



Basel Convention Regional Coordinating Center for Africa for Training & Technology Transfer
Federal Ministry of Environment - University of Ibadan Linkage Centre
for Cleaner Production Technology
and Hazardous Waste Management
University of Ibadan, Nigeria
www.baselnigeria.org



PROCEEDINGS

of the Final Regional Workshop for the Development of Regional Action Plan on Environmentally
Sound Management of Used Oils in Africa

Lagos, Nigeria 6th -7th December 2004



Hosted by the Government of Nigeria with the Financial Assistance
of the Secretariat of the Basel Convention (SBC/UNEP)

The workshop was financed by the Secretariat of the Basel Convention (SBC), Geneva, Switzerland.

This publication is produced within the framework of the Basel Convention for the Development of Regional Action Plan on Environmentally Sound Management of Used Oils

The Basel Convention Coordinating Centre for Africa (BCCC-Nigeria) for Training and Technology Transfer in Hazardous Waste Management (located at the Federal Ministry of Environment-University of Ibadan Linkage Centre for Cleaner Production Technology and Hazardous Waste Management, Nigeria; herein referred to as the "FMENV/UNIV Ibadan/BCCC-Nigeria"), University of Ibadan, Ibadan, Nigeria was established in 1994 following Decision 111/19 made by the Parties to the Basel Convention. The purpose of the BCCC– Nigeria is to promote coordination of the policies and activities of the Basel Convention Regional Centres (BCRCs) in Pretoria South Africa for English Speaking Countries, Senegal for French Speaking countries and Egypt for Arab Speaking Countries towards ensuring successful implementation of the Basel Convention on the Development of Used Oils by countries of the African Region.

Materials in this publication may be freely quoted or reprinted, but acknowledgement is requested together with a reference to the document. A copy of the publication containing the quotation or reprint should be sent to Secretariat of the Basel Convention (SBC).

Available from:

Secretariat of the Basel Convention (SBC)

15 Chem des Anemones

1211 Chatelaine-Geneva

Switzerland

Tel: + 41 22 917 82 18

Fax: + 41 22 797 34 54

E-mail: sachiko.kuwabara@unep.ch

Website: www.basel.int

and

Basel Convention Regional Coordinating Centre for Africa

Ijoma Road, University of Ibadan, Ibadan, Nigeria

Tel: 234 803 301 3378

Fax: 234 2 8103168

E-mail: osibanjo@baselnigeria.org copy to oosibanjo@yahoo.com

website:www.baselnigeria.org

TABLE OF CONTENTS

PREFACE	IV
WORKSHOP PROGRAMME	V
LIST OF PARTICIPANTS	VI
WORKSHOP REPORT	1
PAPER PRESENTATION	
• 'Achieving Environmental Sound Management (ESM) of Used Oil through International Partnership (SBC Perspective)	8
• Pilot Study Of Used Oils in Nigeria by Prof. O. A. Bamiro & Prof. O. Osibanjo	10
• Waste Oil Management Issues and concerns for African Countries and Case Studies from Subregion-English, Speaking African Countries by Dr. John M. P. Mbogoma	19
• Waste Oil Management Issues and Concerns for African Countries - Case Study from Subregion-French Speaking African Countries by Dr. Oumar Cisse	31
• Developing Guidelines and Standards for Used Oil Management by Engr. Dele Ayeni	32
• Appropriate Low Cost Technology for Used Oil Recycling by Engr. K. Chukwuogo	36
• Feasibility Study on ESM of Used Oils in Nigeria by Sustainabiliti Limited	39
• Sustainable Management of Used Oil-UNIDO Experience	48
• Annex I- Draft Template of the Elements of a National Action Plan on Waste Oil Management in Africa	51
• Workshop Communiqué	53

I. PREFACE

The Basel Convention on the Control of Transboundary Movement of Hazardous Waste and their disposal, provides in article 14 for establishment of the Regional Centres. The main goal of the Basel Convention Regional Centres (BCRCs) is to strengthen the capacity of countries of the region for the implementation of the Basel Convention and its amendments. Article 14 stipulates that “according to the specific needs of different regions and sub-regions, regional or sub-regional centres for training and technology transfer regarding the management of hazardous wastes and other wastes and the minimisation of their generation should be established”

Towards the end, the Secretariat of the Basel Convention approved a grant for Nigeria to carry out a Pilot Project on the Assessment and Recycling of Used Oils in Africa. Components of the pilot project included the Preparation of a National Plan for Environmentally Sound Management (ESM) of Used Oils in Nigeria, the organization of two Technical Workshops on Management Practices for Used Oils, the Establishment of a Template for Regional Used Oils Partnership for Africa, and the Development of a Regional Action Plan for the Management of Used Oils in Africa.

The Final Regional Workshop for the Development of a Regional Action Plan on Environmentally Sound Management of Used Oils in Africa, organized by the Basel Convention Regional Coordinating Centre for Africa (BCCC-Nigeria) Ibadan, Nigeria, was held from 6-7 December, 2004 at the Federal Ministry of Environment, Surulere Offices, Lagos, Nigeria.

These proceedings from the workshop contain the introduction to the project, the workshop agenda, the list of participants, the presentations made by country representatives, United Nations/Multilateral Agencies as well as other invited speakers. Annex 1 contains Draft Template of the Elements of a National Action Plan On Waste Oil Management in Africa with primary focus on Poverty Alleviation, Job Creation and Environmental Protection. It is envisaged that this National template will be tested in the various pilot countries under the supervision of the Basel Convention Regional Centres in Africa. The results of these will be presented at a regional workshop to be convened by the Basel Convention Regional Coordinating Centre for Africa where a consensus regional action plan would be developed and adopted. The Workshop Communique is the concluding part of the proceedings.

For ease of placement on the web and downloading purposes, the proceedings have been collated in an order different to that followed during the workshop and provided in the agenda. The first part of the proceedings includes the summary of the workshop. The second part contains presentations by relevant stakeholders, invited speakers and the Feasibility Studies on Environmentally Sound Management of Used Oil in Nigeria

The workshop was supported by funding from the Secretariat of the Basel Convention Trust Fund. This generous support is gratefully acknowledged. The organizers also wish to convey heartfelt appreciation to the co-chairs and all the experts that contributed to the successful outcome of the workshop.

Prof. Oladele Osibanjo

Director

Basel Convention Regional Coordinating Centre for Africa (BCCC- Nigeria)

II. WORKSHOP PROGRAMME

DAY ONE 6th DECEMBER, 2004		
9.00 – 9.30	Arrival/Registration of participants	BCCC-Nigeria
9.30 – 10.00	Guests Seated	
10.00 – 10.10	Welcome Address	Director- BCCC-Nigeria Prof. O. Osibanjo
10.10 – 10.20	Goodwill messages	
10.20 – 10.40	Keynote/Opening Address	Honourable Minister of Environment- Col. Bala Mande (Rtd)
10.40 – 10.50	Vote of thanks	Programme officer-BCCC- Nigeria Mrs. K. Ogungbuyi
10.50 – 11.20	Tea/Coffee Break/Group Photograph	
TECHNICAL SESSIONS		
	SESSION I: Chairman, Chief Philip Asiodu	
11.20 – 11.50	'Achieving Environmental Sound Management (ESM) of used oil through international partnership (SBC perspective)	Ms Sachiko Kuwabara- Yamamoto Executive Secretary of Basel Convention (SBC), Geneva
11.50 – 13.20	Analysis of Nigeria's situation on Management of Used Oil	Prof. O. Bamiro National Expert Used Oil Projects
13.20 – 14.10	LUNCH BREAK	
14.10 – 15.10	Waste Oil management Issues and Concerns for African Countries and Case Studies from Subregion-English, Arabic and French Speaking African Countries	BCRCs – South Africa and Senegal
15.10 – 15.40	Guidelines for improving used oil collection and management in Nigeria	Director Department of Petroleum Resources
15.40 – 16.00	Guidelines for financing infrastructure and technology on used oil management	Director, NAPIMS
16.00 – 16.10	Tea Break/Break out to Syndicate Session	
16.10 – 17.00	Syndicate Sessions on Guidelines for improving Used Oil Management in Africa	
17.00 – 18.00	Plenary Discussion & Wrap Up	
DAY TWO 7TH DECEMBER 2004		
	SESSION II: Chairman, President OPTS	Managing Director Addax Oil
9.00 – 9.30	Developing Guidelines and Standards for Used Oil Management	Director General Standards Organisation of Nigeria (SON)
9.30 – 10.00	Appropriate low cost technology for used oil recycling	BOSKEL Nigeria Limited – Engr K. Chukwuogo
10.00 – 10.30	Development of a used oil partnership initiative in Nigeria (Industry perspective)	Managing Director, Oando
10.30 – 11.00	Recommendations for the development of Used Oil Partnership initiative for Africa (feasibility study)	Prof. O. Osibanjo
11.00 – 11.10	COFFEE/TEA BREAK	
11.10 – 11.40	Agents of change for development of a Used Oil partnership initiative for Africa	The Resident Representative, UNIDO
11.40 – 12.30	Syndicate Session on follow up actions	
12.30-13.30	LUNCH	
	SESSION III: Chairman Prof. O. Osibanjo	
13.30 – 14.30	Plenary Discussion on Recommendation for the development of a used oil partnership initiative for Africa	
14.30 – 15.00	Communiqué and Wrap Up	

III. LIST OF PARTICIPANTS

- 1. Mr. Ayo Adelowo**
Workshop manager
Mandilas Motors Limited
Lagos
Tel: 08023142377
Fax:
E-mail mandilas@mandilas.ng.com
- 2. Engr. A. B. Adereti**
Engineer
Lagos Environmental Protection Agency (LASEPA)
Alausa, Ikeja, Lagos
Tel: 08023260597
Fax:
E-mail: dayodereti@yahoo.com
- 3. Mr. S. A. Ademilokun**
Workshop/Transport Manager
Cadbury Nig. Plc.
Agindigbi, Ikeja, Lagos
Tel: 08033072621
Fax:
E-mail:
- 4. Engr. Dele Ayeni**
Head Petroleum and Petrochemical Department
Standard Organisation of Nigeria (SON),
Operational Headquarters Lekki, Lagos
Tel: 08034540925
Fax:
E-mail:
- 5. Mr. H. O Ajidagba**
Senior Scientific Officer
Lagos Environmental Protection Agency (LASEPA)
Alausa, Ikeja, Lagos
Tel: 08037233288
Fax:
E-mail: habeeboajidagba@yahoo.com
- 6. Mr. Lekan Ayangbola**
Company EHS Manager
British American Tobacco (BAT) Nig. Ltd
Ibadan-Lagos Express Way
Ibadan Toll Gate, Ibadan.
Tel: 08023143472
Fax:
E-mail:

- 7. Mr. A. O. Awofeso**
Environmental Manager
Guinness Nig. Plc.
Ogba Ikeja, Lagos
Tel: 08055476125
Fax:
E-mail: tona.awofes@diageo.com
- 8. Mrs. O. O. Babade**
Deputy Director
Federal Ministry of Environment
Games Village, Surulere, Lagos
Tel: 08033220410
Fax:
E-mail
- 9. Prof. O. A. Bamiro**
National Expert for the project
Department Mechanical Engineering,
University of Ibadan, Ibadan.
Tel: 08023151513
Fax:
E-mail: femibamiro@skannet.com
- 10. Dr. (Mrs.) Benebo**
Director Environmental Health Department
Federal Ministry of Environment
Plot 444 Aguyi Ironsi Street,
Maitama, Abuja.
Tel: 08033090864
Fax:
E-mail:
- 11. Dr. O. O Dada**
Deputy Director
Pollution Control Department
Federal Ministry of Environment (FMENV)
Plot 444 Aguyi Ironsi Street
Maitama, Abuja
Tel: 08033118237
Fax: 234 94131394; 234 94136317
E-mail: droodada@yahoo.co.uk; oludayoodada@yahoo.com
- 12. Prof. F. B. Dayo**
Managing Director/Chief Executive Officer
Triple 'E' System Associate Ltd.
Ikorodu Road, Lagos.
Tel: 08023056251
Fax:
E-mail:

- 13. Dr. F. A. Dawodu**
Department of Chemistry
University of Ibadan, Ibadan
Tel: 08042120219
Fax:
E-mail: foladawodu@yahoo.com
- 14. Mr. Tunde Eseyin**
Power Generation Manager
Cadbury Nigeria Plc.
Ikeja, Lagos.
Tel: 08023166248
Fax:
E-mail:
- 15. Mr. I. E. B. Iroha**
Assistant General Manager
(Environment & Resettlement)
Nigeria Electric Power Authority (NEPA)
NEPA Headquarters,
Maitama, Abuja.
Tel: 08037012815
Fax:
E-mail: ieroha@yahoo.co.uk
- 16. Mr. K. Koyejo**
Principal Manager (Environment and Resettlement)
Nigeria Electric Power Authority (NEPA)
NEPA Headquarters,
Maitama, Abuja.
Tel: 08023132792
Fax:
E-mail: kayode_kayejo@yahoo.co.uk
- 17. Mr. C. E. Nwaononiwu**
Chairman Petroleum Products Sub group of Manufacturer's Association of Nigeria (MAN)
Mobil Oil/RPSG
Apapa, Lagos
Tel: 08035250170
Fax:
E-mail:
- 18. Mr. Dominic Malagu**
Workshop manager
Mandilas Leasing Limited
Ebute Metta, Lagos
Tel: 08056280191
Fax:
E-mail:

- 19. Mr. J. E. Mayomi**
Department of Mechanical Engineering,
University of Ibadan, Ibadan
Tel: 08023755140
Fax:
Email:
- 20. Dr. M. E. Mosanya**
Federal Ministry of Health,
Occupational Health & Safety Division
Harvey Road, Yaba, Lagos.
Tel: 09-5238190, 08023077276
Fax:
E-mail: memosanya@yahoo.co.uk
- 21. Mr. K. A. B Ogungbuyi**
Chief Executive Officer
Sustainabiliti Ltd
6th Floor B Wing, Elephant Cement House
Alausa, Ikeja, Lagos.
Tel: 08033026092
Fax:
E-mail: kayogungbuyi@yahoo.com
- 22 Mr. Chris N. Ohaegbu**
Assistant Chief Executive Officer
Federal Ministry of Commerce,
Abuja.
Tel: 08023011820
Fax:
E-mail:
- 23. Ms. A. A. Oketola**
Department of Chemistry
Michael Ajasin University
Akungba, Ondo State.
Tel: 08037763961
Fax:
E-mail: bolaoketola@yahoo.com
- 24. Dr. I. U. Onyekwelu**
Principal Partner
KEMIRIX Nig. Ltd.,
Lagos
Tel: 08033033355
Fax:
E-mail: igonyekwelu@yahoo.com
- 25. Ms. Tolulope Olusoga**
Department of Chemistry,
University of Ibadan, Ibadan
Tel: 08033813966
Fax:
E-mail: toluolusoga@yahoo.co.uk

- 26. Ms. F. T. Olumide**
Department of Mechanical Engineering,
University of Ibadan, Ibadan.
Tel: 08023031314
Fax:
E-mail:
- 27. Engr. Chief O. Oyefuga**
Chief Executive Officer (CEO)
PAMAQUE Nig. Ltd
Ogba, Ikeja, Lagos
Tel: 08033072043
Fax:
E-mail: mdpamaque@pamaque.com
- 28. Mrs. Ronke Soyombo**
Federal Deputy Director
Federal Ministry of Environment (FMENV)
Plot 444 Aguyi Ironsi Street
Maitama, Abuja.
Tel: 09-6703783
Fax:
E-mail: ronkesoy@yahoo.com
- 29. Mrs. G. T. Williams**
Port Pollution Control Officer (PPCO)
Nigerian Ports Authority(NPA)
Marina, Lagos.
Tel: 08033341953
Fax:
E-mail:
- 30. Dr. M. M. Zagi**
Chief Environmental Officer
Department of Petroleum Resources (DPR)
10 Kofo Abayomi Street
Victorial Island, Lagos.
Tel: 08042116300
Fax:
E-mail:

