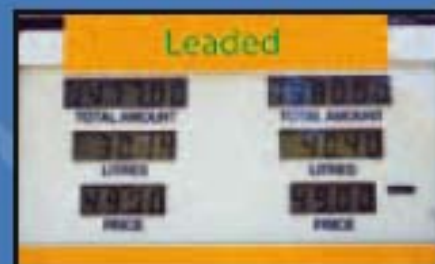


Partnership for Clean Fuels and Vehicles



*Outcome and
Influence Evaluation
of the UNEP Based
Partnership for Clean
Fuels and Vehicles
(PCFV)*



The views expressed in this report are not necessarily the opinion of and/or endorsed by all Partners of the Partnership for Clean Fuels and Vehicles

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United Nations Environment Programme

**Outcome and Influence Evaluation
of the UNEP Partnership for Clean Fuels and
Vehicles (PCFV)**

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Evaluation Office

October 2010

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List of Contents

Abbreviations and Acronyms	iii
Executive Summary	1
1. Introduction.....	5
1.1 Overview of the Partnership for Clean Fuels and Vehicles.....	5
1.2 Evaluation Objective, Scope and Methods	8
2. Activities and Processes Promoting the Phase Out of Leaded Petrol in Sub-Saharan Africa	11
2.1 Objective.....	11
2.2 Activities Undertaken to Move Towards the Total Elimination of Leaded Fuel in Sub-Saharan Africa	11
3. Progress Towards the Phase Out of Leaded Petrol in Sub-Saharan Africa	39
4. Evaluating the Results of the Phase Out of Leaded Petrol	43
4.1 Evaluating Results Through the Creation of a “Business as Usual” Counterfactual.....	43
4.2 Actual and Projected Consumption of Leaded Fuel and Estimates of Leaded Fuel Avoided 2000 to 2015.....	44
4.3 Connections between Leaded Fuel, Blood Lead Levels and Health	53
5. Evaluating Contributions to the Elimination of Leaded Fuel from Sub Saharan Africa by Stakeholder	58
6: Analysis of Causal Pathways Towards Intended Impacts of the Phase Out of Leaded Petrol from Sub-Saharan Africa	62
6.1 Progress at Outcome Level	62
6.2 Presence of Impact Drivers Supporting Progress Towards Impacts.....	65
6.3 Intermediate States.....	68
6.4 Impacts Achieved.....	70
7. Evaluation of the Contribution of UNEP to the Phase-out of Leaded Fuel in Sub Saharan Africa	72
8. Overview.....	73
8.1 Key Success Factors	73
8.2 Areas for Additional Consideration in Future Partnerships.....	76
9. Lessons Learned.....	77
Annex 1 - List of Persons Contacted For PCFV Study	79
Annex 2: Terms of Reference for the Study	80

ABBREVIATIONS AND ACRONYMS

BLL	Blood Lead Levels
CAI-SSA	Clean Air Initiative for Sub Saharan Africa
CH	Clearing House
CSD	United Nations Commission on Sustainable Development
DTIE	Division of Technology, Industry and Economics (UNEP)
ECOWAS	The Economic Community of West African States
ESMAP	Energy Sector Management Assistance Programme (World Bank)
FIA	Federation Internationale de l'Automobile
IPIECA	International Petroleum Industry Environmental Conservation Association
KPRL	Kenya Petroleum Refineries Ltd.
LRA	Lead Replacement Additive
MMT	Methylcyclopentadienyl Manganese Tricarbonyl
Mogas	Motor gasoline (petrol)
MOU	Memorandum of Understanding
NEPAD	The New Partnership for Africa's Development
NGO	Non Governmental Organisation
NRDC	Natural Resource Defence Council
Pb	Lead
PCFV	Partnership for Clean Fuel and Vehicles
PES	Propriete, Sante et Environnement (Burundi NGO)
PIEA	Petroleum Institute of East Africa
RON	Research Octane Number
SACU	Southern Africa Customs Union
SADC	Southern Africa Development Community
SD	Sustainable Development
SSA	Sub Saharan Africa
ULG	Unleaded Gasoline (petrol)
UNEP	United Nations Environment Programme
US EPA	United States Environment Protection Agency
US\$	United States Dollar
VSR	Valve Seat Recession
WHO	World Health Organisation
WSSD	World Summit on Sustainable Development
g/l	grams per litre
mg/dl	milligrams per decilitre
mtons	metric tons

Executive Summary

- A: This report presents the findings of an evaluation of the contribution of the UNEP Partnership for Clean Fuels and Vehicles to the phase out of leaded petrol in Sub Saharan Africa.
- B: The Partnership for Clean Fuels and Vehicles (PCFV) is a global initiative to promote and support better air quality through the introduction of cleaner fuels and vehicles in developing and transitional countries. It is a public-private partnership launched by a group of committed partners from governments, international organisations, industry and non-governmental organisations (NGOs). The United Nations Environment Programme (UNEP) - based Partnership Clearing-House provides technical, networking and financial support for improved capacity and technology transfer through regional, national and local activities related to cleaner fuels and vehicles.
- C: There was one main objective of the initial support provided by the Partnership in Sub Saharan Africa (SSA), namely the total phase-out of leaded petrol in SSA by the end of 2005. If this state were attained, the Partnership would have achieved its objective.
- D: In mid-2001, Sudan was the only SSA country to have totally removed leaded petrol from use within its borders. This meant that some 48 Sub-Saharan Africa countries remained with total or (in a few cases) partial use of leaded petrol, which would need to be reversed within a period of four and a half years.
- E: By the deadline of the end of 2005, the target of helping Sub Saharan Africa to be totally free of leaded petrol was attained.
- F: In order to assess the results of the Partnership, a hypothetical “business as usual” counterfactual scenario was calculated.

The reduction achieved in use of leaded fuel in SSA was of the order of Metric Tons (MT) 17,745 per annum at the end of 2005, rose to about MT 20,138 per annum in 2010 and to MT 23,071 p.a. by 2015. This gives a total of approximately Metric Tons 90,000 avoided by mid 2010, rising to MT190,690 by 2015 and to MT 304,770 by 2020. We cannot precisely predict how long it would have taken to achieve the phase out without the contributions of PCFV and other players. However, it is clear that there had been very little progress prior to the original Dakar Conference in 2001, with only Sudan totally lead-free and motorists in South Africa, Namibia and Botswana having limited access to unleaded fuel. This suggests that, as a very conservative estimate it would have taken ten years rather than five to achieve and that, on this basis, the total amount of leaded petrol avoided would have been at least MT 190,000; with a strong likelihood that this figure would have actually been nearer to MT300,000, in view of the minimal progress, which had been made prior to the Dakar Conference and the establishment of the PCFV. The urban population potentially benefitting from these reductions was expected to rise from 411 million in 2000 to 470 million by 2015.

- G: Research on the connection between Blood Lead Levels (BLLs) and health across continents indicates that the phase out of leaded petrol is the critical factor in reducing overall human exposure to lead. Evidence from Hungary and Thailand is consistent with that for the United States; whilst PCFV-supported research in Ghana showed dramatic decreases in BLLs after the phase out in that country. It is therefore clear that the Partnership contributed to substantial health benefits in Sub Saharan Africa; which in turn promoted social and economic gains through reduced sickness and improved physical and mental development, particularly of children in urban areas.
- H: UNEP made a substantial contribution to this process, operating at three levels. As an institution, often represented at the highest level, UNEP promoted and reaffirmed the importance and achievability of the objective at a series of conferences throughout the region. The widely-respected expertise of UNEP in the realm of international environmental management, coupled with its perceived absence of vested interests was a critical factor in enrolling national political support at the highest levels, which was essential to ensure that intentions were followed through with the intensity and persistence required to phase-out leaded petrol throughout the region.
- I: As a member of PCFV, UNEP helped to bring into the Partnership a broad range of stakeholders and to maintain their commitment through regular and ad hoc meetings. The experience of the organisation in promoting regional (and even global) environmental management initiatives was invaluable in ensuring that the process occurred in a cost effective manner.
- J: At the level of day to day guidance of the process, the UNEP-based and supported Clearing House (CH) provided effective support with, initially, very limited resources. Gradually, the range of activities increased, as did the available resources. The CH enabled PCFV to operate by coordinating, advising, supporting the preparation of documentation, publishing and a range of activities without which the Partnership could not have been effective. As funds increased, from UNEP and other sources, the CH also played a vital role in managing Partnership financial and other support to organisations in SSA countries, to hold meetings, run advocacy campaigns, conduct research and engage in activities essential to underpin the process of change; which often started from a low level of public knowledge and even substantial misconceptions concerning unleaded fuel.
- K: Although it is not possible to **attribute** the phase-out of leaded fuel to the support provided at these three levels by UNEP, or indeed to PCFV as an institution, it is clear that the phase-out would not have been achieved in anywhere near the same timescale without them. The **contribution** of UNEP operated on different levels: as a high level advocate to Governments, influencing support in the right places; as a channel to resources within the Partnership, some of whom were attracted to join because of the reputation of UNEP; and as a facilitator and supporter of activities at various levels, but particularly at the country level.
- L: Evaluation of the role of PCFV in the phase out of leaded petrol in Sub Saharan Africa shows several key aspects, which contributed to its success. These included:

- Intervention design well-focussed on its objectives
- Comprehensive composition of the Partnership
- Ability to support multi-level processes
- Approach tailored to available finance
- High quality management and staff.

M: Areas which were not fully successful and which would warrant additional consideration in any future Partnerships include:

- Need to maximise awareness of established best practice from an early stage
- Develop and implement agreed systems of compliance monitoring and, where feasible, sanctions for non-compliance.

Lesson 1

N: UNEP should consider a Partnership approach for issues for which:

- voluntary change at the desired level appears a feasible objective
- an alliance of different stakeholders can address all dimensions including:
 - political commitment
 - technical expertise
 - financial support
 - public awareness and support
 - industry best practice
- UNEP's reputation as a leader in international environmental change processes can engage high level political support.

Lesson 2

O: Partnerships should be built around the following principles:

- Clear objectives and commonly agreed goals
- Timescale with milestones
- Guiding principles
- Early attention to high level political commitment
- Each partner makes a unique contribution and is essential for success
- Clear governance rules and structure
- Regular review of Partnership performance
- Ability to listen and compromise
- Monitoring system for compliance
- Active consideration of possibilities for sanctions for non-compliance, which might work within a voluntary system.

Lesson 3

P. In order to move from outcomes, which the project can (mainly) directly deliver, to the intended long term impact objectives of the intervention, (which are mainly delivered by other stakeholders) partnership interventions should ensure that essential “impact drivers” are set in motion from the earliest possible stage. These should be determined during the design stage and may include:

- High level support and specified commitments from concerned governments: including high level champions, participation of all appropriate agencies, technical capacity, defined personnel responsibilities, and an adequate level of secured funding.
- Active engagement of civil society organisations at international and national level, with specified contributions and adequate monitoring and assistance to ensure focus on intervention objective
- Focussed participation of private sector representative bodies or companies with specific expertise and interests, which conform closely with those of the partnership
- Public awareness and support, based on production and circulation of materials detailing international best practice standards and support to national organisations, which can interpret and advocate the issues effectively in local contexts
- An appropriate coordination and support mechanism, which can: keep processes moving in line with the agreed schedule; offer or facilitate technical support in response to specific requests; provide financial support, particularly for such areas as local advocacy campaigns; research and monitoring; facilitate linkages and exchanges among partners, and between partners and participating countries; assemble, organise and disseminate up-to-date information to a broad range of interested parties.
- Development and implementation of effective monitoring mechanisms, to determine progress towards the partnership objective, highlight areas of low performance in need of additional attention and assess compliance once time-based deadlines have been passed
- Early consideration of possible sanctions against non-compliance, which might be viable and effective within a voluntary programme of change.

1. Introduction

1. This report presents the findings of an evaluation of the contribution of the UNEP Partnership for Clean Fuels and Vehicles to the phase out of leaded petrol in Sub Saharan Africa.

1.1 Overview of the Partnership for Clean Fuels and Vehicles

2. The Partnership for Clean Fuels and Vehicles (PCFV) is a global initiative to promote and support better air quality through the introduction of cleaner fuels and vehicles in developing and transitional countries. It is a public-private partnership launched by a group of committed partners from governments, international organisations, industry, and non-governmental organisations (NGOs). Since its inception in 2002 this global partnership has helped to reduce vehicular air pollution in developing and transitional countries through the promotion of clean fuels and vehicles, focusing on the elimination of lead in gasoline and the reduction of sulphur in fuels, concurrent with the adoption of cleaner vehicle technologies in developing countries. The United Nations Environment Programme (UNEP) - based Partnership Clearing-House provides technical, networking and financial support for improved capacity and technology transfer through regional, national and local activities related to cleaner fuels and vehicles.
3. The Clearing-House is the main implementing arm of the PCFV, staffed by UNEP staff (of whom several are paid by PCFV funds); and, together with other partners' activities, addresses the mission and mandate of the Partnership. The activities of the PCFV are centered on specific objectives and goals of the global phase out of leaded petrol (gasoline), sulphur reduction in fuels, and the introduction of cleaner vehicles and cleaner vehicle technologies.
4. Partnership support and activities at the regional and national levels with developing country governments to date are said to have been instrumental in supporting significant progress in lead phase out in sub-Saharan Africa, in addition to building consensus, knowledge sharing and facilitating the transfer of technology on cleaner fuels and vehicles from developed to developing countries.
5. The Partnership has raised well over US\$ 3 million in extra-budgetary funds for its global activities to date. Several Partners have provided funding to UNEP for these tasks, which has allowed UNEP to establish the Nairobi-based Clearing-House, which is now staffed by a Unit Head (UNEP in-kind contribution), 3 full-time Associate Programme Officers (one of whom is UNEP in-kind contribution) covering all relevant global regions, two full time consultants, one web support staff member, one communications and information staff member, one finance/budget support member and one (UNEP in-kind) Secretary. The Clearing-House started its work in February 2003.

6. Since its founding, the Partnership has worked with a broad range of partners, including the United States Environmental Protection Agency (US EPA) Clean Energy Initiative, the Clean Air Initiative (CAI) of the World Bank in Africa and the Asian Development Bank in Asia, the Government of Netherlands, private sector organisations and NGOs.

Strategic focus and Activities

7. The Partnership works with developing and transitional country governments, NGOs, industry groups (both oil and vehicle industries), and international organisations to implement activities aimed at reducing harmful vehicle emissions, improving air quality and reducing greenhouse gas emissions through the use of cleaner fuels and vehicles.
8. During the first steering meeting of PCFV Partners in New York in 2002, Partners agreed on the following overall mission statement for the Partnership:
 - Help developing countries to develop action plans to complete the global elimination of leaded gasoline and start to phase down sulphur in diesel and gasoline fuels, concurrent with adopting cleaner vehicle requirements;
 - Support the development and adoption of cleaner fuel standards and cleaner vehicle requirements by providing a platform for exchange of experiences and successful practices in developed and developing countries as well as technical assistance;
 - Develop public outreach materials, educational programmes, and awareness campaigns; adapt economic and planning tools for clean fuels and vehicles analyses in local settings; and support the development of enforcement and compliance programmes, with an initial focus on fuel adulteration;
 - Foster key partnerships between government, industry, NGOs, and other interested parties within a country and between countries to facilitate the implementation of cleaner fuel and vehicle commitments.
9. The Partnership asked UNEP to set up a Clearing-House at UNEP Headquarters in Nairobi to help implement the Partnership's mission. The Partners assigned the following tasks to the Clearing-House:
 - share and disseminate information to the Partners on relevant issues;
 - operate and maintain a website to provide easy access to information, Partner activities, and resources;
 - provide logistics for Partnership activities and events: workshops, technical assistance activities, etc;
 - provide administrative help to Partners;
 - maintain contacts in developing countries;
 - help to gather appropriate information for countries;
 - liaise with the other existing groups working on related activities;
 - help to bring in new partners or participants in Partnership activities; develop and disseminate public outreach materials about the Partnership, along with technical materials for the developing countries;

- help to bring developing country NGOs, universities, and governments into the Partnership or its activities;
 - and support Partners, at their request, in addressing the tasks above.
10. The Partnership, primarily through the UNEP Clearing-House, provides networking, technical and financial assistance to governments, international organizations and NGOs for the implementation of the above mandate and activities. Specifically, this means:
- support (technical, networking (including experts), and funding) for regional and national workshops, seminars and training sessions aimed at developing action plans for the elimination of leaded gasoline, the reduction of sulphur and the promotion of cleaner vehicles (and vehicle fleets) and vehicle technology;
 - support for specific activities for promoting cleaner fuels and vehicles, such as awareness campaigns and pilot heavy duty diesel vehicle retrofit projects aimed at demonstrating cleaner vehicle technology and subsequent decreases in emissions;
 - PCFV Global Working Groups developing resources on such issues as Public Awareness, Octane Levels, Leaded Gasoline Phase Out and Valve Seat Recession;
 - organization of annual Global Partnership Meetings;
 - representation of the Partnership at various related UN and non-UN events;
 - and publishing of Partnership materials, including the newsletter and website; answering queries on cleaner fuels and vehicle issues, and maintaining and developing contacts for fuel and vehicle issues in developing countries.
11. From 2002 to 2006, the PCFV primarily focussed on facilitating and supporting the phase-out of leaded fuel in Sub Saharan Africa. For the period 2006-2010, the focus of PCFV activities has been to develop and implement regional and sub-regional action plans and promote consensus on cleaner fuels and vehicles at the national level; covering those countries, which have yet to eliminate leaded fuel and promoting on a world-wide basis the reduction of sulphur in fuels. The focus continues to include national implementation activities, and where regional events on sulphur and lead are scheduled, promotion of cleaner vehicle considerations.
12. In addition to the global elimination of leaded gasoline, countries need to address sulphur in fuels and all countries that have introduced unleaded petrol will be faced with the issue of cleaner vehicles entering their markets either as new vehicles or second hand vehicles from developed countries. Since the prevalence of leaded fuel has been a major impediment to the adoption of catalytic converters in many developing countries, there is likely to be a substantial increase in the effective use of these in the medium and long term, as unleaded fuel becomes the norm. Catalytic converters reduce harmful emissions by 50 to 90% (depending on the pollutant) and thus bring a major improvement to air quality. The Partnership agreed at the 4th Global Partnership meeting in early December 2005 to launch a global campaign to attempt to phase-out leaded gasoline world wide by

the end of 2008 and to work towards a long-term target of 50 parts per million for sulphur in diesel and petrol vehicle fuels in developing and transitional countries.

1.2 Evaluation Objective, Scope and Methods

1.2.1 Objective

13. The objective of this evaluation is to examine and document the extent, magnitude and significance of any project outcomes, influences and impacts to date, which may provide lessons for the Partnership and for any potential similar programmes in future. The evaluation aims to answer the following key questions:
- To what extent has the partnership and campaign resulted in the phase-out of leaded gasoline in the targeted countries?
 - Has the campaign produced any measurable environmental and health benefits?
 - How effective was collaboration/interaction between the various project partners and institutions during project implementation and how did the partnership promote the goals of the campaign?

1.2.2 Scope

14. Initial discussions between the consultants and the UNEP Evaluation Office led to a decision to focus on the early phase of the Partnership, namely support for the elimination of leaded fuels from Sub-Saharan Africa. This was expected to enable a clear evaluation to be made of a set of activities, which have already been completed, rather than mixing finalised and active elements of the programme; and to enable more effective use to be made of the available budget.

1.2.3 Methodology

15. The evaluation used a Theory Based Approach; which first developed, on the basis of project documents, an understanding of how the project activities were intended to contribute towards its intended objectives through a set of cause and effect chains. The evaluators then sought to assemble the evidence, which would show what activities were undertaken and with what results; describing a set of causal pathways. The evidence was then analysed to produce evaluative findings.
16. The main sources of evidence of the evaluation were: an extensive review of secondary material, including publications, web site material and documentary media such as DVDs; and discussions and interviews with a broad range of stakeholders.

Key elements of the evaluation included:

Secondary Data

- desk review of PCFV documents
- desk review of external documents, web-based resources and multi-media sources such as DVDs

Primary Data

- discussions and interviews in, UNEP, UNEP Evaluation Office and PCFV
- discussions and interviews with partnership members and collaborators, including government officers, industry, international organizations and NGO groups

Analytical Processes

- development and analysis of the key causal pathways used by the project in attempting to achieve its objectives (Figure 1)
- analysis of progress along causal pathways, showing the results of support from UNEP, PCFV and the Clearing House.
- evaluation of the contribution of UNEP, PCFV and the Clearing House
- deriving lessons from the evaluation.

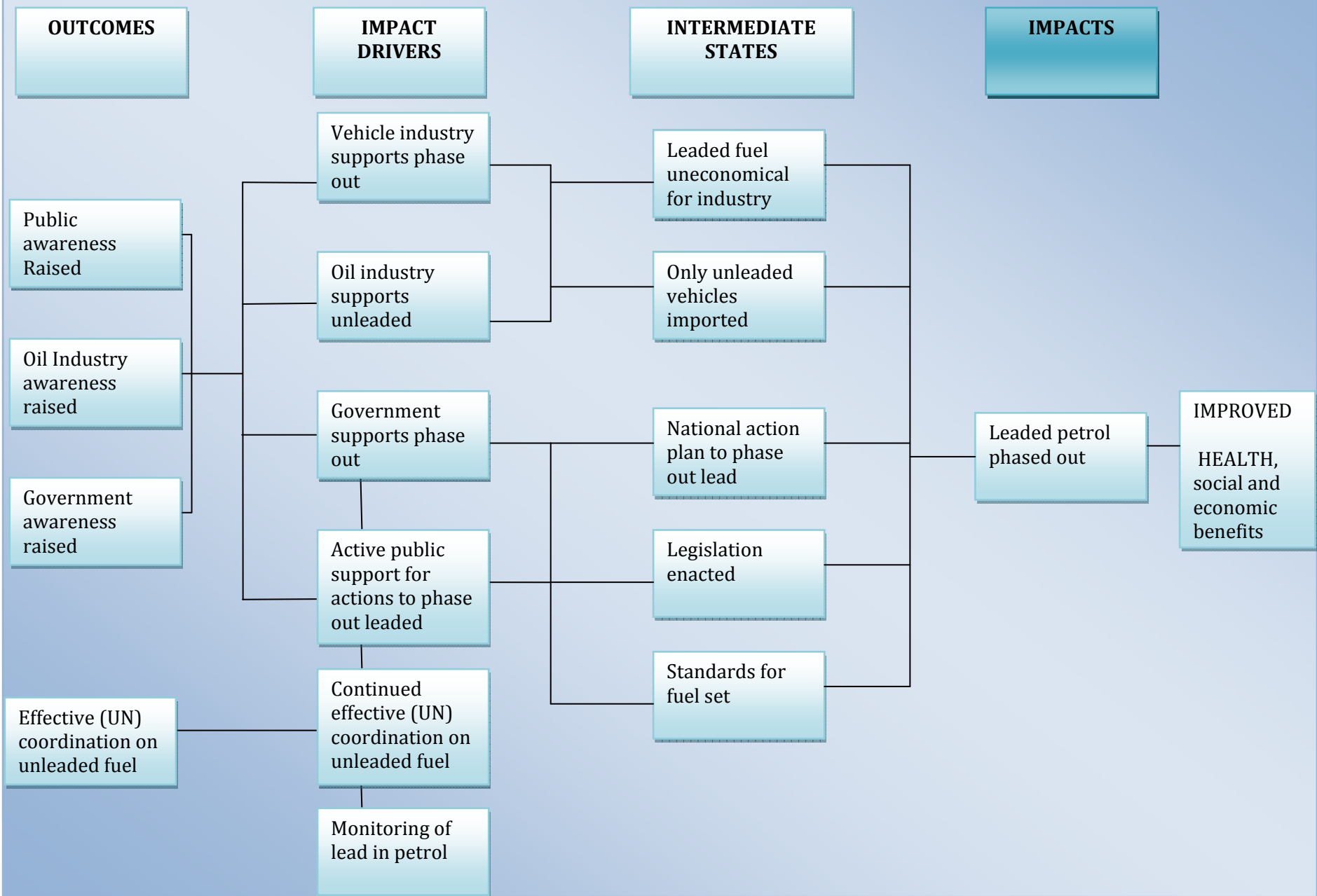
Limitations

17. The available budget did not allow for any fieldwork or country visits, which limited the opportunity to interact with country partners to gain first hand experiences and perspectives on the role of PCFV in the removal of leaded fuel in their countries.

Overview of the Methodology

18. The evaluation team, together with UNEP Evaluation Office, developed the causal pathways, which were intended to be used by the project to achieve its objectives, on the basis of project documents, specifically the Logical Framework of the 2006 PCFV proposal to the European Union for support. Although this was prepared after the phase out of leaded fuel in Sub Saharan Africa and for use in other regions and countries, it was found to encapsulate key elements of the approach, which had been used in Africa. Key elements of the causal pathways included in the Theory of Change of the project are shown as Figure 1 below. Outcomes are results, which can be traced directly to the activities of the project. They can be seen as the first significant step towards the intended impacts of the intervention. Between these outcomes and the impacts, it is usually the case that a set of “intermediate states” must be passed through. In order to continue moving along this causal pathway from outcomes towards impacts, some active support elements are needed. These are classified as “impact drivers” and are essential for progress to be sustained, so that the objective can ultimately be reached. 19.

Figure 1: Causal Chains in the Theory of Change of the PCFV



19. Analysis of project documents showed a clear set of causal pathways leading towards the project's intended objective of improved health (particularly child health), and associated social and economic benefits, through the elimination of leaded petrol from Sub Saharan Africa. This is shown as Figure 1 and is analysed from an evaluative perspective in Chapter 6 of this report.

2. Activities and Processes Promoting the Phase Out of Leaded Petrol in Sub-Saharan Africa

2.1 Objective

20. There was essentially one objective of the support provided by the Partnership in Sub Saharan Africa (SSA) as outlined in the Dakar Declaration of June 2001, namely the total phase-out of leaded petrol in SSA by the end of 2005. If this state were attained, the Partnership would have achieved its initial objective, which was seen as an important step on the way to the global elimination of leaded fuel.

