

Decision

Regional Plan of Action on Atmospheric Pollution

Conscious that atmospheric pollution is a serious threat to public health, human welfare and ecosystem integrity;

Concerned about the effects and costs of air pollution in the achievement of the Millennium Development Goals, and in the potential development of the countries of the region;

Recognizing that rapid urban, agricultural, industrial and fleet growth in the region has made air pollution a growing concern for the region;

Taking note that it is becoming increasingly clear that air pollution is a regional and global phenomenon, due to the ability of pollutants to transform and travel long distances across national boundaries and continents, so that effective cooperation at regional and subregional level is required;

Aware of the benefits of reducing air pollution and their impacts on health in the region and the contribution in the fight against climate change and its consequent effect at the local, regional and global levels;

Encouraged by the significant progress made in some cities in Latin America and the Caribbean in improving air quality as a result of both air quality management plans and other sectoral interventions;

Reaffirming that regional cooperation contribute to maximise resources, synergies and co-benefits to simultaneously address the issues of air quality problems related to the short-lived pollutants , as well as their social, environmental and health effects;

Recalling decision 4 adopted at the XVIII Meeting of the Forum of Ministers of Environment of Latin America and the Caribbean, in which the Ministers instructed the Intergovernmental Regional Network on Air Pollution to continue working on the development of a Regional Action Plan on Atmospheric Pollution for Latin America and the Caribbean and submit it at its next meeting;

DECIDE

- 1. To adopt** the regional plan of action on Atmospheric Pollution as an option of voluntary guide for the development of national action plans appropriate to the particularities of each country with emphasis on technical exchange, capacity building and design alternatives to reduce air pollution.
- 2. To update** this regional plan of action every four years and, due to the relevance of the issue of air quality for the healthy development of our peoples and the conservation of the environment, and **encourage** governments to identify the economic resources needed for the sustainability of the air quality monitoring networks as an essential and priority element for decision-making.
- 3. To request** UNEP's support for the establishment of the general criteria to prioritize actions and the organisation of the modalities of mutual assistance based on the intergovernmental diagnosis set forth in this Regional Plan of Action.
- 4. To strengthen** public-private dialogue and the role of all sectors and levels of government involved in the promotion of commitments and actions to implement this Regional Action Plan in all priority areas defined, in the context of regional, subregional and national planning.
- 5. To ensure** coordination among initiatives promoted in the framework of the Intergovernmental Regional Network with activities developed in the context of other agreements made by countries of the region on issues related to air pollution.
- 6. To call upon** the ITC, in particular the WHO/PAHO, to support governments in the development of epidemiological studies in relation to health damages associated to air pollution in the Latin America and the Caribbean region.



UNITED NATIONS ENVIRONMENT PROGRAMME

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Программа Организации Объединенных Наций по окружающей среде

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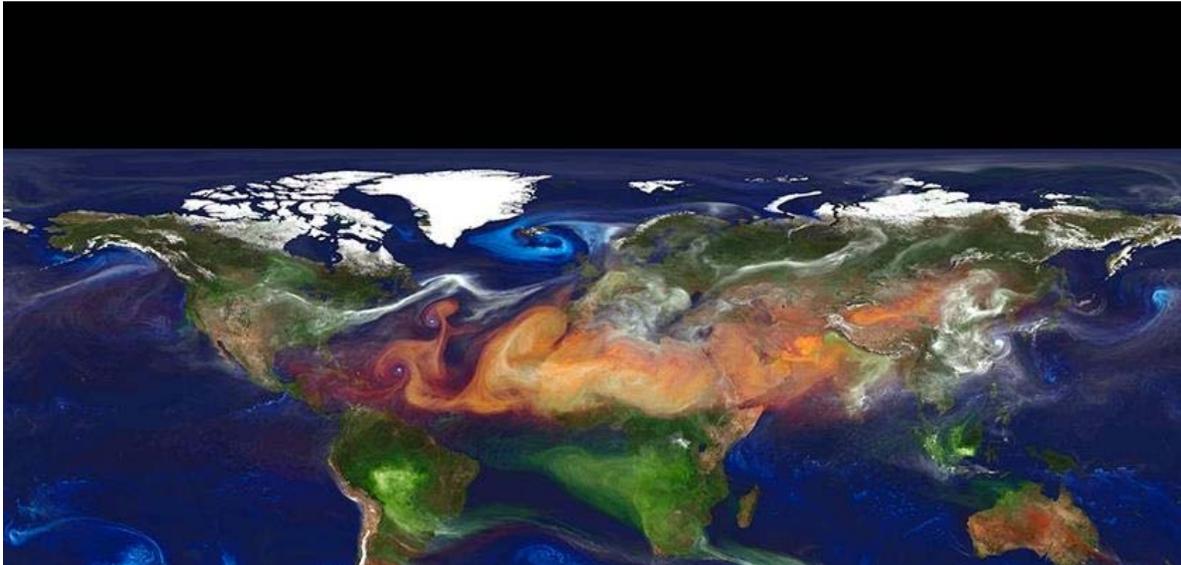
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Appendix

Regional Action Plan for Intergovernmental Cooperation on Air Pollution for Latin America and the Caribbean



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**United Nations Environment
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the Caribbean**

The United Nations Environment Programme, through its Regional Office for Latin America and the Caribbean, thanks the Clean Air Institute (CAI) and Mexico's National Institute of Ecology and Climate Change (INECC), for the preparation of this second draft of the Regional Action Plan for Intergovernmental Cooperation on Air Pollution for Latin America and the Caribbean. This draft considers the contributions made by the experts of the Regional Intergovernmental Network on Atmospheric Pollution and from other individuals and organizations that have provided with valuable comments and information.

Abbreviations and Acronyms

BC	BC
CAI-LAC	Clean Air Initiative for Latin American Cities
CCAC	Climate and Clean Air Coalition
COPD	Chronic Obstructive Pulmonary Disease
GAPF	Global Air Pollution Forum
GHG	Greenhouse Gases
IADB	Inter-American Development Bank
INECC	Mexican National Institute of Ecology and Climate Change
LAC	Latin America and the Caribbean
O ₃	Ozone (tropospheric in this context)
OECD	Organization for Economic Co-operation and Development
PAHO	Pan American Health Organization
PM	Particulate matter
SLCPs	Short-Lived Climate Pollutants
UNDESA	United Nations Department of Economic and Social Affairs
UNEP	United Nations Environment Programme
WB	World Bank
WEC	World Energy Council
WHO	World Health Organization

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Prologue

1. This document was prepared with the aim to advance decisions from the Forum of Ministers of Environment of Latin America and the Caribbean, to: a) establish the Intergovernmental Network on Air Pollution for Latin America and the Caribbean, and b) develop an action plan.

Background

The Air Pollution Problem

2. Air pollution is a serious threat to public health, human wellbeing and ecosystems integrity. Amplified premature mortality, exacerbated morbidity, productivity losses, forest degradation, crops damage and augmented global warming are some of the effects that air pollution spreads at local, regional and global scales. These harmful effects are extremely costly, morally unacceptable and largely hurt the most vulnerable groups of the population, including children and elders, as well as the ill and the poor. Air pollution, its effects and costs largely deter the achievement of the Millennium Development Goals, and national development potential.
3. In particular, air pollution is a serious concern in Latin American and the Caribbean (LAC). The World Health Organization (WHO) estimates that over 100 million people in Latin America are exposed to high levels of air pollution that exceed the recommended guidelines. The Pan-American Health Organization (PAHO) also states that, among other public health effects, urban air pollution in Latin America causes at least 35,000 premature deaths per year. Furthermore, the World Bank estimates that the health related cost of urban air pollution in some Latin American and the Caribbean countries represents about 1% of the national GDP. By 2050, outdoor air pollution is projected to become the top cause of environmentally related deaths worldwide.
4. Indoor air pollution is also a major concern. According to WHO, about 3 billion people worldwide use biomass fuels or coal for cooking and heating. In such cases, Particulate Matter (PM) levels may be 10–50 times higher than the guideline values. Around 2 million premature deaths are linked to indoor air pollution mostly in developing countries and “almost half of these deaths are due to pneumonia in children under 5 years of age”. “More than 1 million people a year die from

chronic obstructive pulmonary disease (COPD) that develops due to exposure to such indoor air pollution. Both women and men exposed to heavy indoor smoke are 2-3 times more likely to develop COPD”.

