

**REPORT OF THE CHAIR OF THE APEC EXPERTS GROUP ON  
NEW & RENEWABLE ENERGY TECHNOLOGIES (EGNRET)  
TO THE 28<sup>th</sup> APEC ENERGY WORKING GROUP (EWG) MEETING  
port douglas, Australia, november 1-5, 2004**

**1. EGNRET ACTIVITIES SINCE EWG 27**

The 22<sup>ed</sup> meeting of the Expert Group on New and Renewable Energy Technologies (EGNRET) was held on May 12-13, 2004 in Honolulu, Hawaii, USA. The meeting was chaired by Cary Bloyd of the U.S. Department of Energy's Argonne National Laboratory. Delegates from Australia, China, Indonesia, Japan, Korea, Mexico, New Zealand, Philippines, Chinese Taipei, Thailand, and the United States of America participated in the meeting.

The meeting followed the workshop "APEC 21st Century Renewable Energy Development Initiative (Collaborative VI): Workshop on Advances in Electricity Storage in Support of Distributed Renewable Energy Based Systems (EWG 07/2003)" which was held May 10-12, 2004, at the same venue. Following the EGNRET meeting, on May 14<sup>th</sup>, the US hosted a workshop on renewable energy financing, whose purpose was to provide input to the EWG on ways to increase financing for renewable energy projects and programs in APEC economies. This workshop was held to help fulfill the APEC Leaders' directive to the EWG regarding the development of markets for renewable energy technologies as a key component of the Energy Security Initiative Action Plan.

As part of EGNRET outreach activities, Cary Bloyd represented EGNRET at the two APEC events. The first was the "APEC Energy Security Initiative: Hydrogen Interim Framework Document Workshop", held in Hawaii, USA, March 29-31, 2004. The Interim Framework Document produced by this workshop was reviewed by EWG representatives and then submitted to the APEC Energy Ministers at their meeting last June in the Philippines. Mr. Bloyd also attended the "APERC 2004 Energy Outlook Workshop" held September 15-17, 2004 in Tokyo, Japan. At this meeting, Mr. Bloyd made two presentations, one was an overview of new and renewable energy activities in the APEC region and the other was on modeling new and renewable technologies.

Two EGNRET project proposals for funding in 2005 were presented to EWG 27, and put forwarded to the BMC for APEC support.

- APEC 21<sup>st</sup> Century Renewable Energy Development Initiative (Collaborative IV): Adoption of Renewable Energy Standards Phase II Final Groundwork

Status: This project was accepted for TILF funding after revision, and will begin in January

2005.

- APEC 21<sup>st</sup> Century Renewable Energy Development Initiative (Collaborative VI): Handbook for Developing City/State Hydrogen and Fuel Cell Programs in APEC Member Economies.

Status: This project was to be supported by the APEC operational account and discussions are still underway concerning its potential implementation.

The 23<sup>rd</sup> meeting of the EGNRET has been scheduled for November 10-12, 2004 in Christchurch, New Zealand.

## **2. UPDATE ON CURRENT EGNRET PROJECTS**

### **Australia: APEC 21st Century Renewable Energy Development Initiative (Collaborative III): Implementation of a System for Accrediting Renewable Energy Training (Self funded).**

This project was completed, and a final report was submitted in June 2004. This project reviewed key competencies across high priority renewable energy training requirements, listed the high-priority renewable energy training courses and resources currently available within the APEC region and discussed the approaches needed to obtain agreement from existing training institutes. It then developed recommendations for implementing a renewable energy training system within APEC. This project was a follow-up project for “APEC 21<sup>st</sup> Century Renewable Energy Development Initiative (Collaborative III): Training and Accreditation Needs and Capability Study”.

