



CTI Technology Transfer Seminar Bulletin

A summary report of the Climate Technology Initiative (CTI) Industry Joint Seminar on Successful Cases of Technology Transfer in Asian Countries

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CLIMATE TECHNOLOGY INITIATIVE INDUSTRY JOINT SEMINAR ON SUCCESSFUL CASES OF TECHNOLOGY TRANSFER IN ASIAN COUNTRIES: 8-9 MARCH 2006

The Climate Technology Initiative (CTI) Industry Joint Seminar on Successful Cases of Technology Transfer in Asian Countries took place from 8-9 March 2006 at the Daewoo Hotel, Hanoi, Vietnam. Organized by the CTI in cooperation with the Ministry of Natural Resources and Environment of Vietnam, the seminar was attended by 144 participants from 11 Asian countries. The seminar provided an opportunity for government representatives, policymakers, and experts from industry, financial institutions and academia to review best practices for technology transfer in the Asian region, with particular focus on case studies on energy efficiency, renewable energies, and project financing. The objectives of the seminar were to identify key success factors for technology transfer in the region, and explore possibilities for the diffusion of best practices. The seminar also sought to identify financial instruments other than the Kyoto Protocol's Clean Development Mechanism (CDM) for financing climate technology transfer.

During the day and a half long meeting, participants heard case-study presentations organized in three thematic sessions, and participated in one panel discussion. On Wednesday, two thematic sessions were held on energy efficiency and on renewable energy technologies. On Thursday, one thematic session was held on project financing. A panel discussion on cooperation among key sectors for technology transfer was also held.

This report provides a brief history of the climate change process, technology transfer and the CTI Industry Joint Seminar series, followed by a summary of the CTI Industry Joint Seminar on Successful Cases of Technology Transfer in Asian Countries.

A BRIEF HISTORY OF CLIMATE CHANGE POLICY, TECHNOLOGY TRANSFER, AND CTI INDUSTRY JOINT SEMINARS

THE UNFCCC AND THE KYOTO PROTOCOL:

Climate change is one of the most serious threats to sustainable development, with adverse impacts expected on human health, food security, economic activity, the environment, water and other natural resources, as well as physical infrastructure. The international political response to climate change took shape in 1992 with the adoption of the UN Framework Convention on Climate Change (UNFCCC). The UNFCCC sets out

a framework for action aimed at stabilizing atmospheric concentrations of greenhouse gases in order to avoid "dangerous anthropogenic interference" with the climate system. Controlled gases include methane, nitrous oxide and, in particular, carbon dioxide. The UNFCCC entered into force in March 1994, and now has 189 Parties.

In December 1997, delegates met in Kyoto, Japan, and adopted the Kyoto Protocol to the UNFCCC that commits developed countries and countries with economies in transition to achieve quantified emissions reduction targets. These countries agreed to reduce their overall emissions of six greenhouse gases by an average of 5.2% below 1990 levels between 2008 and 2012 (the first commitment period), with specific targets varying from country to country. The Kyoto Protocol also establishes three flexible mechanisms to assist the parties in meeting their national targets cost-effectively: an emissions trading system; joint implementation (JI); and the CDM, which encourages projects in developing countries. The Kyoto Protocol entered into force on 16 February 2005 and has been ratified by 162 Parties.

TECHNOLOGY TRANSFER UNDER THE UNFCCC AND THE KYOTO PROTOCOL: Technology transfer is considered a key element in combating climate change under the UNFCCC. Article 4.5 of the Convention addresses technology transfer, stating that "developed countries...shall take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally-sound technologies and know-how to other Parties, particularly

IN THIS ISSUE

A Brief History of Climate Change Policy, Technology Transfer, and CTI Industry Joint Seminars.....	1
Report of the Seminar.....	3
Session I: Case Studies of Energy Efficient Technologies.....	3
Session II: Case Studies of Renewable Energy Technologies.....	4
Section III: Project Financing.....	5
Panel Discussion: Cooperation Among Key Sectors for Technology Transfer.....	5
Closing Session.....	6
Upcoming Meetings.....	6

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developing country Parties, to enable them to implement the provisions of the Convention.” Article 10c of the Kyoto Protocol contains a similar commitment.

