

**APPROVED MINUTES OF THE 13TH MEETING OF
APEC EXPERT GROUP ON ENERGY EFFICIENCY & CONSERVATION
October 28-29, 1998
Honolulu, Hawaii, U.S.A.**

The 13th meeting of the APEC Expert Group on Energy Efficiency & Conservation (EE&C) was held in Honolulu, Hawaii, USA on October 28 and 29, 1998. Representatives from Australia; Brunei Darussalam; Canada; Hong Kong, China; Japan; Korea; New Zealand; the Philippines; Chinese Taipei; Singapore; Thailand; and the United States attended. An observer from the South Pacific Forum was present. The Asia-Pacific Energy Research Center (APEREC), the Department of Business, Economic Development and Tourism (DBEDT) of the State of Hawaii, and the Asia-Pacific Development Council also attended. The list of participants is attached.

Wednesday, 28 October 1998

WELCOME and INTRODUCTIONS

Dr. Larry Hill, on behalf of the U.S. Department of Energy, welcomed all participants and thanked the East-West Center for organizing this meeting in Honolulu. Mr. Hill then introduced Mr. Rashid Ibrahim, Chair of EE&C.

The Chair welcomed all delegates to the meeting and asked delegates to introduce themselves. The Chair then announced that the chairmanship will be passed to Mr. Frank Pool of New Zealand following this meeting.

Ms. Helen Arias of the Philippines made a special statement to thank the East-West Center and the U.S. Department of Energy for hosting this meeting. The Philippines had intended to host this meeting if it were not for the current regional economic crisis. Ms. Arias also thanked the Chair for his kind understanding and noted that the Philippines looks forward to hosting a future EE&C meeting.

PROGRAM OVERVIEW AND HIGHLIGHTS

The Chair gave a brief introduction to the meeting's agenda and distributed documents to participants. They include the Declaration by APEC Energy Ministers made at their Third Meeting in Okinawa, Japan on October 9-10, 1998, summary records of the 15th and 16th Energy Working Group meetings, and approved minutes of the 12th Meeting of APEC Energy Efficiency and Conservation Expert Group in Tokyo, Japan on February 16-17, 1998.

Report on EWG 15th and 16th and EWG decisions

The Chair informed the delegates that a review of EWG structure was carried out at the 15th EWG meeting in Ixtapa, Mexico in March 1998. EWG decided that EE&C should discontinue with the gas liaison group. As a result, only the Inter-Utility DSM liaison group and the Energy for Sustainable Communities Liaison Groups remain under EE&C. The Chair also informed the meeting that the names of these groups have been changed. The former is now known as the Expert Sub-Group on Inter-Utility DSM and the latter is now known as the Expert Sub-Group on Energy for Sustainable Communities. Finally, the Chair informed that the work of these sub-groups will be reviewed once every two years.

The Chair emphasized to the delegates that all APEC activities must conform to standard structure and procedures. This includes participation by non-members. These rules must be observed in accordance with existing procedures.

The Chair then informed the delegates that a small committee has to be formed within EE&C to evaluate all projects under its supervision. The actual evaluation work would be done out of session. It was proposed that the Chair of EE&C be a member. In addition, Australia, Korea, Japan, the Philippines, and U.S.A. expressed interest in serving in this committee. An economy sponsoring a project will need to abstain from evaluating its own work.

Energy Efficiency Improvement Initiatives

Mr. Kensuke Saito of Japan thanked the host economy for organizing this meeting and gave a report on the Energy Efficiency Initiatives which were first proposed in Edmonton in 1997 and then reported at the Energy Ministers Meeting in Okinawa in October 1998.

Mr. Saito informed the delegates that the Okinawa meeting was successful. The Energy Ministers encouraged economies to share their experience in energy efficiency and to develop energy indicators for planning. APERC, in particular, would develop energy efficiency indicators for industries and is expected to complete this task by the end of 1999.

Ms. Lilian Fernandez of APERC also informed the delegates that Mr. Bill Mixon's presentation on benchmarking at an APERC-sponsored conference in September 1998 was well received. She encouraged individual member economies to respond to questionnaires sent out by APERC in developing energy efficiency indicators for industry. (Only 8 responses have been received thus far.) Preliminary findings indicated that there are (1) varying levels of efforts and initiatives among economies, (2) variations of data from sources even within an economy, (3) inadequate resources to establish and institutionalize activities on indicators, and (4) varying degrees of energy intensity on sub-sectors.