### **New Zealand: APEC 21st Century Renewable Energy Development Initiative (Collaborative VIII): Building and Developing an APEC Renewable-Energy Collaboratives Projects Integrator (APEC-CPI) (EWG 02/2003T)**

The goal of this project is to build and develop an APEC Collaboratives Projects Integrator (APEC-CPI) that will create an on-line market place to remove the barriers and impediments to financing, developing, commercializing and implementing renewable-energy technology projects and facilitate trade and investment in renewable energy in the APEC region. The project implementer asked EGNRET and EWG members to provide information on economy specific projects, developers, renewable energy consultants, and associated reports that can be added to the website. The website was officially released at the EGNRET-22 meeting held last May in Hawaii. The web address is: <http://www.apec-cpi.com>

### **USA: Monitoring and Assessing the Design, Operation and Performance of an**

### **Ocean Thermal Energy Conversion (OTEC) Project (Self-funded)**

The purpose of this project is to monitor and assess the design, operation and performance of an ocean thermal energy conversion (OTEC) project proposed for implementation in an APEC-member economy. The land-based OTEC design will be capable of producing both electricity and desalinated water on a large scale, using only solar energy from the tropical ocean. Valuable by-products, such as fish, vegetables and industrial gases offer additional potential opportunities. Discussions are underway with an APEC economy to begin implementation of an OTEC system by late-2004. The project developer has obtained funds to implement one or more 10MW OTEC systems in an APEC member economy. All that is needed from the host economy is to sign a contract to purchase the resulting water and electricity at current competitive market rates.

### **USA: APEC 21st Century Renewable Energy Development Initiative (Collaborative I): APEC Clean Energy/Village Power Private Sector Forum (Self funded)**

This project has been postponed due to funding considerations. The potential rescheduling of the project will be discussed at the EGNRET 23 meeting this year in New Zealand.

### **USA: APEC 21st Century Renewable Energy Development Initiative (Collaborative VIII): Demonstration of the feasibility of operating a renewables-related energy-service company (RESCO) in the hydro-electric field. (Self-funded).**

This project is intended to demonstrate the feasibility of operating a renewables-related energy-services company (RESCO) in the hydro-electric field. Specifically, this project is to identify and prioritize hydro-power generation facilities possessing optimization project opportunities in APEC-member economies. Power generation optimization projects are defined as the modification of, or addition to, power generating equipment in existing facilities. Through the implementation of these power generation facility optimization projects, "latent capacity" is released from the existing power infrastructure without the need for new or greenfield power generation development. This release of "latent capacity" provides for additional power in a given locale with a lower cost and environmental impact per megawatt of capacity. An initial identification of existing hydro-facilities in APEC member economies has been completed an orientation meeting was held in Mexico in late October 2002. As a follow-up activity, a return trip to Mexico to visit potential project sites is planned for late 2004 or early 2005.

### **USA: APEC 21st Century Renewable Energy Development Initiative (Collaborative VI): Workshop on advances in electricity storage in support of distributed renewable energy based systems (EWG 07/2003)**

The purpose of this workshop was to present APEC representative with a review of recent advances in electricity storage as it supports the development of distributed renewable

energy based systems. This workshop directly addressed the growing need of energy planners to understand the costs and benefits of coupling advanced energy storage systems with distributed renewable energy systems. This workshop was held in Hawaii, USA, in May 10-12, 2004. The workshop proceedings are currently underdevelopment.

**USA: APEC 21st Century Renewable Energy Development Initiative (Collaborative I): Technical Workshop to Support Village Power Applications (EWG 04/2003)**

In many cases village electrification in the developing world is conducted solely through the use of grid extension and remote diesel electrification. Although these are both viable methods to supply energy to remote areas, the use of new and renewable energy sources can provide electrification at lower cost in many instances, and will meet sustainable development and local economic development goals. Sustainable rural electrification must consider community structure, local resources, micro-enterprise and gender issues. Currently there is a lack of technical expertise to determine least expensive technical options, as well as a lack of sociological understanding. The workshop will address these topics and provide a means for communication between individuals and organizations addressing village powder issues in the Asia-Pacific region. The workshop will be held November 8-10, 2004 in Christchurch, New Zealand, just prior to EGNRET 23.

**3. NEW EGNRET PROJECTS.**

Of the five EGNRET projects were submitted to the EWG for funding under the operational account in 2004 and two project under the TILF account, one TILF account project was selected for funding in 2004.