5. In addition to its health impacts, air pollution damages agriculture and ecosystems. For example, ground level ozone also affects sensitive vegetation and ecosystems, including forests, parks, wildlife refuges and wilderness areas. When sufficient ozone enters the leaves of a plant, it can interfere with the ability of sensitive plants to produce and store food. Continued ozone exposure over time can lead to increased susceptibility of sensitive plant species to disease, damage from insects, effects of other pollutants, competition, and harm from severe weather. These effects can also have adverse impacts on ecosystems, including loss of species diversity and changes to habitat quality and water and nutrient cycles.
6. Beyond its local effects, there is an increasing evidence of the regional and global nature of air pollution. Long-range transport and transformation of air pollutants across national boundaries and continents can carry pollutants far away from their sources. Thus, local air quality can be impacted by pollution generated elsewhere, to the extent that critical levels may be exceeded. Furthermore, recent scientific research has found that some air pollutants can also contribute significantly to global warming. Those pollutants have been grouped under the term “Short-Lived Climate Pollutants” (SLCPs).
7. Rapid urban, industrial and motorization growth has made the region increasingly concerned with these environmental issues. Significant progress has been made in some Latin American cities to improve air quality as a result of both air quality management plans and sectorial interventions. However, a serious problem remains and air pollution issues are extending to a growing number of urban areas.

The Intergovernmental Network on Air Pollution

8. The Intergovernmental Network on Air Pollution for Latin America and the Caribbean (the Intergovernmental Network) was established by a decision of the Forum of Ministers of Environment in 2008. The objectives of the Network are to:
 - Promote the technical exchange of research and information on air quality management and strengthen capacities;

- Harmonize national air quality management legislation, standards, monitoring methods, and data management procedures;
 - Assessing and proposing policy options for reducing air pollution; and
 - Supporting the development and implementation of a regional action plan with the objective of reducing air pollution in the region.
9. This Regional Action Plan for Intergovernmental Cooperation on Air Pollution for Latin America and the Caribbean responds to this mandate from the Forum of Ministers of Environment.
10. Key elements for a framework agreement on Air Pollution for Latin America and the Caribbean were originally outlined as an outcome of discussions of the Intergovernmental Network held in Panama in April 2010 and submitted to the 18th Meeting of the Forum of Ministers of Environment of Latin America and the Caribbean, held in Quito Ecuador in 2012. Further Ministers agreed to continue working on the elaboration of a Regional Action Plan which would provide orientation to the work of the Regional Intergovernmental network, where potential sources of funding are assessed, with the aim of presenting it to the Ministers at the next Meeting of the Forum for consideration of possible approval.
11. This draft build upon the document entitled “Elements for a Framework Agreement on Air Pollution”. It also incorporates findings and recommendations from an international meeting held on 31st October and 1st November 2012¹, where representatives of 20 Governments in Latin America and the Caribbean (LAC) supported by invited experts from across the region and elsewhere discussed the relevance of short-lived climate pollutants (SLCPs) to Latin America and the Caribbean, and strategies for reducing emissions across the region.
12. Regarding national plans, they are expected to take into consideration the varying levels of development of air pollution and climate policy and available resources in different countries of the region. They may need to complement and work with existing programmes and

¹ The meeting was held in Bogota under the auspices of the Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants (CCAC), and the UNEP Regional Office for Latin America and the Caribbean (ROLAC), and hosted by the Governments of Colombia and Mexico, which are partners in the CCAC. It was held in conjunction with a meeting of regional representatives charged by the Forum of Environment Ministers of Latin America and the Caribbean with preparation of an Action Plan on Air Pollution in the LAC region.

effectively reflect national priorities in respect of the different sectors that generate SLCP emissions.

Elements for Regional Cooperation

13. Members of the Intergovernmental Network on Air Quality have agreed to join efforts to combat air pollution, including SLCPs, based on the following considerations:

- Regional cooperation should allow a maximization of resources, synergies and shared benefits for addressing air quality and SLCPs issues simultaneously, as well as their impacts on health, society and environment;
- National plans should be flexible and differentiated according to national circumstances to improve local air quality;
- Develop and align among the States, as much as possible, the policies, guidelines, legislation, standards, monitoring procedures and data management procedures with respect to atmospheric pollutant management at national level;
- Facilitate the exchange and dissemination of information and research on, and technology for, atmospheric pollutant management through sub-regional networks and databases; including innovative financial options;
- Foster development of research and provide technical assistance to: a) identify and assess sources of pollution and their impacts on human health and the environment, including the climate system; b) design, implement and evaluate intervention options to reduce emissions; and c) quantify impacts of such interventions options;
- Promote cost benefit studies of atmospheric pollution and its impacts, including impacts of intervention options;
- Promote epidemiological studies in the countries for appropriate decision making in each;
- Align emission standards and regulations from point sources and areas to control, and promote research on the effects of transboundary atmospheric pollutants;
- Consider the growing interest in the role of short-lived climate pollutants to improve air quality and mitigate climate change in the near term; promote studies on SLCPs and their mitigation options as part of general atmospheric pollution strategies.
- Establish mechanisms for strengthening regional cooperation South-South and North-South, and inter-regions;
- Recognize subregional differences, enhancing and building upon and progress reached from the most advanced countries in this field and supporting other less developed.
- Develop inter-sectoral approaches.

National and Regional Environmental Governance

14. Key elements to strengthen governance to improve air quality at local, national and regional scales are:

- Consider atmospheric pollution as an intrinsic component of national development plans and review necessary legislation in order to adjust it, as required;
- Promote development of SLCPs national action planning as a key part of the broader air quality management planning to enable countries, to identify achievable 'quick-win' benefits;
- Promote the establishment of cross-sectorial coordination mechanisms (and co-responsibility arrangements) with national authorities, institutes and agencies involved in the development and implementation of policies on atmospheric pollutants and management strategies, including, among others, environment, transportation, energy, agriculture, urban development and finance agencies;
- Build and improve the capacity of atmospheric pollution management units in national environmental agencies and other relevant institutions involved;
- Develop and maintain, as appropriate, national emission inventories for major air pollutants, including greenhouse gases and SLCPs, and assess the impact of the various policies and measures related to these emissions;
- Promote and install air quality monitoring stations for key pollutants using regionally standardized equipment and protocols and, as necessary, on a sub-regional level, linking this to the work being carried out globally with respect to modelling and forecasting with support of international cooperation agencies;
- Identify and share best practices related to financing policies in order to implement measures to reduce atmospheric emissions and carry out evaluations using monitoring and emission inventory systems;
- Facilitate the regional alignment of air quality standards and guidelines and carry out periodic revisions to evaluate the national and regional standards, comparing them with the best international practices;
- Promote the use of networks and knowledge platforms with support from cooperation agencies (North-South, South-South).

