

SUMMARY REPORT OF APEC EWG FINANCING WORKSHOPS

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I. Introduction

In 2003, the Asia Pacific Economic Cooperation (APEC) Leaders committed to work with the private sector and financial institutions to facilitate greater investments in clean and more efficient energy infrastructure and technologies as a key component of the APEC's Action Plan to Enhance Energy Security. To fulfill this directive, the Energy Working Group (EWG) was charged with the responsibility of working with the private sector and financial institutions to identify best practices and develop recommendations to overcome financial barriers to greater investments in this sector.

The EWG was requested to make these recommendations to the Energy Ministers at their June 2004 meeting. As a result, the EWG convened three separate workshops focused on financing energy efficiency, renewable energy, and energy infrastructure projects. Representatives from the EWG, the private sector, financial institutions, NGOs, and government agencies from the region attended each workshop.

This report provides a summary of the three workshop proceedings which stimulated discussions between public and private sector stakeholders on key issues such as, investment needs, barriers, ways to mobilize private capital and reduce investment risks and transaction costs, and mechanisms for public-private partnerships, using the facilities and institutions of the Energy Working Group.

I. A. Energy Efficiency Financing Workshop

The APEC Energy Working Group (EWG) held a workshop in Melbourne, Australia on February 23-24 titled "Financing Energy Efficiency Projects". This Workshop addressed a number of concerns. First, notwithstanding the multiple benefits of these investments, the energy efficiency market in APEC is underdeveloped, and investments are minimal compared to their market potential. Second, public sector investments in energy efficiency projects cannot fully address this funding gap. Private capital investments in energy efficiency projects must be mobilized and investor risk reduced.

Third, closing the gap between energy efficiency projects and financing should be addressed through creative public-private partnerships that tackle issues such as risk, uncertainty and cost. In this regard, the specific characteristics of energy efficiency projects (e.g. smaller scale, different risk profiles, and higher investment hurdles) need to be recognized and effectively addressed.

The participants agreed that energy demand will continue to grow significantly in the APEC region, highlighting the need for considerable investments in energy infrastructure, and an economic and environmental imperative to rationalize energy use through reductions in energy demand and intensity. They recognized that there is significant potential for reducing energy demand through energy efficiency measures, and that this should be a major component of the APEC Energy Working Group's agenda.

Participants also noted the need to reduce dependence on imported energy, reduce the need for investment in new energy sources, and reduce the environmental impacts of energy use, including carbon dioxide emissions. Energy efficiency projects may serve these goals with energy savings covering a significant amount of the costs. Energy efficiency projects also help make industries more competitive by reducing production costs and helping governments reduce their annual operating costs.

Despite these benefits, comparatively little financing is taking place in the APEC region. Under current market conditions, there are substantial barriers that stand between financing and the deployment of energy efficiency technologies (the project-finance gap). Some are common to all small-scale projects, while others appear somewhat unique to energy efficiency.

To address these concerns, the participants recommended that public-private partnerships be developed to design and implement market-based solutions. They also recommended that government initiatives involve a holistic, multi-sectoral approach that encompasses policy drivers, financial products and effective incentives to facilitate private sector financing. Experience has shown that approaches that are ad hoc, piecemeal, and not commercially viable fail to adequately address the project-finance gap.

I. B. Energy Infrastructure Workshop

The Financing Energy Infrastructure Workshop, an initiative of the EWG Business Network (EBN), was held in Hong Kong, on March 19, 2004 in recognition that APEC economies face significant challenges in mobilizing private capital and international financial resources to fund the estimated \$US 3.4 trillion to \$US 4.4 trillion in energy infrastructure investments required over the next 20 years.

As a first step towards addressing barriers to investment, this Workshop sought to enhance understanding of future investment needs in the region and facilitate linkages between government officials, financial sector representatives and energy business representatives. In doing so, the Workshop also responded to the direction given by APEC Energy Ministers, at their meeting in July 2002, to “explore mechanisms for working more closely with financial institutions to facilitate infrastructure development within the region.”

The Workshop identified key risk areas affecting investments and discussed ways in which to reduce the risk profiles of projects in order to lower the costs of capital and lower tariffs for project beneficiaries. The participants recognized the vital role that government policies and programs can play in rationalizing and mitigating risks associated with private investments, creating an attractive investment climate and providing market and political stability.

I. C. Renewable Energy Financing and Investment Workshop

On May 14, 2004 the *Renewable Energy Financing and Investment* Workshop was held in Honolulu, Hawaii in conjunction with the Expert Group on New and Renewable Energy Technology, (EGNRET) meeting May 12-13. The workshop built upon the previous projects undertaken by the EGNRET related to project finance and best practices in the areas of both on-grid and off-grid renewable energy systems.

