Strategic Context

Impacts and Vulnerability to Climate Change

Climate change impacts threaten to stall economic development in Asia and the Pacific, and endanger the health and safety of its vast population. Climate change causes temperature, wind, and precipitation to vary, with profound effects on natural systems. These in turn have effects on the health, safety, and livelihoods of people—especially poor people. Nowhere in the world are as many people affected by climate change as in Asia and the Pacific.

Climate change poses serious risks to the economic growth of all of ADB's DMCs. However, predicted impacts are more severe for certain regions and countries. Drylands of the Himalayas, Central and West Asia, and southern India are likely to experience changes in rainfall, raising concerns about agricultural production and food security. The greater frequency of extreme storm events places all of the region's large river basins at increased risk from flooding. Many coastal cities, especially those located on or near river deltas, will face multiple risks from storms and floods. The low-lying islands of the Pacific, Southeast Asia, and the Indian Ocean are also highly vulnerable to storms, storm surge, floods, and sea-level rise, and their capacity to respond is often hampered by their isolation and weak infrastructure.

Climate change will cause more intense typhoons, droughts, heat waves, landslides, and other natural hazards in a region which already suffers from more natural disasters than any other in the world. For the last decade, Bangladesh, India, the Philippines, and Viet Nam have topped the list of countries facing serious climate risks, and cumulative losses as a result of natural disasters have averaged nearly $20 billion over the same period. Future warming will also cause increasing sea-level rise, warmer ocean temperatures, and rising ocean water acidity, leading to greater coastal erosion and threatening the health of marine ecosystems—

a major source of nutrition and livelihood in Asia and the Pacific.

The cumulative impacts of climate change over the next two or three decades have the potential to reverse much of the progress made towards attainment of the Millennium Development Goals (Stern 2007). The latest global estimates predict the costs of adapting to climate change in developing countries to be between $9 billion and $67 billion per year (Mani et al. 2008). The recently published ADB study, *The Economics of Climate Change in Southeast Asia: A Regional Review* warned that the total economic cost of climate change threats could be equivalent to an annual loss of between 6% and 7% of these countries' GDPs by the end of the century. But early action can mitigate these impacts; the same study indicates that, investments costing as little as 0.2% of GDP have the potential to protect coastal and urban infrastructure from the greatest impacts of climate change.

Emissions Trends and Causes of Climate Change

> *Emissions of greenhouse gases from Asia and the Pacific are growing; energy and infrastructure investments made in the next two decades will shape the region's development path and the future of the global climate.*

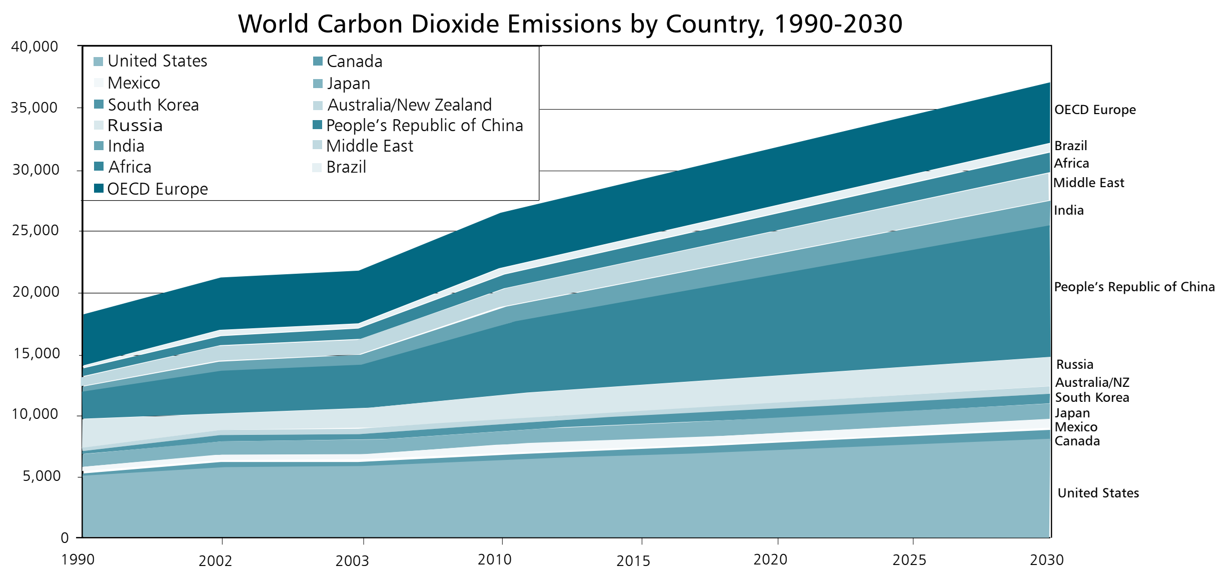
Human activities since the Industrial Revolution—primarily fossil fuel use, deforestation, and agriculture—have nearly doubled the amount of greenhouse gases in our atmosphere. Global scientific consensus confirms that the effects of these heat-trapping gases have already caused global temperatures to rise by 0.5° C, and if current development trends continue, temperatures will increase by 1.4°–5.8° C by 2100. Historically, countries belonging to the Organisation for Economic Co-operation and Development (OECD)[1] have been responsible for the majority of global emissions; however, developing countries are the fastest-growing source of new emissions, and they will soon be the largest absolute source (see Figure 1). India, Indonesia, and the People's Republic of China (PRC) rank in the top 10 emitting countries globally due to the combined effects of their fossil fuel consumption and deforestation (International Energy Agency 2007).