2.2 Activities Undertaken to Move Towards the Total Elimination of Leaded Fuel in Sub Saharan Africa

21. A substantial set of activities, involving many stakeholders, was undertaken to move towards the objective of the total phase out of leaded fuel in Sub-Saharan Africa by the end of 2005. These activities are reviewed below in chronological order, to explore the processes involved and the roles played by various parties.

2.2.1 Events and Activities in 2001

22. Some of the most important activities in the elimination of leaded fuel from SSA occurred before the formation of the PCFV and were catalytic to its formation process. The first, and most important of these was the Regional Conference on the Phase-Out of Leaded Gasoline in Sub-Saharan Africa, held in Dakar, Senegal in June 2001.

The Dakar Conference and Declaration (June 2001)

23. The Dakar Conference can be seen as the formal starting point of the elimination process. This conference fell under the World Bank Clean Air Initiative in Sub-Saharan African Cities and had as its main objective: "to initiate the phase-out of leaded gasoline in sub-Saharan Africa by:
 - Raising awareness about the health impact of leaded gasoline.
 - Building consensus among the main stakeholders on the technical, regulatory, institutional, economic issues and priorities to implement lead phase-out.

- Developing Action Plans to phase-out leaded gasoline with timetable and monitoring indicators”¹.
24. The Conference covered the perceived major issues in considerable detail and with a high level of expertise. The conference highlights included presentations on:
- Health problems associated with leaded gasoline
 - Fuel refining and distribution – technical and financial issues
 - Integrating lead phase-out into air pollution abatement strategies
 - Presentation of successful programs of leaded gasoline phase-out
 - Establishing sub-regional multi-stakeholder teams to facilitate the flow of information and prepare preliminary action plans
 - Initiate follow-up programmes through: disseminating the action plans, launching an AFRICACLEAN Regional Network of African Experts and monitoring the implementation of the action plans.
25. Conference participants included: multilateral agencies and institutions, USEPA, bilateral donors, NGOs and research institutions, oil refining and supply companies, members of the oil industry, network of African consultants, ESMAP sector programme and other partners, including WHO. Conference documentation provided detailed guidelines for the preparation of the sub-regional action plans, covering the following ground:
- Identification of stakeholders
 - Collection of technical and health data
 - Defining appropriate gasoline octane grades
 - Implications of phasing out lead from gasoline for different situations, namely; importing countries, countries with refineries, the fuel distribution and marketing system, reducing the transition period, harmonized fuels technical specifications, pricing and taxes, monitoring progress through blood lead screening, air quality standards, vehicle emissions and public information campaign
 - Data to be collected and submitted in annexes to each sub-regional plan.
26. A number of presentations from representatives of the oil and automobile industry explored the technical and financial issues in depth. A set of five sub-regional working groups, organised around the key refinery centres of the continent, worked on the outlines of the phase-out action plans and made proposals for the future work necessary in each area.

¹ Source: Page 2, “Regional Conference on the Phase-Out of Leaded Gasoline in Sub-Saharan Africa,” The World Bank Clean Air Initiative in Sub-Saharan African Cities, June 26 -28, 2001, Dakar, Senegal.

27. The major output of the Conference was the Dakar Declaration of June 2001. This declaration was agreed by participants from 25 SSA countries; including representatives of government, industry and civil society, as well as from international organisations.
28. The declaration set a deadline for the total elimination of leaded fuel in SSA “by 2005,” moving through phased reduction of the lead content of petrol, from the average of 0.8 g/l in June 2001, to 0.4 g/l by 2002 and 0.2 g/l by 2003. (These intermediate steps were not seen as useful by PCFV, which focussed on its final target). Sub-regional action plans detailing the national programmes were to be drawn up within twelve months of the Declaration. Countries forming sub-regional markets were encouraged to harmonise their petrol norms and standards, so that trade could continue, whilst emphasising the phase-out schedule. The International Petroleum Industry Environmental Conservation Association (IPIECA)² was to give coordination support to inputs from the oil industry and to collaborate with the automobile industry in the process of formulating technical specifications for fuels. Oil supply chain operators were requested to improve their production, storage and distribution facilities to enable the planned phase-out timetable to be achieved. Countries, which imported their petrol independently, were encouraged to accelerate their phase-out by insisting on unleaded fuel.
29. In support of the Declaration, capacity development assistance was requested from international and national agencies, whilst NGOs were invited to participate in the development of public information campaigns in support of the phase out. Donors were encouraged to give priority to the issue in their bilateral discussions with Governments in the region. Regional and sub-regional organisations were encouraged to endorse the programme, as well as to contribute to the harmonisation of standards and technical specifications.
30. In effect, the Conference and the Declaration outlined the essence of the approach, which was later adopted by the PCFV and administered by the Clearing House. UNEP played a support role in the conference organisation and proceedings, together with such bodies as US EPA and IPIECA, whilst the World Bank was its main financier and promoter. UNEP’s role as a leading partner materialised as a result of the first of the Sub-Regional Workshops called to follow up on the Dakar Declaration, held in Nairobi.

² IPIECA was founded in 1974 and has global membership, including national and multi-national petroleum companies and associations. It interacts with a variety of UN and other international organisations and focuses on a number of key issues affecting the industry globally: including Oil Spill Preparedness and Response, Operational issues such as air quality and other health issues, Climate Change, Biodiversity and Social Responsibility. IPIECA’s objective in the context of the partnership is to “Support the worldwide elimination of lead as an additive in transportation fuels” and to “Work with governments and others to constructively encourage prompt action to mandate its elimination.”

2.2.2 Events and Activities in 2002

East African Sub-Regional Workshop (June 2002)

31. The next major formal step in the process was a sub-regional workshop for East Africa held at UNEP Headquarters in Nairobi in June 2002. This gathered 91 participants representing governments, the private sector and civil society, with the goal of developing a sub-regional action plan, based on the Dakar Declaration.
32. The action plan first noted that countries in the East Africa sub-region were totally or largely dependent on one refinery, which therefore represented a critical element in the path towards the phase-out. The action plan recommended that governments in the East African sub-region should declare their intention to phase-out leaded petrol and appoint a group to develop the necessary modalities. Countries should also work towards harmonisation of fuel specifications in the sub-region, to enable regional fuel trading to continue through the phase-out process; enact appropriate legislation or regulations to ensure fuel quality, enforce the required standards and work to eliminate any remaining barriers. By way of example, governments and international agencies were requested to ensure that their own vehicle fleets use only unleaded fuel.
33. The approach of national stakeholder campaigns and projects was proposed to put together the elements necessary to achieve the intended results. These might include fuel specifications, taxation and pricing. Awareness campaigns, focussed on key health and environmental issues, were to be developed for all levels of society, from government officials to fuel pump operators. Other aspects to be covered in these campaigns included vehicle performance, user benefits and dispelling misconceptions about disadvantages of unleaded petrol. In support of these campaigns, research was to be promoted to gather relevant data on such issues as air quality; lead pollution and blood lead levels.
34. Industry was requested to play an important role in the process: by declaring that leaded fuel is unnecessary for cars to run efficiently; providing authoritative technical statements for the Government and the public; and ensuring that unleaded fuel could easily be made available throughout the region.
35. The role of Civil Society was to encourage Government and the private sector to accelerate the phase-out programme, often through ensuring public pressure, based on heightened awareness of the harmful effects of leaded fuel. The National Environment Council in Kenya and similar bodies in the region were to ensure that the phase was a visible part of their agenda. International agencies were called upon to continue their support programmes.
36. The Action Plan tasked UNEP to review progress for a meeting of African Ministers of Environment scheduled for the second half of 2003 or early 2004. To

inform this review, Governments would prepare short progress reports, whilst the industry umbrella organisation, IPIECA, would report back on private sector initiatives and civil society bodies would update their activities and achievements.

World Summit on Sustainable Development (WSSD)

37. The WSSD, which met in Johannesburg in August/September 2002, emphasised the importance of promoting sustainable development in Africa; and the need for government, the private sector, civil society and international organisations to work in partnership to address the many urgent issues facing the continent. The Summit launched “Type-2 Outcomes”, otherwise known as Partnerships, under which governments, civil society and the private sector would work together on certain issues. The Partnership for Clean Fuels and Vehicles was one such partnership.
38. Furthermore, the Plan of Implementation of the WSSD called for the immediate and global phase-out of leaded petrol.

Johannesburg Plan of Implementation

39. The Johannesburg Plan of Implementation aimed to set up activities in support of the political declarations made at the WSSD. One of its platforms was the role of public-private partnerships as a means of implementation. Paragraph 56 (b) of the Plan specifically gave support to the phase-out of leaded petrol. This was seen as a measure reaffirming and supporting paragraph 6.2. (3) of *Agenda 21* of the 1992 Rio Summit, which called for a reduction in the health risks from environmental pollution and hazards.

Partnership for Clean Fuels and Vehicles First Global Partnership Meeting (November 2002)

40. The Partnership established at WSSD held its first meeting in November 2002. Fifty members, with representatives of governments, non-government organisations, industry and international organisations, met in New York to discuss the development of a preliminary programme. The partners agreed that no new organisation was required, but that a Clearing House should be established within UNEP and staffed with “one or more facilitators”; whose role would be “to keep all partners informed of activities, progress and potential for further collaboration.”³ Financial support for the Clearing House was pledged from Governments, international agencies and private sector organisations.
41. The Terms of Reference of the Clearing House have been described in Paragraph 9.

³ Partners for Cleaner Fuels and Vehicles Steering Committee Meeting, 14-15 November 2002 Report, P2.

42. The role of the Clearing House, in terms of raising finance and supporting national governments, was not very clearly specified. However, the declared intention of the Partnership was to work closely with individual countries, which demonstrated the political will to change, to assist them in eliminating leaded petrol and later to reduce other harmful elements of vehicle emissions. Achievement of this goal would be facilitated by support tailored for each individual country, since local circumstances would influence the most effective way forward.
43. Sub-Saharan Africa (SSA) formed the initial target for the Partnership, because of its high reliance on leaded fuel. The partners identified that African countries faced three situations: they used exclusively fuel refined domestically, or they imported all fuel, or they used both domestic and imported sources. In principle, it would be easy for importing countries to simply switch their source to one, which supplied unleaded fuel. However, in practice, many of these countries are landlocked and high transport costs prevent them from switching to any other supplier than their nearest refining neighbour.
44. The concentration of supply sources in a few countries gave the Partnership one strategy: namely to concentrate on assisting key refineries (and their host countries) to update their facilities, so that they could provide unleaded fuel to themselves and their customer countries. A challenge to this approach was rapidly identified. Many of these refineries were partly or wholly owned by governments. These were thought likely to be reluctant to commit the necessary resources to upgrading their plant; since they had many other pressing demands for limited national funding. In this respect, the low public awareness of the harmful effects of leaded fuel was identified as a factor, which might enable governments to give the issue low priority. The Partnership sought to address this issue through substantial support to public awareness programmes managed by Governments and Non Governmental Organisations.
45. These potential hindrances to phase-out were countered by the positive factor that 25 countries had already developed phase-out strategies catalysed by the Dakar and Nairobi meetings discussed above. In the light of the successful Nairobi Conference, UNEP agreed to create a five-year programme of follow-up workshops at sub-regional level.
46. The partners agreed that public awareness would be an urgent task for support, in view of apparently widespread misconceptions that leaded fuel was actually superior. The Partnership was therefore to engage rapidly in developing technical and non-technical materials for public education at all levels and several of the Partners actively provided information from their own experience and resources. On the technical side, one of the Partners, IPIECA had already produced a CD-Rom for developing countries, analysing the various additives that make effective substitutes for lead. The US Environmental Protection Agency (EPA) committed

to help develop public awareness materials for South Africa, which could then be used elsewhere on the continent. Civil Society Organisations were offered support from EPA, IPIECA and the Natural Resource Defence Council (NRDC); while the Manufacturers of Emission Controls Association would help produce information packages on the benefits of eliminating lead and reducing sulphur for technical and non-technical audiences.

47. At this first meeting, the Partnership established Working Groups to undertake comprehensive analysis of three technical issues: the best Octane level to target, valve seat recession and the importance of sulphur in emission reduction. Four other issues were identified as requiring further work, but no entities were identified to champion them. These were:
- The absence of data showing how blood lead level responds to lead phase-out in petrol.
 - The need for global data on lead phase-out and fuel quality specification
 - How to finance refinery upgrading
 - Need to develop capacity and willingness to conduct emission inventory analyses.
48. Since no party was identified to take these forward, they presented a challenge for the Clearing House to address.

2.2.3 Events and Activities in 2003

49. In March 2003 a Technical Experts Group Meeting was organised in Bamako, Mali. This was a follow up to the Dakar and sub-regional meetings and had, as its main objectives, to bring together technical experts from SSA countries “to evaluate progress made in the various sub-regions towards phasing-out of leaded gasoline”⁴ and to draw up a programme of action with a specific timeframe for the phase-out in SSA. Working groups discussed possible ways forward and presented them to the workshop for consideration and support. The agreed items were collated into the Bamako Programme of Action, which was supported by an Implementation Committee chosen by the meeting.
50. The meeting emphasised the importance of government commitment, in order to meet the target of phase-out by 31 December 2005. It was agreed that regions (presumably meaning what have elsewhere been called sub-regions) should draw up, by the end of 2003, strategic action programmes with target dates, with support from the UNEP Clearing House. The importance of “sensitisation” programmes was affirmed, with the indication that these would cost about \$100,000 per country. It was proposed that regional bodies, such as the African

⁴ See “Technical Experts Group Meeting on the Phase Out of Leaded Gasoline in Sub-Saharan African Countries” report 2003.

- Union, ECOWAS and NEPAD (which had agreed to phase-out leaded petrol in SSA by the end of 2005) could play an important role in such campaigns. The Implementation Committee, drawn from government, industry and civil society was tasked to coordinate between the sub-regions. The Committee was also intended to identify countries that could easily switch over, help draw up programmes to facilitate such changeover, identify countries needing additional investment before they could make the change and circulate relevant information.
51. A UNEP presentation at the Bamako Meeting indicated that at the time, 90% of petrol sold worldwide was already unleaded and such petrol was now cheaper than leaded, due to high premiums paid for shipping leaded fuel and the scarcity of the lead additives. It was noted that the practice of countries such as Kenya of selling both types of petrol at the same time, was not desirable; since intermixing of the two would produce a blend capable of destroying the catalytic converters fitted to most new and used imported vehicles. Furthermore, it reduced the strength of the message on the importance of removing leaded fuel from use.
 52. Sub-regional progress reports were presented to the Meeting. As of March 2003, no country in West Africa had introduced unleaded fuel. Benin indicated that, since 80% of its petrol came from Nigeria, it was dependent on that country converting its supply before it could change. Nigeria in turn would have to upgrade its refinery. Mali and Mauritania imported fuels through countries such as Senegal, Togo and Cote d'Ivoire, which still used leaded fuel. Ghana declared its intention to upgrade its refinery and phase-out by June 2003. On the basis of this evidence, the Meeting discussed the importance of the regional supply dimensions and of landlocked countries insisting that transit ports were able to supply them unleaded fuel.
 53. In East Africa, Ethiopia was largely reliant on imports from Sudan, which already produced unleaded petrol. Ethiopia was therefore already marketing unleaded, as well as fuel with a very low (0.09%) lead content. Kenya was still producing leaded fuel at its refinery, which supplied 50% of its domestic market. The remainder was imported in unleaded form and sold as unleaded fuel throughout the country, since the infrastructure to transport unleaded was in place. This also meant that countries supplied by Kenya could become unleaded and continue to receive fuel through their normal channels. This applied to Uganda, northern Tanzania, Rwanda, Burundi and the Democratic Republic of Congo. The Kenyan government was in discussion with those countries, with a view to obtaining their concurrence on moving towards unleaded. At the same time, it was reviewing (with a commitment to decide before the end of 2003) the economic viability of upgrading its refinery to produce unleaded, or whether to use it simply as an import handling facility.
 54. In Southern Africa, several countries (South Africa, Botswana, Lesotho, Mozambique, Namibia, Swaziland and Zimbabwe) were already offering both types of fuel in retail markets; while Mauritius was totally unleaded. Much of the

- responsibility in the region rested on South Africa (as key exporter of fuel to most of the countries in Southern Africa), which had six refineries in need of upgrading and the Government indicated that it would be ready to produce unleaded fuel from the refineries by 1st January 2006.
55. The Bamako Meeting produced a Programme of Action targeting three outputs. The first of these was that Government, parliament and civil society would understand the health risks of leaded fuel and the advantages of phasing-out. Secondly, there would be positive public acceptance of the new fuel, based on an understanding of its advantages. Thirdly, in support of the two outputs above there would be appropriate education and public awareness materials. The plan was intended to run for three years, but its budget and responsibilities were somewhat vague.
 56. June 2003 saw the release of the Action Plan on the Environment Initiative of the New Partnership for Africa's Development (NEPAD), Paragraph 139 of which proposed that support should be given to the elimination of lead in gasoline in Africa.
 57. October 2003 saw the Sub-Regional Conference on the Phase-out of Leaded Gasoline in Southern Africa at which, several institutions and countries presented case studies of the steps they had taken and progress made. The path followed by the Zambian Government, shown in Box 1 below, illustrates some of the complexity of the process in a refining country⁵.

⁵ Source: "Phasing Out Unleaded Petrol: Role of Government", paper presented at the sub-regional conference on phase out of leaded gasoline in Southern Africa, Kenneth O. Kangende. October 2003.

Box 1: Case Study: The Zambian Government Approach to Phase Out

Unleaded petrol was introduced into Zambia in 2001; confined to a few urban centres, with an initial market penetration of only 1%. By late 2003, the country had an annual consumption of some 500,000 tonnes of petrol; of which, about 30,000 tonnes was unleaded. Most fuel came from the country's own Indeni Refinery, with the remainder imported from South and East Africa. Tetraethyl lead compound was added to petrol at the refinery to attain the octane number thought to be required for anti-knocking properties.

The Government's Energy Regulation Board established a Task Team to explore the issue; with members from the Board itself, Department of Energy, Road Traffic Commission, Indeni Petroleum Refinery, the Zambia National Oil Company, Environmental Council of Zambia and oil marketing companies in the country. The team was mainly charged to:

- Establish market demand for unleaded petrol
- Identify options for producing unleaded petrol
- Develop strategies for unleaded petrol.

The Team found no statistics about the extent to which vehicles designed for unleaded petrol were being forced to use leaded in Zambia. They conducted a survey, which showed that franchise dealers were each importing in the range of 100-200 cars per annum and that few vehicles, which were designed to use leaded fuel, remained on the world market. The dealers wanted to see unleaded petrol freely available, so that they could offer a better range of vehicles. It was the dealers who currently converted imported new vehicles to run on leaded petrol; whilst second-hand vehicles from the Far East, designed for unleaded and with catalytic converters (which are destroyed by leaded fuel) were being fuelled with leaded. There was a substantial demand for unleaded petrol from tourists driving through the country and Zambians returning from abroad with new vehicles. The total demand for unleaded petrol was predicted to rise over the next five years from 30,000 to 50,000 tonnes per annum. The oil marketing companies were interesting in establishing some filling stations in the urban centres as sources of unleaded fuel.

How best to produce unleaded fuel proved a complex issue explored by the Task Team. A number of options were reviewed to enable the refinery to produce unleaded fuel. It appeared that it could already produce up to 50,000 tonnes of unleaded per annum without major investment or infrastructure. Thus the amount required for the near future was already within its range, with the production of leaded petrol continuing at current levels. More than this would require the installation of new hardware. One option to scale up unleaded production was the use of high octane oxygenated blending components. The example of Brazil was explored, where ethanol is blended with petrol to achieve the desired octane level. However, this blend was thought to be unsuitable in the African context, since it heightens sensitivity of petrol towards humidity, which can lead to increased corrosion in vehicles. Furthermore, Zambia has no ethanol plant, which would mean additional cost before such a process could be utilised. Other non-lead octane enhancers could be imported, but were expensive, and themselves posed health and environmental issues. In the short term, the most viable option was therefore thought to be importing additional unleaded petrol as necessary, until a satisfactory solution could be found.

The Team also considered the most appropriate policy tools to enable the transition. It emphasised the need for a formal policy pronouncement by Government; backed up by a system of licensing by the Energy Management Board of companies wanting to import unleaded petrol. The Team proposed that unleaded petrol be introduced nationwide by March 2002, with a Government policy statement announcing a dual distribution system until the phase out of leaded petrol by the end of 2005. This process would be supported by legislation requiring new vehicle imports to be designed for unleaded petrol and equipped with catalytic converters. The Environmental Council of Zambia would be tasked to develop vehicle emissions standards. For the retail industry, pump nozzle diameters and fuel filler inlet restrictors would be used to ensure that leaded petrol could not be put into vehicles designed to run on unleaded. The Task Team also recommended that Government enact tax policies in favour of unleaded petrol and establish a National Committee to specify the precise modalities for the transition process.

Whilst the Task Force conducted its work, the Petroleum Products Quality Technical Committee, working under the auspices of the Energy Regulation Board, developed a standard specification for unleaded petrol.

58. Since the Dakar Declaration, IPIECA's role had mainly been to facilitate industry inputs to the phase-out process in SSA, through holding workshops and seminars, with an emphasis on the broader concept of Urban Air Quality, rather than just emissions. At the Southern Africa Workshop in October 2003, IPIECA described the role of the Oil Industry in the phase-out process in SADC member states⁶. It committed itself to help plan and participate in World Bank SSA Regional Conferences, to collaborate with the World Bank on collecting country data on leaded petrol and to support the UNEP-supported PCFV. IPIECA voiced some concerns at this stage with the situation of partially unleaded countries in SSA, citing the possibility of contamination in dual systems, the incapacity of many retailers to accommodate dual grades and the fear that the availability of dual supply might slow down the adoption of unleaded fuel.
59. IPIECA drew attention to the successful emergence of fuels and vehicles as a global issue as a result of the international campaigns and programmes. It emphasised that changes in fuel specifications had already impacted industry and governments in the region and that the consumer would ultimately have to pay for the changes. Although it was important to address countries on a case-by-case basis, regional harmonization of standards had also emerged as an important issue, in order to prevent fuel adulteration and smuggling.
60. Another presentation⁷ at the same Southern Africa Workshop summarised the situation to date in SSA. Unleaded petrol was seen not just as an end in itself, but as a "Gateway to the Future",⁸ which would be characterised by advanced vehicle technologies giving low "conventional" and Greenhouse Gas emissions, using unleaded petrol with low benzene and sulphur content. By this time, it had been shown that unleaded fuel could be operated in all vehicles⁹, including older ones; with no harm and that refinery modifications were available for African facilities to raise the Octane level as required. A detailed analysis was made of the tradeoffs between different possible blends of fuel. The main outstanding issue was whether to make a quick or slow transition. Whilst a slow transition might have political advantages, create less public anxiety and spread the cost over a longer period; it also posed major risks of contamination and would incur additional expenses through dual storage and distribution systems. Although no figures were available for the SSA situation, it appeared that in the USA, the benefits of phasing-out lead outweighed their costs by 10 times; so that even if the process were handled less expeditiously in some parts of Africa, there was highly likely to be a net benefit in economic terms.

⁶ Source: "Phasing Out Leaded Fuel in the SADC: The role of the Oil Industry," Paper presented at the World Bank Clean Air Initiative Subregional Workshop by Rob Cox, IPIECA, October 2003.

⁷ Source: Presentation by Mike Walsh, Cape Town 2003

⁸ Source: Presentation by Mike Walsh, Cape Town, 2003.

⁹ Eliminating Lead from Gasoline: Report on Valve Seat Recession. PCFV, undated.

61. Immediately after the Southern Africa sub-regional meeting in October 2003 there was a SSA Refiners meeting organised jointly by IPIECA, UNEP and the World Bank. This brought together more than 50 representatives from all the major refineries in SSA to discuss how they would upgrade their refining capacity to produce high quality unleaded fuel.
62. The refining industry in SSA¹⁰ at this time saw three major issues to be addressed. Firstly, there were no clearly defined and regionally harmonised fuel specifications. Many standards had lingered from pre-independence days, often with one very high Octane grade (97 or 98 Research Octane Number or RON), which was in many cases difficult for the refineries to attain, and one much lower (89 RON or lower). The emerging consensus was that at least one unleaded grade should be fixed, at around 91 RON, to enable the immediate importation of new vehicles compatible with this grade, with catalytic converters; thereby also addressing a broader range of air quality problems as well as lead. Countries could then offer other grades according to their wishes and capacity.
63. Some SSA refining countries were already able to produce 91 RON ULG with little or no additional costs, sometimes without the use of additives, some of which produced their own problems. Several countries (Nigeria, Ghana, Ethiopia and Angola) had already adopted this specification, while the managers of refineries in Cameroon, Zambia, Cote d'Ivoire and Gabon intended to propose this solution to their regulatory bodies. In the republic of South Africa, a study had recommended the adoption of 91 RON and 95 RON as the optimal pair of grades. If this were adopted, 91 RON ULG could be supplied from there to the countries of the Southern African Development Community (SADC) and the Southern African Customs Union (SACU).
64. The adoption of one basic standard was seen as desirable to help eliminate fuel smuggling and adulteration, both of which are prevalent in SSA. It was, however, noted that the fuel supply in countries and regions should still cater to the existing vehicle fleets using those markets. It was reported that delays in producing final approved standards in South Africa were holding up medium term investment projects.
65. A critical factor discussed by the refiners was the timing of government measures to revise fuel quality specifications. A gap of four to five years between promulgation of revised fuel quality and full implementation was advanced as good practice; although this would not meet the deadline previously agreed by many SSA countries.
66. The second major issue addressed was that of the dumping of fuel types no longer accepted in the US market into African markets. Again the setting of clear

¹⁰ Source: IPIECA Fuels and Vehicles Working Group. "Workshop Report: Somerset West Refiners' Workshop", October 2003.

