Renewable Energy and the Global Environment
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Mr. Chairman, honorable Committee members, I am pleased that you have asked us here today to discuss climate change, renewable energy and the environment, with emphasis on India.

The United States is taking an integrated approach in promoting economic development, addressing clean energy needs, and protecting the environment. This approach is designed to foster breakthroughs in clean energy technologies and encourages global activities that accelerate development and deployment of clean energy technologies across the globe while also meeting the challenge of global climate change.

Renewable energy will continue to play a very key part in U.S. energy and environmental policy, and it is an increasingly important energy source world wide. According to a recent study by the United Nations Environment Program, investments in renewable energy reached a record $71 billion in 2006, a 43 percent increase over 2005. A similar growth trajectory is expected this year.

The US and EU together accounted for more than 70% of this investment in 2006. While renewable energy investment is concentrated in the OECD, there is growing activity in the developing world, especially in China, India and Brazil. Indeed, Chinese companies are the second largest recipients of venture capital in 2006 after the United States. Last year, India was the largest net buyer of renewable energy companies abroad, mostly in European markets. Brazil is the largest renewable energy market in the world. More than 75 percent of Brazil's cars are flex-fuel.

Recognizing the global nature and the serious challenge of these issues the United States continues to collaborate with nations across the globe. Active bilateral and multilateral initiatives and partnerships are identifying solutions by reducing greenhouse gas intensity, creating new investment, building local capacity, and removing barriers to the introduction of cleaner technologies.

I want to briefly describe a number of international initiatives to illustrate the many forms of international partnerships we have to advance the up take of renewable energy by sharing technologies and best practices, and by encouraging more investment in renewable energy both bilaterally and through multilateral institutions.

These initiatives are complementary to President Bush's announcement in May of his support for an effort among major global economies to agree on a new international framework to address climate change, energy security, economic growth and sustainable development. Secretary Rice hosted the first Major Economies Meeting (MEM) on September 27-28 in Washington, D.C., which was attended by senior representatives of seventeen major economies and a United Nations representative. In his speech during the MEM, President Bush emphasized that these countries would work within the UN process to strengthen programs addressing energy efficiency and to advance the global transfer and adoption of clean energy technologies. The Asia-Pacific Partnership on Clean Development and Climate is one of numerous ways the U.S. is rising along with the international community to meet this enormous challenge.

The **Asia-Pacific Partnership on Clean Development and Climate** (APP) brings together six major Asia-Pacific countries Australia, China, India, Japan, Republic of Korea, and the United States, in an effort to address increased energy needs and the associated issues of air pollution, energy security, and climate change. At the New Delhi ministerial meeting in October 2007, the Partners warmly welcomed Canada as the seventh member of the Partnership. An innovative public-private sector effort, the Asia-Pacific Partnership was established to promote economic development, reduce poverty, and accelerate the development and deployment of cleaner, more efficient technologies.

Through engaging private industry, as well as government officials from multiple ministries, the APP is using public-private partnerships to build local capacity, improve efficiency and reduce greenhouse gas emissions, create new investment opportunities, and remove barriers to the introduction of clean energy technologies in the Asia-Pacific region. What makes the approach unique is that APP activities are identified and supported using an innovative "bottom up" approach. By focusing on concrete knowledge and technology transfer, more than 100 individual projects and activities included in the APP Task Force action plans are already yielding concrete results. Together, APP partner countries account for about half of the world's economic output, energy use, and greenhouse gas emissions. APP provides the U.S. a unique opportunity to engage India and China in constructively moving their energy economies toward a more climate friendly direction.

The Asia-Pacific Partnership has created eight task forces to achieve the initiative's goals: One of these task forces works on renewable energy and distributed power generation. Our work on the Renewable Energy and Distributed Generation Task Force has been instrumental in identifying new business, finance, and technology models to facilitate the increased diffusion of renewable energy through market transformation policies and practices.

