Asia-Pacific Partnership on Clean Development and Climate
Executive Summary of Task Force Action Plans

Overview

On October 12-13, 2006, in Jeju, Korea, the Policy and Implementation Committee (PIC) of the Asia-Pacific Partnership on Clean Development and Climate endorsed an initial set of projects and activities contained in eight sector-based Action Plans.

The Partnership is a grouping of six countries — Australia, China, India, Japan, the Republic of Korea, and the United States of America — cooperating to meet both their increased energy needs and associated challenges, including those related to air pollution, energy security, and greenhouse gas intensities.

At the Partnership's inaugural meeting on January 12, 2006, in Sydney, Australia, Ministers agreed to a Work Plan[1] setting out an innovative approach of using government-industry Task Forces to develop sustainable solutions to our shared challenges through bottom-up practical action. Public, private and research experts and leaders from each of the countries have focused on clean development issues in eight key sectors: (1) cleaner fossil energy; (2) renewable energy and distributed generation; (3) power generation and transmission; (4) steel; (5) aluminum; (6) cement; (7) coal mining; and (8) buildings and appliances.

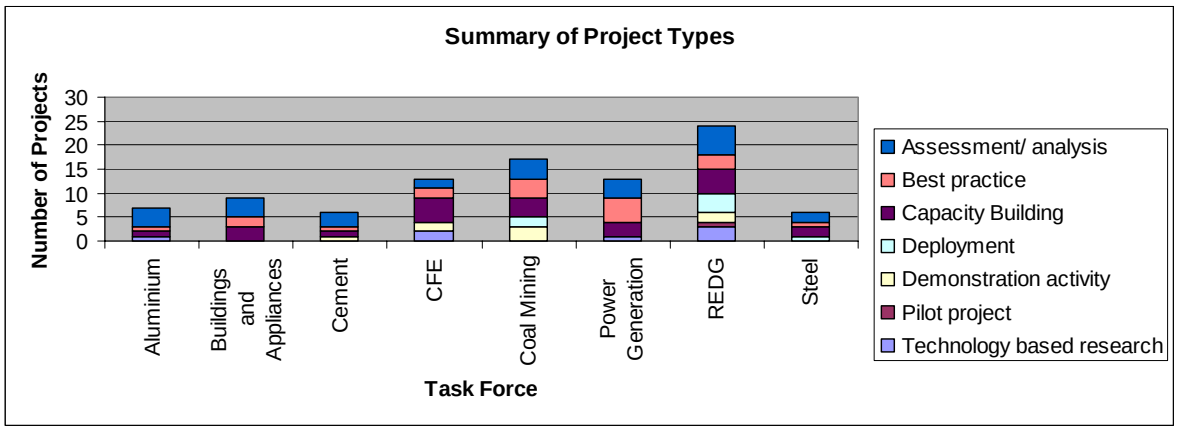
The PIC met in Berkeley, California, on April 18-21, 2006 to initiate the work of the Task Forces. In all, about 300 representatives from government, industry, and research institutions from the six Partner countries met to begin their work. The PIC provided guidance to the Task Forces in undertaking their work while allowing them a significant degree of flexibility to develop projects and activities that fit the circumstances of their sector and theme.

The eight Action Plans are the product of the Task Forces' initial stage of collaboration to formulate detailed Action Plans outlining both immediate and medium-term specific actions.

The Action Plans endorsed in Jeju provide a first step for the Partnership's work, as well as an initial set of actions that Partners intend to implement. These activities represent a significant first step toward a more comprehensive set of actions to address clean development and climate goals. This initial portfolio of Partnership projects is weighted towards activities such as sectoral assessments, capacity building, identifying best practices and technology research and demonstration. Figure 1 below provides an approximate estimate of project types grouped by Task Force.

[1] See http://www.asiapacificpartnership.org/workplan.pdf.

Figure 1. Summary of Project Type by Task Force[2]



The weighting of different project types in the portfolio reflects both the opportunity to make significant improvements in the use of existing energy and industrial technologies, and the need to undertake further analysis and scoping of more ambitious technology projects and opportunities to overcome specific market barriers. A distinctive feature of the Action Plan projects is their involvement by business enterprises from the six Partner countries. Virtually all of the actions identified will involve business, and a number of the activities will be undertaken primarily or exclusively by companies and associations representing commercial enterprises. In this sense the Partnership is building on successful public-private partnerships within Partner countries.

