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MEDITERRANEAN ACTION PLAN

Meeting of Government-designated Experts to examine
a Strategic Action Programme to address Pollution from
Land-based Activities

●
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**STRATEGIC ACTION PROGRAMME TO ADDRESS
POLLUTION FROM LAND-BASED ACTIVITIES**

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1. Introduction

1. The riparian States of the Mediterranean Sea, *conscious* of the economic, social, health and cultural value of the marine environment of the Mediterranean Sea Area; fully aware of their responsibility to preserve and sustainably develop this common heritage for the benefit and enjoyment of present and future generations; recognizing the threat posed by pollution to the marine environment, its ecological equilibrium, resources and legitimate uses; and mindful of the special hydrographic and ecological characteristics of the Mediterranean Sea Area and its particular vulnerability to pollution, have agreed in 1975 to launch an Action Plan for the Protection and Development of the Mediterranean Basin (MAP) and, in 1976, to sign a Convention for the Protection of the Mediterranean Sea against Pollution (Barcelona Convention).

2. The Contracting Parties to the Barcelona Convention, *recognizing* the danger posed to the marine environment living resources and human health by pollution from land-based sources and activities and the serious problems resulting therefrom in many coastal waters and river estuaries of the Mediterranean Sea, primarily due to the release of untreated, insufficiently treated or inadequately disposed of domestic or industrial discharges; and *desirous* to adapt Mediterranean Action Plan, Barcelona Convention and their protocols to the development of the environmental international law, to the United Nations Conference on Environment and Development (Rio de Janeiro 1992), have adopted in Barcelona in 1995 the phase II of the Action Plan for the protection of the marine environment and sustainable development of the coastal areas of the Mediterranean as well as substantial amendments to the Convention and their Protocols. Furthermore, in Syracuse in 1996 a new revised Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources and Activities (LBS Protocol) was signed, which takes into account the Global Programme of Action for the protection marine environment against pollution from land-based activities adopted in Washington in 1995.

3. In accordance with the revised LBS Protocol, the Contracting Parties agreed to take all appropriate measures to prevent, abate, combat and eliminate, to the fullest possible extent, pollution of the Mediterranean Sea Area caused by discharges from rivers, coastal establishments or outfalls, or emanating from any other land-based sources and activities within their territories, giving priority to the phasing out of inputs of substances that are toxic, persistent and liable to bioaccumulate.

4. To this end, they agreed to elaborate and implement national and regional action plans and programmes, containing measures and timetables for their implementation. As a result, regional action plans and programmes have to be formulated by the Secretariat and considered and approved by the relevant technical body of the Parties within one year at the latest of the entry into force of the amendments to the LBS Protocol.

2. Objectives

5. The Strategic Action Programme (SAP) aims at improving the quality of the marine environment by better shared-management of the land-based pollution. SAP also aims at facilitating the implementation by the Contracting Parties of the LBS Protocol. Therefore, it is designed to assist Parties in taking actions individually or jointly within their respective policies, priorities and resources, which will lead to the prevention, reduction, control and/or elimination of the degradation of the marine environment, as well as to its recovery from the impacts of land-based activities. Achievement of the aims of the SAP will contribute to maintaining and, where appropriate, restoring the productive capacity and biodiversity of the marine environment, ensuring the protection of human health, as well as promoting the conservation and sustainable use of marine living resources.

6. The general objective of the SAP, is in accordance with the LBS Protocol, i.e. to eliminate pollution deriving from land-based sources and activities, in particular to phase out inputs of the substances that are toxic, persistent and liable to bioaccumulate listed in annex I to the Protocol.

7. The specific objectives of the SAP Programme are:

- Formulation of principles, approaches, measures, timetable and priorities for action;
- Preparation of a priority list for intervention and investments ("investment portfolio");
- Analysis of expected baseline and additional actions needed to resolve each transboundary priority problems;
- Elements and guidelines for the preparation of national action plans for the protection of the marine environment from land-based activities; and
- Identification of potential roles for Non Governmental Organisations in the implementation of the SAP.

3. Principles and Obligations

8. In order to protect the environment and contribute to sustainable development of the Mediterranean Sea Area, the Parties shall:

- a) *Apply the precautionary principle.* The precautionary approach should be applied through preventive and corrective measures based on existing knowledge, resources and capacities at national level, drawing on pertinent information and analysis at subregional, regional and global levels. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent the degradation of the marine environment;
- b) *Take all appropriate measures to prevent or, where that is not practicable, to reduce pollution, in particular through application of Best Available Techniques (BAT) and Best Environmental Practices (BEP);*
- c) *Apply the polluter pays principle, by virtue of which the cost of pollution prevention, control and reduction measures are to be borne by the polluter, with due regard to the public interest;*
- d) *Undertake environmental impact assessment for proposed activities that are likely to cause a significant adverse impact on the marine environment and are subject to an authorization by competent national authorities;*
- e) *Accord priority to integrated pollution control as an important part of the move towards a more sustainable balance between human activity and socio-economic development, on the one hand, and the resources and regenerative capacity of nature, on the other;*

- f) *Commit themselves to promote the integrated management of the coastal zones, taking into account the protection of areas of ecological and landscape interest and the rational use of natural resources;*
- g) *In implementing the Convention and the related Protocols, adopt action plans, programmes and measures which contain where appropriate time limits for their completion, taking into account, for their progressive implementation, the capacity to adapt and reconvert existing installations and the economic capacity of the Parties and their need for development; and*
- h) *Ensure that, in compliance with the community right-to-know, their competent authorities shall give to the public appropriate access to information on the environmental state in the field of application of the Convention and the Protocols, on activities or measures adversely affecting or likely to affect it and on activities carried out.*

9. The Strategic Action Programme will be consistent with the Global Programme of Action and with the relevant provisions of the Convention on the Law of the Sea, of the Convention on Biological Diversity, of the Convention on Climatic Change and with the legal instruments and actions plans and measures adopted by the Contracting Parties to the Barcelona Convention.

10. In view of the different contributions to global environmental degradation, *States have common but differentiated responsibilities*. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on global environment and of the technologies and financial resources they command.

11. The new LBS Protocol means a change in the strategy selected for the protection of Mediterranean environment; this new strategy is based on sustainability and its purpose is to achieve integrated prevention and control of pollution arising from land based sources and activities, in particular through application of Best Available Techniques and Best Environmental Practice.

4. Establishment of priorities for action

12. The proposed priorities for action are based on the results of the Transboundary Diagnostic Analysis and of the reports on pollution "hot spots", "critical habitats" and "sensitive areas" (areas of concern) and also take in account the LBS Protocol, which in Annex 1, states *"In preparing action plans, programmes and measures, the Parties, in accordance with the Global Programme of Action, will give priority to substances that are toxic, persistent and liable to bioaccumulate, in particular persistent organic pollutants (POPs), as well as to wastewater treatment and management"*.

13. In general, priority actions for the reduction and the elimination of pollution are established taking in account three pollution-related factors:

- i) degradation of marine environment including biological diversity;
- ii) land-based origin; and
- iii) transboundary nature (causes or effects).

5. Analysis of targets and activities

14. An analysis of targets and activities is needed to resolve each transboundary priority problem. These targets and activities would be national or regional and would be of legal, institutional or technical nature.

15. Taking into account the Global Programme of Action, the LBS Protocol and the Transboundary Diagnostic Analysis, the following categories of substances have been selected as priorities. The selected categories of substances cover urban environment and industrial development.

- a) Urban environment
 - Municipal sewage.
 - Urban solid waste.
 - Air Pollution.
 - Marine pollution (Ports and beaches).

- b) Industrial development
 - Toxic, Persistent and liable to Bioaccumulate (T.P.B.).
 - i) Persistent Organic Pollutants (POP).
 - ii) Heavy metals and organometallic compounds.
 - Organohalogen compounds.
 - Radioactive substances.
 - Suspended Solids and Organic Matter.
 - Hazardous Waste.
 - Physical alterations and destruction of habitats.

5.1 Urban environment

16. Large and even medium-size cities pose similar problems and should be studied in an integrated manner: air pollution, collection and disposal of solid waste products, collection and disposal of domestic wastewater, supplies of drinking water. In most cities these problems are usually made worse by small and medium-size industries located within the cities and by industrial agglomerations in the outskirts.

5.1.1. Municipal sewage

17. Recognizing variations in local conditions, municipal sewage improperly discharged into freshwater and coastal environments may present a variety of concerns. These are associated with: (a) pathogens that may result in human health problems through exposure via bathing waters or through contaminated shellfish, (b) suspended solids, (c) significant nutrient inputs, (d) biochemical oxygen demand (BOD), (e) plastics and other marine debris, (f) ecosystem population effects, and (g) heavy metals and other toxic substances, e.g. hydrocarbons, in those cases where industrial sources may discharge into the municipal collection systems.

18. Environmental effects associated with domestic waste water discharges are generally local with transboundary implications in certain geographic areas. The commonality of sewage-related problems throughout coastal areas of the world is significant. Consequently, domestic waste water discharges are considered one of the most significant threats to coastal environments worldwide. In the Mediterranean region, this problem has been made worse by tourism and its seasonal nature, which makes it necessary to have treatment plants which are only used for a few months every year.

19. Most of the secondary treatment plants are not being operated and maintained adequately due to insufficient financial resources and lack of technical expertise. Many countries are now placing special emphasis on designing wastewater treatment facilities to reuse effluents.

20. One of the most common and worrying environmental effects of urban wastewater dumping is the gradual destruction of singular habitats and specifically the meadows containing stable plants, with the resulting decrease in biodiversity.

Proposed targets

21. - By the year (2025), to dispose all municipal waste water (sewage) in conformity with national or international regulations.
- By the year (2005), to dispose sewage from cities exceeding 100.000 inhabitants and areas of concern in conformity with national or international regulations.