- standards was regarded as the way forward, including with regard to dyes added to petrol, so that fuel adulteration could be checked.
67. The third issue was the perceived high costs facing some refineries, which needed to invest in new technology to produce ULG; how to reduce these costs and whether any external sources of financing might be available.
68. The conclusions of the refiners' workshop largely reconfirmed those of earlier meetings. They can be summarised as follows:
- Complete phase-out by the end of 2005 was technically feasible
 - Additives may need to be used to achieve this, in view of the long time necessary to improve refinery infrastructure
 - Some non-refining countries had decided to phase-out early
 - The average lead content in petrol in SSA was steadily reducing
 - The oil and auto industries needed to collaborate closely to ensure that fuel met the needs of vehicles in any location
 - It was important for auto manufacturers to supply only vehicles with catalytic converters to keep the pressure high for ULG
 - Industry and governments should work together to harmonise standards, introduce agreed octane grades and enforce minimum quality standards at the pump. Currently regional and sub-regional inconsistencies opened the door to smuggling and adulteration.
69. As was customary at other workshops and conferences, breakout groups were established to explore: oil product technical specialisations, challenges to implementing new specifications and potential funding needs to do so; what advice participants would give to governments on how to pursue fuel improvements, eliminate misfuelling and fuel adulteration; and the most effective role of industry in multi stakeholder groups.
70. Shortly after the Southern African workshops, on 17th October 2003, the Executive Director of UNEP launched Phase 2 of the initiative to phase out leaded fuel in SSA at a meeting held in Nairobi. Other speakers included representatives of the Netherlands Government and the Royal Dutch Shell Group. UNEP pledged to fund activities in seven SSA countries, with the US EPA and the World Bank working in four others.
71. The Executive Director of UNEP¹¹ emphasised that growing urbanisation in Africa was leading to severe environmental problems, one of which was the dangers posed by lead in the air. In turn urbanisation promoted more cars and petrol use. The effects of these trends were illustrated by a comparative study of lead levels in the blood in a rural area of Kenya, versus those in Nairobi, which

¹¹ Source: "Implementation of the WSSD: support to Sub-Saharan Africa on the improvement of urban air quality through the phase out of leaded gasoline," presentation given by Klaus Topfer, Nairobi, Kenya, October 2003.

- proved to be almost 100 times as high. This perspective was supported by reported results of a health study in Egypt, which indicated that heart attacks, strokes, premature deaths, infant deaths and loss of IQ in children were caused by lead pollution.
72. In December 2003 the Second Meeting of the Global Partnership for Clean Fuels and Vehicles, was held in The Hague, Netherlands. UNEP organised the meeting, through the Clearing House. Fifty people representing 30 partners attended. The Agenda¹² sought to:
- discuss and agree on the development and implementation of the PCFV;
 - establish a governance structure for the Partnership;
 - receive updates from the Global Working Groups on Sulphur, Valve Seat Recession, and Octane regarding their respective progress;
 - receive updates from the regions as to progress in the phase-out of leaded gasoline, as well as identify potential future activities; and
 - Map out ways forward for the future.
73. The Clearing House presented its progress report, budget, funding situation and future activities. The Chairs of the Global Working Groups established at the first Partners' Meeting reported on progress and future activities; these were the Octane Group, Sulphur Group and Valve Seat Recession Group. A sub-group of the Partnership had prepared Governance Rules, which were presented and discussed. Other issues discussed in detail included: the structure of the Partnership's Steering Committee/Advisory group; specification of measurable goals for the Partnership; financial reporting; frequency of Partnership meetings; and the need to ensure full participation of developing countries. Partners agreed on the creation of an Advisory Group for one year, moderated by the UN and operating on a consensus basis; as well as on a set of Governance Rules for the Partnership.
74. Regional breakout groups discussed progress and issues in their areas and reported back to the plenary session. The Africa group reviewed the recent meetings and discussed the up-coming Dakar + 2 Meeting and the Central African Sub-Regional Workshop; and indicated that the perceived requirements for success were: standardised Partnership presentations, replies to national requests for support, promoting action of importers to limit the number of catalysts in fuel and continuing public education. Discussions on the various sub-regional findings led to the decision to establish a Working Group to address public-awareness/education; to be chaired by UNEP.

¹² Source: "Summary of Second Meeting of the Global Partnership for Clean Fuels and Vehicles," The Hague, Netherlands, December 2003.

2.2.4 Events and Activities in 2004

75. A Central African Sub-Regional meeting took place in Douala, Cameroon in March 2004. It was presented as “The World Bank Clean Air Initiative in Sub-Saharan African Cities”, with the support of “The Partnership for Clean Fuels and Vehicles”. The meeting attracted more than 80 representatives of governments, local authorities, industry and civil society from the sub-region of West-Central Africa (covering Angola, Cameroon, Central African Republic, Chad, Congo Brazzaville and Democratic Republic of Congo). As well as plenary presentations, work was conducted by three working groups, covering the following themes¹³:
- Harmonisation of standards and technical specifications
 - Oil supply logistics
 - Consumer needs.
76. The Harmonisation Working Group presented the advantages of this approach and identified the relevant bodies in the sub-region as; the public authorities, sub-regional organisations, oil companies and distributors, storage facility operators and franchises. Harmonisation and standardisation should be supported by public awareness campaigns and monitoring procedures. Challenges anticipated during the reform process included: decontamination of ethylation facilities and storage tanks; and the need to define new specifications for such substances as benzenes by the end of 2005. The Working Group adopted the following principles related to lead phase-out: a single grade of petrol at 91 RON; with minimal and controlled use of additives, supplied in storage facilities or service stations for particular needs, rather than in the refineries; lead content of 0.013g/litre by end 2005.
77. The Oil Product Supply Logistics Working Group noted that, since a twelve month transition period is necessary for full conversion of the oil distribution chain, governments should harmonise their decisions concerning the octane value by August 2004 at the latest. Other recommendations were: additives to be supplied at storage facilities or service stations; use of single petrol grade to combat fraud; regular measurements in storage facilities; awareness campaigns for relevant groups of civil servants and private sector operators dealing with fuel; governments to minimise obstacles to the changeover, with oil companies and retailers playing a leading role; government authorities and international agencies to take the lead by using only unleaded petrol in their fleets; civil society organisations to mobilise public support for the change.
78. The Working Group on the role of consumers noted that awareness campaigns on the key health and environmental issues would encourage support for the phase-

¹³ Source: “Sub-Regional Conference on the Phase-Out of Leaded Gasoline in West Central Africa and Seminar on Air Pollution in Douala,” Working Paper Number 18, Douala, Cameroon, March 2004.

- out. Special campaigns should also be mounted to reach such personnel as mechanics, franchisees and drivers, in order to remove beliefs concerning the dangers of unleaded petrol. Such campaigns should draw on the experience of other regions. Key dates, particularly that of the introduction of unleaded fuel should receive blanket coverage through all media. Fuel quality and its control should be ensured to strengthen the rights of consumers. Additives for older engines with soft valve seats should be publicised and made available, using a list of relevant vehicles to be compiled by the Nairobi Regional Conference of May 2004.
79. On the basis of the findings of all previous meetings (as presented to the sub-regional) and the discussions of the working groups, the participants agreed that there were options to remove lead from petrol and that the plans of refineries in the sub-region were the key to phase-out for most of the countries concerned. Recommendations were made to Governments in the sub-region to: show their resolve to eliminate leaded petrol by the end of 2005 and to organise a working group on the specific modalities to do so; participate with other stakeholders to organise national meetings to prepare road maps for the phase-out; work towards harmonisation of fuel specifications to ease the introduction of unleaded fuel and facilitate regional trade; enact appropriate national legislation and/or regulations to ensure fuel quality; set emission standards and monitor and enforce these.
 80. Progress was to be evaluated at the Dakar + 2 Regional Conference in Nairobi in May 2004. The Conference also proposed that a data base should be set up to cover such aspects as blood lead levels and lead pollution; to sustain public interest in the issue. Continuing support from IPIECA, UNEP and World Bank was requested to ensure that progress was maintained.
 81. Shortly after the March Douala meeting, the Regional Conference on the assessment of the phase-out of leaded gasoline in Sub Saharan Africa (Dakar + 2) took place at UNEP Headquarters in Nairobi in May 2004. This consisted of a two-day Technical Session, followed by a one-day Ministerial Session. The key objectives of the Conference were to take stock of progress towards phase-out in each sub-region, identify key issues and constraints and recommend remaining measures to ensure the deadline was met; and to debate the broader issues of air pollution.
 82. More than 140 participants from the private sector, government, civil society and international organisations met for two days and prepared presentations and recommendations to the Ministerial participants¹⁴. Sub-regional break-out sessions reviewed the situation in each country and developed recommendations for the Ministers' group. They also considered how countries could support one

¹⁴ Source: "Report to Hon. Ministers of Energy and Environment in Participating African Countries on the Outcome of the Meeting of the technical Session held at Gigiri UNEP Headquarters Nairobi Kenya on 4-5 May 2004 on the Phasing Out of Leaded Gasoline in Sub-Saharan Africa," presentation by Wankunda Siwakwi, Rapporteur for Southern Africa Region, May 2004.

- another, particularly by sharing the lessons learned by those countries, which had made most progress.
83. The International Petroleum Industry Environmental Conservation Association (IPIECA) summarised the perspective on progress from the oil industry. As one of the founding members of the Partnership, IPIECA had participated in all the regional and sub-regional meetings since the Dakar Declaration. It produced a document, “Getting the Lead Out,” as part of its commitment to the Partnership to provide technical expertise to assist the phase-out process. A point made by the IPIECA representative¹⁵ is that lead is relatively easy to phase-out, since it only appears in fuel after it has been added during blending. Sulphur, the target of new phases of the Partnership programme, appears naturally in crude oils; and its chemical removal during the refining process is much more difficult and costly.
 84. According to data presented at the Regional Conference, the probability of achieving the objective of total elimination of leaded fuel by the end of 2005 appeared high; since all 13 “refiner” countries in SSA were committed to supplying unleaded fuel by the deadline. They would achieve this by a combination of reducing Octane levels, use of Lead Replacement Additives (LRAs) and limited octane enhancing investments. Regional harmonisation of specifications would take longer, but would not delay attainment of the main objective. The main inhibitor of progress had proved to be government decision-making. Those countries with supply alternatives needed to formally specify what specification would be accepted. Single importers needed a less formal decision to recognise what was available to them. Governments had to make decisions on octane levels and lead replacement additives. Such decisions could be complex, particularly where government was a shareholder in the industry and had financial considerations, including on controlled prices. Significant refinery investments were under consideration in Ghana, Nigeria and Kenya, but it did not appear that any refineries would be put out of business by the changes.
 85. The distribution and marketing situation was less problematic. Countries with only one grade of fuel could easily make a onetime switch. Some companies in Southern and Eastern Africa planned on introducing unleaded as a second grade for the near future. However, multiple grades and the relatively smaller volumes of each would complicate terminal and pipeline operations and would need to be resolved before the end of 2005.
 86. Delays seemed to be to some extent the result of uncertainties about octane requirements of existing fleets, possible need for Lead Replacement Additives, which may themselves have health concerns; and potential damage to older engines. However, it had been confirmed by a range of technical experts that unleaded fuel had not caused any major problems, even with older cars, in regions where the phase-out had already taken place. These uncertainties appeared to have fuelled a set of regional policy debates on the issue, which were not in fact

¹⁵ Source: “Worldwide Phase Out of Lead in Gasoline”, Dr Frank B. Sprow, IPIECA, Nairobi, May 2004.

- producing the required decisions. It seemed that Governments were seeking to obtain their own data, when high quality technical assistance had already been made available through UNEP's coordination. This included the findings on the Partnership's Working Groups on octane and lead reduction additives, including its Valve Seat Recession Working Group, whose findings were expected to be available shortly.
87. The use of other working groups, at various levels, was advocated as an important means of speeding up the decision making process. For example, at national levels, working groups could develop recommended specifications appropriate to the local situation and coordinate between all stakeholders in the phase-out process. However, it was pointed out that there might be a temptation to over-bureaucratise the process, for example by establishing a National Commission, where this was unnecessary. Even the two largest SSA fuel markets, Nigeria and South Africa, do not have such a body. Another caution was given; to ensure that the engagement of NGOs and other public interest groups in working groups should be clearly focussed.
88. At the sub-regional level working groups had been seen as necessary to harmonise specifications. A World Bank presentation pointed out that, in fact there are relatively few importer countries, which are entirely captive to specific refiners, so that choice may be more effective than regulation in many cases. Furthermore, it would make sense to aim for harmonisation across regional economic groupings such as SADC and ECOWAS. Where such working groups are established, they should be restricted to Governmental participation, with industry experts in a supporting role. Other ways of harmonisation were proposed as likely to reduce the potential delays introduced by bureaucracy; for example, by simply following the dominant sub-regional supplier, an approach which had already been adopted by several "importer" countries. For example, it could be anticipated that, without much formality, most Southern African countries would follow the Republic of South Africa and most of Kenya's neighbours would follow the standards it set. If it were later decided to harmonise specifications for the whole of SSA, a high-level working group would be necessary, working closely with diplomatic processes. This might be done through NEPAD.
89. Progress needed to be placed in the context of petrol (gasoline) usage (shortened to "Mogas"¹⁶ consumption.") According to 2003 consumption figures, Nigeria and the Republic of South Africa alone accounted for 75% of Mogas consumption in the whole SSA region; a figure which rose to 85% if their importing neighbours were included. Thus, major progress towards the goal of lead-free petrol in SSA could be achieved by ensuring that these two countries alone consumed and exported only such fuel. A great many of the other countries engaged in the process had very small fuel usage.

¹⁶ "Mogas" is an abbreviation of "Motor Gasoline"

90. In West Africa, by May 2004, Nigeria, Ghana, Cape Verde and Mauritania were already 100% unleaded. The key national constraints to harmonisation of standards (around the 91 RON level gaining broad acceptance by this time) were the refining countries of Senegal, which had a large 87 RON demand for two stroke outboard motors and Cote d'Ivoire. Both countries had pledged to meet the deadline for phase-out, which would bring in line several countries, which they supplied. Nigeria introduced unleaded in 2002, with no formal announcements of this change. In West Central Africa, all refiner countries were committed to the change, but Gabon had not made any decision on the Octane level it would support. The four small importing countries in the Sub-Region would switch once their suppliers had done so. Most countries in Southern Africa had already begun to supply some unleaded, using dual supply systems. The Government of South Africa had not decided on fuel specifications, but was expected to do so by May 2004. There were still potential problems in the area, notably with respect to any period of dual fuel transmission, which could pose problems for terminals and pipelines serving Zimbabwe and Malawi. Mozambique and Zambia were still also undecided on standards and whether they would simply follow South Africa. In the Horn of Africa, several countries were already 100% unleaded. Ethiopia's experience is presented in Box 2 below.¹⁷ In East Africa, Kenya was the main constraint, with difficult decisions to be taken concerning the necessary upgrading of the KPRL refinery in Mombasa and how to modify its pipelines to deal with dual grades during the transition period. In addition, leaded and unleaded petrol were sold at the same price in Kenya and it appeared that motorists were poorly informed about the advantages of buying unleaded.

Box: 2: Ethiopia's Phase Out Experience

Ethiopia had no refinery and imported all of its fuel. In 2001, it switched its supplier to ExxonMobil, obtaining fuel with a substantially lower lead content than previously. It signed up to the Dakar Declaration. Thereafter, the government set specifications for unleaded fuel and participated in a workshop on the phase out process. In July 2003, there was an official decision to go unleaded. The learning points offered from this experience were: the important role of importers and distributors; the value of worldwide experience, notably that all cars could operate on unleaded and that Valve Seat Recession was not a problem; that there was no switchover cost using a single supplier and system; that there were no reasons to delay, since all oil was imported; and the importance of setting a date and acting on it. The Ethiopian experience, in view of its old car fleet, provided an important example to other countries and its officials supported PCFV activities in other countries.

The Role of NGOs

91. The role of NGOs in the process up to Dakar + 2 had included advocacy, information gathering and dissemination; and research and monitoring¹⁸. In

¹⁷ Source: "Lead Phase Out: Ethiopia's Experience", presentation by Yigzaw Mekonnen, Nairobi, may 2004.

¹⁸ Source: "Phase-out of Leaded Gasoline in Sub-Saharan Africa. The Role of Civil Society – Keynote Address", Nairobi, May 2004.

Kenya, NGOs partnered with Government, the private sector, academia and UNEP to form a national taskforce to promote the phase-out. This task force had working groups on awareness creation, research and monitoring and policy review. The awareness group declared itself hampered by lack of finance to produce material and hold workshops; and by the unavailability of unleaded petrol in many areas of the country, which made them reluctant to promote it in those areas. The research and monitoring group identified needs for institutional capacity development and proposed an institutional framework for sharing resources to help with this issue. UNEP funded university student research on blood lead levels in Thika and Nairobi. This working group also felt constrained by lack of finance, equipment, human resources and baseline data. The policy review working group explored policy implications of international agreements to which the country had subscribed and on the linkages between unleaded fuel policies and health. It found that the legal frameworks covering unleaded petrol, car imports and public health were not well aligned.

92. In Ghana, (see Box 3), Government provided the major impetus for the change.

Box 3: The Ghana Approach

In April 2002, the Ghanaian Government inaugurated a National Planning Committee to develop strategies for lead phase out. Three sub-committees looked at issues of health, safety and the environment, infrastructure and marketing regulations. By December 2002, the government approved the lead phase out. A Technical Committee was then established to plan the technical and logistical aspects. This Committee recommended specifications for unleaded fuel. The Tema Refinery committed to upgrade its operations to produce sufficient unleaded fuel for national needs, through the blending of high octane imported fuels and limited use of the additive MMT.

On 8th August 2003, Government Gazetted the Petroleum (Amendment) Regulations, 2003, which entered into force in November, with the formal Instrument on 1st January 2004. According to this regulation, "A person shall not produce, import, store, sell or use leaded gasoline in Ghana".

93. In December 2004, the Third meeting of the Global Partnership took place in New Delhi, India. Forty-four representatives of 25 Partners attended it. Apart from the routine Agenda items, the meeting received the finalised version of the report of the Valve Seat Recession Global Working group and received updates from other Global Working Groups on Sulphur, Octane and Public Awareness. The meeting emphasised future work on sulphur, which was becoming a major new area of emphasis as the lead campaign progressed. Sub-Saharan Africa had seen a very active year, with substantial activities and progress at national level, as shown in Figure 2 below.



Ongoing National Activities

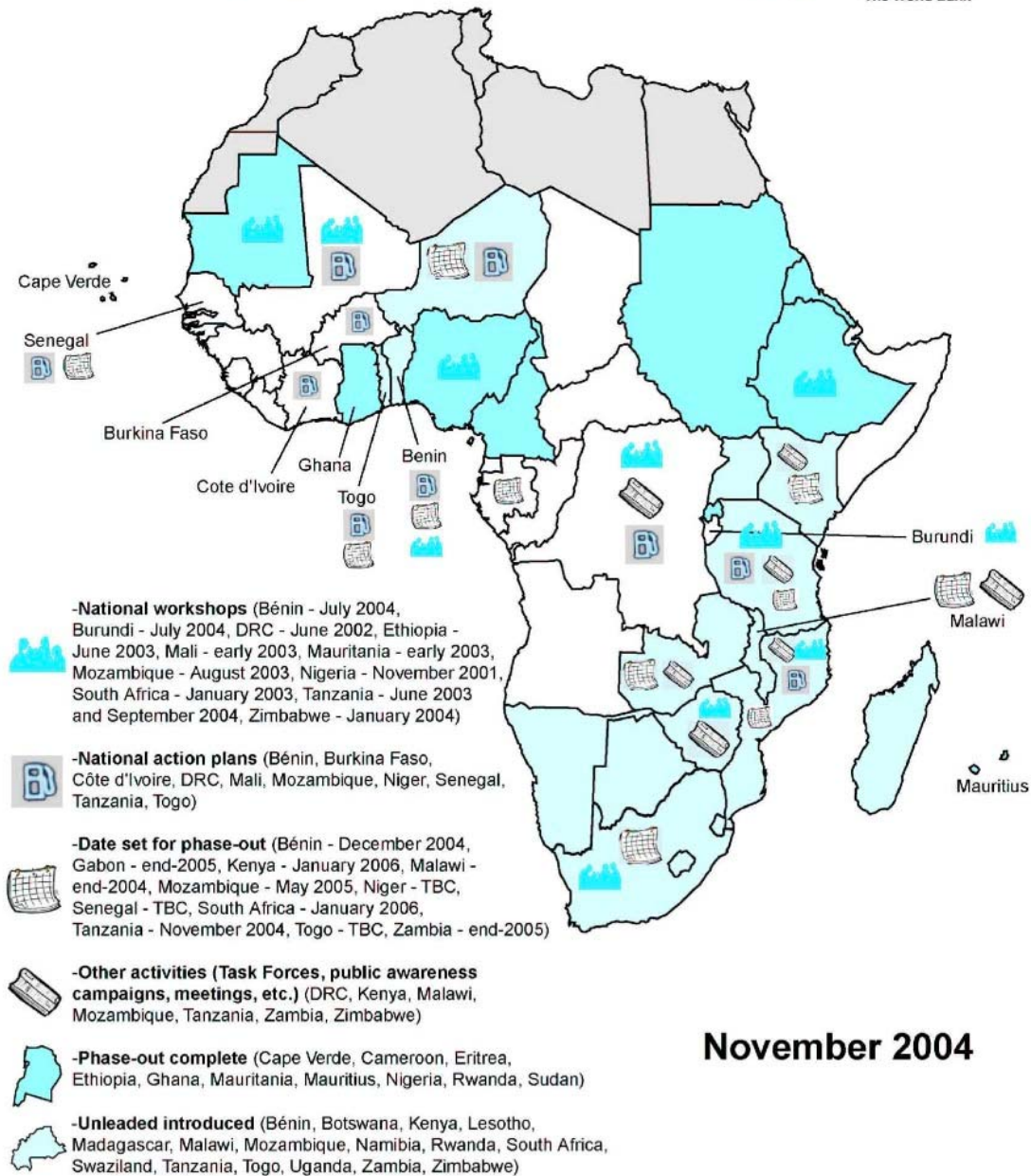


Figure 2: National level activities in Sub Saharan Africa 2003 – early 2005.

94. In its report on activities for 2004, the Clearing House indicated a scaling up of its operations¹⁹. The original one staff member was complemented by two more in October 2004, with additional part-time support from a range of UNEP staff members. PCFV also raised \$1,168,247, largely to support the SSA phase-out and for Clearing House operations. Around \$800,000 of these funds was earmarked for specific projects identified by the donors concerned. The Partnership gained six new members, bringing the total to 67. The Clearing House had been active in the field of information dissemination through a newsletter, website, responding to requests for information, publication of a brochure and production of a video; mainly for use at meetings attended by its representatives and to send out to governments (mostly in Africa) to use as a basis for public information material.
95. The major reported activity of the Clearing House, in addition to its information distribution efforts highlighted above, was support to countries, particularly in SSA. By the end of 2003, only three countries in SSA were fully unleaded; but after one year, this figure had risen to ten, with more than 50% of petrol in the market unleaded. The Clearing House contributed to several Regional and Sub-Regional meetings and supported several other activities.
96. The Global Working Groups of the Partnership had reached different stages of progress. The Valve Seat Recession Group issued a report at the May 2004 SSA Conference, whilst the other three groups were still deliberating. Two new Groups were proposed: one to explore the environmental performance of older vehicles still in use and the other to address new vehicle technologies, including fuel cells and new emission abatement technologies. The Clearing House participated in a broad range of events, as indicated below.

Participation in Central Africa Workshop on phasing-out leaded petrol

97. The Central Africa Sub-regional Workshop (16-17 March 2004) on phasing-out leaded petrol was the last in the initial series of sub-regional workshops held in Sub-Saharan Africa as a follow-up to the June 2001 Dakar Conference. The PCFV gave a presentation at the meeting. Outcomes of this Workshop fed into the May 2004 Conference to assess progress on phasing-out leaded petrol in Sub-Saharan Africa.

Participation in Conference to assess progress made on phasing-out leaded petrol in Sub-Saharan Africa (Dakar+2)

98. Dakar+2 was jointly organised by The World Bank, the US EPA, IPIECA, UNEP and the PCFV (5-7 May 2004). The objectives of the Conference were to: take stock of the progress made in each sub-region in the process of leaded gasoline phase-out; identify key issues and potential constraints and recommend the

¹⁹ Source: "Report back from the Clearing House: 2004 Activities", New Delhi, 2004.

remaining measures to be taken to reach the December 2005 deadline; and debate the overall issues of urban air pollution.

Participation in Clean Air Initiative – Sub-Saharan Africa (CAI-SSA) Steering Committee Meeting

99. One of the agenda items of the 3rd Steering Committee Meeting of CAI-SSA (27-28 October) was an examination of progress toward reaching the Dakar Declaration target of phasing-out leaded petrol in Sub-Saharan Africa by end-2005 and to discuss future issues. The PCFV attended this meeting and provide inputs on this issue.

Support to National-level activities in Sub-Saharan Africa

100. The Clearing-House received funds from the Dutch government specifically to finance national-level activities on leaded petrol phase-out in Sub-Saharan Africa. Thus far MOUs had been signed with three countries, where national workshops were held: Benin, Burundi, and Tanzania. In progress were MOUs with Mozambique, The Gambia, Rwanda, Togo, Uganda, and Somalia. Activities under the MOUs ranged from national workshops to public awareness campaigns. Some of the amounts disbursed were small, under \$10,000; particularly in comparison with amounts suggested at the March 2003 Bamako meeting, where delegates floated the figure of \$100,000 per country as appropriate for “sensitization” programmes. Overall, more than \$1 million was disbursed through 32 agreements, with an average of around \$35,000.