**APEC 21<sup>st</sup> Century Renewable Energy Development Initiative (Collaborative VI): Development of a Sourcebook of Hydrogen Codes and Standards for APEC Member Economies (USA)**

The goal of this project is to develop an information source, *The Sourcebook for Hydrogen Applications*, which captures the hydrogen and fuel cell experience of APEC members including safety, codes and standards. This document will serve as a baseline from which the future discussions of harmonization of standards can take place. The project RFP was released in early January 2004, with a closing date of March 5, 2004. The implementation of at the project is on schedule, with the fist project deliverable being submitted in August, 2004. The first regional workshop associated with the project has been scheduled for November 22, 2004 in Cueranavaca, Mexico. The workshop is open to all APEC member economies. Those interested should contact the EGNRET Chair (“Cary Bloyd”<bloyd@anl.gov>).

**4. Update on the APEC 21<sup>st</sup> Century Renewable Energy**

## **Development Initiative**

The APEC 21<sup>st</sup> Century Renewable Energy Development Initiative was launched by the United States at the fourth APEC energy ministers meeting in San Diego, California in May 2000, at which time it was endorsed by all of the energy ministers. The purpose of the initiative is to advance the use of renewable energy for sustainable economic development and growth of the APEC region. The initiative addresses the principal objectives of the APEC EWG by fostering a common understanding of regional renewable energy issues, facilitating trade and investment in renewable energy technologies and services, and reducing the environmental impact of the energy sector through applications of renewable energy technologies. It also addresses the APEC energy ministers' recommendations regarding the use of renewable energy for sustainable development and diversification of energy supplies. Furthermore, it addresses, from the perspective of renewable energy technology applications, the six priority economic and technical cooperation areas identified by APEC leaders at their meeting in the Philippines in 1996, relating to developing human capital, fostering safe and efficient capital markets, strengthening economic infrastructure, harnessing technologies of the future, promoting environmentally sustainable growth, and encouraging the growth of small and medium-sized enterprises.

The EGNRET has used this initiative as a base to link its projects together by way of a series of collaborative efforts that specifically address the renewable energy-based needs and issues of individual APEC member economies. Projects developed under the initiative take into consideration renewable energy infrastructure, development needs, training requirements, needs for analysis tools and methods, policy formulation, financing, joint-venture development, and the removal of trade barriers

### *Collaborative I: Stakeholders Dialogues, Outreach Forums, and Symposiums Lead Economy—USA*

Collaborative I links together the various outreach activities of the EGNRET that are associated with bringing renewable energy information to the economic leaders, energy ministers, and energy program implementers. Collaborative I includes the facilitation of stakeholder dialogues, outreach forums, and renewable energy-related symposiums. As part of this collaborative, the first APEC Private Sector Renewable Energy Forum was held in Portland, Oregon, on March 28-29, 2001. A second APEC Private Sector Renewable Energy Forum—APEC Clean Energy and Village Power Business Development Forum—was initially planned for early 2004, but has been postponed due to budget considerations.

Collaborative I also includes the APEC operational funded project, APEC 21st Century Renewable Energy Development Initiative (Collaborative I): Technical Workshop to Support Village Power Applications (which will be implemented November 8-10, 2004), and the Korea-sponsored New and Renewable Energy Exhibition (which was held in

November 2002 in conjunction with EGNRET 20). At their meeting in China, the EGNRET agreed to jointly produce an annual paper entitled *Background Document and Vision on the Use and Benefits of Renewable Energy in the APEC Region*. This paper is meant to provide a concise briefing for the EWG on recent trends and successes in the area of new and renewable energy technologies. \_The collaborative links together the various outreach activities of the Expert Group on New and Renewable Energy Technologies, which are associated with bringing renewable energy information to economic leaders, energy ministers, and their staffs. The collaborative will include the facilitation of stakeholder dialogues, outreach forums, and renewable energy-related symposiums.