The Chair asked Japan to identify areas where EE&C could contribute to its initiatives and to present them at the next EE&C meeting.

Ms. Arias inquired how the "pledge and review system" (part of the Energy Efficiency Initiatives) differs from "monitoring and targeting." Australia clarified that the main difference is there are no set quantitative targets in the "pledge and review system" and that it is of a voluntary nature.

REPORT OF EXPERT SUB-GROUPS

U.S.A. reported on the EWG meeting in Cairns, Australia. It was explained that the Expert Sub-Groups on Inter-Utility DSM and Energy for Sustainable Communities are structurally third tier groups under the EE&C expert group. The mandate of these two sub-groups can be found in the Osaka Action Agenda and other earlier statements by ministers.

U.S.A. explained that the first meeting of the Expert Sub-Group on Energy for Sustainable Communities was held in Bangkok in 1997. Dr. Larry Hill is the chair and Ms. Nicro of Thailand is the vice-chair. A framework for sustainability and the original 6 work plans have now been condensed into 4. In addition, the group has finalized terms of reference. The next meeting on renewable technologies for urban planning will be held in Melbourne, Australia in March 1999.

The Expert Sub-Group on Inter-Utility DSM will hold its next meeting in November 1998 in Wuxi, China. This group will have to finalize the terms of reference for consideration of the EWG. Mr. Grayson Heffner of U.S.A. is its chair and Mr. Nicky Lirios of the Philippines is the vice-chair. The group has received support from the majority of APEC economies for its work.

OPEN FORUM

Delegates from Australia, Brunei, Canada, Japan, Korea, New Zealand, the Philippines, Singapore, Chinese Taipei, and U.S.A. gave reports on the development of energy service companies and energy efficiency and conservation financing in their respective economies. Summaries of these presentations can be found in the annex.

Thursday, 29 October 1998

The Chair opened the meeting and requested delegates who joined the meeting today to introduce themselves. Following this, the Chair announced a continuation of the Open Forum and called on Korea to make its presentation.

PROGRESS/STATUS OF CURRENT FUNDED COOPERATIVE TASKS

The Chair introduced Mr. Andre van Rest of U.S.A. as the Co-Chair of this meeting and announced that Mr. van Rest would assume co-chairmanship of the meeting from this point on.

Energy Benchmarking System Development and Implementation

Mr. Bill Mixon explained the objectives of the program and briefed the meeting on the pilot project. The pilot project has established a standard format for data input and formatting (using Excel spreadsheet). The project utilizes Energy Use Indices (EUI) and started with existing data in four areas: office buildings, hotels, paper mills and the ferrous metal industry. A sizeable data base has been collected and more data are expected from U.S.A. and Canada. A number of deliverables have been produced and the final report will be ready by November 1998. Result of analysis will be used to improve benchmark data. This project will continue to expand its data base and add other facilities and "best practices." Future work on this project will be discussed during the energy benchmarking workshop on October 31, 1998.

There was discussion on whether the data are representative of all economies. Mr. Mixon clarified that it had been decided that only actual data received from member economies would be used.

Institutionalization of a Benchmarking System for Data on the Energy Use of Commercial and Industrial Buildings

U.S.A. reported that no work or progress has been made on this project because there is insufficient data to institutionalize a data base and most data, thus far, has come from U.S.A. Hence, U.S.A. questioned whether or not the EE&C group wishes to institutionalize the information or would prefer to reprogram the money (US\$40,000), for example, to hold a workshop to assist countries who want to set up monitoring programs or build data systems. It was suggested that this could be discussed at the benchmarking workshop.