BASEL CONVENTION REGIONAL CENTRES

- 31. Dr Oumar Cisse**
Executive Director
Dakar Basel Convention Regional Centre-
Dakar, Sénégal.
Tel: (221) 827 22 00
Fax: (221) 827 28 13
E-mail: oumar@iagu.org
- 32. Dr. John M. P. Mbogoma**
Executive Director
Pretoria Basel Convention Regional Centre
CSIR, Meiring Naude Road
Building 4, room 130
P. O. Box 109 Silverton, Pretoria 0127
South Africa
Tel: 27-12-349-1130
Fax: 27-12-349-1043
E-mail: john@baselpretoria.org.za
- 33. Prof. Oladele Osibanjo**
Director
Basel Conventional Regional Coordinating Centre for Africa for Training & Technology
Transfer,
Federal Ministry of Environment-University of Ibadan Linkage Centre for Hazardous
Waste Management & Cleaner Production Technology
University of Ibadan, Ibadan.
Tel: 08033013378
Fax:
E-mail: osibanjo@baselnigeria.com; oosibanjo@yahoo.com
- 34. Mrs. O. Ogungbuyi**
Programme officer
Basel Conventional Regional Coordinating Centre for Africa for Training & Technology
Transfer
Federal Ministry of Environment-University of Ibadan Linkage Centre for Hazardous
Waste Management & Cleaner Production Technology
University of Ibadan, Ibadan.
Tel: 08033205818
Fax:
E-mail: kitanogungbuyi@yahoo.com
- 35. Ms. M. P. Maurice-Udo**
Desktop Publishing Officer
Basel Conventional Regional Coordinating Centre for Africa for Training & Technology
Transfer,
Federal Ministry of Environment-University of Ibadan Linkage Centre for Hazardous
Waste Management & Cleaner Production Technology
University of Ibadan, Ibadan.
Tel: 08038471242
Fax:
E-mail: patcyng@yahoo.com

- 36. Ms. A. O. Ukueberuwa**
Intern from USA
Basel Conventional Regional Coordinating Centre for Africa for Training & Technology Transfer
Federal Ministry of Environment-University of Ibadan Linkage Centre for Hazardous Waste Management & Cleaner Production Technology
University of Ibadan, Ibadan.
Tel: 08052156745
Fax:
E-mail: tetse@gmail.com
- 37. Ms. M. G. Lawal**
Temporary Assistant
Basel Conventional Regional Coordinating Centre for Africa for Training & Technology Transfer
Federal Ministry of Environment-University of Ibadan Linkage Centre for Hazardous Waste Management & Cleaner Production Technology
University of Ibadan, Ibadan.
Tel: 08055657226
Fax:
E-mail: keji5@yahoo.com

INTERNATIONAL ORGANISATIONS AND DIPLOMATIC MISSIONS

- 38. Mr. G. O. Ajani**
Programme Officer
United Nations Industrial Organisation (UNIDO)
Plot 1181 Aguyi Ironsi Maitama,
Abuja, Nigeria
Tel: 69-4134294
Fax: 09-4134294
E-mail: adegboyega.ajanieundp.org
- 39. Mr. Ako Amadi**
Environmental and Rural Development Advisor
Canadian International Development Agency (CIDA)
Tel: 09-4130283, 08033072551
Fax:
E-mail: aamadi@cidapsa-ng.org
- 40. Ms. Ngozi Awyanso**
Trade Officer
Embassy of Switzerland
Victoria Island, Lagos
Tel: 08023225246
Fax:
E-mail:

NON GOVERNMENTAL ORGANIZATIONS

- 41. Mr. Leslie Adogame**
Executive Secretary
Nigerian Environmental Society (NES),
Lekki, Lagos.
Tel: 08033301305
Fax:
E-mail:
- 42. Ms. Gladys Fayomi**
Programme Officer
Friends of the Environment (FOTE),
110 Lewis Street, Lagos.
Tel: 08033962723, 01-2633988
Fax:
E-mail: jmaduk2@yahoo.co.uk, omofayomi@yahoo.com
- 43. Igwe Uche**
National Programme Officer
Community Level
Lagos.
Tel: 08037863870
Fax:
E-mail: washnigeria@yahoo.com

OBSERVERS

- 44. Mr. A. A. Adedoyin**
Chief Environmental Scientist (CES)
Federal Ministry of Environment (FMENV)
Games Village, Surulere, Lagos.
Tel: 08033008556
Fax:
E-mail:
- 45. Adegbite A. J.**
Chief Environmental Scientist (CES)
Federal Ministry of Environment (FMENV)
Games Village, Surulere, Lagos.
Tel: 08023110024
Fax:
E-mail: femigbite2004@yahoo.co.uk
- 46. Mrs. Adenaike O. O.**
Senior Environmental Scientist (SES)
Federal Ministry of Environment
Games Village, Surulere Lagos.
Tel: 08033234046
Fax:
E-mail:
- 47. Mr. Adewunmi Adeyinka**
Chief Environmental Scientist
National Reference Laboratory
Federal Ministry of Environment
Games Village, Surulere, Lagos.
Tel: 08033528753
Fax:
E-mail
- 48. Mr. O.W. Akinyemi**
Senior Nursing Officer (SNO)
Federal Ministry of Environment
Games Village, Surulere, Lagos.
Tel: 08023211827
Fax:
E-mail
- 49. Mr. O.O. Adeola**
Principal Environmental Scientist (PES)
Federal Ministry of Environment
Games Village, Surulere, Lagos.
Tel: 08056023745
Fax:
E-mail
- 50. Mrs. A. F. Afolabi**
Assistant Chief Environmental Scientist (ACES)
Federal Ministry of Environment
Games Village, Surulere, Lagos.
Tel: 08033642520
Fax:
E-mail

- 51. Mrs. O. O. Agbenla**
Chief Environmental Scientist (CES)
Federal Ministry of Environment
Games Village, Surulere, Lagos.
Tel: 08055280391
Fax:
E-mail: tagbenla2003@yahoo.com
- 52. Mr. I. E. Abiola**
Principal Environmental Scientist (PES)
Federal Ministry of Environment
Games Village, Surulere, Lagos (FMENV)
Tel : 08034452959
Fax:
E-mail:
- 53. Mrs. Eze E. O.**
EH/FMENV PNO
Federal Ministry of Environment Games Village Surulere Lagos (FMENV)
Tel: 08037870769
Fax:
E-mail: aunnyoeze@yahoo.com
- 54. Mr. Segun S. Imohiosen**
Public Relations Officer
Federal Ministry of Environment
Games Village, Surulere, Lagos.
Tel: 08035958600
Fax:
E-mail: asege123@yahoo.com
- 55. Dr. F.C. Mogo**
Chief Environmental Scientist
Oil & Gas Division
Federal Ministry of Environment
Games Village, Surulere, Lagos.
Tel: 08033157989
Fax:
E-mail:
- 56. Mrs. C.A. Odunlami**
Chief Environmental Scientist (CES)
Federal Ministry of Environment
Games Village, Surulere, Lagos.
Tel: 08023103735
Fax:
E-mail : toluodunlami@yahoo.com
- 57. Rev. J. A. Olabode**
Chief Information Officer
Federal Ministry of Environment
Games Village, Surulere, Lagos.
Tel: 08023196460
Fax:
E-mail:

- 58. Mrs. A.I. Olanipekun**
Chief Environmental Scientist (CES)
Federal Ministry of Environment
Games Village, Surulere, Lagos.
Tel: 08023175742
Fax:
- 59. Mr. A.O. Olugbemi**
Chief Environmental Scientist (CES)
Federal Ministry of Environment
Games Village, Surulere, Lagos.
Tel: 08023050264
Fax:
E-mail:
- 60. Mr. C. O. Okunubi**
Chief Environmental Scientist (CES)
Federal Ministry of Environment
Games Village, Surulere, Lagos.
Tel: 08023136998
Fax :
E-mail
- 61. Mr. S. Y. Omitogun**
Senior Environmental Scientist (SES)
Federal Ministry of Environment Games Village Surulere Lagos (FMENV)
Tel: 08023919425
Fax :
E-mail: ayowand@yahoo.com
- 62. Mr. A. A. Oyewole**
Assistant Chief Environmental Scientist (CES)
Federal Ministry of Environment Games Village Surulere Lagos (FMENV)
Tel : 08033254269
Fax :
E-mail
- 63. Mrs. Y.G. PWOL**
Senior Environmental Scientist (SES)
Federal Ministry of Environment
Games Village, Surulere, Lagos.
Tel : 08056611727
Fax :
E-mail
- 64. Mr. A.G. Yunuss**
Senior Environmental Scientist (SES)
Federal Ministry of Environment
Games Village, Surulere, Lagos.
Tel: 08033222204
Fax:
E-mail: agakaageyahoo.co.uk

Final Technical Workshop for the Development of a Regional Action Plan on Environmentally Sound Management of Used Oils in Africa (Lagos, 6-7th December, 2004)

WORKSHOP REPORT

1. Background

At the sixth Conference of Parties (COP6) in 2002, the African Group requested for the formation of a Global Partnership for the Environmentally Sound Management of Used Oils in Africa and beyond. Accordingly, the Basel Convention Regional Centres in South Africa, Senegal and Egypt, and the Basel Convention Coordinating Centre in Nigeria (BCCC-Nigeria), were charged with the responsibility of establishing a framework for environmentally sound management practices for used oils in order to protect the environment and human health of African nations. At the first session of the Open-ended Working Group of the Basel Convention the project proposal "Assessment and recycling of used oils in Africa" was approved. In 2004 the Secretariat of the Basel Convention approved a grant for Nigeria to carry out a pilot project on the assessment and recycling of used oils in Africa. Components of the pilot project included the Preparation of a National Plan for Environmentally Sound Management (ESM) of Used Oils in Nigeria, the Organization of two Technical Workshops On Management Practices For Used Oils, a Feasibility Study, and the Establishment of a Template for Regional Used Oils. Partnership for Africa, and the development of a Regional Action Plan for the Management of Used Oils in Africa.

The BCCC-Nigeria has carried out this pilot study supported by the Trust Fund of the Basel

Convention to implement projects under the Strategic Plan to gather information on the management of used oils in Nigeria to better define a national plan for the environmentally sound management of used oil and to use Nigeria as a microcosm of the African region.

The Final Regional Workshop for the Development of a Regional Action Plan on Environmentally Sound Management of Used Oils in Africa, organized by the Basel Convention Coordinating Centre for Africa (BCCC) Ibadan, Nigeria, was held from 6-7 December, 2004 at the Federal Ministry of Environment, Surulere Offices, Lagos, Nigeria.

The First Regional Workshop on the same theme which introduced the project to stakeholders and kicked off the enabling activities was earlier held at the same venue on 23rd September, 2004.

The Workshop had the following objectives:

- (i) To present recommendations for the national plan for the environmentally sound management of used oils in Nigeria.
- (ii) To present recommendations for the development of a used oils partnership in the African region.
- (iii) To decide on follow up action for the development of the partnership initiative in the African region, and to disseminate these recommendations throughout the African region.

- (iv) To decide on follow-up action for the draft national plan for the environmentally sound management of used oils.

The Workshop was divided into two technical sessions, which consisted of presentations by both national and regional stakeholders. The topics addressed were: Achieving Environmentally Sound Management of Used Oil; Analysis of Nigeria's Situation on Management of Used Oil; Waste Oil Management Issues and Concerns for African Countries; Guidelines for improving Used Oil Collection and Management in Nigeria; Guidelines for Financing Infrastructure and Technology on Used Oil Management; Appropriate Low-Cost Technology for Used Oil Recycling; Development of a Used Oil Partnership Initiative in Nigeria and Africa; Feasibility Study for the Environmentally Sound Management of Used Oils in Nigeria; and Guidelines and Standards for Used Oil Management. The presentations were followed by questions, comments and syndicate sessions involving detailed discussions relevant to the technical papers.

This report aims to provide an overview of the Workshop, drawing from main points highlighted in the presentations and discussion sessions, and from inputs and concerns raised during the technical sessions. The Workshop recommendations and conclusions, as well as the National and Regional Action Plan for the Management of Used Oils in Africa (Annex 1), constructed and adopted by Participants of the Workshop, are included in the report. The full

Workshop Proceedings are available at the Basel Convention Coordinating Centre for Africa (BCCC-Nigeria), University of Ibadan, Ibadan Nigeria and on the BCCC-NIGERIA-Nigeria website (www.baselnigeria.org).

2. Participants

The Workshop was attended by sixty-one (61) participants, including stakeholders from Industry, Civil Society, Universities, Government, Non-Governmental Organisations (NGOs), Basel Convention Regional Centres (BCRCs), the Media, and United Nations Agencies. Specifically, representative organizations included the Manufacturers Association of Nigeria (MAN), the Standards Organisation of Nigeria (SON), Lagos State Environmental Protection Agency (LASEPA), the Nigerian Ports Authority (NPA), the National Electric Power Authority (NEPA), the Department of Petroleum Resources (DPR), the United Nations Industrial Development Organisation (UNIDO), the Canadian International Development Agency (CIDA), and the Switzerland Embassy. The Directors of the Basel Convention Regional Centres from Senegal (Dr. Oumar Cisse) and South Africa (Dr. John Mbogoma) were also present at the Workshop.

3. Main Objective of the Workshop

The main objective of the Workshop was to define a National Plan for the Environmentally Sound Management of Used Oils in Nigeria, and to decide on follow-up action for the development of a Partnership for Used Oils in Africa and to disseminate these recommendations throughout

the African region. In particular, the Workshop was concerned with the development of:

- (a) modalities for the collection of used oil especially from manufacturing companies and the small scale generators to serve as a feedstock for the recycling/reuse process;
- (b) adequate disposal methods for unusable used oils; and
- (c) modalities for sustained public awareness campaign on the importance of environmentally sound management of used oils and other hazardous waste.

The Workshop also served to increase coordination between the BCRCs in Africa and to bolster the development of a common approach to the management of used oils in Africa. A template for a National and Regional Action Plan for the Management of Used Oils in Africa was deliberated upon and recommended by Workshop Participants.

4. Opening of the Workshop

The Workshop was declared open by the Honourable Minister of Environment, Col. Bala Mande (Rtd.), represented by Director, Department of Environmental Health, Federal Ministry of Environment, Dr. Mrs. M.S. Benebo, who remarked that the Workshop demonstrated the readiness of African countries to develop appropriate strategies for sound management of hazardous wastes in the region. The speech further acknowledged the Workshop to be a significant step in the efforts of the Basel Convention Secretariat in collaboration with the Ministry to build the capacity of Nigerians

and the African Region as a whole, on the Environmentally Sound Management (ESM) of Used Oils. Prof. Oladele Osibanjo, Executive Director of BCCC-Nigeria, delivered the Welcome Address, providing an overview of the situation of used oils management in Nigeria and Africa and expounding on the initiative of Nigeria and other African nations to form a partnership around these issues. Goodwill Messages were presented by representatives of Lagos State Commissioner for Environment, United Nations Industrial Development Organization (UNIDO), Switzerland Embassy and the Canadian International Development Agency (CIDA). CIDA, in particular, expressed its willingness to support proposals emanating from implementable action plans for used oil management. The vote of thanks was delivered by Mrs. Olakitan Ogungbuyi of BCCC-Nigeria, who emphasized the importance of stakeholders involvement in implementing the goals of the Workshop.



Special Guests on High Table

5. Session I: Guidelines for Improving Used Oil Management in Africa

Presentations made during the first session addressed the current situation of used oil management in Africa, drawing on case studies from two the Sub-regions: English and French-Speaking African Countries. The identification of recycling possibilities and potential uses of used oils in Africa were central themes of the presentations, and guidelines for improved collection and management were suggested. Professor O. Osibanjo read a paper on behalf of Ms. Sachiko Kuwabara-Yamamoto, Executive Secretary of Basel Convention (SBC), concerning the achievement of used oils management through a partnership to be facilitated by the Basel Convention Secretariat. The speech stressed the importance of a partnership programme for improving the capacity of the Basel Convention to assist developing countries, as well as for ensuring the sustainability of management practices. Furthermore the Secretariat has been in contact with the International Petroleum Industry Environmental Conservation Association about the establishment of a partnership on used oils in Africa where both the major international and local oil companies do operate. Prof. O. A. Bamiro, the National Expert on the project delivered an analysis of Nigeria's situation on the management of used oils¹, providing some of the essential data necessary for the development of policies and practices for the ESM of used oils in the country. Within his presentation, Prof. Bamiro identified the main sources of used oils in Nigeria, estimations of the quantities and types of used oils produced, stored and disposed, the main actors in the used oil market, existing disposal and treatment facilities and their capacity, and highlighted the results of a survey of informal sector dealings in used oil. The study estimated the market size of virgin oils in

Nigeria at 300 million litres annually, while the volume of used oils in Nigeria is estimated at 150 million of litres annually with a maximum 90 million being collectible for re-processing or re-refining. Uses of used oils varied from direct reuse as lubricant in vehicles with old and worn engines as engine oil, and as boiler fuel, to use as agents for weed killing, wood preservation from termite invasion and even in the manufacture of certain hair creams for women. Concerns for health risks associated with unsanctioned use of waste oils were recognized in the study. Dr. John Mbogoma, Executive Director of BCRC-South Africa, presented a case study describing the proceedings and recommendations resulting from a workshop organized by BCRC-South Africa in 2002 in conjunction with the Cape Town based Rose Foundation. The workshop was developed to create awareness of the best available technologies for the management of used oils in Africa, and of the need to develop local management strategies. The workshop recommended that immediate follow-up activities within the year following the workshop should include the convening of similar workshops involving other countries within Africa; the preparation of guidelines for waste oil management and their circulation to African countries; the convening of follow up workshops that focus on specific areas of waste oil management; and the initiation of country projects within some of the action areas that have been identified.

