inaugural Session:

09:00 – 09:45 Recitation from the Holy Quran

Welcome Remarks (Mahmood Akhtar Cheema, Manager Islamabad Programme Office, IUCN Pakistan)

Remarks (Mr. Muhammad Javed Malik, Secretary Ministry of Environment)

Keynote Address (Mr. Kamran Lashari, Secretary Ministry of Petroleum & Natural Resources)

Setting the Context:

09:45 – 10:30 Experience of Pakistan in moving to cleaner fuels and vehicles (Mr. Hilal A Raza, Director General, Hydrocarbon Development Institute of Pakistan)

Fuel and Vehicle Emission Standards: Trends in Asia (Mr. Herbert Fabian, Transport Program Manager, Clean Air for Asian Cities Center, Philippines)

10:30 – 11:00 Tea break

Technical Session - I: Public Sector

11:00 - 12:00 Fuel Quality, Air Pollution and Health Impacts (Dr. Zafar Fatmi, Head Division of Environmental Health Sciences, Aga Khan University)

Current situation, trends and policies on vehicle emission standards in Pakistan (Mr. Asif Shuja Khan, Director General, Pak-EPA)

12:00 – 12:30 Question & Answer session

12:30 – 13:30 Lunch and Prayer Break

Technical Session - II: Private Sector

13:30 – 14:30 Moving towards cleaner vehicles: Automobile Manufacturers' perspective (Mr. Kamal Rasool, General Manager - Technical, Sigma Motors)

14:30 – 15:00 Question & Answer session

15:00 – 15:30 Tea

Concluding Session:

15.30 – 16.30 Groups Brainstorming

16:30 – 17:00 Reporting by Rapporteurs

17:00 – 17:10 Closing Remarks (Mr. Asif Shuja Khan, Director General, Pak-EPA)

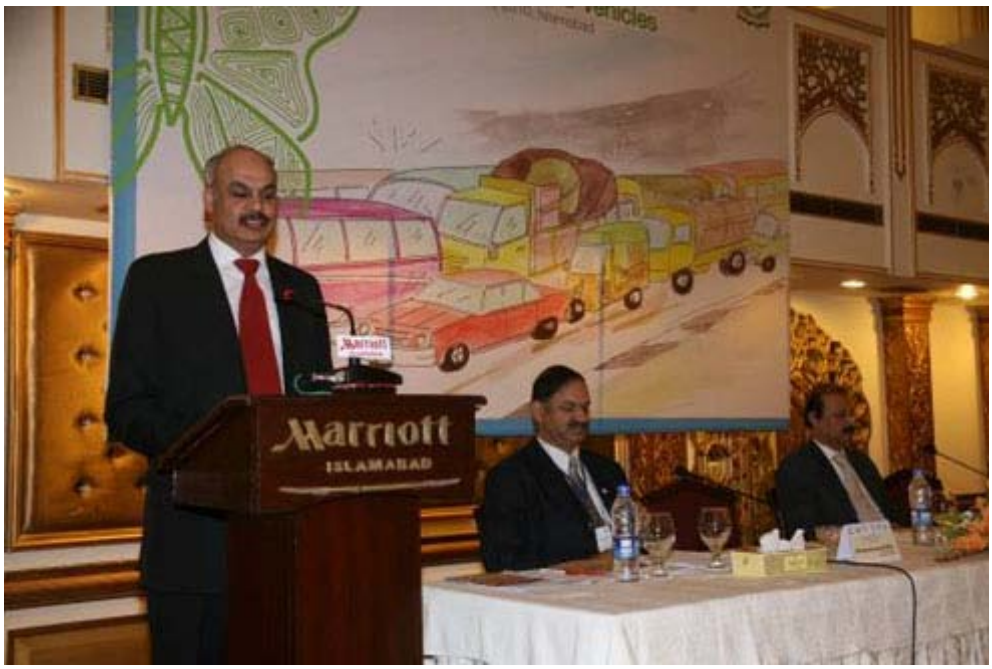
17:10 – 17:15 Vote of Thanks

Annexure III

WORKSHOP PHOTOGRAPHS

(Left to Right): Ahmad Saeed, Mahmood Akhtar Cheema, Muhammad Javed Malik, Kamran Lashari

Workshop Participants



Federal Secretary Environment, Muhammad Javed Malik

Federal Secretary Petroleum & Natural Resources, Kamran Lashari

Director General Hydrocarbon Development Institute of Pakistan, Hilal A. Raza

General Manager (Technical) Sigma Motors, Mr. Kamal Rasool

Head Division of Environmental Health Sciences, Aga Khan University, Dr. Zafar Fatmi

Director General Pak-Environment Protection Agency, Asif Shuja Khan

INTERNATIONAL UNION FOR
CONSERVATION OF NATURE

Islamabad Programme Office

House 21, Street 88
G-6/3, Islamabad
Pakistan

Tel +92 (51) 2271027-34
Fax +92 (51) 2271017
cro.pk@iucn.org

www.iucn.org/pakistan