Support to Kenya leaded petrol phase-out activities

101. The US EPA gave funds to the Clearing-House to support national-level activities in Kenya toward leaded petrol phase-out. Main activities undertaken in this regard were: training of petrol attendants across Kenya on unleaded petrol; and a media campaign to raise public awareness about unleaded petrol.
102. Activities were also reported in Asia, Central and Eastern Europe, West Asia and North Africa, Latin America and the Caribbean. In the global context, presentations were made at the 12th Session of the Commission on Sustainable Development and at the FIA (International Automobile Federation) Foundation Technical Working Group Meeting, where developing country Automobile Associations were informed of the Partnership and invited to support the phase-out programme in their countries.
103. The 2005 Clearing House Work Programme was also presented to the Partnership Meeting. New outreach material was to be created, including a regular newsletter. During the discussion of the Work Programme, it was agreed that all Partners should be actively engaged in the campaign and should share their results with the

Clearing House. The importance of regular financing was emphasised. These funds were used to support activities in various regions and countries and for the costs of the Clearing House itself. . IPIECA raised the issue of the huge sums needed to revamp refineries in some regions. It estimated that South American refineries might need some \$33 billion to upgrade refineries to produce unleaded petrol and low sulphur diesel. Since these sums were considered way beyond the range of the Partnership, the importance of closely involving the World Bank was emphasised; (although the World Bank never joined the Partnership or provided major funding for such refinery upgrading). The Work Programme and Budget were approved.

104. The meeting had three break-out groups, one of which discussed lead phase-out, whilst the others covered new issues emerging as priority areas. This group concluded that the Clearing House should collect the data necessary to make a global inventory of countries still using leaded fuel, that a deadline should be set for global phase-out and that there should be a Questions and Answers section on the PCFV website covering lead issues.
105. Also at this Third Global Partnership meeting, the Advisory Group presented its activities for the first time since it was established at the previous meeting. This Group, which consisted of 14 members, held five conference calls to offer the Partnership advice on the complete range of its activities and to approve new partners. There were discussions concerning the participation of developing country NGOs on the Group, but no decisions were made. Rather, the Group was approved to develop a structure, timeframe and strategy for development, including its membership, for presentation to the Fourth Global Partnership meeting. It would also consider funding possibilities for the Partnership in the same period and report back on its conclusions and proposals.

2.2.5 Events and Activities in 2005

106. An important meeting was the Society of Automobile Manufacturers World Congress in Detroit, USA. This gathering of stakeholders from 97 countries shared information and ideas about advancing automotive engineering. A group of private sector members of the Partnership gave an overview of its approach and achievements to the Congress²⁰. The business case for engaging in such partnerships was presented as follows:
 - Facilitating dialogue and mutual trust among stakeholders
 - Engaging in cooperative activities with others
 - Demonstrating commitment to solving important societal issues
 - Enhancing visibility and reputation of the Partner

²⁰ Source: "The Partnership for Clean Fuels and Vehicles: A New Approach to Helping Countries Achieve Environmental Sustainability in the Transportation Sector". Presentation to SAE 2005, Miriam Lev-On, Ellen Shapiro, Rob Cox, 2005.

- Facilitating a license to operate or expand operations
 - Helping to achieve business goals
 - Promoting the spread of information and new technologies.
107. By early 2005 the next steps identified from the private sector perspective of IPIECA were: the World Bank and PCFV should continue to work with SSA governments to track and support lead phase-out plans; IPIECA should support PCFV technical assistance to governments; and work with the Partnership towards reaching consensus positions on other global fuel and vehicle issues for developing countries, notably fuel Sulphur and vehicle inspection and maintenance.
108. In March 2005 came the Second International Forum on Partnerships for Sustainable Development: Advancing Implementation on Water and Energy, held in Marrakech, Morocco. This reported that, following the WSSD initiative on multi-stakeholder partnerships, 302 Partnerships had been registered with the Commission on Sustainable Development (CSD) Secretariat, of which 44 had a primary focus on Energy for Sustainable Development. The PCFV was one of the most advanced such partnerships, based on the substantial activities of its programme and was invited to present lessons from its experience at the Forum.
109. The Fourth Meeting of the Global Partnership for Clean Fuels and Vehicles took place at UNEP Headquarters in Nairobi in December 2005. Some 40 persons, representing 27 Partners, attended this. The Clearing House reported on progress made and activities performed in the region during 2005²¹. Highlights from the perspective of lead phase-out included: (1) excellent progress made in Sub Saharan Africa, with the entire subcontinent due to eliminate leaded petrol by 1 January, 2006; (2) Partnership growth by 17 new members; (3) growth in CH funds in 2005 due to Partners' renewed support; (4) in 2005 the majority of funds went to activities rather than to supporting the CH, with most going to activities in Sub Saharan Africa; (5) overall activities at the regional and national levels were growing in all PCFV regions.
110. During the year, the Clearing House had been very active in SSA, in close cooperation with many PCFV Partners and some non-PCFV Partners (notably the World Bank). The programme included:

Support to Kenya on phasing-out leaded petrol:

- Environmental Training of Petrol attendants in Kenya

²¹ Source: "Summary of the Fourth Meeting of the Global Partnership for Clean Fuels and Vehicles" Nairobi, 2005. See also: "Report Back from Clearing House: 2005 Activities", Nairobi 2005.

111. This was jointly organised with the Petroleum Institute of East Africa – an NGO that brings together different players in the oil industry to promote oil and gas standards. The sessions reached 346 attendants in Kenya’s 4 biggest cities.
- Public Awareness Campaign
112. The Clearing House together with the National Environment Management Authority - a semi-autonomous government body charged with environmental management - and a multi-stakeholder task team organised a public awareness campaign for radio, TV and newspapers on the benefits of using unleaded petrol.
- Testing of Blood Lead Levels in Nairobi, Kenya
113. The Clearing House coordinated a short study that involved the testing of blood lead levels within Nairobi and its surroundings and the results were compared with those taken in a rural setting. The study showed that 25% of those sampled, mostly in Nairobi, had elevated blood lead levels above the WHO action level of 10 milligrams per decilitre. The relationship between leaded fuel and Blood Lead Levels is discussed in Section

National Workshop on the phase-out of leaded petrol in Burundi

114. The Clearing House supported a national workshop in Burundi on the phase-out of leaded petrol. This was organised by Propriété, Santé et Environnement (PES), a non-governmental organisation. The outcome of the workshop was the decision to phase-out leaded petrol in Burundi by December 2005. PES implemented follow up activities to the workshop, including media shows in 2005.

Support to Tanzania on phasing-out leaded petrol

115. The CH support the implementation of a public awareness campaign of the Lawyers’ Environment Action Team – a non-governmental organisation. The campaign focussed on the benefits of phasing-out leaded petrol and of introducing catalytic converters to contribute towards improved urban air quality. This was a follow-up to a joint workshop organised in 2004.

Support to The Gambia on phasing-out leaded petrol

116. 116. A national workshop organised in collaboration with the Office of the President. Its outcome was a commitment to stop importation of leaded gasoline by 31 July 2005 and to import only cars fitted with catalytic converters by 2006. Public sensitisation was planned for December 2005 to February 2006 (with further support from the CH) and was to be implemented by the National Environment Agency.

Support to Rwanda on phasing-out leaded petrol

117. A multi-sectoral team was involved in a public sensitisation campaign on leaded petrol phase-out. A sensitisation workshop was held in May 2005 and an awareness campaign on radio, television and billboards was delivered. The Government, through the Ministry of Lands, Environment, Forest, Water and Mines, coordinated the team.

Training of Somali Officials on the benefits of unleaded petrol

118. The CH together with the Petroleum Institute of East Africa undertook a training of 5 Somali officials from the Ministry of Environment and Disaster Management at UNEP Headquarters. These officials then held sensitisation meetings for Somali stakeholders on the benefits of phasing-out leaded petrol.

East Africa Regional Workshop

119. A regional workshop, which aimed to develop consensus to phase-out leaded petrol by 31 December 2005, was held in August 2005. Representatives from Kenya, Uganda, Tanzania, Democratic Republic of Congo, Rwanda and Burundi agreed to phase-out leaded petrol by 31 December 2005.

Support to Uganda on phasing-out leaded petrol and introduction of catalytic converters

120. The CH together with a multi-sectoral task team coordinated by the Ministry of Energy and Mineral Development organised a national workshop on 18 August 2005 on the phasing-out of leaded petrol in Uganda. At the workshop, the Government announced its decision to phase-out leaded gasoline by 31 December 2005.
121. A National workshop was held on next steps after phasing-out leaded petrol. This activity was undertaken by a non-governmental organisation, Soroti Environment Concern. Other follow up activities included preparation of petrol standards and public sensitisation on benefits of phasing-out leaded petrol.

Public sensitisation in Malawi on the benefits of unleaded petrol

122. The Ministry of Mines, Natural Resources and Environment of Malawi launched a public sensitisation campaign in June/July 2005 on the benefits of using unleaded petrol. Malawi had committed to phase-out in December 2004 and was liaising with Mozambique for the implementation of this commitment.

National Sensitisation Workshop on the phase-out of leaded petrol in Togo

123. A national sensitisation workshop was held, coordinated by The Ministry of Environment, through a multi-stakeholder team. Togo stopped the importation of leaded petrol from 1 July 2005

Support to Ghana on the benefits of unleaded petrol and introduction of catalytic converters

124. The Clearing House supported Ghana to carry out blood lead level testing and a public sensitisation campaign on the benefits of phasing-out leaded petrol. Prior to phasing-out, Ghana had carried out a study on blood lead levels. Now that two years had passed since the country phased-out leaded petrol, a follow-up study looked at the emerging blood lead level trends. A public sensitisation campaign was then planned, which included the promotion of vehicles fitted with catalytic converters. The relationship between leaded fuel and Blood Lead Levels is discussed in Section 4.3 below.

Other Activities:

Study on Nairobi Vehicle Emissions

125. The Clearing House supported a study conducted on emissions from petrol passenger vehicles in Nairobi, Kenya. The study was conducted in 10 cities worldwide by the University of California, Riverdale,.

Regional Workshop on the Finalization of Leaded Gasoline Phase-out and Urban Air Quality

126. The Clearing House participated in the Workshop on the Finalization of Leaded Gasoline Phase-out and Urban Air Quality organized by the World Bank on 14-15 June 2005 in Dakar, Senegal. The workshop reviewed progress in West and Central Africa in phasing-out leaded petrol and discussed next step issues.

Air Quality National Sensitization Workshops in Dar-es-Salaam, Tanzania and Accra, Ghana

127. The Clearing House participated in national workshops to disseminate the initial findings of air quality monitoring in Dar-es-Salaam, Tanzania and Accra, Ghana on 1-3 December 2005 and 8-10 December 2005, respectively.

Global Activities

128. On the global activities front, the Clearing House commenced publication of its newsletter, intended to have at least three editions per annum. The website remained the main means of disseminating information and a broad range of requests for further details was dealt with directly by the Clearing House. The Global Working Groups continued their activities. The Octane Working Group,

which commenced its deliberations in mid 2003, had disseminated a draft report in late 2005, intended to supplement the report on Valve Seat Recession and to help answer additional questions of developing countries concerning the consequences of phase-out. In the meantime, the Advisory Group held five teleconferences in 2005 and offered advice on the funding and future direction of PCFV. Membership of the Group and the possibility of creating a new Advisory Group were also discussed.

Discussions

129. The main discussions of the Fourth Meeting focused on: (1) Clarification of the role of Partners; as promoting clean fuels and vehicles and providing financial, technical and other expertise for PCFV activities, including participation in global working groups; (2) The need to draw additional attention to the success of the phase-out of leaded gasoline in sub-Saharan Africa; (3) Using lessons learnt from the Africa experience in other regions; (4) The need for increased and more diversified funding for future CH activities; (5) The outputs of the Octane Working Group needed to be finalized as soon as possible in order to be of use to countries still going unleaded.
130. The Partners discussed setting measurable goals, focused on leaded petrol phase out, sulphur reduction and vehicles. However, these were understood to be internal benchmarks, rather than operational directives and countries and regions would still set their own objectives and timeframes, with support from the Partnership. The meeting agreed “To phase-out leaded gasoline by the end of 2008 worldwide to be followed by the global introduction of vehicles with catalytic converters”.
131. With regard to SSA, the work programme for 2006-2007 was phased down, in view of the strong progress made. However, it included limited PCFV support to the decommissioning of leaded facilities in countries that had phased-out.
132. Discussions continued on the membership of the Advisory Group and selection procedures were agreed and attached to the Partnership Meeting notes. The financial status of the Partnership appeared strong, with over \$3 million received, expected to rise to \$4 to \$4.5 million by the end of 2006.

I. 3. Progress Towards the Phase Out of Leaded Petrol in Sub-Saharan Africa

133. At the time of the Dakar Declaration, in mid 2001, Sudan was the only SSA country to have totally removed leaded petrol from use within its borders. This meant that some 48 Sub-Saharan Africa countries remained with partial or total use of leaded petrol, which would need to be reversed within a period of four and a half years.

134. The first half of the available time was used to create awareness, set targets, raise resources and develop support programmes for national activities. By September 2003 the two island states of Mauritius and Cape Verde, had been added to the ranks of the totally unleaded, leaving 46 countries still to achieve phase out. There had been a substantial trend towards availability of both leaded and unleaded fuel in Southern and Eastern Africa, as shown in Figure 3 below²². In addition, a number of countries had stated a deadline for phase-out, as shown in Figure 4 below²³.

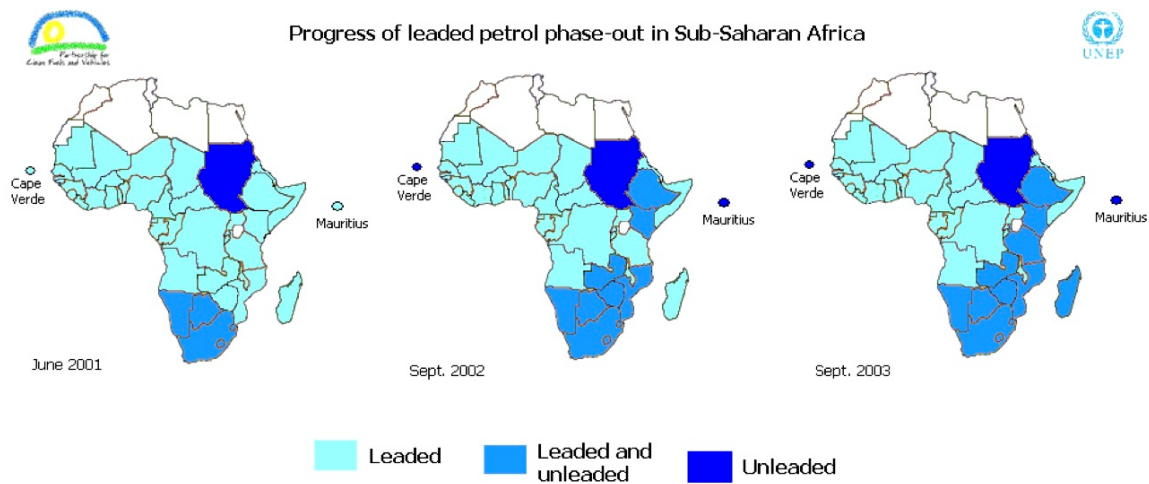


Figure 3: Progress of leaded petrol phase-out in SSA June 2001 to September 2003

²² Source: “Phasing out leaded gasoline in Sub-Saharan Africa”, Source Presentation on Behalf of Partnership for Clean Fuels and Vehicles, October 2003.

²³ Source: Progress in Sub Saharan Africa, UNEP Presentation, Dakar Senegal, 2004.



Status of leaded gasoline phase-out in Sub-Saharan Africa

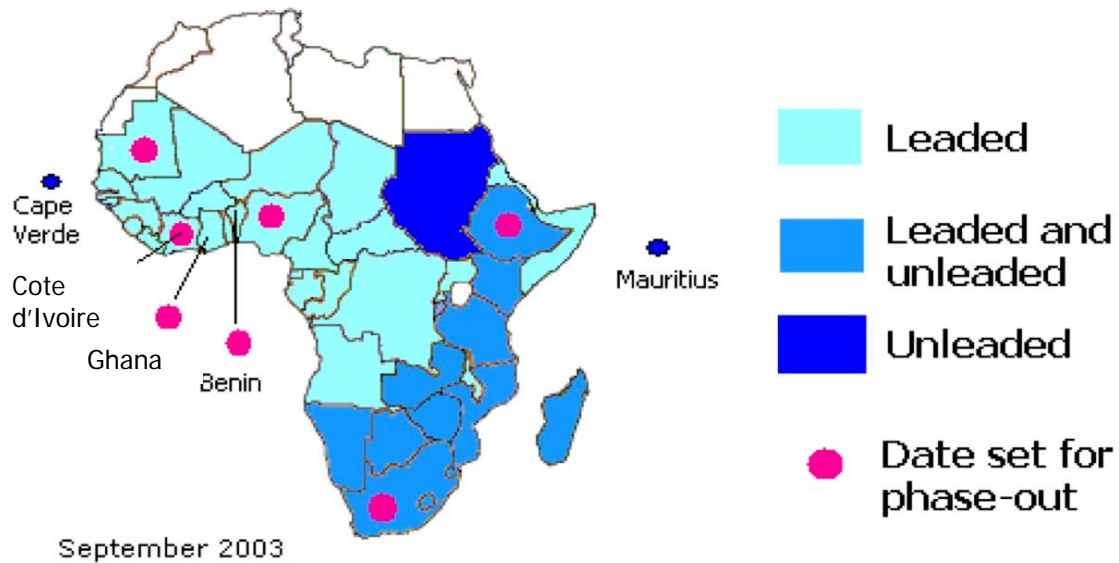


Figure 4: Status and deadlines for phase-out as at September 2003.

135. There was then substantial progress in the six months up until May 2004, with an additional eight countries becoming totally unleaded, as shown in Figure 5 below and over 50% of petrol sold in SSA being lead free. At this time, there were still 38 countries, which had not achieved the planned phase out.

100 % UNL

- ▶ Cape Verde
- ▶ Eritrea
- ▶ Ethiopia
- ▶ Ghana
- ▶ Mauritania
- ▶ Mauritius
- ▶ Nigeria
- ▶ Rwanda
- ▶ Sudan

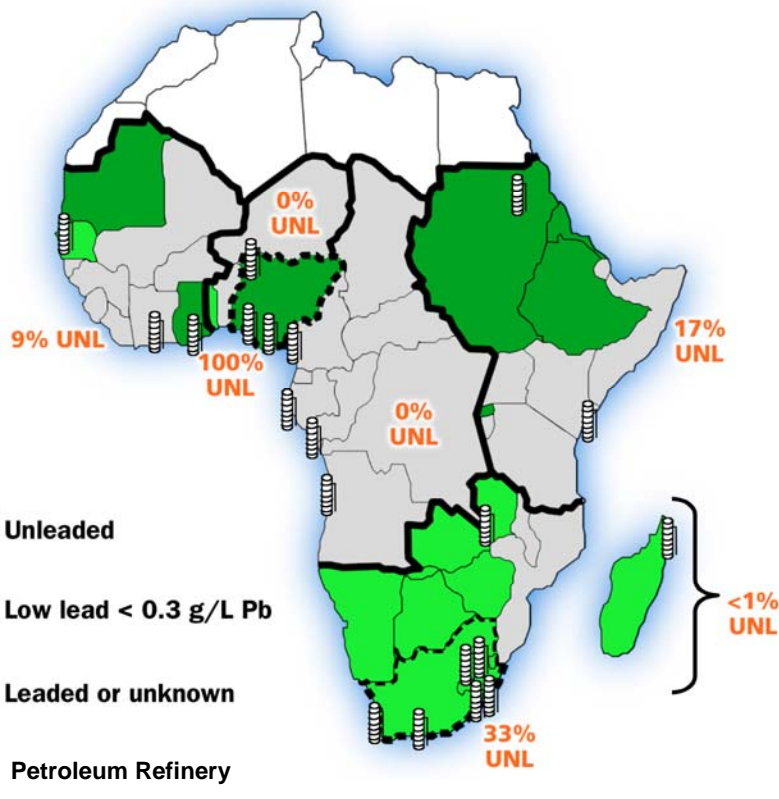
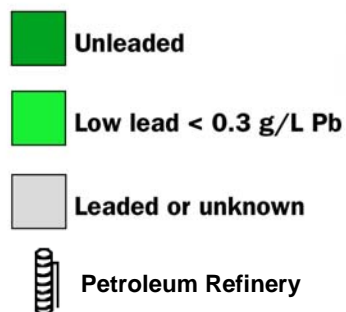


Figure 5: Progress towards unleaded petrol supply as at May 2004²⁴

136. In the next eighteen months, the remaining 50% of petrol sold in SSA also became unleaded, with an additional 38 countries declaring themselves free of leaded petrol. **By the deadline of the end of 2005, the target of helping Sub Saharan Africa to be totally free of leaded petrol was attained.**

²⁴ Source: Presentation by Fred Sexsmith, consultant to World Bank Clean Air Initiative, slide 2, May 2004.

4. Evaluating the Results of the Phase Out of Leaded Petrol

4.1 Evaluating Results Through the Creation of a “Business as Usual” Counterfactual

137. In Chapters 3 and 4 above, we established an overview of what happened in Sub Saharan Africa with regard to the phase out of leaded petrol during the period from 2000 to the end of 2005. In evaluation terms, this gives us a simple “before and after” comparison. Such a comparison is an important part of the narrative of what happened, but does not in itself enable us to draw evaluative conclusions. This is because, apart from the intervention being assessed, many other things may have happened to affect the likelihood that motorists would use unleaded rather than leaded fuel. That being so, we would be assessing the “gross” effect of all forces for and against the use of unleaded fuel, rather than the “net” effect of the intervention only.
138. In order to overcome this challenge, evaluators often construct a “counterfactual” of what would have happened during the period of the intervention, if it had not been there. This is often done by comparing “with project” and “without project” areas with initial characteristics, which are as close as possible to identical; which can then be compared before and after the intervention period. If the intervention is the only significant difference between them over that period, it can be assumed that all, or at least most, of the differences can be attributed to it.
139. There are many types of intervention, which do not lend themselves to the construction of such a counterfactual. The contribution of PCFV to the phase out of leaded petrol in Sub Saharan Africa (SSA) is such an intervention. This is because we have no comparable entity to SSA over the period in question, which had the same characteristics apart from the support of PCFV. We therefore have to use another form of counterfactual, accepting that the comparison it provides is imprecise and is used to gain an approximate view of the “net effect” of the support provided by PCFV and other stakeholders during the period in question.
140. The counterfactual used is a hypothetical “business as usual” scenario, based on available projections of trends of petrol sales in SSA²⁵ from 2000 to 2010. . At the start of this period, Sudan was the only country in the region, which had already phased out leaded petrol. In South Africa, Botswana and Namibia, unleaded petrol was already available in 2000, but on a relatively small scale compared with leaded. In the calculations below, we compare the hypothetical consumption of leaded petrol in 2005 and 2010 with the actual consumption, based on its reported total elimination in the region by the end of 2005.

²⁵ Using fuel consumption and projected consumption data from PCFV.

4.2 Actual and Projected Consumption of Leaded Fuel and Estimates of Leaded Fuel Avoided 2000 to 2015

Fuel Consumption 2000 - 2010: Sub Region 1

141. Sub Region 1 contains 12 countries of Western Africa. In the year 2000, three of these, Cote d'Ivoire, Ghana and Senegal had refining capacity. Petrol consumption was relatively low, accounting for less than 7% of the SSA total and in 2000 none of the countries was consuming unleaded petrol.

Countries	Leaded petrol consumption in metric tons 2000	Projected leaded petrol consumption in metric tons 2010
Burkina Faso	77	99
Cape Verde	10	18
Cote d'Ivoire	211	271
Gambia	20	26
Ghana	385	455
Guinea	50	64
Guinea-Bissau	12	24
Liberia	35	44
Mali	55	74
Mauritania	49	63
Senegal	131	210
Sierra Leone	25	32

Table 1: Leaded petrol consumption in Sub Region 1 countries

Sub Region 1			
Year	Metric tons of leaded petrol per annum (business as usual)	Metric tons of leaded petrol (actual) per annum	Metric tons of leaded petrol avoided per annum
2000	1060	1060	0
2005	1220	0	1220
2010	1379	0	1379

Table 2: Projected leaded petrol avoided in Sub Region 1 countries

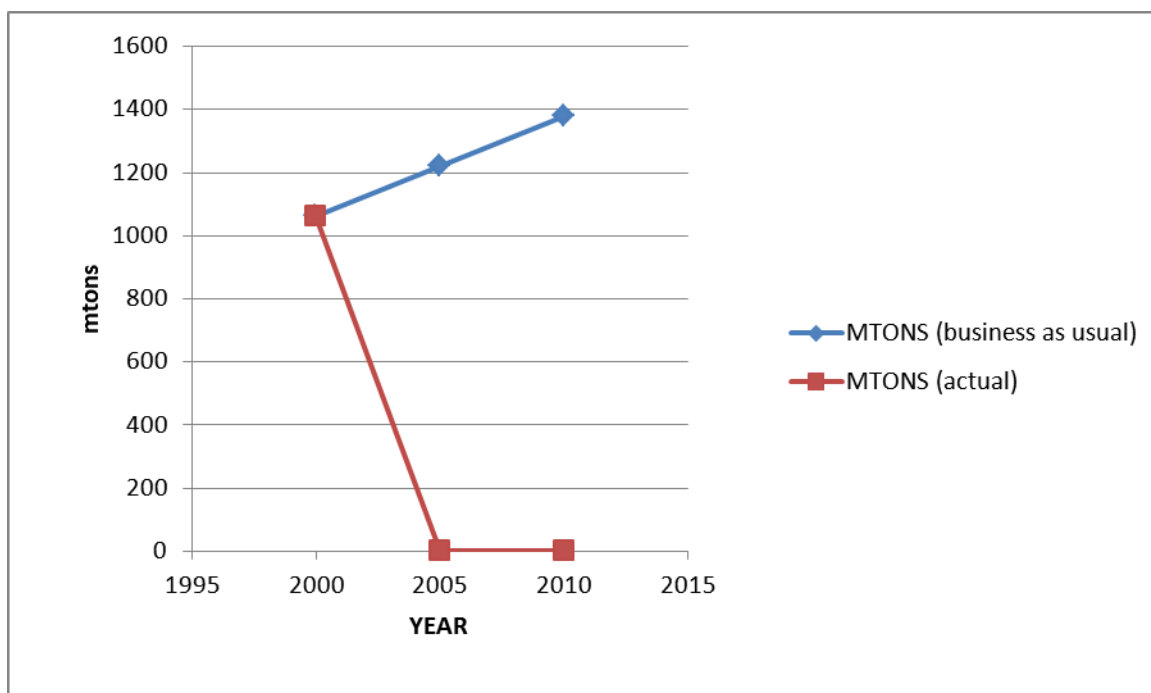


Figure 6: "Business as Usual" and Actual Consumption of Leaded Fuel Sub Region 1

Fuel Consumption 2000 - 2010: Sub Region 2

142. 142. Sub Region 2 contains 5 countries of Western Africa, of which only Nigeria had refining capacity in 2000. Leaded fuel consumption (virtually all of which was in Nigeria) was high, accounting for 35% of the SSA total.

