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NATIONAL COMMUNICATIONS FROM PARTIES NOT INCLUDED IN
ANNEX I TO THE CONVENTION

CONSIDERATION OF THE FIFTH COMPILATION AND SYNTHESIS OF
INITIAL NATIONAL COMMUNICATIONS

An initial assessment of steps taken by non-Annex I Parties to reduce emissions
and enhance removals of greenhouse gases

Note by the secretariat

Summary

This document is produced as an information document in response to decision 2/CP.8 and conclusions of the Subsidiary Body for Implementation (SBI).

Estimates of emission reductions resulting from implemented and/or ongoing mitigation measures indicate that several non-Annex I Parties **are making considerable efforts** to reduce the growth of their emissions. Furthermore, the proposed mitigation measures **show a considerable mitigation potential, provided that obstacles to their implementation are removed.**

The assessment indicates that development, economic concerns and environmental issues are the main drivers of the mitigation measures, not climate change. This suggests that there are many opportunities to reduce greenhouse gas emissions and at the same time advance **important sustainable development concerns** and the objective of the Convention.

The SBI may wish to take note of this document and provide further guidance on future assessments of efforts by non-Annex I Parties and how these efforts should be supported. Future assessments could, for example, describe ongoing efforts and activities by non-Annex I Parties to build capacities and to develop vulnerability and adaptation assessments, as well as their implementation plans and strategies to take these forward.

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I. INTRODUCTION

A. Mandate

1. The Conference of the Parties, by its decision 2/CP.8, requested the secretariat to prepare an information document describing the steps taken by Parties not included in Annex I to the Convention (non-Annex I Parties) to implement the Convention, based on a representative set of initial national communications and other relevant documents, in order to facilitate the implementation of projects listed or proposed by non-Annex I Parties in accordance with Article 12, paragraph 4, of the Convention.

2. The Subsidiary Body for Implementation (SBI), at its seventeenth session, requested the secretariat to initiate the assessment of activities aimed at reducing emissions and enhancing removals of greenhouse gases (GHGs), reported in national communications from non-Annex I Parties as well as in the documents of the Global Environment Facility (GEF) and in other documents, and to report the results of this assessment to the SBI at its nineteenth session (FCCC/SBI/2002/17, para. 21 (e)).

B. Scope of the note

3. This document provides an initial assessment of activities aimed at reducing emissions and enhancing removal of GHGs.

4. This initial assessment is based on a representative set of 31 national communications submitted by non-Annex I Parties,¹ the UNFCCC database (FCCC/WEB/2003/5, available at <http://unfccc.int/>) containing information on proposed projects as provided in 85 initial national communications submitted to the secretariat up to 1 September 2003, GEF documents and other documents. Extensive use was made of other sources of information that detail activities, programmes and measures in response to climate change. An assessment was also made of the potential of activities, planned, proposed or envisaged by non-Annex I Parties, to mitigate climate change, and the way that these activities are being supported.

5. The selection by the secretariat of initial national communications for this assessment was based on several factors, including a regional and geographical balance to reflect the range of possible mitigation activities, the findings of the compilation and synthesis reports, the list of projects proposed by non-Annex I Parties for financing, findings of the types and range of information on projects identified and elaborated, and the availability of more detailed project-specific information in documents prepared by or for the GEF and/or its implementing agencies and from other relevant sources.²

6. Documents from other sources in both hard copy and web-based formats were also considered, especially where evaluations or analyses were undertaken on individual projects, or on the basis of GEF operational programme portfolios. Information from global or regional activities, undertaken or proposed, that aim at reducing emissions and enhancing removals of GHGs, was also considered.

7. Other sources of information included official documents and databases of the UNFCCC (e.g. AIJ portfolio), materials and evaluation reports released by the GEF, reports of the Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention

¹ Albania, Algeria, Argentina, Armenia, Barbados, Bhutan, Chile, Colombia, Costa Rica, El Salvador, Georgia, Ghana, Indonesia, Jamaica, Lebanon, Lesotho, Malaysia, Mauritius, Mexico, Morocco, Peru, Philippines, Republic of Korea, Senegal, Seychelles, Thailand, Trinidad and Tobago, Tunisia, Uganda, Uruguay, Uzbekistan.

² The National Action Plan for Environment of the Kingdom of Morocco was examined as an example of additional information presented by a government relevant to this initial assessment.

(CGE), and technical studies prepared by various institutions and research centres.³ Information from the World Energy Council (WEC) and other mitigation studies were used to present estimates of mitigation potential of the activities, programmes, and measures implemented or proposed by non-Annex I Parties.

8. Annex I presents examples of implemented and ongoing mitigation activities, and annex II of planned mitigation activities, based on 31 national communications, as well as information from other sources.

9. To assess GHG mitigation activities and opportunities in non-Annex I Parties, a number of indicators used by Parties were taken into account: the GHG mitigation potential, expressed in terms of carbon dioxide (CO₂) equivalent; the future reduction potential, expressed as a percentage of the business-as-usual (BAU) scenario; and funding-related indicators, such as average investment of the projects, as well as unit cost of CO₂ reduced.

C. Possible action by the Subsidiary Body for Implementation

10. The SBI, having taken note of the constraints reported by non-Annex I Parties in undertaking mitigation measures, including the preparation of mitigation projects, may wish to request the secretariat to undertake further analysis of the information contained in the non-Annex I national communications, in the list of projects provided by non-Annex I Parties in their national communications submitted in accordance with Article 12, paragraph 4, of the Convention (FCCC/WEB/2003/5), and in other official documents, and to prepare a report on the results of this analysis for consideration by the SBI at its twentieth session. This analysis would be undertaken with a view to identifying and recommending ways to strengthen the links between activities and projects proposed for funding, the Parties' priorities and the potential for mitigation, while recognizing that adaptation activities remain one of the top priorities for funding. The aim would be to develop recommendations for improving the possibilities for funding of projects and activities by the GEF and other sources, including bilateral and multilateral.

11. The SBI may also wish to provide further guidance to the secretariat on how future assessments should be undertaken. Future assessments could, for example, describe ongoing efforts and activities by non-Annex I Parties to build capacities and to develop vulnerability and adaptation assessments, as well as their implementation plans and strategies to take these forward.

II. ASSESSMENT OF STEPS TAKEN OR ENVISAGED TO MITIGATE CLIMATE CHANGE

A. Overview of mitigation activities reported in the 31 initial national communications

12. Initial national communications are meant to be the major source of information on the steps taken to mitigate climate change. However, they rarely include **detailed assessments** of past and/or ongoing mitigation projects or activities; they focus instead on projects, activities or programmes and measures that are envisaged for the future.