Proposed activities

Regional level

22. - By the year (2000), to formulate and adopt guidelines for sewage treatment and disposal and, as appropriate, environmental quality criteria and standards.
- Development of programmes for sharing and exchanging technical information and advice regarding environmentally sound sewage treatment and facilities, including the use of treated waste water and of sewage sludge.
- Establishment of research programmes to identify, validate and develop sewage treatment technologies.

National level

23. - To prepare and adopt, (over a period of two years), national regulations concerning sewage discharges into the sea (and rivers) which takes into account the LBS Protocol and especially its Annex II and whenever appropriate, the measures already adopted by the Parties.
- By the year (2005), to develop National Programmes for environmentally sound Management of Sewage, (NPS), and to this end to ensure:
- i) By the year (2005), that at least the medium and large coastal cities (> 100.000 inhabitants) are connected to a sewer system and dispose all waste water in conformity with national regulation system;
- ii) To locate coastal outfalls so as to obtain or maintain agreed environmental quality criteria and to avoid exposing shell fisheries, water intakes, and bathing areas to pathogens and to avoid the exposure of sensitive environments (such as lagoons, seagrass beds etc.) to excess nutrient or suspended solid loads;

- iii) To promote the primary, secondary and, where appropriate and feasible, tertiary treatment of municipal sewage discharged to rivers, estuaries and the sea;
- iv) To promote the operation and maintenance of existing facilities;
- v) To promote the reuse of the treated effluents for the conservation of water resources. To this end, infrastructural measures, treatment at source and segregation of industrial effluents, shall be encouraged, as well as:
 - a) the beneficial reuses of sewage effluents and sludges by the appropriate design of treatment plant and processes and controls of the quality of influent waste waters;
 - b) the environmentally sound treatment when domestic and compatible industrial effluents are treated together;
- vi) To identify the availability and sustainability of productive uses of sewage sludge, such as land-spreading, composting, etc.

5.1.2. Urban Solid Waste

24. Urban solid waste can affect the pollution of the sea in two ways, through the release of raw waste into the sea, directly or indirectly, especially plastics, and through emissions into the atmosphere of pollutants which may be generated by the combustion of these waste products.

Proposed targets

- 25. - *By the year (2025), the collection and environmental sound disposal of urban solid waste from cities.*
- *By the year (2005), the collection and environmental sound disposal of urban solid waste from cities exceeding 100.000 inhabitants and areas of concern..*

Proposed activities

National level

- 26. - To develop national programmes for environmentally sound management and reduction of urban solid waste.
- To establish environmentally suitable and economically feasible systems of collection and disposal of urban solid waste in large and medium-size cities (> 100,000 inhabitants).
- To promote the reduction and recycling of urban solid waste.

5.1.3. Air Pollution

27. Excessive air pollution is found in most cities in the region with populations exceeding 1 million; air concentrations of particulate and lead often exceed WHO guidelines by a multiple of two to five and annual average SO₂ levels reach more than 100 micro g/m³ in many cities

near refineries and high sulphur, fuel-oil-fired power plants and industries. Vehicles are a major source of urban air pollution. Excessive air pollution in cities has a substantial impact on health.

Proposed targets

28. - *By the year (2025), the levels of air pollutants in cities shall be in conformity with national and international regulations.*
- *By the year (2005), the levels of air pollutants in cities exceeding 100.000 inhabitants and in areas of concern shall be in conformity with national and international regulations.*

Proposed activities

Regional level

29. - By the year (2005), to formulate and adopt emission limit values for the atmospheric pollutants listed in Annex I of the LBS Protocol.

National level

30. - To promote the use of lead-free petrol.
- To improve the inspection and maintenance of vehicles and the renovation of the oldest vehicles through economic or tax incentives.
- To pursue increased regional and domestic natural gas development in order to substitute high sulphur fuel oil with natural gas in particularly, natural gas conversion for urban proximities.

5.1.4. Marine pollution (Ports)

31. The Mediterranean ports are closely linked to the cities; in fact, most cities came into being as a result of being ports. In the 20th century, the specific problems of the large ports have led to them being managed separately from the cities themselves and this is the situation today: the cities and the ports have separate administrations which unfortunately are often not coordinated. The main problems related to marine pollution from ports are:

- i) Releases of waste water and solid waste from ships;
- ii) Accidental spillages during the loading and unloading of hydrocarbons and other toxic substances transported in bulk; and
- iii) Releases of hydrocarbons into the atmosphere during these operations.

Proposed targets

32. - *By the year (2025), all Mediterranean ports shall dispose liquid and solid waste in conformity with national and international regulations.*
- *By the year (2005), the ports of cities exceeding 100.000 inhabitants and in areas of concern shall dispose liquid and solid waste in conformity with national and international regulations.*

Proposed activities

National level

33. - To promote the implementation of environmental audits in ports.
- By the year (2005) the ports at the cities exceeding 100.000 inhabitants (large ports: > 1 million tons or > 100.000 passengers) shall install, in application of the MARPOL Convention:
- a) Services of collection and disposal of the solid waste from the ships;
 - b) The provision of adequate port reception facilities for oily waste; and
 - c) Services of collection and disposal of waste water.

5.2 Industrial development

34. The industrial development of the Mediterranean countries varies greatly, but industry's share in their Gross National Product ranges from 21% in Egypt to 44% in Algeria and its capacity to generate pollution and cause damage to the environment is unanimously recognized.

35. On an international scale, priority has been given to toxic, persistent and bioaccumulable (T.P.B.) pollutants for their effects on human health, long-term and long-distance effects, and less attention is paid to other pollutants such as dissolved solids, biodegradable organic matter and nutrients, because their effects are much more localized and less persistent. These urban pollutants are also generated in large quantities by industries and sometimes in concentrations exceeding those of urban wastewater, and their discharge into the environment can cause damage to ecosystems, habitats and biodiversity.

36. Furthermore, dissolved solids reduce the transparency of water with harmful effects on the roots of stable plants; they settle in the proximity of the dumping areas, resulting in a large area in which the ecosystems have been modified and the biodiversity of animals and plants has been drastically reduced.

37. In addition, biodegradable organic materials are not likely to produce in the open sea the oxygen deficits which occur in rivers, but in areas with reduced movements of water such as coastal lakes, they lead to the well-known serious problems.

38. Finally, nutrients may be dumped just as they are or they may be the result of the oxidization of organic matter, and their presence in the sea may cause eutrophication problems with serious consequences for biodiversity and for the health of the whole marine environment.

Proposed targets

39. - *By the year (2025), to dispose all waste water and air emissions from industrial installations, in conformity with national or international regulations.*
- *Over a period of (10) years, to reduce as far as possible (50 %) the inputs of the substances that are toxic, persistent and liable to bioaccumulate.*
- *Over a period of (10) years, to reduce (by 50%) the inputs of polluting substances from industrial installations in the hot spots and areas of concern.*

40. The timing for targets and for activities may be different for different countries, taking into account the capacity to adapt and reconvert existing installations, the economic capacity of the Parties and their need for development.

Proposed activities

Regional level

41. - By the year (2005), to formulate and adopt guidelines for industrial waste water treatment and disposal.
- By the year (2010), to formulate and adopt, as appropriate, environmental quality criteria and standards for point sources discharges into water or air.
- To develop programmes for sharing and exchanging technical information and advice regarding environmentally sound waste water treatment and facilities, including the use of treated waste water, sludge and waste.
- To establish research programmes to identify, validate and develop waste water treatment technologies.
- To prepare guidelines for the application of BAT and BEP for industries.

National level

42. - To prepare and adopt, over a period of one year, national regulations concerning point sources discharges of industrial waste water into the sea (and rivers) which takes into account the guidelines, criteria and standards adopted by the Parties.
- To make in as short a period as possible an inventory of the point sources discharges and emissions in the hot spots and in the areas of concern.

5.2.1. Substances that are Toxic, Persistent and liable to Bioaccumulate (TPB)

43. Substances that are toxic, persistent and liable to bioaccumulate include organic and inorganic substances. The first ones are named "Persistent Organic Pollutants" and the second ones are some heavy metals and some organometallic compounds.

5.2.1.1. Persistent Organic Pollutants (POPs)

44. Persistent organic pollutants (POPs) are a set of organic compounds that: (i) possess toxic characteristics; (ii) are persistent; (iii) are liable to bioaccumulate; (iv) are prone to long-range transport and deposition; and (v) can result in adverse environmental and human health effects at locations near and far from their source. POPs are typically characterized as having low water solubility and high fat solubility. Most POPs are anthropogenic in origin. Anthropogenic emissions, both point and diffuse, are associated with industrial processes, product use and applications, waste disposal, leaks and spills, and combustion of fuels and waste materials. Once dispersed, clean-up is rarely possible. Because many POPs are relatively volatile, their remobilisation and long-distance redistribution through atmospheric pathways often complicate the identification of specific sources.

45. POPs have long environmental half-lives. Accordingly, successive releases over time result in continued accumulation and ubiquitous presence of POPs in the global environment.

46. The primary transport routes into the marine and coastal environment include atmospheric deposition and surface run-off. Regional and global transport is predominately mediated by atmospheric circulation, but also occurs through sediment transport and oceanic circulation. Movements may also occur through a successive migration of short-range movements that result from a sequence of volatilization, deposition, and revolatilization processes. Due to these transport patterns and chemical characteristics, there is a growing evidence of the systematic migration of these substances to cooler latitudes.