Finally, Dr. Oumar Cisse, Executive Director of BCRC-Senegal, delivered a presentation in which he described a pilot study on ESM of used oils for Francophone Africa and related a proposal for the production of a Guidance Manual for the Management of Used Oils in French-Speaking African Countries. Dr. Cisse's revealed further

¹ Pilot Study of Used Oils in Nigeria was conducted by Prof. O.A. Bamiro and Prof. O. Osibanjo, University of Ibadan, November, 2004.

plans by BCRC-Senegal to develop National Plan for the ESM of used oils in French-Speaking African Countries, including the creation of a National Diagnosis and Feasibility Study and launching of three related workshops.

Discussion

Following the presentations, participants worked together in syndicate sessions to develop a framework for improved used oil management in Africa. Participants recognized that although a legal framework is available for management, it is currently insufficient insofar as the relevant laws are both non-specific and not enforced. Participants agreed that the review and expansion of existing laws is crucial to the proper management of used oils. Capacity building was also stressed, and participants discussed the essential elements of collaboration with organized unions, occupational groups and other stakeholders to encourage cradle to grave management of used oils. It was further suggested that the informal sectors be organised into trade groups and that incentives be offered to collectors of used oils to facilitate cooperation, sustainability and compliance.



Participants in Session

Participants acknowledged that no known technologies were available for proper management in the region and that rapid steps must be taken to address the information and research gap regarding the development of local technologies for recycling and disposal of used oils. Private-public partnerships were stressed, as well as capacity building through involvement of organised occupational groups in workshops. A financial mechanism consisting of market incentives and disincentives was also identified as crucial to the implementation of the national and regional plans and the development of indigenous processing technologies.

6. Session II: Follow-up Actions for the Development of a National/Regional Action Plan

Presentations during this session centered on specifying guidelines and standards, and making recommendations for the management of used oils, and the creation of a used oil partnership initiative for Africa. Engr. D. Ayeni of the Standards Organisation of Nigeria (SON) presented a paper on behalf of Dr. John Ndanusa Akanya, Director General of SON. Within the paper, SON reinforced its initiative to elaborate standards for used oil, taking into special account considerations for human health and worker safety. Mr. Uche Achara of Boskel Nigeria Limited, a Nigerian Company involved in thermal process engineering and environmental management, presented a paper describing a potential low cost technology for used oil recycling. The technology is currently undergoing testing on-site in Nigeria and a “no-

cure, no-pay” guarantee was offered for interested investors in the project. Mr. Kayode Ogungbuyi of Sustainability Limited presented a feasibility study on ESM of used oils in Nigeria, in which the benefits and costs of various recycling options were weighed. The presentation considered such factors as quality and quantity of collected oils, and cost of equipments, and Mr. Ogungbuyi stressed the need for Nigeria and other African countries to enact new legislation specifying the roles and responsibilities of all stakeholders.

The United Nations Industrial Development Organisation (UNIDO) presented some of its past efforts by addressing the environmental hazards resulting from indiscriminate disposal of used oils. The UNIDO approach to used oil management included such steps as awareness building and experience sharing through workshops, promotion of private sector investment and technology transfer, and assistance for developing countries in creating regulatory frameworks for sustainable management of used oils.

Discussion

Following the second session, a template for a National and Regional Action Plan for Management of Used Oils was constructed by a designated committee of experts². The focus of the Action Plan is poverty alleviation, job creation, and environmental protection through the environmentally sound management of used oils.

² The committee of experts included Dr. John Mbogoma (Chairperson), BCRC-South Africa; Prof. O.O. Dada, FMENV, Abuja, Nigeria; Dr. Oumar Cisse, BCRC-Senegal; Mr. Ako Amadi, CIDA, Abuja, Nigeria; Mr. I.E.B. Iroha, NEPA, Nigeria; Prof. O.A. Bamiro, University of Ibadan; Mrs. Ronke Soyombo, FMENV, Nigeria; Ms. Tolulope Olusoga (Secretary), University of Ibadan.

The Action Plan identifies components of an ESM for used oils in Africa, including regulation of the oil sector, institutional coordination, awareness creation, and funding mechanism. It further attempts to assign roles and responsibilities of stakeholders in implementing the management plan. A copy of the National and Regional Action Plan is attached as Annex 1.

7. Conclusions and Recommendations

The Workshop identified and emphasized several key points, including the need for partnerships amongst private, public, and research institutions (knowledge centres) to collaborate in the management of used oil; the need to investigate capacity-building opportunities for management purposes; the need for networking and pooling of efforts and resources amongst national and regional stakeholders; and the need to develop an integrated approach to management, combining efforts to address the range of environmental impacts arising from improper disposal of waste oils. The Workshop further recognized the organization of the informal sector as critically essential to the sustainability of cradle to grave management of used oil in Africa.

The Workshop recommended as follows:

- (i) the creation of an enforcement arm of the Federal Ministry of Environment to deal with the regulation of used oil among other concerns;
- (ii) the promotion of intersectoral collaboration between the Ministries of Environment, Health, Industry, Department of Petroleum

- Resources (DPR), Standards Organisation of Nigeria (SON), and related agencies to work together towards the effective management and disposal of used oils;
- (iii) the review and expansion of existing legislation to identify, in specific-terms, acceptable management options for used oils, including the definition of the roles and responsibilities of stakeholders;
 - (iv) the strengthening of a private-public partnership through cooperation with organised occupational groups and other stakeholders;
 - (v) the involvement of organised groups in workshops for capacity-building and training on enforcement and compliance;
 - (vi) the involvement of NGOs and other Civil Society Organisations as active participants in research and advocacy, awareness creation, and monitoring activities;
 - (vii) the development of a financial mechanism for used oil management programmes; in particular seeking involvement of financial institutions in the funding of used oil management;
 - (viii) the establishment of an incentive system to support used oil management initiatives;
 - (ix) the provision of uniform storage facilities at strategic points, close to the generators of used oil;
 - (x) local know-how should be involved in determining the re-processing and re-refining technologies to be adopted in used oil management;

- (xi) the promotion of product responsibility including eco-labeling requirement for lube oil.

The template for a National and Regional Plan for Used Oil Management was considered and adopted by Workshop participants.

8. Official Closure of the Workshop

Prof. O. Osibanjo formally closed the Workshop, thanking the participants for honouring the invitation, and noting especially the presence of Dr. John Mbogoma and Dr. Oumar Cisse, Directors of the BCCCs for South Africa and Senegal. Mrs. Olakitan Ogungbuyi expressed appreciation for stakeholders' contributions to the Workshop, including the presentations and other forms of inputs. Prof. Osibanjo stressed finally the importance of following through with implementation of the National and Regional Action Plans.

PART II- PAPER PRESENTATION

Achieving Environmentally Sound Management (ESM) of Used Oils in Africa through International Partnership (SBC perspective) **By Ms Sachiko Kuwabara-Yamamoto**

A robust partnership programme capable of engaging a wide range of stakeholders is of critical importance to the effective implementation of the Basel Convention.

Work since the provisional adoption of the work plan for the Basel Convention Partnership Programme at the second session of the Open-ended Working Group has focused on the first handful of activities listed in the work programme. Importantly, initial contacts have been made during this period with the United Nations Global Compact Office, which links approximately 1,600 companies worldwide interested in private-public partnership under the direction of the Secretary-General of the United Nations.

Completion of the partnership programme and realization of its full potential benefits to the Basel Convention will require sustained support from Parties and their partners through the next biennium.

The pilot phase of the partnership programme has seen the successful establishment of a first initiative (the MPPI), the forging of key contacts with industry and other stakeholders and an increased understanding of the manner in which this important element of the Strategic Plan for the Implementation of the Basel Convention should be implemented.

There have been valuable lessons learnt during the year that will be important factors in the development of further initiatives.

It is now clear that a successful partnership programme:

- (a) is an essential ingredient for the success of the Basel Convention in its second decade of implementation;
- (b) is important for improving the capacity of the Convention to assist developing countries;
- (c) is a key plank for a successful resource mobilization strategy that can engage industry, non-governmental organizations, international organizations and other significant stakeholders in the needs of developing countries and the work of the Convention
- (d) requires sustainability in terms of resources and effort;
- (e) requires greater active participation by Parties.

Given time, the partnership programme will raise the profile of the Convention and improve political support; provide an avenue for practical project activity informed by industry and non-governmental organization experience; and link the hazardous waste challenge of the Basel Convention, its Parties and Regional Centres to other significant policy agendas, more allies and new funding sources focused on developing capacity in developing countries and countries with economies in transition.

One of these areas of work is the Used Oils in Africa

The Secretariat has been in contact with the International Petroleum Industry Environmental Conservation Association about the establishment of a partnership on used oils in Africa

where both the major international and local oil companies do operate. Used oils are important because of the large quantities generated globally, their potential for direct reuse, reprocessing, reclamation and regeneration, and because they may cause detrimental effects to human health and the environment if not subject to environmentally sound management, including collection, handling, treatment and disposal.

I am very encouraged by the preliminary work of the First Workshop on Environmentally Sound Management of Used Oil in Nigeria held in Lagos on 23 September 2004. The BCCC is carrying out this pilot study supported by the Trust Fund of the Basel Convention to implement projects under the Strategic Plan to gather information on the management of used oils in Nigeria to better define a national plan for the environmentally sound management of used oil and to use Nigeria as a microcosm of the African region.

On behalf of the Secretariat I wish to thank very much Prof. O. Osibanjo for the organization of this workshop and the participants for their willingness to share experiences. I wish every success in this regional workshop and wish also to express our appreciation for the important support of the government of Nigeria in the work of the BCRC.

PILOT STUDY OF USED OILS IN NIGERIA

by

Prof. O. A. Bamiro
(National Expert)
&
Prof. O. Osibanjo
(Project Coordinator)

Plan of Presentation

- Study objectives and conceptual framework
- Executive summary of major findings
 - Sources of used oils
 - Estimated quantities of used oils generated
 - Main actors in the used oil market
 - Used oil management alternatives for Nigeria
 - Legislative aspects of the management of used oils in Nigeria
 - Conclusion

OBJECTIVE

The Basel Convention Regional Coordinating Centre (BCRC) located at the Federal Ministry of Environment-University of Ibadan Linkage Centre and UNEP/SBC are to investigate and develop recycling possibilities and potential uses of used oils in Africa with the University of Ibadan BCRC coordinating the project and working in close collaboration with the BCRCs in South Africa, Egypt and Senegal respectively towards the development of an African Regional Management Plan for used oil.

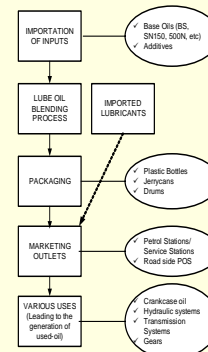
TERMS OF REFERENCE

- Identification of the main sources of used oils in the country and estimations of the quantities and types of used oils produced, stored and disposed.
- Identification of the main actors in the used oil market in the country (mainly those in the production, distribution, storage, refining and utilisation).
- Identification of existing disposal and treatment facilities and their capacity.
- Survey on the informal sector working with used oils.

BASIC INFORMATION

- Volume of sales of virgin oils in the country.
- Market structure of virgin oils in the country.
- Level of generation of used oils.
- Uses of the generated used oils.
- Current prices of virgin oils and used oils.
- Existing legislation governing the management of used oil, the storage, and the environmental controls for the collection and recycling.
- Companies having capacity for economic capability to recycle used oil.
- Estimated total number of automobile/trucks/buses registered in the country.

CONCEPTUAL FRAMEWORK



MAJOR USERS OF VIRGIN OILS

- ✓ TRANSPORTATION
 - ❖ Automobiles
 - ❖ Motorcycles
 - ❖ Buses
 - ❖ Trucks
- ✓ INDUSTRIAL
 - ❖ Chemical and allied products
 - ❖ Rubber and plastic products
 - ❖ Machines (except electrical)
 - ❖ Electrical equipment (transformers)

METHODOLOGY

- Desk Study
- Primary data Collection
- Field visits
- Data Analysis within the framework of the T.O.Rs

Estimation of Virgin Oil Production & Market Size

- ✓ Identification of key players
- ✓ Determination of level of import of base oils by the different key players
- ✓ Level of blending activities by the key players

Estimation of Level of generation of used oils

- Determination of the average % of used virgin oil that ends up as used oil for the different uses in Transportation and Industry identified earlier.
- Estimation based on the combination of data of registered automobiles, buses, and trucks and estimated level of used oil generation in each segment.

DATA COLLECTION METHODOLOGY

- ❖ Desk Study
- ❖ Development and administration of questionnaires
- ❖ Field survey

Desk Study

Nature of Information

- The legislative, economic, technical and environmental aspects of the management of used oils in the country,
- Main sources of used oils, and estimations of quantities and types of oils produced, stored and disposed.
- Identification of main actors in the used oil market, dealing with any aspect of the management cycle of oils.
- Identification of existing disposal and treatment facilities and their ownership

Desk Study

Sources of Information

- Governmental Institutions
- International organisations
- Private sector
- Previous Reports on used oils
- NGOs

Different Categories of Questionnaires

- ❖ Producers of virgin oils
- ❖ Sellers of virgin oils
- ❖ Generators of used oils
- ❖ Dealers in used engine oils
- ❖ Buyers and users of engine oils

QUEST: Producers of virgin oils

Information

- ✓ Identification (individuals/Companies)
- ✓ Level of importation of base oils
- ✓ Blending plant capacity
- ✓ Grades of lubricants produced
- ✓ Level of production/sales
- ✓ Prices
- ✓ Major customers

QUEST: Sellers of virgin oil

Information

- ✓ Identification (individuals/Companies)
- ✓ Types/grades of engine oils being sold
- ✓ Units of sales
- ✓ Prices per unit
- ✓ Average sales per week
- ✓ Major customers

QUEST: Generators of used oils

INFORMATION

- ✓ Identification (individuals/Companies)
- ✓ Use of virgin engine oil
- ✓ Average quantity used per week
- ✓ Frequency of oil change
- ✓ Quantity involved in an oil change
- ✓ Level of used oil generation per week
- ✓ Method of storage of used oil
- ✓ Method of disposal of used oil
- ✓ Knowledge of Recycling

QUEST: Dealers in used oils

- ✓ Identification (individuals/Companies)
- ✓ Sources of used oils
- ✓ Basis of grading
- ✓ Purchase prices
- ✓ Average quantity purchased per week
- ✓ Method of storage
- ✓ Sales prices
- ✓ Volume of sales
- ✓ Identification of the buyers on the basis of usage
- ✓ General and Specific Knowledge of recycling

QUEST: Buyers/Users of Used oils

- ✓ Identification (individuals/Companies)
- ✓ Source of purchase
- ✓ Prices per unit of purchase
- ✓ Average quantity purchased per week
- ✓ Uses of the used oil
- ✓ General and Specific Knowledge of recycling

Field Visits

To administer the questionnaires as well as interviews of key actors in the following major locations Lagos, Ibadan, Aba, Kano, Kaduna, P/Harcourt

MAJOR FINDINGS

Market of Virgin Oils in Nigeria

Major marketers

Mobil, Total, AP, Texaco, Conoil, Oando

Involved with importing base oils as input to their blending plants to produce different grades of lubricants.

Independent Marketers

Romi, Ibetu, Pract Oil, Dozyy, A-Z, Zenon

(involved mainly with importing base oils)

Market of Virgin Oils in Nigeria

- Level of importation of base oils: 264 mlpa
- Estimated total level of base oils: 377 mlpa
- Level of production of virgin oils: 60 mlpa
- Level of importation of virgin oils by AP/Coscharis Motors Ltd: 4.2 mlpa
- Estimated market size of virgin oils: 300 mlpa

Market outlets

- 45 market outlets surveyed
- Mainly petrol stations and some road side sellers
- Sales in gallons, jerry cans, drums
- Several grades of virgin oils were being sold
- Price ranges per gallon SAE 40 (N600 to 1350); 20W-50 Extra Treatment (N1100 – N1550)

GENERATORS OF USED OILS

- A total of 74 used oil generators (industry and transport) in the three zones were surveyed
- The highest individual generators were from industry e.g. Cadbury (830 l/w) RCC (1,000 l/w), Kopek (10,000 l/w)
- Fleet operators were as high as 220 l/w.