13. The information provided in the 31 national communications indicates that GHG mitigation studies had been undertaken in 19 countries (Albania, Algeria, Argentina, Barbados, Chile, Colombia, Costa Rica, El Salvador, Ghana, Lebanon, Mexico, Morocco, Peru, Philippines, Senegal, Seychelles, Thailand, Tunisia, Uruguay) where GEF enabling activity projects or other multilateral or bilateral programmes⁴ included mitigation as part of their activities or where research institutions carried out sectoral mitigation studies.⁵

³ United Nations Environment Programme (UNEP) Collaborating Centre on Energy and Environment (RISO National Laboratory), United Nations Development Programme (UNDP), PEW Centre on Global Climate Change, The International Institute for Industrial Environmental Economics at the University of Lund, Sweden, among others.

⁴ For example, the United States Country Studies Program.

⁵ For example, in Peru.

1. Methodologies used in mitigation assessments

14. The details of the methodologies used in the mitigation assessments were generally not reported. Emissions projections were provided for Albania, Argentina, Chile, Costa Rica, El Salvador, Ghana, Indonesia, Malaysia, Philippines, Republic of Korea, Senegal, Thailand, Tunisia and Uruguay based on models used to develop baseline and mitigation scenarios.

15. Various models were used in the mitigation assessments, mainly for the energy sector: ETO,⁶ COMAP,⁷ GACMO,⁸ LEAP,⁹ MARKAL,¹⁰ MEDEE¹¹ and STAIR.¹² Various macro-economic models, AGRI,¹³ or some country-specific models were mentioned as having been used in simulating future GHG emissions. Many countries also mentioned that they have used simple spreadsheet models developed specifically for mitigation assessment.

2. Sectors examined, timeframes and mitigation potential for proposed mitigation activities

16. The sectors considered were energy, transport, industry, agriculture, land-use change and forestry (LUCF), and waste. Almost all the countries put emphasis on renewable energy and energy efficiency in their strategies and programmes. In Albania, Algeria, Colombia, Costa Rica, El Salvador, Georgia, Mexico, Morocco, Philippines, Seychelles, Tunisia and Uzbekistan, portfolios of mitigation projects were developed, and several potential clean development mechanism projects were identified.

17. Strategies and programmes also included an estimation of the expected emission reduction over periods varying from 5 to 30 years. Twenty-one countries mentioned various time frames used in their mitigation assessments, mainly for the energy sector. The medium-term time frame 2020 was the most frequently used.

18. Albania, Armenia, Costa Rica, Georgia, Ghana, Lebanon, Philippines, Senegal, Thailand, Tunisia and Uzbekistan reported cost estimates of mitigation measures. In Albania, Thailand and Tunisia, least cost analyses for some sectors (mainly energy and LUCF) have also been carried out to rank and select mitigation options. Only a few studies evaluated options in terms of their suitability and cost-effectiveness.

19. The level of reporting, of detail and of the importance given to mitigation of GHG emissions and enhancement of removal by sinks varied greatly among Parties. All Parties included a description of measures aimed at mitigating GHG emissions; 80 per cent of them dedicated a specific chapter or a section to information about programmes containing measures aimed at reducing GHG emissions and enhancing removals by sinks; and the remaining 20 per cent included GHG mitigation assessments as a part of other chapters addressing broader issues such national climate change policies or general description of steps to address climate change. In a few cases, where more detailed information was provided, the reporting was mainly descriptive and limited in scope, and did not consider or quantify the environmental, social and economic impacts. The distinction between planned projects and mitigation project ideas was often not clearly established.

⁶ Energy Technology Optimisation.

⁷ COmprehensive Mitigation Assessment Process.

⁸ Greenhouse Gas Abatement Costing MOdel.

⁹ Long-range Energy Alternatives Planning system.

¹⁰ MARKet ALocation model.

¹¹ Modèle de prévision technico-économique de la demande d'énergie à long terme.

¹² Services, Transport, Agriculture, Industry and Residential energy model.

¹³ The AGRI model is from the Agriculture and Environment Center (AGRIMED) of the University of Chile's School of Agriculture and Forestry.

20. Table 1 shows the ranges of emission reductions estimated by some Parties in the energy sector, based on information contained in some of the initial national communications.

21. Estimates of emission reductions vary greatly across countries and depend on assumed magnitude of structural changes and technological development, and the number of mitigation measures identified. Additionally, the time frames, resources allocated to undertake the assessments, and quality of data used also result in variations. Results of such studies should therefore not be considered as exhaustive. Further work would be needed to assess the scope of the possible mitigation potential of non-Annex I Parties.

Table 1: Emission reduction potential reported in some national communications from non-Annex I Parties

	Number of mitigation options/measures	Reduction potential as compared to business-as-usual scenario		
		Total	Energy sector	Other sectors
Albania		30%	10 Mt of CO ₂ equivalent in 2020 29% reduction by 2020	Waste: 70% reduction by 2020
Algeria	Energy: 5 Waste: 1	23 to 51 Mt CO ₂ equivalent in 2020	6 to 16% reduction by 2020	30%
Argentina		6.9 to 42.3 Mt of CO ₂ per year (2–9%)		
Chile		26%		
El Salvador		10.5 Mt CO ₂ (2020) or 32%		
Malaysia			47 Mt CO ₂ by 2020 14% reduction by 2020	
Morocco	Energy: 15 Industrial processes: 3 LUCF: 3 Waste: 2	9.4 Mt CO ₂ equivalent in 2020 or 8.5%	10%	
Thailand			57 Mt CO ₂ reduction or 12% by 2020	
Tunisia	Energy: 33 Agriculture: 4 LUCF: 6 Waste: 4	21 Mt CO ₂ equivalent in 2020 or 34%	26% reduction by 2020	Agriculture: 21% LUCF: 32% increase in sinks Waste: 40%

B. Sectoral analysis of implemented and/or ongoing and proposed measures based on national communications and other sources

1. Implemented and/or ongoing measures

22. Most of the implemented and/or ongoing mitigation measures reported by non-Annex I Parties were related to the energy, industrial processes, agriculture, LUCF, and waste sectors. The reporting on the energy sector was more detailed, with information provided on energy efficiency, fuel switching and renewables. Some of the technical options adopted in the energy sector are outlined in table 2.

Energy

23. In the energy sector, **energy efficiency** and conservation were described as mutually supportive activities that were employed nationally. These activities included improvements to building designs and the enforcement of building regulations, and energy efficiency policies in the industrial and residential sectors. Other measures included energy audits, the detailing of energy intensity targets, the use of energy efficiency labelling for appliances and equipment, the promulgation of fuel economy targets, the development of traffic management strategies, ownership of smaller cars, use of progressive emissions taxation, the removal of various subsidies, and tax incentives for energy efficient buildings.

24. In the power generation and residential sector, the **switch** from the more carbon intensive fuels to natural or liquefied natural gas was the most commonly reported activity. For example, the use of natural gas was increased considerably. In one country (Tunisia), most of total energy supply comes from natural gas.

25. The main **renewable energy sources** were biomass, geothermal, wind and solar power. In Costa Rica renewable sources of energy contributed 92 per cent of the total energy supply.

