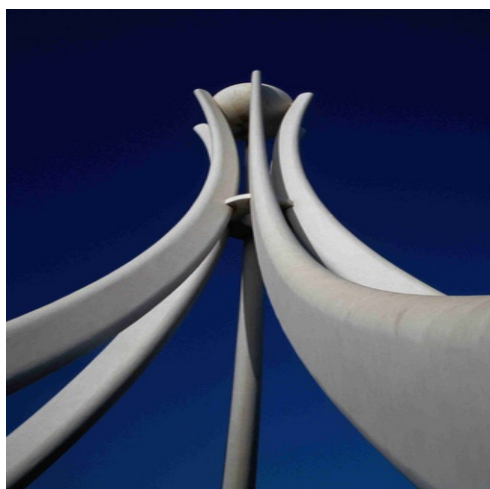




CONCEPT PAPER

Gulf Cooperation Council (GCC) Policy Development Meeting on Clean Fuels and Vehicles



Organized by

Partnership for Clean Fuels and Vehicles,
United Nations Environment Programme, and
Asian Clean Fuels Association

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With support from the Asian Clean Fuels Association (ACFA)

I. BACKGROUND

Air pollution is responsible for approximately three million deaths worldwide each year, and accounts for the plight of millions more around the world who suffer from asthma, chronic obstructive pulmonary disease, cardiovascular disease, and lung cancer. In particular poor air quality in urban areas is the cause of almost 0.8 million premature deaths annually.

Much of the urban air pollutants come from the transportation sector. Vehicles, both gasoline and diesel, emit significant quantities of nitrogen oxides, sulphur oxides, ozone, particulate matter (PM), carbon monoxide, hydrocarbons and fine particles of lead compound, which are harmful to the environment and human health. Hydrocarbons and nitrogen oxides form ground-level ozone which can irritate the respiratory system, reduce lung function and make it difficult to breathe deeply, and inflame and damage the lining of the lungs, which may lead to permanent changes in lung tissue. Carbon monoxide reduces the delivery of oxygen to the body's organs and tissues when it enters the bloodstream through lungs. Fine particles of lead compound are especially harmful to children under age six, interfering with the developing brain and other organs and systems. Sulphur oxides, especially when present as particulate sulphates, have impacts on respiratory health and asthma, result in the acidification of local environment, damaging buildings and urban greenery. A combination of high-sulphur diesel with older vehicle technology leads to the worst scenarios, emitting unsafe levels of smoke, soot, and very fine PM emissions. PM from vehicles is mostly fine and ultra-fine in size, and can be inhaled deep into the lungs. These are associated with premature death, aggravation of respiratory and cardiovascular disease, asthma, acute respiratory symptoms, and increased risk of lung cancer. Especially in the developing world, the growth in urban travel will further exacerbate air pollution problem unless steps are taken to reduce emissions.

These air pollutants can be significantly reduced by the use of clean (unleaded and low-sulphur) fuels, improved engine technology and after-treatment devices. For example, lead phase-out from gasoline immediately reduces the emission of fine lead particles, and makes it possible for lower-emitting engine and vehicle technologies (e.g. catalytic converters) to be applied, which brings further decrease of air pollutants. Fortunately, lead has been eliminated from gasoline in most countries worldwide today. In the Middle East region, leaded gasoline started to be phased out in 1990s. This process began with Gulf Cooperation (GCC) countries such as Qatar and Kuwait, and was followed by other GCC countries (Bahrain, Saudi Arabia, Oman, the United Arab Emirates) and some of non-GCC countries such as Iran and Israel. Today, every GCC countries are free of leaded gasoline.

Lowering sulphur in fuels also contributes directly to the reduction of air pollutants such as sulphur dioxide (SO₂) and sulphate PM from all vehicles, old and new. Particularly in the case of diesel fuel, considerable benefits can be gained by lower sulphur levels, because diesel sulphur levels tend to be much higher than in gasoline and diesel-fuelled vehicles emit significantly more PM than gasoline vehicles.

Another benefit of reducing sulphur in fuels is the increased effectiveness of vehicle emission control technologies, resulting in less vehicle emissions of carbon monoxide, hydrocarbon, nitrogen oxide and PM. As vehicle emission standards becomes 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, NO_x absorbers, selective catalytic reduction, etc.) can be applied, especially with regard to diesel vehicles.

However, although these technologies are or can be applied in existing or new vehicles and lead to significant reductions in overall emission by themselves, they need low sulphur fuels to operate efficiently. Exhaust gas recirculation technique which is widely used engine modification to reduce nitrogen oxides emission need less than 500 parts per million (ppm) sulphur levels in fuel, because the control valve of the system corrodes with higher sulphur levels. Diesel oxidation catalysts, the most common emission control technology found in current diesel vehicles, also require less than 500 ppm sulphur levels to avoid the occurrence of sulphate-related smoke. Diesel particulate filters for PM reduction and selective catalytic reduction for lessening nitrogen oxides only can be introduced by going to very low sulphur levels (below 50 ppm), because high sulphur in fuels causes corrosion of fuel injector and piston rings, oil acidification and overall engine wear, and/or decreases the efficiency of these technologies and devices. Consequently, new modern vehicles with cutting-edge emission control technologies require much lower sulphur fuels.