Rapid economic growth, increases in personal vehicle ownership, and the changing face of the region's population—from rural to urban—are primarily responsible for the dramatic upward trends in regional emissions. Energy demand growth in Asia and the Pacific rose 9.7% from 2000 to 2005, and corresponding greenhouse gas emissions rose by nearly 8% (International Energy Agency 2002, 2007) over the same period. By 2030, Asia will demand more than half of the world's primary energy resources (International Energy Agency 2007), will be home to more than half of the world's urban population—around 2.7 billion people (UN Habitat 2006)—and will be responsible for more than 50% of global emissions.

In addition to causing climate-altering emissions, increasing use of fossil fuels—and especially oil for transport—will decrease global energy security and raise energy prices for countries in

[1] Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Inceland, Ireland, Italy, Japan, Korea, Luxemborg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States..

Figure 1: Energy Related CO_2 Emissions by Country



Source: EIA 2007

Asia and the Pacific. Island states of the Pacific, Southeast Asia, and the Indian Ocean are some of the most vulnerable to energy price hikes. When compounded with their vulnerability to the impacts of climate change, these nations stand to lose the most if energy and emissions trends do not change.

Global Policy and Financial Responses

Enabling policy changes and directing financial flows towards clean energy and climate solutions can spur transformational change in Asia and the Pacific.

Global policy action, and a transition towards low-carbon economic growth, began in earnest more than 15 years ago. Under the United Nations Framework Convention on Climate Change (UNFCCC), many developed countries made preliminary commitments to reduce emissions by 5.2% below 1990 levels between 2008 and 2012 by signing the Kyoto Protocol. Nearly all DMCs also have obligations to report on national greenhouse gas emissions under the UNFCCC, and most are active participants in ongoing global negotiations to develop a post-2012 regime to address the issue of climate change.

The guiding strategy for developing a post-2012 agreement, the Bali Action Plan (adopted at the 13th United Nations Climate Change Conference in December 2007), has four essential elements or "building blocks": mitigation, adaptation, financing, and technology transfer, all of which have implications for sustained economic growth of ADB DMCs.

Mitigation. The findings of the 2007 Intergovernmental Panel on Climate Change (IPCC) reports indicate that emissions must be stabilized at between 450 parts per million (ppm) and 550 ppm to avoid dangerous climate change. To achieve this "developing country emissions need to deviate below their projected baselines within the next few decades." (IPCC 2007). Developing countries are increasingly under pressure to commit to nationally appropriate mitigation actions (NAMAs) and increase efforts to reduce greenhouse gas emissions. Investing in cleaner and more efficient infrastructure will help DMCs to meet potential future commitments to reducing emissions, lead to higher quality of life for the region's inhabitants, and may make goods and services more competitive.[2]

Adaptation. Current financing plans include the Adaptation Fund under the UNFCCC. The fund will mobilize at least $100 million per year based on a 2% tax on the sale of carbon credits from Clean Development Mechanism (CDM) projects and many bilateral and multilateral assistance programs including the newly established Pilot Program on Climate Resilience (PPCR) under the multilateral development banks' Climate Investment Funds (CIF). However, funding allocated thus far fails to address projected long-term needs and known technological and capacity constraints.