Industrial sector

26. Technological improvements, changing practices and innovative methodologies in the cement industry were some of the measures undertaken to reduce emissions.

Agriculture

27. A reduction in fertilizer usage and the consequent N₂O emissions reductions, changes in cultivation practices in rice paddies and the resulting CH₄ emissions reductions, and changes in irrigation practices and the consequent benefits were some of the measures undertaken in the agriculture sector. To a lesser extent, a switch to environmentally friendly agricultural practices and the development of markets for environmentally sensitive agricultural products also influenced the changes made in the agriculture sector.

Land-use change and forestry

28. Measures to reverse deforestation included the prevention of forest fires, reducing illegal logging, reforestation of degraded forest areas, and the protection of forest areas. Other measures included the development and elaboration of forestry master plans, better management practices, better silvicultural practices and improvement in timber utilization.

Waste

29. Waste recycling, methane recovery, development of waste management policies, the rational use of waste, and improvements in the treatment and disposal of wastes were some of the measures undertaken by Parties.

Table 2: Examples of technical options adopted by non-Annex I Parties and benefits reported from those options

Technical option	Party	Activity/project	Benefits
Lighting efficiency	Mexico	Ilumex project (1994–2006) 1.8 million compact fluorescent lamps	100 MW capacity, or 169 GWh/year avoided
	Colombia	60 000 compact fluorescent lamps	Reduction of 927 t CO ₂ equivalent/year
	Argentina	Replacement of old lighting with more efficient types	1450 GWh saved/year
	Albania, Brazil, Chile, China, Costa Rica, Georgia, India, Lebanon, Morocco, Peru, Tunisia, Seychelles, South Africa, Thailand	Replacement of old lighting with more efficient types	To be reported
Energy efficient boilers/furnaces/plants/buildings	Colombia	Heat recovery in the production of coke	Reduction of 65 kt CO ₂ equivalent/year
	Lebanon	National project (1994–2040)	Reduction of 7 to 88 Mt CO ₂ equivalent over the period
	China, Senegal	Instituting energy efficient buildings	
	Peru	Project (2000–2009)	Reduction of 2.1 Mt CO ₂ equivalent
	China, Argentina,	Closure of inefficient energy intensive plants	
High efficiency refrigerators	Philippines, Thailand, Tunisia	Projects (1995–2020)	Reduction of 18.5 Mt CO ₂ equivalent
Energy efficiency appliances	Argentina, Brazil, China, India, Philippines	Labelling of appliances	
Combined heat and power	Brazil, Morocco, Tunisia	Various projects 2001–2020	Reduction of 15 Mt CO ₂ equivalent
Fuel switching	China, El Salvador, Lebanon	Development of natural gas pipeline	
Renewables	Costa Rica	3 AIJ projects – wind power 2000–2010	46 MW installed
	Morocco	Wind farms	115 MW installed
	Tunisia	Wind plants	20 MW installed
	Colombia	Wind plant	27 MW installed
	Albania, Barbados, Brazil, China, Ghana, India, Mauritius, Morocco, Republic of Korea, Senegal, Tunisia	Solar water heating	
	Albania, Algeria, Argentina, Armenia, Barbados, Chile, China, Costa Rica, Georgia, India, Lebanon, Mexico, Peru, Philippines, Republic of Korea	Wind power projects	
	Egypt, India, Mexico, Morocco	Solar thermal power plants	
	Brazil, China, India	Biomass to energy	
	Albania, Argentina, Armenia, Bhutan, Chile, China, Colombia, Costa Rica, El Salvador, Georgia, India, Jamaica, Lesotho, Malaysia, Morocco, Peru, Philippines, Thailand, Tunisia, Uzbekistan	Hydropower projects	

2. Proposed measures

30. The proposed measures mostly relate to the key sectors of energy, transport, industrial processes, agriculture, LUCF and waste. Parties have indicated that they intend to undertake a number of mitigation measures.

Energy

31. Proposed **energy efficiency** measures include improvement of lighting and cooling technologies in the industry and residential sectors. Several Parties are intending to expand their initiatives of replacing incandescent bulbs with compact fluorescent lamps (CFL). Some Parties also intend to introduce stringent measures in the power generation sector aimed at improving efficiency. Almost all Parties intending to undertake efficiency measures provided estimates of the GHG reduction potential, and some also provided estimated abatement costs.

32. Planned **fuel switching** measures involve the switch to natural gas or the expanded use of LPG in transport and cooking, energy supply and industry. The use of regulations and incentives to promote the use of natural gas is also detailed.

33. Among the wide range of **renewable energy sources** being considered by non-Annex I Parties are biomass, solar power, the use of photovoltaics to supply power, and the generation of power from wind, geothermal resources, waves and water including large-scale and micro-hydro projects. In some cases, hydropower is reported as being underutilized. Constraints to the development of renewable energy sources have been identified as high initial investment costs; lack of information on the benefits of renewable energy at the national level; lack of awareness; economic and financial obstacles; lack of institutions; and lack of technical capacity to market and develop the renewable energy resources.

Transport

34. Measures proposed are largely aimed at strengthening emissions standards, improving highway design, traffic flow optimization, developing alternatives such as railways, and taking steps to regulate the import of used vehicles. The estimated mitigation potential of such measures was often not fully specified.

Industrial sector

35. Most of the identified planned measures in the industrial sector pertain to the modernization of industrial processes. In some Parties, the mitigation activities and their potential GHG reduction in the industrial sector are quite considerable.

Agriculture

36. Measures proposed in the agriculture sector relate to water resources management and use, reduction in fertilizer use, changes in cultivation practices in rice paddies, changes in irrigation practices, and pasture and livestock management.

Land-use change and forestry

37. There is a widespread recognition of the potential of forests and, to a lesser extent, land-use changes for enhancing removals of GHGs. Measures proposed included the enhancement of GHG sinks by preserving and increasing the density of existing forest cover, and by planting high productivity forests.

Waste

38. The key activity being planned by many Parties is the recovery of methane for power generation. Some Parties are also planning to minimize their industrial wastes by avoiding unnecessary packaging and using modern treatment technologies and waste recycling.

3. Proposed activities for implementation based on 85 initial national communications

39. Other information reported in initial national communications, compiled by the secretariat in the UNFCCC list of projects, covers activities, programmes and measures identified by non-Annex I Parties. If implemented, these have the potential to mitigate climate change in various sectors including energy, transport and forestry. Some project proposals are not fully elaborated and are often only envisaged without any concrete plans for implementation. Detailed mitigation assessments have often not been undertaken, no implementation plans have been elaborated or reported, and, although frequently mentioned as some of the main obstacles, technological and financial needs and constraints have not been elaborated. The financial resources required for implementation have not been specified.

