



Concept Note on Implementation of Partnership on Clean Fuels and Vehicles in Asia

I. BACKGROUND

1. Air pollution is starting to receive more attention in the development community. This reflects the growing awareness that air pollution has substantial health impacts and that economic costs are significant. Examples of the increased interest in air pollution as a developmental issue are the work done by Asian Development Bank¹ and World Bank, including the establishment of multi-stakeholder Clean Air Initiatives for different regions of the world including Asia².
2. Air pollution in large cities in the developing world is to a large extent caused by emissions from mobile sources of pollution. A large part of recent activities to combat air pollution is focusing on reducing pollution from mobile sources.
3. On the occasion of the World Summit on Sustainable Development (WSSD) in Johannesburg two type 2 Partnerships³ were launched, which are of relevance to the ongoing efforts to reduce pollution from mobile sources. One was launched by UN-DESA, UNEP and International Fuel Quality Center (IFQC)⁴, while the other was initiated by US-EPA⁵. In the course of the discussions during the WSSD it was decided to merge the two into one Partnership. The objectives of the partnership call for overall phasing out of lead in gasoline, reduction of sulfur in diesel and the adoption of cleaner vehicle technology. Broad support was expressed for the Partnership by representatives from:

industry: Alliance of Automobile Manufacturers, America Honda, American Petroleum Institute, Association of International Automobile Manufacturers, Association of Emission Control by Catalyst, BP, Engine Manufacturers Association, International Truck and Engine, International Fuel Quality Center, Manufacturers of Emission Control Association, Shell-US;

¹ <http://adb.org/vehicle-emissions>

² <http://worldbank.org/cleanair/caiasia>

³ Type 2 Partnerships are non-negotiated partnerships in sustainable development aimed at implementing Agenda 21, they supplement the commitments agreed to by Governments through the inter-governmental process.

⁴ http://www.johannesburgsummit.org/html/sustainable_dev/p2_managing_resources/2508_global_part_clean_fuels_vehicles.pdf

⁵ http://www.johannesburgsummit.org/html/sustainable_dev/p2_managing_resources/1110_clean_fuels_vehicles.pdf

Environmental NGOs: natural Resources Defense Council, Global Environment and Technology Foundation, Alliance to end Lead Poisoning;

Countries: Canada, Chile, Central American Commission on Environment and Development (Costa-Rica, Panama, Nicaragua, El Salvador, Honduras, Guatemala and Belize), Italy, Mexico, Netherlands, South Africa, USA, China;

International Organizations: UNEP, UN Department of Social and Economic Affairs, Pan-American Health Organization;

4. The current version of partnership agreement is not specific in terms of targets (except) for lead and not context specific (what needs to be done where). Neither does it fully spell out the relationship between the two main components of the partnership: fuels and vehicles;

5. Asia has made considerable progress in phasing out leaded gasoline. As indicated in attachment 1 there are only few countries in Asia, where leaded gasoline is still available. Indonesia, the largest country, which still has leaded gasoline has announced that after the recent phasing out in the greater Jakarta area, leaded gasoline will now be phased out in the rest of the country by 2003. Attachment 2 shows that the situation for sulfur in diesel is far more diverse in Asia. Some countries, such as Hong Kong have already adopted ultra low sulfur diesel (50 ppm) while others are still far away from this. It is important to note that few countries have so far announced a time path for reducing sulfur in diesel to reach 50 ppm or less.

6. The intention expressed by the Partnership to adopt cleaner vehicle technology can best be achieved through adoption and implementation of tighter emission standards for both new and in-use vehicles. Attachment 3 and 4 indicate that there are considerable differences between countries in Asia in terms of standards that are being used. There are few countries that have already formally announced their intentions for the medium and long term on the adoption of tighter (Euro 3 and 4) emission standards for new vehicles. For in-use vehicles, which are responsible for most of the pollution even less forward planning has been done in terms of emission standards.

