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REVIEW OF THE IMPLEMENTATION STATUS OF THE OUTCOMES OF THE WORLD SUMMIT ON SUSTAINABLE DEVELOPMENT
– AN ASIA-PACIFIC PERSPECTIVE

ACHIEVEMENTS, CHALLENGES AND OPPORTUNITIES FOR SUSTAINABLE DEVELOPMENT IN ASIA AND THE PACIFIC

This document provides an overview of progress in the implementation, related challenges and opportunities for further implementation of the Johannesburg Plan of Implementation in the areas of energy for sustainable development, industrial development, air pollution/atmosphere and climate change in the Asian and Pacific region.

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Introduction

1. Over the past decade, the Asian and Pacific region has experienced the fastest economic growth in the world. However, strong economic growth coincided with increasing pressure on environmental resources, resulting in declining environmental sustainability, continuous governance challenges and security concerns, which indicates that current economic growth patterns are unsustainable.

2. The region faces serious challenges and constraints to further implementation of actions or plans for sustainable development, including the Plan of Implementation adopted by the World Summit on Sustainable Development[1/], ("Johannesburg Plan of Implementation", or JPoI), in the areas of energy for sustainable development, industrial development, air pollution/atmosphere and climate change.

3. Governments represented at the fifth Ministerial Conference on Environment and Development in Asia and the Pacific, 2005 (MCED), which was held at Seoul from 24 to 29 March 2005, recognized that a key objective of member Governments was economic growth. They showed how new approaches could contribute simultaneously to reducing poverty and protecting the environment in an equitable manner. They agreed that making economic growth and environmental sustainability mutually supportive provided a good opportunity for further transition towards sustainable development in Asia and the Pacific.

4. The leadership shown at that regional Conference, together with the rapid economic growth experienced in the region, positions Asia and the Pacific uniquely well for expedited implementation of JPoI.

5. This review provides information to the Commission on Sustainable Development at its fourteenth session, highlighting features of particular urgency or uniqueness to the Asian and Pacific region. It contains a consolidated assessment of progress in the implementation of Agenda 21[2/], the Programme for Further Implementation of Agenda 21[3/], and JPoI, in the areas of energy for sustainable development, industrial development, air pollution/atmosphere and climate change. Major constraints to further implementation are identified, and lessons learned and successful cases are put forward as opportunities for expedited implementation and transition towards sustainable development.

A. Achieving sustainable development in Asia and the Pacific

6. The size and diversity of characteristics and circumstances of countries in Asia and the Pacific position the region to play a key role in global sustainable development. The region is

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[1/] *Report of the World Summit on Sustainable Development, Johannesburg, South Africa, 26 August-4 September 2002 (United Nations publication, Sales No. E.03.II.A.1 and corrigendum), chap. I, resolution 1, annex.*

[2/] *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992, vol. I, Resolutions Adopted by the Conference (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.*

[3/] *General Assembly resolution S-19/2, annex.*

home to more than half the world's population; it includes the largest ocean on earth and is characterized by a huge range of cultures, ecological features, economies and political systems. The region stretches from Turkey and the western-most limits of the Russian Federation to French Polynesia in the South Pacific. The Asian and Pacific region includes three of the most populous and two of the least populous countries in the world. Three of the world's largest countries are in the region as are 12 landlocked countries (2 of which are double landlocked) and 17 small island developing States, three of which are barely a meter above sea level. Of the 14 countries in the Asian and Pacific region characterized as least developed countries (LDCs), 7 are also small island developing States.

7 With different national circumstances come differences in priorities and goals for sustainable development and these pose specific challenges to cooperation on sustainable development.

8. Although not equally distributed, economic growth in the region over the past decade has surpassed that of any other region in the world, enabling 270 million people to escape poverty between 1990 and 2004. Even though 6 LDCs are among the 15 fastest-growing economies of the region, the wealth of Asia and the Pacific differs widely among and within countries, and huge disparities in the level of economic development persist. Despite high level of economic growth, the extent of poverty in many countries remains a matter of great concern. In 2004, approximately 670 million people in the region still lived on less than US$ 1 a day. Income distribution through good governance, more than the conventional growth target focusing on macroeconomic performance, remains a challenge. The severity of poverty has a gender bias as women face greater hardship in lifting themselves and their children out of poverty. Women generally have fewer employment opportunities, less occupational mobility, weaker skills and less access to resources and training.

9. The current pattern of economic growth presents challenges to enhanced sustainable development and poses major threats to environmental sustainability in the Asian and Pacific region.

10. Economic growth in the region has coincided with declining environmental sustainability, as manifested by erosion of the natural resource base, rising levels of pollution resulting in threats to human health and increasing evidence of climate change. Environmentally unsustainable economic growth patterns, with the demand for ecosystem goods and services exceeding the region's natural resource endowments, need to be changed or reversed in order to achieve Millennium Development Goals (MDGs) number 1 (poverty reduction) and number 7 (environmental sustainability). Further implementation of JPoI requires fundamental changes in production and consumption patterns.

11. The challenge is how to continue economic growth for poverty reduction without compromising environmental sustainability. Resolving this conflict holds the key to placing the region on a sustainable development path.

12. As emphasized in the WEHAB (water, energy, health, agriculture and biodiversity) Framework, Agenda 21, the Programme for Further Implementation of Agenda 21, JPoI and MDGs, natural resources are critical inputs to many aspects of social and economic

development, including poverty reduction, gender equality, environmental sustainability, access to safe drinking water, health services and education. Yet, in the region economic growth often receives priority over environmental sustainability. Although economic growth is well recognized as an indicator of a country's success and is a necessary short-term condition for meeting the needs of the population, the perception that environmental and economic growth objectives contradict each other often impedes the pursuit of environmentally sustainable economic growth.

