



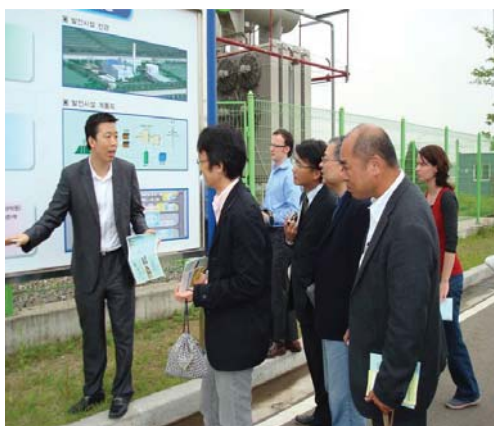
# ASIA-PACIFIC PARTNERSHIP On Clean Development and Climate



## RENEWABLE ENERGY AND DISTRIBUTED GENERATION TASK FORCE OVERVIEW



## OVERVIEW



*Top: Installation of photovoltaic solar cells in rural India as part of an APP project.*

*Middle: Partners are working together to advance new and existing renewable energy technologies, such as this solar system in Australia*

*Bottom: APP members participate in a Renewable Energy and Distributed Generation Task Force site visit in Seoul, Korea.*

The Asia-Pacific Partnership on Clean Development and Climate (APP) brings together the governments and private sectors of Australia, Canada, China, India, Japan, Korea, and the United States in an innovative effort to promote and create an enabling environment for the development, diffusion, deployment and transfer of existing and emerging cost-effective, cleaner technologies and practices, through concrete and substantial cooperation so as to achieve practical results. The Partners also cooperate on the development, diffusion, deployment, and transfer of longer-term transformational energy technologies that promote economic growth while enabling significant reductions in greenhouse gas intensities. In addition, the Partners will share experiences in developing and implementing our national sustainable development and energy strategies, and explore opportunities to reduce the greenhouse gas intensities of Partner economies.

The APP leverages the expertise of public and private partners in five key energy-intensive sectors – aluminum, buildings and appliances, cement, coal mining, and steel – and three energy supply sectors – cleaner fossil energy, power generation and transmission, and renewable energy and distributed generation. Together, APP partners are promoting a cleaner energy future by identifying and taking advantage of opportunities for international collaboration to commercialize and deploy cleaner technologies, particularly in Partners China and India.

APP Partner Countries account for more than half of the world's economy, population and energy use.

## RENEWABLE ENERGY AND DISTRIBUTED GENERATION TASK FORCE

Renewable energy technologies, such as hydro (large and small), solar, geothermal, wind and tidal can deliver power with virtually zero emissions. Distributed generation (including landfill waste methane-based generation) also has the potential to significantly reduce emissions and promote greater cost savings and network efficiencies. Advances in technology design, system planning and grid operations demonstrate the financial viability of distributed utility applications.

The emerging nature of many renewable energy technologies means that there can be market and technical impediments to their uptake, such as cost-competitiveness, lack of awareness of technology options, intermittency and the need for electricity storage. The Task Force recognizes, and will complement, work that is currently being undertaken by many members of the Partnership and the broader international community to address these barriers and to increase the wide-scale uptake of renewable energy. A particularly important role for the Task Force is to identify barriers to technology transfer and financing associated with the deployment of renewable energy and distributed generation technologies. The Task Force will focus on the most promising and cost-competitive technologies and applications both on- and off-grid.

# ASIA-PACIFIC PARTNERSHIP

## On Clean Development and Climate

### **Representative Renewable Energy and Distributed Generation Task Force (REDGTF) activities include:**

#### ***Building Critical Mass for Ultra-High Efficiency Solar Power Stations***

This project aims to deploy 1GW of power station-related technology across Australia, China and the United States, all utilizing breakthrough photovoltaic concentrators producing ultra-high efficiencies that will enable power production for less than 1/6th the cost of current solar power.

#### ***APP Mega Solar Project***

This project aims to install megawatt scale (MW) solar PV units at a number of locations across Korea through a series of financed, managed, and delivered projects. APP Partners will leverage their presence and experience to contribute to the Partnership's goal of accelerating uptake of renewable energy and distributed generation and assist in technology transfer and to accelerate development. The project is scalable from 10MW to 100MW over a multiyear period. As a distributed generator this solar project will bring value to the electricity network and local economy, in addition to the valuable technology transfer. The project aspires to generate 120GWh/year of clean electricity, power 20,000 homes, avoid 120,000 tonnes of CO<sub>2</sub>/year and 25MW of network peak upgrades, and create new skilled installation and manufacturing jobs.