47. Consistent with decision 18/32 adopted by the UNEP Governing Council in May 1995 and with Global Programme of Action, the LBS Protocol states:

- (i) *"In preparing action plans, programmes and measures, the Parties, in accordance with the Global Programme of Action, will give priority to substances that are toxic, persistent and liable to bioaccumulate, in particular persistent organic pollutants (POPs), as well as to wastewater treatment and management";*
- (ii) *"The following categories of substances and sources of pollution will serve as guidance in the preparation of action plans, programmes and measures: 1. Organohalogen compounds and substances which may form such substances in the marine environment. Priority will be given to DDT; Aldrin, Dieldrin, Endrin; Chlordane; Heptachlor; Mirex; Toxaphene; Hexachlorobenzene; PCBs; Dioxins and Furans".*

Twelve Priority POPs

48. The twelve substances identified by the LBS Protocol are organochlorine compounds and can be divided into three groups:

- i) Pesticides: *DDT; Aldrin, Dieldrin, Endrin; Chlordane; Heptachlor; Mirex; Toxaphene; and Hexachlorobenzene.*
- ii) Industrial chemicals: *PCBs (polychlorobiphenyles) and*
- iii) Unwanted by-products: *Hexachlorobenzene; Dioxins and Furans.*

Pesticides

49. The use of the nine pesticides mentioned above is almost completely prohibited in the Mediterranean Region. *Hexachlorobenzene* (HCB) is a fungicide which was used for treating seeds and for preserving wood. It is also an unwanted by-product of the manufacture of industrial chemical products, such as *carbon tetrachloride, trichloroethylene and pentachlorobenzene*, and it is an impurity present in several pesticides, such as *pentachlorophenol* (PCP) and others.

Industrial chemicals

50. The PCBs or *polychlorobiphenyles* are mixtures of chlorinated hydrocarbons which have been extensively used since 1930 as dielectrics in transformers and condensers and to a lesser extent as hydraulic liquids and as nonconductors. Certain PCB substitutes are also dangerous and should be assessed.

Unwanted by-products; Hexachlorobenzene; Dioxins and Furans

51. The *hexachlorobenzene* is also a by-product of the manufacture of some industrial chemical products, as indicated in paragraph 69.

52. *Dioxines and Furans*. The terms *dioxins and furans* are used to describe two groups of environmental pollutants: *polychlorinated dibenzo-p-dioxins (PCDD)* and *polychlorinated dibenzofurans (PCDF)*. Of these 210 different substances, the real toxics are the 17 isomers with chlorine substituted in the 2,3,7,8 positions, the most toxic is the 2, 3, 7, 8-tetrachlorodibenzo-p-dioxin (2,3,7,8 TCDD), the toxicity of the other 16 compounds are related with the toxicity of this substance.

53. *Dioxins and furans* have no use as such, they can be found as contaminants in some products and can be produced in combustion processes. The sources of *dioxins and furans* can be of natural or human origin. The natural sources can be forest fires, volcanic eruptions or enzymatic and photolytic reactions, Studies of sediment cores in lakes near industrial centres have shown that *dioxins and furans* were quite low until about 1920. These studies show increases in *dioxins and furans* concentrations from 1920 to 1970. Declining concentrations have been measured since that time. These trends correspond to *chlorophenol* production trends. There is no doubt today that the presence of *dioxins and furans* compounds in the environment occurs primarily as a result of anthropogenic practices.

54. The most important anthropogenic source of dioxins and furans are:

- i) Combustion installations: incineration of urban, industrial and hospital waste, combustion of residual sludges, fossil power plants;
- ii) Small Combustion sources: car engines, domestic heating, cigarettes;
- iii) The manufacture and use of certain pesticides, especially *chlorophenoxyacids (2.4-D and 2.5-T)*, *chlorinated phenols and PCBs*, in which they are found as impurities;
- iv) Other processes such as paper pulp bleaching, the metallurgy of metals, the recovery of metals, mainly copper wires and electric motors and copper and aluminium turnings.
- v) Accidents: fires involving chlorinated materials mainly chlorophenols and PCB.

Proposed targets

55. - *By the year (2010) to phase out inputs of the 9 pesticides and PCBs and reduce to the fullest possible extent inputs of unwanted by-products: hexachlorobenzene, dioxins and furans.*
- *By the year (2005) to reduce (50 %) inputs of the priority 12 POPs.*

Proposed activities

Regional level

56. - To provide Contracting Parties with technical information and advice on the nine pesticides and PCB substitutes and make appropriate recommendations.

- To develop programmes for sharing and exchanging technical information and advice regarding environmentally sound disposal of the existing quantities of the nine pesticides and PCBs.
- To prepare guidelines for the application of BEP and if possible BAT by the point sources of dioxins and furans mentioned in paragraph 78.

National level

- 57.
- To make, over a period of (one year), an inventory of quantities and uses of the nine pesticides and PCBs, as well as of the industries which manufacture or condition them.
 - By the year (2000), to phase out the use of the nine pesticides, except for those uses which involve the safeguarding of human life when the latter is in danger or when a risk/benefit analysis is very conclusive.
 - By the year (2000), to prohibit the manufacture, marketing and use of PCB.
 - By the year (2000), to promote the collection and environmentally sound disposal of the existing quantities of the nine pesticides and PCBs.
 - To reduce the emission of *HCB, dioxins and furans* as much as possible and, in order to do so, promote the implementation of environmental audits and apply BEP and if possible BAT to the processes which generate these compounds, such as waste-incineration plants or recovery of metals mainly copper wires and electric motors.

Other POPs

58. The Working Group on Strategies of the Convention on Long-Range Transboundary Air Pollution is preparing a draft Protocol on POPs and noted that, with one reservation, there was general agreement on the inclusion into the protocol the 12 substances, named here "Priority 12", plus PAHs, *hexabromobiphenyl and chlordecone*, while *short-chain chlorinated paraffins, lindane and pentachlorophenol* required further examination.

Polycyclic Aromatic Hydrocarbons (PAHs)

59. The group PAHs contains hundreds of substances occurring naturally in oil in ppm levels. PAHs are also formed from incomplete combustion of organic matter, this process is the main source for PAHs in air. PAHs with a molecular weight exceeding 228, are almost completely bound to particles in the air. Also in the aquatic environment PAH are mainly bound to particles due to their low solubility in water.

60. In the preparation of the draft Protocol on POPs has been proposed the following definition for PAHs: *Polycyclic Aromatic Hydrocarbons*, are organic compounds made of two or more condensed benzene rings and was proposed as reference substances the six compounds: *fluoranthene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3.cd)pyrene and benzo(g,h,i)perylene*, named the six Borneff PAHs. Other proposal expand the list to 10, 12, 15, 16 or 22 PAHs compounds. In general *benzo(a)pyrene* was the most common used reference substance for PAHs.

70. The most important sources of PAHs are:

- a) Point sources: Primary aluminium industry; Power generation; Iron and steel industry; Ferroalloy industry; Shipyards; Petroleum refineries; Creosote production; Production of creosote treated timber; Asphaltic plants and Coke ovens; Cable burning.
- b) Diffuse sources: Road construction; Road traffic; Use of creosote treated timber; Domestic coal and wood combustion.

Proposed target

- 71. - *By the year (2025) to phase out, to the fullest possible extent, inputs of PAHs.*
- *By the year (2010) to reduce (25 %) inputs of PAHs.*

Proposed activities

Regional level

- 72. - To prepare guidelines for the application of BEP and BAT by the point and diffuse sources of PAH mentioned in the previous paragraph.
- By the year (2010), to formulate and adopt, as appropriate, environmental quality criteria and standards for point sources discharges and emissions of PAH.

National level

- 73. - To promote the implementation of environmental audits in the industrial installations mentioned in the previous paragraph and located in selected hot spots.
- To reduce the emission of PAH as much as possible and, in order to do so, apply BEP and if possible BAT to the processes which generate these compounds.

5.2.1.2. Heavy metals and organometallic compounds

Heavy metals

74. *Mercury.* The most important industrial sources of mercury are: combustion of coal in power plants; chlor/alkali production; manufacture and disposal of batteries; waste incineration and roasting and smelting in non ferrous metal smelters.

75. *Cadmium.* The most important industrial sources of cadmium are: zinc and lead metal processing; electroplating; cadmium compounds production; pigment production; manufacture and disposal of batteries; stabilizers for plastics and phosphate fertilizers manufacture.

76. *Lead.* The most important industrial sources of lead are: lead metallurgy; manufacture and disposal of batteries; additives for petrol; enamels and ceramic glazes and glass manufacture.

77. *Mercury, cadmium and lead* arrived to the environment through liquid discharges and through atmospheric emissions.

78. *Zinc*. The most important industrial sources of zinc are: zinc and brass metallurgy; recoverings of metallic surfaces; galvanizing of steel; manufacture of viscose and rayon and the manufacture and disposal of batteries.

79. *Copper*. The most important industrial sources of copper are: copper metallurgy; recovering of metallic surfaces; electric cables and pesticides.

80. *Chrome*. The most important industrial sources of chrome are: chrome metallurgy; recovering of metals; tanneries; textile and wool dyeing; corrosion inhibitor in closed cycle cooling systems.

Proposed target

81. - *By the year (2025) to phase out to the fullest possible extent pollution of the Mediterranean Sea caused by discharges, emissions and losses of mercury, cadmium, lead, zinc, copper, chrome and their compounds.*
- *By the year (2000) to reduce (25 %) inputs of heavy metals.*

Proposed activities

Regional level

82. - To prepare guidelines for the application of BAT and BEP in the industrial installations sources of heavy metals.
- By the year (2010), to formulate and adopt, as appropriate, environmental quality criteria and standards for point sources discharges and emissions of heavy metals.