13. Planning perspectives and political systems that reward short-term economic gain lead to neglect of short-term as well as long-term environmental sustainability issues. Even where policies that encourage environmental sustainability have been introduced, the institutional, financial and human capacity to formulate, monitor and implement the policies is often lacking. Additional political will as well as enhanced capacity and financial support at national and international level are necessary for the implementation of effective and efficient policies that support environmental sustainability and the expedient implementation of JPoI.

B. Progress in and constraints to sustainable development in Asia and the Pacific

14. The Asian and Pacific region has made considerable progress towards sustainable development and the achievement of the MDGs. Strategic approaches to sustainable development are increasingly being considered at the country level, focusing on finding the right balance between economic growth, poverty reduction and environmental sustainability. Since the United Nations Conference on Environment and Development in 1992, many Asian and Pacific countries have developed national strategies and plans that form the basis for their transition towards sustainable development. At MCED, Asian and Pacific countries recommitted themselves to promote sustainable development by adopting the Regional Implementation Plan for Sustainable Development in Asia and the Pacific, 2006-2010[4/], and the Seoul Initiative on Environmentally Sustainable Economic Growth (*Green Growth*)[5/]. A number of relevant forums, some of which are reflected in the annex table, have shown commitment for action at subregional level to address challenges related to environmental sustainability, good governance and security.

15. In the past 10 years the region has seen an impressive increase in awareness of the concepts of sustainable development. Region-wide, development is the overriding priority, with poverty eradication being the principal aim closely linked to agriculture for food security and rural development. Other priorities for sustainable development include access to basic education and health care for children, men and women; control of population growth; access to modern energy services; rational use of energy and natural resources; promotion of environmentally sound technologies; and environmental protection.

[4/] *The fifth Ministerial Conference on Environment and Development in Asia and the Pacific, 2005 (United Nations publication, Sales No. E.05.II.F.31), Report of the Conference, annex II.*

[5/] Ibid, annex III.

16. Ensuring environmental sustainability has been recognized as a necessary condition for maintaining economic growth in the Asian and Pacific region. Countries in the region are seeking ways to strengthen their ability to achieve industry-related sustainable development goals in support of poverty reduction, cleaner production, energy for sustainable development and action on the atmosphere and climate change.

17. In some countries, efforts to promote sustainable consumption and production have intensified. "Green purchasing" both by industries and consumers has increased along with partnership initiatives among Governments and businesses in pursuit of sustainable development at the local, national and subregional levels.

18. Nevertheless, the region as a whole is experiencing mounting ecological imbalances resulting in increasing air and water pollution, forest degradation, soil erosion, fresh-water flow alterations, adverse impacts on coastal ecosystems and problems in solid waste management.

19. Despite some progress, macroeconomic policy in many cases does not yet integrate or attach sufficient priority to environmental sustainability concerns. Only 15 countries in the region have been assessed as "early achievers" or "on track" in developing national sustainable development strategies for enhanced integration of the principles of sustainable development into country policies and programmes.

C. Impacts of energy and industrial developments on air pollution/atmosphere and climate change

20. While industry and energy contribute immensely to social and economic development, they are also main contributors to the environmental challenges facing the region, including climate change and deteriorating air quality. With increasing recognition of the negative impacts and risks to future prosperity stemming from climate change and air pollution, public and political pressure to change the direction of development in the industrial and energy sectors has emerged. Further progress and constraints towards sustainable development in the four areas are therefore closely interlinked.

21. Current patterns of economic growth already risk irreversible environmental damage. A major challenge facing the region is to find ways to ensure that industrial development and energy consumption and production do not pose a threat to improved environmental sustainability. The environmental challenge is embedded in the need to transform the region's development paradigm so that growth in the production of goods and the provision of services does not lead to increases in pollution, waste generation and other forms of environmental degradation. Ecological efficiency must be improved through the use of more renewable and less non-renewable resources, creating more usable output per resource input, generating less waste and recycling.

22. Natural resource-, energy- and pollution-intensive industries dominate manufacturing and production in many parts of the region, and link industrial development, including the exploitation, transformation and consumption of energy, closely to air pollution and global environmental change. The link is manifested in several ways, including in the industrial

components of energy and water production, distribution and consumption; in the emissions of greenhouse gases, sulphur dioxide and nitrogen oxides from industrial activity and combustion of fossil fuels; and in the generation and discharge of pollutants and other waste into the natural environment. The following areas are of particular concern:

(a) Energy production and consumption have significant impacts on local and regional ecological carrying capacity. Emissions such as sulphur dioxide, carbon dioxide, hydrocarbons, particulate matter and heavy metals from commercial energy and mining activities have significant adverse impacts on land, water, air and ecosystems across the region;

(b) A substantial share of industrial growth in developing countries revolves around the transformation of raw materials into industrial products. These processes are not only resource intensive but often polluting in nature. Air pollution in industrial centres and urbanized areas, which can be transboundary, is a priority problem. Examples of polluting industries include large metallurgical, chemical and construction industries, coal-based power plants and a range of small and medium-sized enterprises (SMEs). Industrial "hot spots" of polluting industries present serious threats to human health and the environment. Industries and agro-processing are often based on technologies and techniques that rely on massive resource throughput or operate at low efficiency, thus causing high levels of pollution;

(c) Air pollution poses a major challenge to sustainable development in the region. Emissions of particulates, nitrogen oxides and sulphur dioxide, stemming mainly from coal combustion, are severe in China, India and several East Asian and South-East Asian countries. Concentrations of suspended particulate matter and lead in most mega-cities in Asia range from moderate to heavy. Soil acidification as a result of increasing sulphur dioxide emissions is another major issue in the region. Indoor air pollution from biomass utilization in cooking causes severe health problems in rural areas. In India, for example, indoor air pollution causes 500,000 deaths annually, mainly women and children under five years of age;

(d) The share of global emissions of carbon dioxide in developing Asian countries has increased and is projected to increase further. **Asia** currently accounts for around 40 per cent of total global greenhouse gas emissions; with the current economic outlook, the share is expected to increase sharply. At the same time, the Pacific subregion accounts for less than 1 per cent of global emissions. There is recognition of the need to re-examine and assess planned or ongoing structural change in energy and industry from a climate change perspective. Among these changes are replacement of capital stock and avoiding long-term, carbon-intensive technology lock-in;

23. All stakeholders have an obligation to evaluate their contribution to these risks and to participate in the transformation to a more sustainable industrial system.