7. Within Asia there are very few groups at present who have the “institutional infrastructure” and capacity to stimulate and coordinate discussions among different stakeholders from national-local governments, private sector and civil society. CAI-Asia is emerging as a group who does have such potential. It has membership from key government organizations (SEPA in China, Central Pollution Control Board in India, Pollution Control Department in Thailand, Ministry of Environment in Indonesia) as well as local governments (about 20 mega cities in December 2002), key NGOs and universities in Asia. In addition it has involvement of international private sector through membership of Ford Motor Company and Shell. It is well connected to large number of development agencies that are supporting projects aimed at reduction of pollution from mobile sources. It has linkages to relevant Japan based industrial associations and research organizations such as FAMI (Federation of Asian Motorcycle Industries), AAF (Asian Automotive Federation), JAMA (Japanese Automobile Manufacturers Association), JASIC (Japan Automobile Standards Internationalization Center), and JARI (Japan Automotive Research Institute). etc. Finally, <http://adb.org/vehicle-emissions> , one of the partner web sites of CAI-Asia is the most comprehensive portal site on pollution from mobile sources in Asia.

II. PRINCIPLES FOR OPERATIONALIZATION OF PARTNERSHIP ON CLEAN FUELS AND VEHICLES IN ASIA

8. To realize the objectives of the Partnership: improvement in air quality, the improvement in fuel quality is the first step. The reduction of sulfur in diesel and especially removal of lead in gasoline have important positive impacts in terms of reduced emissions. It needs to be realized though that other very substantial additional reduction emissions will only be realized if vehicles are equipped with emission reducing technologies (catalytic converters for gasoline vehicles and particulate filters or traps for diesel vehicles). To ensure that the Partnership maximizes its impact it is important that it focuses on both fuel standards and emission standards. Until now efforts in Asia to reduce pollution from vehicles have now always sufficiently acknowledged the inter-linkage between these two processes⁶.

9. To ensure that the Partnership will actually result in improvements of air quality an active involvement of the auto industry and the oil companies will be required. To ensure the full cooperation of both auto and oil industry in the implementation of the partnership it is important to ensure that discussions on fuel are comprehensive and not limited to lead and sulfur only. To realize cleaner vehicle technology for gasoline powered vehicles, reduction of lead is one step but reduction of sulfur will also be required to ensure that vehicles will be able to meet for example stricter emission standards such as Euro 3 standards (or equivalent). Also, both the auto and oil industry can be expected to have hesitations to enter into a detailed discussion on lead and sulfur without discussing other important fuel parameters such as aromatics, benzene, octane, cetane etc. While lead and sulfur can be used as “rallying calls”, a comprehensive approach needs to be adopted. For the auto industry a potential harmonization of emission standards also needs to be followed by harmonization of testing procedures to fully realize benefits from harmonization.

10. For the Partnership to be successful in its objectives attention will have to be given to in-use vehicles as well. This in acknowledgement of the large number of in-use vehicles in Asia. Fuel quality improvements will have a certain impact on the emissions of these vehicles. Unlike for new vehicles it is not as easy to improve the actual technology of the vehicle. In stead, work needs to be done to determine what kind of interventions can be made to determine how in-use vehicles can be made less polluting. This can best be done through pilot studies and projects. Fuel quality improvements and pilot studies are to be accompanied by a gradual tightening of in-use emission standards.

11. The large percentage of 2-3 wheeled vehicles in Asia makes it imperative that due attention is given to these vehicles in the implementation of the partnership in Asia.

12. A time frame of two years is proposed for the (initial) implementation of the partnership in Asia. This should be adequate for information collection, capacity building, discussion and consensus building.

13. To motivate supporters of the Partnership it is important monitor what the actual impact is in terms of reduced emission loads as a consequence of the implementation of

⁶ An exception is the Auto-Fuel Policy Report of the Mashelkar Report in India, see http://www.petroleum.nic.in/afp_con.htm

activities carried out in support of the objectives of the Partnership. Linking the results of this impact monitoring to analysis of costs involved is expected to make it easier to raise funding in the future for activities aimed at reducing emissions from mobile sources of pollution.