Financing. Major developing countries, including India, have stated that their willingness to reduce greenhouse gas emissions is contingent on the delivery of finance and clean technology through international cooperative action. The emerging financial architecture under the post-2012 agreements is likely to include rights for developing countries to sell various types of emissions reductions credits (as is the case now with the CDM and REDD).

Technology transfer. It is widely recognized that technology transfer is essential to support mitigation and adaptation efforts, particularly in developing countries. However, there is significant disagreement on whether the role of the UNFCCC in finance and technology transfer should be more action-based or advisory, and to what extent intellectual property rights should be respected in responding to what many deem a global climate crisis.[3] Providing risk insurance and leveraging resources from the Clean Technology Fund of the CIF and others, ADB will promote transformational technology deployment in larger countries, such as Indonesia and the Philippines, while ADB's Clean Energy Financing Partnership Facility is available to support smaller countries in Asia and the Pacific. ADB will support the creation of a Low Carbon Technology (LCT) Marketplace, providing the financial assistance needed to bridge the gap between the expectations of LCT holders and what LCT buyers can reasonably expect to recover from the large but lower priced energy market in Asia and Pacific. The Global Environment Facility (GEF) is tasked with coordinating efforts under the Bali Action Plan, and, as an implementing agency, ADB will further explore opportunities for technology transfer, particularly in the areas of energy and transportation infrastructure development.

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2 Sector targets and taxes on greenhouse-gas-emitting industries are two options under consideration to help countries reduce emissions under a post-2012 agreement. Should either become a reality, moving towards low-carbon production will help keep DMC industries globally competitive.

3 Similar to the World Trade Organization rulings for compulsory licensing of prescription drugs (namely for HIV/AIDS, malaria, etc.), some countries have argued that compulsory licensing should be used to spread technologies that reduce climate vulnerability and greenhouse gas emissions.

Helping countries to meet immediate infrastructure investment needs can sustain economic growth in the region while simultaneously helping them to achieve long-term energy security and climate benefits.

Now more than ever, growing financial resources for lower-carbon growth and building climate-resilient economies can influence the direction of development in Asia and the Pacific. Although economic growth in Asia and the Pacific has been strong, the pattern of growth has lacked attention to resource efficiency, energy security, and climate resilience. Exports have been a principal engine of growth, but now the region's economies face sluggish demand as a result of the global financial crisis. Public sector spending on critical infrastructure—including in energy, sanitation, and transport—has a key role to play in keeping the region's economies strong. With more funds earmarked to supporting sustainable growth, this devastating blow to the global economy presents a real opportunity for countries in Asia and the Pacific to invest in public goods that will simultaneously increase energy security, promote long-term economic competitiveness, and address climate change.

Financial resources. Immense investments in energy supply and infrastructure will be made in the next two decades to support economic growth in Asia through to 2030, and more than $6 trillion of this investment is required for Asia alone (International Energy Agency 2007, p. 45–47). In addition to the trillions required for infrastructure investment, the estimated annual investment needs for environmental issues in Asia and the Pacific are as high as $100 billion, including $30 billion for renewable energy, $28 billion for adaptation to climate change, $14 billion for energy efficiency, and $8 billion for sustainable management of water resources. Although financial flows are increasing rapidly overall,[4] the flow of funds does not come close to meeting global needs, and funding for adaptation and mitigation is far from equal.[5] ADB has access to internal climate change funds of less than $400 million—a relatively limited amount compared to its ordinary capital resources. External resources include those administrated by the GEF and the multilateral CIF (see glosary for fund description). ADB will guide internal and external resources to priorities outlined in this report, as well as increase the share of investment it is making in environmentally sustainable growth and climate change.

Catalyzing private sector investments to address climate change. The UNFCCC and others have estimated that over 85% of investment and financial flows into infrastructure investments originate from the private sector. In the context of efforts to address climate change, ADB is helping DMCs create an environment conducive to private

4 Developed countries are pledging more and more funding for climate change programs through their development assistance programs, and the Climate Investment Funds, managed by the multilateral development banks are becoming operational. From January 2007 to July 2008 alone, 18 new funding initiatives were announced with nearly $3 billion in bilateral finance, and an almost equal amount was pledged to multilateral initiatives.