1. Energy for sustainable development

24. The average per capita energy consumption in the region is around 60 per cent of the global average. While developed countries and developing countries of North, West and Central

Asia have a per capita consumption well above the global average, developing countries in the Pacific and in South, South-East and North-East Asia are still well below the global average.

25. The low per capita energy consumption indicates that a large fraction of the population in Asia and the Pacific lacks access to modern energy services and thus is deprived of a key tool for escaping poverty. Approximately 1.7 billion people in developing Asian countries in 2002 relied on biomass for cooking and heating; worldwide 63 per cent of people without access to electricity lived in Asia and the Pacific. Energy poverty, particularly in rural areas of the region, has disproportionate effects on women. Women spend significant time and physical effort on gathering fuel, carrying heavy loads over increasingly long distances. Many informal income generating activities are fuel-intensive, and this makes women particularly vulnerable to fuel scarcities and increasing fuel prices. Lack of energy services adversely affects other important aspects of life, such as education, safety, and health.

26. Over the past 25 years, developing countries have extended electricity supplies to more than 1.3 billion people, 500 million in rural and 800 million in urban areas. China and India gained good experience with integrated rural development programmes that can be studied and adapted in other parts of the region. Bangladesh, Kiribati, Nepal and the Philippines have demonstrated renewable energy technology applications as either nationwide programmes or local projects. Successful projects in some countries, such as Indonesia, Pakistan and Sri Lanka, have demonstrated the viability of providing basic services to the poor through partnerships among government and private-sector entities and the community.

27. As impressive as these accomplishments are, large gaps in access still remain, especially in rural areas. For example, in South and South-East Asia, electrification levels range from 30 to 50 per cent for rural areas, and from 68 to 90 per cent in urban areas. Expanding access to electricity and other modern energy services thus remains a major challenge to improving living conditions, especially for rural populations.

28. Energy security in the region worsened as fast economic growth increased the demand for energy, resulting in increased net imports, primarily from Middle Eastern sources. Boasting huge reserves of fossil fuels, the economies of Central, North and West Asia play an important role in energy development for the region. Countries less well endowed with fossil fuel reserves in the Pacific, South and South-East Asia increasingly are looking towards lowering their import dependency by utilizing indigenous renewable energy resources, among other means. Subregional and regional cooperation for energy development, trade and sharing can complement such endeavours.

29. The fuel supply mix varies across Asia and the Pacific and is heavily dependent on available reserves within countries. Fossil fuels are predominant and are expected to remain so in the foreseeable future. In 2003, over 80 per cent of energy demand in the region was met by coal, oil and gas, with dependency on fossil fuels exceeding 90 per cent in some subregions. Some countries, however, rely heavily on traditional biomass.

30. The region is endowed with abundant renewable energy resources, such as wind, biomass, geothermal, hydro and solar, among others. However, despite the surge in energy demand over past decades, renewable energy resources remain largely untapped. Some progress

has been made in the region towards sustainable energy development taking advantage of locally available and environmentally benign renewable energy resources. It is particularly encouraging to note that many Governments are recognizing the benefits of utilizing renewable energy resources in order to provide rural energy services. Progress is however not observed across the board, and the share of modern renewable energy is marginal. Some projections indicate that, even by 2030, these sources will meet only 3 per cent of the region's annual energy demand.

31. While developed countries in the region have taken the lead in harnessing new and renewable energy resources for power generation, developing economies continue to rely on inadequate external financial and technical support to utilize these resources. Many installations and technologies are either in the pilot stage or at the early stages of commercialization. Commercialization of renewable energy technologies remains a challenge to their wide-scale adoption.

32. Energy efficiency and conservation have vital roles to play in long-term sustainable energy development strategies. Many Governments are recognizing the benefits of promoting energy conservation practices among consumers through the introduction of demand-side management. In view of rising oil prices and import dependency, some countries are initiating eco-efficient practices through the use of alternative energy sources and clean energy technologies. Energy intensity measures how much energy is consumed per economic output and is often a proxy for the impact of energy conservation policies. It is notable that energy intensity in many developing countries of the region is higher than that of developed countries. Supply side management is an area with significant opportunities for improving energy transformation efficiency.

33. Inadequate access to financing and technologies poses a constraint to rapid improvement of energy efficiency. Many policies and regulations in the region do not encourage energy conservation or energy efficiency owing largely to energy investment and pricing policies and subsidies for certain forms of energy. Some countries that until recently heavily subsidized petrol have adjusted prices and subsidies in the wake of volatile and soaring oil prices.

34. Significant differences in approaches to energy pricing across the region are amplified between large energy exporters and countries that are energy importers. A recent study[6/] shows that countries range from those that spend 6 per cent of total State revenues on subsidizing fuel to those that obtain 33 per cent of State revenues from fuel taxation.

35. The energy sector is the most significant source of greenhouse gas emissions and a major source of air pollution. Fortunately there has been a positive trend towards using clean energy and cleaner and more advanced energy technologies; some efforts have been made towards energy efficiency and conservation. However, a major challenge facing the region is how to continue to provide and expand access to energy services in support of economic growth and poverty eradication without jeopardizing long-term prosperity and environmental sustainability.

6/ German agency for technical cooperation (GTZ), *International Fuel Prices 2005*, 2005.

2. Industrial development

36. The Asian and Pacific region has a wide range of experience in promoting growth in the industrial sector. Industrial development has progressed in areas where power facilities, trained labour, modern transport and raw materials are available. Countries such as Japan, the Republic of Korea and Singapore led the way towards industrialization, and China and India are currently making considerable strides in this direction. A number of other countries such as Indonesia, Malaysia and Thailand have developed their economies, supported by an influx of foreign investment and the effects of globalization. However, sustainable development efforts in general and those of sustainable industrial development in particular have been slowed and in some cases interrupted by financial crises and environmental and natural disasters.