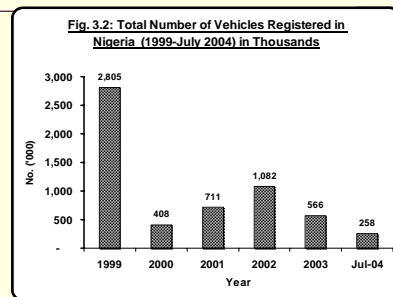
GENERATORS OF USED OILS

- Storage in plastic kegs, metal drums, plastic drums, etc.
- Disposal – sale, pouring on ground, re-use as fuel to fire boilers, re-use as lubricant, supply to collection centres

Estimate of Used Oil generation

- Experiences from similar studies of other African countries (e.g. Egypt) showed that used oil generation could be estimated at 50% of virgin oil while the figure of collectible used oil could be as low as 30%. The latter arises from the reality of unsafe disposals as well as alternative uses. Thus, volume of used oils in Nigeria is estimated at about 150 mlpa with a maximum of 90 mlpa being collectible for re-processing or re-refining.

Estimate of Used Oil generation



Estimate of Used Oil generation

From the Federal Road Safety Commission (FRSC), the total number of vehicles registered in Nigeria between January 1999 and July 2004 was 5,828,900. The estimated total number of registered vehicles was 11,657,800, including the pre-1999 registered vehicles still plying the roads. Assuming 80% of the vehicles are cars and the rest being trucks/buses, the estimated used crankcase oil was 163 mlpa. Industry-based used oil was estimated at 54 mlpa, leading to a total national used oil generating capacity of 217 mlpa.

Dealers in Used Oils

- 35 dealers spread over the three zones were surveyed
- 95% considered the business lucrative
- Sources of used oils: mechanic villages (16), service stations (16), industry (20), and self generation (10)
- Grading based on the perceived quality of the source
- Volume of sales 12 l/w to 2,500 l/w

Dealers in Used Oils

- Sale prices for used oils varied from N20 to as high as N150 per gallon.
- Treatment of used oils did not transcend mere settling to remove particulate matter, and, in limited cases, open air heating to evaporate entrained water.
- Oil storage was mainly in metallic and plastic containers (jerry cans and drums).

Dealers in Used Oils



Dealers in Used Oils



Dealers in Used Oils



Uses of Used Oils

- A total of 47 users were surveyed.
- Purchase price varied from N20/gallon to N150/gallon
- Identified Major uses
 - Direct reuse as lubricant in vehicles with old and worn engines as engine oil.
 - Boiler fuel – some industries use the used engine oils as fuel for their boilers.
 - Bakery – used in the furnace as fuel.
 - Weed killer – poured on the ground to control weeds.
 - Dust control – poured on the ground and roads to suppress dusts.
 - Block and Balustrade making - used as lubricant in mould equipment.

Uses of Used Oils

- Wood preservation – used to prevent termites from destroying the wood.
- Gear oil – used engine oil is mixed with grease to produce gear oil.
- Hair cream – used to protect the scalp from the burning sensation of hair relaxers.
- Hydraulic oil – used in heavy duty vehicles equipped with tipping mechanism.
- Road construction – used in addition to bitumen by some construction companies.
- Rust prevention – used for this purpose by those selling motor spare parts.

Wood treatment with used oil

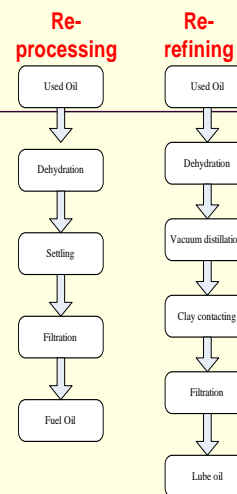


Driver of usage

The rather harsh economic situation has encouraged some of the above uses. Used oil still with calorific value comparable to that of diesel or LPFO is a welcome candidate as a source of fuel at cost as low as N25 per litre for good quality compared with diesel, for example, at above N60 per litre when available in the market. Such alternative usage is therefore driven by economic consideration with little regard for environmental impacts.

Used Oil Management Alternatives

- Re-processing into fuel oil
- Re-refining into lube oil
- Destruction



Advantages of Re-refining

- Environmentally sound long-term solution
- Creates jobs locally
- Reduces the amount of imported base oils for local blending

Disadvantages of Re-refining

- Requires a well-developed waste-oil collection system to be established
- Recycled lube oil requires a well-developed market
- Requires extensive capital investment
- The re-refining option requires a reputable recycling company to ensure the marketability of the product
- Proper disposal of end-waste residues is costly and problematic

Advantages of Re-processing

- Benefits from a well-established demand in Nigeria for fuel substitute
- Creates jobs locally
- Limits the negative effects of the current practice of uncontrolled burning of used oil
- The quality control of the re-processed fuel oil is monitored by the purchaser

Disadvantages of Re-processing

- Requires a well-developed waste-oil collection system to be established
- Requires extensive capital investment
- Proper disposal of end-waste residues is costly and problematic

Destruction

Advantages

- Economically feasible at lower processing volumes
- Cement factories may be willing to procure the used oil

Disadvantages

- Air emissions, although minimal, will still need to be addressed
- May face stiff opposition

Oil Re-refining Projects in Nigeria

The Lube Oils Limited, Otta

- In 1996, Lube Oils Limited, with the assistance of UNIDO assessed the techno-economic feasibility of refining used lubricating oil
- The project, based on an Italian Process design, increased in cost from the initial projection of N500 million to close to N4 billion.
- There was problem with getting sufficient quantity and quality of used oils to make the project economically viable.
- Now committed to a phased local development of the process technology

Oil Re-refining Projects in Nigeria

The FMENV

- The contract for the fabrication a plant has just been awarded to a fabricator. It is hoped that the Ministry will equally invest in the provision of the very much needed research and technological backup for such project whose requirements for success transcend mere fabrication.

Legislation on used oils

- S 15 (2) stipulates that "no oil in any form shall be discharged into public drain, rivers, lakes, sea, or underground injection without a permit issued by FMENV or any organisation designated by the FMENV"
- S11 (1) states that "the collection, treatment, transportation, and final disposal of waste shall be the responsibility of the industry or facility generating the waste."
- S 17 states that "An industry or facility which is likely to release gaseous, particle, liquid, or solid untreated discharges shall install into its system, appropriate abatement equipment in such manner as may be determined by FMENV"

Concluding Remarks

- **Feedstock (upstream) quality degree and nature of contamination and environmental/health risks associated with handling and processing, volumes and types.**
- **Treatment processes** for getting appropriate quality feedstock for downstream industries or users, impacts on resource conservation, percentage of the product recovered, energy savings.
- **Impacts of treatment processes** on public health and environmental media.
- **Final disposal** of end-of-the-pipe output of treatment processes in the framework of environmentally sound management of hazardous wastes.

Concluding Remarks

- **Economics** (economic viability/sustainable market and commercial feasibility; product value).
- **Technology and techniques** (treatment capacity, feedstock capability) and their potential impacts on the environment.
- **Location** of existing or planned facilities.
- **Infrastructure** for clean and efficient collection, storage, and transport of used oils.

Concluding Remarks

- **Public perception.**
- **Legislation** (i.e. on air emissions).
- **Socio-economic benefits** (i.e. employment opportunities).
- **Knowledge of cases or processes** which have gone wrong in the past.
- **Availability** of cleaner production methods and clean technologies.

Waste Oil management Issues and Concerns for African Countries - Case Study from Subregion-English Speaking African Countries

By Dr. John Mbogoma

EXECUTIVE SUMMARY

The appropriate management of waste oil is a common problem for many African countries where much of the wastes have negative environmental and human health risks because of inadequate systems for collection, storage, recycling, disposal etc. This is happening despite the availability of technology and management systems in several parts of Africa. There is therefore a need to stimulate awareness and promote technology transfer within sectors involved with the general oil market, particularly businesses that produce, market or sell oil products and could promote better waste management practices at the country level.

There are many approaches to the sound management of the waste oils, some of which might or might not necessarily be relevant within the African context. Consequently, at the initiative and sponsorship of the Secretariat of the Basel Convention, the Basel Regional Centre in Pretoria in collaboration with the Cape Town-based ROSE Foundation, convened a Workshop with the following objectives:

1. To create awareness of current best available waste oil management practices;
2. To understand the current status of waste oil management within the invited African countries;
3. To examine a South African system of waste oil management as a model (ROSE Foundation); and
4. To develop guidelines for waste oil management action plans that would lead to improved country and African regional management practices.

The workshop was attended by country representatives from a selected group of African countries that included Botswana, Egypt, South Africa, Lesotho, Zambia, Malawi, Kenya, Tanzania, Uganda and Mozambique. Each country participated as a team with one government representative, an industry representative and a representative from a relevant NGO. The workshop had the following format (see programme):

- An opening information transfer session to discuss the environment and current international waste oil management practices;

- A session during which the status of waste oil management within the countries was presented and discussed ;
- A session at which the background and working of the ROSE Foundation system was presented and discussed; and
- A session during which future approaches and frameworks for waste oil management were developed.

The workshop concluded that in order to improve general waste oil management within countries of the region there is a need to both initiate and rejuvenate activities within several key areas. The ROSE Foundation, a South African company involved in used oil recycling, provides a useful model for other countries to follow. Preliminary guidelines on certain specific activities were generated during the workshop and are presented in section 4 of the report. The main action areas within the African region have been identified as:

- The development of appropriate policies and strategy for waste oil management;
- Improving national management systems that deal with waste oil;
- Promoting activities that act as agents of change within respective countries;
- Stimulating cooperative governance so as to include all government departments and all sectors of the waste oil industry;
- The creation of strategies that use incentives and disincentives to expedite desired changes in market and management behaviour;
- The development of a more interactive waste oil stakeholder community within countries;
- The creation of financing mechanisms which promote the development of cooperative approaches to waste oil minimisation and recycling
- The appropriate development of infrastructure and use of technology for waste oil management;
- The initiation of national waste oil education and awareness programmes; and
- The development of information systems that meet the needs of waste oil decision-makers within each of the countries.

It was recognised that this particular workshop represented only the first step in the development of an approach to improving waste oil management practices within the African region and that the ideas generated would take many years to implement throughout the region. However, the workshop recommended that immediate follow-up activities within the next 12 months should include:

- The convening of similar workshops involving other countries within Africa;
- The preparation of guidelines for waste oil management and their circulation to African countries;
- The convening of follow up workshops that focus on specific areas of waste oil management; and
- The initiation of country projects within some of the action areas that have been identified.

Introduction

The Rabat Declaration that was produced at the first Continental Conference for Africa organised by the Basel Convention Secretariat in January 2001 reinforced Africa's position on the importance of Environmentally Sound Management (ESM) of waste oils. Specifically it underlined the problems related to pollution caused by used oils which directly threatens ground waters, drinking water and the environment. It suggested urgent steps to address this situation through

- Strengthening of the legal framework regarding solid remediation and used oiled management
- Strengthening of collaboration between Governments and Multinational oil companies to cover recovery, reuse, and proper storage
- Promotion of technologies,
- Promotion of awareness and regional cooperation.

A regional survey that was conducted by the Pretoria Basel Convention Regional Centre in most of the English speaking African countries in July 2001 also confirmed that waste oil is one of Africa's environmental problem areas.

While it is understood that oils themselves are not especially toxic, they have considerable potential to cause environmental damage by virtue of their ability to spread over large areas of land and water. Films or coverings of oil substances may reduce or prevent air from reaching life forms within an area of land or sea and can rapidly result in significant degradation of environmental quality in those media. Sources of such waste oils are from lubrication, metal machining/cutting, tank washings in oil depots and refineries, electrical power equipments (transformers and capacitors). By nature of their use, they will contain various contaminants including heavy metals, combustion products and substances arising

from the original use (e.g. PCBs). Of particular concern is the oils contaminated with PCBs through admixing of PCBs and other mineral oils.

The appropriate management of waste oil is a common problem for many African countries where it poses negative environmental and human health risks because of inadequate systems for collection, storage, recycling, disposal etc. This is happening despite the availability of technology and management systems in several parts of Africa. There is therefore a need to stimulate awareness and promote technology transfer within sectors involved with the general oil market, particularly businesses that produce market or sell oil products and could promote better waste management practices at the country level.

There are many approaches to the sound management of the waste oils, some of which might or might not necessarily be relevant within the African context. Consequently, at the initiative and sponsorship of the Secretariat of the Basel Convention, the Basel Regional Centre in Pretoria in collaboration with the Cape Town-based ROSE Foundation convened a Workshop FROM 15-17TH October 2002 with the following objectives:

1. To create awareness of current best available waste oil management practices.
2. To understand the current status of waste oil management within the invited African countries.
3. To examine a South African system of waste oil management as a model (Rose Foundation).
4. To develop guidelines for waste oil management action plans that would lead to improved in-country and regional management practices

The workshop was attended by representatives from a selected group of African countries that included Botswana, Egypt, South Africa, Lesotho, Zambia, Malawi, Kenya, Tanzania, Uganda and Mozambique. Each country participated as a team with one government representative, an industry representatives and a representative from a relevant NGO. The workshop had the following sequence of activities:

- An opening information transfer session to discuss the environment and current international waste oil management practices;
- A session at which the status of waste oil management within the countries was presented and discussed;
- A session at which the background and working of the ROSE Foundation system was presented and discussed (this included site visits).

- A session during which future approaches and frameworks for waste oil management was developed.

Workshop Programme

The workshop programme occupied three days that were separated into distinct phases to achieve the objectives of the workshop.

Phase 1: The first day was devoted to achieving the first two objectives. This involved the provision of background information on waste oil and the status of waste oil management in the respective delegates' countries.

Phase II: The second day (objective 3) was devoted to reviewing and understanding the operations of the ROSE Foundation, which is South Africa's most successful used oil recycling company. This included presentations from specialists and site visits to a collection depot and a used oil recycling plant.

Phase III: The third day (objective 4) involved an interactive workshop session at which delegates:

Defined the problems/issues that need to be addressed in terms of improving waste oil management

Developed a preliminary outline of a framework for technical guidelines on the management of waste oil in Africa

Waste Oil Management Issues and Concerns

The development of technical guidelines for the management of waste oil in Africa has to be based on the real situation, as experienced by the parties involved in waste oil management. Each of the countries that participated provided descriptions of the status of waste oil management in their respective countries. In order to develop a common perspective of the overall situation, the delegates were separated into three sectoral working groups, comprising

industry,
government and
NGOs.

Each of the groups was requested to identify the key generic problem areas and issues which would need to be addressed in order to achieve better waste oil management. The responses are outlined below.

3.1 Industry Sector

The issues identified by the industry group include:

- There is an incoherent approach from industry, as the many oil companies appear to have different policies and ways of how to tackle the issue of waste oil. There is evidently poor interaction within the industry sector, as evidenced by different standards and technological methodologies. The approach in each country is dependent on the separate company policies.
- There is a lack of self-regulation indicating that the industry sector is not yet at the stage where it can enforce certain management practices and standards within the waste oil market.
- Industry has done very little to create and develop awareness about the environmentally sound management of waste oil. Although government tends to be blamed for poor societal awareness of good waste oil practice, industry has done very little. It is incumbent on industry to educate the public and government on these practices. In addition, there are numerous laws and regulations, which many companies are not aware of, and need to familiarise themselves.
- Industry has not set up financial mechanisms by which waste oil minimisation can be easily achieved. Lack of these financial mechanisms forms a major primary barrier to hindering sound waste minimisation and recycling practices within the majority of the African countries.

3.2 Government Sector

The Government sector representatives identified the following issues:

- There is poor coordination between the different stakeholders, particularly between the government departments that are concerned with waste oil management. Government officials appear to be unable to interact on the waste oil problems that require attention.
- There is inadequate registration of companies and waste oil precursor products. Poor knowledge within government of oil companies and oil products is the result.
- There is inadequate regulation of the waste oil market.

- There is poor enforcement of existing regulations primarily because of insufficient personnel and the absence of guidelines on waste oil management practices.
- There is a distinct absence of guidelines on waste oil management practices.
- There is an absence of capacity building activities that help raise the ability of each country to identify and deal with waste oil problems and issues.
- There is an absence of suitable waste oil management training activities.
- The waste oil markets in most countries of the region are not sufficiently liberalised, thereby creating the appropriate climate for the development of collective or community waste oil management systems.

3.3 Non-Governmental Sector (NGO)

The NGO group identified the following issues:

- Despite all the regulations and systems in place waste oil pollution still represents one of the daily problems experienced in society.
- Transportation of oil appears to be one of the main areas where major problems are encountered.
- Sustainability of oil usage and waste oil management is a problem.
- There is poor awareness and public education of waste oils within society.
- Policy makers do not appear to be working towards ensuring that there is a sound relationship between government and industry.
- There is poor industry commitment to ensuring that there are sound waste oil management practices in place.
- There is equally poor government commitment to ensuring that oils and their wastes are effectively managed to the benefit of the environment.
- There is little monitoring and evaluation of waste oil practices and their environmental impacts.
- There is very little research that is taking place to provide government and industry with appropriate information for policy and management decisions.