Further projects will be added to the portfolio as they are developed by the Task Forces and by Partner countries, and as experience with the Partnership and opportunities to leverage resources increase. Task Forces have also been asked to report on the progress of their Action Plans on a periodic basis, and to develop more specific ways of articulating goals for their projects and activities as they complete their sectoral analyses and scoping studies.

Following is a summary of the work of each Task Force and examples of the actions each is taking.

Cleaner Fossil Energy Task Force

The Cleaner Fossil Energy Task Force recognizes that coal, oil and gas will remain critical fuels for all six Partner economies. Given predictions of increasing energy demand in the Asia-Pacific region, the Task Force seeks to improve the efficiency and environmental performance of fossil fuel use. The Task Force identified a range of key advanced coal and gas technologies that can significantly reduce greenhouse gas emissions, air-borne pollutants and other environmental

[2]The numbers of projects assigned to each category in Figure 1 are approximate. Projects were allocated to one category only, although in a number of cases they contain components of more than one category.

impacts, including Integrated Gasification Combined Cycle (IGCC), producing hydrogen from coal, and Ultra-Supercritical Pulverized Coal. The use of carbon dioxide (CO_2) capture and storage also could help reduce greenhouse gas emissions from fossil fuel use. The Task Force is actively working to share best practices, eliminate market barriers to the deployment of these technologies, and increase the utilization and efficiency of cleaner fossil energy.

- Australia is working with other Partners to develop post combustion capture technologies and share learning and skills relating to carbon capture and storage.

- Australia and the United States are working to identify and address potential barriers to the delivery of liquefied natural gas and cross border pipeline gas. Additionally, they are working to improve processing and transportation technologies.

- Japan and the United States are co-sponsoring clean coal workshops to promote information sharing on IGCC and other clean coal technologies.

- Japan is working with Australia to improve CO_2 enhanced coal bed methane recovery. These efforts will improve energy security and greenhouse gas outcomes.

Renewable Energy and Distributed Generation Task Force

Renewable energy and distributed generation technologies will be critical for all six Partner countries to realize the goals of energy access, energy security, poverty alleviation, and mitigating the economic and social effects of increasing fossil fuel prices. The Renewable Energy and Distributed Generation Task Force is working to promote renewable energy technologies, such as hydro, solar, geothermal and wind, which generate virtually zero emissions. The Task Force is promoting distributed generation as a model that can significantly reduce emissions and promote greater cost efficiencies, as well as respond to the demographics of energy poverty, thereby increasing access to modern energy services. To promote these objectives, the Task Force will strive to identify barriers to technology transfer and financing associated with deployment of renewable and distributed generation technologies, focusing on cost competitive technologies with both on and off-grid applications.

- The United States is partnering with India and China to help provide customized rural power solutions based on local fuel sources. Development of gasified biomass-fueled engines could provide power to some of the almost 400 million rural residents who lack adequate and/or reliable power supplies and will power schools, health clinics, small industry, and agricultural production.

- Australia is working with the United States and China to develop and establish high efficiency solar technology that delivers affordable clean energy. The initiative aims to deploy over 1 billion watts (GW) of solar concentrator photovoltaic based power stations,

creating an opportunity for solar energy to become commercially competitive in the energy market across Partner countries.

- Korea and Japan are jointly leading an investigation in cooperation with other Partners to identify the best combination of renewable energies for use in independent electricity supply systems.

- Australia and China are investigating the use of solar thermal energy to enhance the energy content of natural gas or coal bed methane, for application in electricity generation or transport fuels. The Partners aim to construct the largest demonstration plant for solar-enhanced fossil fuels and test the technology at commercial scale.

- The United States will work with China to deploy combined heat and power systems that use petroleum coke oven gas to produce electricity and thermal energy. Use of these systems across China will improve air quality and human health, and save significant volumes of greenhouse gas emissions.

Power Generation and Transmission Task Force

The six Partner countries produce forty-nine percent of the world's electricity. Improvement in power generation and transmission efficiency in Partners thus has the potential to reduce the emissions of millions of tons of CO_2 and pollutants. This share of power will likely continue to grow given both China and India's goals to increase access to modern energy services throughout their rural regions and the need for increased generation capacity in all Partners. Despite growing demand for power, the potential for mitigation of greenhouse gas and pollutant emissions in Partners is substantial. The Power Generation Task Force is working to bring efficiency gains to all Partners through their planned activities. The Task Force proposed activities under categories of Best Practices for Power Generation, Best Practices for Transmission and Distribution, Best Practices for Demand Side Management, and Information Sharing.