In 2001, Parties to the UNFCCC adopted a framework for actions to enhance the implementation of Article 4.5. The framework contains five key activities relating to technology needs assessments, technology information, enabling environments, capacity building and mechanisms for technology transfer. Funding to implement the framework is provided through the Global Environment Facility climate change focal area and the Special Climate Change Fund. The CDM is also expected to contribute to the transfer of cleaner and more efficient technologies to developing countries.

Parties to the UNFCCC took further action in 2001 by establishing an Expert Group on Technology Transfer (EGTT) to help advance the Convention’s technology-related goals. Since then, workshops have been held on technology information (Beijing, China, April 2002), needs assessments (Seoul, Republic of Korea, April 2002), enabling environments (Ghent, Belgium, April 2003), and innovative financing (Montreal, Canada, September 2004 and Bonn, Germany, October 2005), and adaptation technologies (Tobago, June 2005).

At the eleventh Conference of the Parties (COP-11) to the UNFCCC, serving as the first Meeting of the Parties (MOP-1) to the Kyoto Protocol, held in Montreal in November-December 2005, delegates, *inter alia*: endorsed EGTT’s 2006 Work Programme; requested a side event on the issue of public technologies; took note of pilot networking between UNFCCC’s Technology Transfer Clearing House and regional technology information centers; and asked the UNFCCC Secretariat to organize a high-level roundtable on lessons learned, technology deployment, transfer, cooperation and partnerships.

CTI INDUSTRY JOINT SEMINARS ON TECHNOLOGY DIFFUSION: The Climate Technology Initiative is a multilateral initiative that was established in 1995 at the first Conference of the Parties to the UNFCCC, and operates as an Implementing Agreement under the International Energy Agency (IEA). Its mission is to bring countries together to foster international cooperation in order to accelerate the development and diffusion of climate-friendly and environmentally-sound technologies and practices. CTI works with the UNFCCC Secretariat and the EGTT, as well as relevant IEA Implementing Agreements and other international organizations and initiatives. Its activities are designed to be consistent with UNFCCC objectives, in particular the framework for technology transfer that was adopted at the seventh Conference of the Parties in Marrakesh, Morocco, 2001. The CTI has an ongoing programme of seminars and workshops designed to support the UNFCCC process and facilitate the diffusion of appropriate technologies and practices. The CTI also organizes a series of joint industry seminars. The first CTI Industry joint seminar for the Asia and Pacific Region was held in Beijing in May 1998.

Second CTI Industry Joint Seminar on Technology Diffusion in Asia: This seminar was held from 14-15 January 2000 in Cebu City, the Philippines. The seminar’s sessions covered: the UNFCCC and technology diffusion and transfer; lessons learned from existing projects in the Asia region; financing for climate change projects; information and capacity-

building needs; the institutional environment; and practical steps to promote, facilitate and finance transfer of, and access to, environmentally-sound technologies and know-how.

CTI Industry Joint Seminar on Technology Diffusion in Eastern Europe and Central Asia: This seminar, organized by the CTI and the UN Industrial Development Organization (UNIDO), in cooperation with the UNFCCC and the Austrian Government, was held in Vienna, Austria from 28-29 October 2003. The event sought to increase participants’ awareness of climate change and technology transfer issues, review experiences in the region, and promote environmentally-sound projects by encouraging collaboration between policymakers, technology transfer specialists, financial institutions, and the private sector. The seminar focused on: the status of technology transfer under the UNFCCC and Kyoto Protocol; the role of developed countries and multilateral and financial organizations in diffusing technology; and financial barriers.

CTI Industry Joint Seminar on Technology Diffusion in ASEAN and Small Island States in the Pacific Region: This seminar was held from 4-5 February 2004 in Jakarta, Indonesia. Organized by the CTI and the New Energy and Industrial Technology Development Organization (NEDO) in cooperation with the Indonesian Government and the UNFCCC, the seminar focused on clean energy and energy efficiency, as well as challenges experienced by governments, industry, academia and the finance sector in promoting technology transfer. The seminar’s sessions covered: government perspectives on strategies for the introduction of clean energy technologies; possibilities for private sector cooperation between developing and developed countries; financial barriers and the role of multilateral and financial institutions; and practical steps to promote and facilitate access to, and transfer of, clean energy technologies.