40. The UNFCCC database contains information on proposed mitigation projects provided in the 85 initial national communications¹⁴ submitted to the secretariat up to 1 September 2003. The list of projects includes about 450 mitigation projects proposals, 65 per cent of which relate to the energy sector, 15 per cent to forestry, 7 per cent to waste, 7 per cent to transport, 4 per cent to agriculture (17 projects), and 2 per cent to industrial processes (8 projects). Emission impacts were estimated for only 16 of these projects.

41. In energy uses, the proposed projects include both supply-side and demand-side projects. Among the **141 supply-side mitigation measures**, 102 projects involve renewable energy development, of which 31 relate to solar energy, 23 to hydropower, 14 to wind power, and 14 to various other renewable energy solutions. The supply-side also includes 24 projects promoting the efficient conversion of fossil fuels, and 10 measures involving switching to lower-carbon fossil fuels. The demand-side management includes 149 projects, of which 87 relate to end-uses in buildings (mainly targeting equipment and appliances, as well as building efficiency), 33 to energy efficiency in the transport sector, and 23 to the industrial sector.

42. The energy sector (290 projects) has the greatest mitigation potential. To a lesser extent, LUCF (70 projects) appears to be an important sector in terms of its mitigation potential, and to its economic and ecological importance in non-Annex I Parties.

43. Seventy forestry projects are proposed, but it was not possible to allocate them to clear classes of actions, as all subsectors involved in the list include various types of intervention. Among the proposed forest projects, 40 (57 per cent) are located in the Latin America and the Caribbean region.

44. In the transport sector, the proposed projects include measures relating to fleet and traffic management (32 projects), and to energy-related measures (33 projects) included in the energy sector. The small number of proposed projects in the waste sector (33 projects) reflects its lower importance and mitigation potential.

45. Of the 17 proposed projects in agriculture, nine relate to better livestock management, six to increasing carbon storage by soils, and two to improving rice production practices.

¹⁴ Of the 31 initial national communications reviewed in the current work, 29 were included in the 85 initial national communications compiled by the UNFCCC secretariat. Two others (Albania, Uganda) were included in the fifth compilation and synthesis report of national communications from non-Annex I Parties (FCCC/SBI/2003/13).

C. Implementation of activities, programmes and measures to mitigate climate change based on other sources of information

1. The GEF-funded activities

46. The GEF is one of the main sources of financing of mitigation projects in non-Annex I Parties. Information from the GEF covers mitigation projects financed through its climate change focal areas since its inception as a pilot programme (1991–1994). As at 31 December 2000, a total of 113 mitigation projects have been approved for funding and either have been or are being implemented in non-Annex I Parties, financed through five operational programmes relating to removal of barriers to energy efficiency and energy conservation (34 projects), promotion/adoption of renewable energy by removing barriers and reducing implementation costs (56 projects), reducing the long-term costs of low GHG-emitting energy technologies (9 projects), promoting environmentally sustainable transport (3 projects), and short-term response measures (11 projects). Apart from the projects that target individual countries, the GEF-funded activities also include some global and regional projects.

47. It was difficult to estimate mitigation potential and assess costs in this initial assessment given the difficulties in evaluating and comparing estimates across projects. Generally, the cost per tonne of CO₂ reduction is not reliable, either because only rough estimates were made when the project documents were prepared, or because of the diverging approaches used to estimate emission impacts and assess costs.

Removal of barriers to energy efficiency and energy conservation

48. Eight of the 34 projects aimed at removal of barriers to energy efficiency and energy conservation were considered in this assessment. The total investment (GEF contribution and co-financing) mobilized by these projects amounts to US\$ 645 million (40 per cent of the total investment engaged under this programme). A large emission reduction potential of 169 Mt CO₂ is indicated (an average of 21 Mt CO₂ per project).

49. The average investment unit cost would be US\$ 3.8 per tonne of CO₂ avoided. The unit cost of projects aimed at removal of barriers to energy efficiency and development of energy efficiency through energy service companies ranges from US\$ 1.5 (energy efficiency investments, India) to US\$ 4.7 (Second Beijing Environment Project – space-heating boilers, China). Other types of projects, involving greater investment requirements, result in higher unit cost, ranging from US\$ 17.6 (Building chiller replacement, Thailand) to US\$ 20.1 (Control of greenhouse gas emissions through energy-efficient building technology in Côte d'Ivoire and Senegal).

50. The analysis of barrier removal projects highlights the cost effectiveness of energy efficiency related projects, based on readily available direct project cost and investment data, although the data do not fully cover cost assessments. Other information, such as investment requirements in the longer term to continue the process launched by the projects, is not systematically available.

51. Table 3 presents a rough quantitative list of the past, ongoing and future projects in non-Annex I Parties, as compiled from the different sources of information addressing the GHG mitigation issue in non-Annex I Parties.

Table 3: Total investment (US\$ million) and GHG mitigation (Mt CO₂ equivalent) based on information from various sources

Sources of information	Number of non-Annex I Parties	Number of projects	Status	Total investment (US\$ million)	GHG mitigation (Mt CO ₂ equivalent)
Initial national communications submitted as of 1 September 2003	85	450	Mostly envisioned projects	^a	^a
GEF project portfolio	85	113	Past/ongoing projects	6 400	^a
AIJ project portfolio	27	59	Past/ongoing projects	NA	347
WEC project database	85	316	Past/ongoing and planned projects	NA	629

^a Lack of data prevented an analysis of total or average GHG mitigation cost of reduction potential.

NA: Not available

Promotion/adoption of renewable energy by removing barriers and reducing implementation cost

52. Of the 56 projects aimed at removing barriers, only 14 are included in this assessment. The total direct investment mobilized by these 14 projects amounted to US\$ 725 million (20 per cent of the total investment in this programme).

53. A very large emission reduction potential of 622 Mt CO₂ (an average of 44 Mt CO₂ per project) is envisaged. The average investment cost would be US\$ 1.2 per tonne of CO₂ avoided, which is only 33 per cent of the average under the barrier removal programme (see paragraph 49 above). The unit cost ranged from US\$ 0.1 (Market development for solar water heaters, Morocco) to US\$ 4.9 (Barrier removal in Malawi renewable energy program). The renewable energy development programme implemented in China required a much higher unit cost (US\$ 8.6). Other types of projects, involving greater investment, result in much higher unit cost, ranging from US\$ 34.8 (Tejona wind power, Costa Rica) to US\$ 442 (Decentralized rural energy programme, Benin and Togo).

2. UNFCCC activities implemented jointly

54. The UNFCCC database on activities implemented jointly (AIJ) projects lists 59 ongoing projects implemented in non-Annex I Parties. Of these, a full cost picture is available for 10 projects, partial cost estimates for 23 projects, and no cost assessment for the other 26.

55. The emission impacts picture is much more complete than the cost assessment, but is still only partial. GHG reduction estimates have been provided for 53 AIJ projects. An examination of the 31 initial national communications compiled as a part of this study shows that only Costa Rica and Mexico, and Chile to a lesser extent, have reported on their AIJ projects.

