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REPORT

Seminar on Clean Fuels and Vehicles in Western Asia and North Africa  
Beirut, 17 – 19 March 2004

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## SUMMARY

Many countries have been taking measures, since three decades, to control the emissions from energy utilizations in different sectors, especially in the transport sector through improving fuel quality and using less polluting fuels. Among the most significant efforts made in this field are the shift to unleaded gasoline and sulphur reduction in both gasoline and diesel. Cleaner fuels are considered the most effective method in decreasing air pollutants, since they tackle emission control from the source, as well as they decrease operational and maintenance costs and fuel consumption, especially in vehicles.

ESCWA, with the cooperation with the United Nations Department of Economic and Social Affairs in New York (DESA) and the United Nations Environment Program (UNEP) and the United States Environmental Protection Agency (EPA), organized the seminar to discuss the issues of clean fuels and vehicles in Western Asia and North African countries during 17 – 19 March 2004. The seminar brought together around 58 experts and professionals, as well as NGOs and international agencies working in the fields of energy, environment and sustainable development. It aimed for the participants to exchange views and experiences and to assess the needs and actions required for improving fuel quality, particularly the elimination of lead in gasoline and the reduction of sulphur from diesel and gasoline.

Several technical papers were presented during the seminar in addition to three roundtable discussions. The discussion sessions covered several topics related to the seminar, mostly the concern of the negative impacts of lead and diesel and the need of new vehicles for unleaded gasoline and low-sulphur diesel; the current situation of the transport sector in ESCWA countries and its environmental impacts; the international commitments concerning clean fuels and vehicles; fuel additives and upgrading refinery processes; vehicle inspection and maintenance programs; and the importance of clean fuels promotion initiatives and campaigns.

Discussions concluded that, there is a gap between fuel standards in ESCWA countries and international standards, therefore the participants recommended that member countries should work together to improve fuel specifications/standards according to the situation and circumstances of each country as well as setting plans for the complete switching to unleaded gasoline. International organizations and agencies were invited to provide technical and legislation support to ESCWA countries according to needs of each country. Also it is recommended to deal with fuel specifications and vehicle specifications as integrated system/unit. The participants recommended to work towards reducing the sulphur content to comply with the most recent international standards (for example: 500 ppm for diesel and 30-50 ppm in gasoline) and to pay attention to vehicle inspection and tuning programs parallel to fuel specification improvement. In view of that, the participants invited the organizers (ESCWA, UNEP, DESA) to organize training programs on vehicles inspection & maintenance. Also, it is recommended to allocate funds to conduct awareness campaigns and media programs related to cleaner fuels and cleaner transport means, with the support and participation of NGO's and the civil society in awareness activities.

# I. ORGANIZATION OF THE SEMINAR

## A. BACKGROUND AND JUSTIFICATION

1. The energy sector, worldwide, plays an important and effective role in achieving a sustainable development. However, the environmental impacts of energy utilization are amongst the main problems facing sustainable development. The major environmental challenges facing the energy consuming sectors lie in the adoption of cleaner fuel on a wider scale and upgrading energy consuming equipment to become more efficient and less polluting. Many countries have been taking measures, over the past three decades, to control the emissions obtained from energy utilizations in different sectors and especially in the transport sector through improving fuel quality and using less polluting alternatives. Among the most significant efforts made in this field are the shift towards unleaded gasoline and sulphur reduction in both gasoline and diesel.

2. Accordingly, within the framework set by the Johannesburg World Summit on Sustainable Development, in 2002, taking into consideration the guidelines of the United Nations Committee on Sustainable Development, and complying with the efforts taken to encourage production and consumption of cleaner fuels, the United Nations Economic and Social Commission for Western Asia (UNESCWA), the United Nations Department of Economic and Social Affairs in New York (DESA) and the United Nations Environment Program (UNEP), organized a seminar for regional and international experts on Clean Fuels and Vehicles in Western Asia and North Africa. The main theme was to discuss the issue of clean fuel and vehicles and to encourage emission reduction in the transport sector in West Asian and North African countries.