*Collaborative II: Micro-Business Development  
Lead Economy—USA*

Collaborative II fosters the development of micro-enterprise activity in rural and remote regions of APEC economies, using renewable energy as the electricity source. The collaborative uses technical and business expertise within specific APEC economies to identify viable micro-enterprise activities that create income-generating opportunities and raise the standard of living of rural populations. Some of the Collaborative II projects undertaken in specific communities will be self-replicating in other communities. The purpose of this collaborative is not to demonstrate renewable energy technologies; rather, it is to demonstrate rural development opportunities with renewables as a primary energy source. Under this initiative, the EGNRET implemented the “Greenstar Micro-Enterprise Project Combining Solar Power and Internet Connectivity for Sustainable Development”. Future activities under Collaborative II include the production of the *APEC Business Development Guide for Micro-Enterprise*. In support of Collaborative II, a paper entitled *Renewable Energy for Microenterprise*, developed by the National Renewable Energy Laboratory, will be distributed to EGNRET representatives. In addition, a session on productive uses of renewable energy is being included in the APEC Village Power Workshop being held November 8-10, 2004 in Christchurch, New Zealand.

*Collaborative III: Renewable Energy Training and Certification Network  
Lead Economy—Australia*

Collaborative III involves the identification of currently available renewable energy training and certification systems within member economies; an assessment of the needs of member economies for qualified staff to plan, design, install, operate, and maintain renewable energy systems; an assessment of the gap between currently available training and current needs; and an assessment of how training resources may be allocated to better meet the needs of member countries.

The second project implemented under this collaborative was “Development and Implementation of a System for Accrediting Renewable Energy Training”. This project was self-funded by Australia, with the final report being submitted in June 2004. It

was developed in response to a need identified during the previous APEC-funded project, “Training and Accreditation Needs and Capabilities Study” (EWG04/2002), and seeks to develop and recommend a system for accrediting renewable energy training within the APEC region. The key output will be a report that identifies and describes high-priority renewable energy training courses and resources which are currently available, develops key competencies across high-priority renewable energy training courses and resources, recommends an approach for gaining relevant training provider institution agreement to implement accreditation, and recommends an approach for implementing a renewable energy training system within the APEC region.

*Collaborative IV: Renewable Energy Standards*  
*Lead Economy—China*

The objectives of this collaborative are to (1) review and document available standards for renewable energy systems for (a) off-grid applications, including mini-grids and stand-alone systems, and (b) grid-interactive applications; (2) categorize according to types of standards (e.g., components, systems, interconnections, safety); and (3) prepare harmonized/synthesized proposed standards for APEC economies. Collaborative IV includes a TILF-funded project entitled Adoption of Renewable Energy Standards. A follow-up project was proposed to the EWG. The project was accepted for funding and will begin in January, 2005. The project is entitled “APEC 21st Century Renewable Energy Development Initiative (Collaborative IV): Adoption of Renewable Energy Standards Phase II—Final Groundwork”. The ultimate purpose of this collaborative is to reduce trade barriers within the APEC region for renewable energy technologies and services by working towards a harmonized set of standards.

*Collaborative V: Distributed Energy Resources*  
*Lead Economy—New Zealand*

Collaborative V provides the means to move local distributed energy resources know-how within an APEC economy to collective information accessible by all participating APEC economies and promote standardization of distributed energy resources practices across commercial, political, environmental, and social operations and regions. New Zealand has already held a series of seminars around the country, promoting stakeholder interest and participation in this collaborative.

A workshop on distributed generation, distribution, and efficiency was recently held in Mexico City in 2002 to further develop an action plan for this collaborative. The recommendations from the workshop were designated as the five working areas of this collaborative. It is expected that the two projects under Collaboratives VI and VIII including “APEC 21st Century Renewable Energy Development Initiative (Collaborative VI): Workshop on Advances in Electricity Storage in Support of Distributed Renewable

Energy Based Systems” and “APEC 21st Century Renewable Energy Development Initiative (Collaborative VIII): Building and Developing an APEC Renewable Energy Collaboratives Projects Integrator (APEC-CPI)”, will also promote distributed generation technologies in the APEC region. Both of these projects were completed in 2004.