56. GHG reduction estimates have been provided for 53 AIJ projects – 12 Latin American Parties have implemented 37 out of 59 AIJ projects (63 per cent), nine Asian Parties have implemented 14 (24 per cent), and six African Parties have implemented 8 (13 per cent). Of 59 AIJ projects reported, 28 relate to energy supply (47 per cent), of which 21 focused on the development of renewable energy technologies. The AIJ portfolio also includes 11 industrial projects addressing process improvement and energy efficiency (19 per cent), and four on energy efficiency in other sectors (7 per cent). The AIJ database also includes 13 forestry projects (22 per cent of the whole AIJ portfolio), two projects in the waste sector and one in the agriculture sector.

57. The total emission reduction amounts to about 311 Mt CO₂ equivalent. Latin American countries report the largest CO₂ reduction, with 96 per cent of the total AIJ portfolio. This is due to the higher number of projects implemented in that region, and to the higher average emission reduction per project (9 Mt CO₂ equivalent) than in the other regions. This average is particularly influenced by three

projects that share 62 per cent of the GHG mitigation impact of the whole AIJ portfolio – a landfill project in Argentina (81 Mt CO₂ equivalent) and forestry projects in Bolivia and Costa Rica (55 and 57 Mt CO₂ equivalent, respectively).

3. Information from the World Energy Council

58. The World Energy Council (WEC) interactive Internet site (www.worldenergy.org) database contains information on GHG reduction projects from all over the world, including power generation, energy efficiency, fuel switching, cleaner energy introduction, renewable energy, and forestry projects. Although it is not considered to be exhaustive, comprehensive or representative of all GHG reduction projects implemented, it provides an indication of what is being implemented or planned in non-Annex I Parties.

59. The information included in the database could partly be covered by some national communications, but information in the national communication is more generic, and reports on what could be done in the future to mitigate emissions. The WEC database provides more precise information on well-defined ongoing and/or planned projects, with implementation dates, and reports systematically on the GHG reduction within the time frame 1999–2010.

60. The WEC database lists 342 ongoing/planned projects (including two global projects), originating from 85 non-Annex I Parties. The beneficial effects resulting from these projects amount to a reduction of 753 Mt CO₂ equivalent. Apart from nuclear-power-based projects, the remaining projects will contribute to a reduction of 639 Mt CO₂ equivalent per year, averaging 2 Mt CO₂ equivalent per project per year.

61. The WEC database shows that China alone has 37 energy efficiency, fuel switching and renewable energy projects, including large-scale hydropower projects, with a mitigation potential of 205 Mt CO₂ equivalent over the period 2001–2010. Twenty-five of these projects accounting for 180 Mt CO₂ equivalent are in an advanced implementation or planning phase. Funding for the remaining 12 projects is yet to be secured.

62. Of the 342 projects in the WEC database, 301 are country-specific and are being undertaken in three regions, but at an unequal distribution. Asia has 158 projects, with 76 per cent of the GHG mitigation potential, due to a large number of Asian countries included in the database (32), and also to the presence of China and India which have the most promising GHG mitigation potential among non-Annex I Parties. Africa is second, with 27 countries and 76 reported projects, representing 15 per cent of the potential reduction. Latin America and the Caribbean region is third, with 17 countries and 67 projects, representing 9 per cent of the reductions.

III. CONCLUSIONS

63. A number of preliminary conclusions can be drawn from this initial assessment of the steps taken or envisaged by non-Annex I Parties to implement the Convention. The steps include activities, programmes and measures aimed at reducing emissions and enhancing removals of GHGs. Information provided by non-Annex I in their national communications and other sources indicates that considerable emission reductions have been or are being achieved, mainly in the energy sector. Although some of these activities, undertaken or planned, can be attributed to climate change considerations and were driven by an expectation of an increase in demand for energy services, there is a wealth of information indicating that many of these activities have been driven by national development priorities, modernization of energy systems, energy security, infrastructure development, environmental protection, and social and economic considerations. Steps have also been taken to reduce emissions and enhance removals of GHGs in the industrial processes, agriculture, forestry and waste sectors. Many of these

measures have been supported by national and/or multilateral or bilateral financial and technical resources and assistance.

64. The GHG mitigation impact resulting from past and ongoing activities is considered modest compared to the mitigation potential. The expected emission reduction potential, resulting from the implementation of planned mitigation activities or measures, is much greater. It would appear, though, that Parties will not be able to realize this potential unless they are supported in addressing a number of constraints reported, namely in acquiring the **resources necessary to undertake rigorous and transparent mitigation assessments, and to acquire the capacity, technology and investment** necessary to sustain the current efforts and to implement new ones. As regards the ancillary benefits from protecting the environment, many studies indicate that caring for the environment will result in carbon sequestration, better air quality, and protection of agricultural land and water supply.

65. Many non-Annex I Parties have proposed projects for funding in accordance with the Convention, but they report many constraints. Few projects proposed for funding have been implemented or are likely to be implemented unless additional efforts are made. Efforts to further develop, refine and detail project proposals, based on national development strategies and priorities and on mitigation potential, would improve the chances for funding; and efforts to build capacity, provide training, and exchange experiences and know-how, including methodologies, would facilitate project implementation. In this regard, it seems important to establish better links between climate change activities and sustainable development strategies.

66. In the preparation of this initial and partial assessment of activities aimed at reducing emissions and enhancing removals of GHGs taken by non-Annex I Parties, difficulties were encountered in designing relevant comparative indicators across countries and sectors in order to assess the GHG mitigation efforts and potential, thus limiting the ability to comprehensively assess the efforts.