National level

83. - To reduce the discharges and emissions of heavy metals as much as possible and, in order to do so, promote the implementation of environmental audits and apply BEP and, if possible, BAT in the industrial installations sources of heavy metals, giving priority to installations located in the selected hot spots.
- To prepare National Programmes on reduction and control of pollution by Heavy Metals.
- To adopt and apply the measures for preventing mercury pollution adopted by the Parties in 1987 (releases into the sea, max. conc. 0.050 mg/l).
- To adopt and apply for the industries of the alkaline chloride electrolysis sector, as well as the previous standard, the maximum value of 0.5 grams of mercury per tonne of chlorine production capacity installed.(brine recirculation) and 5 grams of mercury per tonne (lost brine technology) (2 g of mercury from total releases into water, air and products).
- To adopt and apply the anti-pollution measures for cadmium and cadmium compounds adopted by the Parties in 1989 (releases into the sea, max. conc. 0.2 mg/l)., and the measures for control pollution caused by zinc, copper and their

compounds adopted by the Parties in 1996 (releases into the sea, max. conc. 1.0 mg/l for zinc and 0.5 mg/l for copper).

- To prepare environmental voluntary agreements in which authorities, producers and user are committed on a basis of a reduction plan.

Organometallic compounds

84. Organometallic compounds are compounds where one metal atom is covalently bound to at least one carbon atom. These types of substances are often used as intermediates in chemical industries. Several organometallic compounds decompose rapidly in water and air and thus less important as environmental contaminants, However, some organometallic substances are sufficiently stable and used as pesticides or stabilizers in other chemical products.

85. *Organomercuric compounds.* These compounds are used in dyes and as pesticides. The use of these compounds has been drastically reduced in the last 20 years and therefore the input to the environment has decreased.

86. *Organolead compounds.* Two compounds; *tetramethyllead* (TML) and *tetraethyllead* (TEL), are of major interest due to the large quantities used as additives to petrol. TML and TEL that evaporate from petrol are stable in air and almost insoluble in water, the degradation product trialkyllead are soluble in water and toxic.

87. *Organotin compounds.* These compounds are formed by a tin atom bound to one, two, three or four alkyl groups; of them, only the *three-alkyltin* has a commercial importance today. *Trialkyltin* compounds (eg *tributyltin oxide*, *tributyltin fluoride*, *triphenyltin hydroxide*) are used as antifouling agent in paints for boats and wood construction in water, is also used as pesticide in agriculture and in medicine as disinfectant, due to their biocide properties, organotin compounds are used as anti-fouling agents in cooling systems in industrial installations (power plants, oil refineries) and, due to their physico-chemical properties, as a stabilizing agent for PVC. *Trialkyltin* compounds are lipophilic, very toxic and stable their use as antifouling paints is restricted.

Proposed targets

88. - *By the year (2010) to phase out inputs of the organomercuric compounds and reduce to the fullest possible extent inputs of organolead and organotin compounds.*
- *By the year (2010) to reduce (50 %) inputs of the organometallic compounds.*

Proposed activities

Regional level

89. - To prepare guidelines for BAT and BEP in the industrial installations sources of organometallic compounds.
- By the year (2010), to formulate and adopt, as appropriate, environmental quality criteria and standards for point sources discharges and emissions of organometallic compounds.

National level

90. - To reduce the discharges and emissions of organometallic compounds as much as possible and, in order to do so, promote the implementation of environmental audits and apply BEP and, if possible, BAT in the industrial installations sources of organometallic compounds.
- Promote the use of lead-free petrol.
 - To make an inventory of the uses and quantities of organomercuric used.
 - To (reduce) or (phase out) by (2005) the use of organomercuric compounds.
 - To adopt and apply the anti-pollution measures for the organotin compounds adopted by the contracting Parties in 1989.
 - To phase out the use of organotin compounds as anti-fouling agents in cooling systems.

5.2.2. Organohalogen compounds

5.2.2.1 Halogenated Aliphatic Hydrocarbons

91. A number of halogenated aliphatic hydrocarbons are known to be of natural origin. The majority of these natural halogenated aliphatic hydrocarbons are formed in the marine environment. Among these compounds between twenty and thirty million metric tons of methyl-iodide and methyl-chloride are estimated to be present in equilibrium between water and air. Other natural compounds of this type may contain fluorine, chlorine or bromine atoms, as methyl-bromide, less often iodine. Algae are important producers of natural halogenated compounds.

Chlorinated solvents

92. Chlorinated solvents are not persistent, not bioaccumulating and not toxic in marine waters; they are volatile compounds and in atmosphere break down over a short period of time. Their environmental impact is minimal and the reason for the attention paid is the possible effects on ozone depletion and the relatively high volumes used. Methylene chloride and tri and tetra-chloroethylene have not effects on ozone depletion and have not significant greenhouse warming potential.

93. Chlorinated solvents are commercially produced in large quantities; the solvents more used are: *dichloromethane (methylene chloride)*; *1,1,1-trichloroethane, trichloroethylene and tetrachloroethylene (perchloroethylene)*. European production of these four solvents was approximately 400.000 tonnes/year in 1994, and world production was around 1 million tonnes in 1992.

94. *Methylene chloride* is perhaps the most versatile of chlorinated solvents and is used in a very wide range of industrial applications.

95. *1,1,1-Trichloroethane* has been a solvent of choice for "cold cleaning" of components in a variety of industries as a result of its relatively high exposure limits. As a result of its ozone depletion potential its use has been prohibited for the Montreal Protocol since 1996.

96. *Trichloroethylene* is very widely used as a solvent for metal surface preparation within the engineering industry.
97. *Perchloroethylene* is the principal solvent used for dry cleaning and for degreasing metals.
98. *1,2-dichloroethane* is used in the chemical industry as an intermediary in vinylchloride production. This substance is also used in the pharmaceutical and rubber industries. *Vinylchloride* is used in the production of *polyvinylchloride* (PVC). The total PVC market in the world is about 20 million tonnes. Emissions of *1,2 dichloroethane and vinylchloride* are almost exclusively into the atmosphere.
99. The residue obtained after polymerization of *vinylchloride* is called EDC-tar (*ethylene dichloride tar*). Volumes of about 70.000 tons EDC-tar may be produced every year in north-western Europe only. EDC-tar was until mid seventies dumped in the Nord Sea but it is now used to recover solvents and other chemical components before it is incinerated. Incomplete combustion of EDC-tar will result in the formation of new more stable chlorinated substances emitted via de flue gas.
100. *Trichloromethane* (Chloroform). Most chloroform is used for the production of *chlorofluorocarbons* (CFCs). It is also used as a solvent in the pharmaceutical and bandages industries and as an intermediate in the production of paints and pesticides. The chlorination of swimming pools and drinking water also leads to the formation of trichloromethane that it is also formed by decomposition of 1,2 dichloroethane in the exhaust fumes of motor vehicles and the decomposition of trichloroethene in the atmosphere. Atmospheric emissions account for the largest part of the overall emissions. The chemical industry in particular is responsible for trichloromethane emissions.

Chlorinated Paraffins (CP)

101. The chlorinated paraffins (CP) are commercial products of polychlorinated alkanes with carbon chain lengths of C10 to C30. The chlorination degree within each chain length group varies between 40 and 70 % chlorine. In average, an alkene with a chlorination degree of 55 % contains twice as many carbon as chlorine atoms while a CP with 70 % chlorination has the same number of chlorine and carbon atoms. CP are lipophilic substances with very low water solubility.
102. The most important industrial uses of chlorinated paraffins are: plasticisers of paints and coatings; plasticisers of sealing products; fluids for working on metals; flame retardant for rubber, plastic materials and textiles. The world production of CP is estimated in 300.000 tons.
103. This class of chlorinated aliphatic compounds is of low volatility and the distribution of CP is mainly due to aquatic transportation where CP most probably are absorbed to particles and surface film. The CP more dangerous for the environment are the short-chain chlorinated paraffins, especially the paraffins with a chain length of between 10 and 13, and whose chlorine content is greater than 50% of their weight. CP may contaminate the environment as such but can also form other serious pollutants, eg when are treated at elevated temperatures.

5.2.2.2 Halogenated Aromatic Hydrocarbons

Chlorobenzenes

104. All chlorinated benzenes are used in chemical industries. *Mono-, di-, and trichlorobenzenes* are utilized as solvents and chemicals intermediates in pesticides and pharmaceuticals. Large quantities of chlorinated benzenes are produced every year, *1,4 dichlorobenzene* is also used as a pesticide and air freshener, *tri and tetrachlorobenzenes* have been used as PCB replacement agents in transformers and capacitors and in heat transfer media.

105. Chlorobenzenes are also produced unintentionally in a number of industrial processes, eg. in the manufacture of magnesium, in the manufacture of chlorinated solvents and pesticides. Chlorobenzenes are mainly transported in the air due to their volatility, the risk to aquatic ecosystems are therefore considered to be negligible. *Hexachlorobenzene* has been treated as priority POPs.

Polychlorinated naphthalenes (PCN)

106. PCN are still produced even though the large scale production has ceased. The commercial PCN products are mixtures of naphthalenes substituted with 1-8 chlorine atoms. PCN are used as insulating material in capacitors, as fire retardants, as wood preservatives and as pesticides.

107. *Polychlorinated naphthalenes* are formed at combustion of material containing organohalogen material and during the production of magnesium. PCN contain persistent congeners that can be bioaccumulated. The degradation of PCN congeners seems to be slow in sediments. The rate of metabolism decreases with increasing chlorine content and the toxicity seems to increase with increasing chlorine content.

Polybrominated diphenyl ethers and polybrominated biphenyls

108. *Pentabrominated diphenyl ether (PBDEs)* and *Polybrominated biphenyls (PBBs)* are used exclusively as flame retardants, in electronics, textiles and engineering plastics. The worldwide production of PBDEs in 1990 was estimated at 4000 tonnes and the production of *decabromobiphenyl* is around 1000 tonnes.

109. The International Programme on Chemical Safety (IPCS) has made the following recommendations:

"Persistence in the environment and accumulation in organisms suggest that commercial PBDEs should not be used";

"Human beings and the environment should not be exposed to PBBs in view of their high persistence and bioaccumulation and potential adverse effects at very low levels after long-term exposure. Therefore, PBBs should no longer be used commercially".