4. Proposed Guidelines for Improving Waste Oil Management in Africa

The delegates were requested to define the guidelines (requirements and prerequisites) for a management approach that would be applicable within the African context. The workshop felt that there are numerous areas that require comment and action (see Figure 1).

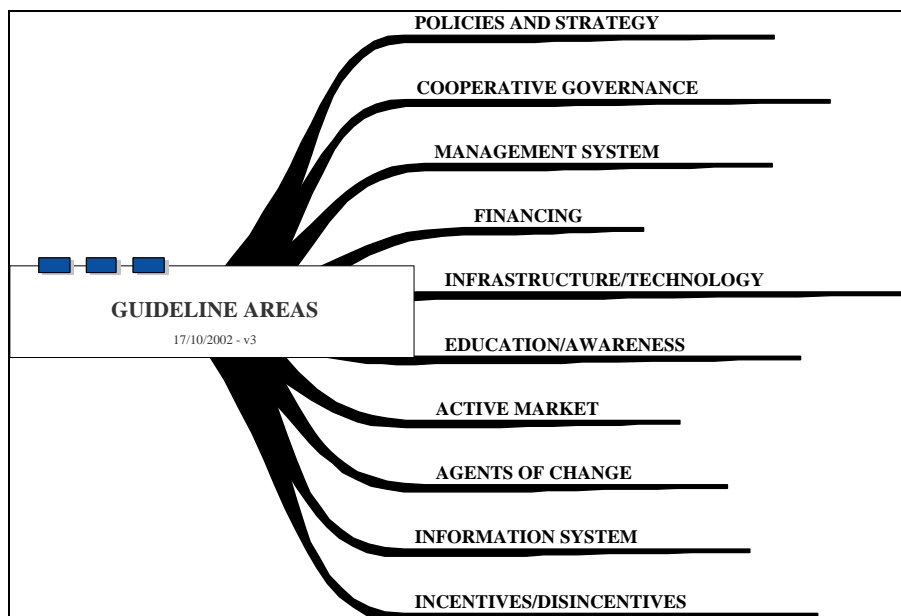


Figure 1: Schematic diagram to highlight areas where countries should consider initiating activities for improving waste oil management.

4.1 Policies and Strategy

There is a need for all countries to review and develop policies that promote better management of waste oil. The approach to this should take into account the following:

- The environmental impacts of current waste oil management practices should be assessed and evaluated in order to determine the extent of the waste oil problem on a national basis and also to understand the contributors to the problems.
- Governments should set waste oil management for priority action and make appropriate commitment statements which reinforce this. The statements should incorporate the principles by which waste oil will be managed.
- The development of waste oil management policy should be a transparent process involving the main stakeholders in the waste oil market.
- Policies should ensure that there is accountability for actions and roles that are required to implement policy.
- The process should lead to the setting of objectives, strategic plans to achieve objectives as well as implementation plans.
- A key component of policy should be that of promoting general awareness about waste oil and the best approaches to managing it.

- Provision should be made for regular reviews of progress towards meeting the policy and its objectives.

4.2 Management System

Appropriate national waste oil management systems need to be set up within African countries. These should provide the following elements:

- Leadership and accountability for national waste oil management.
- Interactive involvement of all stakeholders in the necessary decision-making and programmes
- Management systems that cater for:
 - Necessary Environmental Impact Assessments including risk assessment.
 - The implementation of policy and the goals that have been set.
 - Regular review audits.
 - Appropriate planning and the allocation of resources.

4.3 Agents of Change

A major contributor to the existing waste oil management problems is the fact that many countries simply lack the ability to change the ways and customs that prevail. The workshop indicated that there is a great need to change perceptions and attitudes. This can be achieved by the introduction of "**Agents of Change**" which are capable of introducing and hastening the required actions. Examples of such agents include regulations, incentives, schemes, projects, industry/government forums, the establishment of institutions/leaders with specific responsibilities, promotion of NGO activity, community organisations and individual patrons within industry. Each country's policy and strategy should ensure that there are sufficient agents of change to overcome the inertia of changing the old and unacceptable practices.

4.4 Cooperative Governance

There should be promotion of the concept that working together and cooperation is the best way to achieve what is in the best interests of each country and its sustainability. This means that proactive partnerships between, and within, government, industry and civil society need to be developed. It is unacceptable for there to be no coordination or

interaction between government departments or between industrial waste oil generators. Mechanisms to promote and facilitate this cooperative interaction are required.

4.5 Incentives/Disincentives

Countries should consider the introduction of a system of incentives/disincentives which encourage/discourage certain approaches and practices. Some of the envisaged suggestions include:

- Government legal incentives such as the introduction of:
 - Permits
 - Certification
 - Self-regulation systems for industry
 - Fines
- Community incentives such as:
 - Recognition awards
 - Citizen empowerment programmes
- Monetary incentives such as:
 - Tax exemption
 - Deposits and bonds
 - Fines
- Industry Incentives such as:
 - Standards
 - Certification
 - Self-regulation

4.6 Developing an Active Market

All countries should strive to secure better knowledge of the market in terms of contributors to waste oil. Free trade should be encouraged but this cannot override environmental or human health aspects. An active market should be promoted with transparent and open knowledge of:

- Who is generating waste oil
- What are the market processes and who are the players
- Who are the potential outlets for waste oil

The active market can be also be promoted by having joint forums and sector-based newsletters and /or websites to promote information exchange.

4.7 Financing

The development of starter financing and funding mechanisms to initiate waste oil minimisation and/or recycling initiatives is recommended. The way in which this is carried out could include several options such as an industry fund or a national environmental fund based on mutually negotiated contributions from government and industry. This could be based on an agreed percentage of the sales and tax contributions from oil products.

The structure of the fund and its management is open to negotiation in terms of the regulations of the particular country. However, the fund could be used amongst others to:

- Finance small industries to initiate collection, storage and recycling of waste oils.
- Promote national awareness on waste oil and its management.
- Promote coordination and self-regulation of waste oils.
- Provide research and project funding for new initiatives.

4.8 Infrastructure and Technology

Waste oil management requires the use of appropriate infrastructure and technology. All facilities involved with waste oil management should preferably be user and environmentally friendly. In each case approaches need to be developed on:

- How to finance such facilities?
- Which facilities and what technologies are most appropriate?
- Who will be the owners?
- How will the facility be operated?
- Where will the facility or facilities be sited in order to be most effective for the market?
- What standards should be instituted and how will compliance be regulated?
- The legislation that might be required to enable the correct use and management of facilities and technology.

4.9 Education and Awareness Programmes

The initiation of action education and awareness programmes on waste oil and its management should be considered a priority issue. Recommended activities include:

- Establishment of waste oil forums and community awareness campaigns.

- Support of NGO organisations.
- Support of activities at schools, universities and technical colleges.
- Introduction of waste oil material into school and university curricula.

4.10 Information Management Systems

The management of any resource or waste material cannot be done without the establishment of an information management system that collects and reports on relevant information concerning the resource. In the case of oil products and their associated waste it is important that each country establishes an information system that provides continual information on who is manufacturing, who is distributing and what is the fate of the associated waste oils. The waste oil information management systems within each country should have the following functions and characteristics:

- They should maintain a database of all oil users and the details of their permits.
- They should contain a national inventory of waste oils, their siting and details of the quantities and means by which these wastes are treated or disposed of.
- They should ideally be transparent and have the cooperation of industry in terms of the provision and exchange of relevant information.
- There should be regular (annual) reporting on the status of waste oils and their disposal/usage. This should be done from a technical, quantitative and economic perspective.
- The management of the system should be sustainable in that funding could be provided out of a national fund derived from taxes, permits or a levy on oil products. Government, in collaboration with industry, should be involved interactively in the management of this.

5. Conclusions and Recommendations

This workshop represented only the first step in the development of an approach to improving waste oil management practices within the African region. It succeeded in identifying some of the main issues that need to be addressed by most African countries if waste oil management practices are to be considered as being environmentally sound. The model of the ROSE Foundation is one that is useful for countries to consider in the pursuit of practical and economic ways of introducing and operating used oil-recycling activities.

However, the workshop recommended that immediate follow-up activities within the following 12 months should include:

- The convening of similar workshops involving other countries within Africa;
- The preparation of guidelines for waste oil management and their circulation to African countries;
- The convening of follow-up workshops that focus on specific areas of waste oil management

Waste Oil management Issues and Concerns for African Countries - Case Study from Subregion-French Speaking African Countries
By Dr. Oumar CISSE

ACTIVITIES

- A. National Pilot Study : Burkina Faso, Democratic Republic of Congo & Senegal (Informal Sector) Country Selection Criteria:** coastal country, a non coastal one and a country from Central Africa.
- B. Production of a Manual on Environmentally Sound Management of Used Oils for Francophone Africa**
Objective : Support Decision Makers on the diagnosis of the national situation, and the preparation of a national plan of environmentally sound management of the used oils in the sub-Saharan countries.

National Study Content (2 months)

- **Launching Workshop (3 days):** To get the support of national institutions and share the methodology, issues addressed (presentation of the project, its expected outputs, formulation of a programme of activities, test of the field visit methodology,)
- **Realization of National Diagnosis:** it will consist of the description, assessment, quantification, identification of the current situation of used oils management
 - Field Visits
 - Compilation of information
- **Mid term National Workshop:** Presentation of the National diagnosis results and preparation of the feasibility study
- **Feasibility Study:** To prepare the National Plan of the environmentally sound management of used oils
- **Final National Workshop:** To report back et share results of the projects

Production of a Guidance Manuel for Francophone Africa (100 pages, French)

- **Components**
 - Inventories (Use, Nature & Stocks)
 - Environmental Issues of Used Oils recycling and Environmental Impact Assessment on Ecosystems and Public Health
 - The Study of existing Used Oils Recycling and Burning Practices
 - Regulatory Aspects
 - Evaluation of the potential Industrial Installations For treatment and disposal
 - Economic Assessment of Used Oils Management Sector
 - Preparation of Environmentally Sound Management National Plan

Management of Used Oils in Senegal

- Problems : used oils in water and air pollution
- Involvement of a private company since 1982, SRH
- Inter-ministerial Decree (Environment & Industry) which bans burning and rejection of worn oils in nature
- Oils companies committed to buy the regenerated oils (incorporation in lubricants; 40%)
- Problems of SRH : Liberalization in 1986 (importation of unrefined olive oils), Old fashioned process (acid one), low collection
- Consumption of lubricants in Senegal: 15 000 tons/y
- Collected quantity : 1 500 tons/year

Developing Guidelines and Standards for Used Oil Management
By Engr. Dele Ayeni
Standards Organisation of Nigeria, Lagos, Nigeria

INTRODUCTION

The subject of the paper is “Developing Guidelines and Standards for Used Oil Management”.

The topic becomes apt at a point like this when SON in conjunction with Federal Ministry of Environment is collaborating to make the environment a safer place for mankind. Recently, SON reviewed the Standards on Petrol and Diesel to reduce the sulphur content level.

SON being the National Standards Body is charged with the responsibility of elaborating standards and ensuring compliance to government policies on standardization and quality control.

I feel honoured indeed to have been given the privilege to speak to you all on this great occasion on “Developing Guidelines and Standards for Used Oil Management”.

The subject presents a fundamental issue when viewed alongside with the ways used oil is being disposed in the country. Our environment is continuously being decimated by used oil poured carelessly on the ground and in water drains without giving a thought to its effect on the eco-system.

It is against this background that SON is calling on all stakeholders to join hands and work out ways of managing used oil to ensure sound management practices of used oil with a view to protecting the environment and health of Nigerians and Africans at large.

This is why we feel this workshop could not have come at any other time but now and it is in the light of this that I welcome you to this presentation.

THE MANDATE:

Standards Organisation of Nigeria (SON) was established by Act NO. 56 of 1971 which vested on it the authority for Standards elaboration, specification and quality assurance system of commodities, manufactured industrial and imported products and services generally, including metrology. This act has since undergone various amendments the latest

of which is act No 18 of 1990, which gave the organization an autonomous status as a parastatal under the supervision of the Federal Ministry of Industries.

FUNCTIONS OF SON

Standards Organisation of Nigeria is charged under the above Act to perform among other things these functions:

- Organise tests and do everything necessary to ensure compliance with designated approved standards.
- Undertake investigations as necessary into the quality of facilities, materials and products in Nigeria and establish quality assurance system including certification of laboratories systems and products.
- Ensure and maintain a reference standard for calibration and verification of measures and measuring instruments (metrology).
- Compelled and update Nigerian Standards specifications and inventory of products/services requiring standardization.
- Register and regulate standard mark and specification
- Advice department of government of Federation or a state on specific problems relating to standard specification.

WHAT IS USED OIL

Used oil means any semi-solid or liquid consisting totally or partially of mineral oil or synthesized hydrocarbon (synthetic oil), oily residues from tanks, oil waste mixtures and emulsions. All these may arise from industrial, or non-industrial sources during process such as lubrication that makes the oil unsuitable for its original purposes due to the presence of contaminants or impurities and loss of original properties.

COMPOSITION OF ENGINE OIL

Engine Oil is a combination of Base Oil and additives. The additives impart some specific properties to the lubricating oil. Engine oil contains 70% base stocks and a few of a percentage of 30% of additive packages either used singularly or as a combination.

Such additives include:

- Oxidation inhibitors (Antiwear additives)
- Corrosion inhibitors (Antirust)
- Defoamants (Pour point depressants)
- Viscosity Index improvers (Detergent and dispersant)
- Extreme pressure additives (Emulsifier).

These additives are chemical compounds made from metals such as Barium, Boron, Calcium, Magnesium, Molybdenum, Phosphorus, Silicon, Sodium, Zinc etc. There are specific characteristics that are used to describe, identify and also influence the choice of lubricating oils for various applications. Viscosity is the most important single characteristics of a lubricating oil and it is a measure of its internal resistance to flow or friction. Other important parameters include viscosity index, gravity, flash point, pour point, and sulphated ash, among others.

VALUES OF A GOOD LUBRICANT

Lubricants are essentially valuable for the maintenance of engines, devices, machines, and surfaces in contact among others. Because of the presence of additives, lubricants provide the following:

- Maintain a film of oil between moving parts so as to minimize the functional effect of metal to metal.
- Act as a cooling medium, thus absorbing excessive heat generation
- Remove dirt from engine parts thus keeping them clean and efficient.
- Prevent destructive rust and corrosion in the engine.
- Act as a seal in some areas where fluid are not desirable or feasible for application e.g. Piston ring grooves.
- Prevent seizure in heavy duty industrial machinery and equipment.
- Prevent the formation of deposits/sludge in the internal combustion engines.

In all, the additive component is a major influence in the quality performance of lubricants. The composition and choice of additives differ from company to company.

EFFECT OF USED OIL ON ENVIRONMENT

The responsibility of government, its agencies and support from corporate and individual need to be intensified to make our environment a better place for this and future generation. It is rather unfortunate that the national environmental policy is very unpopular because the corporate world sees it as an anti-economy and a necessary debt to be paid for industrialization of the urban centers.

Confirmed studies by bodies have shown that the biosphere is full of green house gases comprising of 40-45% of CO₂, 20% of CH₄, 17% of CFCs and 12% of NO₂ and Ozone.

In Nigeria, an average of 300million litres of Lubricating Oils are consumed annually. The potential used oil level is about 80% of the annual consumption and thus the environment is prone to about 240 million litres of used oil for management. Most of these either ends up in the drains or are poured carelessly on the land thus polluting the environment.

Nigerian government through Act 53 of 1983 and Environmental Guidelines and Standards for the Petroleum Industry (EGASPIN) 2002 empowered both the Federal Ministry of Environment and Department of Petroleum Resources (DPR) respectively to prevent, and minimize the undesirable ecological effects associated with Petroleum Industry. The Regulation further stated, "No Oil, in any form shall be discharged into public drain, rivers, lakes, seas or underground injection without a permit issued by the Minister of Environment".

SON on its own part is looking at the possibilities of elaborating Standards for used oil for various purposes such as Re-use, Re-cycling and Recovery. This standard shall consider the basic element of environmentally sound managements that include:

- The extent to which used oil can be treated for specific usage.
- Potential harm to human and health
- Processing of hazardous wastes and by products of the process itself and
- Workers safety among others.

CONCLUSION

Mr. Chairman and distinguished audience, from the foregoing, the need to develop guidelines and standards for used oil management cannot be over emphasized. It needs the cooperation of all to achieve this. Accordingly as the proverbial bird on Prof. Chinua Achebe's "Things Fall apart" which have learnt to fly without perching in order to outwit the hunter, SON will at all times endeavour to be alive to its responsibilities as change/technology managers.