Annex IExamples of implemented and ongoing mitigation activities

<p><u>ALGERIA</u></p> <p>Fuel switching: Continues to develop the use of gas in vehicles (conversion of 40,000 vehicles and 160 service stations to liquefied petroleum gas (LPG), promotion of natural gas; to double between 1994 and 2020; promotion of natural gas for cooking, LPG in rural areas away from gas network</p> <p>Transport: Measures being undertaken could reduce fuel consumption by 33 per cent between 1994 and 2020</p> <p><u>ARGENTINA</u></p> <p>Energy efficiency: Ambitious energy efficiency programme that includes pilot programmes for residential/commercial</p> <p>Technology: Technology modernization and cleaner energy use programme</p> <p>Fuel switching: Natural Gas Vehicle Programme</p> <p><u>ARMENIA</u></p> <p>Renewable energy: Small hydropower</p> <p><u>BARBADOS</u></p> <p>Renewable energy: 32,000 solar water heaters installed, saving 30–35 MW of electricity</p> <p><u>BHUTAN</u></p> <p>Renewable energy: Small hydropower</p> <p><u>BRAZIL</u></p> <p>Energy efficiency: Demand-side programmes promoting conservation and efficiency in the electricity generation and transport sectors; independent power producers given open access to the transmission grid (gas-fired cogeneration plants); tax incentive introduced in 1993 to encourage use of less powerful cars (engine less than 1 litre) reduced emissions by nearly 2 Mt C per year</p> <p>Fuel switching: Development of natural gas industrial market; variety of incentives to promote biofuels; in 2000, industrial fuel switching to gas reduced carbon emissions by 0.4 Mt</p> <p>Renewable energy: Production and use of ethanol and sugar cane bagasse; use of alternative energy sources for power generation; about 25 per cent of gasoline sold contains ethanol in a blend required by law; bagasse used in combined heat and power (cogeneration: 1,000 MW, 40 per cent was added in 1999–2001) plants (in 2000, this reduced CO₂ emissions by almost 1 Mt)</p>	<p>LUCF: Nullification of land titles by reform agency has shifted control of more than 20 million hectares to small-scale farmers with the aim of decreasing deforestation; fire control programmes and tax incentives for landowners who protect forest cover on their property with the aim of reducing emissions</p> <p><u>CHILE</u></p> <p>Energy efficiency: Documents promoting energy-efficient building design; programme replacing lights in large percentage of municipalities</p> <p>Renewable energy: Continues to use solar thermal, photovoltaics (PV), wind, geothermal; three plants using forest wastes or wastes from paper plants to generate heat, electricity; some small hydropower in place</p> <p><u>CHINA</u></p> <p>Energy efficiency: Energy efficiency improvements; energy intensity declined by an average of 4 per cent a year (1977–1997); by 2000, energy price reform and technological progress contributed to an estimated carbon mitigation of about 100 Mt a year</p> <p>Fuel switching: Switching from coal to natural gas</p> <p>Renewable energy: Renewable energy development</p> <p>LUCF: Major afforestation efforts undertaken; similar efforts made to replace crop lands with wood and grass (forest cover increased from 13 to 17 per cent of the country); goals of the forestry protection are to reduce wood production by about 20 million m³/year and to afforest almost 13 million hectares, and to protect 94 million hectares of forest (increased carbon sink by 47 million hectares)</p> <p><u>COLOMBIA</u></p> <p>Energy efficiency: Use of compact fluorescent lamps (CFLs), may lead to emission reduction of 927 tonnes CO₂ equivalent per year; policy to improve energy efficiency of buildings; policy promoting combined heat and power (CHP), particularly in sugar, food, beverage, tobacco, paper and printing, hotels and hospitals areas</p> <p>Fuel switching: Policy to promote alternative fuels, particularly natural gas, LPG and gas conversion programmes</p> <p>Transport: Many programmes to improve traffic management currently in place</p> <p>Agriculture: Promotion of production of bioproducts</p> <p><u>COSTA RICA</u></p> <p>Transport: Improve integrated transport network system in metropolitan areas, emissions reduced by 3,595 tonnes CO₂ equivalent per year</p>
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<p>Industry: Use of alternatives for clinker in cement industry</p> <p>Agriculture: Reduced fertilizer usage</p> <p>LUCF: Protected areas, 45 Mt CO₂ equivalent in 2000–2015</p> <p>Waste: Developed a waste management policy</p> <p><u>EL SALVADOR</u></p> <p>Fuel switching: Promotion of LPG</p> <p>Industry: Cement and lime production equipment being modernized</p> <p><u>GEORGIA</u></p> <p>Renewable energy: 15 small hydro plants</p> <p><u>GHANA</u></p> <p>Fuel switching: Planning to increase penetration of LPG; promotion of natural gas and propane</p> <p><u>INDIA</u></p> <p>Energy efficiency: Energy policy initiatives have resulted in reductions of carbon emissions growth; introduction of market-based pricing for both power and liquid fuels; improvements in stoves; reduction of gas flaring in fossil fuel production; improvements in demand- and supply-side efficiency; introduction of emissions limiting performance standard in 2000; improvement in combustion efficiency of conventional coal technologies; important technological advances in coal washing; new combustion technologies being introduced, and capture of coal-bed methane being promoted; annual reporting of energy conservation measures mandatory for private companies since 1995; government investment in natural gas collection and delivery pipelines supported dramatic reduction in gas flaring, amounting to 29 per cent of gas production in 1990 and less than 6 per cent by 2000</p> <p>Fuel switching: In Delhi, 84,000 public vehicles converted from gasoline and diesel to compressed natural gas (CNG) in about one year; increased use of natural gas for electricity generation; public investment to develop natural gas infrastructure for long distance and local distribution; share of gas in power generating capacity risen from 2 to 8 per cent over past 10 years; LPG has