Countries	Leaded petrol consumption in metric tons 2000	Projected leaded petrol consumption in metric tons 2010
Benin	62	70
Chad	31	37
Niger	48	51
Nigeria	5431	7052
Togo	61	65

Table 3: Leaded petrol consumption in Sub Region 2 countries

Sub Region 2			
Year	Metric tons of leaded petrol per annum (business as usual)	Metric tons of leaded petrol (actual) per annum	Metric tons of leaded petrol avoided per annum
2000	5633	5633	0
2005	6450	0	6450
2010	7274	0	7274

Table 4: Projected leaded petrol avoided in Sub Region 2 countries

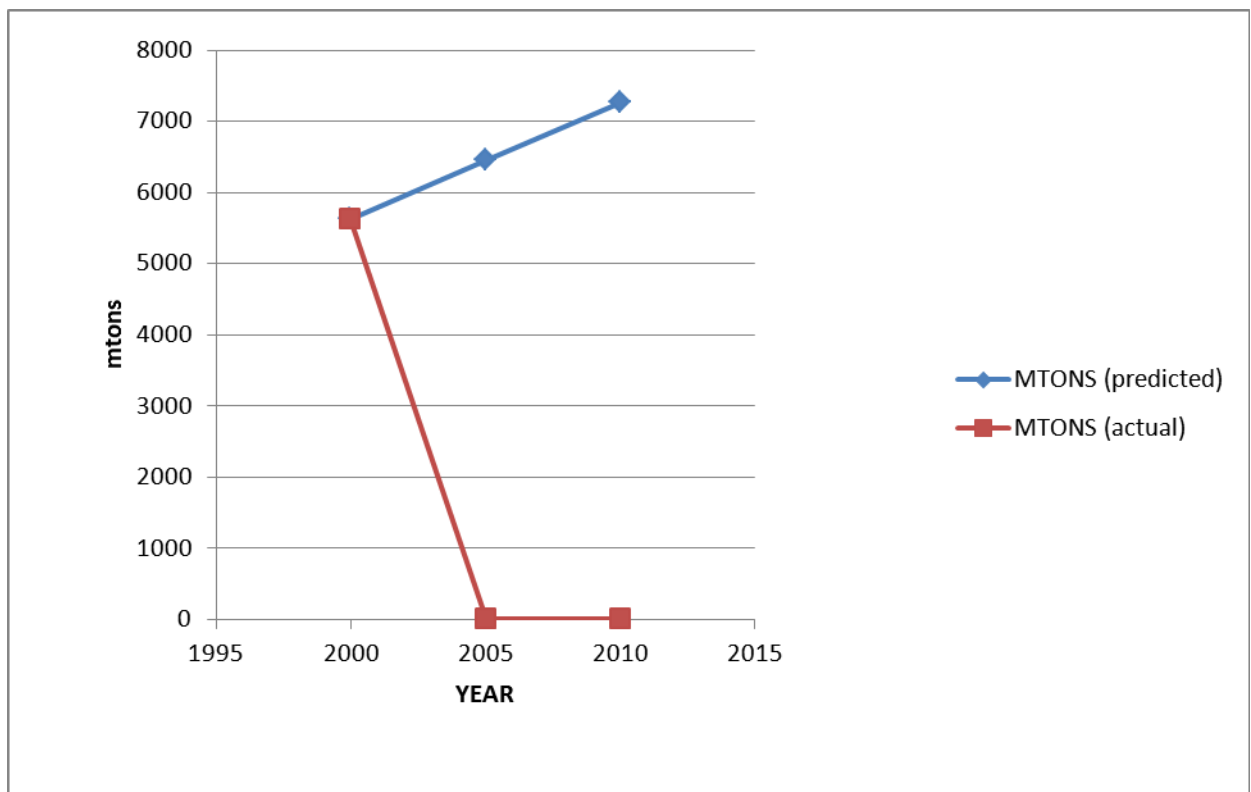


Figure 7: "Business as Usual" and Actual Consumption of Leaded Fuel Sub Region 2

Fuel Consumption 2000 - 2010: Sub Region 3

143. Sub Region 3 contains seven countries of West Central Africa, three of which (Cameroon, Democratic Republic of Congo and Gabon) had refining capacity. Petrol consumption was negligible, accounting for only 4% of the SSA total.

Countries	Leaded petrol consumption in metric tons 2000	Projected leaded petrol consumption in metric tons 2010
Cameroon	325	520
Central Africa Rep. (Brazzaville)	25	48
Dem. Rep. of Congo	165	186
Equatorial Guinea	5	7
Gabon	53	76
Sao Tome & Principe	7	10

Table 5: Leaded petrol consumption in Sub Region 3 countries

Sub Region 3			
Year	Metric tons of leaded petrol per annum (business as usual)	Metric tons of leaded petrol per annum (actual)	Metric tons of leaded petrol avoided per annum
2000	641	641	0
2005	780	0	780
2010	925	0	925

Table 6: Projected leaded petrol avoided in Sub Region 3 countries

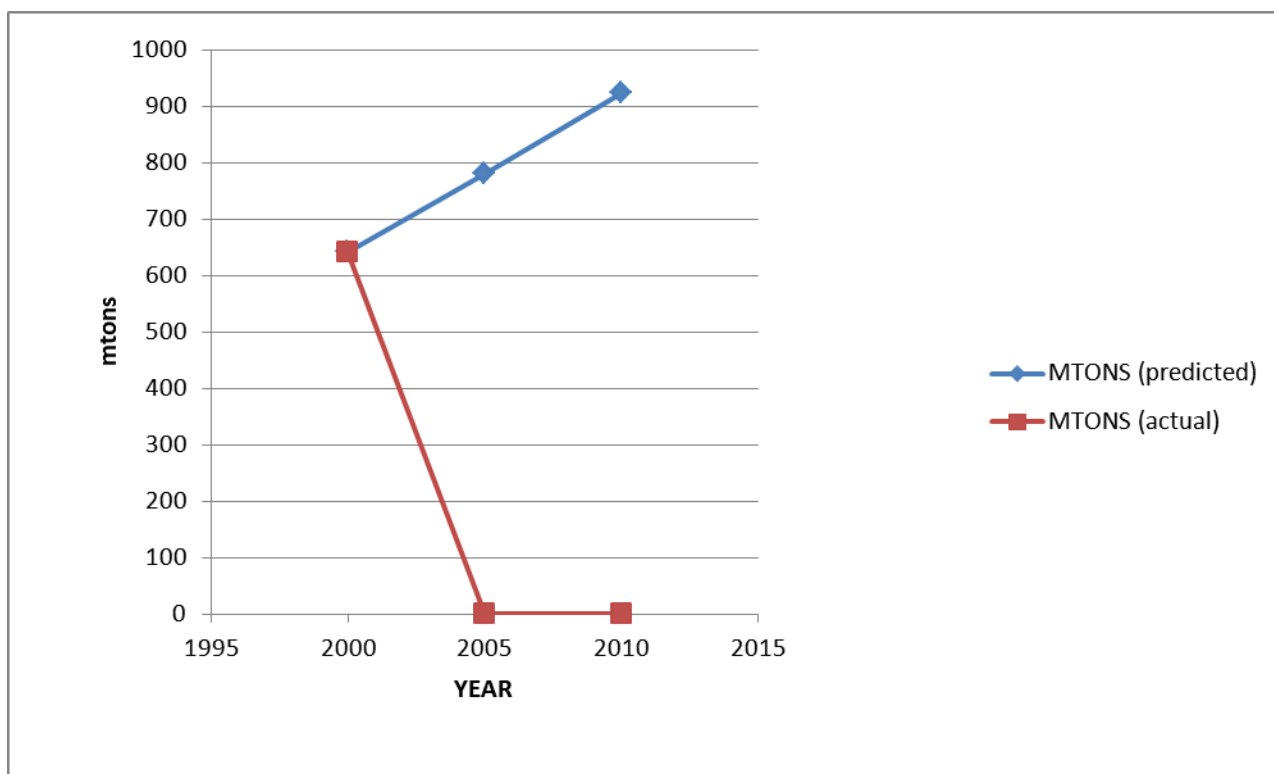


Figure 8: “Business as Usual” and Actual Consumption of Leaded Fuel Sub Region 3

Fuel Consumption 2000 - 2010: Sub Region 4

144. Sub Region 4 contains 13 countries of Southern Africa, 2 of which (South Africa and Angola) had refining capacity. Fuel consumption was high, accounting for 47% of the SSA total. This was very unevenly distributed, with South Africa accounting for 83% of the sub regional total. In 2000, unleaded petrol was already available in South Africa, Botswana and Namibia, although on a limited scale. To take account of this, the leaded fuel consumption figures for these three countries have been reduced by the following percentages: 2000 (25%), 2005 (27.5%) and 2010 (30%) based on a probable trend of slowly increasing use of unleaded fuel as new vehicles were imported or assembled in the sub region.

Countries	Leaded petrol consumption in metric tons 2000	Predicted leaded petrol consumption in metric tons 2010
Angola	142	184
Botswana	175	337
Comoros	4	5
Lesotho	35	44
Madagascar	63	91
Mauritius	75	104
Mozambique	40	58
Namibia	214	316
Seychelles	10	13
South Africa	6112	7235
Swaziland	40	60
Zambia	139	166
Zimbabwe	304	399

Table 7: Leaded petrol consumption in Sub Region 4 countries

Fuel Consumption - Sub Region 4			
Year	Metric tons of leaded petrol per annum (business as usual)	Metric tons of leaded petrol per annum (actual)	Metric tons of leaded petrol avoided per annum
2000	7353	7353	0
2005	7975	0	7975
2010	9014	0	9014

Table 8: Projected leaded petrol avoided in Sub Region 4 countries

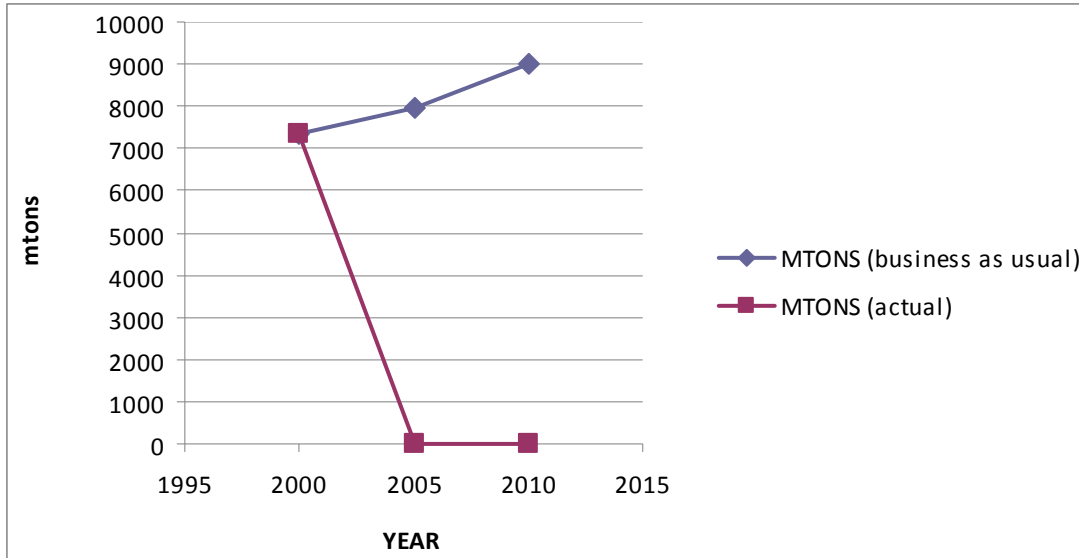


Figure 9: “Business as Usual” and Actual Consumption of Leaded Fuel Sub Region 4

Fuel Consumption 2000 - 2010: Sub Region 5

145. Sub Region 5 contains 11 countries of Eastern Africa, with Kenya as its key refining centre. Petrol consumption was modest, at only 7% of the SSA total.

Countries	Leaded petrol consumption in metric tons 2000	Projected leaded petrol consumption in metric tons 2010
Burundi	50	82
Djibouti	14	21
Eritrea	14	16
Ethiopia	120	135
Kenya	423	549
Malawi	80	131
Rwanda	55	94
Somalia	64	82
Sudan	0	0
Tanzania	156	225
Uganda	130	211

Table 9: Leaded petrol consumption in Sub Region 5 countries

Sub Region 5			
Year	Metric tons of leaded petrol per annum (business as usual)	Metric tons of leaded petrol per annum (actual)	Metric tons of leaded petrol avoided per annum
2000	1106	1106	0
2005	1320	0	1320
2010	1546	0	1546

Table 10: Projected leaded petrol avoided in Sub Region 5 countries

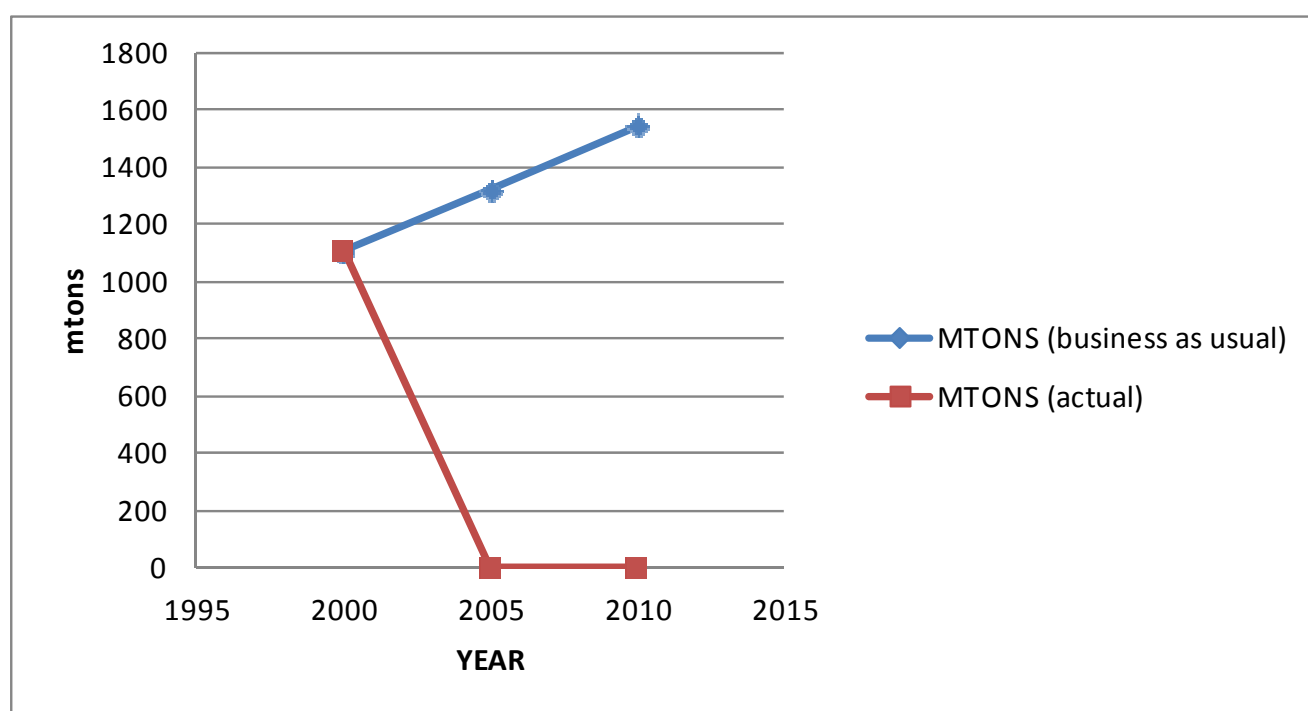


Figure 10: "Business as Usual" and Actual Consumption of Leaded Fuel Sub Region 5

Leaded Fuel Consumption 2000 - 2010: Summary of Sub-Saharan Africa

146. In Sub Saharan Africa as a whole, it can be seen that by the end of 2005, the "business as usual" counterfactual shows a regional total of avoided leaded petrol of Metric Tons 17,745 per annum, rising to Metric Tons 20,138 per annum by 2010. Beyond this date, the gains become increasingly imponderable. On the one hand, it is clear that there was very slow movement towards unleaded fuel in SSA before the Dakar Conference and the creation of the PCFV. This suggests that adoption would have continued at a very slow pace, taking perhaps as long as

twenty years to cover the whole of SSA; giving a final phase out completion date of around 2021. On the other hand, the declining worldwide share of leaded fuel might well have placed commercial pressure on the economics of supplying the relatively small African market with such fuel, suggesting an earlier phase out trajectory of perhaps ten years, giving a phase out completion date of around 2011. Perhaps the most reasonable assessment is that the phase out would have taken at least 15 years from the starting point in 2000, as shown in Table 11 and Figure 11 below.

Fuel consumption - all SUB REGIONS			
Year	Metric tons of leaded petrol per annum (business as usual)	Metric tons of leaded petrol per annum (actual)	Metric tons of leaded petrol avoided per annum
2000	15793	15793	0
2005	17745	0	17745
2010	20138	0	20138
2015	23071	0	23071

Table 11: Projected leaded petrol avoided in all Sub Regions

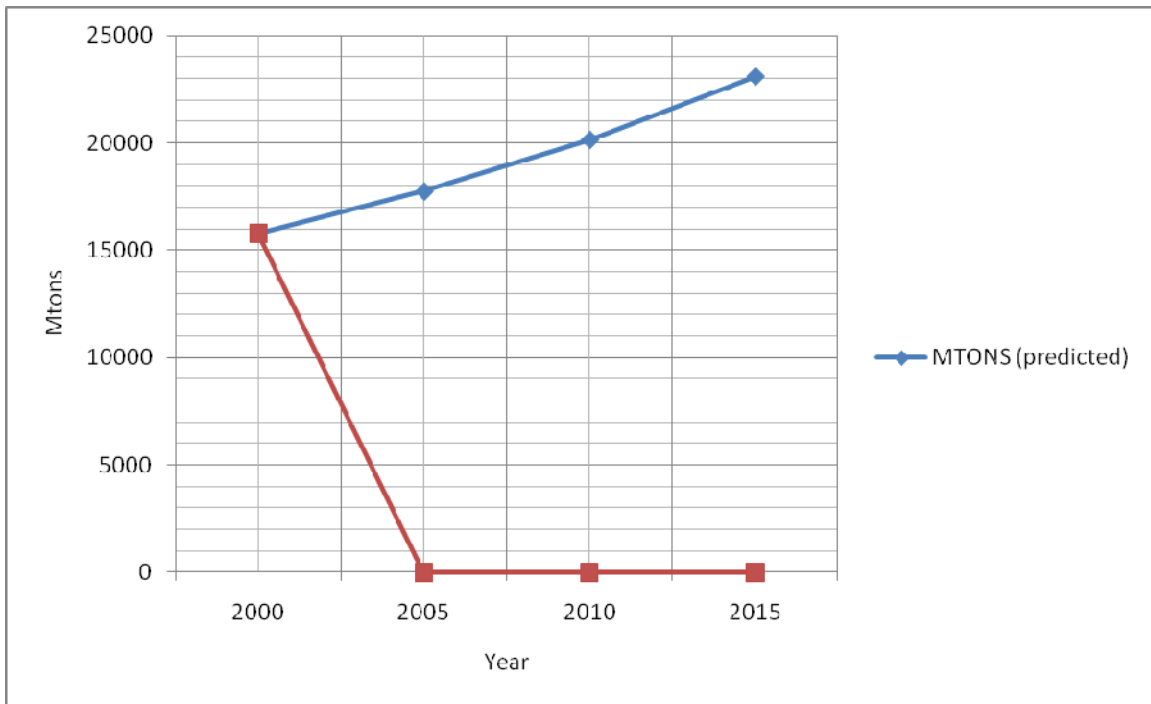


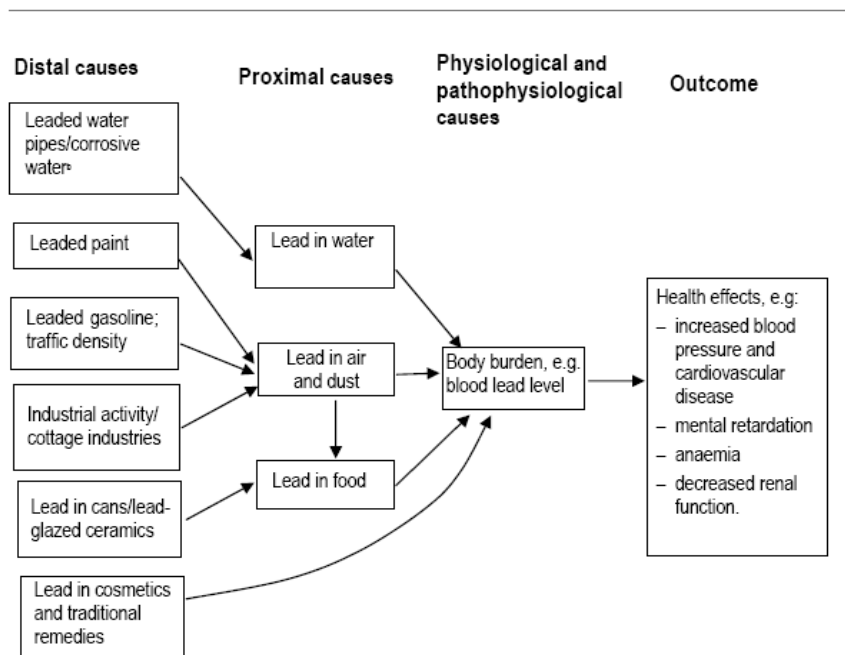
Figure 11: “Business as Usual” and Actual Consumption of Leaded Fuel Sub Saharan Africa

4.3 Connections between Leaded Fuel, Blood Lead Levels and Health

Connections Between Leaded Fuel and Health

147. The connections between lead exposure and health are well-documented and have been the subject of extensive research by such agencies as the US Environmental Protection Agency and the World Health Organisation. There are numerous pathways through which lead can be ingested by the human body, as shown in Figure 12 below. Historically, the use of lead in developed countries has been increasingly restricted, with associated reductions in Blood Lead Levels. The greatest single source of lead in humans in the twentieth century was petrol (gasoline) and from the early 1970s developed countries began to phase out such fuel.

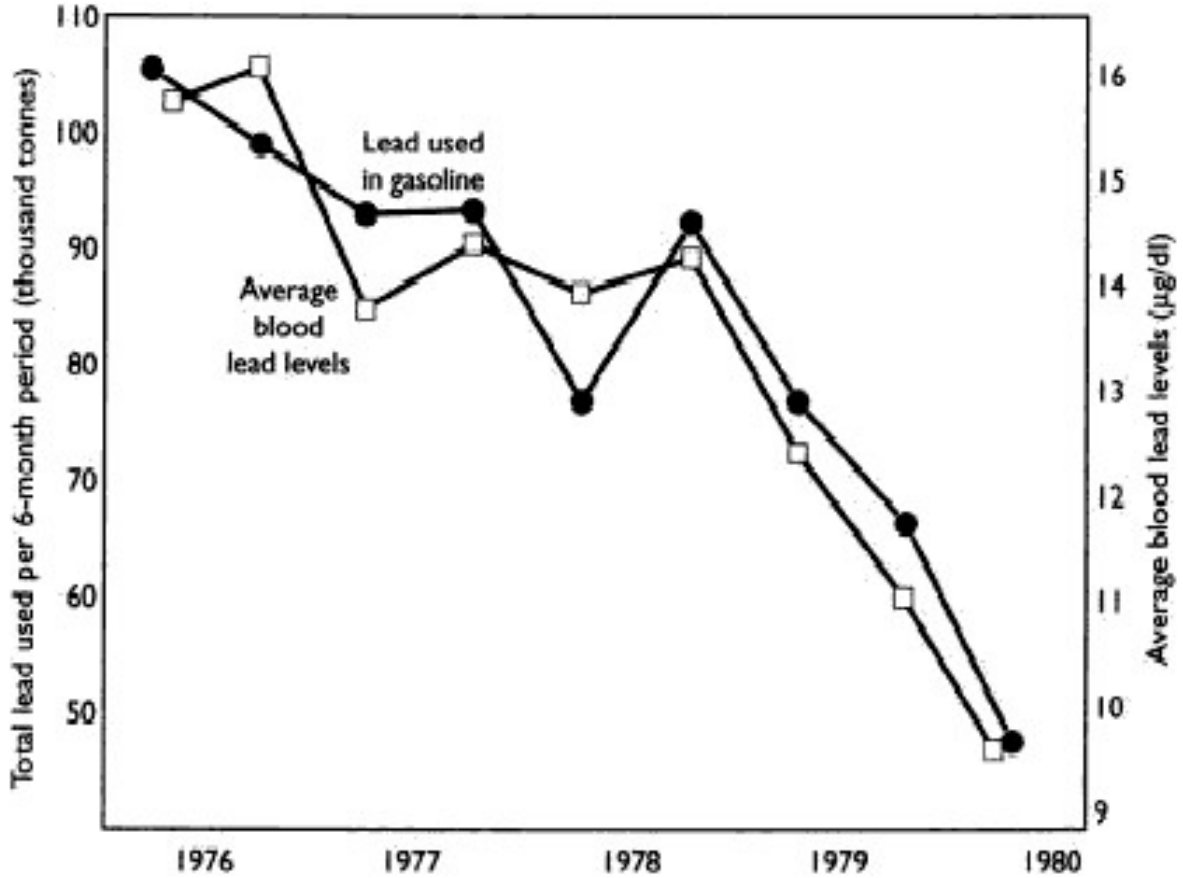
Figure 12: Causes contributing to lead related effects in humans



^a Source: Fewtrell et al. (2003).