## B. VENUE AND DATE OF THE SEMINAR

3. The Seminar on Clean Fuels and Vehicles in Western Asia and North Africa was held during the period 17 - 19 March 2004 at the United Nations House in Beirut/Lebanon.

## C. ORGANIZATION

4. The seminar was jointly organized by ESCWA, United Nations Department of Economic and Social Affairs in New York (DESA) and the United Nations Environment Program (UNEP). Additionally, the United States Environmental Protection Agency (EPA) sponsored some participants from Iraq.

## D. OPENING SESSION

5. Ms. Mariam Al- Awadhi, Deputy Executive Secretary of ESCWA, Ms. Lucia Bartocci, Division for Sustainable Development - DESA, and Mr. Rob de Jong, Partnership for Clean Fuels and Vehicles, UNEP participated in the opening session. They stressed the importance of the transport sector in achieving sustainable development and the major challenges facing the energy and transport sectors in adopting cleaner fuel on a wider scale and shifting motor vehicles into using cleaner fuel types and energy efficient technologies. The importance of regional and international cooperation and reinforcing partnerships between different parties in this field have been emphasized as well.

## E. PARTICIPANTS

6. Experts from ESCWA member countries concerned with issues related to cleaner fuels, representing the Ministries of Petroleum and Energy, petroleum industries, NGOs, regional experts and international organizations on clean fuels and elimination of lead participated in the meeting, for a total of 58 participants.

## F. GOALS AND OBJECTIVES

7. The seminar brought together a wide range of experts and professionals, as well as NGOs and international agencies working in the fields of energy, environment and sustainable development to exchange views and experiences and to assess the needs and actions required for improving fuel quality, particularly the elimination of lead in gasoline and the reduction of sulphur from diesel and gasoline. It also aimed at identifying vehicle standards that should be applied to reduce emissions; and developing public awareness programmes and enhancing cooperation between all stakeholders concerned with the petroleum industry and its use in the transport sector.

## II. DISCUSSIONS AND DEBATES

8. The seminar stressed the importance of the transport sector in achieving sustainable development and that the major challenges facing the energy and transport sectors lie in the adoption of cleaner fuel on a wider scale and shifting motor vehicles into using cleaner types fuel and energy- efficient technologies. The importance of regional and international cooperation and reinforcing partnerships between different parties in this field have been emphasized. It has also been pointed out that the efforts made to mitigate transport-related pollution problems are not in conformity with the size and impact of these problems, especially with the growing demand for energy in the transport sector. Four different session formats were held during the seminar to discuss these issues, in addition to three roundtable discussion and the final session for the adoption of recommendations.

### A. REGIONAL PERSPECTIVE

9. ESCWA paper and national papers from the region gave an overview of the problems associated with the transport sector and discussed the current trends being followed to adopt cleaner fuels and cleaner engines in the sector. The discussion covered the sources and types of primary and secondary air pollutants, current fuel specifications (gasoline and diesel), and the options for reformulating these fuels so as to reduce the emissions impacts. The papers also discussed the current status of the refining industry in the region and its role in providing the market with cleaner transport fuels.

10. An ESCWA paper reviewed a case study on reducing the sulphur and lead emissions in the transport sector in Lebanon, the current transport sector in Lebanon, pollution levels compared to international standards, and environmental and health impacts, and the reduction in lead concentrations in air and in blood achieved through the shift to unleaded fuel. The paper also stressed the importance of the newly re-instated inspection and maintenance (I&M) program on the pollution mitigation strategies introduced through Decree No. 341, adopted in 2002.

11. The national papers focused on the current status of transport sectors in individual countries and their impacts on the environment. A paper from the Syrian Arab Republic presented the current air pollution from motor vehicles in major Syrian cities and the mitigation strategies of the Syrian Ministry of Transport. It mainly discussed the Syrian plans to adopt natural gas as a transport fuel and the future plans for updating the fuel specifications in Homs refinery so as to produce cleaner transport fuels.