In addition to the fuel's lead and sulphur levels, other important fuel properties should also be targeted for improvement. For gasoline vehicles, other fuel properties which can reduce significantly the amount of air pollutants emitted from the vehicles are: RVP (Reid Vapour Pressure), benzene, aromatics and olefins level. The presence of oxygenates in gasoline will enhance combustion, resulting in lower exhaust emissions and a higher octane fuel will improve engine efficiency resulting in better mileage. For diesel vehicles, a high cetane number fuel is desirable together with lower density and low level of polyaromatics (PAN).

A global effort to deal with the above mentioned issues was launched at the World Summit for Sustainable Development in 2002 through the formation of the Partnership for Clean Fuels and Vehicles (PCFV). The PCFV, whose clearing house is based at the United Nations Environment Programme (UNEP) in Nairobi, has over 100 member organizations including governments, international organizations, industry groups, and non-governmental organizations. The PCFV assists developing countries to phase-out leaded gasoline (global campaign deadline is the end of 2008), and to promote low sulphur fuels and cleaner vehicles. As eliminating lead from gasoline has made great progress worldwide, the PCFV is now focusing more on phase-down of sulphur levels in fuels.

At the 4th annual Global Partnership Meeting of PCFV in 2005, partners agreed on the long-term global target: "To reduce sulphur in vehicle fuels to 50 ppm or below worldwide, concurrent with clean vehicles and clean vehicle technologies, with roadmaps and timelines developed regionally and nationally." The Sulphur Working Group of the PCFV finalized its report - *Opening the Door to Cleaner Vehicles in Developing and Transition Countries: The Role of Lower Sulphur Fuels*. (For more information or to obtain a copy of the report, please visit: www.unep.org/pcfiv).

Global levels of sulphur in fuels differ greatly, by country, by region, and by fuel type. Sulphur levels in gasoline range from below 10 ppm to as high as 1,000 ppm, and those in diesel range from 10 ppm to more than 10,000 ppm. In regions like Europe, the US, and Japan sulphur levels are being reduced to below 10-15 ppm, and many countries around the world are lowering the limits of allowable sulphur in fuels and adopting tailpipe emission standards to reduce vehicle pollution.

According to information available as of July 2006, the Gulf Cooperation Council (GCC) countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates), have sulphur levels in diesel mostly in the region of 5,000 ppm, with one exception of 3,500 ppm in Kuwait, where the regulatory standard is 5,000 ppm. Legal standards of sulphur in diesel are 10,000 ppm in Saudi Arabia and Oman; Saudi Arabia is planning to lower this to 500 ppm by 2007. The United Arab Emirates is known to be planning for a sulphur level to 50 ppm by 2010, and some low sulphur diesel (500 ppm) is currently available in Bahrain. (see Annex VI)

The PCFV and Asian Clean Fuels Association (ACFA) thus plan to hold a two-day policy meeting focusing on 'clean fuels and vehicles' for GCC countries to be held in January 2008, with logistic support from GCC General Secretariat, and UNEP Regional Office for West Asia (ROWA) located in Bahrain. The meeting can be considered as a follow-up of the 'Policy Development Meeting for the Middle East, West Asia and North Africa on Clean Fuels and Vehicles' held in Cairo, Egypt, in 2006 to discuss leaded gasoline phase-out, low sulphur fuels and low emission vehicle technologies, organized by the PCFV and Asian Clean Fuels Association (ACFA). The most notable result of that meeting was an intervention that resulted in the passing of a resolution by the Ministerial session of the League of Arab States (LAS) in Algiers in December 2006, stating: "Appreciating the efforts exerted by Arab States that have been using Unleaded Gasoline; and inviting other Arab states to achieve this (goal) by Year 2008, utilizing the support provided by UNEP vis-à-vis the PCFV Initiative; as well as inviting all Arab States to reduce sulfur contents in Diesel."

The agenda for the upcoming meeting will be dedicated to the situation in GCC, the systems approach to fuels and vehicles, the industry perspectives, and discussion and agreement on next steps: A detailed draft agenda is attached. Prior to this meeting, information gathering exercises on the status of air quality legislation, fuels and vehicles (including alternative) and progress/plans for the future of clean fuels and vehicles will be carried out. Updated information will be made available for discussion at the meeting. Through this event, consensus is expected to be built among all relevant sectors on lower sulphur levels in fuels, clean vehicle targets, and transfer of knowledge and technology among countries within and outside GCC.

II. OBJECTIVES AND EXPECTED OUTCOMES

The meeting will serve as a significant step in engaging countries in further discussions and cooperation at the national level to create national action plans on the better implementation of clean fuels and vehicles and sustainable air quality management within the region.