Overview of Trade Flows of Energy Using Products between APEC Member Economies

Ms. Karen Holmes, a consultant to the Export Council for Energy Efficiency, briefed the delegates of her work in this project. She informed the meeting that she had used United Nations Commodity Trade Statistics (adding in Chinese Taipei data) and the

study is in terms of value in trade. Field visits were made to Korea, Japan, China and Chinese Taipei for clarification of data. A draft report has been completed and it contains an executive summary. She drew attention to Chapter 2 on market characterization. On the relationship between trade flows and mandatory and voluntary labeling programs, she found that products with the highest traded value are air conditioners and motors. Refrigerators also rank high, while lighting ranked the lowest in value. On a quantity of trade basis, lighting is the largest, followed by motors, air conditioners and refrigerators. On flows of products requiring mandatory energy tests, ballasts ranked the highest (a large volume of the ballast trade is accounted for solely by three economies, viz., Canada, Mexico, and U.S.A.). This is followed by air conditioners (large flows in U.S.A. affected the numbers) and motors. On products where voluntary or mandatory programs exist, air conditioners rank the highest.

The implications of the study are that analysis should take into account what are the most valuable flows which are now subjected to energy testing and flows that are potentially subjected to energy testing. In addition, potential for energy savings may be another criterion for consideration. Air conditioners meet all three criteria, while refrigerators meet the final one.

Workshop on Emerging Energy-Efficient Industrial Technologies

Dr. Larry Hill reported that the workshop addressed technologies on steam, compressed air, motors, materials, membranes and sensors. On the first three, the main issue is implementation of existing, mature technologies. On the latter three, revolutionary changes are still likely.

The delegates discussed the outcomes of the workshop (see proceedings of workshop) and decided that as an immediate measure U.S.A. will begin to post information available from the Department of Energy (DoE) onto the U.S. DoE web site for member economies' access. U.S.A. will also coordinate further information gathering to be presented at the next EE&C meeting for development of any future project activity.

APEC Energy-Efficient Training and Certification Program

U.S.A. informed the meeting that there have been serious set backs to the project (the company contracted to carry out renewables and efficiency portion went bankrupt). More recently, several APEC economies have experienced difficulties due to the current economic crisis, which have impacted on this program's progress.

However, efforts are underway to revive the project, beginning with renewables. This will begin with the preparation of an APEC renewable-energy cooperative training concept paper (due December 15, 1998) to culminate in an APEC energy-efficiency cooperative training plan (by June 15, 1999).

On the energy efficiency side of this project, U.S.A. questioned if EE&C still wish to continue with it. After much discussion, U.S.A. announced that it will send email

reminders to each economy for nominations to a training network. Mr. Rashid, Chair of the group, requested interested economies to respond to Mr. van Rest upon receipt of the email.

Workshop on Energy-Efficient Retrofitting of Commercial Buildings

U.S.A. reported that the project should begin officially in 1999. Mexico has volunteered to host this project at the time of the next EE&C meeting. A proposed date is the last week of March 1999.

APEC Energy Efficiency Database Construction

Mr. Kazuki Tanabe explained that this project is a response to the outcome of the Energy Ministers' Meetings. The objective of the project is to establish a database of energy efficient technologies. Some preliminary findings based on responses from APEC economies have been established.

As funding of this project has not been finalized, Japan indicated that if APEC funding is not approved, this project would be reconsidered. On the relationship between this project and APERC's work in developing energy efficiency indicators, Ms. Fernandez explained that APERC's work would be complementary to this project.

Review of Energy Efficiency Test Standards and Regulation in APEC Member Countries

The Chair invited Mr. Lloyd Harrington, a consultant with Energy Efficiency Strategies, to introduce this project, its objectives, and scope to the meeting. The project will be carried out by four partners over a period of nine months and in two phases. This project is being managed by the Steering Group on Energy Standards.

EE&C THEME ADMINISTRATION AND OPERATION

It was agreed that members of the evaluation committee will serve for two years.

Mr. Frank Pool of New Zealand, who will take over the chair of this group following this meeting, will in conjunction with Mexico inform members on the date of the next meeting when it is finalized.

SUMMARY AND MEETING CONCLUSIONS

Mr. Rashid expressed his appreciation to all members of the group who had been very helpful and cooperative throughout the tenure of this chairmanship. He thanked Mr. Andre van Rest and Dr. Jong-Duck Kim, previous chairmen of the group, and all members of the group who had helped to move forward EE&C activities.

Finally, Mr. Rashid thanked the U.S. Department of Energy, the East-West Center, particularly Dr. Larry Hill and his staff, and all delegates for making this meeting a success.