The purpose of the *Renewable Energy Financing and Investment* Workshop was to identify ways to increase financing for renewable energy projects and programs in APEC countries. The participants identified three major barriers to financing renewable energy projects: costs and pricing, uncertainty created by government policies and regulations, and lack of capital markets. To address these barriers, the participants recommended that the APEC economies (1) adopt policies, regulations and incentives that could provide a transparent, predictable, non-discriminatory framework to reduce investment costs of renewable energy investments; (2) engage private sector, multilateral and bilateral financial institutions to develop financial mechanisms and risk mitigation instruments to increase the rate of return on these investments; and (3) commit to forge public-private partnerships for transactional structures and to provide better access to accurate, timely information upon which capital markets can rely in making investment decisions.

II. Market Assessment

The overall economic growth of the APEC economies is accelerating at a rapid pace, from about \$12.5 trillion in 1990 to a projected \$32 trillion in 2020. The annual average growth rate is 3.5% per annum. China's economy is expected to grow at the fastest rate of 7.2%, followed by Russia at 5.2%. Economic growth in Latin America will be driven by strong investments from Europe and the US. North America's economy is expected to grow at 3.2% per year, with South East Asia's economy expected to be about 4.9% per year. Total population is expected to increase from 2.5 billion in 1990 to 3 billion in 2020, with an annual growth rate of 0.8%. China will continue to account for half the total population in the region followed by Southeast Asia. Population growth in Latin America is estimated at 1.5% per annum and declining growth rates are projected for Russia.

Projected increases in living standards and population are among the main drivers of future electricity consumption in developing APEC economies. Energy demand is expected to increase from 3.6 Billion tons of oil equivalent (Btoe) in 1999 to 6 Btoe in 2020, with an annual average growth rate estimated at 2.5% per annum. North America accounts for 44% of final energy demand in 1999 but its share is projected to decline to 38% by 2020 due to strong economic expansion in China and Southeast Asia. Fossil fuel, including oil (36%), coal (27%), and natural gas (22%), is projected to comprise the bulk of the APEC primary energy supply. This will include increased oil import dependency from 36% in 1999 to 54% in 2020, most of which is expected to be sourced from the Middle East.

New and renewable energy (excluding hydro) is expected to grow at 1.1% and its share is expected to fall from 8.4% in 1999 to 6.8% in 2020 due to a shift towards commercial fuels. Wind and solar capacity is projected to increase from 5.2 GW in 1999 to 39.9 GW in 2020, however, even with projected capacity increases at 10% per annum, the total share remains small at 1.2%.

Given this market assessment, investments in cleaner fossil fuels, energy efficiency, and new and renewable energy technologies should be seen as vital to moving APEC economies towards the sustainable energy future that has been endorsed by APEC Leaders and Ministers. The benefits of clean and more efficient infrastructure development are manifold, including increased agricultural production, decreased energy-related health and environmental impacts, local economic development and increased energy security.

II. A. Benefits of Infrastructure Investments

The total gross domestic product in APEC will double by 2020, growing at an average annual rate of 3.5 percent. Demand for energy in the APEC economies is forecast to grow by 60 percent in the same period, at a rate of 2.5 percent each year. In view of such rapid growth in both GDP and energy demand, significant investment in new energy infrastructure and technologies will be required to meet the future energy needs of the region. The APEC economies can benefit from attracting foreign investors and adopting cleaner, more efficient technologies to increase their energy sector's capacity and its infrastructure. Both producing and consuming economies will benefit from assuring that energy infrastructure is sufficient and flexible to meet growing demand. Investments in energy producing economies can enhance efficiencies and market linkages, while increasing environmental protection. Moreover, energy security depends on adequate infrastructure to support all segments of the energy supply chain.

Public funds will not be sufficient to meet the growing demand. There is a critical need for mobilizing private capital for infrastructure development. In this regard, good governance; clear, open, transparent, and predictable rules and procedures; sanctity of contracts; and protection of property rights are important to attract the foreign and private sources of capital, technology and expertise needed to facilitate both modernization and diversification of energy sources in the region.

II. B. Benefits of Energy Efficiency Investments

Given the growing demand for energy and rising costs for fuels, the rational and efficient use of energy is a critical component of an overall energy strategy. Investments in energy efficiency projects can reduce dependence on foreign fuel supplies and reduce import trade balances. Investments in energy efficiency projects can reduce the need for investments in new power generation and, because such investments can pay for themselves through energy savings, they can be implemented without rate hikes or unacceptable increases in energy tariffs.

Energy efficiency projects can be one of the most cost-effective means of reducing energy intensity and environmental impacts, including carbon emissions, in the region.

Energy efficiency projects can add to a nation's competitiveness. In the increasingly global economy, production costs are measured on a global basis. Therefore, energy efficiency investments can make industries more competitive by reducing production costs per unit of output.

As in many countries, national and local governments in the region are dealing with budget constraints that limit their capacity to deliver essential services. Energy efficiency investments in the public sector can result in reduced operating budgets and provide savings that can be used to expand or deliver new services. The common ownership and management of government facilities means that government projects can be more easily bundled for financing. For this reason, the public sector is a primary target for Energy Service Companies (ESCO) in many Western economies.