37. Export-led industrial expansion is a defining feature of the region's economic growth. The past decade witnessed an increase in the share of technology-intensive industrial products in exports in many high- and medium-income countries in the Asian and Pacific region reflecting the increasing trend towards the internationalization of production processes and the potential for further economic growth. However, low-income economies have remained at the lower level of the industrial performance scale. The gap among low-income and middle- and high-income developing countries in the Asian and Pacific region has widened, pointing to a growing industrial divergence within economies of the region.

38. Challenges faced by agro-based industries in the region include a lack of transport facilities and logistical problems; the inadequacy of skills at various stages of agro-based processing owing to poor education, improper training and lack of exposure to improved systems of production; the lack of cost-effective, efficient and modern technology for agro-processing industries; and policy and financial support measures. Increasing globalization has brought both challenges and opportunities to agro-based industrialization in Asia and the Pacific. The rapid growth in international trade has made many developing countries more dependent on food imports. Whereas structural change in national economies, from agriculture to industry, particularly manufacturing, and services is a global phenomenon, the change has numerous implications for poverty reduction, food security, social cohesion in rural communities and women's income, employment and status.

39. The vital role of SMEs as generators of employment and income and as a force in domestic and export markets is increasingly recognized by many developing countries in the Asian and Pacific region. SME promotion has been a key element in economic policy, aimed at increasing competitiveness. A variety of SME support mechanisms have been put in place in many countries of the region. Although the potential impacts of SMEs on the environment are well recognized, the measures to help diffuse environmentally sound technologies among SMEs have been inadequate.

40. Owing to their natural endowments, size and remoteness from markets small Pacific island economies produce a relatively narrow range of goods and services. The share of manufacturing in the total gross domestic product of these economies is the lowest in the Asian and Pacific region. A few countries have developed copra, fishing, sugar and tourism industries; some islands have significant mineral resources, and many have commercially exploitable forest and fishery resources.

41. In terms of ranking on the Environmental Sustainability Index[7/] scale, stronger industrial performers tend to pollute more than others as a result of the higher shares of industrial activity in their economies. National experiences, which are successful in economic terms, have raised concerns and pose a threat to social and environmental sustainability, and risk jeopardizing both economic growth and the quality of life in the region. Industry, including mining and energy resource exploitation, has put significant pressures on the environment, underlining the need for action to promote environmentally sustainable growth patterns in the region.

42. The developed countries of the region have instituted significant policy changes that recognize the importance of efficient resource allocation, productivity improvement and international competitiveness. Developing countries in Asia and the Pacific are increasingly aware of the importance of environmentally sustainable industrial development and have become more efficient in controlling industrial waste. Several measures have been implemented, or are being prepared, in order to attain sustainable industrial growth in some countries, including promotion of environment-friendly industrial structures, establishment of sustainable energy systems, development and dissemination of cleaner production technologies, education and training, clean industry financing and regional cooperation in implementing technology exchange. In some countries, environmental management in industry has been initiated and implemented, including the development of eco-industrial estates and the introduction of international standards for production processes to promote resource use efficiency in industry.

3. Air pollution/atmosphere

43. The different geographic and climatic features of small island countries and territories, hilly terrains and plains, desert and semi-desert areas and coastal stretches, all of which can be found in the region, represent different concerns, challenges and opportunities in terms of air quality and atmospheric issues. Diverse socio-economic conditions also influence the nature, extent and impacts of air pollution. Irrespective of this diversity, there are issues of common concern to most countries in the region.

44. Deterioration of indoor and urban air quality, transboundary pollution, including acid deposition and haze, sand and dust storms and greenhouse gases, are the major atmospheric issues in the region.

45. In most developing countries of the region, the use of coal and biomass fuels for cooking and heating is a major source of indoor air pollution and constitutes a significant health hazard, in particular for women and children in poorer communities. Some estimates indicate that indoor air pollution is one of the largest single risk factors for mortality, at approximately 6 per cent.

46. There is evidence of improved air quality in some urban centres, including Kolkata, India and Shanghai, China. Significant improvements are also reported in concentrations of sulphur dioxide and the use of chlorofluorocarbons, which are major ozone-depleting substances, has

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[7/] An initiative of the Yale Center for Environmental Law and Policy and the Center for International Earth Science Information Network of Columbia University in collaboration with the World Economic Forum and the Joint Research Centre of the European Commission.

dramatically declined in the region. However, outdoor air pollution, especially in urban areas, is on the increase because of rapid urbanization, increasing vehicular traffic, industrial growth and increased energy consumption. Of the 15 cities in the world with the highest levels of particulate matter, 12 are located in Asia, and analyses of air-quality status in mega-cities indicate high levels of suspended particulate matter. The problem becomes severe in cities where high concentrations of sulphur dioxide occur simultaneously. High levels of ozone, lead and carbon monoxide also raise concerns.

47. Regulatory measures, economic instruments and technological options for air pollution control have been adopted at the national level with varying degrees of success. Measures include initiatives for compliance with international agreements relating to ozone-depleting substances and climate change and facilitation of cleaner fuels, clean production and transport technologies. However, national strategies for integrated air quality management and institutional mechanisms and infrastructure for the implementation are largely too weak for significant progress to occur. Capacity-building activities for integrated air pollution management are at the initial stage, and financial and technical support for initiatives in developing countries is currently inadequate.