ANNEX

SUMMARIES OF OPEN FORUM PRESENTATIONS

Australia

Mr. John Butterfield gave a presentation on the energy service industry in Australia. The energy service industry in Australia is still in its infancy and to a large extent unproven. There is an expectation in Australia that energy market reform will lead to increased competition and diversification of the energy services provided by companies. A role of government is to track developments and changes in the Australian energy market. The trends identified are published in a biennial publication "Energy Trends."

Australia has a number of initiatives in the area of energy performance contracting and third party financing. Many private sector companies provide energy performance contracting services but there is still a gap between market potential and services provided. Government has developed a number of programs in response. The longest running of these was introduced by the Sustainable Energy Development Authority (SEDA is an agency of the government of New South Wales). The program seeks to marry service providers with government agencies where potential energy efficiency savings exist. This program has recently been extended to private sector companies under the "Energy Smart Business" program. Huge market potential exists in these areas and significant greenhouse gas reductions are expected.

The Commonwealth government is also working on a program that will operate in a similar way and be applied to Commonwealth-owned and occupied buildings. Energy performance contractors will be chosen competitively to form a panel that will provide energy performance contracting and third party finance to the Commonwealth government.

Australia also has a green power program, also run by SEDA. There is strong growth in this area with a number of private sector companies now providing this service also (a premium is added to the cost of electricity and this premium is used by companies to invest in renewable energy generation projects.)

A question was asked on what specific measures have been taken by the Australian government in market facilitation. Mr. Butterfield cited the example of the work that SEDA is doing in provision of standard contract documentation and in marrying service providers and financing with customers.

Brunei

Mr. H. Japar conveyed his appreciation to the Chair and to the East-West Center and the U.S. Department of Energy for hosting this meeting in Honolulu.

He informed the meeting that energy demand in Brunei is still low and industry still has to become competitive because fossil fuel and natural gas are consumed at low prices. In fact, electricity in Brunei is among the cheapest in the region. Nonetheless, the government of Brunei has been implementing an energy efficiency guideline since the early 1980s, especially in government buildings. He informed the delegates that Brunei would like to exchange and learn further from the experience of other APEC economies.

Canada

Mr. Nick Marty reported that all ESCOs in Canada are in the private sector. A few are big and have over 10 years of business experience in Canada. Contracts usually last from 4 to 8 years. ESCOs projects are rising in number and value. The total value rose from C\$50 million in 1991 to C\$300 million in 1996. Most energy service companies (ESCOs) activities in Canada are in the commercial building sector, including hospitals and schools. The commercial sector consumes 13% of secondary energy in Canada. Of this, 53% is used for space heating and 14% for lighting. Hence, these are the two areas of focus for ESCOs. To further promote energy efficiency, the use of ESCOs is encouraged through government programs.

Two programs, in particular, promote retrofitting in commercial building and ESCOs are components in both of them. The first is the Federal Buildings Initiative (FBI) which aims to improve energy efficiency by 20% in federal government buildings and crown corporations. Under this program, a list of pre-qualified ESCOs has been compiled to help customers identify ESCOs. To date, over 60 projects (more than 4,000 buildings) have been completed. More than C\$150 million has been made in private sector investment and C\$22 million gained in annual energy savings. FBI has been very popular because of the savings generated and reductions in greenhouse gas emissions (because the government aims to be a leader and model in this issue). Nonetheless, despite these achievements, the Office of Energy Efficiency has only reached 30% of its potential within the federal government after six years. The second program, Energy Innovators, aims to encourage Canadian organizations to become energy "innovators" in adopting energy efficient practices. These organizations have to commit to long-term plans to improve energy efficiency. The main task is to raise awareness of energy efficiency through information dissemination.

A delegate inquired whether the federal government programs are able to generate sustainable growth in ESCOs. Mr. Marty answered that the Energy Efficiency Office is investigating this. It appears that, at present, ESCOs have sufficient demand/business from governments so there is no real motivation to seek contracts in the private sector component of the commercial sector. Mr. Marty also added that commercial firms that

choose to implement energy efficiency often do it on their own instead of using ESCOs because they see the profit potential in this activity.