II. C. Benefits of Renewable Energy

Renewable energy has significant potential to enhance energy security, mitigate global climate change, address regional and local environmental concerns, and reduce poverty by delivering energy services to remote areas and generating income. In order to realize this significant potential, APEC economies are recognizing their critical role in improving the policy and regulatory climate to establish a sustainable, commercially viable market for renewable energy.

Significant reductions in the costs of renewable energy technologies, as well as dramatic improvements in performance and reliability, are making renewable energy projects cost competitive for a variety of grid and off-grid applications today. Reliance on cleaner technologies, like renewable energy, can reduce the high costs of meeting the APEC region's growing infrastructure needs arising from the price volatility of conventional fuels, as well as, can enhance energy security by diversifying the energy mix. Further, the existence and development of locally-based renewable energy resources in many APEC economies can contribute to greater energy independence. In addition, governments are now recognizing that environmental damage can exact high economic and social costs on GDP and national health care systems.

The growing interest on the part of the private sector, multi-lateral lending institutions, and bilateral credit programs in designing funding mechanisms that share and mitigate risks¹ can help to increase the rate of return of renewable energy investments rendering them more cost-effective and even profitable. Also, calculating and monetizing carbon emissions reductions and avoidances can increase the value of and rate of return on renewable energy projects.

¹ Credit risks (i.e., political/country, exchange rate, sponsor) and commercial risks (i.e., resource, technology, operating, revenue, environmental)

Even at the grassroots level, renewable energy is gaining momentum, providing a powerful market stimulus. Consumer support for environmentally-sound energy options (e.g., green pricing and certificate programs occurring in US, Europe and elsewhere) are motivating more engaged responses from governments and the marketplace to renewable energy options.

With embedded production to meet peak demands, renewable energy can offer back-up power to existing systems (though some limitations may be experienced). Renewable energy provides flexibility in energy planning and investment. Renewable energy systems can be sourced close to the load requirement without the need for costly grid extension. Because these systems are modular in nature, they can help meet the demand-supply balance in an incremental manner with shorter construction horizons without the costly, high minimum size requirements of traditional power plants. For off-grid applications, renewable energy is a competitive option for providing energy services in rural, dispersed, or geographically challenging areas, which avoids the otherwise prohibitive costs of grid extension due to distance and access difficulties.

Overall, renewable energy provides local employment and opportunities for income generation. Renewable energy technologies are environmentally beneficial, contributing to improved air quality at global, national, and local levels. Finally, reliance on cleaner technologies, like renewable energy, can help to protect APEC economies from currency exchange risks and balance of payments imbalances.

III. Barriers to Investment in Clean and More Efficient Energy Technology and Infrastructure

Notwithstanding the critical need for changes in the intensity of energy use and for diversity of fuel supply, relatively little investment is taking place in this sector of APEC today. There are a number of common barriers that affect energy efficiency and renewable energy, as well as the necessary infrastructure for cleaner, efficient energy use. Barriers to investment in any sector may be generally characterized as risk, cost and uncertainty. This is also true for the energy sector.

For infrastructure investments, the financial structures necessary for successful deals are fairly well understood. The principal barriers are variables such as the credit quality of the borrower, regulatory uncertainty and the lack of economic and political stability within the host country. These factors may be mitigated by host government efforts to provide greater certainty and stability and to undertake energy sector reforms.

For efficiency and renewable investments, the market structure is less developed. For example, many local investors are unfamiliar with the typical costs and benefits of efficiency and renewable projects. These kinds of projects require financial structures that lenders do not typically use in their traditional programs. As a result, financial models for efficiency and renewable projects have not been widely developed or accepted by the financial community.

Many local project developers and ESCOs in the region lack the necessary experience to package proposals for local investors. Although efficiency and renewable project developers may have strong technical skills, they often lack financing experience and the ability to prepare sound business plans or financial documents. The absence of widely recognized financial structures for these projects compounds the problem. As a result, local banks often will not give these projects serious consideration.

The transaction costs (due diligence, investment structuring) of energy efficiency and small scale renewable projects are high relative to total project costs, even when the original business plan is strong. So, lenders favor larger projects that can more easily carry transaction expenses. Moreover, bankers are generally evaluated on the loan volume they produce annually. Bank incentive structures, therefore, do not reward officers who focus on smaller-scale projects.

On the borrower's side, the risks and transaction costs associated with efficiency and renewable financing can result in high interest rates and short maturity terms. Further, the need for hard currency to purchase foreign goods and services leads to currency risk, which is often borne by the borrower.

Financial investors, borrowers and energy policy-makers may not be fully aware of the costs, benefits, and applications of efficiency and renewable technologies and how they could contribute directly to progress and growth (for example, agriculture, education, health care, clean water supplies, small and medium enterprise development, telecommunications, transport, etc). APEC economies can expand local markets for efficient energy and renewables by engaging other sectors of the economy, as renewable energy provides an "energy input" and energy efficiency provides "savings" that can be turned into assets for further social and economic development.