III. POTENTIAL CAI-ASIA SUPPORT/INVOLVEMENT IN IMPLEMENTATION OF PARTNERSHIP

14. It is expected that different types of activities will be implemented to contribute towards the implementation of the Partnership. For activities aimed at Asia CAI-Asia will be able to make a contribution to the following types of activities.

A. Information collection and management

- i) Continuation of data collection and documentation on fuel and emission standards and associated topics through <http://adb.org/vehicle-emissions> In addition to information on standards this will also include information on costs of upgrading refineries to meet new fuel standards. This will be key issue in efforts to improve fuel quality⁷. Information collection will also have to extend to ongoing efforts to reduce emissions from in-use vehicles;
- ii) Provide assistance to drawing up list of information gaps and assist in identification of groups that can help fill such gaps;

B. Capacity Building

- iii) Capacity building to help decision makers from different sectors in Asian countries help understand the linkage between vehicle emission standards, fuel standards and vehicle emission control technologies. Use can be made of the Clean Air Training Network (CATNet-Asia), which has been set up under the CAI-Asia umbrella to strengthen air quality management related training in Asia. Also, discussions have been initiated with IFQC on the possibility of cooperation in delivering training activities to decision makers on this topic;
- iv) Cooperation can also be sought with JAMA, who are in the process of conceptualizing activities that will enable them to provide technical inputs through resource persons in local and national level dialogues on emission and fuel standard issues.

C. National Level Dialogue

- v) Initiate and stimulate local and national level discussion on emission and fuel standards as well as other priority actions to reduce pollution from mobile sources. There are quite wide differences in Asian countries on the manner in which emission and fuel standards are being discussed. In some countries, such as India and Thailand there are mechanisms in place that have ensured

⁷ Several studies have either been completed or are in process on this topic. These include a study initiated by APEC for all APEC countries, draft results on a country by country basis are available. Study on China carried out by Energy Foundation, results are available. Study for Sri Lanka carried out by World Bank, also completed. Study in Thailand which is ongoing. Study to assess costs of reducing sulfur in 145 refineries across Asia, carried out by CAI-Asia, which is ongoing.

that fuels and emission standards are discussed in an integrated manner. In other countries such as Indonesia, Vietnam, Philippines and Malaysia this much less the case. Although most of the countries have assigned on paper responsibility for the formulation of emission standards and fuel standards there is not always an active follow up to this. It is the experience of CAI-Asia that for a well coordinated approach to the formulation of integrated emission and fuel standards to succeed that it is important that: (a) an institutional mechanism exists in which governments, oil and auto industry and civil society are represented, (b) that sufficient time is given to such a group to arrive at its recommendations, (c) that such a group has access to relevant information, and (d) that the group has a well established mandate to ensure that its recommendations are subsequently translated into formal regulations;

- vi) CAI-Asia has an established membership across Asia. CAI-Asia members are well represented in national level groups and committees charged with formulation of emission and fuel standards. This offers the possibility for CAI-Asia to act as the conduit to assist and strengthen such groups in their efforts to formulate medium term integrated emission and fuel standards;

D. Regional Dialogue

- vii) To initiate and stimulate regional debate on emission and fuel standards use can be made of the CAI-Asia listserv⁸.
- viii) There is a need for regional dialogue on efforts required by oil companies to improve fuel quality. Unlike for other approaches to reduce emission from mobile sources there has been relatively little discussion and debate on this since information on this topic is only becoming available now⁹. Such a regional workshop could possibly be organized in conjunction with the second Asian Fuels Conference, which is scheduled for September 2003, and in which IFQC is one of the co-organizers;
- ix) The activities aimed at strengthening local and national level dialogues on fuel and emission standards fit in well with the ongoing regional JASIC Government/Industry meetings on harmonization of vehicle standards and regulations¹⁰. An important objective of the JASIC process is to increase the participation of Asian countries in WP 29, with the ultimate aim for Asian countries to accede to the 1955 and 1998 Agreements on Certification and Harmonization. If activities to stimulate debate on local and national level with respect to emission and fuel standards are well coordinated with JASIC this will enhance the effectiveness of the JASIC process¹¹. National level delegates will be better prepared for the meetings and more progress can be