5.2.2.3 Chlorinated Phenolic Compounds

110. Chlorophenolic compounds are chlorinated aromatic substances with one or several hydroxy groups, bound to aromatic nucleus. The acidic character influences the behaviour of these compounds in the aquatic environment considerably, depending on the pH- value of the

receiving water bodies. *Chlorophenols* are toxic compounds effecting primarily the energy metabolism.

111. Chlorophenols mainly *pentachlorophenol* have been used extensively- and are still used in many countries- as pesticides (mainly fungicides and bactericides) in wood protection. The main releases of chlorinated phenols into the aquatic environment are derived from the use of *pentachlorophenol* and from discharges of bleaching effluents from pulp mills. The two dominating factors influencing the formation of chlorophenols are the amount of elemental chlorine used and the lignin content of the unbleached pulp. In this process are formed chlorinated phenols, guaiacols and catechols. Chlorophenols may be source of dioxines.

5.2.2.4 Pesticides

112. A number of different organohalogenated compounds are used as pesticides. One important part of these compounds are mentioned earlier in Priority POPs and in chlorobenzenes and chlorophenols. The pesticides not yet mentioned and relevant for the marine environment are the Lindane and the Chlorophenoxy acids.

113. The insecticide Lindane is the *gamma isomer of hexachlorocyclohexane* (HCH). The alpha and beta isomers are also present in the raw product and contribute to the environmental contamination. The beta isomer is the most persistent compound.

114. *Chlorophenoxy acids*, (2,4 D and 2,5 T) are widely used and have caused contamination of the ground water. To date they have not been detected in samples from the marine environment as far as we know. The relationship between these pesticides and dioxins is a matter of concern.

Proposed targets

115. - *To phase out pollution of the Mediterranean Sea caused by discharges, emissions and losses of organohalogen compounds.*
- *By the year (2010) to reduce (50 %) inputs of the organohalogen compounds.*

Proposed activities

Regional level

116. - To prepare guidelines for the application of BAT and of BEP in industrial installations sources of organohalogen compounds.
- By the year (2010), to formulate and adopt, as appropriate, environmental quality criteria and standards for point sources discharges and emissions of organohalogen compounds.

National level

117. - To reduce the discharges and emissions of organohalogen compounds as much as possible and, in order to do so, promote the implementation of environmental audits and apply Best Environmental Practice and, if possible, Best Available Techniques in the industrial installations sources of organohalogen compounds, giving priority to installations located in the hot spots.

- To prepare National Programmes on reduction and control of pollution by Organohalogen Compounds.
- To adopt and promote the application of the anti-pollution measures approved by the Parties.
- To regulate the releases of organochlorines at paper and paper pulp industries by limiting the discharges measured as AOX (absorbable organic halogen) to 1 kg per tonne of pulp produced.
- To make an inventory of the uses and quantities of CP used.
- To phase out by (2005) PDBEs and PBBs.
- To reduce and control the manufacture and use of certain products such as the 2,4-D and 2,5-T herbicides, and the tri-, tetra- and penta chlorophenols, used in the treatment of wood.
- To prepare environmental voluntary agreements in which authorities, producers and users are committed on a basis of a reduction plan.

5.2.3. Radioactive Substances

118. Radioactive substances have entered and/or are entering the marine environment, directly or indirectly, as a result of a variety of human activities and practices. These activities include production of energy, reprocessing of spent fuel, military operations, nuclear testing, medical applications and other operations associated with the management and disposal of radioactive waste and the processing of natural materials by industrial processes. Other activities, such as the transport of radioactive material, pose risks of such releases. Radioactive materials can present hazards to human health and to the environment.

Proposed target

119. - *To reduce and/or phase out emissions and discharges of radioactive substances in order to prevent, reduce and eliminate pollution of the marine and coastal environment by human-enhanced levels of radioactive substances.*

Proposed activities

120. - To promote policies and practical measures including setting targets and timetables to minimize and limit the generation of radioactive waste and provide for their safe processing, storage, conditioning, transportation and disposal.
- To adopt measures, including BAT and BEP, for the reduction and/or elimination of inputs of radioactive substances to the Mediterranean Sea.

5.2.4. Suspended Solids and Organic Matter (SSOM)

121. Many industries produce liquid waste with similar characteristics than the domestic waste water and their main pollutants: Suspended Solids, Oxydable Organic Matter, Nitrogen and Phosphorus can be treated with similar techniques. Their pollution load may be measured in population-equivalent.

122. The most important sources of these substances are:

- i) manufacture of Food and Beverages: Slaughtering, preparing and preserving meat; Manufacturing of dairy products; Canning & preserving of fruit and vegetables; Canning, preserving & processing of fish, crustaceans and similar foods; Manufacture of vegetable oils and fats; Sugar factories and refineries; Distillery; Wine production; Beer manufacturing;
- ii) Manufacture of Textiles: Wool processing and Cotton processing;
- iii) Tanneries and leather finish industry;

Most of the above industrial sectors are represented by small and medium industries, are located in the cities and discharge their waste water to municipal sewer.

- iv) Paper and paper-pulp industry;
- v) Phosphatic Fertilizers industry;
- vi) Pharmaceutical industry: Basic substances (Fermentation and extraction processes);

These last industrial sectors often include big industries and they generated large quantities of pollutants similar to those of domestic origin besides other specific pollutants which need to be treated separately.

Proposed targets

- 123. - *By the year (2025), to dispose all waste water from industrial installations sources of SSOM, in conformity with national or international regulations.*
- *Over a period of (10) years, reduce as far as possible (by 50 %) the inputs of the suspended solids, biodegradable organic matter and nutrients from industrial installations sources of these substances.*

Proposed activities.

Regional level

- 124. - To prepare guidelines for the application of BAT and of BEP in industrial installations sources of SSOM.
- By the year (2010), to formulate and adopt, as appropriate, environmental quality criteria and standards for point sources discharges of SSOM.
- By the year (2010), to formulate and adopt guidelines for waste water treatment and waste disposal from SSOM industries.

National level

- 125. - To reduce the discharges of pollutants as much as possible and, in order to do so, promote the implementation of environmental audits and apply BEP and, if

possible, BAT in the industrial installations sources of SSOM, giving priority to installations located in the hot spots.

- To develop National Programmes for environmentally sound management of waste water and solid waste from SSOM industrial installations, and to this end ensure:
 - i) by the year (2005), that at least the SSOM industrial installations located in areas of concern, dispose all waste water in conformity with national regulation system.
 - ii) To locate coastal outfall so as to obtain or maintain agreed environmental quality criteria and to avoid the exposure of sensitive environments (such as lagoons, seagrass beds etc.) to excess nutrient or suspended solid loads;
 - iii) To promote primary, secondary and, where appropriate and feasible, tertiary treatment of SSOM waste water discharged to rivers, estuaries and to the sea;
 - iv) To promote the operation and maintenance of facilities.
 - v) The reduction and beneficial use of waste water or other solutions appropriate to specific sites such as no-water and low-water solutions;
 - vi) The identification of the availability and sustainability of productive uses of waste water sludge, and other waste such as land-spreading, composting, energetic uses, animal feed, etc.;
 - vii) To prepare environmental voluntary agreements in which authorities, producers and users are committed on a basis of a reduction plan.

5.2.5. Hazardous Wastes

126. This Programme includes the waste products which contribute to cross-border marine pollution, these being the hazardous waste. The definition of hazardous waste is complicate and the waste products which are normally considered to be dangerous are those listed in the annex or annexes to the legal document in question e.g. the Protocol concerning cross-border movements of dangerous waste products, approved in Izmir in October 1996, or the Basel Agreement on the same subject.

127. Hazardous wastes may affect the marine environment through direct or indirect discharges of the raw waste products into the sea, or through releases into the atmosphere or the release into the water of pollutants which may be generated in the process of disposal or treating these waste products. Special attention should be paid to the proper management and disposal of stocks of obsolete chemicals.

Proposed targets

- 128. - *By the year (2025), to dispose all hazardous wastes in a safe and environmentally sound manner and in conformity with national or international regulations.*

- Over a period of (10) years, to reduce as far as possible (by 20 %) the generation of hazardous waste from industrial installations.
- By the year (2010), to dispose (50 %) of the hazardous waste generated in a safe and environmentally sound manner and in conformity with national or international regulations.

Proposed activities

Regional level

129. - To prepare a Mediterranean Strategy for the Management of Hazardous Wastes. This strategy will be based on the principles of prevention, reduction and reuse, and the application of Best Available Techniques and Best Environmental Practices for the disposal; the regulation of transport and the restorative actions will be taken into account.
- To formulate and adopt anti-pollution measures for hazardous wastes.

National level

130. - To prepare National Plans concerning the Management of Hazardous Wastes. These National Plans include an evaluation of the quantities of hazardous wastes produced and the financial resources necessary for their environmentally sound collection and disposal, and National or Regional Programmes for specific wastes.
- To establish systems for the environmentally sound disposal of hazardous wastes.
 - To prepare environmental voluntary agreements in which authorities, producers and users are committed on a basis of a reduction plan.

5.2.5.1 PCBs Waste

131. The PCBs or *polychlorodiphenyles* are mixtures of chlorinated hydrocarbons which have been extensively used since 1930 as dielectrics in transformers and condensers and to a lesser extent as hydraulic liquids and as nonconductors.

Proposed target

132. - *By the year (2005), collect and dispose all PCB waste in a safe and environmentally sound manner.*

Proposed activities

National level

133. - By the year (2000), to make an inventory of the quantities of PCB stored, of the quantities of PCB in equipment currently in use and of the quantities of waste, generally oils, contaminated with PCB.

- To prepare Pilot Programmes aimed at safe disposal of the PCBs; these Programmes should consider their progressive elimination including the decontamination of the equipments and containers.