III. A. Barriers to Infrastructure Projects

In some APEC economies, particularly developing economies, attracting finance for infrastructure projects has proved difficult. Infrastructure projects often encounter barriers related to land use, permits, regulatory approvals, potential cost overruns, labor disputes, rate structures and fiscal and political instability.

The risks associated with permitting and regulatory approval can be compounded by lack of transparency in the regulatory processes of both local and national governments. Project completion risk will be elevated in environments known for high levels of corruption. Operating risks may be exacerbated by difficulty in collecting accounts receivable, strikes and labor disputes, and force majeure.

Although political risk insurance is available from a number of sources, the risk premium will reflect the level of political stability and high premium payments will directly impact on the ultimate financial costs of projects.

Capital markets also need strengthening to expand opportunities for companies in developing economies to finance energy projects. Bonds can provide long-term capital for investment in projects at lower interest rates than bank loans. Bonds can also limit

the amount of energy investment financed by foreign borrowing, reducing the mismatch between domestic currency assets and foreign currency liabilities that contributes to project risk.

III. B. Barriers to Energy Efficiency Projects

Under current market conditions, substantial barriers stand between financing and deployment of proven energy efficiency technologies.

Restrictive lending environments in many countries have resulted in prohibitive lending requirements. For energy efficiency developers and ESCOs, one of the most difficult lending conditions to address is the high collateral requirements imposed by local banks. It is not uncommon for banks to require collateral pledges of 130 – 150% of a loan amount. Most local ESCOs and project developers are thinly capitalized and cannot meet these requirements. Even the most successful ESCOs would rapidly commit assets to projects and soon exhaust their capacity to meet these conditions for lending.

Most local financial institutions lack experience with cash-flow lending, as they prefer balance sheet analysis and financing. Energy efficiency projects basically need a cash flow financing structure where energy savings serve as the collateral. This model is not compatible with balance sheet financing which is generally considered a lower risk lending practice. This factor, among others, gives energy efficiency projects a higher risk profile.

Energy efficiency projects compete for capital with other projects that have lower perceived risk profiles. For example, efficiency technology is less known or trusted than many fossil fuel technologies.

Lack of awareness of the benefits of energy efficiency projects by decision-makers in companies is also a major impediment. Given the many demands made on facility managers and corporate executives, it is difficult to attract their attention to these projects. Without the full support of corporate executives, especially Chief Financial Officers, it is difficult to move a project through a company's decision making process.

One of the key marketing elements of energy efficiency projects is the projected savings that will result from project implementation. However, project beneficiaries and lenders have a lack of confidence in ESCO guarantees. Moreover, lenders are often not confident that a particular ESCO will stay in existence for the life of the efficiency project.

III. C. Barriers to Renewable Energy Projects

Although renewable energy market penetration is increasing in APEC economies, there exist a number of barriers that are hindering more widespread advancement of these technologies.

Continued use of government and utility subsidies for fossil energy can create an uneven playing field making it difficult for renewable energy projects to compete with conventional projects for financing. While some level of subsidization of renewable energy will be necessary to boost market volume, capital cost subsidies and donated equipment undermine markets. Instead, “smart” subsidies should be considered by APEC economies that provide for some level of cost recovery and a stimulus for technology production.

Most renewable energy projects require high up-front development and capital costs, despite their low operation and maintenance costs. This problem is compounded by the high transaction costs relative to the level of financing and the volume incentive structures that banks use.

Renewable energy projects typically need long-term financing to be viable and affordable. The terms of renewable energy financing need to match the time needed to implement the project. Most lending institutions in the region have a relatively short maturity tolerance (5-10 years maximum). While large-scale conventional energy projects may be able to attract longer-term financing from international investors and multilateral lending institutions, smaller scale projects often fall below the necessary project size to access these sources of capital.

Traditional methods of assessing the cost of electricity on a per-kilowatt basis can overestimate the cost of renewable energy-based electricity and underestimate the projected costs of fossil fuel outlays of conventional energy projects. Taking into account environmental externalities, as well as the volatility of fossil fuel sources, can render renewable energy-based electricity more competitive than previously believed. However, most lending institutions do not use more comprehensive valuation methodologies of renewable energy input costs and benefits in their project and program assessments.

In many economies of the region, the regulatory framework for project approval is not harmonized between the national and local levels, leading to extensive and sometimes contradictory project approval procedures. Moreover, complex government review processes often preclude transparent, non-discriminatory, and timely approval of projects.

Although economies in the region are developing and implementing policies and programs more favorable to renewable energy projects, the financial markets need long-term commitments to these policies before they can factor them into a project’s financial analysis.