12. Egypt's paper presented the control of transport emissions. It included an overview of the mitigation options adopted in Egypt to control transport emissions such as improving the fuel quality, shifting to unleaded fuel, reducing the sulphur content in diesel, switching to natural gas, and enforcing standards and I&M programs.

13. Jordan's paper discussed the options and measures being adopted to reduce lead and sulphur from transport fuels. The paper also highlighted the I&M program currently being enforced in the Kingdom.

14. A paper from Saudi Arabia focused on the adopted program for periodical inspection and maintenance (I&M) of motor vehicles and its impacts on the technical status of the fleet.

15. A paper from Palestine presented a mathematical model for estimating lead emissions from gasoline motor vehicles in Gaza strip.

16. A number of presentations related to clean transport fuels were also presented by experts from Oman, Kuwait, Tunisia, Algeria, and Morocco.

#### B. INTERNATIONAL PERSPECTIVE

17. The papers presented by international experts and consultants, discussed several relevant issues such as international collaboration and agreements on clean fuels and vehicles. Resolutions from the Johannesburg Summit in 2002 were highlighted, together with the recommendations for ESCWA and North African countries to reduce lead and sulphur contents in transport fuels. The discussion also covered the Partnership for Cleaner Fuels and Vehicles (PCFV) as recommended by the Summit for establishing collaboration between private and public sectors in individual countries.

18. The speakers also focused on the negative impacts of lead and sulphur, and on the wide variation of the sulphur content in fuel between 25 ppm and 10000 ppm. The discussion highlighted the importance of partnership (PCFV) and technical assistance and expertise it can provide for the objectives set for cleaning the transport sector. (Further information can be obtained from the PCFV website: [www.unep.org/pcfvy](http://www.unep.org/pcfvy)).

19. The participants were also introduced to the objectives of the International Petroleum Industry Environmental Conservation Association (IPIECA), a voluntary non-profit organization whose membership includes both petroleum companies and associations at the national, regional or international levels. Representative of the Lead Pollution Prevention Trust presented the health impacts of lead on children, and measures adopted to phase out leaded fuels from the transport sector.

20. Representatives of the Asian Clean Fuel Association (ACFA) presented their plans for a cleaner gasoline in Asian countries, and discussed the possibilities of expanding their activities to cover the ESCWA region. They also presented a comparative analysis of the cost and benefits associated with the phasing out of leaded fuel, and the specifications of transport fuels used in 16 Asian countries. The speakers also highlighted the basic rules for air quality management, impacts of fuel specifications on the emissions, and outcomes of fitting filters in the vehicles for capturing fine particulate matters. A case study from Jakarta was presented.

#### C. ROUND TABLE DISCUSSION

21. Three roundtable discussions were held during the seminar focused on three main issues: (a) increasing public awareness through various media, on the role and benefits of clean fuels, and the role that governmental and non-governmental organizations can play in this aspect; (b) phasing out leaded fuel, reducing the sulphur content, and conducting campaigns to promote clean transport fuels; and (c) environmental effects of some additives and reformulated fuels and their impacts on vehicles performance.

#### D. DISCUSSION AND INTERVENTIONS

22. Group discussions were organized to focus on the main issues raised. Below is a brief on the outcomes:

- **Phasing out of leaded fuel:** This issue was received with high interest from all participants, especially that unleaded fuel constitutes currently up to 85% of the world transport fuel. It was also emphasized that most ESCWA member countries have already started the process of phasing out leaded fuels, and that a timetable needs to be set for achieving a complete phase out with emphasis on the environmental impacts of some additives. The impact of lead on the catalytic converters was also highlighted.