On government actions to promote ESCOs, Mr. Marty emphasized that the government provides no financial subsidies. All ESCOs operate on private capital and obtain third party financing for retrofitting. Their profits come from energy savings. The payback time is generally between 4 and 8 years. Since government offices operate in a long-term framework, this long payback period is not a problem. Moreover, no reductions in the electricity charges are realized during the contracted period. Hence, the main initial benefit is in greenhouse gas reduction. Usually several buildings are bundled into one project and the average project value is C\$1.2 million and C\$200,000 in energy saving.

Hong Kong, China

Mr. Kam Kuen Lam explained that ESCOs are still a very new concept in Hong Kong. Since the commercial sector consumes some 50% to 60% of all electricity in Hong Kong, even a 10% reduction would be highly desirable. Since financial institutions in Hong Kong do not yet recognize investment potentials in energy efficiency, they are only interested in contracts with government offices, universities and hospitals. Another problem with ESCOs in Hong Kong is that there are very few of them; hence, the tenders are not highly competitive. In response, the government is working to develop a set of common protocol of measurement and standard contracts.

The first energy efficiency project was completed at the Hong Kong University of Science and Technology, but there were problems with equipment failure. The second project was at a large 2,000-bed, fully air-conditioned government hospital. The project was completed in early 1998. However, early reported savings are lower than the initial expected savings. An explanation is now being sought from the contractor.

Japan

Mr. Kazuki Tanabe reported on the development of ESCOs in Japan. He pointed out it is important to raise public recognition of ESCOs as well as their attractiveness as business investment targets. Serious study of ESCOs in Japan began in 1996. To encourage energy efficiency, the Energy Conservation Center of Japan (ECCJ) has set up a special committee to study ESCOs and to promote their expansion in Japan. It now has 208 member organizations and companies as well as 63 committee members. Improving energy efficiency in the commercial sector is becoming a main goal since its energy consumption has increased to 25% of all energy consumed in Japan. Mr. Tanabe presented different levels of energy efficiency improvements and their estimated payback time and financial gains. The optimal payback period is estimated to be 5 to 7 years.

The promotion of ESCOs in Japan is mainly in the residential and commercial sectors. Construction companies are now selling more energy efficient houses, but it is not clear

whether this may have a greater impact than ESCOs in promoting energy efficiency and conservation.

In answer to a question on the presence of financial mechanisms to achieve its goals, Mr. Tanabe explained that the development of financial systems is tied to the energy conservation assurance system. Promoting ESCOs may also require rule adjustments. Also, although there are high goals in improving energy efficiency, even a 5% to 10% reduction would be highly desirable and a 5 year pay back period appears more acceptable to businesses. For now, the priority is to publicize ESCOs. On membership in the ESCO committee, many kinds of industries and professionals are involved, including banks, construction firms, lawyers, and academics.

Korea

Mr. Hwang Gyou-Cheol reported on energy conservation financing and ESCOs in Korea. He informed the meeting that the Korean government has been providing long-term and low-interest loans, grants and tax incentives to support energy conservation. In fact, the Korean Energy Management Corporation (KEMCO) manages a government fund to support rational energy use, mass energy supply systems, and new and renewable energy development. On long-term loans, most have a 3 to 5 year grace period, a 5 to 7 year pay back period, and a lower than market interest rate. In 1998, almost US\$300 million in long-term loans were made. On grants, between 1992 and 1997, US\$66 million was disbursed and the largest allocations have gone to the industrial sector (US\$29 million). In 1997, US\$26 million in grants was made to 403 industries. Finally, on tax incentives, tax reductions are given for the installation of energy efficient devices. Before 1997, it was 10% of investment. After 1997, it was reduced to 5% of investment.

On ESCOs in Korea, they have been established since 1991 to stimulate private sector interest in energy efficiency. The number of ESCOs has grown from 3 in 1992 to 22 in 1998. These 22 registered ESCOs have been created by manufacturing (8) firms, construction (5) firms, and engineering (9) firms.

KEMCO's assistance programs for ESCOs include a US\$31 million fund to provide loans at 7% interest, with a 5-year grace period and a 5-year payback period. The average loan size is US\$3.8 million. Investment by ESCOs in Korea was at an average of US\$4 million annually between 1993 and 1997. By July 1998, the number has increased to 28 cases and grown to US\$10 million

On financing from KEMCO, Mr. Hwang clarified that although approval is given by KEMCO, loans are channeled through commercial banks. Also, grants are only made for R&D.