5.2.5.2. Obsolete Chemicals

134. Obsolete chemicals include stocks of banned organochlorine compounds such as Dieldrin and DDT, stocks of chemicals out of date or out of use for any reason.

Proposed target

135. - *By the year (2005), to collect and dispose all obsolete chemicals in a safe and environmentally sound manner.*

Proposed activities

National level

136. - To intensify training programmes for identification, handling and disposal of obsolete chemicals.
- To promote national inventories of stocks of obsolete chemicals
 - To prepare Pilot Programmes aimed at safe disposal of the obsolete chemicals; these Programmes should consider their progressive elimination including the decontamination of the equipments and containers.

5.2.5.3. Used lubricating oil (luboil)

137. The definition of used lubricating oils in terms of LBS Protocol, is given as "*any mineral-based lubricating oils which, through use, storage or handling, have become unfit for the purpose for which they were originally intended, in particular used oils from combustion engines and transmission systems, as well as mineral oils for machinery, turbines and hydraulic systems*".

138. The most important sources of used lubricating oils are: primary metallurgies; finished metallic products; machinery; electrical material; transport equipment; chemical products; rubber and plastic and motor vehicles. The used lubricating oils can be divided into three categories:

- i) Used lubricating oils which may be reused after treatment;
- ii) Used lubricating oils contaminated by other substances (e.g. PCB); and
- iii) Industrial waste products contaminated by lubricating oils.

Proposed target

139. - *By the year (2005), to collect and dispose 50 % of the used lubricating oil in a safe and environmentally sound manner.*

Proposed activities

Regional level

140. - To formulate and adopt a norm on maximum amount of PCB an oil may contain before it is considered to be contaminated.

National level

141. - By the year (2000), to make an inventory of the quantities of the three categories of lubeoil.
- To prepare and adopt National Pilot Programmes for the collection, recycling and disposal of used lubeoils.
- To adopt and apply the anti-pollution measures for lubeoils adopted by the Contracting Parties in 1989.

5.2.5.4 Used Batteries

142. There are primary batteries and secondary or accumulator batteries. The first are designed to supply only a continuous or intermittent discharge and cannot be effectively recharged; secondary batteries can be recharged. The main types of primary batteries are: the traditional zinc-carbon Leclanche battery, alkaline batteries, mercury batteries, silver oxide batteries, zinc batteries, lithium batteries and nickel-cadmium batteries. Secondary or accumulator batteries may be the lead-acid type, which are the most commonly used in cars, or nickel-iron and nickel-cadmium alkaline batteries. Once batteries are used, they are either thrown away or collected in order to recover the metals. In both cases, harm may be done to the environment.

Proposed target

143. - *By the year (2005), to collect and dispose 50 % of the used batteries in a safe and environmentally sound manner.*

Proposed activities

National level

144. - To promote national inventories of used batteries.
- To prepare Pilot Programmes for collection, recovery and safe disposal of the used batteries.

5.3 Physical alterations and destruction of habitats

145. The increase of populations and economic activities in coastal areas is leading to an expansion of construction and physical alterations to coastal areas and waters. Building of ports and marinas, dredging operations, sand and aggregate extraction, building of coastal defences, beaches restoration and other activities linked to urban and agricultural expansion, are giving rise to alterations of wetlands, shorelands, beachfront and seafloor. Important habitats are being destroyed.

146. The damming of river systems can result in a reduction of freshwater and sediments with their nutrients loads with possible changes in estuarine conditions and adverse effects on biological diversity and biological productivity.

Proposed targets

147. - *To safeguard the ecosystem function, maintain the integrity and biological diversity of habitats which are of major socio-economic and ecological interest through integrated management of coastal areas;*
148. - *Where practicable, restore marine and coastal habitats that have been adversely affected by anthropogenic activities.*

Proposed activities

Regional level

149. - The formulation of guidelines for the preservation of habitats and normal ecosystem functions in coastal areas, particularly in the context of integrated coastal management.

National level

150. - To support programmes for integrated coastal management.
- To undertake environmental impact assessment for proposed activities that are likely to cause significant physical alterations and destruction of habitats.
- To establish a system of previous authorization by competent national authorities for works which cause physical alterations of the natural state of the coastline or destruction of coastal habitats.

6. Institutional Aspects

6.1. Authorization or regulation

151. In accordance with article 6 of the LBS Protocol, *Point source discharges into the Protocol Area, and releases into water or air that reach and may affect the Mediterranean Area, as defined in article 3 of the Protocol, shall be strictly subject to authorization or regulation by the competent authorities of the Parties.*

- i) *Regulations* are needed for both, point sources discharges and releases into water or air that reach and may affect the Mediterranean Area, and
- ii) *Authorizations* are needed for:
- (a) Point source discharges of liquid effluents into the Protocol Area, that is the Mediterranean Sea and the rivers of his hydrologic basin, that may affect the Mediterranean Sea;

(Municipal sewage discharges would be not included).

(b) Point source discharges (emissions) into the atmosphere under the following conditions:

- the discharged substance is or could be transported to the Mediterranean Sea Area under prevailing meteorological conditions;
- the input of the substance into the Mediterranean Sea Area is hazardous for the environment in relation to the quantities of the same substance reaching the Area by other means.

152. The point sources discharges from existing installations and from new installations should be differentiated. For the former the national regulations should be gradually adapted to, and for the latter the system of prior authorization should be used, taken due account of the national regulations.

Proposed target

153. - *By the year (2025), to dispose all waste water and air emissions from industrial installations, in conformity with national or international regulations.*

Proposed activities

National level

154. - To prepare/review and adopt if necessary, (over a period of two years), national regulations concerning point sources discharges of domestic and industrial waste water into the sea and rivers, which takes into account the guidelines, criteria and standards adopted by the Parties.
- To prepare and adopt, over a period of two years, national regulations concerning point sources emissions into the air from industrial installations which takes into account the guidelines, criteria and standards adopted by the Parties.

Existing point sources discharges and emissions

Proposed activities

155. - To make an inventory, in as short period as possible, of the point source discharges and emissions in the hot spots and in the areas of concern.
- To support the progressive implementation of the National Regulations by the existing industrial installations.

New point sources discharges and emissions

156. Discharges and emissions from new establishments (industries and human establishments) should have prior authorization, in which the conditions under which this release may be authorized are listed. This permission should be negotiated during the initial phase of any project and Best Available Techniques and Best Environmental Practice should be taken into account. If a project may have significant consequences for the environment it will be necessary to evaluate the environmental impact.

157. The conditions imposed will take into account the National Regulations or the contents of Annex II and the measures accepted by the Contracting Parties.

Proposed activities

158. - By the year (2000) all point sources discharges from new establishments shall have prior authorization by the competent authorities.
- To undertake environmental impact assessment for proposed activities that are likely to cause a significant adverse impact on the marine environment and are subject to an authorization by competent national authorities.

6.2 Monitoring and enforcement

159. In order to ensure compliance with the conditions laid down in the authorizations and regulations, the Authorities responsible should establish a system of monitoring and inspection.

Proposed target

160. - *By the year (2000) each Party will establish a inspection system and a monitoring programme.*
- *By the year (2000) the Parties will be establish a permanent river water quality/quantity register.*

Proposed activities

National level

161. - The establishment of inspection system to ensure compliance with the conditions laid down in the authorizations and regulations.
- The establishment of monitoring programmes to evaluate the effectiveness of actions and measures implemented under this Programme.
- The establishment and improvement of local air pollution monitoring programmes in cities exceeding one million inhabitants.
- The establishment and improvement of local monitoring programmes to control and assess effluents discharge;
- The establishment and improvement of river monitoring programmes.
- The establishment of permanent registers of river quality and quantity accessible to all Parties on selected rivers (about 50).
- The establishment of a data bank on socio-economic indicators related to sea and river quality and pollutants fluxes associated with GIS.
- The establishment of an inventory for major point atmospheric sources following EMEP/CORINAIR guidelines.

7. Capacity Building

162. Capacity building activities will be based on the priorities established and can be grouped into three categories:

- development of new institutions and strengthening existing environmental management institutions;
- monitoring, inspection and information systems;
- application of the best available techniques and the best environmental practice.

Proposed activities

163. - To support programmes on institutional capacity building on environmental matters.
- To develop training programmes on Environmental Impact Assessment.
 - To develop training programmes on environmental auditing and management.
 - To develop training programmes on environmental education.
 - To develop training programmes on monitoring and inspection.
 - To promote cleaner production techniques and practices through training of industry personnel.
 - To prepare a general manual with guidelines on implementing cleaner technologies.
 - To organize sufficient training and educational programmes for local administration to operate and maintain adequately sewage treatment facilities.
 - To facilitate access to sources (public or private, national or multilateral) of technical advice and assistance with respect to particular source-categories and sectors.
 - To facilitate the identification of opportunities for projects contributing to sustainable development for the private sector.
 - To develop training programmes on river monitoring.
 - To develop training programmes on air pollution monitoring.
 - To prepare a river monitoring manual by year (2000).
 - To prepare guidelines for linking socio-economic indicators to water quality indicators through GIS to check pollution control.

8. Public participation

Proposed activities

National level

164. - To increase decentralization and public participation in environmental management by:
- i) gradually decentralizing the operational functions of environmental management to municipal and local levels;
 - ii) disclosing specific types of information;
 - iii) involving affected parties, the private sector, local NGOs and the media in decision making regarding specific environmental policies and issues through mechanisms such as public consultations and environmental audits;
 - iv) identifying potential roles for Non Governmental Organisations in the implementation of the SAP.

9. Reporting

165. In accordance with article 13 of the LBS Protocol *"The Parties shall submit reports every two years, to the meeting of the Contracting Parties, through the Organization, of measures taken, results achieved and if the case arises, of difficulties encountered in the application of the Protocol"*.