#### ***Identification of High-Prospect Geothermal Energy Projects in China***

This project will focus on the identification of highly prospective geothermal

energy projects in China. The emphasis is on geothermal prospects in the non-volcanic regions that comprise the bulk of China. The primary goal of the proposed co-operative project is to produce a portfolio of high prospect geothermal projects that are ranked in terms of profitability, risk and "do-ability." Partners have worked together to collect data during site visits that was used in the construction of a Geothermal Characterization GIS database.

#### ***Feasibility Study and Development of Smart Energy Solution Using Various Renewable Energies***

This study on the development of independent electricity supply systems will facilitate the integration of electric Distributed Generators (DG) into smart energy solutions to select regions in Partner countries. This will allow several different DGs to be operated as a microgrid that can optimally balance the supply and demand of energy, including electric power and heat, while exchanging information and operating in harmony with the existing utility infrastructure.

#### ***Demonstration of Solar-Enhanced Fuels for Electricity and Transport Applications***

This project aims to demonstrate improved cost-effectiveness of solar technology by using concentrated solar energy in a new "solarization" process to reform natural gas with steam and CO<sub>2</sub> to produce syngas, which can feed a gas turbine. This project will build on work already conducted by APP Partners that will ultimately develop new reactors and catalysts able to use CO<sub>2</sub> as a reactant,

thus making use of the waste stream and minimizing water use. By demonstrating the complete process of solar energy in a working environment this project expects to launch the process of construction of one or more successive plants. A 200kW reformer reactor has been installed onto a solar tower in Newcastle, Australia and reactor tests are underway and subsequent additions to gas processing will allow for operation of a fully functioning facility. Construction and commissioning of a bench scale rotary reactor has been completed and planning for the installation of this reactor onto the tower is underway.

#### ***New generation small wind turbines for remote power systems and grid connection***

In this collaborative activity, APP Partners are researching and developing economically viable, reliable small wind turbines for remote power systems located away from the electricity grid as well as for connection into the grid. The project will study small wind turbine operation in a wide range of situations, with the goals of improving design, developing safety methodologies and reducing system costs. The main components for the five demonstration turbines have been completed and the first unit installed. Currently, testing is underway to validate and refine the controller algorithms, measure the quality of the output power, and to validate whether the turbines conform to the relevant standards.

### ***Accelerating the Deployment of “Smart Minigrids” in APP Countries***

This project will help to develop technologies for the reliable and efficient operation of minigrids, and seek to prove the technical feasibility, commercial viability and ability to efficiently integrate renewable energy. Participating Partners have completed technical studies as well as the scope and design of a pilot smart minigrid.

### ***Collaborative Development and Demonstration of an Optimized Model for Remote Village Electrification Using Renewable Energy***

This project aims to develop and demonstrate a highly replicable model for remote village electrification in India, using solar PV and other technologies. In doing so, Partner countries plan to build capacity within India’s renewable energy tech-

nical service provider network, improve the technical support for, and increase the sustainability of decentralized generation and renewable energy systems. The community renewable energy systems model will demonstrate the reduction of GHG emissions through offsetting and potentially eliminating the need for conventional liquid petroleum fuels in a number of remote communities. The model will be implemented in three rural villages in India, resulting in electricity provision for up to 1,200 people. Field work to support a renewable energy system in the areas has begun, and system installations are slated to begin in early 2010.

### ***Co-operation Research for Long Term Reliability of PV Modules in India and Japan***

The goal of this project is the development of anti-degradable PV modules

which can perform under the harsh environmental conditions of India and Japan. By researching how to fabricate PV modules more adapted to India’s climate, this project will aid the deployment of renewable energy in India. This project will produce a detailed report on the process of field degradation of PV modules, determine methods and processes of producing an anti-degradable PV module, and will produce a report containing the data of environmental parameters of India and Japan.

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## **CURRENT RENEWABLE ENERGY AND DISTRIBUTED GENERATION TASK FORCE PROJECTS**

Building Critical Mass for Ultra High Efficiency Solar Power Stations ■ APP Mega Solar Project ■ Deploy CHP Systems in China That Utilize Coke Oven Gas for Fuel Feedstock ■ Facilitate Deployment of Highly Efficient CHP Applications, Including Fossil and Biomass Fueled Industrial, Institutional and District Energy CHP Projects in Partner Countries ■ Identification of High Prospect Geothermal Energy Projects in China ■ Analysis of Regulatory Barriers to Renewable Energy Uptake in Partnership Developing Countries ■ Creating an Enabling Framework for Re-Deployment in the Partnership ■ Quality Renewable Energy Training in China and India ■ International Scholarships for Photovoltaics and Solar Energy Engineering at University of New South Wales



*For more information on these projects and the Renewable Energy and Distributed Generation Task Force, please visit:*

[www.asiapacificpartnership.org](http://www.asiapacificpartnership.org)