- Partners are implementing activities including site visits, peer review visits, workshops, and capacity building to share information and techniques on several methods to improve power plant efficiency and reduce pollution. Some of these techniques include combustion optimization methods in coal-fired power plants, sulfur dioxide (SO_2) reduction technologies in power plant flue gas, and intelligent soot blowing system for steam generator efficiency improvement. As an initial start for this activity, the United States is hosting Indian, Chinese, and Korean power plant engineers in October 2006.

- Indian, U.S., Japanese, and Australian utilities are planning site visits to the United States and Japan to share information on plant operation and/or life extension for aging power plant steam/gas driven turbines. These visits will focus on reconstructive measures

intended not only to prolong their service time and raise their reliability but also to improve their efficiency.

- Partners' Power generators will establish a forum for addressing challenges through more efficient market and regulatory frameworks. The initial objective of the forum is to establish a shared understanding regarding increased investment in efficient power systems that will result in more reliable, affordable, and sustainable sound energy services.

Steel Task Force

Partners presently account for more than 57 percent of the world's total production of crude steel. Production is expected to increase, with India and China leading the way. Partners on the Steel Task Force have worked together to identify technologies to reduce the emissions and energy consumption of the global steel sector.

- The Task Force will publish and distribute online a "State-of-the-Art Clean Technologies Handbook" that contains the best available energy saving technologies and practices in the iron and steel industry.

- Partners will continue to survey the state of the industry in each Partner, including technology deployment, recycling rates, and barriers to the implementation of cleaner technologies and practices. Through this survey, Partners will identify the potential for reducing CO_2, SO_2, and other emissions, and develop sector performance indicators and benchmarks based on common boundary definitions for iron and steel making.

- Partners will increase recycling and the use of waste products as part of their work to reduce energy usage, air pollution, and CO_2 emissions attributed to steel production.

Aluminium Task Force

Partners account for approximately 37 percent of the world's aluminium production. The aluminium industry is one of the fastest growing sectors, with rapid growth in developing countries. Through the Partnership, countries can advance industry toward global perfluorocarbon (PFC) reduction objectives and address the management of waste byproducts and emissions resulting from the aluminium production processes. Partners will promote best practice performance, increase technical support, and identify impediments to deployment of best available and affordable technology. The six Partners' aluminium associations agreed to a memorandum of understanding (MOU) in May 2006 which included a commitment to enhance the greenhouse gas performance of aluminium production processes and to enhance existing cooperative arrangements across the sector. The MOU signing is a strong signal that the Partner

country aluminium associations will work together to leverage funding to further the Task Force's goals.

- Under the Aluminium Task Force Action Plan, Partners are working to reduce emissions of PFCs, a class of compounds that are potent greenhouse gases. In order to achieve this goal, Partners will work to adopt standard facility-specific measurements, complete benchmark assessments, and identify potential technical upgrades. Training workshops and emissions benchmark activities are under development for 2007.

- The United States, Australia, and China are working to decrease emissions of fluorides, substances generated during smelting that can have serious environmental impacts on local flora and fauna, by providing operators with information on their emissions performance and identifying practical reduction mechanisms.

- China, India, and Australia will work together to develop environmentally sensitive and economically viable methods of processing high silica bauxite in response to the global decline in high grade bauxite residues. The Partners will also work to develop technically and economically sound uses for bauxite residue (also known as red mud), the environmentally problematic material that is left over from alumina processing.

- The United States is leading a project to promote aluminium recycling. Recycling uses only 5% of the energy required for primary metal production and avoids emissions of PFCs and other environmental pollutants associated with alumina processing and aluminium production. The first steps in this project are developing baseline recycling rates and an annual reporting mechanism to monitor progress.

Cement Task Force

Cement is an essential material for social infrastructure and has played a vital role in providing the foundation for economic development around the world. The production process for cement is energy intensive and requires a large amount of natural resources for fuel and raw materials. Consequently, the aggregate amount of CO_2 emitted from the global cement industry has reached about 2.2 billion tons, accounting for approximately five percent of global man-made CO_2 emissions. Energy accounts for up to 40 percent of the cost of cement production. Energy efficiency improvements therefore have great potential to reduce costs, while dramatically reducing the majority of pollutants generated by fuel combustion.