Action Plan Objectives

15. The overall objectives of this Regional Action Plan are to postulate common directions at short, medium and long-term, for members of the Intergovernmental Network on Air Pollution for Latin America and the Caribbean to abate air pollution in the region and mitigate emissions of priority pollutants, as well as to substantially decrease local, regional and global impacts of air pollution.

Overall Objective

16. The higher-level objective of this Action Plan is twofold:
- Reduce the contribution to priority pollutants from the region of priority pollutants aiming to mitigate impacts to public health, food security, regional climate change mitigation and other positive impacts.
 - Improve air quality in urban areas of the LAC region that reduce negative impacts on, and risks to human health, and the environment based on harmonized standards.
17. The Action Plan is designed to foster collaboration at regional and national levels towards achieving the adoption/creation of national and local policies and programmes to significantly improve air quality and protect public health and the environment while contribute to mitigate climate change, enhance quality of life and other co-benefits.

Regional Objectives

18. The regional objectives are:
- a. Strengthening the Intergovernmental Cooperation on Air Pollution for Latin America and the Caribbean.
 - b. Promote and disseminate mechanisms to reduce air pollution, to raise awareness of air pollution impacts, as well as prevention and mitigation strategies;
 - c. Assisting countries to develop and/or enhance national plans and region-wide actions, by identifying and overcoming barriers, enhancing capacity, generating and disseminating knowledge, deploy technologies and mobilizing technical and financial support;
 - d. Promoting best practices and showcasing successful efforts;
 - e. Contributing to improve scientific understanding of air pollution, its sources and impacts, and supporting its application to design and implement mitigation strategies;
 - f. Improving capacities and resources to quantify impacts of interventions;

- g. Promote and disseminate scientific, technological and good practice contributions from other countries to enhance environmental sustainability; and,
- h. Foster intergovernmental agreements to reduce emissions of priority pollutants in Latin America and the Caribbean.

Country-Specific objectives

19. The Proposed Country-Specific objectives in participating nations are:
- a. Improving air quality and improving public health by preparing, implementing and enforcing National Plans to reduce priority air pollutants, through:
 - The adoption of comprehensive strategies according to their national and local circumstances;
 - The mainstreaming pollution reduction in existing and future relevant sectorial policies; and
 - The creation and enhancement of policy instruments and guidelines for local governments, as well as to address barriers, for improving air quality while reducing transboundary atmospheric pollutants, including SLCPs.
 - b. Adoption of standards for monitoring, control and enforcement of air pollution to enable priority pollutants abatement; and
 - c. Establish means, mechanisms, indicators and instruments to monitor efficacy of adopted strategies to reduce priority pollutant emissions at local, national and regional scales.

Strategy

20. The decision 4 of the Forum of Ministers of Environment of Latin America and the Caribbean entangles the preparation of: a) a regional action plan that should serve as a framework for all national action plans and deal with the air pollution in the long term at a regional level; and b) national action plans to be prepared by each participant country.
21. Both Regional Action Plan and National Action Plans should identify and address key barriers to implementing sound air quality management programmes and related measures. In particular, the Regional Action Plan should propose specific actions to address these barriers in its role of supporting the national action plans. Common barriers to be addressed include: a) institutional barriers; b) regulatory barriers; c) financial barriers; d) technical barriers; and, e) cultural barriers.

22. The Regional Action Plan supports the objectives of the Intergovernmental Network on Air Quality for Latin America and the Caribbean (the Intergovernmental Network) by fostering:
- a. An improved regional cooperation and dialogue on exchange of research and knowledge on air quality management and related issues;
 - b. A harmonization of national air quality management legislation, standards, monitoring methods and data management procedures;
 - c. A better understanding of (and assessment tools on) synergies and co-benefits of taking joint measures against the emission of atmospheric pollutants and greenhouse gases;
 - d. Technical assistance, guidance and training to promote air quality improvement in the region by addressing the different sectors involved: a) transportation, b) urban planning and management, c) point and area sources, d) forest fire, uncontrolled burning, and deforestation;
 - e. An expanded coordination and cooperation amongst countries, stakeholders, donors and other organizations engaged in addressing air pollution, climate change and related issues in the region;
 - f. An improved outreach to key stakeholders and the public; and
 - g. Strengthened national and regional governance.
23. The products and processes resulting from activities of this Regional Action Plan will be open to the direct participation of all Latin American and the Caribbean countries, allowing them access to vital lessons learned. The resulting increases in demand for resources and technical assistance will create opportunities for donors, technical agencies and governments to participate with resources under a common framework.
24. The Regional Action Plan will be divided into the following components:
- Component 1. Technical assistance, training and capacity strengthening
 - Component 2. Policy dialogue, cooperation and coordination
 - Component 3. Assessment methodologies of policies, plans and projects
 - Component 6. Research
 - Component 5. Awareness raising
 - Component 4. Regional Plan Monitoring and Evaluation
25. These components will function in a complementary fashion towards the achievement of the regional objectives stated above.

26. On the other side, the national action plans will be designed and implemented according to their different capacities, as well as socioeconomic and bio-geophysic circumstances. Technical assistance will be key for preparing both baselines and national plans. Each national action plan is expected to focus on the following windows:
- Air quality management instruments, including emission inventories, norms and compliance surveillance, air quality standards and monitoring; and health effects and economic assessment, economic valuation, as well as the appropriate models to assess baselines and measures assessment based on benefits analysis.
 - Sustainable Transport
 - Production, supply and quality of fuels
 - Urban Planning and Management
 - Point and Area Sources, including methane emitting sectors such as solid waste management facilities, and natural gas and oil production
 - Forest Fire, uncontrolled burning, and deforestation
 - Indoor air pollution
27. The elements referred in previous sections provide more information on the particular issues to be address under each window. Both the Regional Action Plan components and the National Action Plans windows will function in complementary fashion towards the achievement of each of the objectives of this Action Plan. In conjunction, the Regional Action Plan and the National Action Plans will contribute towards the adoption/creation/enhancement of air quality and climate change programmes and related sectorial programmes and support the adoption of national policies to significantly lower air pollutant emissions.
28. Due to their significant impacts on air quality and/or climate change, as well as the important benefits of their control on health, ecosystems, economy and other co-benefits, the priority pollutants to be addressed during the first step are:
- Respirable Particulate Matter (both PM10 and Pm2.5), with particular emphasis on size and toxicity, including Black Carbon.
 - Tropospheric Ozone (O3), including its precursors.
 - Hydrocarbons (HC), including Volatile Organic Compounds (VOC)
 - Nitrogen oxides (NO_x)
 - Sulphur dioxide (SO₂)
 - Carbon Monoxide (CO)
 - Toxic compounds

29. In long-term, Member States may wish to review and update the list of priority pollutants. Following there is a description of those pollutants.

Particulate Matter

30. Particulate matter (PM) is the term used for a mixture of solid particles and liquid droplets suspended in the air. These particles originate from a variety of sources, such as power plants, industrial processes, and motorized vehicles (particularly diesel vehicles), and they are formed in the atmosphere by transformation of gaseous emissions. Their chemical and physical compositions depend on location, time of year, and weather. Particulate matter is composed of both coarse and fine particles.
31. The major components of PM are sulphate, nitrates, ammonia, sodium chloride, carbon, mineral dust and water. It consists of a complex mixture of solid and liquid particles of organic and inorganic substances suspended in the air. The particles are identified according to their aerodynamic diameter, as either PM₁₀ (particles with an aerodynamic diameter smaller than 10 µm) or PM_{2.5} (aerodynamic diameter smaller than 2.5 µm). When PMs are inhaled, they may reach the peripheral regions of the bronchioles, and interfere with gas exchange inside the lungs.
32. The effects of PM on health occur at levels of exposure currently being experienced by most urban and rural populations in both developed and developing countries. In addition to its short term exposure impacts, chronic exposure to particles contributes to the risk of developing cardiovascular, respiratory diseases and lung cancer. In developing countries, exposure to pollutants from indoor combustion of solid fuels on open fires or traditional stoves increases the risk of acute lower respiratory infections and associated mortality among young children; indoor air pollution from solid fuel use is also a major risk factor for chronic obstructive pulmonary disease and lung cancer among adults.