The State Department is currently providing cost-share funding for four of these APP projects that involve accelerating renewable energy up take in India in the following areas:

- Accelerate the commercialization of a solar photovoltaic(PV) system in 4 Indian states by working with local business and banks;
- Deployment of a one mega watt PV pilot power plant with the Tata Group;
- Identify and remove technical barriers to the deployment of renewable energy in three Indian states through a project involving US and Indian regulators and utilities;
- Promote biomass and biogas power generation systems in rural areas of Central India.

Washington International Renewable Energy Conference (WIREC). The United States will host the Washington International Renewable Energy Conference (WIREC 2008) in Washington DC, March 4-6, 2008. WIREC 2008, the third international ministerial-level event on renewable energy,

will be a key opportunity for government, industry and civil society leaders to advance the integration of renewable energy and advance shared goals for climate, sustainable development and energy security. The event builds upon outcomes from the 2002 World Summit on Sustainable Development and the Bonn (2004) and Beijing (2005) Renewable Energy Conferences. The timing for WIREC 2008 is optimal, because many countries have established leadership positions in renewable energy technology development, manufacturing and market adoption through innovative policies.

WIREC 2008 will focus on rural development, finance, commercialization/market adoption, research and development, as well as other cross-cutting issues. WIREC 2008 includes a ministerial level meeting for governments (federal and local), the private sector and civil society, and a co-located, but separately managed trade show and exhibition.

WIREC 2008 will also provide an opportunity to advance renewable energy globally by bringing world leaders together to raise issues, exchange information, share experiences and best practices, and provide a global platform to highlight and promote strategies for significant development and rapid scale up of renewable energy systems worldwide, including second generation biofuels.

The United States is well positioned to host WIREC 2008. We are a major producer of renewable energy such as biofuels, and a principal developer of renewable energy technology, including solar, wind and battery. The United States is a substantial marketplace for renewable energy industries, and we lead the world in venture capital financing of renewable energy projects. Also, our federal system of government means that we have 50 states and hundreds of county and city jurisdictions experimenting with an array of models to advance the diffusion of renewable energy technologies.

US-India Energy Research Cooperation

S&T cooperation between India and USA is characterized by over fifty years of successful and productive exchange of scientists and scientific ideas, joint workshops and conferences, collaborative research projects, training and fellowship programs and technology transfer in virtually all areas of Science & Technology. An Inter-Governmental Science & Technology Cooperation

Agreement between India and USA was signed on October 17, 2005 in Washington.

The two sides recognized and agreed to cooperate on expanding the unique role of science and technology in Indo-US relations. They agreed to set up an Indo-US Standing Science & Technology Joint Commission.

A Joint Statement to this effect was issued on March 2, 2006 during a visit by President Bush to New Delhi. According to the Joint Statement, the Indo-US Standing Science & Technology Joint Commission will provide a framework and vigorous public-private partnership aimed at:

- Serving as a bridge for dialogues between the government science and technology agencies in both countries;
- Fostering R&D and scientific exchanges between government, universities, research institutions, and the private sectors;
- Encouraging the joint research and development of fast and medium track S&T projects for commercial products for mutual benefit of both countries;
- Encouraging commercialization of new technologies and identifying and reducing regulatory and bureaucratic barriers in both countries;
- Overseeing Indo-US Cooperation in Science and Technology implemented through existing and emerging arrangements, including the Indo US S&T Forum and the Bi-national S&T Endowment Fund.

About 15 energy-related cooperative research programs with heavy DOE engagement have been or are underway with Government of India counterparts. A few examples of a robust portfolio include:

- DOE's National Renewable Energy Laboratory is working with Indian counterparts to evaluate and possibly install a renewable-based hybrid power system in the Bay of Mumbai.
- The Cooperative Technology Implementation Plan for India promotes the diffusion of clean energy technologies. CTIP India works with the

government to promote policies and financial pipelines to create an enabling environment for private investment. CTIP India works with communities to identify how the revenue stream from mini-hydropower can contribute to other water management projects.

- A power generation partnership with DOE's National Energy Technology Laboratory is working to advance research and development of clean and efficient power generation.