SON will also like to use this medium to appeal to Nigerians to stop the indiscriminate pouring of used oil into drains or on the ground, thus polluting our environment.

Please come let us work together for a safer environment.

APPROPRIATE LOW COST TECHNOLOGY
FOR USED OIL RECYCLING
 BY
BOSKEL NIGERIA LIMITED
 •THERMAL PROCESS ENGINEERING.
 •ENVIRONMENTAL MANAGEMENT.

BASEL CONVENTION REGIONAL WORKSHOP FOR THE DEVELOPMENT OF ENVIRONMENTALLY SOUND MANAGEMENT OF USED OILS IN AFRICA.
 LAGOS, DECEMBER 2004

BOSKEL

BOSKEL IN BRIEF

- INCORPORATED IN 1989.
- ENVIRONMENTAL MANAGEMENT
- THERMAL PROCESS ENGINEERING.
- STAFFING - 75 NIGERIANS.
- CLIENTS - INCLUDE: SPDC, ELF, SNEPCO, TSF, DEL, SCHLUMBERGER, HALLIBURTON ETC.
- PRODUCTS INCLUDE SMOKELESS FLARES, TDUs, INCINERATORS ETC.

BOSKEL

USED LUBE. OILS

SOURCES:

1. VEHICLES - LAND, SEA, AIR.
2. MACHINERIES – AGRICULTURAL, CONSTRUCTION.
3. INDUSTRIES.

TYPES:

1. PETROLEUM BASED
2. ADDITIVES. SYNTHETIC

BOSKEL

USED LUBE. OILS

QUANTITIES

VEHICLES:	>900,000,000 PER ANNUM.
MACHINERIES:	>200,000,000 PER ANNUM.
INDUSTRIES:	> 50,000,000 PER ANNUM.
TOTAL:	>1,150,000,000
	=> >95,000,000 MONTHLY

THIS WILL FILL A 2M DEEP SWIMMING POOL, WHICH IS AT LEAST 1KM LONG AND AS WIDE AS A FOOTBALL FIELD.

BOSKEL

TECHNOLOGY

APPROPRIATENESS

1. DEVELOPED BY AFRICANS.
2. IMPROVED AVAILABILITY.

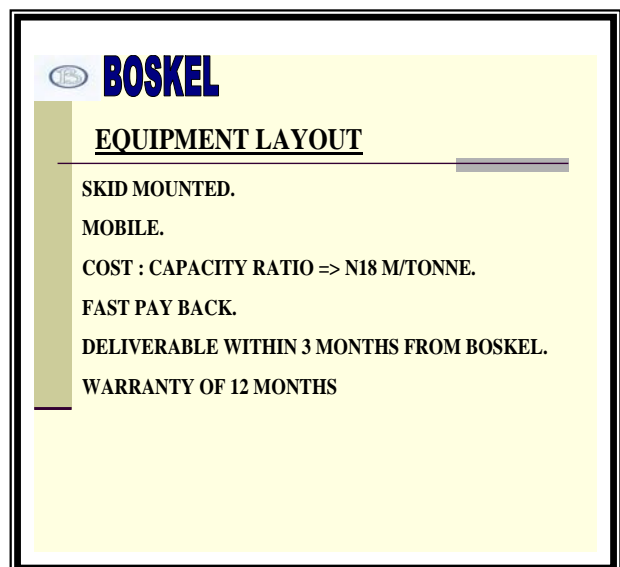
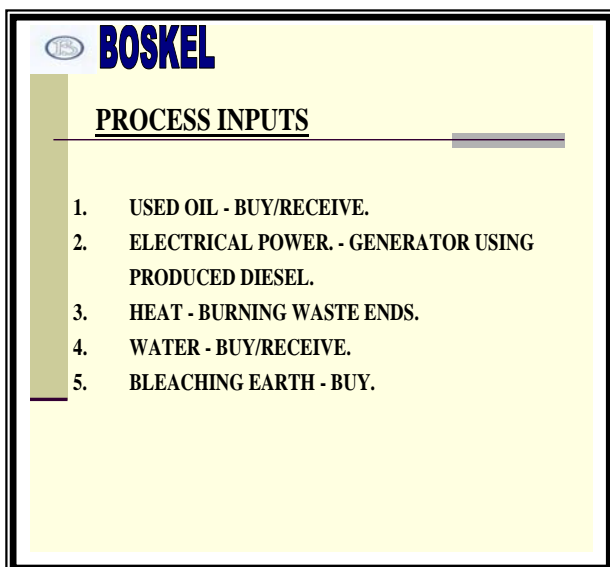
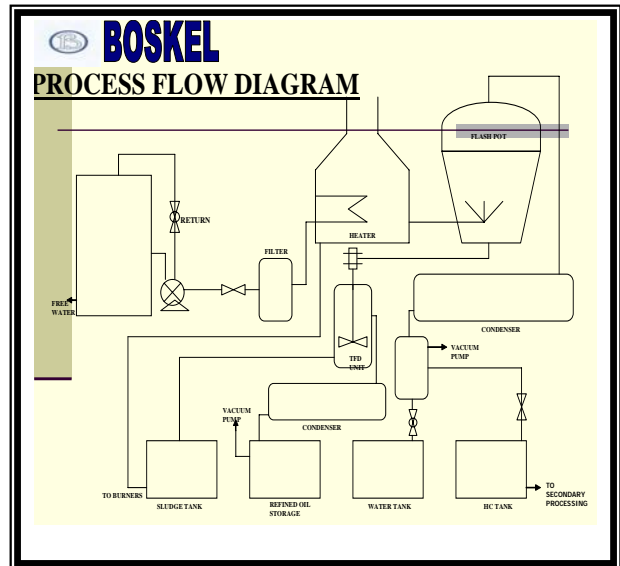
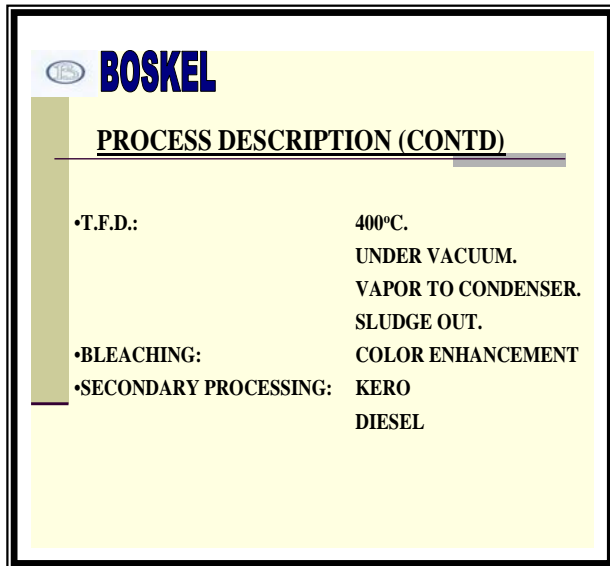
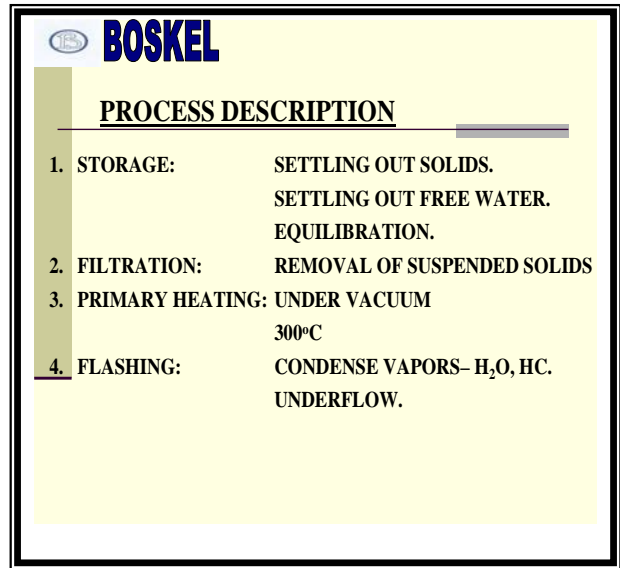
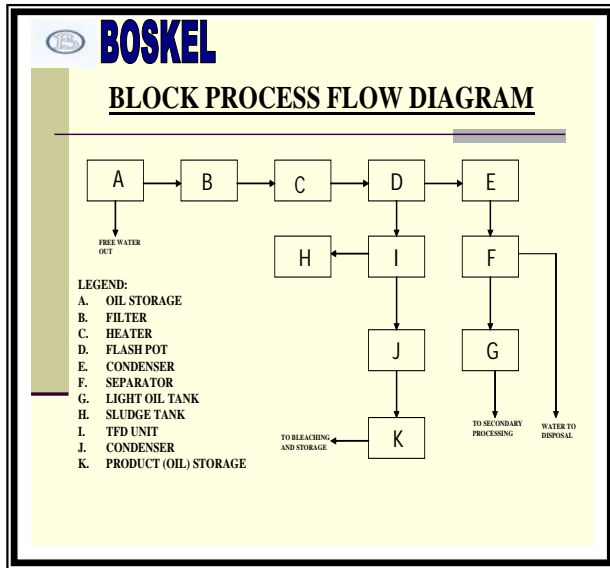
LOW COST


1. AFFORDABLE.
2. MULTIPLIABLE.

BOSKEL

CONTAMINANTS IN USED OILS

1. WATER.
2. LIGHTER BOILING HYDROCARBONS – THERMO-MECHANICAL CRACKING.
3. COLOR-CARBON DEPOSITS.
4. SOLIDS – INCLUDING METAL CHIPS.



 **BOSKEL**

EQUIPMENT LAYOUT

SKID MOUNTED.

MOBILE.

COST : CAPACITY RATIO => N18 M/TONNE.

FAST PAY BACK.

DELIVERABLE WITHIN 3 MONTHS FROM BOSKEL.

WARRANTY OF 12 MONTHS

Feasibility Study on ESM of Used-oils in Nigeria

Sustainabiliti Limited

0803 302 6092



Study Goals

- ◆ Provides a description of the road map for developing a national plan for the environmentally sound management of used oils in Nigeria.
- ◆ Considers the various methods available taking cognisance of the technical, legislative, economical and environmental feasibility of each.

Project need

- ◆ The appropriate management of waste oil is a common problem for many African countries where it poses negative environmental and human health risks because of inadequate systems for collection, storage, recycling, disposal, etc.
- ◆ This is happening despite the availability of technology and management systems in several parts of Africa.
- ◆ There is therefore a need to stimulate awareness and promote technology transfer within sectors involved with the general oil market, particularly businesses that produce market or sell oil products and could promote better waste management practices in Nigeria..

Introduction

- ◆ The management of used oil in Nigeria is particularly important because of the large quantities generated nationwide, their potential for direct re-use, reprocessing, reclamation and regeneration and because they may cause detrimental effects on the environment if not properly handled, treated or disposed of.
- ◆ Used lubricating and other oils represent a significant portion of the volume of organic waste liquids generated worldwide.
- ◆ The three most important aspects of used oils in this context are: contaminant content, energy value and hydrocarbon properties.

- ◆ Used oil as referred to in this report, is an oil from industrial and non-industrial sources which has been used for lubricating or other purposes and has become unsuitable for its original purpose due to the presence of contaminants or impurities or the loss of original properties

- ◆ The United States Environmental Protection Agency (EPA), simply defines used oil as exactly what its name implies—any petroleum-based or synthetic oil that has been used. During normal use, impurities such as dirt, metal scrapings, water, or chemicals can get mixed in with the oil, so that in time the oil no longer performs well. Eventually, this used oil must be replaced with virgin or re-refined oil to do the job at hand. EPA's used oil management standards include a three-pronged approach to determine if a substance meets the definition of used oil.

◆ To meet EPA’s definition of used oil, a **substance must meet each of the following three criteria:**

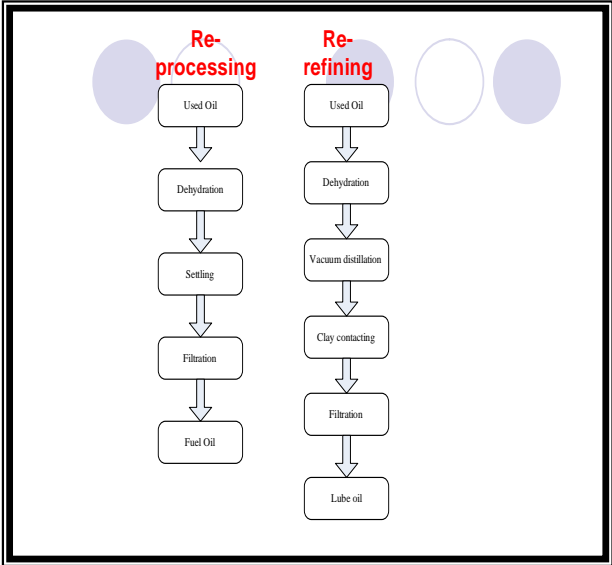
◆ **Origin**—the first criterion for identifying used oil is based on the origin of the oil. Used oil must have been refined from **crude oil** or made from **synthetic** materials. Animal and vegetable oils are excluded from EPA’s definition of used oil.

◆ **Use**—the second criterion is based on whether and how the oil is used. Oils used as lubricants, hydraulic fluids, heat transfer fluids, buoyants, and for other similar purposes are considered used oil. Unused oil such as bottom clean-out waste from virgin fuel oil storage tanks or virgin fuel oil recovered from a spill; do not meet EPA’s definition of used oil because these oils have never been “used.” EPA’s definition also excludes products used as cleaning agents or solely for their solvent properties, as well as certain petroleum-derived products like antifreeze and kerosene.

◆ **Contaminants**—the third criterion is based on whether or not the oil is contaminated with either physical or chemical impurities. In other words, to meet EPA’s definition, used oil must become contaminated as a result of being used. This aspect of EPA’s definition includes residues and contaminants generated from handling, storing, and processing used oil. Physical contaminants could include metal shavings, sawdust, or dirt. Chemical contaminants could include solvents, halogens, or saltwater.

Options for Used oil Reuse

- ◆ **Recycling**
- ◆ **Reprocessing**
- ◆ **Reclamation**
- ◆ **Regeneration**



Recycle, Reuse, Recover

- ◆ **Reconditioned** on site, which involves removing impurities from the used oil and using it again. While this form of recycling might not restore the oil to its original condition, it does prolong its life.
- ◆ **Inserted into a petroleum refinery**, which involves introducing used oil as a feedstock into either the front end of the process or the cooker to produce gasoline and coke.

◆ **Re-refined**, which involves treating used oil to remove impurities so that it can be used as a base stock for new lubricating oil. Re-refining prolongs the life of the oil resource indefinitely. This form of recycling is the preferred option because it closes the recycling loop by reusing the oil to make the same product that it was when it started out, and therefore uses less energy and less virgin oil.

- Re-refining requires modern processes which are expensive to operate when all safety and environmental considerations are included into the overall operating system.
- Apart from economic considerations, oil regeneration technologies depend to some degree on the quality of waste oil and particularly in it not containing significant concentrations of more difficult to process oil products such as heavier fuel oils or chlorinated hydrocarbons, the presence of which can seriously affect the technical performance of the regeneration process, and its ability to produce lubricating or similar products of sufficiently good quality.
- All regeneration processes involve the application of reasonably sophisticated technology, and require care and expertise in their operation.

- Regenerated products such as lubricants cannot command prices higher than premium quality new materials, in reality they usually sell for somewhat less.
- Thus, regeneration processes are constrained both by feedstock and product prices which are dictated by oil product prices, and the margin between feedstock costs and product income must cover the total regeneration process cost if the activity is to be economically viable as the process will produce wastes that have to be disposed of with the disposal costs of the residues representing a significant proportion of total costs.

- ◆ **Processed and burned for energy recovery**, which involves removing water and particulates so that used oil can be burned as fuel to generate heat or to power industrial operations.
- ◆ This form of recycling is not as preferable as methods that reuse the material because it only enables the oil to be reused once. Nonetheless, valuable energy is provided (about the same as provided by normal heating oil). The inherent high energy content of many used oil streams may encourage their direct use as fuels, without any pre-treatment and processing, and without any quality control or product specification.