48. At the global level, chlorofluorocarbons were successfully phased out under the Montreal Protocol,[8/] and successful experiences are emerging in Asia and the Pacific. At the subregional and regional levels, encouraging intergovernmental initiatives have been taken, including the ASEAN Agreement on Transboundary Haze Pollution, the Malé Declaration on Control and Prevention of Air Pollution and Its Likely Transboundary Effects for South Asia, the Acid Deposition Monitoring Network in East Asia, projects under the Convention on Long-range Transboundary Air Pollutants, and collaboration for the monitoring of dust and sand storms. These regional initiatives need to be strengthened and widened in scope to address other issues of concern such as indoor air pollution, ground-level ozone, the emission of mercury, the phasing out of lead, the promotion of clean technologies and development as well as trade in sustainable energy resources and technologies.

4. Climate change

49. The diverse geographical and climatic characteristics of the Asian and Pacific region mean that the effects of climate change and the nature of countermeasures vary across subregions, countries and even within countries. Also, demographic and land-use profiles, natural resource endowments, energy mix and economic structures affect the challenges and the opportunities for addressing climate change-related concerns.

50. Regional concerns are underlined by extreme weather and natural disasters; approximately 45 per cent of the world's annual natural disaster casualties occur in Asia and the Pacific.

51. Stresses from climate and climate-related events and phenomena that could be exacerbated by future climate change are already being felt by most countries in the region.

8/ United Nations, *Treaty Series*, vol. 1522, No. 26369.

Small island developing States, in particular coral atoll countries, and countries with long coastlines and low-lying areas encounter severe floods and drought, adverse effects from changes in the El Niño-Southern Oscillation phenomenon, tropical storms and changes in storm patterns, salt- water intrusion, storm surges, coral reef damage and changes in migratory patterns of commercially important fish. Other countries such as those in North-East Asia have expressed concern about the long-term sustainability of their arid/marginal regions and glacial melting and resultant floods which cause concern in parts of the Himalayas and Central Asian mountain regions. Sectors and areas that are keenly vulnerable include agriculture and food security, water resources, coastal zones and marine ecosystems, terrestrial ecosystems (forests, rangelands etc.), human health and human settlements, fisheries, biodiversity, infrastructure, coral reefs and tourism.

52. Per capita greenhouse gas emissions in the developing countries of Asia and the Pacific are much lower than the global average. In some countries, they are 10 to 20 times lower than those of developed countries. Nonetheless, total emissions from the region are increasing rapidly. Five of the top 20 emitters of carbon dioxide are located in the region; and 9 countries in the region account for 38 per cent of the total global greenhouse gas are emissions. At the same time, some of the world's smallest emitters and sequesters of greenhouse gases are also in the region.

53. Among the main contributors to the rise in greenhouse gas emissions are by-products of the combustion of fossil fuels such as coal with high carbon content, mainly for power generation, and the increasing use of petroleum-based modes of transport.

54. Some countries in the region have initiated institutional and governmental changes for better integration, coordination and implementation of climate change activities at the national and local levels. A number of subregional and national action plans for climate change, which serve as frameworks for national planning and capacity-building efforts, have been developed and reported under the United Nations Framework Convention on Climate Change.[9/] Nevertheless, the low priority accorded climate change policy and the lack of integration of climate change issues into national development plans remain matter of concern; mitigation and adaptation issues deserve additional policy attention. Often, policies for economic development and energy supply are prioritized at the expense of climate policy; thus, there is a need for improved awareness among policymakers on the importance of integrating climate change concerns into energy and economic policies and plans.

55. In most countries, mitigation policies exist, for the promotion of energy efficiency and alternative sources of energy, for transportation, for carbon sequestration and for technology development and transfer, but the implementation of such policies remains weak.

56. Adaptation in agriculture, forests, terrestrial, fragile and mountainous ecosystems is considered among the high priority measures for most Asian countries. For small island developing States, adaptation in agriculture, housing, infrastructure development, water resources and coastal zones, including sea-level rise, is a top priority. Countries across the region have identified various adaptation options ranging from the introduction of water policy reforms,

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[9/] (A/AC.237/18 (Part II)/Add.1 and Corr.1, annex I. Text agreed upon and adopted by the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change, in New York on 9 May 1992.

focusing on water conservation, to the improvement of health-care systems. Other adaptation options include inter-basin water transfer, desalination, flood management and construction of dams, development of drought-tolerant crops, improvement of early warning systems, enhancement of erosion control, training and assisting farmers, integration of coastal zone management, enhancement of forest management, protection of tourism, infrastructure, strengthening of environmental legislation and promotion of conservation.

57. While some developed countries of the region have taken on binding commitments under the Kyoto Protocol,[10/] developing countries play an increasingly vital role, including through the Clean Development Mechanism (CDM) of the Kyoto Protocol. Of the 33 CDM projects registered worldwide, 15 are registered within the region, with India hosting 7 projects. However, the current CDM process is complex and several institutional, financial, information and capacity-building barriers to CDM implementation have been identified as hampering the efforts of many developing countries and countries with economies in transition to seize the benefit of CDM for sustainable development.

D. Opportunities for furthering the sustainable development agenda in Asia and the Pacific

58. The review shows that, despite progress, the region faces serious challenges and constraints to further implementation of actions or plans for sustainable development, including JPoI, in the areas of energy for sustainable development, industrial development, air pollution/atmosphere and climate change. Implementation is often subject to financial and capacity constraints, and enforcement remains inadequate in some countries. Stronger political will as well as enhanced capacity are necessary for the implementation of effective and efficient policies that support environmental sustainability and the expedient implementation of JPoI.

59. However, opportunities for enhanced transition to sustainable development emerge as valuable lessons are learned, indicating that reconciliation of economic growth and environmental protection objectives is possible for further transition towards sustainable development in Asia and the Pacific. The annex table points to a number of successful initiatives and good practices at the national, subregional and regional levels for further implementation through policy dialogues, partnerships among multi-stakeholders, South-South cooperation and enhanced regional and subregional cooperation.