Policies and pricing mechanisms relating to grid extension/integration issues, including linkages to existing transmission and distribution grids and “dispatchability” of renewable energy technologies are not fully developed in many economies. This will often result in lack of reliability of power purchase agreements between developers and utilities.

Due to a mixed record of experience with deregulation, corporate fraud, and power project failures in recent years, capital markets have been reluctant to take on unfamiliar risks, and have opted for traditional, short-term solutions that discourage investment in renewable energy technologies, given that they are considered new to the market and, in some instances, not familiar to financiers.

IV. General Approach to Addressing Investment Barriers

In each case, the workshop participants recognized that in order to accelerate the market for clean and more efficient energy projects, the regional financial markets must be stimulated and supportive policy and regulatory frameworks put into place. Also, for solutions to be effective, actions need to be tailored to local laws, conditions and needs.

The recommendations developed by the workshop participants reflect three guiding principles:

- First, public/private partnerships are needed to design and implement market-based remedies to these barriers. Neither sector acting alone can fully address this challenge. Public budgets are constrained and private investments have not been effectively mobilized. Over the last decade, private sector investment in the energy sector has been declining in developing country markets, due in large part to the mixed record of deregulation and privatization activities. Funding and support mechanisms need to be locally managed and operated and, where possible, denominated in local currencies to avoid exchange rate costs and risks.
- Second, the public sector’s role should focus on providing effective incentives for private sector investments. Market growth is more responsive to reductions in costs and risks, than to gifts or subsidies. In fact, extending equipment or system donations without some cost recovery can undermine the market. Conditional grant/loan funding and/or the use of “smart subsidies” should be supported initially to build market volume. These funding instruments, however, need to be project-related, time-bound with sunset provisions, and aimed at expanding, not distorting sustainable, commercial markets. The design of clean energy financing mechanisms should focus on pooling and mitigating risks (insurance, guarantees, partial guarantees, etc), lowering transaction and capital costs, and building local institutional and financial capacity.
- Finally, host country initiatives should take a “holistic” approach, combining policy drivers, economic incentives and financial intermediation. Experience has

shown that piecemeal or single focus initiatives have typically failed to effectively open markets for clean and more efficient energy investments. Also, these investments should be considered as critical to the development of other sectors, for example health care, agriculture and education, rather than as stand-alone “energy” projects.

V. Best Practices and Recommendations

V. A. Recommendations for Cleaner and More Efficient Energy Infrastructure Projects

The Energy Infrastructure Workshop identified ten priorities for financing projects:

- *Energy infrastructure projects must be consistent with an economy’s energy security and sustainable development objectives (e.g., strengthening the security and reliability of affordable energy to all, achieving environmental improvement of energy production and use). Government policies in these areas should be specified in sufficient detail to provide clear guidance to project developers and their financiers to facilitate long-term investment and financing decisions.*
- *When establishing or reforming energy market structures, economies should recognize that energy infrastructure can be owned by government or the private sector (domestic and foreign). Privatization is only one means of mobilizing private investments in energy infrastructure. The issuance of revenue bonds by public agencies is a growing means of mobilizing private investment in energy infrastructure.*
- *Economies should establish stable, transparent, independently administered, predictable and non-discriminatory legal, fiscal, regulatory and trade regimes that support the enforceability of project contracts and consider the interests of all participants, including for projects of a cross-border nature. Judicial systems must also be free of political influence or interference in resolving disputes among project development parties or between project sponsors and host country governments. Political influence in the judicial process can have a long-term chilling effect on private investment.*
- *In the longer term, full cost and benefits of energy infrastructure projects should be underpinned by end-user demand for such services and the ability of customers to pay for such services at tariffs that make projects financially viable. Project developers, lenders and host country sponsors should consider financial viability and affordability in their assessments of proposed projects.*
- *Energy infrastructure projects should: a) be well planned and supported by credible demand forecasts; b) be clearly described to potential investors; c) be supported by an open, transparent and competitive bidding process to facilitate participation from a broad range of potential investors (banks, institutional investors, pension funds, multilateral financial institutions); d) have stable,*

transparent, non-discriminatory, timely and administratively efficient project approval processes; and e) have competent and experienced project sponsors..

- *Energy infrastructure project contracts, which are commercial in nature and to be resolved by the negotiating parties, should include provisions to address financial risk, including for inflation, interest rate and foreign exchange rate fluctuations, and investor returns.*
- *Project financiers should have a proven track record in project financing, a capacity for long-term commitment and for communicating with project stakeholders throughout the life of the project, and a willingness and capacity to effectively partner with project developers and share project risk.*
- *The participation of multilateral financial institutions and/or international financial institutions in energy infrastructure projects can enhance their quality, capacity and credit standing through services such as independent analysis and evaluation, risk mitigation, debt provision and credit guarantees.*
- *Project financiers should be able to exercise effective operational and management control of projects with minimal government intervention. Decisions for government intervention, for example, should include consideration of the needs of developers and financiers and the long-term viability of projects.*
- *Economies should permit project financiers to undertake capital transfers and unrestricted repatriation.*

These principles reflect the important role of governments in attracting energy sector investment. To mobilize private capital, good governance, transparency and accountability are vital; as is having sound energy pricing policies, minimizing restrictions on ownership and management and technological choices, and integrating environmental considerations. By providing fair competition, governments can help ensure that the most cost-effective energy projects are financed in competitive markets. Market-based prices can help assure that energy investments take place where they are most needed and economically justified.