- **Sulphur content reduction:** The need to reduce sulphur content in fuels, especially diesel, has been stressed by several experts and participants who proposed that this issue be given a high priority. High concentration of sulphur in emissions may affect the emission control devices of other pollutants such as particulate matter, hydrocarbons, and carbon monoxide. It was agreed to reduce the sulphur content in accordance with international standards (for example: 500 ppm for diesel, and 30-50 ppm for gasoline).
- **Fuel additives and upgrading of refining process:** The problem of additives to transport fuels has been discussed with emphasis on the characteristics of MTBE additives used to raise the octane number in unleaded fuels.
- **Inspection and maintenance programs:** Case studies and reports from several member countries namely Egypt, Jordan, Saudi Arabia, and Syria have clearly indicated that having a well-maintained motor fleet is an effective measure for emissions reduction. This has to be accompanied with quality upgrade of different transport fuels. It has been suggested to request international partners to conduct training workshops on various vehicles testing technologies.
- **Public awareness and promotion campaigns:** The participants emphasized the role of media and promotion campaigns in increasing the public awareness concerning clean transport fuels. A recommendation has been made for governmental bodies, supported by different organizations and NGOs, to allocate sufficient budgets for clean fuels promotion initiatives and campaigns.

### III. RECOMMENDATIONS

23. The participants invited ESCWA countries to work together on materializing the following recommendations, taken into considerations the individual social and economic condition of each country.

#### A. TRANSFER FROM LEADED TO UNLEADED GASOLINE

- (1) Developing (Modifying) the specifications/standards related to production and use of cleaner fuel, and follow up the implementation of these standards.
- (2) Taking measurements of various pollutants emitted from vehicles, and working to reduce their emission rates through modifications in fuel chemical composition and by using appropriate additives.
- (3) Setting time plans and implementation methodology for the countries that intend to switch to unleaded gasoline.
- (4) Inviting the international organizations and agencies to support the member states technically and through appropriate legislation, each country according to its own needs and request.

#### B. SULPHUR REDUCTION IN VEHICLE FUELS

- (1) Reducing the sulphur content in transport diesel fuels in ESCWA countries, through cooperation of all regional parties, so as to comply with the most recent international standards (500 ppm for example).
- (2) Dealing with fuel specifications and vehicle specifications as integrated system/unit.
- (3) Working towards improving fuel quality as economically feasible as possible.
- (4) Working towards reducing the sulphur content in gasoline to reach to accepted levels 30-50 ppm for example), within a pre-set time frame according to needs and conditions of each ESCWA country.

(5) Taking into consideration the lead and sulphur contents and other fuel specifications (such as paraffin concentration) when expanding the refining industry.

(6) Stressing the need for modern I&M programs that include exhaust gases measurements. These programs should be accompanied with efforts to improve fuel specifications.

### C. PUBLIC AWARENESS

24. Public awareness programs, that emphasize the impact of air pollution on the environment and in particular air quality, have an important role in promoting cleaner fuels. The health impacts are associated with various social and economic consequences reflected in the economic cost of medical treatment and the drop in productivity. Awareness programs also have a major role of facilitating the adoption and implementation of new regulations and legislations to ban polluting fuels and endorse efficient transportation planning that curbs traffic congestion and promotes public transport. Furthermore, public awareness is instrumental to help in implementing the relevant laws and increase the public acceptability to these laws by highlighting their social and economic benefits. In this frame, the following recommendations are suggested:

(1) Governments should allocate funds to conduct awareness campaigns and media programs related to cleaner fuels and cleaner transport means.

(2) Information, data, and results of air quality monitoring should be made readily available to the media.

(3) Support scientific research in the field of cleaner fuels and transport systems, making results available to the public through media and communication channels.

(4) International organizations should sponsor the flow of information at the regional level and among different countries, as well as support producing awareness programs for different public categories.

(5) The media have the responsibility to allocate more space and time for the promotion of cleaner fuels, and enhance the public awareness to the risks associated with lead, sulphur and other pollutants.

(6) Adoption and promotion of modern and strict specifications and standards required for unleaded and lower sulphur fuels, suitable for old vehicles in some ESCWA countries.