Second CTI Industry Joint Seminar on Technology Diffusion in Central and Eastern Europe and the Commonwealth of Independent States: This seminar, organized by the CTI and UNIDO, was held in Vienna, Austria from 28-29 October 2004. Focusing on linkages between climate change and energy efficiency, the seminar reviewed best practices for the deployment of energy efficient technologies and considered how policies such as energy security, market reform and social and rural development can create incentives for improving energy efficiency. It also sought to identify major barriers to the diffusion of energy efficient technologies in Central and Eastern Europe and the Commonwealth of Independent States.

CTI Industry Joint Seminar on Technology Diffusion of Energy Efficiency in Asian Countries: This seminar, organized by the CTI in cooperation with the Government of China and Tsinghua University, was held from 24-25 February 2005 in Beijing, China. The seminar addressed technical and policy options for improving energy efficiency in the transport, residential and industrial sectors. The objective of the seminar was to increase awareness of energy efficiency in Asian countries, discuss activities related to climate technology transfer, and provide insight on best practices, technology transfer policies, barriers, and the CDM.

CTI Joint Forum on Project Formation: This seminar, jointly organized by the CTI, the International Emissions Trading Association (IETA), and UNIDO, was held on 21 October 2005, in Madrid, Spain. The Forum brought together government



and business representatives from countries engaging in Joint Implementation (JI) activities under Article 6 of the Kyoto Protocol and focused on the prospects and possibilities of JI in light of practical examples and experiences already gained. The seminar addressed legal definitions, country experiences and potential rules for the two JI tracks.

REPORT OF THE SEMINAR

The CTI Industry Joint Seminar on Successful Cases of Technology Transfer in Asian Countries began on Wednesday morning with opening speeches.

Nguyen Cong Thanh, Vice-Minister of Natural Resources and Environment, Vietnam, welcomed participants, highlighting that the seminar will strengthen the collaboration among Asian countries and international organizations in order to improve energy efficiency and promote renewable energy in Asian countries. Emphasizing that climate change is at the heart of global concern, he stressed the need for sharing best practices related to energy efficiency and renewable energy technologies.

Toshi Sakamoto, CTI Executive Committee and Ministry of Economy, Trade and Industry of Japan, outlined the origin, activities and accomplishments of the CTI, highlighting the CTI's mission to encourage international cooperation in the development and diffusion of climate-friendly and environmentally-sound technologies and practices. Noting that the CTI has organized numerous events on technology diffusion and capacity building in every region of the world, he said that this seminar is different from the others since it focused on: disseminating successful case studies in energy efficiency and renewable energy technologies; identifying key success factors; and addressing financial aspects of technology transfer.

Antonio Pflüger, International Energy Agency (IEA), presented the IEA's activities, noting that the IEA is an integral part of its members' energy security, conducts policy analysis, convenes expertise, and publishes findings and shares them within the energy community. He highlighted that Implementing Agreements under the IEA, one of which is the CTI, are strictly demand-driven. He also said that future activities of the IEA will focus on extending the partnership and involvement of non-member countries in Implementing Agreements and promoting international networks for energy research and development.

SESSION I: CASE STUDIES OF ENERGY EFFICIENT TECHNOLOGIES

This session was moderated by Antonio Pflüger, IEA, and included case-study presentations on motor system optimization in China, coke dry quenching in China, and energy efficiency at a brewery in Vietnam. Following the presentations, participants from China, India, Indonesia, the Philippines, Malaysia, Thailand and Vietnam commented on the presentations and shared their own country experiences.