Proposed activities

National level

166. - Every two years, to prepare and submit to the meeting of the Parties reports on application of the Protocol. Such reports shall include:
- a) National Regulations, action plans, programmes and measures implemented in application of the Protocol;
 - b) Statistical data on the authorizations granted in accordance with article 6 of the Protocol, in (2) years;
 - c) Data resulting from compliance monitoring;
 - d) Quantities of pollutants discharged from their territories.

10. Resource Mobilization

167. The mobilization of resources is essential for the development and implementation of this Programme. However, it is important to clearly state that most of the resources should be national and that it is the polluters, the consumers, the users and the Governments which should provide the resources necessary for the application of the Programme, knowing that the benefits obtained could be greater than the costs involved.

Proposed activities

168. - To gradually change prices for water uses in line with their economic costs to encourage more efficient water use, and to mobilize the funds needed for operation, maintenance and new investment;
- To establish and apply certain fees for the supply of municipal or industrial water according to the volumes consumed: These fees should gradually cover the costs of collection, treatment and distribution.
- To establish and apply a tax for the treatment of wastewaters which gradually covers the costs of their treatment and removal. This tax should be applied to the users of domestic or industrial water which may be adequately treated at sewage treatment plants.
- To establish a fee for the discharge of wastewater which complies with the regulations adopted for its discharge into public channels, rivers and the sea. This fee should take into account the volume of water discharged and its quality, and its ultimate aim should be to help maintain and monitor the quality of the receiving water.
- The users should gradually pay for the costs of collection and disposal of urban solid waste.
- The port services should be paid by the users.
- To assist the Contracting Parties in obtaining and managing financial resources for the collection and environmentally sound disposal of the existing quantities of the nine pesticides and PCBs.
- The collection and disposal of the industrial waste products should be paid by the producer.

11. National Action Plans

169. One of the SAP Programme objectives is to establish elements and guidelines for the preparation of national action plans for the protection of the marine environment from land-based activities.

170. The elements for the preparation of National Programmes of Action are presented in a separate document.

12. List of proposed activities and associated costs

HOT SPOTS

PROPOSED ACTIVITIES	ASS.COSTS x 1000 USD	DATE
List of 109 Hot Spots with main activities and impact assessment and list of 29 Priority HS		Donors Conference 1997
Pre investment studies for each 29 PHS.	2.900	1998
Prepare environmental audit for each 29 PHS.	290	1998
Prepare action plan for remedial actions in order to control pollution at 29 PHS.	50	1998
Implement action plan for remedial action at 29 PHS	1.366.000	2000 / 2008
Establishment of inspection system and monitoring programme at 29 PHS.	2.000	1998/1999
Pre investment studies for 80 HS.	2.000	1998/1999
Prepare environmental audit for each 80 HS.	800	1998/1999
Prepare action plan for remedial actions in order to control pollution at 80 HS.	20	1998/1999
Implement action plan for remedial action at 80 HS.	1.000.000	2000 /2008
Reduction of 50 % emissions of POP from HS.	50.000	2000 / 2008
Reduction of 50 % discharges and emissions of heavy metals	50.000	2000 / 2008
Reduction of 50 % organohalogen compounds	50.000	2000 / 2008
Reduction of 50 % the inputs of S.S., biodegradable org. matter and nutrients 500.000 t/y BOD	600.000	2000 / 2008
Reduction of 20 % the generation of Hazardous Waste.	250.000	2000 / 2008
Dispose 1 M tons of Hazardous Wastes in a safe and environmentally manner: - 20 Temporary safe storage for H.W. - 10 Treatment Plants for H.W.: 5 physico/chemical. and 5 integrated. - 20 Permanent safe storage for H.W.	10.000 35.000 250.000 50.000	2000 / 2010
Establishment of inspection system and monitoring programme at 75 Hot Spots	1.000	1998 / 1999
TOTAL	3.720.060	

SENSITIVE AREAS

PROPOSED ACTIVITIES	ASSOCIATED COSTS x 1000 USD	DATE
List of 21 sensitive areas		
Prepare action plan for remedial actions for 21 sensitive areas	30	1998/1999
Remedial actions for 21 s. areas	80.000	1999/2000
Development of the methodology for selection of s. areas	15	1998
Development of the methodology for determination of the cost of protection	15	1998
TOTAL	80.060	

INTEGRATED COASTAL ZONE MANAGEMENT

PROPOSED ACTIVITIES	ASS. COSTS x 1000 USD	DATE
Development of regional strategy for ICZM	150	1999/2000
Implementation of two regional or sub-regional ICZM pilot projects	400	2000/2001
Two studies on cost/benefit when implementing ICZM. (one coastal and one insular)	200	1998/1999
Implementation of a pilot project on integrated river basin management including affected coastal area	400	1998/1999
Implementation of two pilot projects in selected islands	300	1998/1999
Preparation of guidelines on Integrated Management of medium and small Mediterranean islands	100	1998/1999
Implementation of two ICZM projects in selected large coastal urban areas	600	1998/1999
Preparation of guidelines on Integrated Management of Mediterranean Coastal and Industrial Agglomerations	100	1998/1999
TOTAL	2.250	

PUBLIC PARTICIPATION

PROPOSED ACTIVITIES	ASSOC. COSTS x 1000 USD	DATE
Prepare and adopt if necessary national legislation on public information	170	1998/1999
Prepare printed material and TV spots	300	1998/1999
Identification of potential roles for NGO in the implementation of the SAP Programme.	80	1998/1999
Development of institutions and processes facilitating public participation in env. management.	200	1998/1999
TOTAL	750	

COASTAL CITIES

PROPOSED ACTIONS	ASS.COST x 1000 USD	DATE
Sewage treat. plants in developing countries in 5 cities > 1 M (8.8 M) in 29 cities > 0.1 M (9 M)	352.000 1.260.000	1998/2008
Treatment, Recovery and Disposal of sewage sludge.	38.000	1998/2008
Urban solid Waste reduction, management and disposal in 34 cities (5.3 M t/y)	1.500.000	1998/2008
Promote lead-free petrol in 34 cities	30.000	1998/2000
Inspection, maintenance and renovation of the oldest vehicles. (1 M vehicles)	300.000	1998/2008
Support the development of natural gas use (10 M inh.)	150.000	1998/2008
TOTAL	3.630.000	

PORTS

PROPOSED ACTIVITIES	ASSOCIATED COSTS x 1000 USD	DATE
Environmental audits in 30 Mediterranean Ports	30.000	1998 / 2002
Installation of MARPOL facilities		
Collection and disposal of sewage from ships		
Collection and disposal of solid waste from ships		
TOTAL		

CLEAN PRODUCTION

PROPOSED ACTIVITIES (Regional level)	ASS. COSTS x 1000 USD	DATE
Preparation of guidelines for BAT and BEP for main point sources of dioxins and furans and experts meeting.	100	1998/1999
Preparation of guidelines for BAT and BEP for main point sources of PAH and experts meeting.	100	1998/1999
Preparation of guidelines for BAT and BEP for main point sources of organometallic compounds and experts meeting.	100	1998/1999
Preparation of guidelines for BAT and BEP for main point sources of organohalogens compounds and experts meeting.	100	1998/1999
Preparation of guidelines for BAT and BEP for main point sources of SS and organic matter and nutrients and experts meeting.	100	1998/1999
Publication of the 10 guidelines in two languages.	100	1998/1999
TOTAL	600	

NATIONAL PROGRAMMES

LEVEL	PROPOSED ACTIVITIES	ASSOCIATED COSTS x 1000 USD	DATE
Regional	Guidelines for industrial waste water treatment and disposal.	100	1998/1999
Regional	Mediterranean Strategy for Management of Hazardous Waste	100	1998/1999
Regional	Guidelines for sewage treatment and disposal	100	1998/1999
Regional	Guidelines for reuse of waste water and sludge	100	1998/1999
National	National Programmes of Action for LBS	200	1998/1999
National	National regulations on point sources discharges of domestic and industrial w.w. into the sea and rivers.	200	1998/1999
National	National regulations on point sources emissions into the air.	200	1998/1999
National	National Programmes for Sewage Management.	200	1998/1999
National	National Programmes for Urban Solid Waste	200	1998/1999
National	National Programmes for Heavy Metals	200	1998/1999
National	National Programmes for Organohalogen compounds	200	1998/1999
National	National Programmes for SS, Organic matter and nutrients	200	1998/1999
National	National Plans for Hazardous Waste	200	1998/1999
National	Pilot Programmes for PCBs	200	1998/1999
National	Pilot Programmes for Obsolete Chemicals	200	1998/1999
National	Pilot Programmes for used Luboils	200	1998/1999
National	Pilot Programmes for used Batteries	200	1998/1999
National	Pilot project for management of Hazardous Waste from military establishments	200	1998/1999
TOTAL		3.200	

MONITORING AND ENFORCEMENT

PROPOSED ACTIVITIES	ASSOCIATED COSTx 1000 USD	DATE
Establish by the Parties a Inspection system to ensure compliance with national regulations	10.000	1998/2001
Establish a Monitoring programme to evaluate the actions	10.000	1998/2001
Establish a air monitoring programme in 5 cities exceeding 1 M inhabitants	5.000	1998/2001
Local monitoring programmes to control and asses effluent discharges.	2.000	1998/2001
River monitoring programmes for water flow, sediment load and pollution loads (50 rivers)	5.000	1998/2001
Permanent register of river data (50 rivers)	50	1998/2001
Data bank on socio-economic indicators related to sea and river quality	50	1998/2000
Inventory of major air point sources	20	1998/2000
Inventory of point source discharges and emissions in the hot spots and areas of concern	20	1998/2000
TOTAL	32.140	1998/2001

CAPACITY BUILDING

PROPOSED ACTIVITIES	ASSOCIATED COST x 1000 USD	DATE
Support programmes on institutional capacity building.	5.000	1998/1999
Develop. training programmes on EIA.	500	1998/1999
Develop. training programmes on environmental auditing and management.	500	1998/1999
Develop. training programmes on environmental education.	500	1998/1999
Develop. training programmes on monitoring and inspection.	500	1998/1999
Develop. training programmes on cleaner production techniques and practices.	500	1998/1999
Provision of training for local administration to operated and maintained treatment plants.	500	1998/1999
Facilitation of access to sources of technical advice and assistance.	500	1998/1999
Develop. training programmes on river monitoring.	500	1998/1999
Develop. training programmes on air monitoring.	500	1998/1999
Training programmes on cleaner production for industrial managers.	500	1998/1999
Training programmes on cleaner production for public sector responsables.	500	1998/1999
Training and education programme on ICZM	500	1998/1999
TOTAL	6.500	1998/1999

PUBLIC INDUSTRIAL SECTOR

Public Industrial Sector (P.I.S.) considered are composed by:

Oil Refineries; Petrochemicals; Power plants; Basic iron & steel; Basic aluminium; Phosphatic fertilizers; Paper & paper pulp; Cement production.