1. Structural changes

60. A transition towards sustainable development requires a paradigm shift, where priorities, attention and resources are directed towards eco-efficient practices, supporting developments within the carrying capacity of the ecosystems in the region. Environmentally sustainable economic growth would entail redirection and redistribution of growth, creating opportunities

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[10/] Kyoto Protocol to the United Nations Framework Convention on Climate Change. Agreement adopted at the Third Conference to the Parties to the United Nations Framework Convention on Climate Change, Kyoto, Japan, 1-10 December 1997.

and tools for about 670 million people in the region who are living below the poverty line to escape poverty.

61. Strong policies and strategies are needed to develop synergies and linkages between economic growth and environmental sustainability. National Governments have the major responsibility and opportunity for ensuring implementation of commitments. Moving forward with the progress in the preparation and completion of national sustainable development strategies (NSDS) is an opportunity that the region must grasp in order to accelerate the mainstreaming process for environmental protection and sustainability at the national and local levels. Establishment of legislative and institutional frameworks is part of this process. The intensified involvement of stakeholders from all the sectors concerned in the development and implementation of NSDS presents an opportunity for improving implementation through integrated approaches and ensuring political and public support for initiatives.

62. Every year substantial investments are made in conventional, unsustainable energy and industrial development. Market opportunities are emerging in the adaptation of environmentally sustainable technologies, including clean energy technology and cleaner production, and these hold the promise of further promoting environmental sustainability as a business opportunity. Promoting a climate for “green” public, private and foreign investments would support a shift towards environmentally sustainable economic growth, creating a level playing field for sustainable options. Changing how the long-term costs and benefits of investments are calculated would provide an opportunity for integrating sustainability considerations within financial evaluations.

63. Recent experiences have illustrated how greater stakeholder involvement during the development of policies, programmes, and projects could ensure sustainability, ownership and effective implementation. Increased recognition of the role and involvement of non-governmental organizations and women’s groups indicates their positive contribution to promoting and strengthening public awareness and education, especially on environmental concerns and the linkages to sustainable development. The role of the media is equally important to raise public awareness on key issues and promote behaviour change.

64. The private sector is also showing interest in partnering with Governments and local communities, for example, in developing and operating renewable energy-based power plants and in energy conservation and efficiency projects. Partnerships between Government and industry are instrumental in the establishment of frameworks for “green” investment and the promotion of more efficient, less resource-intensive and cost-effective production For example, industrial ecology, where complementary industries in the same industrial zone can utilize each other’s resources such as waste heat or energy, is one opportunity for enhancing process efficiency, reducing emissions and creating new jobs.

65. Gender, women and energy has successfully emerged on the regional development agenda and is viewed as a critical pathway for linking energy interventions to the achievement of the MDGs. Because women are particularly impacted by the continued use of traditional fuels, a special commitment is necessary to provide enhanced household energy services. Additional

commitment is also needed to invest in energy technologies that enhance women's income generation opportunities, health and education.

2. Policy tools

66. A variety of tools that can be put in place at the national level to support the structural changes or paradigm shift outlined above emerge from good policy practices, which are already in place in some countries of the region:

(a) Setting voluntary targets and formulating flexible, market-driven policy that can increase the share of environmentally sound technologies and processes, such as increasing the share of renewable energy in the energy mix or introducing efficient technologies and processes in production and consumption, are important steps which some countries have already taken;

(b) A well-demonstrated tool for integrating sustainability considerations in planning, financial evaluation and project appraisal is mandatory environmental impact assessments. These have been instrumental in the appropriate design and public acceptance of large hydropower projects, for example;

(c) The means for developing and enhancing the roles of businesses and financial institutions in the transition towards environmentally sustainable economic growth include the following: (i) "green" taxation and budget reform, (ii) "green" infrastructure development (water, energy, transport), (iii) "green" business growth for reducing poverty, and (iv) "green" investment policies, including investment in resource-saving society and ecosystem services;

(d) Productivity increases, renewable energy purchasing, energy efficiency increases, adoption of carbon-neutral policies at the company level, together with demand-side management, are other tools for synergizing climate change and air pollution mitigation; another is industrial development for economic profit. Cost savings and the reduction of greenhouse gas emissions, stemming from the introduction of such measures in leading corporations around the world, is an approach that has been termed "carbon down, profit up";

(e) Several capacity-building initiatives on climate change mitigation and adaptation that have been conducted or are ongoing within the region have contributed to raising awareness. The active involvement of local communities in climate efforts holds promise for making further progress and stronger links between poverty reduction and climate change. Bundling small-scale CDM projects to realize a greater development dividend provides an opportunity that needs further support and promotion.

(f) A number of integrated approaches to national energy policies and planning have emerged, enabling energy to be a means to development rather than an end, and overcoming institutional barriers such as women's lack of access to credit, training and employment.

3. Transboundary collaboration

67. Collective approaches are instrumental for constructive dialogue between and among countries; an enormous potential exists for enhanced subregional and regional collaboration as well as other types of partnership to further the sustainable development agenda. The following initiatives in the area of environmental cooperation in most subregions provide valuable lessons for action to address environmental challenges:

(a) Cooperation among developing countries or South-South cooperation is gaining ground and countries readily offer to share their experience with others. This becomes beneficial as some countries make significant progress in developing, adapting and demonstrating clean technologies, appropriate for and easily adaptable to other developing countries;

(b) In meeting the challenge of providing access to energy services, well recognized as a prerequisite for poverty eradication, it is encouraging that distributed energy systems based on locally available resources are rapidly becoming sustainable options for meeting rural energy demand. However, many developing countries lack the required resources; therefore, capacities need to be strengthened at the community level to facilitate operation and maintenance. Also, increased involvement of private sector requires delegation of authority to supply basic services;

(c) Efforts made by international agencies and financing institutions to implement various commitments on the atmosphere could be further enhanced through coordinated national and intergovernmental initiatives. To channel the available resources, it would be desirable to establish trust funds under existing national and intergovernmental initiatives;