Robert Williams, UNIDO, presented on motor system optimization experiences, UNIDO's training programme in China, and on system standards. He underscored the need to focus on system efficiency rather than component efficiency, noting that a system with highly efficient components can have low overall efficiencies. Regarding UNIDO's training programme in China, Williams said that the focus was to develop capability to analyze industrial energy systems, rather than offering "ready made" solutions. He drew attention to the cross-cutting nature of

training, noting that training is not specific to particular sectors or industrial processes, and said that the training programme in China resulted in identification of nearly 40 million kWh in energy savings. He said lessons learned include that training is resource intensive and that transferred knowledge resides in individuals who might eventually leave thus jeopardizing its continuity. Williams outlined barriers to efficiency and proposed a system energy-efficiency standard approach. He said UNIDO is developing documentation to be made available online in an ISO-friendly format so that it can be inserted into the documentation of factories seeking ISO 14000. He also said that incorporating energy efficiency into ISO certification provides the industry with incentives to act. Participants raised questions regarding mandatory energy audits, system maintenance and potential areas for energy savings.

Teruo Okazaki, Nippon Steel Corporation of Japan, described energy saving initiatives in the steel industry, highlighting Japan Iron and Steel Federation's (JISF) voluntary initiatives, which focus on energy saving in production processes, utilization of waste energy and materials, and international cooperation through technology transfer. He outlined Nippon Steel's contribution to the Carbon Fund and participation in CDM projects as a contribution to greenhouse gas emissions reductions on a global scale through technology transfer. He then presented experiences of a NEDO energy saving model project for coke dry quenching facilities in China. Okazaki highlighted that technology transfer within the steel industry leads to a large reduction in carbon dioxide emissions on a global scale and that the CDM is a powerful tool for accelerating technology transfer. In the ensuing discussion, participants asked questions on the calculation of energy costs for coke production.

Sigeru Sakashita, Mayekawa Company Limited, Japan, presented on the CDM project to increase efficiency in Bia Thanh Hoa brewery in Vietnam. He underlined some of the problems addressed in the project, such as inefficient coal boilers, use of large quantities of water, no wastewater treatment and high electricity consumption. He noted that coal is very cheap in Vietnam and thus provides no incentives for energy savings. Sakashita outlined in technical detail four proposed improvements and their benefits, including vapor re-compression (VCR) steam recovery systems, improved refrigeration, optimized pasteurization, and biogas boiler. He then specified three aspects of technology transfer in this project, including hardware, software, and group activity, and underscored dissemination possibilities to other industries, such as VCR to distilleries and sugar plants, refrigeration to dairy plants, optimized pasteurization to soft drinks, and biogas to all industries with wastewater. Participants raised questions on economic efficiency and CDM.

DISCUSSION AND COMMENTS: M.S. Shivarama, Essar Steel Limited, India, said that the Indian steel industry is mainly run by the government and large corporations, and that there exist national policies on steel, energy and environment, including on energy efficiency and environmentally-sound technologies. He noted that energy audits are mandated for designated energy consumers. Maryam Ayuni, Ministry of Energy and Mineral Resources, Indonesia, emphasized the importance of improving energy efficiency through system optimization, capacity building in energy management, and energy service company (ESCO) business. She also stressed the need for addressing financial

barriers in technology transfer, and the importance of data and correct calculation for the CDM. Sutji Rahayu, Persero, Indonesia, underscored the limitations of power generation. Evelyn Bacud, Asia Brewery Incorporated, the Philippines, noted that biogas is corrosive and not readily suitable for distillation because of refining needs, and requested technical details on biogas use. Hamdan Mokhtar, Bioprocess Technology Centre SIRIM Berhad, Malaysia, underscored the importance of a good working model and the continuity of programs, including CDM. He noted that industry has to report to the government on energy consumption in Malaysia. Somkiat Sutiratana, Ministry of Energy, Thailand, expressed Thailand's interest in applying these successful technologies and practices, and highlighted the need for foreign investment and assistance for technology transfer. Noting successful experiences of NEDO model projects in China, Huang Dao, China Iron and Steel Association, said that international cooperation is essential for technology transfer. Bui Huy Phung, Vietnam Academy of Science and Technology, highlighted Vietnam's considerable achievements in energy efficiency in the past decade. Regarding motor system optimization, he sought detailed information on particular technologies and economic efficiency.