V. B. Recommendations for Energy Efficiency Projects

The Energy Efficiency Workshop made the following recommendations to reduce barriers and spur financing for efficient energy products and processes:

Adoption of Supportive Policy Frameworks

Continue, through the Expert Group on Energy Efficiency and Conservation, efforts to harmonize standards, labeling and testing for products including, where appropriate, to work with the APEC Sub-Committee on Standards and Conformance and other relevant regional organizations (e.g. Asia Pacific Laboratory Accreditation Cooperation.)

Another example of policy drivers are government-led procurement practices that can help build demand for efficient products and processes. One example of such a

program is the United States Federal Energy Management Program (FEMP) that has been highly successful at helping to create a market for ESCOs. As the largest energy consumer in the United States and the world, the Federal Government can create tremendous market pull for efficiency projects by promoting efficiency practices at Federal facilities. Federal agencies are required to reduce energy use by 35 % by 2010 in comparison to 1985 levels. This mandate is supported by FEMP programs that help government facility managers procure and contract for energy saving services including the development of standard procurement and contract documents.

Thailand's Energy Conservation Act of 1992 requires large buildings and factories to establish energy efficiency targets, conduct energy audits, and develop implementation plans. This program is tied to a special fund for implementation of projects and has been instrumental in the establishment of the emerging ESCO industry in Thailand.

Support APEC economy efforts to promote awareness raising of energy efficiency and demand-side energy management within the APEC region through the activities of the EWG Expert Groups, APERC, the EWG Business Network and the EWG Pledge and Review Program.

Government incentives can include reduced import duties, subsidies, infrastructure bond schemes, low interest government loans, deductions for feasibility studies, renewable energy certificates, rebates for equipment and tax incentives (e.g. accelerated depreciation). Japan's tax incentives for investments in energy efficiency equipment and facilities have led to a high dissemination of such equipment. As a result, Japan's industrial sector ranks as the highest in the world in terms of energy efficiency improvements.

Mexico's private trust fund for financing electricity savings has successfully co-funded hundreds of projects in the industrial, commercial, and service sectors. In addition, the national agency for the promotion of energy efficiency in Mexico, CONAE, has conducted nearly 1,000 audits of government buildings.

Government programs should be designed to stimulate private sector investments in energy efficiency projects. Well-designed programs can effectively leverage private sector investments with minimal government outlays.

Development of Financial Mechanisms

Invite multilateral financial institutions (e.g. Asian Development Bank, World Bank) to join the EWG Business Network. Many of these institutions are actively seeking to fund energy efficiency projects through a variety of innovative financial mechanisms. Dialogue with the EWG Business Network could provide additional insights relating to developer needs.

Encourage multilateral financial institutions and bilateral credit programs to develop and deploy new financial products to facilitate greater private investments in

energy efficiency projects. This may be accomplished through direct consultations and via the EWG Business Network and EWG Experts Groups.

A number of innovative programs are currently available that could be tailored to stimulate energy efficiency project financing such as, the US Agency for International Development's Development Credit Authority (DCA) program and the Asian Development Bank's (ADB) local currency lending program. The Development Credit Authority provides 50% guarantees to local banks for lending for qualified projects. It has been used to support energy efficiency projects in Eastern Europe but has not been deployed for this purpose in APEC. DCA management would welcome proposals of this kind in the region. The ADB local currency lending program is a new initiative at the bank designed to eliminate currency risk for local projects and to provide longer loan maturities (up to 15 years) than local banks provide.

Assist APEC economy efforts to establish and support financial intermediaries and special purpose vehicles. The purpose of intermediaries is to facilitate energy efficiency project financing through techniques such as local debt mobilization, project aggregation, packaging and streamlining. This may be encouraged through the Implementation Facilitation Assistance Teams and EWG Experts Groups.

Several models exist that could serve as examples for the design of intermediary structures specifically created to close the gap between energy efficiency projects and affordable financing. These examples include bond banks and master leasing programs in the United States and the Australian (NSW) fund.

A financial intermediary or "special purpose entity (SPE)" would focus on the factors creating the project finance gap in local or regional markets and design financial mechanisms and transaction documents to address the problems. In many cases, the SPE would benefit from previous technical capacity building. The SPE could:

- Pool or bundle small-scale projects to raise the profile of the potential investment and lower overall transaction costs;
- Establish standard technical requirements appropriate to the projects; for example, audit documents, energy performance contracts, and performance monitoring and verification protocols;
- Establish standard application procedures, underwriting criteria, tendering documents and lending terms, balancing the interests of both lenders and borrowers;
- Organize credit enhancements for the overall portfolio from the host government, donor organizations or private insurance companies;
- Manage the process of initial project review, project intake, disbursement and repayment.