New Zealand

Mr. Frank Pool gave a presentation on ESCOs and energy efficiency financing in New Zealand. He explained that there had been some interest in the shared savings approach 10 years ago but has since declined. Some initial ESCO private sector projects are now underway. A number of re-emerging ESCOs in New Zealand also

operate in Australia. There has been especially strong market-driven growth in co-generation following energy sector reform.

Since 1987, New Zealand has corporatized its state energy assets with some privatization. Electricity retailing and generation is being unbundled from natural monopoly lines businesses. As a result, all forms of energy supply have become very competitive at all levels. Also, there are many mergers and acquisitions and a great dynamism in the electricity and gas sector.

There are now 815 companies in the Energy Wise Companies Campaign (EWCC) which focuses on energy efficient business process key principles improvement. Of these, 200 are very active and annual awards are given. This has proven to be a win-win situation for both the government (low cost and good motivation) and industry (prestige and recognition).

On promoting energy efficiency within the government, a voluntary government sector commitment program is in place. The government also provides financing. This has proven to be very successful and very popular with local and central governments. The pay back period is usually 3 to 5 years. No interest is charged, but an administration fee is levied.

To promote partnerships with local government, an Energy Wise Councils Partnership is in place. There is also the Internet-based Rideshare project, which has produced promising results so far and is popular with universities and local governments because it is low cost and self-policing.

Within the business community, a loan scheme was available until the early 1980s. The scheme has been discontinued because of bad debts and other problems. Energy audits were then now a strong focus, but there was limited progress in implementing recommendations. The Energy Efficiency and Conservation Authority (EECA) provides a management mentoring service to EWCC signatories. The main task is to help them get started in their own energy management programs. Budget cuts may compel EECA to start to charge companies for this service.

Within the private sector, the energy management industry is still in its infancy, although there is some interest among financiers in energy efficiency investments. Some non-monopoly components of electricity sector are beginning to pursue energy efficiency business opportunities. There is also strong competition for co-generation funding opportunities by energy supply companies.

Nonetheless, on the whole, there may be only limited potential for ESCOs in New Zealand. Their real value may be in discouraging excuses for inaction based on financial reasons. In addition, decision makers may hesitate to implement energy efficiency via ESCOs because of uncertainty of facilities "going" use to them to be confident in signing multi-year contracts with ESCOs. Mr. Pool felt that there were probably better prospects in contract facilities and maintenance management approaches.

In response to a question on the impact of energy prices on energy efficiency, Mr. Pool said that it is too early to determine if lower energy prices associated with energy reform would provide a greater discouragement of energy efficiency than the growth in energy efficiency services provision from enhanced competition.

On prospects for outsourcing facilities management, many government offices, including the military, are now more inclined to contract facilities management. On measurements for the annual award, Mr. Pool explained that it is based on self-reporting of progress by companies in achieving the program principles. Finally, although there is no energy regulatory agency in New Zealand, the government also exercises light-handed information disclosure regulations on terms and conditions of pricing by dominant energy sector companies. There is also recourse under the Commerce Act against any claimed monopoly behavior.

The Philippines

Ms. Helen Arias explained that the Philippines has a three-pronged strategy in promoting energy efficiency and conservation. It involves technical advice and training, demonstration, and information dissemination, and financial support. The Technology Transfer for Energy Management Project (TTEM) was implemented in 1985 with a US\$5 million grant from USAID. The project aims to introduce technologies that are proven in other countries but are not widely used in the Philippines.

A major component of TTEM is the Demonstration Loan Fund (DLF) which provides soft loans for viable energy efficiency and demand-side management projects including equipment purchase, engineering design and management, as well as contingency spending (e.g. price adjustments). The maximum amount of the loan is US\$125,000 or 5 million pesos. The interest rate is based on the Manila Reference Rate (MRR) plus 1%, with a 1-year grace period and a payback time of 5 years. To date, there are 9 participating financing institutions. Companies receiving the loans must agree to provide open and free access to sites, provide information and present itself as a model for study. TTEM-DLF is now a part of the regular program of the Philippine Department of Energy. Between 1996 and 1998, 11 projects have been initiated after the first phase has culminated in the implementation of 17 demonstration projects in the 1985-1990 period.