SESSION II: CASE STUDIES OF RENEWABLE ENERGY TECHNOLOGIES

This session was moderated by Ajay Mathur, Senergy Global Private Limited, India, and included case-study presentations on rice husk power generation in Thailand, biomass gasification for thermal applications in Myanmar, and wind power for rural electrification in China. Following the presentations, participants from China, Indonesia, the Philippines, Malaysia, Thailand and Vietnam commented on the presentations and shared their own country experiences.

Natee Sithiprasasana, A.T. Biopower Company Limited, Thailand, presented on the Pichit rice husk power plant in Thailand. He explained that the project was a result of government policies to promote substitutes for fossil fuels and encourage the private sector to build, own and operate power plants. Sithiprasasana underscored the importance of sound technology in order to attract investment, and explained the operational details of the 22MW biomass power plant, including husk storage, suspension fire boiler technology, zero wastewater system and selling of ash as a byproduct to cement factories. He said the costs of the plant, at \$US 1.5 million per MW of installed capacity, are higher than conventional plants, but that the extra cost is due to high environmental awareness in Thailand, and compensated by selling CDM credits and byproducts such as high-quality ash. Sithiprasasana highlighted the global and local benefits of the plant, as well as socio-economic aspects of the project, such as legally-binding contracts with the local community, establishment of compensation and environmental funds, and supervision by local community.

Questions were raised on the payback time, rice-husk supply, CDM and electricity price regulation. Sithiprasasana explained that contracts for rice husk supply were secured with 20 rice mills from the surrounding area, that tariffs for electricity from renewable energy sources are regulated in Thailand, and that CDM registration of the project is pending the approval of national regulations by government.

Sunil Dhingra, the Energy and Resources Institute (TERI), India, spoke on using modern biomass technologies as alternative to hydrocarbon fuels and existing conventional energy resources, highlighting TERI's research activities on biomass gasification technology development. Presenting a successful demonstration of a biomass gasifier for thermal applications in the tobacco curing industry in Myanmar, he said that the use of a biomass gasifier, which uses local agricultural residue as its main input, provides opportunities for increased income for local communities, in addition to substantial environmental benefits. He noted that the use of biomass gasifiers can be further expanded to other applications, such as community cooking, sericulture and other small rural industries, as well as for providing electricity in remote rural areas. Following the presentation, participants discussed the possibility of using rice husks in biomass gasifiers, the energy efficiency and costs of biomass gasifiers, and technical requirements for biomass preparation.

Charlie Dou, Beijing Bergey Windpower Company Limited, presented on wind power technology and rural electrification in China. He said that around 29,000 villages and 70 million people are un-electrified in China, noting differences in statistics depending on definitions. Dou said the Chinese National Township Electrification Program has the objective of electrifying 1000 villages, and noted its successes so far, which include the electrification of more than 700 villages with wind power and photovoltaics. He underlined the importance of the programme for awareness rising, as a pull for the photovoltaic industry, and as a base for further dissemination of renewables. Dou also noted that the programme's key challenges include maintaining renewable energy systems in operation at a sustainable cost, establishing rural energy service companies, setting tariffs for off-grid electricity, and developing quality standards. He then shared his company's experiences on how to do business in China, underscoring the differences between cultural, social and legal systems.

DISCUSSION AND COMMENTS: Zhang Binliang, Administrative Centre for China's Agenda 21, overviewed renewable energy use in China. Outlining national renewable energy policies, such as the Renewable Energy Law, he said that the use of renewable energy in China is expected to increase significantly, and called for technology transfer and financial support for promoting renewable energy. Hayat Sulaiman, Ministry of Industry, Indonesia, outlined Indonesia's policy on renewable energies, in particular on encouraging industries to use bio-fuels as a substitute for fossil fuels. He described a rice husk power plant in the Sumatra province as a successful case of bio-fuel use that provides opportunities for job creation and additional energy for local communities. Chew Jit Seng, Malaysia Palm Oil Association, said that Indonesia's renewable energy efforts focus on increasing the use of renewable energy in rural areas and plantations, and that industries look forward to more opportunities for renewable energy projects through the CDM. Maximino Marquez, Department of Energy, the Philippines, underscored seasonality of biomass as a problem for biomass power generation, and highlighted resource availability for renewable energies. He stressed the need to consider, *inter alia*, pro-poor criteria. Mont Uthaiphatrakul, Papop Company Limited, Thailand, highlighted methane production from agricultural waste, as well as the importance of the private sector engagement in technology transfer. Nguyen Tien Nguyen, Vietnam Science