Black Carbon (BC)

33. BC is a short-lived climate pollutant that is a major component of soot and is produced by incomplete combustion of fossil fuel and biomass. It is emitted from various sources including motorized vehicles (particulate diesel vehicles), biomass stoves, forest fires, agricultural open burning and some industrial manufacturing facilities.

34. Specific BC health effects are still being assessed but it is clear that strategies to reduce BC involve a reduction in PM because of the consistency of their sources. While the proportion of BC varies PM source, the type and quality of fuel for the diesel combustion between 50 and 75% of the PM emissions can result in BC emissions. Not too far away, gasoline combustion could result in values between 30% and 40% of PM emissions. Still, this implies a close relationship between the PM and the BC emissions. In developing countries where emissions of PM generate millions in losses in response to respiratory and cardiovascular diseases, besides thousands of deaths per year, reducing BC emissions may imply health benefits that make action extremely beneficial and cost-efficient.

Tropospheric Ozone

35. Ozone at ground level – not to be confused with the ozone layer in the upper atmosphere – is one of the major constituents of photochemical smog. It is formed by the reaction with sunlight (photochemical reaction) of pollutants such as nitrogen oxides (NO_x) from vehicle and industry emissions and volatile organic compounds (VOCs) emitted by vehicles, solvents and industry. The highest levels of ozone pollution occur during periods of sunny weather.
36. Excessive ozone in the air can have a marked effect on human health. It can cause breathing problems, trigger asthma, reduce lung function and cause lung diseases. In Europe it is currently one of the air pollutants of most concern. Several European studies have reported that the daily mortality rises by 0.3% and that for heart diseases by 0.4 %, per 10 µg/m³ increase in ozone exposure.
37. In addition to its health effects, tropospheric or ground level ozone (O₃) is also a SLCP responsible for a large part of the human enhancement of the global greenhouse effect and has a lifetime of a few days to a few weeks.

Nitrogen Dioxide (NO₂)

38. Nitrogen dioxide (NO₂) causes health impacts, is a precursor to ozone and an acidification and eutrophication cause. Main NO₂ anthropogenic sources are combustion processes (electric generation and internal combustion engines).
39. NO₂ is the main of nitrate aerosols that is a large PM_{2,5} constituent and in the presence of ultraviolet light, it turns into ozone. In short duration exposure it is a toxic gas that causes major inflammation of

the respiratory tract. Acidification has effects on terrestrial ecosystems, freshwater and marine systems.

Hydrocarbons including Volatile Organic Compounds

40. Hydrocarbons are compounds containing various combinations of hydrogen and carbon atoms. They may be emitted into the air by natural sources (e.g., trees) and as a result of fossil fuel combustion, fuel volatilization and solvent use.
41. When reacting to the NO_x in presence of solar radiation, these compounds participate in tropospheric ozone. Most of these volatile compounds such as the benzene, toluene, Polycyclic Aromatic Hydrocarbons, and aldehydes have high toxicity levels.
42. Volatile organic compounds or VOCs are organic chemical compounds whose composition makes it possible for them to evaporate under normal indoor atmospheric conditions of temperature and pressure³.

Sulphur Dioxide (SO₂)

43. Sulphur dioxide (SO₂) is a criteria pollutant. Primary sources of SO₂ are the use of fuels with high sulphur content such as coal, vehicle fuels and other fuels used for power generation.
44. Sulphur dioxide (SO₂) emissions have health impacts as gas and also by contributing to PM_{2.5}. SO₂ also has effects on terrestrial and freshwater ecosystems by acidification. Since sulphate aerosols cool the atmosphere, it is necessary to consider the impacts of this reduction in designing climate change mitigation policies.

Carbon Monoxide

45. Carbon monoxide is a criteria pollutant. It is a colourless, odourless gas resulting from the incomplete combustion of hydrocarbon fuels. CO interferes with the blood's ability to carry oxygen to the body's tissues and results in numerous adverse health effects. Over 80 percent of the CO emitted in urban areas is contributed by motor vehicles. CO is a criteria air pollutant.

Air toxics

46. Air toxics, also known as hazardous air pollutants, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Examples of toxic air pollutants include benzene, which is found in gasoline; perchloroethylene, which is emitted from some dry cleaning facilities; and methylene chloride, which is used as a solvent and paint stripper by a number of industries. Examples of other listed air toxics include dioxin, asbestos, toluene, and metals such as cadmium, mercury, chromium, lead compounds and others.

Strategic Sectorial Actions

47. This section introduces the major issues and actions that each country should consider for adoption under the scope of this Regional Plan, considering its national circumstances and priorities, including policy instruments such as regulations, economic instruments and information, among others.

- Transport sector
- Brick and pottery production
- Biomass use for cooking and heating
- Power plants and industrial facilities
- Oil and gas activities
- Solid waste management
- Wastewater management
- Agriculture, forestry and livestock
- Other

48. Following there is a discussion of issues and recommended strategic actions to address those sectors from an integrated perspective comprising air pollution management and mitigation of SLCPs. Table 3 summarizes these priority sectors and their relationship to key pollutant to be addressed by the regional action plan. As agreed by member of the Intergovernmental Network, this action plan should be designed to foster collaborative efforts at a regional and global level. In this context, box 2 shows sectorial actions in which the Climate Chance and Clean Air Coalition is focused its own action plan

Transport sector

49. The transport sector is the main source of air pollutants in the region. It is also one of the largest and the fastest growing source of

greenhouse gas emissions from fossil fuels. Latin America is highly urbanized and motorization has been grown very rapid. The problems that this brings –including the economic impacts of congestion, inefficient fuel consumption, deterioration in the quality of life, and other issues such as road safety – require integrated urban strategies which combine these various considerations. However, reducing the impact of vehicle emissions – particularly BC - on public health should always be a key consideration within such multi-objective planning processes.

50. Emission reduction from the transport sector requires two complementary strategies: i) to reduce vehicle emission rates (diminishing amount of emissions per kilometre travelled) and ii) to manage transport activity (rationalizing growth of kilometres travelled). These strategies can be achieved by: a) avoiding unnecessary and inefficient, highly polluting trips per passenger; b) shifting to more efficient and cleaner modes; and, c) by improving technologies and fuels, aligning emission standards and vehicle fuels specifications at a regional level.
51. There are many examples of impressive programmes to reduce emissions in the region's largest cities, including Mexico City, Santiago, Rio de Janeiro, Sao Paulo, and Bogota, but the rapid unplanned growth of cities can offset the impact of new policies and technologies. Strategies are now needed that can take respond to this and can extend the successful multi-intervention strategies developed in the larger cities to rapidly-growing smaller cities and to other regions.

Actions

52. Against this background, implementation of the following set of sustainable transport policies are needed to achieve the required emission reductions in areas such as:
 - Cleaner vehicles and fuels
 - Enhanced public transport
 - Integrated non-motorised transport options
 - Travel demand management
 - Integrated land use and transport planning
 - Freight management

Cleaner vehicles and fuels

- A key measure is improvement in fuel quality, including sulphur content of diesel aiming for sulphur content not exceeding 50 ppm by 2015, or the soonest possible after this date, considering the

subregional differences related to the state of knowledge on this subject, as well as existing policies and standards.