In response to questions on tendering procedures for building management systems, Ms. Arias explained that building management systems are normally supplied by building control suppliers (e.g. Honeywell) who usually treat these as sub-contracts. Also, a bill to restructure the electric power industry is expected to pass by June 1999 while the privatization of the National Power Corporation (NPC) is expected to take at least 2 to 3 years. Finally, on the number of ESCOs in the Philippines, Ms. Arias quoted from a newsletter that there are about 10 but none of them operate as ESCOs in the real sense.

Singapore

Dr. Lee Siew Eang presented a review on Singapore energy policy and works of ESCOs. This includes the adoption of a policy for green technology in power generation, a review to set new minimum target for building envelopes, establishing performance standards for services system, providing incentives to industry to upgrade energy systems, and encouraging improvement in demand side management.

ESCOs encounter difficulties operating in Singapore due to many common barriers to raising energy efficiency (e.g. low energy costs, lack of commitment by decision makers, etc). Also, the banking sector in Singapore does not yet see energy efficiency as an investment avenue. Finally, ESCOs in Singapore are still insufficiently institutionalized. He requested EE&C to help develop and enhance the professional position of ESCOs.

On EE&C, Dr. Lee first emphasized the importance of workshops and dialogues for continuing exchanges (e.g. sharing success stories) to help promote energy efficiency. Second, he proposed that EE&C should also give emphasis to developments in areas other than industry, for example, property development, transportation and management.

Chinese Taipei

Mr. Kung Yuan Lin reported on energy conservation financing in Chinese Taipei. Measures now include tax credits (e.g. 34 items and those additional ones approved by the Energy Commission), low interest loans, and the granting of 2-year accelerated depreciation for equipment, including those of new and renewable energy.

On ESCOs in Chinese Taipei, there are only 6 organizations conducting related activities. Of these, maybe only two qualify as ESCOs. The main barriers to promoting ESCOs are (1) energy flow is difficult to track or meter, (2) cash flow problems for ESCOs, (3) poor system design (of original system, hence requiring more extensive and higher cost changes), (4) difficulty in establishing agreeable baseline of measurement, and (5) inadequate equipment performance data.

Thailand

Thailand gave no presentation at this meeting.

The United States

The report was in two parts: first by Dr. Larry Hill on ESCOs in U.S.A.; the second by Mr. Maurice Kaya (of DBEDT) on partnership programs between the State of Hawaii and the Philippines.

Mr. Hill explained that ESCOs first started in U.S.A. in the late 1970s when consultants launched independent businesses to introduce energy efficiency through shared savings contracts. By the 1980s, utilities companies were starting their own ESCOs. The most profitable ones today are the partnership ones, e.g., ESCOs in partnership with the U.S. Federal Energy Management Program.

However, the business of ESCOs is not highly profitable. (For instance, membership of the National Association of Energy Service Companies reflects high turnover.) Real profits lie in other parts of the business. Companies such as Honeywell and Johnson Controls are profitable. The key barriers to ESCOs growth are high interest rates, high energy costs, business overhead costs for ESCOs themselves, and organizational barriers. On the future of ESCOs in U.S.A., energy performance contracts are expected to be less profitable over time, while bonds, lease agreements, and grants would likely be new areas for profits.

In response to various questions, Mr. Hill explained that (1) most business contracts for ESCOs in the United States are in the private sector, (2) alignments have become increasingly important for ESCOs (e.g. obtaining pre-qualification status from the government helps them to obtain business contracts), and (3) deregulation in the 1980s has caused utility companies to create their own energy service providers.

Mr. Kaya introduced to the delegates efforts by the State of Hawaii to develop energy efficiency projects with Asia-Pacific economies. He talked specifically about the Energy Efficiency Cooperation Project between the State of Hawaii and the Philippines. Most recently in June 1998, a conference was held in Manila and other technology transfer workshops will also take place. All of these efforts aim to stimulate growth of ESCOs in the Philippines.

Mr. Kaya explained that the State of Hawaii is interested in working with APEC economies and invited economies to contact him, DBEDT, or Dr. Larry Hill. Information is also available on the web site. Furthermore, he explained that Hawaii has strengths in renewable energy, such as bio-residuals in co-generation, based on its history in commercial plantation, e.g., the sugar cane industry.