and Technology Academy, pointed out the need to consider competition factors for large-scale biomass, in particular competition for land use, food security and animal feedstock. He also underscored the different factors to be considered for grid-connected and off-grid renewable electricity projects.

Responding to questions and comments, Natee Sithiprasasana highlighted the importance of the site selection of a rice husk power plant in order to ensure a continuous supply of the biomass throughout the year. Sunil Dhingra said that the next stage of the biomass gasification project in Myanmar will focus on expanding the application of biomass gasification to other sectors, as well as engaging the private sector in technology transfer. Charlie Duo said that resource availability is crucial for renewable energy technology application.

SUMMARY OF DAY ONE PRESENTATIONS: Morihiro Kurushima, CTI Programme Manager, summarized the case-study presentations, noting their usefulness in learning from activities of industry, governments, international institutions and academia. He underscored the importance of industry participation in the seminar, saying that industry should be the main stakeholder in technology transfer. He noted that technology has no borders, but also that technologies are not generic, and that each country and region needs different technologies for their own specific circumstances. Kurushima also highlighted the function of CTI, and its role as a coordinator between industry, government, financial circles and academia.

SECTION III: PROJECT FINANCING

This session was moderated by Marina Ploutakhina, UNIDO, and included a presentation on financing technology transfer, followed by discussions and comments with participation of government, industry and academia representatives from China, the Philippines, India, Indonesia, Thailand, and Vietnam.

Junji Hatano, Clean Energy Finance Committee of Mitsubishi UFJ Securities (MUS), Japan, presented on financing climate technology transfer. Noting that financing is one of the essential elements for technology transfer, he stressed that requisites for financing include reasonable return on investment and availability of funds. He said that the reasonable return can be secured by increasing the project's profitability by monetizing its environmental value, highlighting ESCO CDM methodologies and CDM bundling as examples of such an approach. Emphasizing that a large number of projects with high profitability are still precluded from implementation due to lack of funding, Hatano noted that funds can be made available by means of dedicated financial instruments based on public-private partnership. As an example, he explained a financing scheme based primarily on private funding with partial funding from the public sector through seed money, co-financing, and indirect support by governments and international financial institutions. Regarding capital market opportunities, he emphasized channeling developed country "green" money to "green" projects in developing countries, and targeting environmentally conscious investors. Following the presentation, participants raised questions on programmatic CDM, CDM bundling, financial additionality, CDM reform and its continuation beyond 2012.

DISCUSSION AND COMMENTS: Fun Ping, Ministry of Science and Technology, China, stressed the shortage of capital for investment, noting that potential project owners are unwilling to pay high transaction costs. He also underscored the need to reform the CDM in order to reduce transaction costs and make

it simpler. Satya Suman Tak, Ministry of Steel, India, mentioned that two NEDO model projects are being implemented in India. Ajay Mathur, Senergy Global Private Limited, India, stressed the need for financing the replication and up-scaling of model projects. Highlighting risks associated with the novelty of technologies and management, he said that the use of partial risk guarantee schemes is important in order to reduce such risks. Franciscus M. Agustinus, PT Garudafood Putra Putri Jaya, Indonesia, shared Indonesia's experience with government technical and financial support to the private sector for promoting energy efficiency. Alice Herrera, Department of Science and Technology, the Philippines, said that her country recognizes the importance of reducing greenhouse gas emissions, although there is no binding commitment under the Kyoto Protocol. She highlighted that with the introduction of the CDM, entrepreneurs' interest in environmentally-friendly business has increased, but that there is still a low level of understanding of the CDM. She welcomed the concept of ESCO CDM methodology, and stressed the importance of choosing appropriate financing schemes and reducing transaction costs. Thanarat Worasute, Department of Industrial Works, Thailand, described a successful model project of biogas generation from wastewater treatment sludge. He said the project could be replicated at a larger scale. As an example of environmental project financing schemes he mentioned the Thailand Energy Conservation Fund. Nguyen Chi Quang, Hanoi University of Technology, Vietnam, stressed the importance of carefully identifying financial mechanisms appropriate to country-specific conditions. He highlighted the need for not only hardware transfer, but also for know-how transfer, and called for information dissemination in many languages.