(d) The Asian and Pacific region has a relatively low profile in global climate regime discussions. Considering the current rise in greenhouse gas emissions from the region and the vulnerability of most countries to the impacts of climate change, the opportunity for proactively engaging in negotiations for greenhouse gas emission mitigation should be seized. One emerging opportunity is to harness the benefits of CDM through unilateral CDM projects for achieving sustainable development goals and contributing to climate change mitigation. This approach can reduce the current complexities in undertaking CDM projects to the benefit of a large number of countries including some not listed in the annex;

(e) To tap the region’s rich experiences in many aspects of sustainable development, a strong and sustainable network of national or subregional data-collecting and monitoring centres offers a good opportunity for analytical work at subregional and regional levels. An important part of establishing monitoring frameworks is the development of appropriate indicators that are well defined and easy to measure. Furthermore, translating the monitoring data and information into policies/frameworks and implementation of realistic preventive measures will become ever more important;

(f) The proximity of countries and the abundance of natural resources in some and the lack of them in others would contribute towards improved environmental sustainability and security through systematic trade and exchange. For some countries, the globalization process offers a good opportunity for enhancing cross-border energy trade; for others, in particular small

island developing States and landlocked developing countries, challenges are abound to grasp the opportunity;

(g) Sustainable energy and cleaner production provide environmentally benign and economically viable services in support of environmentally sustainable economic growth. Given that the region has great potential for hydropower and other renewable energy resources and that it has gained significant experience in the application of clean technologies in cleaner production, there are considerable opportunities for diffusion and adaptation of renewable energy and clean technologies through sharing research, development, knowledge and best practices;

(h) Wider replication of good practices within and among countries requires enabling environments in the form of commitments, transparent institutional and legal frameworks, institutional collaboration and accessible funding. Such efforts can be further supported by developed countries as well as the United Nations and other international organizations.

(i) There is a need for an overall institutional framework that includes specific goals for rural energy service provision and recognizes the importance of gender-sensitive approaches in the formulation of energy programmes at national, regional and local levels.

Annex
Selected initiatives towards energy and industry for sustainable development and mitigation of air pollution and climate change [a/]

Environmentally sustainable economic growth	
Australia	National Strategy for Ecologically Sustainable Development adopted in 1992. Policy implementation is in support of environmentally sustainable economic growth
China	Resource-saving society: Plan to adopt efficiency of resource-use as a basic principle in all economic sectors and institutionalize it and decrease the GDP energy intensity by 20 per cent in the Eleventh Five-Year Plan
Japan	The 3R (reduce-reuse-recycle) policy adopted at the national level. The 3R initiative from 2004 is aimed at promoting eco-efficiency also internationally
Republic of Korea	The Resource Recycle Society: extended producer responsibility, waste minimization through volume-based collection and other
Russian Federation	National programme of social and economic development, 2006-2008 (2005)
Renewable energy targets [b/]	
Australia	Renewable Energy Act 2000 requires the generation of 9,500 Giga Watt hours of additional renewable electricity per year by 2010
Bangladesh	5 per cent by 2010 and 10 per cent by 2020
Cambodia	90 per cent by 2030
China	10 per cent of electricity power capacity and 5 per cent of primary energy by 2010 15 per cent of primary energy by 2020
Fiji	Fiji Electricity Authority to become a renewable energy utility by 2013
India	10 per cent of added electric power capacity during the period 2003-2012
Japan	Around 7 per cent by 2010
Lao People's Democratic Republic	100 per cent by 2010 and 2020
Nepal	91 per cent by 2007, 93 per cent by 2017 and 95 per cent by 2027

a/ Information is gathered from the information documents prepared for the Asia-Pacific Regional Implementation Meeting (RIM, www.unescap.org/esd/rim), and from participants to the RIM. The list is not exhaustive and updated by ESCAP on a continuous basis.

b/ Source: ESCAP, 2005.

Pakistan	10 per cent by 2015
Philippines	100 per cent increase in renewable energy power capacity by 2011
Republic of Korea	5 per cent of total primary energy by 2011
Thailand	8 per cent of total primary energy by 2011
Vanuatu	Vanuatu to become a renewable energy economy by 2010
Viet Nam	2 per cent by 2010 and 3 per cent by 2020
	Enhanced utilization of renewable energy
Australia	Solar Cities trial (A$ 75 million), Renewable Energy Development Initiative (A$ 100 million), advanced electricity storage technology for renewable energy (A$ 20 million), wind energy forecasting capability installation (A$ 14 million)
China	Renewable energy law (2005) is aimed at promoting biomass, solar, hydro, wind and geothermal sources
India	A national hydropower initiative targeting an additional 50,000 MW hydropower by 2012, of which 50 per cent would be from run-of-river projects
Japan	Special measures law on promoting use of new energy by electric enterprises (2002) Demonstration projects utilizing photovoltaic power generation system (1992 onwards)
Niue	Memorandum of Understanding with Greenpeace to work towards a 100 per cent renewable energy economy
Republic of Korea	Preferential purchase of electricity produced from renewable energy resources
Russian Federation	Russian programme of development of renewable energy resources (Russian Federation/GEF)
Thailand	Energy conservation law of 1992 mandates renewable energy Power purchase price assurances and subsidies for small power producers
Viet Nam	Renewable Energy Action Plan to develop geothermal, solar, wind and nuclear power
	Renewable energy for sustainable rural development
Australia	Renewable Remote Power Generation Programme for renewable energy technology utilization in remote areas includes the Indigenous Renewable Energy Services Programme targeted at remote indigenous communities