⁸ Listserv is a discussion forum and bulletin board dedicated to air quality management in Asia and is open to all who want to discuss and share experiences on air quality in Asia. It currently has over 700 members. To join send a blank email to: join-cai-asia@lists.worldbank.org

⁹ Several regional workshops have been conducted in the past in Asia on strategies to reduce vehicle emissions. These are well documented in different reports and there is no need to repeat such regional workshops. See Bellagio declaration (...); different UN, World Bank and ADB guidelines. (details to follow)

¹⁰ Seven regional meetings have been organized so far. Initially the focus was Improvement of Regulations and Certification Systems, Participation in WP29 and Accession to the 1958/1998 Agreements. Subsequently the attention shifted to Participation in WP29, and Accession to the 1958/1998 Agreements. Recently the focus is on: "How should regulation harmonization activities be advanced in the future? How should certification systems be established under the 1958 agreement?"

¹¹ This applies to emission standards and regulations. JASIC also deals with safety standards and regulations as well.

made during the regional meetings. For the parties to the Partnership, such as the governments and the auto industry, linking up with the JASIC process will help to ensure that the outcomes of the local and national dialogues are recognized at the international level. (This through the WP29 process). The 8th JASIC Government/Industry meeting will be held in Vietnam in October 2003 and it is expected that in 2004 another regional meeting will be held. Sufficient scope therefore exists for CAI-Asia to coordinate with JASIC;

E. Pilot Programs

- x) Pilot programs are an useful instrument to explore the effectiveness of especially innovative approaches to reduce the emissions from in-use vehicles. Pilot projects can be hardware oriented (e.g. retrofitting of vehicles with pollution control devices or fuel conversion), or soft ware oriented (e.g. Inspection and Maintenance (I/M), or just improved maintenance). Such pilot projects will ideally be implemented in cities where there is a well established network of actors (government, private sector, civil society) to help avoid that the pilot projects are implemented in isolation. It would help if there is sufficient capacity available to monitor what the actual reduction in emission load is and what the possible impact on air quality will be.
- xi) CAI-Asia can be helpful in bringing the results of such pilot programs together in the form of a knowledge database, which will help decision makers in other locations to make a choice of which type of interventions to adopt to reduce emissions of in-use vehicles.

IV. LINKAGE OF ASIA BASED ACTIVITIES WITH GLOBAL ACTIVITIES IN SUPPORT OF PARTNERSHIP ON CLEAN FUELS AND VECHICLES

15. The activities in Asia proposed in this concept note will be coordinated by CAI-Asia. The implementation of a large part of the activities will be done by CAI-Asia members. This is fully in line with the structure and operating philosophy of CAI-Asia. After agreement has been reached on the programmatic approach, actual implementation can be done with the active involvement of members.

16. EPA, UNEP and UN-DESA are currently contemplating what kind of organizational structure to set up for the overall management of the Partnership. There are certain tasks that need to be carried out at an overall level. These include: (a) development of an overall conceptual framework for the implementation of the Partnership, what is included and what not. This can best be done based on suggestions made in different geographical regions; (b) discuss with global organizations their commitment towards the objectives of the Partnership, and their involvement in the implementation of the Partnership in the different geographical regions. Use can be made in such negotiations of suggestions made in different regions. Such general agreements will make it easier to get a buy-in at the regional, national and local level. (c) monitoring and evaluation of implementation of the Partnership and its impact. This includes periodic reporting to the relevant UN organizations and other relevant groups.

17. This approach allows sufficient flexibility for individual regions, such as Asia to develop its own approaches to the implementation of the Partnership without losing the overall context of the Partnership.

V. FINDING THE RESOURCES FOR THE IMPLEMENTATION OF THE PARTNERSHIP (IN ASIA)

18. A successful implementation of the Partnership will result in considerable decrease in premature mortality due to exposure to air pollution. It will also greatly reduce the number of days lost by workers, children in school and will reduce their use of health care facilities. This will lead to considerable economic savings¹². In addition there is also a potential for direct cost savings by both the auto and the oil industry. Both industries have an interest in transparency and predictability. In order to be able to plan it is important for these industries that governments announce medium to long term emission standards and fuel standards. This will allow the industry to plan. Both the auto and the oil industry are global industries. If it were possible to achieve a greater degree of harmonization in standards this will allow them to reduce the complexity of their industry, which potentially can reduce in considerable cost savings.