PANEL DISCUSSION: COOPERATION AMONG KEY SECTORS FOR TECHNOLOGY TRANSFER

Toshi Sakamoto, CTI, moderated this panel discussion, which included six panelists from government, industry, financial sector and international organizations.

Antonio Pflüger, IEA, noted the increasing relevance of clean technologies in government policies and corporate strategies. He noted the great potential of renewable energies, but warned that renewable energies are considered a matter for environment ministers in many countries, and fail to get the attention of these ministers. He underscored that fossil fuels will remain a pillar of energy supply, noting IEA's estimated expected \$US 5 trillion investment on power generation until 2025.

Robert Williams, UNIDO, noted that increased demand on energy efficiency in the last months is attributable to high energy prices. He underscored that energy efficiency is a continuous process, with a great potential for greenhouse gas reductions in the medium term (30 years). He said that high energy prices make many projects cost-effective, but that other barriers need to be overcome.

Ajay Mathur, Senergy Global Private Limited, underscored that the newness of technology, management and revenue collection for renewable energies inhibit their deployment. He stressed that investors adopt technologies only when the technology has been successfully deployed elsewhere. He pointed out three requirements for successful projects, including an appropriate product, appropriate policies and appropriate financing, and discussed the role of CDM for large and small projects, highlighting the importance of bundling for small projects.

Charlie Dou, Beijing Bergey Windpower Company Limited underscored the importance of operation, management and appropriate financing for renewable energies, highlighting training as essential. He underscored the need for national-level policies for technologies that do not qualify for CDM, noting that investors expect a reasonable return on investment.

Junji Hatano, Mitsubishi UFJ Securities Company Limited highlighted that CDM investors' concern is shifting from project approval to project risks, including reliability of technology, capability of management and finance. He also underscored the role of renewable energies and energy efficiency in national energy security, as well as language barriers to CDM project development.

Nguyen Khac Hieu, Ministry of Natural Resource and Environment, Vietnam, highlighted institutional arrangements, legal framework, and technical and finance barriers. He said host countries open up new opportunities for technology transfer and sustainable development by accepting the legal framework of CDM.

In the ensuing discussion, participants and panelists discussed CDM, information exchange, and energy dependence. It was noted that projects should be commercially viable and that the CDM should be considered the cherry on the cake. It was also noted that education and finance are both important and that they cannot replace one another.

CLOSING SESSION

Nguyen Khac Hieu, Ministry of Natural Resources and Environment, Vietnam, highlighted that the seminar has provided the participants with a comprehensive review of successful cases of energy efficiency and renewable energy technology transfer, but that efforts still need to be taken to promote energy conservation in developing countries. Summarizing the presentations and discussions, he said that the seminar addressed a number of important issues, including the economic effectiveness and sustainability of projects. He thanked the CTI and participants for their contributions, which have made the seminar a successful gathering.

Toshi Sakamoto, CTI Executive Committee, highlighted the broad participation of industry representatives in the seminar. He hoped that the seminar was useful in addressing, *inter alia*, policy implications and technical details of climate technology transfer. Closing the seminar, he thanked the Government of Vietnam for hosting the seminar, as well as speakers, moderators and participants for their contributions.

The meeting was closed at 1:02pm.