Partner countries account for about 61 percent of global cement production. The Cement Task Force therefore has significant potential to achieve its long-term goals to reduce CO_2 emissions, conserve energy through sharing information on clean energy technologies, and cooperating further to diffuse such technologies.

- Australia, China and Japan are working to create a Cement Centre of Excellence, where Partners can share best practices and benchmark information on environmental performance, energy efficiency and enhanced use of alternative fuels and raw materials for cement production. In addition, the Cement Centre of Excellence will provide technology scholarships and facilitate specialist exchanges among companies to drive information sharing and technology development and deployment.

- Japan's public and private sectors have teamed up to coordinate information gathering among the Partners as well as developing the draft Partnership cement protocol for data collection. Based on the results of this effort, Japan and the United States will work to select key performance indicators and develop benchmarks for evaluating emissions reduction potentials, which are essential input for the Cement Centre of Excellence.

- The United States will lead on two projects, one which will identify and address both legal and regulatory barriers to, as well as incentives for, reducing the CO_2 intensity of cement production and deploying cleaner manufacturing technology. The second will explore how concrete may be used in certain applications (e.g., residential housing) to reduce energy use and thereby mitigate climate change.

- Australia will lead a project to examine the potential economic and energy efficiency gains from utilizing cement plant waste heat to generate electricity and, if gains are identified, the technical and engineering challenges of retrofitting cogeneration facilities at an Australian plant.

Coal Mining Task Force

Coal is the world's most abundant and widely distributed fossil fuel. Although coal deposits are widely dispersed, over 58 % of the world's recoverable reserves are located in four Partnership countries: the United States (27 %), China (13 %), India (10%) and Australia (8.7%). According to the International Energy Agency, by 2030, coal-based power generation is projected to more than triple, with coal likely providing 33% of global electricity generation. The Coal Mining Task Force is working to improve coal mining and beneficiation efficiency, reduce coal's environmental impacts, and improve coal mining's safety record. This includes promoting best available technologies and practices in coal preparation, coalmine methane capture and improved mine health and safety.

- Partner countries are facilitating technology transfer among the countries to improve coal quality, increase recovery, and reduce costs. A workshop supported by the United States will be held in India to highlight coal preparation technologies for high ash Indian coal. Sharing best practices in coal preparation will improve the quality of the coal after mining, increase energy efficiency, and reduce pollution from coal burning.

- Methane gas has become a valuable resource in some coalmines and is being captured for use in on-site electricity generation or sold to natural gas providers. The United States is exchanging leading practices on coalmine methane capture and recovery. As a result, Partners will have new opportunities to reduce emissions and profit from this clean energy source.

- The Coal Mining Task Force has the goal to achieve zero harm by promoting leading health and safety practices in Partners through sharing best practices. When adopted, these will significantly reduce the number of accidents per year. A workshop will be held in Washington, D.C., to share information on safety practices among Partners. In addition, Australia and China have signed a memorandum of understanding to implement leading safety practices in a demonstration mine in China.

- Australia is compiling, with information provided by Partners, a "Leading Practice Sustainable Development Program for the Mining Industry" project. This project will provide an essential compendium of coal mining best practices and the most efficient coal mining technologies.

Buildings and Appliances Task Force

Together, buildings and appliances use between 20 and 40 percent of total primary energy in Partners. By addressing power demand in appliances, office and consumer electronics, and lighting, as well as building design and operations, the Task Force strives to significantly improve energy efficiency, especially in the residential and commercial sectors. This will lead to economic benefits and defer investment in energy supply.

- Task Force projects will develop understanding and skills in improving the performance of new and existing buildings, including through sharing of best practices and disseminating information in a common framework to identify and assess energy efficiency options, development of accessible demonstration buildings, and training for public and private sector building owners and managers in effective operations and maintenance. The Task Force aims to demonstrate how a 10-15% energy reduction in existing buildings can be achieved at low-cost/no-cost.

- The Task Force is working to consider effective approaches to building codes for minimum compliance and promote the use of the best practice building design tools for large commercial and residential buildings. The Task Force is also working on certification of buildings which will not only demonstrate their potential to save energy but also improve market transparency, which can be a catalyst for greater energy efficiency in buildings.

- Partners will address appliance efficiency by developing harmonized appliance test procedures and promoting consumer awareness and government procurement programs. It will also work to reduce waste standby or "idle" power consumption.

- The Task Force is exploring ways to improve financing and leasing options in public and private buildings, using energy savings performance contracts, utility incentives, and demonstration buildings.