- Similarly, by 2015, establish increasingly stringent vehicle emission standards coupled to the appropriate fuel specifications, for light, medium and heavy-duty vehicles, as well as motorcycles. In the case of countries that are not able to establish such standards in 2015, they should have a process to establish such standards.
- Introducing better fuel in designated urban areas can be an option, particularly in large urban areas. However, improvements in fuel quality should be carried forward with regard for what is being done in other cities in the region as varying quality can be a disincentive to introduction of new technologies that require high quality fuel.
- Improvements in fuel quality and stringent emission standards need to be complemented by better inspection and maintenance. Regulatory programmes are now emerging in some countries but need to be more widely developed and applied. There is also scope for voluntary programmes which can encourage good practice;
- Targeting old and high emitting vehicles² (including scrap page schemes), particularly diesel emissions from heavy-duty vehicles, from fleets and individual owners, can be an effective approach. However, for this to be publicly acceptable, steps need to be taken to protect individual owners. For instance flexible financing, duty tax exemptions and/or reduction of registration fees may need to be put into place for small companies and individuals, backed by the state.
- Taking into consideration the absence of homologation labs to verify standard compliance with new vehicles, promote the requirement of internationally recognized certificates and introduce labels that enable the identification according to their emissions, before importing.
- Explore the possibility of undergoing alliances with universities in countries or at subregional level, for example in the Caribbean, to develop capacities in the relevant laboratory analyses to certify the good condition of the vehicle parks periodically
- Implement Eco-labelling initiatives to inform consumers and promote the acquisition of cleaner vehicles at national level may also have a role to play, based on experiences in some.
- For those countries where the import of used vehicles is permitted, promote the establishment and enforcement of stringent emissions control regulations and ensure that the condition of these vehicles does not pose a threat to human health and the environment;
- Explore and adopt modern technologies and standards (or other policy instruments) that promote vehicle fuel efficiency and the reduction of

² In Latin America public transport fleets are relatively old technologies that barely meet regulations equivalent to Euro II emissions. This is an issue that also affects the sustainability of public transport systems, increases levels of accidents, and discourages their use by citizens. In Sao Paulo, for example, the public transport fleet represents a major source of particulate matter (37% of total transport emissions) and nitrogen oxides (31%). In Bogota buses provide 39% of particulate matter emissions from mobile sources.

emissions, for new vehicles and for those in circulation, including vehicle scrap-page programmes;

- Carry out detailed economic, social, and environmental evaluations to assess the use of biofuels and other clean fuels.

Sustainable Transport

53. Sustainable transport strategies include: a) enhancing public transport; b) land use and transport coordination; c) promoting non-motorized transport; d) travel demand management; and, e) freight management. There are different initiatives from which the Regional Action Plan and National Plans could build upon. Since 2009, the Clean Air Institute is implementing a Regional Sustainable and Air Quality Programme in coordination with national execution agencies and local governments from Argentina, Mexico and Brazil that could be easily expanded throughout the region. Embarq and ITDP have also an intense activity in several cities of the region. Sustainable transport also forms part of the 5-year Sustainable Development Plan of the United Nations Secretary General.

54. Following there is a general description of general intervention that is necessary to implement sustainable transport interventions, complementing those related to clean vehicles and fuels.

Enhancing public transport

- Providing circulation priority and investment for low emission, less carbon intensive, safe, high-capacity and financially sustainable public transport systems;

Integrated land use and transport planning

- Fostering the creation of compact cities and dense urban areas, where population has access, with minimum time, distance and cost, to work, school, markets, public space and recreational areas, throughout appropriate instruments and institutions that foster that integrated planning.
- Foster inner urban biological corridors.

Non-motorised transport

- Developing and promoting systems and infrastructure for non-motorized transport (cycling and walking), interconnected with the public transport system;
- Raise awareness among the population and local authorities on non-motorized benefits for health and environmental benefits.

Travel demand management

- Reducing use of less efficient modes through the implementation of efficient information systems for selection of routes and destinations, control and reduction of parking space, car-pooling and development of sustainable mobility plans in private companies among other measures. In Bogota, congestion is currently being studied.

Freight management

- Considering that emission inventories consistently place freight as a key player in overall particulate matter emissions (and therefore BC emissions), there is a need to develop comprehensive plans to enhance this subsector, including technology, operations, routes monitoring, freight regulation, eco-driving, logistic and scrapping options.

Brick and pottery production

55. Most brick and pottery production in LAC is non-mechanized and traditional, using inefficient kilns which use wood, waste and heavy oil to fire them. In many cases, brick and pottery kilns are located in dense urban areas, significantly affecting health of local population as well as that of workers. Information on total brick and pottery production, number of workers, number of kilns and their location is sparse, especially at the LAC regional level. There is a general lack of information on the informal brick and pottery making sector in the region, including children labour exploitation practices, as well as efficient ways to control emissions from these kilns.
56. It has become clear that regulation of the sector is not straight forward. There are cases where the informal sector has grown at the expense of the formal sector when emissions regulation has been imposed -and the informal sector do not follow regulations. Promoting kiln manufacturer associations can help emission control, by promoting the necessary cultural change and helping access to finance. This is important as brick kiln owners in the informal sector cannot access credit in the formal financial sector – banks are generally unwilling to give loans. New sources of funding are needed to provide resources for technology upgrade investments and relocation.
57. Initial investment in new technology can be very high and so state intervention is likely to prove necessary to provide initial finance. There are examples of successful intervention in LAC with innovation funding mechanisms. Policies promoting mechanization and new

product development, such as those implemented in China, are good examples that could be considered by the LAC region.

58. Other key priorities in the short to medium terms include:

- Developing a better information base on the sector across the continent and developing awareness campaigns and training to brick kiln workers. These are important and have been developed to some extent in LAC, but need to be more widespread;
- There needs to be wider recognition that, although there have been important success stories in modernization, the traditional artisanal sector remains very large;
- Ways need to be found to catalyse and spread new and cleaner technologies, and to create a viable market framework within which the transition can be welcomed rather than resisted by the industry;
- South-South collaboration should be encouraged because much can be learned from countries that had gone through a change process relatively recently.
- An important effort should be made to formalize informal establishments to ameliorate their impacts while protecting worker and their families.
- The sharing of successful experiences about sustainable consumption mechanisms that would allow the consumer to take informed decisions, through appropriate labelling and product origin identification.

59. The issues regarding regulation and policy development and implementation are being explored through the CCAC initiative on brick kilns. This will try to develop strategies for effective implementation, as well as clarify the different local, regional and global issues.

Biomass use for cooking and heating

60. Wood is still used to cook across the LAC region, where many countries still rely on it and it remains the main fuel used for cooking. Although there is very little data on wood fuel use it is clear that there is no fuel that can totally replace it. Indoor exposure to smoke from woodstoves has an enormous contribution to premature deaths and chronic pulmonary disease, particularly for children and elders.

61. The environmental, social and health impacts remain very high. For instance, in the Caribbean (where there are more endemic plants per square km than anywhere else in LAC) fuel wood use led to

deforestation – 86% of land was deforested in the Dominican Republic threatening biodiversity and endemic plant life.