^b Corrosive water is water that is highly acidic or alkaline, and that can dissolve certain metals (such as antimony cadmium, copper, lead or nickel) in pipes and fixtures. When corrosive water stands in contact with fittings the concentrations of these metals can be elevated, even though their levels may be normal in "flushed" samples.

148. The decisive contribution of the phase-out of lead in petrol to overall lead-related health effects has been clearly shown by evidence gathered in the USA, as shown in Figure 13 below.



Institute of Medicine, EPA, 1998

Figure 13: Connection between Phase Out of Leaded Petrol and Blood Lead Levels in the United States of America.

149. In the context of the PCFV, it was believed that the same trend in reduction in BLL, with the associated health benefits, would occur in developing countries as in developed countries. In other words, it was believed that other causes of BLL were generally relatively minor, compared with the role of petrol. The Partnership sponsored a modest amount of research on the issue over time and collated evidence from several developing countries and those with economies in transition.
150. The results are consistent across continents indicating that the phase out of leaded petrol is indeed the critical factor in reducing overall human exposure to lead. Evidence from Hungary and Thailand is consistent with that shown above for the United States (see Figures 14 to 17 below).

Figure 14: Lead in gasoline (g/L): Hungary

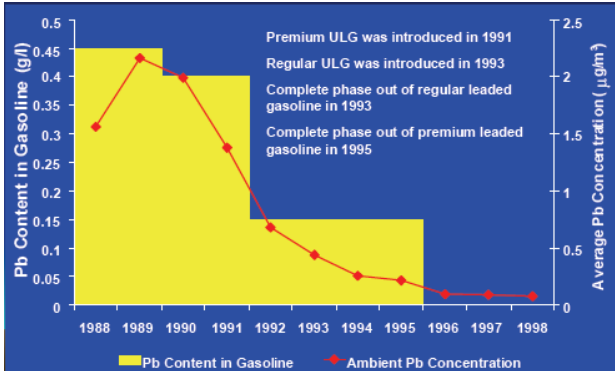


Figure 15: Mean blood lead levels (µg /dL): Hungary

Figure 16: Ambient lead concentrations and levels in fuel in Bangkok

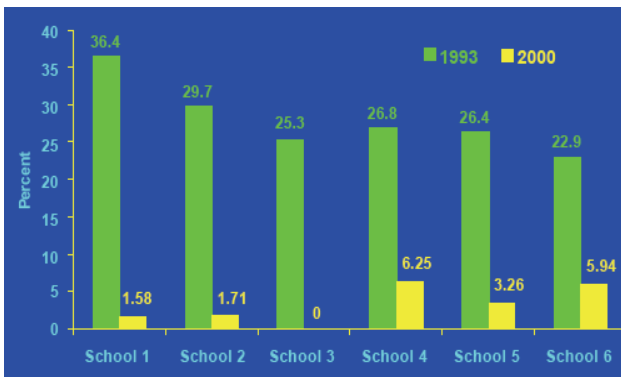


Figure 17: % school children with blood lead levels >10 µg /dL in Bangkok

151. Specific evidence from Africa is relatively rare, but some is available from research conducted in collaboration with PCFV/UNEP. A pre phase out study in Kenya confirmed that the effects of leaded petrol were primarily felt in urban areas, where the concentration of both vehicles and population were higher²⁶. Both the minimum and maximum levels of lead in the blood were at least four times lower among the rural population than their urban counterparts.

²⁶ Blood Lead Levels in Kenya: A Case Study for Children and Adolescents in Selected Areas of Nairobi and Olkalou, Nyandarua District. (Njoroge G. Kimani, Kenyatta University, Nairobi, Kenya. September 2005)

Blood lead levels in Four Kenyan Urban Areas and One Rural Area

AREA OF STUDY	N	MEAN	MODE	SD	%>10µg/dl	%.5µg/dl	MIN Pb LEVEL	MAX Pb LEVEL
Urban Areas								
KARIOBANGI NORTH	36	6.3	4.5	3.7	17.0	44.0	2.1	16.5
BABADOGO	26	7.3	3.6	4.8	27.0	62.0	1.5	21.8
WATHAKA	19	5.1	3.2	3.4	10.0	40.0	1.4	13.0
PUMWANI	30	8.4	8.3	3.8	30.0	83.0	3.5	20.3
Rural Area								
OLKALOU	10	1.5	0.8	1.0	0.0	0.0	0.4	3.8

Source: Kimani, Table 4.

Table 12: Blood lead levels in Four Kenyan Urban Areas and One Rural Area

152. This evidence supports the prevalent perspective that urban populations in Africa were experiencing considerable negative health impacts from the high concentration of lead from the rising number of vehicles. These fed into broader negative social, economic and human development impacts. The seriousness of this issue was compounded by the rapid growth of urbanisation in SSA. From an initial (2000) urban population in the region of 411 million, projections²⁷ indicated growth to 470 million by 2015 and up to 500 million by 2020. This is the level of population, which stood to benefit from the reduction of lead in the urban environment.
153. The extent to which the phase out of leaded petrol actually affected urban Blood Lead Levels has been specifically investigated in Ghana. *The Environmental Protection Agency in Ghana conducted research on BBL in 2003, when leaded petrol was still in use, and in 2006, after its removal from the country. According to this, “The research has established a linkage between lead exposure from environmental sources and blood lead levels of the study population. The decline in blood lead levels in 2006 is consistent with and undoubtedly related to the reduction in exposure to lead from environmental sources” (shown to be mainly from petrol).*
154. “The overall mean blood lead level of 5.33 µg/dl for both subjects and controls in 2006 compared with that of 2003 (26.4 µg/dl) suggest that there has been a dramatic decrease in blood lead levels. This is further confirmed by the decrease in the mean lead levels for subjects from 26 µg/dl to 5.53 µg/dl and controls from 27 µg/dl to 4.87 µg/dl below the WHO recommended limit of 20 µg/dl”. The drop in Blood Lead Levels is shown in Figure 18 below.

²⁷ Source: “The Urban Transition in Sub-Saharan Africa: Implications for Economic Growth and Poverty Reduction”, World Bank Africa region Working paper Series, Number 97. Chrstine Kessidy, 2005.

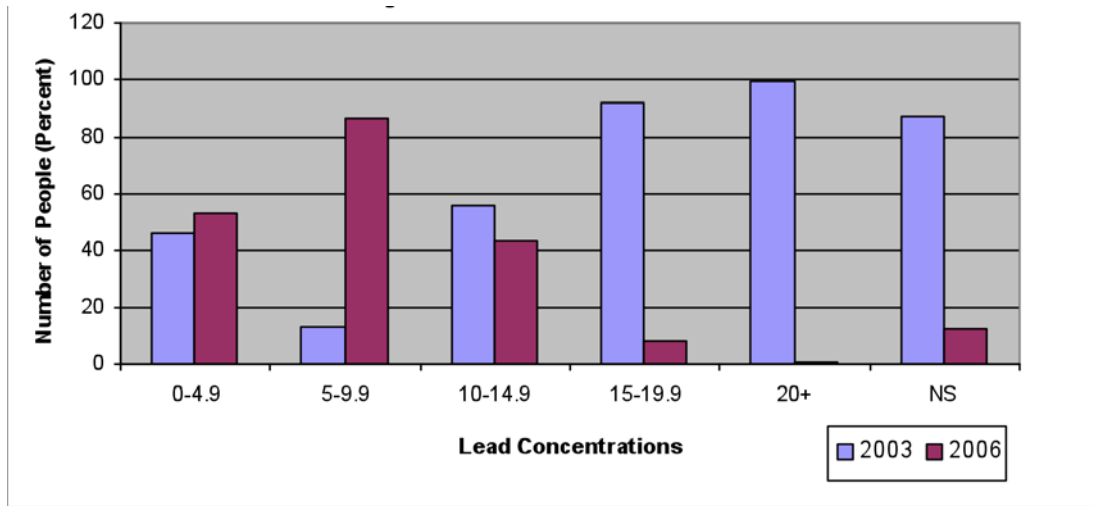


Figure 18: Changes in Blood Lead Levels ($\mu\text{g}/\text{dl}$) in Ghana Pre and Post Leaded Fuel Phase Out.

155. The evidence from Ghana is indicative of the impact of lead phase out in Africa. More extensive research is being conducted by the Department of Environmental and Occupational Health of California State University on behalf of the Partnership, but published results were not available at the time this report was prepared. It is understood that, in addition to more detailed assessment of the health benefits, the data produced by the study indicate that for Africa as a whole (i.e. including Africa north of the Sahara) the benefits of lead phase out are of the order of US\$ 92 billion per annum, some 4% of GDP (R. De Jong. Pers. Com).

5. Evaluating Contributions to the Elimination of Leaded Fuel from Sub Saharan Africa by Stakeholder

156. The contribution of some of the key stakeholders is outlined in Table 13 below. This is not intended to be a comprehensive analysis of every contribution of every stakeholder. Rather, it serves to show that a broad range of stakeholders participated in the successful attainment of the objective of the phase-out of leaded petrol in Sub-Saharan Africa and that there were complex and changing inter-relationships between the numerous players and their individual contributions to the process.

Table 13: Analysis of some of the contributions of key stakeholders in the phase-out of leaded petrol in Sub-Saharan Africa 2001 - 2006

Stakeholder	Contribution
WSSD	<p>The UN-hosted WSSD made major contributions to the phase-out as follows:</p> <ul style="list-style-type: none"> • Launched “Type-2 Outcomes,” conceived as partnerships between Government, Civil Society and the Private Sector. PCFV was one of the first to be formed and rapidly became one of the most active. • The Johannesburg Plan of Implementation supported the global phase-out of leaded petrol.
UNEP	<p>After the successful Sub-Regional Meeting (of the World Bank’s Clean Air Initiative) held in Nairobi, UNEP agreed to support a further five-year programme of follow-up workshops at this level. These workshops were also linked to the World Bank Clean Air Initiative, which sometimes appears as the lead agency on their official documentation.</p> <p>UNEP hosted the Regional Conference on the Assessment of the Phase-out of Leaded Gasoline in Sub Saharan Africa (also known as Dakar +2), which consisted of two days of technical discussion followed by a one day Ministerial Session. UNEP’s ability to attract high levels of political representation, active participation and commitment at such gatherings emerges as one of the key drivers of the process.</p> <p>Active support from successive Executive Directors gave a high profile to the phase-out programme, which catalysed the necessary high-level political support among African Governments.</p> <p>UNEP offered to host the Clearing House and to contribute towards staffing and other resources needed to develop an extensive programme of</p>

Stakeholder	Contribution
	support at regional, sub-regional and national level.
PCFV	<p>The partners came from governments, NGOs, private sector and agreed to receive support from a small “Clearing House”, established in UNEP. Role of CH with national governments not clearly specified at this stage. Target countries were mainly in SSA in initial stage.</p> <p>The Partnership, particularly through its Working Groups on Valve Seat Recession, Octane and Public Awareness (later followed by the Sulphur Group), produced high quality technical and advocacy materials, which were widely disseminated and used; and which provided information and legitimacy of value to Government decision makers.</p> <p>The Partnership made funds available, administered by the Clearing House, for a broad variety of national level activities in such fields as research, information dissemination and planning workshops; which played an important role in supporting and advocating the phase-out to national audiences and Governments.</p>
Clearing House for PCFV	<p>The CH organised meetings of the Partnership, at which broad range of issues discussed and decisions made concerning the direction of financial, technical and public information support.</p> <p>Supported work of PCFV Global Working Groups on Octane, Sulphur and Valve Seat Recession, including editorial assistance.</p> <p>Disseminated a broad range of informational products on the importance of lead phase-out and, later, other topics such as sulphur. Later established newsletter. Hosted web-site with increasing opportunities for direct interaction with CH team on technical issues.</p> <p>Administered funds from various sources, used to support regional and (mainly) national level activities advocating or in support of the phase-out process.</p> <p>Attended international, regional, sub-regional and national forums, as well as training activities; and presented the programme of the Partnership for information dissemination, advocacy and to raise further support.</p> <p>Actively raised funds to expand the scope and range of its support, particularly for national programmes.</p>
US - EPA	<p>The most prominent and active bilateral agency, engaged throughout the history of the PCFV and before.</p> <p>Partnered the World Bank in the Dakar Conference and one of the early members of PCFV. Co-hosted Dakar +2 meeting.</p>

Stakeholder	Contribution
	<p>Played active role at Partnership meetings and financed some of the running costs of the Clearing House.</p> <p>Gave assistance to Governments and NGOs, much of which was later channelled through PCFV, often on an “earmarked” basis.</p>
<p>International NGOs, Trade Organisations, Trusts, etc.</p>	<p>A variety of international NGOs, Trusts and other entities played major roles in establishing, participating in and supporting the Partnership. These ranged across many interests, including health advocacy and reform (e.g., Trust for Lead Poisoning Prevention), clean air technology (e.g., Environmental and Energy Technology and Policy Institute), vehicle manufacturers (e.g., the Japan Automobile Manufacturers Association, Inc.) and industry perspectives (e.g., chemical industries, petroleum suppliers, refiners, publishers).</p> <p>These organisations played important roles in steering the direction of the PCFV, assisting the Clearing House on technical issues, supporting sub-regions and national Governments (directly or through information products) and in advocacy for lead phase-out.</p>
<p>IPIECA</p>	<p>One of the most active trade-based associations. This international organisation representing the Petroleum industry was an active stakeholder prior to the Dakar conference and its follow-up; and had already produced a CD-Rom analysing the various additives which can substitute for lead.</p> <p>Early member of the PCFV and played an active role throughout the SSA programme; providing assistance to Governments and within the Partnership, to enable consensus to be reached on basis of best available technical information.</p> <p>Joint organiser (with UNEP and World Bank) of the important SSA Refiners’ Meeting, which provided valuable pointers on a broad range of technical issues to countries and other stakeholders involved in the phase-out process.</p> <p>Participated in all regional and sub-regional meetings and a key player bridging the perspectives of the oil industry, Government and civil society, in addition to its important technical inputs.</p>
<p>NEPAD</p>	<p>Launched Action Plan on the Environment Initiative, which gave high level African political support to the phase-out process.</p>
<p>National Governments in SSA</p>	<p>Governments formed the “bottom line” of the process. Since there was generally little public pressure in favour of unleaded petrol, most Governments were concerned to receive support to generate data and communications, which could bring public opinion behind the</p>

Stakeholder	Contribution
	<p>commitments they had made in the light of international trends. Technical advice was also valued. Support from national Governments, notably Environment Ministries, was strong, as witnessed by high levels of attendance at sub-regional and national meetings; and the willingness to make political and legislative interventions in favour of the phase-out.</p>
<p>National NGOs</p>	<p>A broad range of national NGOs played important roles in advocacy, information gathering and dissemination, research and monitoring. In many cases, this placed pressure on Government to act, whilst at the same time providing legitimacy for the changes enacted, by providing important information to the public on health aspects of leaded fuels and the absence of “downsides” to motorists from using unleaded petrol.</p>
<p>World Bank (Clean Air Initiative in SSA)</p>	<p>Catalysed phase-out of leaded gasoline in SSA through Dakar Conference (2001), which:</p> <ul style="list-style-type: none"> • Brought together broad range of stakeholders including US EPA, bilateral donors such as the Netherlands, NGOs, research institutions, oil supply and refining companies and industry associations, automobile industry associations, African consultants, WHO and UNEP • Raised awareness of health issues • Helped build understanding and consensus among stakeholders on technical, regulatory, institutional, economic issues and priorities • Promoted development of national level Action Plans, with timetables and monitoring indicators • Promoted agreement on the Dakar Declaration, which committed 25 countries to phase-out by end of 2005 • Set in motion process of Sub-Regional workshops. <p>Jointly facilitated (with UNEP, US EPA, IPIECA and others) series of Sub-Regional Workshops. The first of these was in East Africa and held at UNEP HQ, which achieved the following:</p> <ul style="list-style-type: none"> • Pinpointed the one sub-regional refinery as critical path in phase-out for several countries • Set up process of national stakeholder meetings • Built on UNEP’s preparatory work on phasing out leaded fuel, through its formal incorporation into phase-out process, with role of reviewing progress and reporting to African Ministers of Environment at their next summit (late 2003).

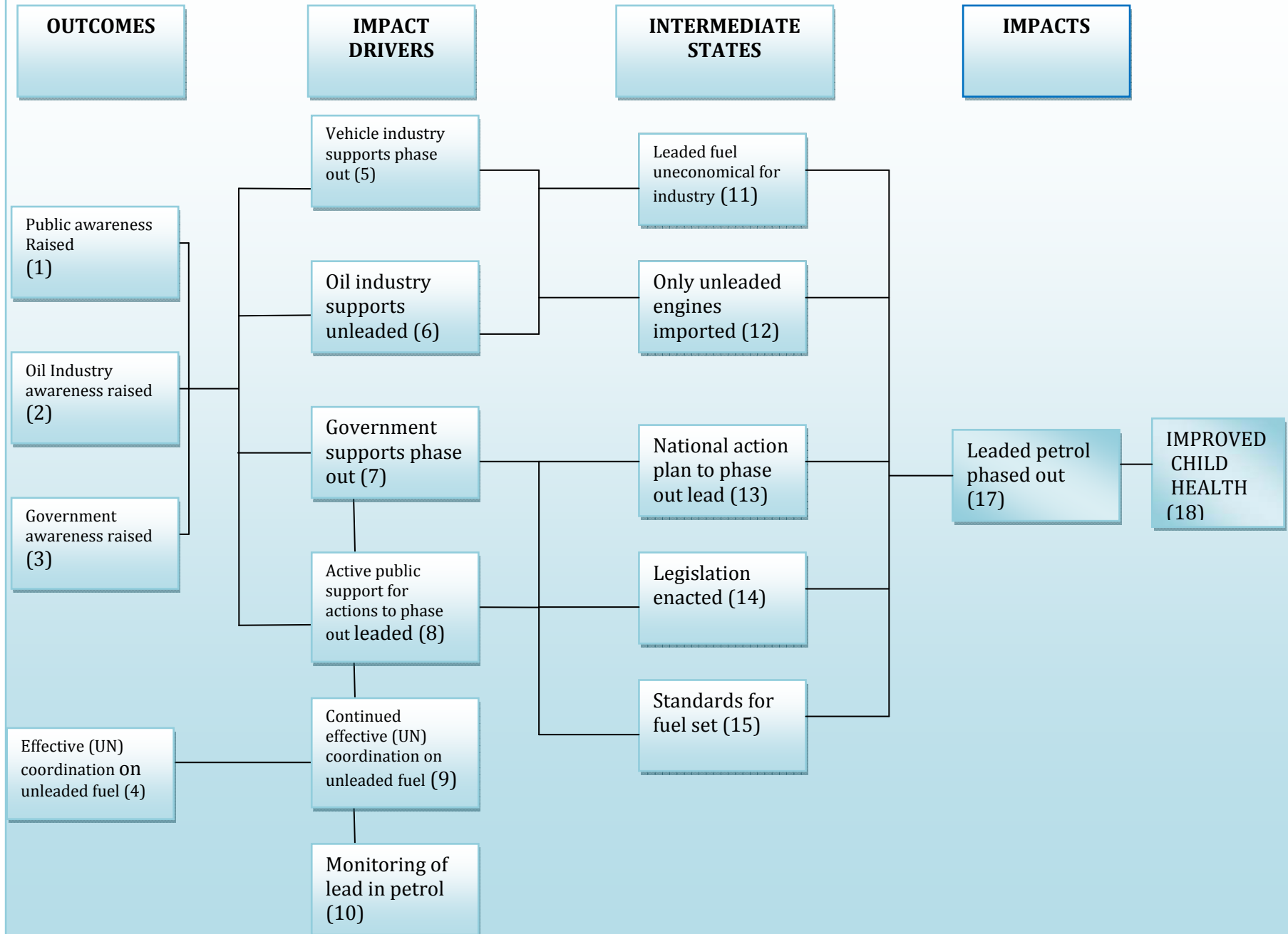
6: Analysis of Causal Pathways Towards Intended Impacts of the Phase Out of Leaded Petrol from Sub-Saharan Africa

157. At this stage, it is appropriate to return to the Theory of Change for the PCFV, drawn up on the basis of the 2006 Proposal for European Union funding. This will enable us to see whether the Theory of Change held true, to what extent the anticipated cause and effect chains occurred and which stakeholders contributed to the process in various ways. The Theory of Change and its individual components are analysed on a box by box basis, in Figure 19 below.

6.1 Progress at Outcome Level

158. The first level of results analysed is at the outcome level, which includes results expected to be delivered (in part or in whole) by the intervention. The phase out process has been mapped out on a country-by-country basis and for Sub-Saharan Africa as a whole in Chapters 3 and 4. Every country targeted reached its phase out objective by the target date of the end of 2005. The cause and effect chains through which the phase out was achieved, based on the Theory of Change developed in Section 1.2.3 will now be assessed, to develop an understanding of the contribution of different activities and inputs. This assessment is based on: detailed review of reports on the outcomes of activities supported by the PCFV; reports presented by country representatives at Sub-Regional and national meetings, other documentary sources and interviews with stakeholders, as detailed in Chapter 1.

Figure 19: Analysis of Causal Pathways



160. The first intended outcome, shown as **Box 1**, was the raising of public awareness of the benefits of switching to unleaded petrol. This outcome depended on the prior availability of knowledge likely to promote public acceptance, or even support for the change. In many countries of SSA, it was reported that there was initially a preference for leaded petrol; based on locally-accepted wisdom, that this gave better performance and did not damage the older type of engine, which was a major part of the vehicle stock. The advantages of unleaded were primarily advanced from a health perspective, initially through the Dakar Conference, then through the follow-up Sub-Regional Meetings and on to national workshops. Contributors to the attainment of this outcome therefore included international agencies (including the World Bank, UNEP and US EPA), International NGO members of the Partnership (such as The Trust for Lead Poisoning Prevention), trade-based bodies (notably IPIECA) and national NGOs in many SSA countries and Governments. A further dimension of this issue, which featured in campaigns in several countries, was the damaging effect of leaded fuel on catalytic converters, which thereby raised other health and environmental problems. In achieving increased public awareness across SSA, the efforts of the Clearing House were also instrumental: both in terms of its publications and other media and through its support to awareness workshops and campaigns in many countries.
161. The second outcome level result (**Box 2**) was intended to be the raising of awareness and support of the oil industry, internationally and nationally, for the transition to unleaded fuel across Africa. Since leaded petrol had already been phased-out in Europe, USA and Latin America, it can be assumed that the oil industry internationally was already aware of the health effects of leaded fuel, particularly in urban areas, which are the mainstay of the SSA fuel demand. However, it was still exporting such fuel to most of SSA. In addition, several international companies owned (wholly or partly) and operated refineries producing leaded petrol. The awareness of the industry was therefore most in need of persuasive information on the range of alternatives to lead additives for refineries and of the costs of introducing these. PCFV, notably IPIECA, produced high quality technical information on these issues and sponsored major gatherings of SSA refiners to develop and propose technically and economically viable approaches for African refiners.
162. The third result at this level was intended to be raised national Government awareness of the need to move to unleaded fuel (**Box 3**). This was a major aspect of the overall programme and was implemented through SSA-wide and Sub-Regional meetings, supported by several key stakeholders including UNEP, World Bank and US EPA. PCFV members were substantive participants in many of these meetings and the Clearing House often played an organising and facilitating role, including funding support to ensure appropriate attendance. The publicity materials produced by or on behalf of the Partnership provided long-

term support to ensure that the messages of the meetings remained current in between them. The participation of successive Executive Directors of UNEP in these events appears to have contributed to the attendance of high level Government representatives, including Ministers, which enabled Government awareness to be raised at a sufficiently senior level to ensure action.

163. The fourth intended outcome was the establishment of an effective coordination system among the numerous stakeholders interested in lead phase-out (**Box 4**). Whilst there were a number of key players at the major international events, none of these could effectively fulfil the role of permanent coordinator. This became very clear with the creation of the Partnership. In between its annual meetings and in preparation for them, there was a steady stream of activities, both small and large, which needed to be moved forward. This might have been achieved through the creation of a new international body, but the preferred solution was to have a voluntary Partnership of interested stakeholders, from very diverse backgrounds and levels; supported by a small “Clearing House”. One major player in the overall process remained outside of the Partnership, namely the World Bank; which preferred to continue to make its contribution to phase out through its own Clean Air Initiative SSA programme, which covered a broader range of issues than PCFV. The World Bank’s initiative brought together many of the same stakeholders involved in the Partnership, where the overall leadership and coordination of the phase-out process became focussed over time. As well as keeping the wheels of the Partnership turning, the Clearing House also over time became an effective partner for countries, supporting all sectors through its publications, direct advice to Governments, NGOs and the private sector, and its disbursement of modest amounts of funds in support of specific activities designed to promote the phase-out process. In turn, the Clearing House was supported by several stakeholders, particularly the US EPA and UNEP, both of which provided financial and technical support.