- Mobilize private capital for qualified projects.
- Disseminate the resolution of financing barriers by disclosing all the standard terms and conditions necessary to qualify for lending or investment.

Support the development of an international “Energy Efficiency Financing Protocol” for application within the APEC region. The Protocol may include standard procedures and documentation, and training on non-asset based financing for financiers, ESCOs and project hosts. These protocols will help establish norms for the financial analysis, structuring and implementation of energy efficiency projects. As such, they provide financial institutions with increased levels of information, clarity and transparency. Standard protocols can also be effective tools for training local commercial lending institutions in the evaluation and structuring of efficiency projects.

Capacity Building and Information Sharing

Produce and disseminate a series of Case Studies to illustrate how APEC economies have sought to facilitate energy efficiency financing (e.g., through the identification of policy drivers, financial programs and intermediation). Case Studies should identify best practices and lessons learned to inform policy and program formulation within APEC economies. Examples of successful and unsuccessful projects in APEC economies would help policy makers design effective programs based on past experience in the region.

Encourage the accreditation and promotion of Energy Service Companies (ESCOs) operating within the APEC region through organizations such as the Pacific Accreditation Cooperation.

V. C. Recommendations for Renewable Energy Projects.

To promote renewable energy financing, the Renewable Energy Financing Workshop recommended the following:

Adoption of Supportive Policy Frameworks:

- *Establish stable, transparent, independently administered, predictable and non-discriminatory legal, fiscal, regulatory and trade regimes that support the enforceability of project contracts and consider the interests of all participants, including those relating to projects of a cross-border nature.*
- *Support policy and regulatory frameworks that stimulate renewable energy investment and market development and promote “best practices,” including incentives structured for sustainability, pricing practices that reflect economic and environmental costs, net metering and policies tailored to different stages of technology development and deployment.*

- *Encourage, through consultation with the Expert Group on New and Renewable Energy Technology (EGNRET), APERC, and the EWG Pledge and Review Program, the adoption of more comprehensive methods of assessing costs of energy projects (e.g., analysis of end-user life-cycle costs, including the valuation of environmental impacts, as opposed to dollars per kilowatt cost) as a basis for developing energy policies and incentives.*
- *Standardize terms of reference for new and renewable energy projects; through the EGNRET, continue to work with APEC economies to harmonize technical standards for renewable energy equipment and products.*
- *Encourage within APEC economies, multi-ministry coordination to assure that renewable energy incentive and financial programs are consistent with other national policies and designed to achieve the purposes intended.*

Development of Financial Mechanisms:

- *Invite representatives of multilateral financial institutions (e.g., Asian Development Bank, International Finance Corporation, Inter-American Development Bank, World Bank) to participate in the EWG Business Network (EBN) and to work closely with the EGNRET to facilitate investment in project development through services such as independent analysis and evaluation, risk mitigation, debt provision to cover payback periods and credit guarantees.*
- *Through direct consultations and via the EGNRET, encourage multilateral financial institutions and bilateral credit programs to increase renewable energy lending by:*
 - *Standardizing procedures and documentation for project assessment and review;*
 - *Integrating renewable energy lending with agricultural, health, housing and other sector lending;*
 - *Incorporating environmental and social factors into the design of financial programs;*
 - *Developing and expanding credit enhancement facilities through export credit agencies (e.g., renewable energy licensing companies, guarantee facilities);*
 - *Designing risk sharing and mitigation instruments to reduce capital and transaction costs.*

Capacity Building and Information-Sharing:

- *Expand the APEC-Collaborative Project Integrator (CPI) and the EWG website to provide information and guidance on best practices and lessons learned, financial programs and intermediation, and policies and incentives within APEC economies. In particular, promote the development of an interactive facility to assist on project identification and assessment, financing sources and partners based on the*

collaborative activities of the EWG's "21st Century Renewable Energy Development Initiative."

- *Use the capabilities of the EGNRET, the APEC-CPI and the EWG website to develop a market facilitation network that will build public-private partnerships between key NGOs, financial representatives, government agencies, and entrepreneurs in order to link private capital to project development.*
- *Using such mechanisms as the Implementation Facilitation Assistance Teams (IFAT) and the Expert Groups, promote and commit resources to the development of pre-feasibility and risk mitigation facilities that provide training and assistance to:*
 - *Local financial institutions to increase lending in local currency and to establish consumer/microcredit facilities; and*
 - *Local entrepreneurs, including on early stage business planning, market assessment and pre-investment support.*
- *Use the capabilities of the EGNRET, EBN, APEC-CPI and the EWG website to increase awareness of and support outreach activities on the costs, benefits and applications of renewable energy systems.*

VI. Conclusion

Through its existing institutions and programs, the APEC Energy Working Group can play a vital role in bringing together governments, the private sector and the financial community to address the project-financing gap that exists within the APEC region through: 1) encouraging public-private partnerships that can design market-based remedies to financing barriers, with a focus on developing locally-managed and operated funding and support mechanisms; 2) promoting effective government incentives for private sector investment; and 3) working with host countries on developing holistic approaches that combine policy drivers, economic incentives and financial intermediation.