62. Cook stove programmes have therefore assumed importance in a variety of respects, and there have been a range of initiatives in the sub-region. One of these was a major LPG gas promotion linked with reforestation measures, and this has proved very successful. Government to state policy and public-private partnerships have been involved in the subsidized conversion to LPG. Subsidies are expensive, but as that example showed, can meet social needs. Alternative technologies that do not require subsidies are however to be preferred.
63. Efficient cook stoves could eliminate many emissions and help protect forests. It is important to be sensitive to the needs of users in developing alternatives (e.g. smoke is good for mosquito control and open fires are also used for light or drying clothes, quite apart from the many uses of traditional cooking). Cultural change is therefore an important issue with regard to the promotion of cleaner cooking. Costs and final use are also very important.
64. Whilst there are multiple programmes and projects on cook stoves, current initiatives cannot be relied on to deliver SLCP emission reductions. They are also often isolated, with a lack of coordination and systematized approach. There can also be a lack of quality control and a need for minimum standards.
65. Market-creation can be a significant issue. It is important to engage the private sector, but it is difficult when stoves are given away. In all circumstances it is important to use financing that can preserve a role for the private sector. Any successful programme must include the private sector, as well as government and civil society.
66. A helpful further step in policy development would be the preparation of information packages to be presented to stakeholders in the region (e.g. decision makers from different ministries).
67. Finally, policy development should also take account of the following important general considerations:
 - Training programmes and promote public awareness of the impact of indoor air pollution;
 - Promote the use of accessible and more efficient devices for clean combustion and safer energy;
 - Promote formulation of technical specifications for domestic combustion devices and establish emission standards;

- Promote the substitution of conventional cook stoves with improved clean alternatives;
- Support energy efficiency emphasizing manufacturing of product that mitigate BC emissions needs to be built into the next generation of models;
- In case of the need of using biomass, foster biomass from forestation and reforestation;
- Creating a special fund to focus on emission reductions.
- Focusing on the health benefits will help deliver support for SLCP mitigation;
- Importance of user friendly designs; local presence to help with maintenance;
- Promote the use of cleaner and more advanced technologies and energy, including the use of renewable energy;
- Promote and support the building of energy efficient houses, which location takes also into consideration transport and land use criteria;
- Promote electrification of poor areas to avoid the use of fuel lamps and promoting solar lamps, mini grid or off grid lightening relevant to areas with scattered or distant population;
- Promote the establishment of standardized methodologies to analyse control parameters for sick building syndrome.
- Implement a campaign to measure indoor air pollution and its impacts;
- Foster assessment of indoor air pollution and its impacts.

Power plants and industrial facilities

68. A significant percentage of thermal power plans and other facilities in Latin America and the Caribbean utilize heavy fuel oil, and some power plants use coal as fuel, which results in BC emissions. There is a need to adopt adequate policies, legal frameworks and guidelines to promote the adoption of effective technologies and the best practices in combustion facilities by 2015 or the soonest possible before this date. Following there are key considerations to reduce emissions from this sector:

- Draft and adopt policies and legal frameworks to facilitate and promote the use of cleaner fuels, implementation of emission control systems and the efficient use of energy in industrial facilities;
- Require environmental impact evaluations and environmental audits, as the case may be, for businesses and activities having potential and real impacts on air quality; as well as the application and enforcement of environmental management plans;

- Promote the establishment and/or adoption of emission standards and regulations for the different activities and ensure compliance with them; and,
- Develop the capacity for the national monitoring of emissions caused by area and point sources.

Oil and gas activities

69. There is ample opportunity to reduce methane and BC emissions from hydrocarbons exploitation and transformation in Latin America. Around 22% of global methane emissions are from venting and leakage of natural gas, totalling 1,595.2 million tons of CO₂ equivalent (MMtCO₂e) in 2010. For anthropogenic methane the Oil and Gas sector is possibly the largest area for LAC methane emissions reduction.
70. Reduction of emissions in the sector can draw on the following:
- Methane emission reduction not only improves air quality it is beneficial for health, industrial safety, and clean energy production;
 - Projects with high return rates to reduce methane emissions
 - Apply resources for training, feasibility studies, modelling, and technology workshops in the oil & gas sector.

Solid Waste Management

71. Comprehensive solid waste management (SWM) can: a) reduce waste in landfills; b) produce many useful by-products through recycling, gas capture/incineration, composting, and disposal; c) reduce emissions, generate energy and improve public health.
72. Extensive planning, management, and investments are however required, and this can be dependent on strong municipal institutions and effective legislative and regulatory foundations. There are opportunities for collaboration with activities of the Global Methane Initiative (GMI), including the GMI's Colombian Biogas Model that has been used to develop the Colombian Low Carbon Development Strategy.
73. On the other side, waste burning in open dumps is one of the main sources of BC emissions in the region, with emissions that are about 2.5 times higher than those confined combustion³. Despite its

³ Emissions from waste and agricultural burning reached about 910,000 ton/year of BC, equivalent to 27% of world total emissions from these activities.

contribution, this source is usually neglected or underestimated in emission inventories and scientific research is scarce. However, it is clear that this issue cannot be ignored in the quest to reduce emissions of BC in the region.

74. Some measures recommended to reducing emissions from solid waste management include:
- Improve and enforce regulations and other instruments to ban waste burning in open dumps;
 - In those countries where thermal treatment of solid wastes is allowed, establish appropriate regulations, including monitoring and enforcement requirements;
 - Establish and enforce regulations and other instruments to foster methane emission control and recovery from landfills;
 - Develop guidelines and provide technical assistance and training to control and use energy from landfill emissions; and,
 - Explore emission trading options based on experiences from Methane to Markets, the Clean Development Mechanisms and others.

Wastewater Management

75. Large and centralized wastewater treatment plants can effectively harvest methane emissions while treating wastewater, as in Santiago, Chile. Built-in biodigesters or sludge pyrolysis can produce natural gas or electricity, creating a new energy resource and improving environmental quality.
76. Barriers to further progress include regulatory structure and high investment costs. These merit early investigation to help secure wider methane emission reductions.
- Disseminate technologies to control and reduce methane, H₂S and other compounds;
 - Incentivize implementation of norms and standards to control emissions; and
 - Apply clean production measures for industrial wastewater treatment plan.

Agriculture, forestry and livestock

77. Ozone production from precursors emitted from biomass burning has a significant potential to affect forest and crop productivity and

health. In addition, PM from biomass burning has led to an increase of respiratory problems in the Amazon. The deforestation rate has seen a large reduction in Brazil in recent years. However, fire counts are not decreasing.

78. It is considered that about 90% of fires are human-induced, and therefore potential mitigation strategies can play an important role. To promote action more discussion between scientists, communities, and government is required. Estimates of costs related to fire induced impacts would promote policy development and should be pursued. There is an opportunity for sharing experience, for instance on the banning of sugar cane burning in Sao Paulo which will start in 2016. In general, new technologies present an opportunity for mitigation, but social and economic issues also need to be resolved so as to reduce incentives and pressures for burning.
79. There is a need to study the relation between air pollution and deforestation and forest degradation.
80. Sustainable agriculture and livestock practices have an enormous potential to prevent and reduce MP and other emissions, bringing a number of other environmental positive impacts and substantial social and economic benefits.
81. Policies should be promoted:
 - Promote sustainable land management, such as reforestation, implementation of silvo-pastoral systems and intensive livestock practices.
 - Apply mechanisms to control expansion of the agriculture border.
 - Promote a cultural change in relation to traditional techniques (sugar cultivation practices, agricultural burning, agrochemicals and pesticides)
 - Increase environmental stewardship of forests & agricultural lands;
 - To protect fragile and sensitive regions, enactment and/or strengthening and enforcement of regulations for prohibiting open burning of agricultural waste, as well as to foster the adoption of alternative fertilizing techniques to prevent burning.
 - Outdoor burning of biomass is a major source of particulate matter and BC across LAC. Deforestation is a principal driver of biomass, notably in the Amazon, but savannah fire is also a major source, as is burning of sugar cane before harvest;
 - to support research on the frequency and impact of forest fires in Latin America and the Caribbean;

- promote the development and strengthening of the population's capacity to prevent and control forest fires, both provoked by man and natural causes;
- develop and implement early warning systems for fires, such as fire management strategies;
- promote reforestation programmes in deteriorated landscapes and develop alternative livelihood programmes.