Follow-up activities on this collaborative based on the recently completed projects will be discussed at the next EGNRET meeting.

*Collaborative VI: Renewable Energy Technology Applications  
Lead Economy—USA*

The objective of Collaborative VI is to identify and demonstrate potential applications of renewable energy technologies in the APEC region. Suggested project areas included hybrid renewable systems for schools in rural areas, renewable energy technology parks, and best practices for biomass applications. Collaborative VI also aims to set up a database on renewable energy technology applications and best practices, and to hold workshops for information exchanges. A self-funded project, entitled Monitoring and Assessing the Design, Operation and Performance of an Ocean Thermal Energy Conversion (OTEC) Project, is being undertaken as part of this collaborative and is expected to be implemented in last 2004 or early 2005. There was also an APEC operational account project which was implemented in May of 2004 as part of this collaborative entitled APEC 21<sup>st</sup> Century Renewable Energy Development Initiative (Collaborative VI): Workshop on Advances in Electricity Storage in Support of Distributed Renewable Energy-Based Systems. This project has crosscutting links to several of the APEC 21<sup>st</sup> Century Collaboratives.

The most recent project approved under Collaborative VI is “APEC 21st Century Renewable Energy Development Initiative (Collaborative VI): Development of a Sourcebook of Hydrogen Codes and Standards for APEC member economies”. The goal of this project is to develop an information source, *The Sourcebook for Hydrogen Applications*, which captures the hydrogen and fuel cell experience of APEC members, including safety, codes, and standards, to serve as a baseline from which the future discussions of harmonization of standards can take place. Implementation of this project began in 2004 and is on schedule.

A project entitled “APEC 21st Century Renewable Energy Development Initiative (Collaborative VI): Workshop on Advances in Clean Transportation Fuels” has been proposed for future funding. The purpose of this project is to present APEC representatives with a review of recent advances in clean transportation fuels. This project will directly address the request of the EWG to the EGNRET to examine the implications of clean transportation fuels on APEC member economy energy security.

*Collaborative VII: Web-Based Renewable Energy Information Dissemination*

*Lead Economy—New Zealand*

Collaborative VII aims to provide news and information to a wide range of targets within APEC economies on a range of renewable energy applications. This information will validate the feasible applications of renewable energy technologies and provide complete “how-when-where” information for interested parties. A major activity of the collaborative is the 2003 TILF-funded project “APEC 21<sup>st</sup> Century Renewable Energy Development Initiative (Collaborative VIII): Building and Developing an APEC Renewable Energy Collaboratives Projects Integrator (APEC-CPI)”. This project links those of the financing collaborative with project identification and information sharing (<http://www.apec-cpi.com>). This project was completed in 2004 and the web site was officially announced at EGNRET 22 in May of 2004.

*Collaborative VIII: Financing  
Lead Economy—Mexico*

The objective of Collaborative VIII is to provide a roadmap in the form of a set of guides, tools, and databases available through a website that will facilitate financing of renewable energy projects in the APEC region through existing international commercial and multilateral financing mechanisms. Mexico has developed a work plan that was accepted by the EGNRET. The concepts presented in the work plan are being integrated into a web-based system that would include four portals: (1) a financing portal that would list lenders and their requirements and application forms, etc.; (2) a portal containing potential renewables-based projects, in specified format; (3) a portal containing tools for financial analyses; and (4) a portal listing available expertise to perform financial and other analyses and implement potential projects. The principal project under this collaborative is an APEC funded activity led by Mexico, entitled “APEC 21<sup>st</sup> Century Renewable Energy Development Initiative (Collaborative VIII): Financial Roadmap for the APEC Region”. The final report was completed in early February 2004. The project provided major input the Renewable Energy Financing Workshop held in Hawaii in May of 2004. Future activities will be discussed at the next EGNRET meeting. Financing is also a session theme at the APEC Village Power Technical Workshop be held in Christchurch, New Zealand just prior to the next EGNRET meeting in November 2004.