(7) NGO's and the civil society in general should be supportive to the campaign for cleaner fuels and transport technologies, through awareness enhancement activities. This would help to develop positive attitudes towards public transport and cleaner car use practices. NGO's should be urged to exchange experiences with civil society associations dealing with clean fuels in other countries.

### D. FUTURE ACTIVITIES

(1) The international organizations should help in transferring the experiences achieved in some (developed) countries in the field of clean fuels to other countries.

(2) The cooperation at the regional level should be encouraged, through effective partnership of all parties.

(3) The seminar organizers (ESCWA, UNEP, DESA) were invited to organize a training activities on modern procedures for vehicles inspection & maintenance programs.

## IV. SEMINAR EVALUATION

25. A questionnaire was distributed to participants on the last day of the seminar to evaluate its relevance and effectiveness. The results showed that most participants considered the topics of the meeting relevant to their work, that the workshops achieved its objectives and that the recommendations were specific and clear. The majority of respondents agreed that the meeting introduced new ideas, but that the adopted recommendations can only partially be applied.

In what follows is the outcome of this questionnaire.

*1= Very Poor    2= Poor    3= Good    4= Very Good    5= Excellent*

### A. ORGANIZATIONAL ASPECTS:

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Arrangements	-	7%	9%	50%	34%
Duration	-	12%	-	-	88%
Organization of work	-	-	7%	45%	48%

### B. SUBSTANTIVE CONTENT OF THE PAPERS:

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Appropriate coverage of the subject	-	-	19%	60%	21%
Relevance to prevailing issues of the region	-	-	-	37%	63%

### C. OTHER RELEVANT ISSUES TO THE SESSIONS & DOCUMENTS:

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Up- to- date information	-	-	33%	-	67%
Active and useful discussions	-	-	10%	54%	39%
Level of participation and interest generated	-	-	7%	53%	37%
Papers were sufficient to cover the topic addressed	-	-	3%	66%	24%
Practical & achievable recommendations in the near to medium future	10%	-	36%	45%	9%

Annex I

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Annex II

**PROGRAMME OF WORK**

**DAY 1: WEDNESDAY 17 MARCH 2004**

09:30 - 10:00 Registration

10:00 - 10:30 **Opening Session** (MOEW of Lebanon - DESA – ESCWA – UNEP)

10:30 - 11:00 BREAK

11:00 - 12:30 **Phasing out Lead**

CHAIR PERSON: Ms. Anhar Hegazi

CO- CHAIR PERSON: Mr. Maeen Al Mahaqri

- REGIONAL TRENDS FOR CLEAN FUEL AND CLEAN ENGINE  
Mr. Hamdy Abou El Naga – Egypt
- CLEAN GASOLINE TRENDS IN EAST ASIA  
Mr. Clarence Woo - Asian Clean Fuels Association
- PHASE OUT LEAD  
Mr. Jim Rochow - Trust for Lead Poisoning Prevention.

12:30 - 13:30 BREAK

13:30 - 15:30 **Countries Experiences on Mitigation of Air Pollution from the Transport Sector**

CHAIR PERSON: Mr. Mohamad Srouf Al Sabban

CO- CHAIR PERSON: Mr. Nabil Safwat

- CONTROL OF VEHICLES' EXHAUST TO REDUCE AIR POLLUTION, CASE OF EGYPT  
Mr. Samir A. Al- Mowafi - Regional Center for Protection of the Environment and Pollution Reduction
- MEASURES TAKEN FOR TECHNICAL INSPECTION OF VEHICLES IN JORDAN  
Ms. Randa El-Rabadi – Ministry of Transport
- POLLUTION CAUSED BY TRANSPORT SECTOR AND MEASURES TAKEN TO REDUCE THIS POLLUTION  
Mr. Mahmoud Al-Haffar – Ministry of Transport - Syria
- MODELING OF LEAD EMISSIONS FROM PETROL VEHICLES IN PALESTINE: A CASE STUDY FOR THE CITY CENTER OF GAZA  
Mr. Zeyad El-Ghussain – Ministry of Energy and Natural Resources
- THE CASE OF YEMEN  
Mr. Helal Al-Riashi – Ministry of Water and Environment