Regional Components

82. This action plan involves the implementation of the following region wide components:

- Component 1. Technical assistance, training and capacity strengthening
- Component 2. Policy dialogue, cooperation and coordination
- Component 3. Methodologies for integrated assessment of policies, plans and projects
- Component 4. Research
- Component 5. Awareness raising
- Component 6. Regional Plan Monitoring and Evaluation

Component 1. Technical assistance, training and capacity strengthening

83. The purpose of this component is to provide guidance, technical assistance and training to authorities and key stakeholders from Intergovernmental Network country members, for preparing and implementing national programmes that successfully address local, regional and global air pollution issues and their relative climate implications.

84. Activities of this component include:

- a. Preparation and dissemination of guidelines for preparing national plans, in close consultation with national governments. These guidelines should provide elements for defining objectives, strategies, activities, indicators, timeframe, responsibilities and resources to ensure an effective implementation, enforcement, monitoring and evaluation of National Plans.
- b. Provision of technical assistance and training to national governments and key stakeholders for conducting the preparation, adoption and implementation of national plans, including
 - i. Baseline assessment
 - ii. Identification and assessment of policy options

- iii. Prioritization of intervention options
 - iv. Policy implementation
 - v. Monitoring, reporting and validation
 - vi. Communication and outreach
 - vii. Other key themes as identified
- c. Building of a database of qualified experts and supporting organizations from the region and elsewhere that can assist government in their national plans design and implementation.
 - d. Designing and implementing a regional training programme to enhance capacities for national plans design and implementation.
 - e. Compilation and/or development and dissemination of training modules on air quality management, SLCPs reduction strategies, policy options, assessment methodologies, monitoring and evaluation and other related topics.
 - f. Organize a South-South and North-South personnel exchange programme to speed up capacity development for policy design, implementation, monitoring and evaluation, including the possibility of “secondments” at international development organizations such as World Bank, IADB or PNUMA.
 - g. Develop an implementation of an online regional knowledge-sharing platform, which can facilitate access to and exchange of data, information and experiences relevant for designing and implementing National Plan. Since language is a major obstacle to knowledge sharing, an effort should be made to develop a trilingual platform (Spanish, Portuguese and English) at least for the most relevant information according to criteria to be established by members of the Intergovernmental Network. Among other subjects, this online knowledge platform, that would work as a Clearing House Mechanism should contain:
 - i. Manuals, guidelines and procedures,
 - ii. Design of air quality management plans, including SLCPs;
 - iii. Policy instruments (regulations, incentives, information, etc.);
 - iv. Permitting, licencing, surveillance and enforcement procedures;
 - v. Preparation of emission inventories, including a compilation of local emission factors, relevant and updated data and estimation procedures for SLCPs;
 - vi. Air quality monitoring, modelling and forecast;
 - vii. Estimation of health and other air pollution effects;
 - viii. Methodologies and tools to assess impacts of different intervention options (transport sector, brick kiln production, solid waste management and landfills, etc.);

- ix. Policy and technology options;
- x. Case studies and best practices;
- xi. Scientific research on selected topics;
- xii. Educational information;
- xiii. Awareness raising tools and materials;
- xiv. Tools to facilitate operation of communities of practice on selected key topics;
- xv. Resources opportunities; and
- xvi. Links to key institutions that are data, information and knowledge sources.

Component 2. Policy dialogue, cooperation and coordination

85. The aim for this component is to facilitate interaction, collaboration and alliance building between members of the network and key stakeholders, to support the implementation of the Regional Action Plan, as well as to foster experience and information exchange and identification of opportunities for shared action and collaboration.

86. This component includes the following activities:

- a. Establishment and operation of a Regional Action Plan's Steering Committee integrated by high-level representatives of the Regional Intergovernmental Network, plus UNEP as Secretariat of the Network and with the support of donor organizations, self-selected civil society and private sector representatives, selected relevant experts and researchers. The purpose of this Steering Committee will be to provide guidance, advice and follow up regarding the implementation of this Regional Plan. The Steering Committee will also identify opportunities for improving National Plans by addressing financial, institutional, regulatory and cultural barriers and recommend long-term strategies and instruments at the Latin America and the Caribbean scale. The Steering Committee should meet once a year and report to the Forum of Ministers of Environment for the Latin America and the Caribbean on the progress in the implementation of the Action Plan.
- b. Establishment of a mechanism to coordinate and foster agreements with other Forums of Ministers in the region (transportation, urban development, energy, health, etc.) in areas of common interest that could contribute to inter-sectorial collaborations. In particular, there is already in place the Regional Environmental and Sustainable Transport Forum, led by IADB, which could largely contribute to the Intergovernmental Network objectives.
 Launching of international thematic working groups to exchange

experiences, discuss and foster harmonization of national guidelines, regulations, standards and procedures at a regional level, considering national circumstances but also synergies and collaboration opportunities. Priority subjects involve:

- Harmonization of emission and fuel standards at a regional level (i.e. new and in use vehicle standards, fuel specifications, energy efficiency standards);
 - Harmonization of air quality standards;
 - Policy, plans, programme and project assessment methodologies;
 - Testing methods;
 - Air quality management tools;
 - Emission inventory methodologies;
 - Air quality monitoring, modelling and forecast; and,
 - Industrial regulation systems, including licencing, permitting and enforcing
- c. Co-organize a major biannual Regional Air Quality, Health Effects, Climate Change Conference or workshop, including a technology exhibit, to explore a wide range of options and opportunities for facilitating and encouraging networking, capacity building and knowledge dissemination. The purpose of this component is to provide a regional platform for gathering authorizes and key stakeholders involved in the design, implementation, monitoring and evaluation of the Regional Action Plan and National Plans.

Component 3. Methodologies for Integrated Assessment of Policies, Plans and Projects

87. The purpose of this component is to facilitate access to policy, programme and project evaluation tools focused on an integrated environmental strategies approach, as well as to facilitate specialized expertise to help countries to evaluate impacts of their interventions.
88. This component will include the identification, collection and dissemination of methodologies to evaluate the impacts of policy interventions on atmospheric pollutants, including SCLPs, in collaboration with national, regional and international academic institutions. Application of these methodologies should form a sound basis to institutionalize standardized decision-making processes and stakeholder involvement.

Component 4. Research

89. This component aims to identify research needs and opportunities which could contribute to the enhance the scientific understanding of air pollution and the role of SLCPs, including sources, ambient levels, health and environment effects, economic impacts, policy interventions, technology options, measurement techniques, among others. Activities of this component involve:
- a. Identify key research topics that should be included in a Regional Clean Air and Climate Change Research Programme
 - b. Identification of key researchers and academic institutions.
 - c. Identification of key research needs such as:
 - i. SLCPs and other pollutant emission rates, sources and global warming potential
 - ii. Epidemiological studies should be identified regarding short and long-term air pollution impacts, with a particular emphasis on particulate matter, as well as the identification of major disease burdens.
 - iii. Addressing knowledge gaps on economic valuation of health effects attributable to air pollution, including generation of local values for avoided fatality, aversion to environmental risks, human capital approach, etc.
 - iv. Air Quality and Forecasting at local and regional scales
 - v. Conduct an assessment of the available scientific information on the subject of long-range transport of suspended particles caused by emissions from the deserts of North Africa and, where appropriate, conduct scientific research to assess the contribution that the concentrations of this pollutant has in the air quality of cities mainly in the Caribbean.
 - d. Foster the establishment of a regional network of education, training and research institutions, identifying regional centres of excellence for researching and exchange knowledge on atmospheric pollutants management and other related topics, integrating them into a research network supported by a scholarship programme.