largely replaced coal and kerosene in urban households; public vehicles converted to CNG</p> <p>Renewable energy: Introduction of modern renewable energy systems; strong promotion of renewable technologies; creation of the Ministry of Non-Conventional Energy Sources (1992); improved efficiency of wood stoves in 34 million homes helped reduce deforestation in areas where wood fuels were unsustainably harvested; “technology push” programmes including solar lanterns (photovoltaic cells), home and street lighting systems, water pumps, and stand-alone power plants; direct solar water heating systems in urban buildings; high initial penetration of wind, small hydro, biomass, and industrial-waste-based electricity generation technologies</p>	<p>LUCF: Forest conservation measures include prohibiting the use of forest land for non-forestry purposes, encouraging agroforestry and private plantations to meet industrial wood needs, and expanding areas under protection (14 million hectares protected during past decade)</p> <p><u>INDONESIA</u></p> <p>Energy efficiency: Removal of subsidies for electricity; tax incentives on energy efficiency equipment</p> <p>Renewable energy: Small hydropower</p> <p>LUCF: Developed a regulatory framework</p> <p><u>JAMAICA</u></p> <p>Renewable energy: Use of biofuels and bagasse for electricity generation</p> <p><u>LEBANON</u></p> <p>Energy efficiency: Thermal building guidelines</p> <p>Industry: Cement: emissions reduced by 6 Mt CO₂ equivalent by 1994–2040</p> <p><u>LESOTHO</u></p> <p>Energy efficiency: Guidelines</p> <p>Renewable energy: 4 mini-hydro units</p> <p><u>MALAYSIA</u></p> <p>Energy efficiency: Energy efficiency guidelines</p> <p><u>MAURITIUS</u></p> <p>Fuel switching: Promotion of LPG for cooking</p> <p>Renewable energy: In 1995, bagasse already accounted for 32.5 per cent of primary energy supply</p> <p><u>MEXICO</u></p> <p>Energy efficiency: Created a fund to support energy saving, ILUMEX project; regulation of energy consumption of buildings; promotion of CHP</p> <p><u>PERU</u></p> <p>Energy efficiency: Efficiency improvement/conversion of industrial boilers, emissions reduced by 2 Mt CO₂ equivalent per year; energy efficient lighting</p> <p>Transport: World Bank project on improvement of transport infrastructure</p> <p>Agriculture: Planting coffee trees – may reduce emissions by 45 Mt CO₂ during 1999–2020</p>
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<p><u>PHILIPPINES</u></p> <p>Energy efficiency: Using CFLs may reduce emissions by 33 Mt CO₂ equivalent over 1999–2008 (setting of regulatory standard for efficiency of fluorescent lamps)</p> <p>Fuel switching: Using natural gas, emissions reduced by 55 Mt CO₂ equivalent over the 1999–2020 period</p> <p>Renewable energy: Small hydropower</p> <p>LUCF: Developed Forestry Master Plan</p> <p><u>REPUBLIC OF KOREA</u></p> <p>Energy efficiency: Insulation mandatory in new buildings, and financial support available for insulation retrofits in existing buildings; commercial: mandatory building audits for large buildings; permit applications for large buildings must be accompanied by energy efficiency plan; minimum energy efficiency standards established for hotels, hospitals, public baths, indoor swimming pools; energy suppliers required to develop and implement demand-side management plans – rebates for efficient lighting one measure; promotion of CHP in industrial complexes; tax incentives and financial assistance to replace inefficient motor systems and other equipment; minimum efficiency standards for motors; plan to replace all motors with high-efficiency ones by 2006; research priority</p> <p>Fuel switching: Major LNG promotion; LNG in apartment complexes larger than a certain size; promotion of LPG in rural areas and smaller cities where LNG pipeline not yet available, CNG, electricity; programmes to promote CNG for private vehicles, and LPG for taxis and trucks</p> <p>Renewable energy: Small hydropower</p> <p>LUCF: Developed regulatory framework</p> <p><u>SENEGAL</u></p> <p>Fuel switching: Tax policy making wood fuel less competitive; gradual penetration of butane</p> <p>Renewable energy: Some large agro-industries use wastes to produce in-house electricity, can sell surplus to grid</p> <p><u>SEYCHELLES</u></p> <p>Energy efficiency: Energy efficient standards in building design recently introduced; no tax on CFLs</p> <p>Fuel switching: LPG typically used in hotels, restaurants, rapidly replacing kerosene in domestic sector; promoted by zero tax on LPG stoves, low taxes on LPG, etc.</p> <p>Transport: Road improvement programme</p>	<p><u>THAILAND</u></p> <p>Energy efficiency: Reduction of emissions by 22 Mt CO₂ equivalent to be achieved between 1995 and 2020; energy efficiency as part of demand-side management programme; promote sale of commercial energy to grid by private sector (CHP)</p> <p>Fuel switching: LPG, natural gas in buses and taxis</p> <p>Renewable energy: Renewable energy (biomass, solar, hydro, waste); programme promoting sale of electricity to grid from private sector, commercial and renewable sources such as bagasse, paddy husk, etc.</p> <p>Agriculture: Improve water management in rice paddy</p> <p><u>TRINIDAD AND TOBAGO</u></p> <p>Fuel switching: Fuel pricing policy to encourage use of CNG</p> <p><u>TUNISIA</u></p> <p>Energy efficiency: Building energy management system, reduced emissions by 10 Mt CO₂ equivalent over 2001–2020 period; working on thermal regulation for buildings</p> <p>Fuel switching: Has switched to natural gas for electricity generation</p> <p>Renewable energy: Solar water heating and wind power, emissions reduced by 12.6 Mt CO₂ equivalent over the 2001–2020 period</p> <p>LUCF: Forestry mitigation measures could account for 21 per cent of total projected emissions reduction in 2020</p> <p>Waste: Methane recovery; to account for 6 per cent of the GHG emission reduction by 2020</p> <p><u>UGANDA</u></p> <p>Renewable energy: Small hydropower</p> <p><u>UZBEKISTAN</u></p> <p>Fuel switching: Some use of compressed, liquefied gas</p>
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Annex IIExamples of planned mitigation activities