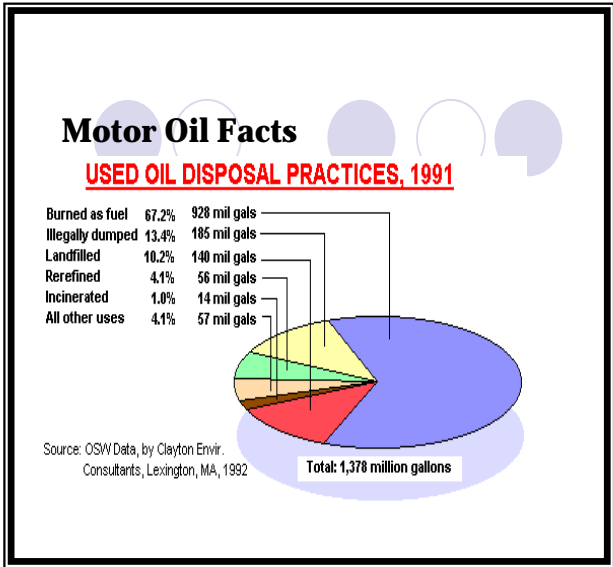
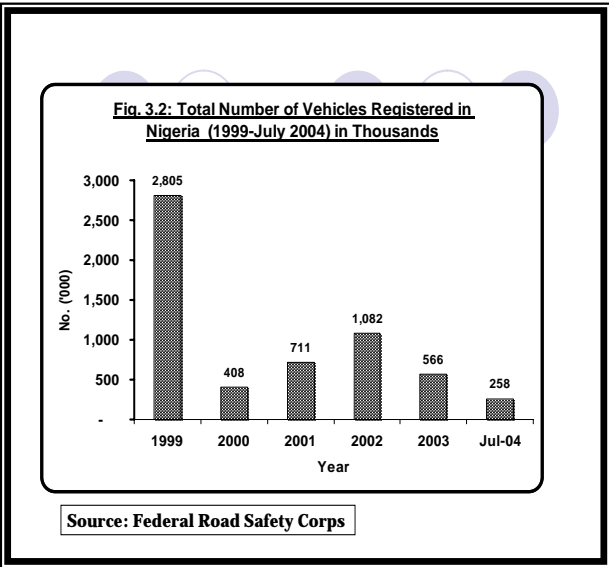
- Such direct uses do not constitute good practice, unless it can be demonstrated that combustion of the waste can be undertaken in an environmentally sound manner.
- The use of waste oil as fuel is possible because any contaminants do not present problems on combustion, or it can be burnt in an environmentally sound manner without modification of the equipment in which it is being burnt.

- Where fuels are to be marketed broadly, it is certainly desirable that used oils are subjected to both source and quality screening and those products are supplied to a specification. As a precautionary measure for the overall system integrity, conditions should be expressly specified to ensure a minimum level of control is established, and that equipment for blending, separation, etc. is provided; used as necessary; and properly maintained when this type of activities are subject to a licence, permit or authorisation system.

Crankcase oils

- ◆ Mismanagement of used motor oil is a serious, but little-recognized, environmental problem.
- ◆ Every year, privately owned automobiles and light trucks have the potential to generate at least 300 million gallons of used crankcase oils.
- ◆ This mismanagement causes needless damage to streams, ground water, lakes, and the oceans and wastes a valuable non-renewable resource, causing us to be more dependent on foreign imports of oil as the refineries are epileptic in their operations.

- ◆ To solve the used oil problem, we must stop careless, destructive practices & ensure that oil is, in fact, recycled.
- ◆ Dealing with the millions of sources involved demands a bottom-up, rather than a top-down, approach.
- ◆ Improving used oil management is one area where local governments, often working with private sponsors and civic organizations, are in an ideal position to help solve a major environmental problem.



- ◆ Since 1000 AD, world population has tripled, while fossil fuel use has grown tenfold.
- ◆ In 1989, almost 60% of USA's automotive oil was changed by consumers themselves.
- ◆ Used oil from a single oil change (approx. one gallon) can ruin a million gallons of fresh water - a year's supply for 50 people.
- ◆ Used oil is insoluble, persistent, slow to degrade, sticks to everything from beach sand to bird feathers, and can contain toxic chemicals and heavy metals that pose a health threat to humans, plants, and animals.

- ◆ An estimated 200 million gallons of used motor oil is improperly disposed of each year in the U.S. by being dumped on the ground, tossed in the trash (ending up in landfills), and poured down storm sewers and drains.
- ◆ Recycling used oil would save the U.S. 1.3 million barrels of oil per day.
- ◆ The world's largest waste oil processing plant is located in East Chicago, Indiana. The facility is to recycle 75 million gallons per year of crankcase and industrial oil and 20 million gallons per year of oily wastewater.
- ◆ One gallon of used oil provides the same 2.5 quarts of high quality lubricating oil as 42 gallons of crude oil.

Legislative Feasibility

- ◆ The Federal Environmental Protection Agency (FEPA) and now Federal Ministry of Environment (FMEEnv.) was established on 30th December 1988 by Decree No. 58 of 1988, and charged with the full legal responsibility to control and oversee the state of the Nigerian environment.

- ◆ Decree No. 58 of 1988 as amended by FEPA Decree No. 59 of 1992 presents FEPA as the environmental watch-dog and conscience of the nation whose function, amongst others, is to motivate and inspire, to raise the levels of environmental action and awareness, and take the lead in the formulation and co-ordination of environmental policy and monitoring activities at all levels of government and sectors of the Nigerian economy.

Other Legislation on the Environment


- Harmful Wastes (Criminal Provisions) Decree 42 of 1988;
- Federal Environmental Protection Agency Decree 58 of 1988 as amended by Decree 59 of 1992 and further amended by Decree 14 of 1999;
- The National Policy on the Environment (1989,1999);
- The National Policy Guidelines and Standards for Environmental Pollution Control in Nigeria (1991);
- National Effluent Limitation, Regulations S.I. 8 of 1991;
- Pollution Abatement in Industries and Facilities Generating Wastes Regulations S.I.9 of 1991;

- Hazardous & Solid Wastes Management Regulations S.I.15 of 1991;
- Environmental Impact Assessment Decree 86 of 1992;
- Sectoral Guidelines for Environmental Impact Assessment;
- National Guidelines for Environmental Audit in Nigeria, 1999;
- National Guidelines on Environmental Management system in Nigeria 1999;
- National Guidelines on Hazardous Chemical Management, 2001
- Handbook on Hazardous Waste Management, 2001;

- ◆ The National Effluent Limitation, Regulations S.I. 8 of 1991; **makes it mandatory for industrial facilities to install anti-pollution equipment, and makes provision for effluent treatment while prescribing maximum limits of effluent parameters allowed for contravention including oil and grease from various manufacturing or service industrial sector. It further prescribes limit for discharge of oil and grease into surface water (10mg/L) and for land application (20mg/ml).**


- ◆ The National Environmental Protection (Pollution Abatement in Industries and Facilities Generating Wastes) Regulations S.I.9 of 1991 among other things **impose restrictions on the release of toxic substances and stipulates requirements for monitoring of pollution to ensure that permissible limits are not exceeded while unusual and accidental discharge's contingency plans, generator's liability and strategies for waste reduction and the safety of workers are put in place.**

- S 15(2) stipulates that “no oil in any form shall be discharged into public drain, rivers, lakes, sea, or underground injection without a permit issued by the Agency or any organisation designated by the Agency (FMEnv.)”
- S 11 (1) states that “the collection, treatment, transportation, and final disposal of waste shall be the responsibility of the industry or facility generating the waste.”
- S 17 states that “An industry or facility which is likely to release gaseous, particle, liquid, or solid untreated discharges shall install into its system, appropriate abatement equipment in such manner as may be determined by the Agency (FMEnv.)”



- ◆ Hazardous and Solid Wastes Management Regulations S.I.15 of 1991 regulates the collection, treatment and disposal of solid and all forms of hazardous wastes from municipal and industrial sources, and gives the comprehensive list of chemical and chemical wastes by toxicity categories.

(Empty box)



- ◆ In the interim, a Policy directive from the FMEnv., to all facilities and individuals generating used oils to ensure discharge into designated receptacles in conjunction with Lubricant marketers / producers.
- ◆ This will require Awareness campaign and the empowerment of the FMEnv. through recruitment and training of Enforcement Officers.

Technical Feasibility

- ◆ Used engine oil constitutes the major portion of used oil in Nigeria.
- ◆ Often disposed of indiscriminately into the environment posing a threat to human health.
- ◆ A widespread source of environmental degradation and ecological damage in the country.
- ◆ Considering that there were 194,394 km of roads in Nigeria with 60,068 km paved (including 1,194 km of expressways, and 134,326 km unpaved as at 1999, while over 90% of engine oil change is carried out by road-side mechanics in locations scattered all over the 774 Local Government Areas in Nigeria, we should not be surprised.

Main Actors

- Generators
- Collection centres and Aggregation points
- Dealers / Sellers
- Users / Buyers
- Producers
- Burners

Economic feasibility

- ◆ Adequate supply of used oil exists in Nigeria to ensure the sustainability of a used oil management programme in the country.
- ◆ With the current electricity supply situation, most Nigerian commercial & manufacturing concerns make do with their own Electricity Generating sets.
- ◆ Some companies particularly in the Food and Beverage industrial sector like Cadbury Nigeria Plc, Stanmark Cocoa Processing Company Limited are on Electricity Generating Sets 24-hours daily to maintain the integrity of their products which are susceptible to spolioation if there is a 30-second power outage.

Collection Methods

- ◆ Curb-side collection either as a regular part of trash and garbage collection, or as part of pickups for other recyclable materials (such as glass, plastics, aluminium, and paper) The used oil programme must work with the collectors so that they can integrate used oil into their operations. Trash collection trucks or trucks designed for collection of recyclables can be retrofitted with a used oil collection tank or a rack on which to store containers of used oil. The used oil will need to be transferred from the truck to a holding tank until it is picked up by a reputable hauler.

- ◆ **Central collection:** A central collection station is a place where do-it-yourselfers can drop off used oil in an appropriately designed drum or tank. The station should be well marked to ensure that it is used for uncontaminated lubricating oil only and should be serviced regularly by a hauler to make sure that there is always room to receive more oil.

Likely Collection Station Locations

- Auto supply stores**
- Fire stations**
- Automobile service stations**
- State auto inspection stations**
- Convenience stores**
- Municipal garages**
- Discount stores**
- Government and private garages**
- Car dealerships**
- Landfills open to the public (especially in rural areas)**
- Retail outlets that provide oil changing service**
- Recycling drop-off centres**
- Marinas**

- ◆ The economic viability of a used oil management programme will be affected by transport costs, end uses, pollution abatement investment; social acceptability considerations as well as regulations would form part of the analytical procedure. Regulations and other economic instruments would need to be developed and implemented to assist in sustaining the market.
- ◆ It should be noted that setting up a used oil recycling programme is costly as it requires an effective network that is all encompassing.

Environmental Feasibility

- ◆ Although some of the reuse and recycling techniques are technically sound, the costs involved in the re-refining process and combustion of used oils can be very high. In this regard, source reduction should be seen as a primary objective in a strategy for hazardous waste management. The economics of the reuse and recycling of used oils as a preferred option must be critically examined before considering final disposal. Re-refining may not provide an adequate return on investment thus; viable and ecological sound alternatives should be investigated before considering final disposal options.

◆ The direct burning of used oil in conventional combustion devices can create serious pollution problems and although this can be reduced by fitting pollution abatement equipment, in most cases this is not very practicable as was the case at Universal Steels Company, Ogba-Ikeja, Lagos State which was closed down by FEPA.

● The burning in specially designed waste incinerators can diminish these problems, though the process is very expensive, particularly if they do not provide for energy recovery as in the case of LAWMA owned Waste Incinerators in Lagos State.

Consideration Criteria for adopting BAT

- The extent to which used oil can be treated to obtain specific products;
- Potential of harm to human health and environment;
- Economic balance and market opportunities;
- Transport requirements / costs;
- Location of treatment facilities;
- processing of the hazardous waste contaminants and by-products of the process itself;
- Worker safety.

● Questions relating to the appropriateness of certain treatment technology are a function of the regulations, availability of facilities, their location, the market mechanism (competitive uses of the products). Experienced professionals and waste managers are required to critically assess the various factors before deciding to select a preferred recycling or reuse option. The contaminants and environmental / health risks associated will ultimately limit the number of acceptable reuse or recycling options of used oils.

● The availability, or otherwise, of waste management resources (collection, storage, transport and treatment) will restrict the selection of environmentally sound disposal options including blending, segregation, gravity separation, strategic storage for the preparation of optimal feed stock blend.

- Site selection,
- Design standards for facilities,
- Training of operators of the facility,
- Environmental assessment,
- Operation/discharge standards, monitoring and control,
- Emergency and contingency plans,
- Records and record keeping,
- Decommission,
- History of management practices,
- Preferred management methods for a particular waste stream,
- Regulatory instruments,
- Compliance with technical standards,
- Enforcement requirements.

Next Steps

- Presently, there is no used oil management programme in Nigeria. It is necessary for the FMEnv, the DPR, and SON to jointly harmonise the framework of the proposed programme in conjunction with private sector operators in the Oil sector and interested stakeholders in the Nigerian State.
- As envisaged, the initial start-up costs might seem colossal, but the attendant benefits outweigh the costs.

- ◆ Sensitisation through a coordinated public awareness campaign to educate the populace on the importance of recycling used oils, turning 'Waste to Wealth'
- ◆ Capacity building programmes for all Stakeholders
- ◆ Used oils collection methods should be given adequate attention as it will ultimately determine the success of the proposed used oil recycling programme particularly from the small-scale generators.

Possible Sources of Funds

- The MTN Foundation and BAT Nigeria Foundation are among possible sources of funding for this project, apart from the Ecological Fund in The Presidency.
- Donor Agencies – DANIDA, CIDA, etc.
- World Bank & UN Agencies
- For the project to be sustainable, it must, in the long-term, be private-sector owned though public-sector led at the initial planning stage.
- A system whereby oil market operators report their monthly lubricant sales volumes to the DPR similar to the Industry Market Performance Statement (IPMS) in Botswana need to be adopted to build a data base of monthly lubricant sales.

- Furthermore, oil market operators could donate articulated vehicles (Trailers) and funds for designing/manufacturing or purchasing collection vessels, while also providing tanks for use in the storage and processing of used oils under the auspices of the proposed UOCF.
- In Africa, there are established used oil management programmes in Egypt, Senegal, South Africa and Zambia which can be understudied to prepare a blue-print for the proposed programme in Nigeria.

SUSTAINABLE MANAGEMENT OF USED OILS – UNIDO EXPERIENCE

PRESENTED BY UNIDO RIDC

**AT A REGIONAL WORKSHOP FOR THE
DEVELOPMENT OF REGIONAL ACTION
PLAN ON ENVIRONMENTALLY SOUND
MANAGEMENT OF USED OILS IN AFRICA
LAGOS, NIGERIA, 6 – 7 DECEMBER 2004**

UNIDO MISSION

- A SPECIALIZED AGENCY OF THE UN WITH FOCUS ON POVERTY REDUCTION BY FOSTERING PRODUCTION GROWTH
- ASSIST DEVELOPING COUNTRIES AND COUNTRIES WITH ECONOMIES IN TRANSITION IN THEIR FIGHT AGAINST MARGINALIZATION IN TODAY'S GLOBALIZED WORLD
- MOBILIZED KNOWLEDGE, SKILLS, INFORMATION AND TECHNOLOGY TO PROMOTE PRODUCTIVE EMPLOYMENT, A COMPETITIVE ECONOMY AND A SOUND ENVIRONMENT

ENVIRONMENTALLY SOUND INDUSTRIAL DEVELOPMENT (ESID)

- INDUSTRIAL CLEANER PRODUCTION
 - POLLUTION CONTROL AND WASTE MANAGEMENT
 - ESTs, BETs, BATs, LCA
 - AUDITS AND ENERGY EFFICIENCY
- NATIONAL CLEANER PRODUCTION CENTRES (NCPCs)
 - IN CO-OPERATION WITH UNEP
 - INFORMATION DISSEMINATING ON CP, ESTs
 - TRAINING
 - INTERNATIONAL NETWORKING AND LINKAGES
 - REPOSITORY OF INFORMATION MATERIAL ON CLEANER PRODUCTION
 - INVOLVE IN IMPLEMENTING CP DEMONSTRATION PROJECTS

ENVIRONMENTALLY SOUND INDUSTRIAL DEVELOPMENT (ESID) cont..d

- ENVIRONMENTAL MANAGEMENT
 - DIMINISHING EMISSION OF WASTE
 - MONITORING THE IMPACT OF EMITTED EFFLUENT
 - INTRODUCING ENVIRONMENT FRIENDLY TECHNOLOGIES FOR WASTE TREATMENT AND DISPOSAL
 - CAPACITY BUILDING IN ACQUISITION OF ESTs, BEPs, BATs
 - SOUND MANAGEMENT OF HAZARDOUS WASTES