Bangladesh	42,000 solar home systems installed (Grameen Shakti)
Nepal	123,000 biogas units installed (Nepal Biogas Support Project)
Russian Federation	National ecological doctrine
Tonga	Reduction of kerosene consumption for lighting by about 70 per cent in remote islands through introduction of photovoltaic lighting
	Clean technology development and transfer
Australia	Establishment of a low-emission technology demonstration fund
Singapore	Technical assistance and financial grants to adopt energy-efficient technologies and equipment
Republic of Korea	10 year national plan for energy technology development
	Climate change
Australia	Climate Change Strategy 2004 to meet national Kyoto target (Limiting emissions to 108 per cent of 1990 levels between 2008 and 2012) and provide a framework for action beyond Kyoto
China	National climate change programme to be published by end 2006. Afforestation and reforestation policy to be further implemented
India	Afforestation policy. Forest and tree cover is planned to be increased from the existing 23 per cent to 25 per cent by 2007 and 33 per cent by 2012
Japan	Kyoto Mechanisms Acceleration Programme: support to stakeholders in Japan and host countries for successful implementation of projects under the flexible mechanisms of the Kyoto Protocol
Russian Federation	Comprehensive Implementation Plan of the Kyoto Protocol
	Efficient use of energy
Australia	Minimum energy performance standards regulate energy efficiency levels and mandates energy labelling for electrical appliances The National Framework for Energy Efficiency includes demand-side energy-efficiency measures in residential, commercial and industrial sectors
China	Energy saving and conservation measures through regular five year updates to energy conservation law (1998) and national energy conservation plans (1985-2010)

Fiji	Pilot project on appliance labelling and minimum energy performance standards
India	Energy conservation act (2001), electricity act (2003) and establishing the Bureau of Energy Efficiency helped conservation measures, such as energy standards, labelling of equipment/appliances, energy codes for buildings and energy audits Improved efficiency of wood stoves in 34 million homes
Japan	Energy conservation law (1979) Top-Runner Programme to establish standard targets for energy consumption efficiency
Republic of Korea	Financial assistance to energy-efficient investments Promotion of low stand by power devices.
Russian Federation	National Energy Strategy, up to 2020
Singapore	Voluntary “green” labelling scheme for electrical appliances
Thailand	Promotion of more efficient use of energy under strategic plan, 2002-2011
Viet Nam	Efficiency improvement of coal-fired cooking stoves
	Sustainable transportation
Australia	National average fuel consumption target for new petrol passenger motor vehicles of 6.8 litres per 100 km. Mandatory fuel consumption labelling. Green Vehicle Guide rating environmental performance of new vehicles.
China	Government pledge on investment in the transportation sector to achieve annual growth of 7 per cent in energy efficiency
India	Use of bio-diesel: The blending of ethanol in petrol and diesel is to be gradually increased to 10 per cent
Indonesia	Integration of public transport system in urban areas and registration for vehicle emission control and use of clean fuel
Philippines	Use of 1 per cent biodiesel (coconut) for all government vehicles
Republic of Korea	Fuel switch to compressed natural gas for buses in major cities by 2007 Rationalization of fuel taxes (gasoline, diesel and liquefied petroleum gas)
Russian Federation	Vehicles emissions regulations (Government decree, 2005)
Singapore	Additional registration fee/electronic road pricing Mandatory inspection for vehicles older than five years

Viet Nam	Fuel efficiency improvement with lean-burn engines in transportation
	Pricing reform
Fiji	Regulatory review of Fiji Electricity Authority
India	Introduction of market-based pricing for power and liquid fuels Rationalization of power tariffs in agricultural sector Gradual removal of energy subsidies, regulatory restructuring, privatization and unbundling of State-owned utilities
Indonesia	Reduction of fuel subsidies and fuel-price restructuring (2005)
Malaysia	Adjustment of petrol subsidies (2005)
Philippines	Tax duty redemption or reduction, investment and commitment to “green” independent power producers (1999-2028)
	Other national initiatives
New Zealand	Development of environmental performance indicators for monitoring and reporting on environmental health
Samoa	Oil price cuts through owning and leasing on tender the bulk fuel storage facilities
	Regional and subregional initiatives
Asia	Programme for National Cleaner Production Centres (UNIDO/UNEP)
Asia and the Pacific	Greenhouse Gas Emission Reduction from Industry in Asia and the Pacific (GERIAP, UNEP) Kitakyushu Initiative for a Clean Environment (Japan, ESCAP) Seoul Initiative on Environmentally Sustainable Economic Growth (Republic of Korea, ESCAP) Regional Energy Programme for Poverty Reduction (UNDP) Asia-Pacific Network for Climate Change (AP-Net) Asia-Pacific Partnership on Clean Development and Climate APEC Energy Working Group
Central Asia	Regional Environment Action Plan (ISDC, ADB, UNDP, UNEP)
East Asia	Acid Deposition Monitoring Network in East Asia (Governments, UNEP)

North-East Asia	Initiative to enhance energy collaboration for improved energy security (ESCAP)
	Network on Prevention and Control of Dust and Sandstorms in North-East Asia (ADB, ESCAP, UNCCD, UNEP)
	Project on Long-range Transboundary Air Pollutants
	North-East Asia Programme for Environmental Cooperation
Pacific Islands	Pacific Islands Regional Energy Policy (Council of Regional Organizations in the Pacific, SOPAC)
	Pacific Islands Framework for Action on Climate Change, 2006-2015 (Council of Regional Organizations in the Pacific, SPREP)
	Pacific Islands Energy and Gender Network (SOPAC)
	Pacific Islands Energy Strategic Action Plan (Council of Regional Organizations in the Pacific, SOPAC)
	Pacific Islands Energy Policy and Strategic Action Planning (SOPAC, Denmark)
	Pacific Islands Renewable Energy Project (GEF, UNDP, SPREP)
	Pacific Renewable Energy Training Initiative (Council of Regional Organizations in the Pacific, ESCAP)
	Promotion of Environmentally Sustainable Transportation in the Pacific Islands (SOPAC)
South-East Asia	ASEAN Haze Agreement (ASEAN, UNEP)
	ASEAN Plan of Action for Energy Cooperation
South Asia	Malé Declaration on Control and Prevention of Air Pollution and Its Likely Transboundary Effects for South Asia (Governments, UNEP)
	South Asia Regional Initiative for Energy Programme (USAID)
West and Central Asia	Plan of Action for Energy/Petroleum Cooperation in the ECO Region (2001-2005)

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