15:30 - 16:00 BREAK

16:00 - 17:00 **Roundtable Discussion on Public Awareness for Clean Fuels**

- Mr. Najib Saab - Environment & Development Journal - LEBANON
- Mr. Mohamad Srour Al Sabban - Senior Advisor to the Minister of Petroleum in Saudi Arabia
- Mr. Clarence Woo - Communications Director - Asian Clean Fuels Association
- Mr. Samir El-Mowafi - Regional Center for Protection of the Environment and Pollution Reduction – EGYPT
- Mr. Mohamad Kordab – Economic and Social Commission for Western Asia
- Mr. Farid Chaaban – American University of Beirut

**DAY 2: THURSDAY 18 MARCH 2004**

09:00 - 10:30 **Partnership Activities for Clean Fuels & Vehicles**

CHAIR PERSON: Mr. Yahia Shamiah  
CO- CHAIR PERSON: Mr. Mohamad Kordab

- PARTNERSHIP FOR CLEAN FUELS AND VEHICLES: INTERNATIONAL COMMITMENTS  
Ms. Kathleen Abdalla - DESA
- BRIEFING ON ACTIVITIES UNDERWAY BY THE PARTNERSHIP FOR CLEAN FUELS & VEHICLES.  
Mr. Rob de Jong - United Nations Environment Programme
- GETTING THE LEAD OUT: DRAWING ON LESSONS LEARNED IN BAHRAIN  
Mr. Rob Cox – International Petroleum Industry Environmental Conservation Association (IPIECA)

10:30 - 11:00 BREAK

11:00 - 12:30 **Countries Experiences on Phasing out Lead**

CHAIR PERSON: Ms. Kathleen Abdalla  
CO- CHAIR PERSON: Mr. Bassam Anani

- REFINERIES NEEDS AND MEASURES FOR LEAD ELIMINATION FROM GASOLINE AND SULFUR REDUCTION FROM GASOLINE & DIESEL IN JORDAN  
Mr. Samer Hatamleh – Jordan Petroleum Refinery Company
- THE ROLE AND NEEDS OF OIL REFINERIES IN DEVELOPING CLEAN FUELS FOR VEHICLES IN SYRIA  
Mr. Adnan Izz Eddin – General Company of Homs Refinery
- *Experiences from GCC and North African Countries*

12:30 - 13:30 BREAK

13:30 - 15:30 **Discussion Groups**      Group Leaders:

- Mr. Michael Walsh
- Mr. Hamdy Abou El Naga
- Mr. Rob Cox

15:30 - 16:00    BREAK

16:00 - 17:00    **Report back from Discussion Groups**

**DAY 3: FRIDAY 19 MARCH 2004**

09:00 - 10:30    **Sulfur Reduction**

CHAIR PERSON: Mr. Rob de Jong  
CO- CHAIR PERSON: Mr. Mohamad Arous

- BEYOND LEAD: THE SULFUR CHALLENGE  
Mr. Michael Walsh
- TOWARDS UNLEADED AND SULFUR-FREE TRANSPORT SECTOR IN LEBANON  
Mr. Farid Chaaban – American University of Beirut
- *Experiences from GCC and North African Countries*

10:30 - 11:00    BREAK

11:00 - 13:00    **Roundtable Discussion on the Way Forward and Actions Needed on Sulfur Reduction and Lead Elimination.**

- Ms. Anhar Hegazi - ESCWA
- Ms. Kathleen Abdala - DESA
- Mr. Rob de Jong - UNEP
- Mr. Michael Walsh - Consultant
- Mr. Hamdy Abou El Naga - Consultant
- Mr. Salah Kandil - ESCWA

13:00 - 14:00    **Summary and closing**