<p><u>ALBANIA</u></p> <p>Energy efficiency: Planned measures in industries may account for 47 per cent of mitigation potential; law on energy efficiency for existing buildings; new energy code for buildings to ensure adequate insulation; energy efficient lighting; CHP; energy efficient motor systems</p> <p>Renewable energy: Small hydropower</p> <p>Transport: Rehabilitation of roads</p> <p>Agriculture: Intends to provide better management of pasture including adjustment of stoke rating</p> <p>Waste: Considering electricity generation using recovered methane</p> <p><u>ALGERIA</u></p> <p>Energy efficiency: Energy efficient lighting; promoting CHP in large institutions, hospitals, etc.</p> <p>Fuel switching: Continue promoting LPG, natural gas</p> <p>Transport: Improved traffic management, flow</p> <p>Waste: Expects to collect 60 per cent of the methane from municipal solid waste by 2020</p> <p><u>ARGENTINA</u></p> <p>Energy efficiency: CHP</p> <p>Fuel switching: Greater penetration of natural gas in the transport sector</p> <p>Agriculture: Intends to reduce CH₄ emissions by changing diet of cattle</p> <p><u>ARMENIA</u></p> <p>Energy efficiency: Intends to undertake measures in major sectors; emissions reduced by 609,000 tonnes CO₂ per year by 2010</p> <p>Fuel switching: Planning to use natural gas in power generation; increase by 72 per cent in 2005–2010 period</p> <p>Renewable energy: Planning to increase share of the hydro power generation</p> <p><u>BARBADOS</u></p> <p>Energy efficiency: Energy efficient lighting; energy efficient motor systems</p>	<p>Fuel switching: Intends to increase the share of natural gas; electric vehicle strategy</p> <p>Renewable energy: Bagasse for cogeneration</p> <p><u>BHUTAN</u></p> <p>Energy efficiency: Improve building designs to minimize heat losses</p> <p>Renewable energy: Planning to provide financial support for hydro power generation</p> <p><u>BRAZIL</u></p> <p>Energy efficiency: Incremental abatement in emissions from: CHP fired by natural gas (1.8 Mt C by 2010, 4.4 Mt C by 2020); electricity conservation (7.1 Mt C by 2010, 25.2 Mt C by 2020)</p> <p>Fuel switching: Continuation of switching to natural gas in the industrial sector should reduce carbon emissions by 1.1 Mt by 2005 and 1.4 Mt by 2010</p> <p>Renewable energy: Incremental abatement in emissions from: use of ethanol (1.2 Mt C by 2010, 1.7 Mt C by 2020); CHP fired by sugar cane bagasse (3.4 Mt C by 2010, 5.3 Mt C by 2020); wind power (1.9 Mt C by 2010, 3.5 Mt C by 2020); small-scale hydro (2.9 Mt C by 2010, 4.5 Mt C by 2020)</p> <p><u>CHILE</u></p> <p>LUCF: Forestry mitigation options projected to account for 43 per cent of the total emissions reduction</p> <p><u>CHINA</u></p> <p>Energy efficiency: Energy efficiency technology (combination of various energy options aiming at reducing emissions by more than 800 Mt C by 2030)</p> <p>Fuel switching: Switching to natural gas</p> <p>Renewable energy: Increase use of renewables</p> <p><u>COLOMBIA</u></p> <p>Fuel switching: Undertaking conversion of cars to natural gas (continued expansion of CNG, LPG)</p> <p>Renewable energy: Plans to use wind energy to pump drinking water; interest in identifying, evaluating and prioritizing strategies to eliminate barriers to export of electricity produced by cogeneration in sugar and other industries; small hydropower</p> <p>Transport: Replacing vehicles by more efficient ones</p>
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<p><u>COSTA RICA</u></p> <p>Energy efficiency: Energy efficient lighting</p> <p>Fuel switching: Use of LPG in transport sector</p> <p>Renewable energy: Intends to expand its power generation using renewable source – would avoid 183,000 tonnes CO₂ equivalent per year</p> <p>Transport: Improve roads and traffic control, flow</p> <p><u>EL SALVADOR</u></p> <p>Energy efficiency: New construction designs; energy efficient lighting</p> <p>Fuel switching: Intends to increase share of natural gas use; continued expansion of LPG; use of natural gas and LPG for transport</p> <p>Renewable energy: Small hydropower; biomass to electricity generation</p> <p>Transport: Improve road network</p> <p><u>GEORGIA</u></p> <p>Energy efficiency: Energy efficient lighting</p> <p>Renewable energy: Completion and modernization of hydro power plants; reduction by 1.8 Mt CO₂ by 2025</p> <p>Transport: Promote a cleaner fleet; renewal of roads</p> <p>LUCF: Promoting high productivity forests</p> <p><u>GHANA</u></p> <p>Energy efficiency: Energy efficiency standards and audit; energy efficient lighting</p> <p>Fuel switching: Continued expansion of LPG; use of natural gas for transport</p> <p>Renewable energy: Small hydropower</p> <p><u>INDIA</u></p> <p>Energy efficiency: The main measures are in demand- and supply-side management measures and in improvements in electricity transmission and distribution</p> <p>Fuel switching: Switching from coal to gas</p> <p>Renewable energy: Government is strongly promoting the increase in the use of renewables for new power generating capacity by 2010</p> <p>Agriculture: Enhanced cattle feed; anaerobic manure digesters; low methane rice varieties; cultivation practices; improved fertilizer application; nitrification inhibitors</p>	<p><u>INDONESIA</u></p> <p>Fuel switching: Promotion of switch to clean alternatives in transport sector</p> <p>Renewable energy: Implementing project for three hydropower units</p> <p>Transport: Encouraging public transport</p> <p><u>JAMAICA</u></p> <p>Renewable energy: Greater use of bagasse for electricity generation</p> <p><u>LEBANON</u></p> <p>Energy efficiency: Energy efficient motor systems</p> <p>Renewable energy: Intention to use solar and wind resources; biomass-derived gases for transport</p> <p>Transport: Encouraging public transport</p> <p><u>LESOTHO</u></p> <p>Energy efficiency: Improved building designs; energy efficient lighting (residential/commercial, electric, solar)</p> <p>Fuel switching: Plan to increase share of LPG usage; promotion of biogas, LPG, electricity for cooking</p> <p>LUCF: Afforestation programme, 3,770 kt CO₂ sequestered by 2030</p> <p><u>MALAYSIA</u></p> <p>Renewable energy: Biomass waste (rice husks, wood fuel, palm oil wastes) for power cogeneration</p> <p><u>MAURITIUS</u></p> <p>Fuel switching: Encourage use of LPG for cooking; gas from sugar cane ethanol for transport</p> <p>Renewable energy: Implementation of gasification technology</p> <p><u>MEXICO</u></p> <p>Energy efficiency: Energy efficient lighting (residential and commercial sectors)</p> <p>Transport: Replacing vehicles with more efficient ones</p> <p><u>MOROCCO</u></p> <p>Energy efficiency: Efficient use of energy in industry, emissions reduced by 10 Mt CO₂ equivalent by 2020</p> <p>Fuel switching: Switch to natural gas in industry, emissions reduced by 15 Mt CO₂ equivalent by 2020</p>
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<p>Renewable energy: Small hydropower</p> <p>LUCF: Planning forestry mitigation measures that could account for 12 per cent of the total projected emissions in 2020</p> <p>Waste: Intends to recover methane. To account for 7 per cent of the GHG emissions reduction by 2020</p> <p><u>PERU</u></p> <p>Fuel switching: LNG, CNG for vehicles, LPG for taxis, CNG for buses</p> <p>Renewable energy: Plans to install wind turbines, avoid 1 Mt CO₂ per year; small hydropower</p> <p>Transport: Plans to replace old vehicles with more efficient ones</p> <p><u>PHILIPPINES</u></p> <p>Energy efficiency: Energy efficient design for new buildings; energy efficient motor systems</p> <p>Renewable energy: Interest in biomass to energy systems</p> <p>Transport: Rehabilitation of roads</p> <p>Agriculture: Reduction in rice fields and proper fertilizer use</p> <p><u>REPUBLIC OF KOREA</u></p> <p>Fuel switching: Use of natural gas; research into ethanol for transport</p> <p>Transport: Strengthen exhaust gas emission standards</p> <p>Agriculture: Intends to reduce CH₄ in paddy areas</p> <p><u>SENEGAL</u></p> <p>Energy efficiency: Working on a project for improved energy efficiency in buildings</p> <p>Fuel switching: Planning to increase share of LPG/butane for cooking through price incentives</p> <p><u>SEYCHELLES</u></p> <p>Energy efficiency: Energy efficient lighting</p>	<p>Fuel switching: Continued promotion of LPG over kerosene and electricity for cooking; interested in LPG or CNG pilot study in transport</p> <p>Transport: Construction of bypass roads; improved traffic management system</p> <p><u>THAILAND</u></p> <p>Waste: Considering electricity generation using recovered methane</p> <p><u>TUNISIA</u></p> <p>Energy efficiency: Development of thermal regulation; energy efficient lighting</p> <p>Fuel switching: Promotion of biogas for cooking; use of LPG for transport</p> <p>Renewable energy: Small hydropower</p> <p>LUCF: Forestry mitigation measures could account for 21 per cent of total projected emissions reduction in 2020</p> <p>Waste: Methane recovery. To account for 6 per cent of the GHG emission reduction by 2020</p> <p><u>UGANDA</u></p> <p>Fuel switching: Ethanol blending for transport</p> <p>Renewable energy: Continued expansion of small hydropower</p> <p><u>UZBEKISTAN</u></p> <p>Energy efficiency: Energy saving in the power sector; introduce more strict efficiency standards for buildings; energy efficient lighting</p> <p>Fuel switching: Promote the use of gas in power generation</p> <p>Renewable energy: Small hydropower</p> <p>Industry: Intends to modernize processes</p> <p>LUCF: Has considered protecting afforested land, emissions reduced by 2.5 Mt CO₂ per year</p> <p>Waste: Measures to be undertaken may reduce emissions by 4 Mt CO₂ per year</p>
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