ENVIRONMENTALLY SOUND INDUSTRIAL DEVELOPMENT (ESID) cont..d

- WATER MANAGEMENT
 - DEVELOP THE CONCEPT OF INTEGRATED ENVIRONMENTAL MANAGEMENT IN SOLVING NATIONAL AND REGIONAL PROBLEM OF WATER POLLUTION
 - CAPACITY BUILDING WITHIN THE COUNTRIES AND REGIONS FOR EFFECTIVE ENVIRONMENTAL MANAGEMENT
- BIODIVERSITY CONSERVATION
 - FACILITATE AN ENABLING ENVIRONMENT FOR TECHNOLOGY TRANSFER AND INVESTMENT PROMOTION RELATING TO SUSTAINABLE UTILIZATION OF BIODIVERSITY
 - ENVIRONMENTAL IMPACT ASSESSMENT OF BIOTECHNOLOGY
 - AWARENESS BUILDING IN THE AREA OF GENETIC MODIFICATION

WASTE OILS - CHARACTERISTICS

- SOURCES
 - * COMBUSTION ENGINES
 - * TRANSMISSION SYSTEM
 - * INDUSTRIAL MACHINERY AND EQUIPMENT
 - * TURBINES
 - * HYDRAULIC SYSTEMS
- CONTAINS HIGH LEVELS OF COMBUSTION-DERIVED POLY AROMATICS HYDROCARBONS (PAHs) AND HEAVY METALS
- PAHs ARE LINKED TO CARCINOGENESIS
- HAZARDOUS

DISPOSAL METHODS

- DISPOSED INDISCRIMATELY INTO DRAINS, RIVERS AND OCEANS
- ROAD OILING TO SUPPRESS DUST
- UNCONTROLLED BURNING
- WOOD PRESERVATIVES

ENVIRONMENTAL IMPLICATIONS OF INDISCRIMINATE DISPOSAL

- POLLUTE THE ENVIRONMENT AND CONSTITUTE ENVIRONMENTAL HAZARDS
- WIDESPREAD SOURCE OF ENVIRONMENTAL DEGRADATION AND ECOLOGICAL DAMAGE
- HAS SERIOUS IMPLICATIONS ON THE AIR QUALITY AND THE UNDERGROUND WATER TABLE
- THREAT TO AQUATIC LIFE AND ENDANGERING DRINKING WATER SUPPLY
- CONSTITUTE AESTHETIC NUISANCE

UNIDO FOCUS

- ADDRESS THE ENVIRONMENTAL HAZARDS RESULTING FROM INDISCRIMINATE DISPOSAL
- ASSESS THE SCALE OF POSSIBLE PROBLEMS FROM INDISCRIMINATE DISPOSAL OF WASTE OILS
- ASSESS/EVALUATE THE EXISTING PROCESSING TECHNOLOGIES FOR WASTE OILS
- ESTABLISH ECONOMIC BENEFITS FROM THE RECYCLING/REFINING OF WASTE OILS

UNIDO APPROACH

- UNDERTAKE TECHNO-ECONOMIC STUDIES ON THE FEASIBILITY OF WASTE OIL RECYCLING/PROCESSING
- AWARENESS BUILDING AND EXPERIENCE SHARING THROUGH WORKSHOPS ON WASTE OILS RECYCLING/PROCESSING
- PROMOTE PRIVATE SECTOR INVESTMENT AND TECHNOLOGY TRANSFER
- ASSIST IN DEVELOPING INSTITUTIONAL AND REGULATING FRAMEWORK FOR SUSTAINABLE MANAGEMENT OF WASTE OILS

UNIDO ACTIVITIES

- TECHNO-ECONOMIC STUDIES IN 12 COUNTRIES – FOUR COUNTRIES IN EACH OF ASIA, AFRICA (EGYPT, SENEGAL, KENYA, ZIMBABWE), AND SOUTH AMERICA
 - GENERATION OF WASTE LUBRICANTS
 - EXISTING LEGISLATION RELATING TO WASTE OILS
 - ASSESSMENT OF RELATED ENVIRONMENTAL FACTORS
 - EXISTING OR PLANNED FACILITIES FOR RECYCLING OF WASTE OILS
 - RECOMMENDATIONS ON ECONOMICALLY VIABLE AND ENVIRONMENTALLY SOUND PROCESSING TECHNOLOGIES

CLEAN TECHNOLOGY WORKSHOP FOR RECYCLING OF WASTE LUBRICATING OILS, CAIRO, EGYPT 25-28 JANUARY 1993

- ATTENDED BY 13 AFRICAN COUNTRIES
- FOCUSED ON OPTIMUM MEANS OF DISPOSAL
 - INCINERATION IN A PURPOSE DESIGNED INCINERATOR PLANT
 - USED AS A FUEL COMPONENT AFTER TREATMENT
 - RECYCLING TO RECOVER LUBRICANT BASE OIL

INVESTMENT & TECHNOLOGY PROMOTION

- TECHNO-ECONOMIC FEASIBILITY STUDY CARRIED OUT FOR A PRIVATE COMPANY IN LAGOS, NIGERIA
 - ASSESSMENT OF EXISTING TECHNOLOGIES – KTI, PROCESS, VISCOLOBE, INTERLINE, SOTOLUB ETC.
 - VISITS TO EXISTING PLANT IN EUROPE
 - STUDY ESTABLISHED THE VIABILITY OF ESTABLISHING A RECYCLING/REFINING PLANT
 - INVESTMENT AND TECHNOLOGY PROMOTION

INSTITUTIONAL & REGULATORY FRAMEWORK FOR SUSTAINABLE MANAGEMENT OF WASTE OILS

- PROJECT IN THE PIPELINE
- REDUCE ENVIRONMENTAL IMPACT FROM COMPONENTS THROUGH APPLICATION OF LOW COST ENVIRONMENTALLY SOUND TECHNOLOGIES FOR RESTORATION AND REMEDIATION OF CONTAMINATED SITES
- PILOT DEMONSTRATION ON RECYCLING AND REFINING OF USED LUBRICATING OILS
- FRAMEWORK FOR AN INTEGRATED WATERSHED AND COASTAL OIL SPILL MANAGEMENT
- REGIONAL AND NATIONAL CAPACITY STRENGTHENING
- PROJECT MANAGEMENT, CO-ORDINATION, INFORMATION DISSEMINATION AND STAKEHOLDER INVOLVEMENT

INTERNATIONAL CO-OPERATION/ COLLABORATION FOR SUSTAINABLE WASTE OIL MANAGEMENT

- UN AGENCIES – UNIDO, UNEP, UNDP, IMO, WB/IFC
- BILATERAL/MULTILATERAL FUNDING ORGANIZATIONS – AU, GEF, WB/IFC
- PROCESS TECHNOLOGY LICENSORS
- GOVERNMENT AND PUBLIC SECTOR AGENCIES
- PRIVATE SECTOR COMPANIES, CONSULTANCY FIRMS
- R & D INSTITUTIONS, ACADEMIA
- CIVIL SOCIETIES

ANNEX 1

**A. DRAFT TEMPLATE OF THE ELEMENTS OF A NATIONAL ACTION PLAN ON WASTE OIL MANAGEMENT IN AFRICA
FOCUS OF THE PROJECT: POVERTY ALLEVIATION, JOB CREATION AND ENVIRONMENTAL PROTECTION**

SN	COMPONENT	PLAYERS/STAKEHOLDERS	ISSUES/RESPONSIBILITIES
1.	National Institutional Arrangement	For example, Ministries of Environment, Labour, Finance, Planning & Urban development, Department of Petroleum Resources (DPR), Rural Development, Commerce, Industry, Justice, Private Sector Association, Ministry of Health, Trade Unions, Non Governmental Organizations (NGOs), Environmental, Health, Oil and Gas Committees of the National Assembly, Standards Organization of Nigeria (SON), States Environmental Protection Agencies (SEPA), Presidency, Law Enforcement Agencies, Association of Local Governments of Nigeria (ALGON).	<ul style="list-style-type: none"> - Proper inter sectoral coordination on policy, technical issues - Sharing of information - Development of legal framework, laws and regulation governing ESM of used oil - Specific Regulation to address cradle to grave management of used oil - Enforcement, compliance and monitoring agency need to be in place - Accessions and implementation of relevant international/multilateral Environmental agreements
2.	Regulation of the Oil Industry	<p>a. Formal Sector (oil marketers and used oil generators)</p> <p>b. Informal sector</p>	<p>a.</p> <ul style="list-style-type: none"> - Explore cradle to grave approach (generation, collection, transportation, storage, use, recycling/disposal) - Corporate responsibility of the oil companies in putting aside some funds - Product responsibility (corporate responsibility) <p>b.</p> <ul style="list-style-type: none"> - Organized activities with incentives - More awareness of the health risks and impact - Recognition of informal sectors and organizing them into trade groups - Use of incentives for collectors - Privatization of the management and trade groups of waste oils - Creating awareness - Making use of existing outlets of waste oils as initial collection points - Need to establish confidence - Provision of uniform storage facilities at strategic points possibly with same colour and appropriate inscription - Agents providing storage facilities to be responsible for maintenance - Storage facilities to be close to generators for easy assess
3.	Addressing Health and Environmental Impacts	<ul style="list-style-type: none"> - Ministry of Health - Ministry of Labour - Higher institutions of learning - Industries - Researchers - Ministry of Environment - DPR 	<ul style="list-style-type: none"> - To determine the extent of the impacts on human health and the environment through research. - Internalize the economic costs of these impacts
4.	Funding Mechanism	a. Government	<p>a.</p> <ul style="list-style-type: none"> - Creation of incentive system to be established to fund – Research, use in both private and informal sector management activities - Sourcing from the Ecological fund through viable proposals - This ecological fund should also bridge the gap between incentive and gain to dealers i.e. trade-offs - Seek bilateral funds from donors

		b. Private sector	<ul style="list-style-type: none"> - Provide sufficient budgetary allocations to key ministries like the ministries of Environment, Health, Industry e.t.c. <p>b.</p> <ul style="list-style-type: none"> - Creation of a Private sector fund- to be managed by the private sector. - Through corporate responsibilities of the oil companies in putting aside some funds at a set percentage.
		International organization, NGOs	<ul style="list-style-type: none"> - Making available private sector development funds as grants and risk capital to waste oil ventures. - Need to develop specific proposals for funding by donor agencies - Through funding institutions like the World bank, need to link with the national development strategies and poverty eradication programmes e.g. NEPAD or even Ecological fund
5.	Awareness	Institutions (the three tiers of institutions) e.g. Colleges of Health technologies NGOs Basel Convention Regional Centres (BCRCs)	Various stakeholders to benefit from knowledge on the importance of environmental sound management of waste oil- To include decision makers, senior officials (at all levels of government), all relevant stakeholders, operatives, etc.
6	Capacity building		
6.1	Training	Training institutions e.g. <ul style="list-style-type: none"> - BCRCs - NGOs - Colleges of Health technologies 	This is a formal training through development of accredited short and long courses to various stakeholders.
6.2	Institutional Strengthening	All institutions shown above	To enable these institutions discharge their responsibilities effectively
6.3	Professional Exchange	All the experts involved in the implementation of the plan	To enable the various key experts discharge their responsibilities effectively
7.	Technology Development	Research Institutions e.g. <ul style="list-style-type: none"> -Federal Ministry of Environment (FMENV) - BCRCs - DPR - Ministry of Science and Technology and its institutions - Industry 	<ul style="list-style-type: none"> - Identify the gaps on the information and knowledge on technologies for handling waste oil in an environmentally sound manner - Evaluation of existing technologies – global and regional - Ensure that these technologies are accredited - More involvement in the selection, adaptation or development of appropriate technologies in waste oil - Provision of infrastructure for scientific and laboratory analysis
8.	Database and Information Generation	<ul style="list-style-type: none"> - BCRCs - FMENV, DPR - Industries - National Planning(Statistics) - International Organizations 	<ul style="list-style-type: none"> - Database on all the players involved in the life cycle management of waste oils - Data collection, processing and dissemination - Through awareness and sensitization and establishment of information exchange network nationally, regionally and internationally

B. REGIONAL COORDINATION

The template will be tested in the various pilot countries under the supervision of the Basel Convention Regional Centres in Africa. The results of these will be presented at a regional workshop to be convened by the Basel Convention Regional Coordinating Centre for Africa where a consensus regional action plan would be developed and adopted.¹

WORKSHOP COMMUNIQUÉ

1. The Final Technical Workshop for the Development of a Regional Action Plan on the Environmentally Sound Management of Used Oils in Africa, organized by the Basel Convention Coordinating Centre for Africa (BCCC-Nigeria) Ibadan, Nigeria, was held from 6-7 December, 2004 at the Conference Hall of the Federal Ministry of Environment, Games Village, Surulere, Lagos, Nigeria. The Workshop was sponsored by the Secretariat of the Basel Convention, Geneva, Switzerland.
2. The Workshop was declared open by the Honourable Minister of Environment, Col. Bala Mande (Rtd.), represented by Director, Department of Environmental Health, Federal Ministry of Environment, Dr. Mrs. N. S. Benebo. Prof. Oladele Osibanjo, Executive Director of BCCC-Nigeria, delivered the Welcome Address, while Goodwill Messages were presented by representatives of Lagos State Commissioner for Environment, United Nations Industrial Development Organization (UNIDO) and the Canadian International Development Agency (CIDA). Mrs. Kitan Ogungbuyi delivered the Vote of Thanks.
3. The Workshop was attended by sixty-one (61) participants, including stakeholders from Industry, Civil Society, the Universities, Government, Non-Governmental Organizations (NGOs), the Media, and United Nations agencies.

Specifically, representative organisations included the Manufacturers Association of Nigeria (MAN), the Standards Organization of Nigeria (SON), Lagos State Environmental Protection Agency (LASEPA), the Nigerian Ports Authority (NPA), National Electric Power Authority (NEPA), Department of Petroleum Resources (DPR), and the Switzerland Embassy. The Directors of the Basel Convention Regional Centre from Senegal (Dr. Oumar Cisse) and South Africa (Dr. John Mbogoma) were also present at the Workshop.

4. The Main Objective of the Workshop was to develop recommendations for a National Plan for the Environmentally Sound Management of used oils in Nigeria, and to decide on follow-up action for the Development of a Partnership for Used Oils in Africa and to disseminate these recommendations throughout the African region; and in particular, to develop:

- (a) modalities for the collection of used oil, especially from manufacturing companies and the small scale generators to serve as a feedstock for the recycling/reuse process
 - (b) adequate disposal methods for unusable used oils; and
 - (c) modalities for sustained public awareness campaign on the importance of environmentally sound management of used oils and other hazardous waste.
5. The Workshop was divided into three (3) technical sessions with focus on identifying issues and concerns toward the development of a national plan for the Environmentally Sound Management of used oils in Nigeria and the development of used oils partnership in the African region.
6. The technical sessions consisted of presentations by both national and regional stakeholders. Topics addressed include:
- (a) Achieving Environmentally Sound Management of used oil;
 - (b) Analysis of Nigeria's situation on management of used oil;
 - (c) Waste oil management issues and concerns for African countries;
 - (d) Guidelines for improved used oil collection and management in Nigeria;
 - (e) Guidelines for financing infrastructure and technology on used oil management;
 - (f) Appropriate low cost technology for used oil recycling;
 - (g) Development of a used oil partnership initiative in Nigeria and Africa.
7. The presentations were followed by questions, comments and syndicate sessions involving detailed discussions relevant to the technical papers.

Recommendations

8. The Workshop recommended as follows:
- (i) the creation of an enforcement arm of the Federal Ministry of Environment to deal with the regulation of used oil among other concerns;
 - (ii) the promotion of intersectoral collaboration between the Ministries of Environment, Health, Industry, Department of Petroleum Resources (DPR), Standards Organisation of Nigeria (SON), and related agencies to work together towards the effective management and disposal of used oils;
 - (iii) the review and expansion of existing legislation to identify, in specific-terms, acceptable management options for used oils, including the definition of the roles and responsibilities of stakeholders;
 - (iv) the strengthening of a private-public partnership through collaboration and cooperation with organized occupational groups and other stakeholders;

- (v) the involvement of organized groups in workshops for capacity-building and training on enforcement and compliance (bottom-to-top approach);
 - (vi) the involvement of NGOs and other Civil Society Organisations as active participants in research and advocacy, awareness creation, and monitoring activities;
 - (vii) the development of a financial mechanism for used oil management programmes; in particular seeking involvement of financial institutions in the funding of used oil management;
 - (viii) the establishment of an incentive system to support used-oil management initiatives;
 - (ix) the provision of uniform storage facilities at strategic points, close to the generators of used oil;
 - (x) local know-how should be involved in determining the re-processing and re-refining technologies to be adopted in used oil management;
 - (xi) the promotion of product responsibility including eco-labeling requirement for lube oil.
9. The template for a National and Regional Action Plan for used oil management was deliberated upon and recommended for adoption.

The adoption of the communiqué was moved by Mrs. Funke Babade and seconded by Dr. (Mrs.) M. E. Mosanya