5 According to a study by the Oxford Institute for Energy Studies, between 2000 and 2006, $600 million in funding was made available for adaptation efforts while more than $80 billion was made available for mitigation. Much of this difference is a result of flows from the carbon markets, which are increasing rapidly. Trades more than doubled in value in 2008 to $125 billion, and more than $32 billion of this was generated from the CDM—more than five times the amount of bilateral and multilateral financing combined.

sector investment that can reduce greenhouse gas emissions—whether in clean energy, sustainable transport, or improved land use. During 2008, ADB launched five clean energy investment funds that will help provide equity for projects that mitigate climate change in DMCs. ADB will also continue to facilitate private sector investments through innovative financial mechanisms—including equity funds and risk assurance—that help address early stage financial and skills gaps of managers of clean energy projects in developing countries.[6] Insurance schemes will also be explored with the private sector to help countries plan for increasing impacts of climate-related natural disasters.

ADB's Commitment to Addressing Climate Change

> *As part of Strategy 2020, ADB will invest in inclusive and environmentally sustainable growth, addressing climate change as one of five core areas of operation. ADB will use its strengths as a development partner to transform business-as-usual practices to meet regional and country development needs and respond to climate change.*

Strategy 2020 commits ADB to use its technical and financial resources to help DMCs make the transition onto low-carbon growth paths—using cleaner sources of energy and using energy more efficiently—and building resilience to the expected impacts of climate change. Strategy 2020 also sets a target of 40% of investment resources to be directed towards environment and climate change by 2020.

While ADB's commitment to address climate change is increasing, it is not new; on the contrary, ADB has been engaged in promoting low-carbon development and enhancing adaptive capacity of DMCs for well over a decade. Significant recent increases in lending have helped to advance ADB's climate change goals, most notably in 2008 when ADB lending for clean energy topped $1.7 billion and a dedicated fund to address climate change adaptation and mitigation, including reducing emission from deforestation and land degradation, supported more than 25 programs addressing DMC climate change priorities.[7] However, growing urgency and the proliferation of efforts to address climate change in every part of the region demand a closer alignment of ADB support to country and regional climate change and development needs. For ADB, this means increasing the capacity of staff and reorienting investment plans to incorporate climate change considerations into all operations.

Climate Change Implementation Plans

To incorporate climate change considerations into all project areas, a gap analysis was performed to compare ADB's lending portfolio with the unique climate-change-related threats (and opportunities) facing each of its regions. In March 2008, ADB management requested each regional operations department to prepare a climate change implementation plan (CCIP).

6 This issue is addressed in more detail in Carmody and Ritchie 2007. The new ADB–GEF project, the Private Sector Operations Division's Renewable Energy Enterprise Development - Seed Capital Access Facility, is also working in this area.

7 ADB set a $1 billion dollar target for clean energy investment in 2008. This target is expected to double in 2009–2010. ADB's Energy Efficiency Initiative and Climate Change Fund are defined in the glossary.

This document was to provide an analysis of ongoing climate responses funded by ADB and development partners, and provide recommendations on how to better align ADB's lending with country climate priorities. Focal points from each regional operations department and the Regional and Sustainable Development Department, along with technical experts in climate change mitigation, adaptation, and finance, prepared CCIPs from September 2008 to May 2009. Plans were prepared in consultation with resident mission staff and national stakeholders.[8]

The resulting five regional CCIPs describe where ADB can increase efforts to address climate change in each region, as well as areas where ADB will seek partnership to meet DMC needs. The CCIPs provide recommendations for interventions at three levels: policy, institutional, and operational, and include sector-specific responses. Short- and medium-term actions are outlined in Annex 1, showing where ADB will immediately focus climate change investment. Climate change investment at ADB has continued to grow throughout the CCIP process in response to needs identified; in fact, more than a dozen additional projects addressing climate change were designed in parallel with CCIP development.[9]

The implementation and monitoring of CCIPs will be carried out under each DMC's country strategy. In addition, biannual reports will monitor ADB's investment in priority areas identified by CCIPs. Next steps and plans included herein will be refined, based on evolving country priorities, dialogue with donor partners, and improved scientific predictions of climate change impacts.

[8] The CCIP provide input into Country Partnership Strategies; the recommendations are not binding. Therefore, informal consultations were held in ADB DMCs to refine recommendations and formal consultations will be held when investments are proposed as part of ADB's Country Partnership Strategies.

[9] Capacity building technical assistance has been approved for 10 countries in Central Asia, Azerbaijan, India, Nepal, Sri Lanka, and Viet Nam.