UPCOMING MEETINGS

WORKSHOP ON CLIMATE ADAPTATION CHALLENGES: BUILDING CAPACITY FOR AFRICAN BASED RESEARCH: This workshop is scheduled to take place from 26 - 28 March 2006, in Nairobi, Kenya. Participants will seek to support the capacity of African researchers, end users and stakeholders to identify key areas of future research on climate adaptation and to build capacity for climate adaptation. The event is organized by the Linking Climate Adaptation Network and will be hosted by the Institute of Development Studies the Africa Office of ActionAid International. For more information contact: Farhana Yamin, IDS; tel: +44-1273-606261; fax: +44-1273-621202; e-mail: f.yamin@ids.ac.uk; Internet: <http://www.linkingclimateadaptation.org>

WORKSHOP ON CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT: This workshop will be held from 7 - 8 April 2006, in New Delhi, India, and aims at exploring the linkages between climate change and sustainable development, and will report to CSD-14. It is organized by the UN Department of Economic and Social Affairs and The Energy Research Institute (TERI), with the support of the Government of India. For more information contact: UN Division for Sustainable Development; tel: +1-212-963-8102; fax: +1-212-963-4260; e-mail: dsd@un.org; Internet: http://www.un.org/esa/sustdev/ssissues/climate_change/climateChange_inter.htm

TWENTY-FIFTH SESSION OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC): The Panel will meet from 26 - 28 April 2006, in Louis, Mauritius. The session will address, *inter alia*, the IPCC Programme and Budget for 2006 to 2009 and Draft Rules of Procedures for the Election of the IPCC Bureau and any Task Force Bureau, and will review the IPCC Terms of Reference. For more information contact: Rudie Bourgeois, IPCC Secretariat; tel: +41-22-730-8208/84; fax: +41-22-730-8025/13; e-mail: IPCC-Sec@wmo.int; Internet: <http://www.ipcc.ch/meet/session25.htm>

FOURTEENTH SESSION OF THE UN COMMISSION ON SUSTAINABLE DEVELOPMENT (CSD-14): The Commission will meet from 1-12 May 2006, at the United Nations Headquarters in New York. The meeting will review progress on atmosphere/air pollution, climate change, energy and industrial development. For more information contact: UN Division for Sustainable Development; tel: +1-212-963-8102; fax: +1-212-963-4260; e-mail: dsd@un.org; Internet: <http://www.un.org/esa/sustdev/index.html>

CONFERENCE ON CLIMATE CHANGE TECHNOLOGY: ENGINEERING CHALLENGES AND SOLUTIONS IN THE 21ST CENTURY: This conference is scheduled to take place from 9 - 12 May 2006, in Ottawa, Canada, and aims to provide opportunities for engineers and others involved in climate change modeling, monitoring, mitigation, adaptation, education, investment and risk management to network and exchange views. For more information contact: John Grefford, Chair Organizing Committee; tel: +1-613-839-1108; fax: +1-613-839-1406; e-mail: Grefford@IEEE.org; Internet: <http://www.CCC2006.ca>

TWENTY-FOURTH SESSIONS OF THE SUBSIDIARY BODIES OF THE UN FRAMEWORK CONVENTION ON CLIMATE CHANGE (SB-24): The twenty-fourth Sessions of the Subsidiary Bodies (SB-24) of the UN Framework Convention on Climate Change will take place in Bonn, Germany, from 15-26 May 2006. For more information contact: UNFCCC Secretariat; tel: +49-228-815-1000; fax: +49-228-815-1999; e-mail: secretariat@unfccc.int; Internet: <http://www.unfccc.int>

TWELFTH CONFERENCE OF THE PARTIES TO THE UNFCCC AND SECOND MEETING OF THE PARTIES TO THE KYOTO PROTOCOL: UNFCCC COP 12 and Kyoto Protocol COP/MOP 2 will take place from 6-17 November 2006 in Nairobi, Kenya. These meetings will also coincide with the 25th meetings of the UNFCCC's subsidiary bodies. For more information, contact: UNFCCC Secretariat; tel: +49-228-815-1000; fax: +49-228-815-1999; e-mail: secretariat@unfccc.int; internet: <http://www.unfccc.int>