TYPE OF INDUSTRY	PROPOSED ACTIVITIES	COST x 1000 USD	DATE
P.I.S.	Develop environmental audit and environmental management.	1.000	1998/1999
P.I.S.	Apply authorization and regulation system.	1.000	1998/1999
P.I.S.	Establish monitoring and inspection system.	10.000	1998/1999
P.I.S.	Evaluation of discharges and emissions.	1.000	1998/1999
P.I.S.	Inventories, collection and disposal of hazardous waste.	50.000	1998/2003
P.I.S.	Support environmental performance reports.	1.000	1998/1999
P.I.S.	Develop environmental voluntary agreements.	1.000	1998/1999
P.I.S.	Reduction of discharges and emissions of pollutants.	100.000	1998/2008
TOTAL		165.000	1998/2008

PUBLIC SERVICES SECTOR

The Public Sector Services (P.S.S.) considered are: Railway transport; Road transport; Air and Sea transport; Transport and distribution of electric energy.

TYPE OF SECTOR	PROPOSED ACTIVITIES	COST	DATE
P.S.S	Develop Environmental Audit	1.000	1998/1999
P.S.S	Inventories of hazardous waste	1.000	1998/1999
P.S.S	Collection and disposal of used oils; PCB and used batteries	50.000	1998/2003
P.S.S	Support environmental performance reports	1.000	1998/1999
P.S.S	Prepare environmental voluntary agreements.	1.000	1998/1999
P.S.S	Promote lead-free petrol use.	100.000	1998/2003
TOTAL		154.000	1998/2003

MILITARY ESTABLISHMENTS

PROPOSED ACTIVITIES	ASSOCIATED COST x 1000 USD	DATE
Prepare National Pilot Project for env. management of hazardous waste	1.000	1998
Inventory, collection and disposal of hazardous waste.	50.000	1998/2003
TOTAL	51.000	1998/2003

SUMMARY

CLUSTER	ASSOCIATED COST x 1000 USD	DATE
HOT SPOTS	3.720.060	1998/2008
SENSITIVE AREAS	80.060	1998/2008
INTEGRATED COASTAL Z.M.	2.250	1998/2001
PUBLIC PARTICIPATION	750	1998/2001
COASTAL CITIES	3.630.000	1998/2008
PORTS		
CLEAN PRODUCTION	600	1998/2001
NATIONAL PROGRAMMES	3.200	1998/2001
MONITORING AND ENFOR.	32.140	1998/2001
CAPACITY BUILDING	6.500	1998/2000
PUBLIC INDUSTRIAL SECTOR	165.000	1998/2008
PUBLIC SERVICES SECTOR	154.000	1998/2003
MILITARY ESTABLISHMENTS	51.000	1998/2003
TOTAL	7.845.560	1998/2008

ESTIMATE COSTS OF THE ACTIVITIES FROM 1998 TO 2008

The figures are in thousand US dollars.

	1998/ 1999	2000/ 2001	2002/ 2003	2004/ 2005	2006/ 2007	ESTIMATE COSTS x 1000 USD
Hot Spots	9.060	927.750	927.750	927.750	927.750	3.720.060
Sensitive Areas	40.045	40.015				80.060
Integrated C.Z.M.	1.125	1.125				2.250
Public Participation	750					750
Coastal cities	726.000	726.000	726.000	726.000	726.000	3.630.000
Ports						
Clean Production	600					600
National Programmes	3.200					3.200
Monitoring & Enforcement	16.070	16.070				32.140
Capacity Building	6.500					6.500
Industrial P.S.	55.000	40.000	30.000	20.000	20.000	165.000
Public Services	54.000	50.000	50.000			154.000
Military Estab.	21.000	20.000	10.000			51.000
TOTAL/YEAR	933.350	1.820.960	1.743.750	1.673.750	1.673.750	7.845.560

ANNEX

A. PUBLIC INDUSTRIAL SECTOR

1. Most countries in the region have an important public industrial sector which is made of large industries with structural and management deficiencies. At the same time, they produce important goods and employ a dependent workforce. Many of these industries generate a great deal of pollution which is difficult to reduce given their economic situation.

2. Despite the diversity of situations and problems, the public industrial sector in general includes:

- Oil refineries;
- Petrochemicals;
- Power plants;
- Basic iron and steel metallurgy;
- Basic aluminium metallurgy;
- Phosphatic fertilizers;
- Paper and paper pulp;
- Cement production.

3. A programme concerning the reduction of pollution could start with the public sector enterprises, which would set an example and encourage private companies to do the same. The difficulties involved in starting this process should not be underestimated, but neither overestimated.

4. Nearly all of these industries are or will shortly be undergoing reconversion and the state will have to invest large sums of money in the process. It is imperative that this conversion be taken advantage of in order to improve the technologies from the environmental point of view.

5. It is therefore proposed to focus the action on the aforementioned industrial sectors.

Proposed targets

6. - *The industrial public sector by the year 2025 shall dispose waste water and atmospheric emissions in conformity with national or international regulations and hazardous waste are environmentally safe disposed.*
- *Over a period of (10) years, to reduce as far as possible (50 %) the inputs of the substances that are toxic, persistent and liable to bioaccumulate.*
- *Over a period of (10) years, to reduce by 50% the inputs of polluting substances from industrial installations in the hot spots and areas of concern.*

Proposed activities

Regional level

7. - To prepare guidelines for the application of BAT and of BEP in those industrial sectors.

National level

8. - To support the development and the application of Environmental Management and Audit Schema (EMAS).
- To adopt measures, including BEP and if possible BAT for the reduction and/or elimination of inputs of polluting substances to the Mediterranean Sea.
 - To apply progressively the authorization and regulation system.
 - To establish monitoring and control systems.
 - To support the evaluation of the quantities, characteristics and composition of the liquid discharges and atmospheric emissions.
 - To make inventories of the hazardous waste produced and develop programmes for their collection and safe disposal.
 - To support the preparation of environmental performance reports.
 - To prepare environmental voluntary agreements in which authorities, producers and users are committed on a basis of a reduction plan.

B. THE PUBLIC SERVICES SECTOR

9. The public services sector of concern to this Programme, mainly consists of: Railway transport; Road transport; Air and Sea transport; Transport and Distribution of electric energy.

10. All of these services produce pollutants:

Railways: used oils, PCB, asbestos, CFC cooling liquids.

Buses: used oils, cooling liquids, releases into the atmosphere.

Air routes and airports: used oils, releases into the atmosphere.

Sea routes and ports: used oils, cooling liquids (CFC), refuse, ballast water.

Transport and distribution of electric energy: used oils, PCB and oils contaminated with PCB.

Proposed targets

11. - *By the year 2025 air emissions and hazardous waste from the public services sector shall be in conformity with national or international regulations and environmentally safe disposed.*
- *Over a period of (10) years, to reduce as far as possible (by 20 %) the generation of hazardous waste from public services sector, and dispose (50 %) of the hazardous waste generated in a safe and environmentally sound manner and in conformity with national or international regulations.*
- To prepare environmental voluntary agreements in which authorities, producers and user's are committed on a basis of a reduction plan.
- To promote the use of lead-free petrol.

C. THE MILITARY ESTABLISHMENTS

Basis for action

12. Military establishments have a number of environmental areas of common concern. These common environmental areas deal with natural and cultural resource management, land use, contamination, noise, hazardous materials and wastes. In general, the armed forces feel they have an obligation toward environmental protection and recognize that environmental protection is an important and politically sensitive topic.

13. The military activities produce hazardous wastes, mainly used lubricating oils, used oils and PCB from transformer, used batteries and obsolete chemicals.

14. In 1995, The UNEP Governing Council approved one project on "Survey on the application of environmental norms by military establishments in developing countries (South East Asia)" AS/0701-95.01".

15. One of the proposed activities was to carry out a pilot survey in order to compile information on treatment and disposal of hazardous wastes from military establishments.

Proposed activities

16. - To prepare a national pilot project for the environmental sound management of hazardous wastes from military establishments.
- These pilot project may include inventories of hazardous wastes existing and produced by armed forces and the financial resources necessary for their environmentally sound collection and disposal. The pilot project will be focused on used lubricating oil, PCB, obsolete chemicals and used batteries.
- To support the development of Environmental Audit Schema in military establishment.

- *Over a period of (10) years, to reduce as far as possible (50 %) the inputs of the substances that are toxic, persistent and liable to bioaccumulate.*

Proposed activities

17.
 - To support the development and the application of Environmental Management and Audit Schema (EMAS) in the public services sector.
 - To make inventories of the hazardous waste produced by the sector.
 - To develop programmes for the collection and disposal of used oils; PCB and used batteries.
 - To support the preparation of environmental performance reports.
 - To prepare environmental voluntary agreements in which authorities, producers and users are committed on a basis of a reduction plan.
 - To promote the use of lead-free petrol.