The **Renewable Energy and Energy Efficiency Partnership** (REEEP) is a multi-stakeholder partnership whose goal is to expand the global market for renewable energy and energy-efficiency technologies by structuring policy and regulatory initiatives for clean energy and facilitating financing for energy projects. To further REEEP's agenda, the United States has been especially active in developing best practices for financing energy efficiency and renewable energy projects and an open network of affiliated organizations for distributed peer production of models and tools for energy smart community planning and development.

To date, REEEP has funded over 100 projects in 44 countries that address market barriers to clean energy in the developing world and economies in transition. These projects provide new business models, policy recommendations, risk mitigation instruments, handbooks, and databases for advancing renewable energy and energy efficiency, in addition to delivering measurable greenhouse gas reductions.

M2M

Launched in 2004, the Methane to Markets Partnership is a multilateral initiative that promotes energy security, improves environmental quality, and reduces greenhouse gas emissions throughout the world. The Partnership consists of 21 Partners (including India) with the European Commission as the most recent partner to join the group. In addition, over 600 private-sector and other government and civil society organizations participate in the Partnership through the Project Network.

Capturing and using "waste" methane provides an additional energy source that stimulates economic growth while reducing global emissions of this powerful greenhouse gas. EPA estimates that this Partnership could recover up to 500-billion cubic feet of natural gas (183 million metric tons of carbon dioxide equivalent) annually by 2015.

IPHE

The International Partnership for the Hydrogen Economy (IPHE), initiated in 2003 by the Secretary of Energy, provides a mechanism to coordinate multinational research, development and deployment programs that advance the transition to a global hydrogen economy. The United States hosted the first Ministerial meeting of the IPHE and the Partnership's 16 countries (including India) and the European Commission are working together to advance research, development, and deployment of hydrogen and fuel-cell technologies, and develop common codes and standards for hydrogen use. The IPHE Steering Committee has officially recognized 30 collaborative projects that advance the group's goals. In addition, IPHE is working on common goals for hydrogen and fuel cell technologies and the technical objectives that support these goals.

CSLF

The United States hosted the first meeting of the Carbon Sequestration Leadership Forum (CSLF) in Virginia, in June 2003. The CSLF is focused on the development of improved cost-effective technologies for the separation and capture of carbon dioxide for its transport and long-term storage. CSLF membership has grown to 21 governments (including India) and the European Community since 2003. Policy and Technical committees and six task forces covering risk assessment, storage capacity estimation, projects interaction and review, legal issues, capacity building in emerging economies, and financial issues have been established to advance the work of the partnership.

Recent accomplishments include the release of a CSLF, Technology Roadmap, and several task force reports. The CSLF also has jointly sponsored workshops with the G8 and the International Energy Agency, and in May 2007, the CSLF sponsored a capacity building workshop attended by participants from six emerging economy members. To date, 19 collaborative projects have been recognized formally by the CSLF.

The **Global Bioenergy Partnership** (GBEP) was launched at Gleneagles in 2005 by the G-8 plus Brazil, China, India, Mexico and South Africa. GBEP is designed to power a cleaner future by supporting wider, cost-effective biomass and biofuels deployment, particularly in developing countries where biomass use is prevalent. The United States is actively supporting GBEP's work including leading work on developing common methodologies for

measuring the GHG benefits of biofuels. In addition to the United States, GBEP partners include Canada, China, France, Germany, Italy, Japan, Mexico, Russia, the United Kingdom, the Food and Agriculture Organization of the United Nations (FAO), the International Energy Agency, the United Nations Foundation, and the European Biomass Industry Association. The GBEP Secretariat is managed by the FAO.

The **International Biofuels Forum** (IBF), a joint project of Brazil, China, India, South Africa, the United States and the European Commission, was launched on March 2, 2007 to develop strategies to promote the sustained use and production of biofuels around the globe. The forum has created a mechanism to structure the dialogue among some of the biggest producers and consumers of biofuels to address energy security and global warming issues and to use biofuels as an instrument for development.

IBF is working closely with Global Bioenergy Partnership to create common standards and codes for bioenergy products, which should help facilitate world trade.

Thank you for your attention and I look forward to answering any questions you may have.