APPENDIX A

LIST OF PARTICIPANTS FOR EACH WORKSHOP

[Organize by Financial Community, Private Sector, Public Sector]

APEC Renewable Energy Financing Workshop

May 14, 2004 – Honolulu, Hawaii USA

Financial Sector Participants:

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Ministry for Works & Energy
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Private Sector Participants:

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Rocky Mountain Institute
USA

Dominique Dowding
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APEC-CPI
New Zealand

Mitch Ewan
Hydrogen Systems Program Manager
Hawai'i Natural Energy Institute
University of Hawai'i
USA

Glenn Hamer
First Solar
USA

Lena Hansen
Rocky Mountain Institute
USA

[Similarly, Insert Listings for the Energy Efficiency and Infrastructure Workshops]

APEC 21st Century Renewable Energy Development Initiative

A major activity of the APEC Expert Group on New and Renewable Energy Technologies (EGNRET) is the APEC 21st Century Renewable Energy Development Initiative, which was launched by the United States at the fourth APEC energy ministers meeting in San Diego 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 made during their previous four meetings 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.

Under this initiative, the APEC EGNRET is undertaking 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. The initiative is based on the development of a multi-year work program and a strong commitment to implementation from both developed and developing member economies.

The first major activity of the initiative was the development of the Survey of APEC Member Economies' Renewable Energy-Based Priority Needs and Issues Relating to Sustainable Development. The survey was sent out by EGNRET in December 2000 to all Energy Working Group members, to invite the energy officials of APEC member economies to share their experiences with current renewable applications relating to sustainable development and growth and to identify barriers, issues, and priorities involving these applications. The goal of the survey was to provide information that could help in the design and implementation of collaboratives that effectively respond to APEC member economic priorities.

A second major activity of the initiative was the organization of the APEC Private Sector Renewable Energy Forum in March 2001, in Portland, Oregon. The Forum was attended by over 100 private sector and government representatives from 17 APEC economies. An objective of the forum was to promote extensive private sector involvement in the

identification and implementation of renewable energy projects. A priority activity of the forum was to propose collaborative projects to be implemented in the APEC region. The projects of interest were application-driven in the areas of on-grid, hybrid, or stand-alone systems, such as the use of renewable energy for rural health care, education, or economic development; utilization of wind technologies for grid-connected power; and the use of distributed power in rural electrification. Projects could also be program-based, in such areas as renewable energy financing, regulations, training, and standards.

Based on the results of the survey and the discussions at the Private Sector Forum, eight collaborative projects were agreed upon by EGNRET with certain economies also agreeing to take the lead in developing the collaborative. The eight collaboratives are:

Collaborative I: Stakeholders Dialogues, Outreach Forums, and Symposiums

Lead Economy—USA

Collaborative II: Micro-Business Development

Lead Economy—USA

Collaborative III: Renewable Energy Training and Certification Network

Lead Economy—Australia

Collaborative IV: Renewable Energy Standards

Lead Economy—China

Collaborative V: Distributed Energy Resources

Lead Economy—New Zealand

Collaborative VI: Renewable Energy Technology Applications

Lead Economy—USA

Collaborative VII: Web-Based Renewable Energy Information Dissemination

Lead Economy—New Zealand

Collaborative VIII: Financing

Lead Economy—Mexico

Since the APEC 21st Century Renewable Energy Development Initiative was launched, EGNRET has implemented nine projects under the initiative with two additional projects being put forward by the EWG for funding in 2005. The EGNRET has strived to mold all of its project work to support the initiative. The work undertaken by Mexico in support of the Collaborative VIII on financing is an example of how the work has proceeded. After renewable energy financing was identified by the private sector participants as a priority in 2001, Mexico submitted a proposal for APEC funding which was accepted by the EWG and put forward to the BMC for their support. Mexico then worked with the APEC Secretariat to put the project out for international tenders, and a consultancy from Australia was selected for the project. The final project report was delivered on time and within budget in February 2004. That report, *APEC 21st Century Renewable Energy Development Initiative: (Collaborative VIII): Financial Roadmap for the APEC Region* has formed the basis for much of the work on renewable energy financing being undertaken under the current energy security initiative.

In the future, EGNRET will strive to translate the priorities identified by the Energy Ministers at EM6 into its project work under the Energy Ministers approved APEC 21st Century Renewable Energy Development Initiative.