6.2 Presence of Impact Drivers Supporting Progress Towards Impacts

164. In between the outcomes delivered (more or less) directly by an intervention and its intended long-term sustained impacts there are often a number of “intermediate states.” In order to move towards these intermediate states active support may be needed on several dimensions. A concept used to analyse such support is that of “**impact drivers.**” In the Theory of Change derived from the PCFV 2006 funding proposal, six impact drivers appeared necessary. We now analyse whether these were actually put in place and by whom.
165. The first important impact driver (**Box 5**) to enable countries to move from the outcomes achieved towards the overall impact objective was the support of the in-country vehicle industry for phase-out. In most countries in SSA, it is clear that vehicle suppliers, in almost all cases importers of new or used vehicles (apart from vehicle assembly/manufacture in South Africa) had a strong interest in seeing the adoption of unleaded fuel as the standard. This was because they were

- constrained in the range of models they could import, because the great majority of vehicles available internationally were already designed to run on unleaded fuel and had catalytic converters, which are ruined by the use of leaded fuel. Indeed, some importers went to the expense of removing the catalytic converters before putting the vehicles up for sale locally.
166. The main part of the vehicle industry with reservations about the switch was therefore the networks of dealers of local second-hand cars and of maintenance shops, who initially subscribed to the belief that unleaded fuel could damage older engines, specifically through “valve seat recession”. There was widespread belief that lead deposits formed a “cushion” between the engine valves and the cylinder head, thereby reducing wear and prolonging the engine life. Older engines were thought to have been made of materials, which are more susceptible to wear than modern engines, a problem which was later removed by the introduction of improved valve design and materials. Thus, many users and distributors of older vehicles feared that the requirement to use unleaded fuel would cause damage to their engines. Here, the work supported by the Partnership on Valve Seat Recession, culminating in an influential publication on the topic²⁸, contributed to awareness that the anticipated damage had no support on the basis of experience from those countries, which had already switched. Furthermore, the many national meetings, training sessions, workshops and publicity campaigns supported (at modest level) through funds channelled by the Clearing House made a major contribution to dispelling these fears and bringing the auto industry into the ranks of supporters of phase-out.
167. The second impact driver (**Box 6**) to move the process forward (or hinder it) was the support of the oil industry in SSA countries. Although the industry internationally had, in principle, adopted a supportive position on the switch to unleaded fuel, in several influential SSA countries this was not initially the case. This was particularly so in the key refining countries, such as Kenya and South Africa, where there were fears of substantial technical and financial difficulties in making the switch. In this area a number of stakeholders made substantial contributions to catalyse changing perspectives and approaches. The Dakar Conference, in which the World Bank took a prominent role, with EPA support and some UNEP participation laid the groundwork to address these issues.
168. The establishment of the Partnership was a critical step in overcoming the potentially strong opposition from the oil industry in SSA, particularly the refiners. The Partnership sponsored and published expert studies reviewing the range of options for refineries, including their cost implications and followed these up through a strong presence in critical international meetings, notably that of SSA Refiners in South Africa in October 2003. Other issues addressed included the setting and monitoring of national fuel standards, regional integration of standards and procedures for switching over from leaded or dual systems to

²⁸ “Eliminating Lead from Gasoline: Report of Valve Seat Recession,” Report by the Valve Seat Recession Working Group, Clearing House for PCFV, Nairobi, (undated).

- unleaded only. One of the key factors, which both ensured the quality of support given and gained the confidence of those in the industry in SSA was the presence of well-established industry bodies such as IPIECA and some oil companies (e.g., Exxon Mobil), who played a prominent role within the Partnership.
169. The next, and perhaps most critical impact driver (**Box 7**), was the active commitment of national Governments to the switch to unleaded fuel. The first platform of support to ensure this was the series of meetings at all levels, from SSA-wide, through sub-regions to national level, justifying and promoting the switch to unleaded fuel. These meetings gained credibility from the high level support from UNEP, which is widely seen on the continent as having legitimacy in the realm of environmental agreements and movements. Paradoxically, the relatively low level of funding available to and through UNEP appears to confer upon it something of the status of an “honest broker, ” as compared to more affluent development institutions, which are perceived to have more of their own interests to pursue, in addition to their public agendas. The support and participation of PCFV members at the multiple levels of meetings (although rarely at national level) also played an important role in persuading Governments that the switch to unleaded was both desirable and inevitable; as did the steady stream of information materials on the processes and benefits of the phase-out.
170. The Clearing House also made a substantial contribution towards ensuring continuing Government commitment across the region, through its funding of many national level awareness campaigns, training programmes and conferences. Although in many cases, the financial support given was modest (often in the range of \$6,000 - \$10,000), there were also more substantial grants, where it seemed that a broader range of activities would be needed to ensure Government and public support. At ground level, much of the pressure placed on Governments came from local NGOs, either directly, or through increased citizen awareness generated through campaigns. Other important players at these levels included: journalists, academics and, for example in Tanzania, the legal profession who saw the field of environmental law as one which could influence the decision to switch to less harmful fuels.
171. The support of national Governments discussed above was itself, in many countries driven by active public support for the transition (**Box 8**). This support was to a considerable extent raised as a result of national NGO or Government campaigns; often assisted by funds from the Clearing House, as well as by informational materials produced by PCFV members or Working Groups. Attendance by Government officers at Regional and Sub-Regional meetings also kept the profile of the phase-out high and in turn enabled Governments to present its advantages to the public in their countries.
172. The initial outcomes of the high profile Conferences and meetings needed to be sustained and turned into national phase-out programmes; some of which, particularly in refining countries, were complex and needed to be sustained over

several years. This situation called for sustained coordination (**Box 9**), to ensure that the pressure to phase-out continued, to ensure flows of technical and advocacy information, to offer timely financial assistance in support of national campaigns and to monitor progress. The Clearing House was the main source of this coordination, drawing on PCFV partners as necessary and with support from UNEP to periodically bolster Government-level commitment.

173. Another potential impact driver would be effective programmes to monitor the lead content of petrol (**Box 10**), particularly in areas where smuggling or fuel adulteration might be anticipated to present issues. No evidence was found that this area has been strongly developed either centrally at PCFV level or nationally. PCFV subscribes to a commercial service which conducts limited sample-based monitoring across SSA (among other areas) and provides some information on incidences of the discovery of leaded petrol. The Clearing House, through its extensive networks, also receives reports of possible reversion to the use of leaded fuel, which it tries to follow up informally. Since the transition to unleaded fuel is essentially a voluntary action of Governments and there is no binding Convention (such as is the case, for example, for Ozone Depleting Substances) with sanctions for contravention, there are no formal means for penalising “reversion”. Various approaches have been tried in countries to institutionalise monitoring. In Tanzania, an NGO took responsibility for this. Generally speaking, UNEP accepts country reporting on the issue, except where it has strong information to the contrary. In the case of Egypt, for example, UNEP discovered that part of the fuel supply to one region of the country was still leaded and removed the country from the unleaded list. There are often rumours of remaining leaded sources, which the Clearing House reports to the countries concerned. The Ministries of Environment and Health are often strong allies in attempts to ensure compliance.

6.3 Intermediate States

174. A set of Intermediate States was also identified as part of the cause and effect chain encompassed within the Theory Of Change constructed for the project. These represented steps which would enable or lead to the intended long term impact targeted by the project. Five such Intermediate States were identified.
175. The first of these was that leaded fuel would become uneconomical for industry (**Box 11**). This was particularly important at national and sub-regional levels. The high costs and risks of running dual systems were emphasised from an early stage by a range of PCFV partners, both in conferences/workshops and in publications. Substantial support work was also undertaken specifically with oil refiners and distributors, to develop a range of approaches, which could be cost effective in particular situations. The active participation of the industry within PCFV was an important factor in promoting this Intermediate State, which was a mix of perceptions and actual realisation of costs, compared with the sales benefits of retaining leaded fuel. As increasing numbers of countries committed to the switch, this Intermediate State was largely realised.

176. The next Intermediate State was considered to be that only engines designed to run on unleaded petrol should be imported or (rarely) built in SSA (**Box 12**). In principle, this should make leaded petrol unattractive. This did not prove to be such a decisive factor as anticipated. In most SSA countries this was already the case for all newly delivered vehicles. The problem proved to be that dealers simply removed the catalytic converters, which allowed the vehicles to continue to use leaded petrol. More broadly, motorists with vehicles designed to be used with unleaded fuel simply ran them on leaded fuel, thereby removing the potential benefits of the catalytic converters and continuing to emit lead into the local environment. Concerns of the many African motorists using old vehicles that unleaded fuel would damage them was strongly countered through technical information published by PCFV on the basis of studies by its Working Groups. This information was also widely disseminated at the regional and sub-regional meetings organised or supported by PCFV; and thereafter found its way into the discussions at many national meetings and in advocacy campaigns, often supported through the CH funding mechanism.
177. Another critical step in the phase-out process, as envisaged in the Theory of Change underlying the project, was the existence of national action plans (**Box 13**). These were found to be generally present and to largely cascade down from sub-regional action plans prepared at the various meetings held under the auspices of UNEP and/or the World Bank. National level meetings then discussed details of exactly what needed to be done and laid out programmes to achieve this. One of the driving forces in this process appeared to be the existence of publicly-announced timescales, initially for the SSA region as a whole, but later on sub-regional and national levels. Many countries received support through the CH for meetings and campaigns, which contributed to the formulation and acceptance of national plans. The body of technical information provided through PCFV also underpinned preparation of plans, since such material was often not locally available.
178. The enactment of legislation was another step (**Box 14**) seen as critical to reaching the intended objective of phase-out. Whilst this was indeed required in many countries, others managed to make the transition without legislation, through a variety of lower level Government procedures. In the case of countries, which simply imported fuel from one source, the process was often simple and quick, once the decision had been made. The evidence does not suggest that this was an area, which received substantial direct support from PCFV; although much of the substantive material on which legislation might be based had been circulated through the Partnership and is likely to have played an enabling role for those drawing up the necessary legal documentation.
179. The setting of standards for fuel (**Box 15**) did prove to be a critical step for most countries and was widely achieved. This also had important sub-regional dimensions, to reduce possibilities of smuggling of lower quality fuels,

adulteration and continued unofficial sales of leaded petrol. Governments often appointed specialist national bodies or ad hoc groups to prepare the necessary documentation and proposals in this area, before taking formal decisions. PCFV provided substantial support in this area, through Sub-Regional Meetings, refiners' meetings, supporting technical documentation and on-line support. Several of the specialist bodies and individuals within the Partnership made important contributions in this area of support.

6.4 Impacts Achieved

180. A major impact intended to be achieved with the assistance of the PCFV was improved health, particularly child health in urban areas of SSA, through the reduction of lead pollution from vehicles. To directly demonstrate that such health benefits have actually been delivered would require large scale clinical studies across Africa, which have not been undertaken and would be difficult to complete now, in view of the absence of pre-intervention baselines. However, substantial proxy information is available, which gives confidence in our ability to give an accurate overview of what has happened.
181. Research on linkages between leaded fuel and Blood Lead Levels has been collected in the United States and in several developing countries. In addition, PCFV has sponsored limited research to investigate the health changes achieved, notably in Kenya and Ghana and more recently through a Global Lead Health Impact Study undertaken by the Department of Environmental and Occupational health of California State University. Evidence from different sources and countries is consistent and indicates that, when leaded petrol is prevalent, it accounts for 80% or more of lead in humans, with a particular concentration in urban areas. In specific localities there may be other prevalent sources of lead exposure, but these are of limited significance in national and regional profiles. Since Africa is rapidly urbanising and has an ever-growing car owning population, it is clear that in the "business as usual" scenario without the project, the use of leaded petrol would have continued to expand rapidly in the short to medium term.
182. There are factors noted by some members of the Partnership, which may partially reduce the benefits obtained. The first of these factors is the need to decontaminate facilities in some countries, where lead is still present as a residue or in stocks of materials. This is not formally within the PCFV mandate and has not been a major area of focus, although limited support has been given to such processes. Such contaminants may, to a small extent, reduce the health gains made by the phase-out. The second is the fact that there are other sources of lead in the environment in some locations in some countries. These may include paint, car batteries as well as the still authorised uses of leaded fuel in aviation, agriculture, vintage and race cars. To those Partners whose primary focus is on lead, this is seen as a problem, which could perhaps have been addressed, if PCFV had a somewhat wider mandate. On the other hand, it is the specificity of

the mandate, which has enabled the Partnership to be so effective. Furthermore, as shown above, a range of international studies and some Africa specific results show clearly that leaded fuel is by far the greatest contributor to lead in humans and that its phase out is in itself a major contribution to human health objectives and associated economic costs.

183. The third factor is that it has later emerged that some of the additives used to replace lead in fuels themselves pose health risks (although less than those posed by lead). This particularly applies to metallic additives such as Methylcyclopentadienyl Manganese Tricarbonyl (MMT), a manganese based substitute. For some in the Partnership, this is a paradoxical area. PCFV has gained much of its strength from its broad range of partners; and the active support of industry has enabled it to reach stakeholders, who may otherwise have been left out of this environmental intervention. However, the presence of representatives of the chemical industry is seen by some as posing a challenge, when it comes to addressing the use of “controversial” additives to replace lead, since the Partnership makes its decisions on the basis of consensus. This issue has not been resolved and, although the health dimensions are not unanimously agreed, there are substantive concerns among the Partners. PCFV has provided a platform via its website, through which documentation on this issue by all parties has been shared, enabling stakeholders to make their own decisions on the basis of the best evidence currently available. A final observation raised is that the title of the Partnership could be considered misleading. It could more accurately refer to “cleaner” rather than “clean” fuels. Even improved fossil fuels cannot be considered clean, since they still harm the environment. In this respect, the possibility of PCFV venturing further into non-fossil fuels was raised, although again the danger of “mandate creep” was also noted.
184. Overall, the reservations held by some stakeholders in the Partnership do not refer to what has already been achieved, but to what still needs to be done to achieve a totally lead-free environment. For some, it would be good for the Partnership to expand its activities to cover these additional areas, while for others these lie outside of the mandate originally given to the PCFV.
185. As shown in Section 4.2, the reduction in use of leaded fuel in SSA actually achieved was of the order of Metric Tons (MT) 17,745 per annum at the end of 2005, rose to about 20,138 per annum in 2010 and to 23,071 by 2015. This gives a total of approximately Metric Tons 90,000 avoided by mid 2010, rising to MT190,690 by 2015 and to MT 304,770 by 2020. We cannot precisely predict how long it would have taken to achieve the phase out without the contributions of PCFV and other players. However, it is clear that there had been very little progress prior to the original Dakar Conference in 2001, with only Sudan totally lead-free and motorists in South Africa, Namibia and Botswana having limited access to unleaded fuel. This suggests that, as a very conservative estimate it would have taken ten years rather than five to achieve and that, on this basis, the total amount of leaded petrol avoided would have been at least MT 190,000; with

a strong likelihood that this figure would have actually been nearer to MT300,000, in view of the minimal progress, which had been made prior to the Dakar Conference and the establishment of the PCFV. The urban population potentially benefitting from these reductions was expected to rise from 411 million in 2000 to 470 million by 2015.

7. Evaluation of the Contribution of UNEP to the Phase-out of Leaded Fuel in Sub Saharan Africa

186. As shown above, the use of leaded petrol has been eliminated in Sub Saharan Africa. Although monitoring data are insufficient to guarantee that there are not minor incidences of use in isolated pockets, the evidence assembled from various sources shows that any such incidences would be very minor and localised. The initial situation in 2001, when only one country was lead free, was transformed by the end of 2005, when all 49 countries declared themselves to have reached this status.
187. UNEP made a substantial contribution to this process, operating at three levels. As an institution, often represented at the highest level, UNEP promoted and reaffirmed the importance and achievability of the objective at a series of conferences throughout the region. The widely-respected expertise of UNEP in the realm of international environmental management, coupled with its perceived absence of vested interests was a critical factor in enrolling national political support at the highest levels, which was essential to ensure that intentions were followed through with the intensity and persistence required to phase-out leaded petrol throughout the region.
188. As a member of PCFV, UNEP helped to bring into the Partnership a broad range of stakeholders and to maintain their commitment through regular and ad hoc meetings. The experience of the organisation in promoting regional (and even global) environmental management initiatives was invaluable in ensuring that the process occurred in a cost effective manner.
189. At the level of day to day guidance of the process, the Clearing House provided effective support with, initially, very limited resources. Gradually, the range of activities increased, as did the available resources. The CH enabled PCFV to operate by coordinating, advising, supporting the preparation of documentation, publishing and a range of activities without which the Partnership could not have been effective. As funds increased, the CH also played a vital role in managing Partnership financial and other support to organisations in SSA countries, to hold meetings, run advocacy campaigns, conduct research and engage in activities essential to underpin the process of change; which often started from a low level of public knowledge and even substantial misconceptions concerning unleaded fuel.

190. Although it is not possible to **attribute** the phase-out of leaded fuel to the support provided at the three levels by UNEP, or indeed to PCFV as an institution, it is clear that the phase-out would not have been achieved in anywhere near the same timescale without them. The **contribution** of UNEP operated on different levels: as a high level advocate to Governments, influencing support in the right places; as a channel to resources within the Partnership, some of whom were attracted to join because of the reputation of UNEP; and as a facilitator and supporter of activities at various levels, but particularly at the country level.

8. Overview

191. The Partnership for Clean Fuels and Vehicles has demonstrated that the instrument promoted by the 2002 World Summit on Sustainable Development of a “Type 2 Outcome,” or Partnership between governments, the private sector, civil society and international organisations can deliver its intended results under certain circumstances. The PCFV is often cited as one of the most successful examples of this instrument and this evaluation has confirmed its results and analysed the factors, which enabled these to be achieved.

192. Evaluation of the role of PCFV in the phase out of leaded petrol in Sub Saharan Africa shows several key aspects, which contributed to its success. These included:

- Design
- Composition of the Partnership
- Coverage of Processes Involved
- Approach tailored to available finance.

193. Areas for additional consideration at the earliest possible stage by future Partnerships include:

- Need to maximise awareness of established best practice
- Achieve consensus on possible systems of compliance monitoring and on the extent to which sanctions might be imposed within a voluntary system.

8.1 Key Success Factors

8.1.1 Design Well-Focussed on Objective

194. For its initial objective, the phase out of leaded petrol in Sub Saharan Africa, the PCFV designed a specific and relatively simple objective with a set time scale. The process involved was designed to begin with meetings to secure high level political commitment, which proved the critical factor in ensuring progress in spite of the voluntary nature of the phase out. Thereafter, regular regional and sub-regional meetings were programmed, which established a process of competitive emulation amongst countries, under which the governments sought to

ensure that they were able to conform with new standards being attained by their regional peers.

8.1.2 Comprehensive Composition of the Partnership

195. The Partnership included a broad range of stakeholders, each of whom was able to make a specific contribution to the process, within an agreed framework for action. The sum of the Partnership was greater than its individual parts, since the diverse membership enabled it to address a complex range of issues and tasks within a short time frame, with coordination provided by a small central function (the Clearing House). In particular, the partners included:

- international agencies able to generate and maintain high level political support;
- technical specialists, able to assist in specifying what actions were needed to meet the commitments made and what standards were appropriate and feasible within the specified time frame;
- agencies able to offer financial support, which could be used to provide assistance to countries with such aspects as research and public awareness campaigns;
- industry support able to provide peer pressure for producers to move towards industry best practice.

8.1.3 Ability to Support Multi-Level Processes

196. The Partnership was able to keep processes moving at several different levels at the same time. At the global level, the Partnership had members who were able to promote its cause in all regions of the world; which in turn raised the profile of lead phase out as the international norm, against which non participants would be seen as unnecessarily risking the health of their population and in particular children. The identity of the Partnership as a UNEP-supported entity gave it a high level of international credibility and assured national governments that its aims represented environmental best practice.

197. In terms of the industries involved with fuel and vehicles worldwide, the Partnership offered a range of support for specific technical issues important to the phase out process, as well as the incentive of a network of industrial Partners supporting a common cause and approach.

198. The Partnership also brought together a range of international and national Civil Society Organisations, whose interest overlapped around the issue of phasing out leaded petrol, but did not necessarily coincide, on other issues. It created an issue-specific coalition, which acted as a pressure group and as a support to regional and local NGOs, which needed in particular, technical knowledge around which to base their advocacy campaigns.

199. At the regional level, the involvement of UNEP at the highest level promoted participation of Government officers at a sufficiently senior level to ensure that commitments made were followed by effective action. The close identification of UNEP with Africa was another positive factor in ensuring support for the initiative.
199. Nationally, the Partnership established links:
- with Government, through the series of regional, sub-regional and national meetings and support projects, in which it participated or offered support; and through its publications and the technical support made available through the members
 - with civil society, through its direct support, particularly for awareness-raising programmes and through the international network of partners and production of supporting documents.
200. The Partnership was supported by a Clearing House located in UNEP Nairobi. Without this, it would not have been possible to keep the complicated multi-level strands of the phase out process moving at the pace required to meet the established deadline. The Clearing House made technical information available from its industry experts to all partners; notably governments, NGOs; and from private sector partners with specific experience and expertise, to others entering the process from a less advanced position. Furthermore, over time it raised additional funds, which it was able to use to provide small scale financial support, particularly for relevant awareness raising and research activities. The Clearing House proved to be a very cost-effective, efficient and innovatory example of a development instrument. Key factors in its success included resisting the temptation to expand too much in terms of mandate and personnel, tailoring the approach to the actual and potential funding and high quality management and staff.

8.1.4 Tailoring the Approach to Available Finance

201. The role of finance in the Partnership provides another valuable lesson. On a number of occasions, stakeholders at national and industry level raised the issue of lack of finance as a barrier to the phase out process. At national level, government representatives made substantial estimates of the costs of campaigns considered necessary to raise public awareness and support. Industry practitioners suggested that the high costs of refurbishing refineries to produce high quality unleaded fuel would be a major barrier. In the event, the Partnership did not seek to obtain large amounts of finance and most of the grants it made to governments and civil society organisations were small. Despite this limitation, a major transformation was accomplished in Sub Saharan Africa region in a short time span. This indicates that for some types of issues, political commitment, regular follow up and comprehensive technical support may be as effective, or even more effective than large scale financing.

8.2 Areas for Additional Consideration in Future Partnerships

8.2.1 Need for Rapid and Effective Dissemination of “State of the Art” Information

202. One lesson from the processes of the SSA lead phase out is the importance of maximum circulation and publicity of authoritative technical information. The Partnership produced a range of high quality technical documents on most of the critical issues for the phase out process. Despite this, the numerous meetings held and national level studies commissioned or conducted by governments, and their working parties, task forces and the like showed a tendency to “reinvent the wheel,” by trying to investigate issues, which had already been resolved at an international level. To some extent, studies commissioned by the Partnership were bound to have a time lag before reports were issued and still more before these became widely known. Furthermore, it seems that countries used the process of developing their own approach as an important element of reaching the decision to phase out. However, in any future programme based on a Partnership model the PCFV experience suggests that the earliest possible resolution of technical issues and circulation of definitive guidelines might offer scope to short-circuit the tendency of countries to seek national solutions for issues, for which international best practice has already been agreed

8.2.2 Early Establishment of Compliance Monitoring Systems and Agreement on Sanctions for Non Compliance

203. Another area where the phase out programme was not fully effective is that of monitoring compliance to the principle of exclusive use of unleaded fuel (for normal motoring purposes). Several regional and sub-regional meetings discussed the potential problems of the use of stockpiles of lead additives, smuggling of

leaded fuel and fuel adulteration. However, monitoring of the extent to which such practices have actually occurred is modest and there are no agreed sanctions, which might be applied against any “guilty” parties. On the one hand, this issue is sensitive, given the voluntary nature of the phase out process. On the other, the results and health benefits of participating countries could be undermined by individuals or organisations, which do not conform to the new standards. The Partnership believes that it has been relatively successful in pressurising countries to conform to their obligations through informal “blacklisting” and the desire of countries not to be seen to be lagging behind their peers. For any future Partnerships dealing with changes for which compliance might become an issue, it would be important to consider from the earliest stage, whether there might be any approach to compliance monitoring and potential sanctions, which could work within a voluntary framework like the PCFV. In the case of lead phase-out, it is clear that the voluntary approach reached a high level of effectiveness. However, in other cases, where such sanctions appear essential, it may be that a voluntary approach would be less effective than a formal inter-governmental agreement..

9. Lessons Learned

9.1 Lesson 1

205. UNEP should consider a Partnership approach for issues for which:

- voluntary change at the desired level appears a feasible objective
- an alliance of different stakeholders can address all dimensions including:
 - political commitment
 - technical expertise
 - financial support
 - public awareness and support
 - industry best practice
- UNEP’s reputation as a leader in international environmental change processes can engage high level political support.

9.2 Lesson 2

206. Partnerships should be built around the following principles:

- Clear objectives and commonly agreed goals
- Timescale with milestones
- Guiding principles
- Early attention to high level political commitment
- Each partner makes a unique contribution and is essential for success

- Clear governance rules and structure
- Regular review of Partnership performance
- Ability to listen and compromise
- Monitoring system for compliance
- Active consideration of possibilities for sanctions for non-compliance.

9.3 Lesson 3

207. In order to move from outcomes, which the project can (mainly) directly deliver, to the intended long term impact objectives of the intervention, (which are mainly delivered by other stakeholders) partnership interventions should ensure that essential “impact drivers” are set in motion from the earliest possible stage. These should be determined during the design stage and may include:

- High level support and specified commitments from concerned governments: including high level champions, participation of all appropriate agencies, technical capacity, defined personnel responsibilities, and an adequate level of secured funding.
- Active engagement of civil society organisations at international and national level, with specified contributions and adequate monitoring and assistance to ensure focus on intervention objective
- Focussed participation of private sector representative bodies or companies with specific expertise and interests, which conform closely with those of the partnership
- Public awareness and support, based on production and circulation of materials detailing international best practice standards and support to national organisations, which can interpret and advocate the issues effectively in local contexts
- An appropriate coordination and support mechanism, which can: keep processes moving in line with the agreed schedule; offer or facilitate technical support in response to specific requests; provide financial support, particularly for such areas as local advocacy campaigns, research and monitoring; facilitate linkages and exchanges among partners, and between partners and participating countries; assemble, organise and disseminate up-to-date information to a broad range of interested parties.
- Development and implementation of effective monitoring mechanisms, to determine progress towards the partnership objective, highlight areas of low performance in need of additional attention and assess compliance once time-based deadlines have been passed
- Early consideration of possible sanctions against non-compliance, which might be viable and effective within a voluntary programme of change.