Component 5. Awareness raising and outreach

90. The purpose of this component is to enhance a common understanding and consciousness of challenges and opportunities for addressing air pollution in Latin America and the Caribbean, as well as the dissemination, expected benefits and ownership building of the Regional Action Plan.

91. This component should also involve:

- a. Design and implementation of a campaign to reinforce awareness about challenges and opportunities of the urban air pollution problem in LAC. This campaign (or campaigns) should target specific audiences, such as national and local decision makers from the different government sectors involved, development agencies, private sector associations, civil society organizations, universities and research centres, and the general public. This campaign should highlight the local, regional and global implications of air pollutants, including impacts to health, environment, society and economy, including climate as in the case of SLCPs. It should also include the multiple benefits of air pollution prevention and control.
- b. Design and implementation of an online platform at a regional level to compile all key available air pollution related data, ensuring its survival in the midterm, as well as of its associated institutional memory. This platform could be hosted, for example, at the PNUMA servers (Clearing House Mechanism).

Component 6. Regional Plan Monitoring and Evaluation

92. The purpose of this component is to design and implement a Monitoring and Evaluation Framework, which could be used for to follow up and evaluate the implementation of both the Regional Action Plan and National Plans. Activities to be developed under this component comprise:

- a. Definition of appropriate indicators that may include, on one hand: emission reductions, air quality improvement, (national/local) health effects (particularly for inhalable particulate matter), economic impacts, monitoring of institutional capacities, data availability, consistency and quality, stakeholder participation, public reporting, etc.
- b. Targeted training to enhance capacities for monitoring and evaluation of emission inventories, implement air pollutants transfer and release registries, implement air quality monitoring systems and improve abilities to assess health and economic impacts of both air pollution and policy interventions.
- c. Once approved this action plan, the Intergovernmental Network will develop a detailed work programme including a common indicators framework to monitor and assess progress at national and regional levels, taking into consideration existing indicators.

Medium term goals

93. Goals for 4 years:

- Goal 1: 100 % of countries in the region have adopted national standards for air quality in direction to the WHO guidelines, and / or harmonization processes.
- Goal 2: 100% of countries have in place programmes requiring priority cities to: a) evaluate and communicate air quality, including audits, and b) prepare emission inventories and
- Goal 3: 75% of countries which still do not have in place monitoring systems, have at least one city where air quality evaluations are performed.
- Goal 3: 50 % of countries in the region have national action plans for air quality and emissions inventory priority pollutants.

94. Goals for 8 years:

- Goals 4. Reduce the growth rate of the population exposed to levels of particulate matter above the limits set by WHO.

Resources

95. Foreseeing the approval of this Regional Action Plan, it is advisable that the Intergovernmental Network should start identifying, as soon as possible:

- On-going projects in each of the countries related with activities and actions considered in this Action Plan, to maximize synergies and avoid duplications.
- Initiatives at the national, regional and global scales, which could support its implementation
- Potential financial, technical assistance and other resource sources at national and international levels, both public and private, to enable its implementation. Such sources could include donations, sponsorships and climate finance instruments, as appropriate.

References

Centro Mario Molina. Estrategias regionales y sectoriales para lograr un desarrollo sustentable y de baja intensidad de carbón en México. 2010. *Resumen Ejecutivo*. Centro Mario Molina. México, 2010.

Moore, Frances C. and MacCracken, Michael C. Mitigation of Short-Lived Greenhouse Gases as the Foundation for a Fair and Effective Climate Compromise between China and the West. *Climate Institute*.

Ramanathan V, Agrawal M, Akimoto H, Auffhammer M, Autrup H, Barregard L, Bonasoni P, Brauer M, Brunekreef B, Carmichael G, Chang W. C, Chopra U. K, Chung C. E, Devotta S, Duffus J, Emberson L, Feng Y, Fuzzi S, Gordon T, Gosain A. K, Hasnain S. I, Htun N, Iyengararasan M, Jayaraman A, Jiang D, Jin Y, Kalra N, Kim J, Lawrence M. G, Mourato S, Naeher L, Nakajima T, Navasumrit P, Oki T, Ostro B, Trilok S, Panwar, Rahman M. R, Ramana M. V, Rodhe H, Ruchirawat M, Rupakheti M, Settachan D, Singh A. K, Helen G. St., Tan P. V, Tan S. K, Viet P. H, Vincent J, Wang J. Y, Wang X, Weidemann S, Yang D, Yoon S. C, Zelikoff J, Zhang Y. H, Zu A 2008 Atmospheric Brown Clouds: Regional Assessment Report with Focus on Asia. United Nations Environment Programme, Nairobi, Kenya

Swiss Contact. Energy Efficiency in Artisanal Brick Kilns in Latin America to Mitigate Climate Change (Presentation). *Swiss Contact*. México 2011.

TCEQ. A Study of Brick-Making Processes along the Texas Portion of the U.S.-Mexico Border: Senate Bill 749. *Texas Commission on Environment Quality*. December 2002.

UNEP. Final Report of the Eighteen Meeting of the Forum of Ministers of Environment of Latin America and the Caribbean. *Santo Domingo, República Dominicana*. February 2008.

UNEP. Final Report of the Seventeen Meeting of the Forum of Ministers of Environment of Latin America and the Caribbean. *Santo Domingo, República Dominicana*. February 2008.

UNEP. Final Report of the Sixteen Meeting of the Forum of Ministers of Environment of Latin America and the Caribbean. *Santo Domingo, República Dominicana*. February 2008.

UNEP. Implementation Plan for the Framework Agreement on Atmospheric Pollution in Latin America and the Caribbean (Preparatory Phase). *Draft*. *UNEP*, 2012.

UNEP. Implementation Plan for the Framework Agreement on Atmospheric Pollution in Latin America and the Caribbean (Preparatory Phase). *UNEP* 2012.

UNEP. Integrated Assessment of BC and Tropospheric Ozone Summary for Decision Makers. *UNEP*. 2011.

UNEP. Report of the Regional Intergovernmental Network on Air Pollution. Panama, 2009.

US State Department. Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants. Press release. February 2012.

Zell, E. et al. Recomendaciones para Combustibles y Vehículos Limpios para Centroamérica y la República Dominicana. *Batelle*. Noviembre, 2009

OECD. Environmental Outlook to 2050. *Organization for Economic Cooperation and Development*, 2012

WEC, Global Transport Scenarios 2050. World Energy Council. London, 2011.

WHO. Global Burden of Disease Report (2002)

Cifuentes, L, et al. Urban Air Quality and Human Health in Latin America and the Caribbean. IADB. Washington DC, 2005

DESA, World Urbanization Prospects The 2011 Revision. United Nations, New York, 2011.

Bapna, M. Forests, Climate Change and the Challenge of REDD. World Resources Institute, 2010.

Hollaway, M.J. et al. Intercontinental trans-boundary contributions to ozone-induced crop yield losses in the Northern Hemisphere. Leeds University. *Biogeosciences*, 9, 271–292, 2012. 16 January 2012.