19. To identify the resources required for the implementation of the Partnership in Asia a two-pronged approach is proposed:

- i) Use can be made of existing initiatives such as the JASIC Government/Industry meetings, the proposed JAMA support for national level dialogues, and existing CAI-Asia activities, as well as those from its members. An important reason for these organizations to agree on coordinating their activities and to actually directly cooperate in some activities through combining resources is that this will enhance the relevance of their activity, and increase its impact. Combined activities also have a considerable potential for cost saving.
- ii) Additional resources will have to be identified. These can come both from traditional development institutions or they can come from the private sector, especially from the auto and oil industry. As mentioned above there are substantial benefits to be gained for these industries if a clear path leading towards harmonized standards can be mapped out.¹³

¹² Current impact of air pollution in Asia is estimated at 1-3% of GNP.

¹³At the recent Paris auto show Chief executives from 13 top automakers pledged to jointly press for global environmental standards in reducing emissions. They stressed that standardization on some issues such as pollution among countries also could help lower costs for automakers doing business at a global scale. See: http://www.automotivedigest.com/view_art.asp?articlesID=7356

Chart 1: Phase out of leaded gasoline in Asia



ATTACHMENT 2

Chart 2: Current and Proposed Sulfur levels in Diesel in Asia, EU and USA

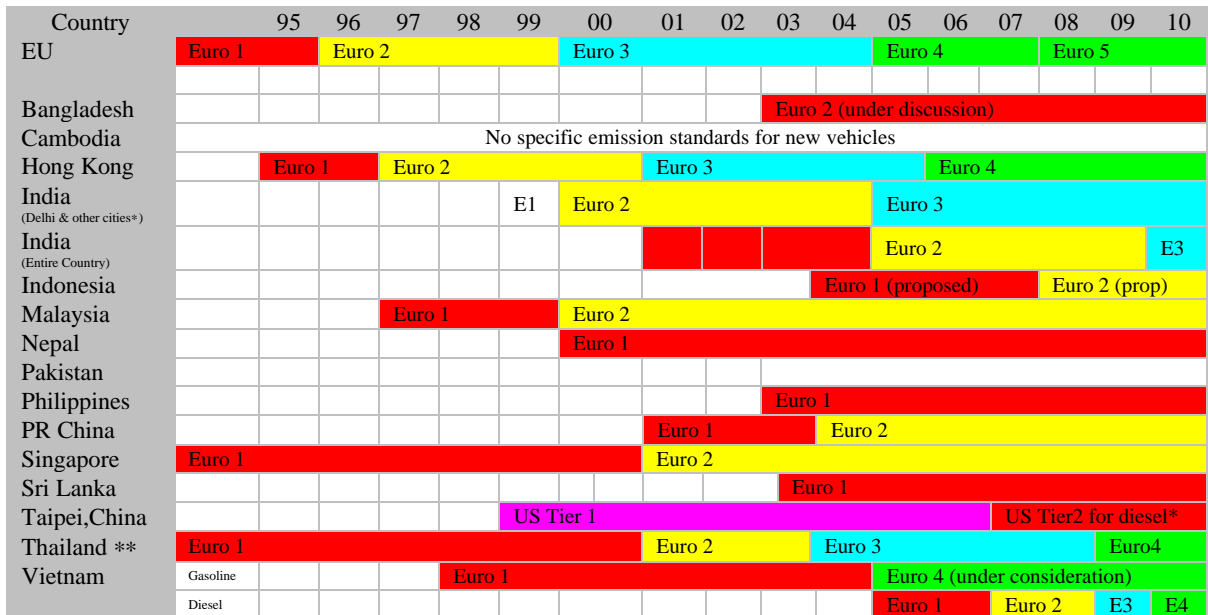
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Bangladesh							5000									
Cambodia					2000											
PR China	5000		2000													
Hong Kong, China		500					50									
India	5000				2500	***				500					350	
Indonesia	5000															
Japan	500									50		10				
Korea	500															
Malaysia	5000		3000				500 marketed									
Nepal																
Pakistan							4600		2500 under consideration							
Philippines	5000					2000			500							
Singapore	5000		500													
Sri Lanka								3000								
Taipei, China	500															
Thailand	2500			500												
Vietnam	10000							2000		500						
United States	500														15	
EU					350					50				10		