Annex 1 - List of Persons Contacted For PCFV Study

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Mary M'Mukindia	Programme Officer- Urban Environment Unit-Division of Technology, Industry and Economics (DTIE)
Wanjiku Manyara	General Manager, PIEA
Wangari Kihara	Principal Corporate Communications Officer, NEMA
Jane Akumu	Programme Officer- Urban Environment Unit-Division of Technology, Industry and Economics (DTIE)
Elisa Dumitrescu	Programme Officer- Urban Environment Unit-Division of Technology, Industry and Economics (DTIE)
Vered Ehsani	Programme Officer- Urban Environment Unit-Division of Technology, Industry and Economics (DTIE)
James Kagai	Programme Officer- Urban Environment Unit-Division of Technology, Industry and Economics (DTIE)
Veronica Stannah	Programme Officer- Urban Environment Unit-Division of Technology, Industry and Economics (DTIE)
Emmanuel Quartey	African Refiners Association (ARA)
Fred Potter Hart	Downstream Energy Services
Jane Metcalfe	U.S. Environmental Protection Agency (USEPA)
John Mooney EETPI	Environmental and Energy Technology and Policy Institute
John Walsh	Afton Chemical
Michael Walsh	Consultant
Richard Kassel	Natural Resources Defense Council (NRDC)
Rob Cox	International Petroleum Industry Environment Conservation Association (IPIECA)
Terry V. Thiele	Lubrizol Corporation
Thomas H. Hatfield	California State University
James K.W. Rochow	Trust For Lead Poisoning Prevention
John Guy	U.S. Environmental Protection Agency (USEPA)
David Vance Wagner	Vehicle Emission Control Center Ministry of Environmental Protection-China

Annex 2: Terms of Reference for the Study

Outcome and Influence Evaluation of the UNEP Partnership for Clean Fuels and Vehicles (PCFV)

1. BACKGROUND AND OVERVIEW

The Partnership for Clean Fuels and Vehicles (PCFV) is the leading global initiative to promote and support better air quality through the introduction of cleaner fuels and vehicles in developing and transitional countries. It is a type-II WSSD public-private partnership launched by a group of committed partners from governments, international organisations, industry, and non-governmental organisations (NGOs). Since its inception in 2002 this global partnership has helped to reduce vehicular air pollution in developing and transitional countries through the promotion of clean fuels and vehicles, focusing on the elimination of lead in gasoline and the reduction of sulphur in fuels, concurrent with the adoption of cleaner vehicle technologies in developing countries. The United Nations Environment Programme (UNEP)-based Partnership Clearing-House provides technical, networking and financial support for improved capacity and technology transfer through regional, national and local activities related to cleaner fuels and vehicles.

The Clearing-House is the main implementing arm of the PCFV, staffed by UNEP staff (of which several are paid by PCFV funds) and together with other partners' activities fully addresses the mission and mandate of the Partnership. The activities of the PCFV are centered on specific objectives and goals of global lead phase-out, sulphur reduction in fuels, and the introduction of cleaner vehicles and cleaner vehicle technologies.

Partnership support and activities at the regional and national levels with developing country governments to date have already accomplished significant progress in lead phase-out in sub-Saharan Africa, in addition to building consensus, knowledge sharing and facilitating the transfer of technology on cleaner fuels and vehicles from developed to developing countries.

The Partnership has raised well over 3 million USD in extra-budgetary funds for its global activities to date. Several Partners have provided funding to UNEP for these tasks, which has allowed UNEP to establish the Nairobi Clearing-House, staffed by 3 full-time Associate Programme Officers covering all relevant global regions (Latin America and the Caribbean, Central and Eastern Europe, Sub-Saharan Africa, Middle East and North Africa, West Asia, Asia Pacific), a Programme Management Assistant, a part-time (UNEP in-kind) Programme Officer and a part-time (UNEP in-kind) Secretary. The Clearing-House started its work in February 2003.

Relevance to UN and other UNEP Programmes

The Partnership's efforts complement other important UN activities related to transport and air quality, including the UN Department for Economic and Social Affairs (UNDESA) Global Initiative on Transport Emissions (GITE), UNEP Division of Technology, Industry and Economics' (DTIE's) transport activities, and UNEP/ UN HABITAT cooperation on programs like the Cities Alliance and the Sustainable Cities Programme. In addition, since its founding, the Partnership has worked with the ongoing Clean Air Initiative (CAI) of the World Bank in Africa and Asian Development Bank in Asia, and the United States Environmental Protection Agency (US EPA) Clean Energy Initiative.

Legislative Authority and Contribution to Subprogramme:

During the 22nd Session of the Governing Council (GC) of UNEP, Governments reaffirmed the need to eliminate the use of leaded gasoline through decision 22/4 III *Chemicals: Lead*, urging governments, international organizations, intergovernmental forums and civil society to make use of and provide available information, technical assistance, capacity building and funding needed for countries to phase-out. Governments also recalled the WSSD Plan of Implementation calling for the reduction of respiratory diseases and other health impacts resulting from air pollution, with particular emphasis on lead. Based on the report of the Executive Director on work implemented by the Division of Policy Development and Law (DPDL), the GC also acknowledged progress already made and efforts already underway to assist phase-out, including the PCFV's efforts in bringing together governments, industry, international organizations and NGOs to promote the wider use of cleaner fuels worldwide. The GC further:

- (a) called upon governments that have not yet done so to act urgently to eliminate the use of lead in gasoline;
- (b) requested the Executive Director, in cooperation with other members of the Inter-Organization Programme for the Sound Management of Chemicals, in particular with the World Health Organization, as well as with other partners, including the private sector, to assist Governments, through information exchange and capacity-building, in their efforts to phase-out lead in gasoline, lead-based paint and other sources of human exposure, to prevent exposure to lead and to strengthen efforts for monitoring and surveillance as well as treatment of lead poisoning.

During the 23rd Session of the GC, Governments reaffirmed the decisions taken at the 22nd Session through Decision 23/9 III *Chemicals Management: Lead and Cadmium* (see Annex 1). Other GC decisions supporting the work of the Urban Environment Unit with include: 20/28 *Promoting interlinkages among global environmental issues and human needs*, 21/24 *Policy and advisory service in key areas of institution-building*, 22/9 *Support for Africa*, 22/10 *Poverty and environment in Africa*.

Strategic focus and Activities

The Partnership works with developing and transitional national and local governments, NGOs, industry groups (both oil and vehicle industries), and international organisations to implement activities aimed at improving air quality through the use of cleaner fuels and vehicles.

During the first steering meeting of PCFV Partners in New York in 2002, Partners agreed on the following overall mission statement for the Partnership:

- Help developing countries to develop action plans to complete the global elimination of leaded gasoline and start to phase down sulphur in diesel and gasoline fuels, concurrent with adopting cleaner vehicle requirements;
- Support the development and adoption of cleaner fuel standards and cleaner vehicle requirements by providing a platform for exchange of experiences and successful practices in developed and developing countries as well as technical assistance;
- Develop public outreach materials, educational programmes, and awareness campaigns; adapt economic and planning tools for clean fuels and vehicles analyses in local settings; and support the development of enforcement and compliance programmes, with an initial focus on fuel adulteration; and
- Foster key partnerships between government, industry, NGOs, and other interested parties within a country and between countries to facilitate the implementation of cleaner fuel and vehicle commitments.

Partners asked UNEP to set up a Clearing-House at UNEP Headquarters in Nairobi to help implement the Partnership's mission. The Partners assigned the following tasks to the Clearing-House:

- share and disseminate information to the Partners on relevant issues;
- operate and maintain a website to provide easy access to information, Partner activities, and resources;
- provide logistics for Partnership activities and events: workshops, technical assistance activities, etc;
- provide administrative help to Partners;
- maintain contacts in developing countries;
- help to gather appropriate information for countries;
- liaise with the other existing groups working on related activities;
- help to bring in new partners or participants in Partnership activities; develop and disseminate public outreach materials about the Partnership, along with technical materials for the developing countries;
- help to bring developing country NGOs, universities, and governments into the Partnership or its activities;
- and support Partners, at their request, in addressing the tasks above.

The Partnership, primarily through the UNEP Clearing-House, provides networking, technical and financial assistance to governments, international organizations and NGOs for the implementation of the above mandate and activities. Specifically, this means:

- support (technical, networking (including experts), and funding) for regional and national workshops, seminars and training sessions aimed at developing action plans for the elimination of leaded gasoline, the reduction of sulphur and the promotion of cleaner vehicles and vehicle technology;
- support for specific activities for promoting cleaner fuels and vehicles, such as awareness campaigns and pilot heavy duty diesel vehicle retrofit projects aimed at demonstrating cleaner vehicle technology and subsequent decreases in emissions;
- PCFV global Working Groups developing resources on Public Awareness, Octane, and Leaded Gasoline Phase-out: Valve Seat Recession;
- organization of annual Global Partnership Meetings;
- representation of the Partnership at various related UN and non-UN events;
- and publishing of Partnership publications, including the newsletter and website, answering queries on cleaner fuels and vehicle issues, and maintaining and developing contacts for fuel and vehicle issues in developing countries.

The Partnership's cleaner fuels and vehicles-related activities to date include the following: 4 Global Partnership meetings in the USA, Netherlands, India and UNEP headquarters in Kenya; 2 World Bank CAI-Africa meetings in France and Belgium; Partnership Fair participation at CSD 11 in New York; participation in the Second International Forum on Partnerships for Sustainable Development in Morocco; PCFV presentation at the 2005 Society of Automotive Engineers World Congress in the USA; 2 Sub-Saharan Africa (SSA) regional conferences in Senegal and Kenya; 5 SSA sub-regional workshops in Senegal, Benin, Kenya, South Africa and Cameroon; organization of a western hemisphere meeting in the USA; organization of a technical experts group meeting in Mali; 2 regional workshops for Central America in Guatemala and El Salvador; regional workshop for Latin America held in Mexico; Partnership launch for West Asia in Lebanon; Partnership event for Central & Eastern Europe in Italy; SSA Refining Expert Meeting in South Africa; West & Central Africa CAI-Africa meeting in Senegal; SSA regional workshop in Uganda; cleaner fuels and vehicles regional workshop for Central and Eastern Europe & Turkey in Hungary; in addition to which national workshops, public awareness campaigns and environmental training events have been sponsored and organized for Indonesia, Chile, Burundi, Benin, Tanzania, The Gambia, Uganda, Chile, Malawi, Rwanda, Kenya, and Somalia.

For the 2006-2010 period, the focus of PCFV activities will be to develop and implement regional and sub-regional action plans and consensus on cleaner fuels and vehicles at the national level. The focus will be on national implementation activities, and where

regional events on sulphur and lead are scheduled, cleaner vehicle considerations will be integrated. Plans for national activities in 2006-2007 include work in Chile, Ecuador, Cuba, FYR Macedonia, Turkey, Bulgaria, Serbia & Montenegro, Albania, Afghanistan, Cambodia, Laos, Bhutan, North Korea, Indonesia, Yemen, Syria, Jordan, Palestine, Morocco, Tunisia, Algeria, CIS countries, China, South Africa and an additional 10 Southern Africa countries. In addition, numerous regional events are planned for South America, the Caribbean, the CIS countries, North Africa and the Middle East, and Sub Saharan Africa.

In addition to the global elimination of leaded gasoline, countries need to address sulphur in fuels and all countries that have introduced unleaded petrol will be faced with the issue of cleaner vehicles entering their markets either as new vehicles or second hand vehicles from developed countries. In the medium term, all developing countries' petrol fleets will therefore switch to catalytic converter cars. The Partnership agreed at the 4th Global Partnership meeting in early December 2005 to launch a global campaign to phase-out leaded gasoline by the end of 2008 and to work towards a long-term target of 50 parts per million for sulphur in diesel and petrol vehicle fuels in developing countries.

Almost all of these developing countries are looking for support, especially technical and networking assistance, to manage this switch and to ensure the maximum environmental and health benefits from the introduction of these cleaner vehicles. The PCFV supports normative and practical activities to advise on the adoption of cleaner vehicles. Interest in biofuels and alternative zero emission vehicles is also growing in these countries

TERMS OF REFERENCE FOR THE EVALUATION

1. Objective and Scope of the Evaluation

The objective of this evaluation is to examine and document the extent, magnitude and significance of any project outcomes, influences and impacts to date and determine the likelihood of future impacts of UNEP's partnership and campaign for clean fuels and vehicles. The evaluation will answer the following key questions:

1. To what extent has the partnership and campaign resulted in the phase-out of leaded gasoline in the targeted countries?
2. Has the campaign produced any measureable environmental and health benefits?
3. How effective was collaboration/interactions between the various project partners and institutions during project implementation and how did the partnership promote the goals of the campaign?

2. Methods

. This evaluation will be conducted as an in-depth evaluation study of outcomes and influences of UNEP's partnership and campaign to eliminate leaded gasoline and reduce

the level of sulphur in diesel fuel globally. The consultant will coordinate closely with UNEP/ Evaluation Office for any logistic and/ or methodological issues encountered to properly conduct the review in as independent a way as possible, given the circumstances and resources offered. The draft report will be circulated to key staff in UNEP DTIE and UNEP/ Evaluation Office. Any comments or responses to the draft evaluation report will be sent to UNEP / Evaluation Office for collation and the consultant will be advised of any necessary or suggested revisions.

The findings of the evaluation will be based on the following:

1. A desk review of relevant PCFV documents including, but not limited to:
 - (a) The project documents, outputs, monitoring reports (such as progress reports to UNEP and relevant correspondence);
 - (b) Relevant material published on the project web-site <http://www.unep.org/PCFV/>.
2. Face-to-face and telephone interviews with intended users and beneficiaries of the programme outputs and other stakeholders involved with this work, including in the participating countries' international bodies, and private sector organizations. As appropriate, these interviews could be combined with an email questionnaire
3. Development and analysis of the key causal pathways used by the project in attempting to achieve its objectives. Causal pathways will be 'mapped' for each of the major activities and/ or outputs of the work on Partnership for Clean Fuels and Vehicles.
4. Using the causal pathways as an analytical framework, the sources of evidence of use or application of outputs by key target users and evidence of use by unintended audiences should be collated. Sources may include:
 - (a) Findings from web-based searches and analysis of citations/ acknowledgements in key policy or policy-related documents;
 - (b) Interviews with substantive professional staff of the UNEP-based Partnership Clearing-House and any associated collaborators and partners, including national and local government, industry, international organizations and NGO groups.
5. Where results of the led phase-out campaign can be established (e.g. documented evidence of legislation to phase-out leaded gasoline in countries) attempts should be made to collate evidence of the consequences of the use of (influences) of such legislation highlighting any examples where it is (or may be) possible to link such influence to environmental, human health or economic benefits.

Key Evaluation principles

In attempting to evaluate any outcomes influences and impacts that the project may have achieved, evaluators should remember that the project's performance should be assessed by considering the difference between the answers to two simple questions "*what*

happened?” and *“what would have happened anyway?”*. These questions imply that there should be consideration of the baseline conditions and trends in relation to the intended project outcomes influences and impacts. In addition, it implies that there should be plausible evidence to **attribute** such outcomes, influences and impacts **to the lead phase-out campaign**. Where UNEP works in partnership with other agencies, it will be difficult to separate the role of UNEP from the other actors. In such cases the concept of ‘contribution’ can be applied – where outcomes influence or impacts are attributed to a group of actors rather than to any single actor.

Sometimes, adequate information on baseline conditions and trends is lacking. In such cases this should be clearly highlighted by the evaluator, along with any simplifying assumptions that were taken to enable the evaluator to make informed judgements about performance.

3. Evaluation report format and review procedures

The report should be brief, to the point and easy to understand. It must explain the purpose of the evaluation, exactly what was evaluated and the methods used. The report must highlight any methodological limitations, identify key concerns and present evidence-based findings, consequent conclusions, recommendations and lessons. The report should be presented in a way that makes the information accessible and comprehensible and include an executive summary that encapsulates the essence of the information contained in the report to facilitate dissemination and distillation of lessons.

Evidence, findings, conclusions and recommendations should be presented in a complete and balanced manner. Any dissident views in response to evaluation findings will be appended in an annex. The evaluation report shall be written in English, be of no more than 50 pages (excluding annexes), use numbered paragraphs and include:

- i) An **executive summary** (no more than 3 pages) providing a brief overview of the main conclusions and recommendations of the evaluation;
- ii) **Introduction and background** giving a brief overview of the UNEP partnership and campaign for clean fuels and vehicles and providing summary information on when the evaluation took place; places visited; who was involved; the key questions; and, the methodology (full details might be presented in an annex);
- iii) **Scope, objective and methods** presenting the evaluation’s purpose, the evaluation criteria used and questions to be addressed;
- iv) **Evidence of outcomes and influence** providing *factual evidence* and interpretations of such evidence. This is the main substantive section of the report and might be structured around the main causal pathways associated with this work;
- v) **Conclusions:** Presentations of the main conclusions that can be drawn from the evidence gathered;
- vi) **Lessons (to be) learned** presenting general conclusions from the standpoint of the design and implementation of the work, based on good

practices and successes or problems and mistakes. Lessons should have the potential for wider application and use. All lessons should 'stand alone' and should:

- Briefly describe the context from which they are derived;
 - State or imply some prescriptive action;
 - Specify the contexts in which they may be applied (if possible, *who, when and where*).
- vii) **Annexes** may include additional material deemed relevant by the evaluator but must include:
1. A list of interviewees, and evaluation timeline
 2. A list of documents and websites reviewed / consulted

Review of the Draft Evaluation Report

The draft report will be submitted by the evaluator to UNEP Evaluation Office. Evaluation Office then shares the draft report with the corresponding Programme or Project Officer and his or her supervisor for initial review and consultation. The DTIE staff are allowed to comment on the draft evaluation report. They may provide feedback on any errors of fact and may highlight the significance of such errors in any conclusions. The consultation also seeks feedback on the proposed recommendations. UNEP Evaluation Office collates all review comments and provides them to the evaluator along with its own comments for consideration in preparing the final version of the report.

4. Submission of Draft and Final Evaluation Reports.

The final report shall be submitted in electronic form in MS Word format and should be sent to:

Segbedzi Norgbey, Chief,
UNEP Evaluation Office
P.O. Box 30552-00100
Nairobi, Kenya
Tel.: (254-20) 7624181
Fax: (254-20) 7623158
Email: segbedzi.norgbey@unep.org

The final evaluation report will be published on the Evaluation Office web-site www.unep.org/EOU and may be printed in hard copy.

5. Resources and schedule of the evaluation

This final evaluation will be undertaken by international evaluators contracted by the Evaluation Office, UNEP. The contract for the lead evaluator will begin on 7th January 2010 and end on May 30th, 2010. The contract will cover 7 weeks spread over 20 weeks. The lead evaluator will submit a draft report on April 30th to UNEP/ Evaluation Office. Comments on the final draft report will be sent to the consultant by May 15th 2010 after which, the consultant will submit the final report no later than May 30th 2010.

The evaluators should have the following qualifications and undertake the duties and travel described:

Lead Evaluator:

The evaluator should not have been associated with the design and implementation of the project in a paid capacity. The evaluator will work under the overall supervision of the Chief, Evaluation Office UNEP. The evaluator should be an international expert in environmental management or conservation with a good understanding of hazardous substances and hazardous waste. The consultant should have the following minimum qualifications: (i) experience in campaigns for environmental causes and a good understanding of the impact of hazardous substances on human health and the environment; (ii) experience with management and implementation of research projects and in particular with research targeted at policy-influence and decision-making; (iii) extensive experience with project evaluation and impact assessment. Knowledge of UNEP programmes is desirable. Fluency in oral and written English is a must.

Supporting Evaluator:

The supporting evaluator will, under the supervision of the Lead Evaluator, assist in review and collation of project documentation, conduct email surveys, internet-based documentary research and participate in stakeholder interviews. The supporting evaluator will work under the supervision of the lead evaluator, with the division of labour agreed among the team. The consultant should have the following minimum qualifications: (i) experience with project management and implementation; (ii) experience in conducting email surveys and internet-based research; (iii) experience with data analysis and report preparation. Fluency in oral and written English is a must.

6. Schedule Of Payment

The evaluator will receive an initial payment of 30% of the total amount due upon signature of the contract. A further 30% will be paid upon submission of the draft report. A final payment of 40% will be made upon satisfactory completion of work. The fee is payable under the individual Special Service Agreement (SSA) of the evaluator and **is inclusive** of all expenses such as travel, accommodation and incidental expenses.

In case, the evaluator cannot provide the products in accordance with the TORs, the timeframe agreed, or his products are substandard, the payment to the evaluator could be withheld, until such a time the products are modified to meet UNEP's standard. In case the evaluator fails to submit a satisfactory final product to UNEP, the product prepared by the evaluator may not constitute the evaluation report.

PCFV LIST OF PARTNERS

1. African Refiners Association (ARA)
2. Arlon Chemical
3. Alliance of Automobile Manufacturers
4. American Honda
5. American Petroleum Institute (API)
6. Asian Clean Fuels Association (ACFA)
7. Association for Emission Control by Catalyst (AECC)
8. Association of European Automobile Manufacturers (ACEA)
9. Association of Intl. Automobile Manufacturers
10. Association of Southeast Asian Nations (ASEAN) Working Group
11. Blacksmith Institute
12. BP America Inc.
13. Canadian International Development Agency (CIDA)
14. Caucasus Environmental NGO Network (CENN)
15. Central American Commission on Environment and Development
16. Centre for Science and Environment (CSE)
17. Centre of Expertise and Certification of Oil and Oil Products 'Organic Ltd'
18. Centro de Transporte Sustentable
19. Centro Mario Molina Chile
20. Chile National Commission on the Environment (CONAMA)
21. China State Economic and Trade Commission
22. CITACAFRICA LLP
23. Corpaire – Institution mandated by Ecuadorian Government for Air Quality Control
24. Daedalus LLC
25. Democratic Republic of Congo - Ministère de l'Environnement, Conservation de la Nature, Eaux et Forêts
26. Ecogestion
27. El Salvador Daily News
28. Energy and Environment Saving Ventures
29. Engine Manufacturers Association
30. Environment Australia
31. Environment Canada
32. Environmental and Energy Technology and Policy Institute
33. Environmental Defense
34. Environmental Liaison Centre International (ELCI)
35. European Commission
36. European Fuel Oxygenates Association
37. RA Foundation
38. Fleet Forum
39. Forum For Environment
40. Ghana Environmental Protection Agency
41. Global Environment and Technology Foundation
42. Indonesian Ministry of Environment
43. Institute of Environmental Studies (IES) Albania
44. Institute of Petroleum Studies
45. International Energy Agency (IEA)
46. International Fuel Quality Center
47. International Petroleum Industry Environment Conservation Association (IPIECA)
48. Israel Ministry of Environmental Protection
49. Italy Ministry of Environment and Territory
50. Japan Automobile Manufacturers Association
51. Japan Petroleum Energy Center (JPEC)
52. Kenya Auto Bazaar Association
53. Kjaer Group A/S
54. Komite Penghapusan Bensin Bertimbel (KPBB)
55. Korean Ministry of Environment (MoE)
56. Kukulkan Foundation
57. Lagos Metropolitan Area Transport Authority (LAMATA)
58. Lao PDR, Ministry of Public Works and Transport
59. Lawyers' Environmental Action Team (LEAT)
60. Lubrizol Corporation
61. Manufacturers of Emission Control Association (MECA)
62. Mexican Center for Environmental Law, A.C. (CEMDA)
63. Mexico - Instituto Nacional de Ecología (INE)
64. Mexico Office for Environment and Natural Resources (SEMARNAT)
65. Ministry of Environmental Protection (MEP, China)
66. Mongolia, Ministry of Nature, Environment and Tourism
67. Mozambique Ministry for Coordination of Environmental Affairs
68. National Association of Automobile Manufacturers of South Africa (NAAMSA)
69. National Automotive Council (Nigeria Ministry of Industry)
70. National Environment Management Authority (NEMA) - Kenya
71. Natural Resources Defense Council (NRDC)
72. Navistar Inc.
73. Netherlands Ministry of Housing, Spatial Planning & Environment (VROM)
74. Nigeria Federal Ministry of Environment
75. Observatoire du Sahara et du Sahel / The Sahara and Sahel Observatory (OSS)
76. Organisation Internationale des Constructeurs d'Automobiles (OICA)
77. Pan American Health Organization (PAHO)
78. Petrobras
79. Petroleum Corporation of Jamaica
80. Petroleum Institute of East Africa (PIEA)
81. Pontifical Catholic University of Rio de Janeiro
82. Regional Environment Centre for Central and Eastern Europe (REC-CEE)
83. Regional Environmental Centre for the Caucasus (REC Caucasus)
84. Salzburg AG Utilities UAE FZE
85. Scientific and Research Institute of Motor Transport (NIAT)
86. Serbian Chamber of Commerce
87. Society of Indian Automobile Manufacturers (SIAM)
88. Somali Ministry of Environment and Disaster Management
89. South Africa Dept. of Minerals & Energy
90. South African Petroleum Industry Association (SAPIA)
91. South Asia Co-operative Environment Programme (SACEP)
92. Southern Centre for Energy and Environment
93. Standards Organization of Nigeria (SON)
94. Thailand Ministry of Natural Resources and Environment (MonRE)
95. The Clean Air Initiative for Asian Cities Center (CAI-Asia)
96. The Clean Air Institute/Clean Air Initiative for Latin American Cities
97. The Climate and Carbon Market Department of the Environment Secretary of Rio de Janeiro State
98. The LEAD Group
99. The LEVON Group
100. TNT
101. Tracerco, U.K.
102. Trust For Lead Poisoning Prevention
103. U.S. Agency for International Development
104. U.S. Department of Energy
105. U.S. Environmental Protection Agency
106. United Nations Dept for Economic & Social Affairs (UNDESA)
107. United Nations Environment Programme (UNEP)
108. United Nations Industrial Development Organization (UNIDO)
109. United Nations World Food Programme (WFP)
110. Universidad Nacional de Colombia
111. Vanilla-Jatropha Development Foundation (VJDF)
112. VBD Automotive Technologies
113. World Resources Institute (WRI)
114. Yemen Environment Protection Authority



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