To this end, this meeting aims at developing a clear vision of the way forward for cleaner fuels and vehicles with the aim of harmonization of standards within GCC countries, along with the steps to be taken at the national levels, with the overall objective to improve urban air quality in the region, and also aiming at sensitizing stakeholders and policy makers of GCC countries. Specific goals include:

- (1) A better understanding of the current state of fuels and vehicles of the GCC countries, and the challenges and opportunities available for cleaner fuels and vehicles;
- (2) A clearer understanding of 'who's who' and ongoing initiatives in GCC countries on this topic;
- (3) Improved sharing of information and knowledge through the establishment of expert networks and communication structures on fuel and vehicle issues for improved air quality;

(4) Development of a realistic, step-by-step plan and timeframe for a reduction of sulphur levels in vehicle fuels to the lowest feasible level in each country and improvement in other fuel properties concurrent with emission control technologies with the aim of emulating the standards set by the European Union;

(5) An outline of concrete recommendations and next steps for cleaner fuels and vehicles in GCC countries.

These goals will be pursued by the execution of the following:

- Review on sulphur levels in gasoline and diesel fuels, vehicle emission standards and other fuel properties which affect air pollution;
- Highlight the health and economic benefits of introducing clean fuels and vehicles;
- Present the work of UNEP: its efforts to reduce sulphur levels in vehicle fuels, and how it can assist stakeholders in the promotion of cleaner fuels and vehicles;
- Give participants a forum to present opportunities and barriers to introducing cleaner fuels and vehicles in their countries;
- Discuss mechanisms and policy options to be applied to improve air quality through clean fuels, vehicles and public transportation;
- Provide an opportunity for dialogue and decision-making on the future of fuel quality and vehicle emissions in the region;
- Explore the way forward to cleaner vehicle technologies and regulations, better air quality management, and periodic regional meeting;
- Encourage the formulation and/or implementation of national action plans for cleaner fuels and vehicles; and
- Encourage region/ country specific suggestions from the workshop to better formulate national action plans.

The outputs envisioned are:

- Improved communication and cooperation between all sectors on cleaner fuel and vehicle emissions issues in each country and among GCC countries;
- Sensitization of policy makers in the region as to the importance of clean fuels and vehicles in the improvement of air quality, urban health and environmental protection;
- Knowledge of the PCFV mission and its activities in the region;
- A clearer idea of steps to be taken nationally to address vehicular emissions and produce cleaner fuels;
- Determination of actionable next steps for reducing sulphur in diesel to lower than 50 ppm and cleaner vehicles in the region, including follow-up at national level and the passing of a regional resolution on clean fuels and vehicles: for some this would be an immediate reality, for others, a long term goal to be achieved in various stages; and
- National-level follow up with countries, especially, Memoranda of Understanding (MOUs) with countries on implementing stricter fuel standards, encouraging the use of new vehicle and emission control technologies for better air quality management.

III. ORGANIZATION

The meeting will be held in March 2008 in Bahrain. PCFV will be responsible for the implementation of the meeting in close collaboration with the UNEP office in Bahrain (UNEP ROWA) UNEP.

1. Organization of National Surveys and Information-gathering on GCC countries prior to the meeting, to be completed. A description of the scope of this exercise and a copy of the national surveys to be used to gather this information is provided in Annex IV.
2. Organization of the meeting to be held March 2008 in Manama, Bahrain.
3. Follow-up activities and reporting include:
 - a. Encouraging GCC national institutions in membership and participation of the PCFV and its activities;
 - a. A written report on the outcomes of the meeting with recommendations and next steps, to be distributed to all participants;
 - b. Any awareness/ informational material to be produced

UNEP shall provide all necessary human resources, logistical and administrative support to undertake the work described above.

The countries to be invited from the GCC are: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the UAE; in addition, one representative from the following LAS/Middle East countries will be invited to attend as the meeting can be of benefit to more than GCC countries: Algeria, Egypt, Iran, Jordan, Lebanon, Libya, Morocco, Syria and Tunisia. Target participants will be some 50 people from broad range of relevant sectors and institutions. Invitations to be made in each country will include delegates from: Ministries of Environment/ Oil/ Energy/ Transportation (preferably senior to middle level managers / policy makers), industry groups (including local refineries and oil companies, vehicle manufacturers / retailers), civil society and research. Ministerial level delegates from the GCC countries and guests from international organizations, PCFV partners and the countries out of the GCC will also be invited according to their availability.

This meeting will be participated by a broad range of relevant sectors and institutions, including delegates from: Ministries of Environment/ Oil/ Energy/ Transportation (preferably senior to middle level managers / policy makers), industry groups (including local refineries and oil companies, vehicle manufacturers / retailers, emission control technology producers), NGOs involved in air quality and cleaner fuel and vehicle programs, and research institutes. Ministerial level delegates from the GCC countries and guests from international organizations, PCFV partners and non-GCC countries will also be invited according to their availability and interest (please see prior paragraph)

IV. Correspondence and Inquiries

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