> 500 ppm

51 – 500

< 500 ppm

Chart 3: Emission standards for new vehicles (light duty vehicles)



Euro 2 introduced in Mumbai, Kolkata and Chennai in 2001. Euro 2 in Bangalore, Hyderabad, Khampur, Pune and Ahmedabad in 2003, Euro 3 to be introduced in Delhi, Mumbai, Kolkata, Chennai, Bangalore, Hyderabad and Ahmedabad in 2005

*gasoline vehicles under consideration

** Heavy duty diesel standards: up to 1999: Euro 1, 2000 – 2005 Euro 2, 2006 onwards Euro 3

ATTACHMENT 4

Chart 4: Current In-Use Vehicle Emission Standards

	Gasoline			
	CO %	HC ppm	NOx ppm	test
Bangladesh	24 g/km	2 g/km		Making use of dynamic test
Cambodia	4.5	10,000		
Hong Kong (post 1992)	0.5			Low idle or in accordance with man. spec.
	0.3			High idle, $\lambda = 1 \pm 0.03$ or in accordance with man.spec.
India	3			Idle
Indonesia	4.5	1200		Idle
Malaysia	3.5-4.5	6-800		Idle
Nepal	3	1000		
Pakistan	6			Idle
Philippines prior to Jan. '97	4.5	800		Idle
Philippines Jan '97 – Dec '02	3.5	600		Idle
Philippines Jan '03	0.5	100		Low idle At high idle CO 0.3 ($\lambda = 1 \pm 0.03$) or in accordance with manufacturers specs.
PR China light duty	4.5	900		Idle
PR China heavy duty	4.5	1200		Idle
Singapore	3.6-6			Idle
Sri-Lanka produced before 1998	4.5	1200		Low idling
Sri-Lanka produced after 1998	3.0	1200		Low idling
Taipei, China				
Thailand prior to Nov. '93	4.5	600		Idle test
Thailand after Nov. '93	1.5	200		Idle test
Vietnam Proposed End 2002	6.0	1500 (4S)		Value is for 4 central cities, Rest of Country CO 6.5%
Vietnam 2005 (proposed)	4.5	1200 (4S)		Value is for 4 central cities, Rest of Country CO 6.0%
Vietnam 2008 (proposed)	3.0	600 (4S)		Value is for 4 central cities, Rest of Country CO 4.5%

	Diesel			
	Smoke HSU	HC ppm	PM $\mu\text{g}/\text{m}^3$	test
Bangladesh	65	2 g/km		
Cambodia				
Hong Kong	60			On Road
	50			Dyno lq down test for vehicles emissions testing notice
India	65			Free acceleration
Indonesia	50			
Malaysia	50			
Nepal	65*			
Pakistan	40			Acceleration mode
Philippines registered before Dec. '02	2.5 m^{-1}			If turbo charged 3.5 m^{-1} , at 1000 meter altitude 4.5 m^{-1}
Philippines registered Jan. '03 onwards	1.2 m^{-1}			If turbo charged 2.2 m^{-1} , at 1000 meter altitude 3.2 m^{-1}
PR China		1200		
Singapore	50			
Sri-Lanka	65			Idle
Sri-Lanka	75			Free acceleration
Taipei, China				
Thailand	45			Opacity test-free acceleration
Thailand	35%			Opacity test - loaded
Thailand	50			Filter test – free acceleration
Thailand	40%			Filter test - loaded
Vietnam current for 4 Central cities	72			Current standards for Idle CO 6.0%
Vietnam nationwide	85			
Vietnam nationwide 2005	72			Newly Registered from 2005: 50 HSU

*1995 and after manufactured vehicles