



**WORKING TOGETHER TO ACCELERATE
DEVELOPMENT AND DIFFUSION OF
CLIMATE-FRIENDLY TECHNOLOGIES AND
PRACTICES**

CTI CLIMATE
TECHNOLOGY
INITIATIVE

Message from the Chair

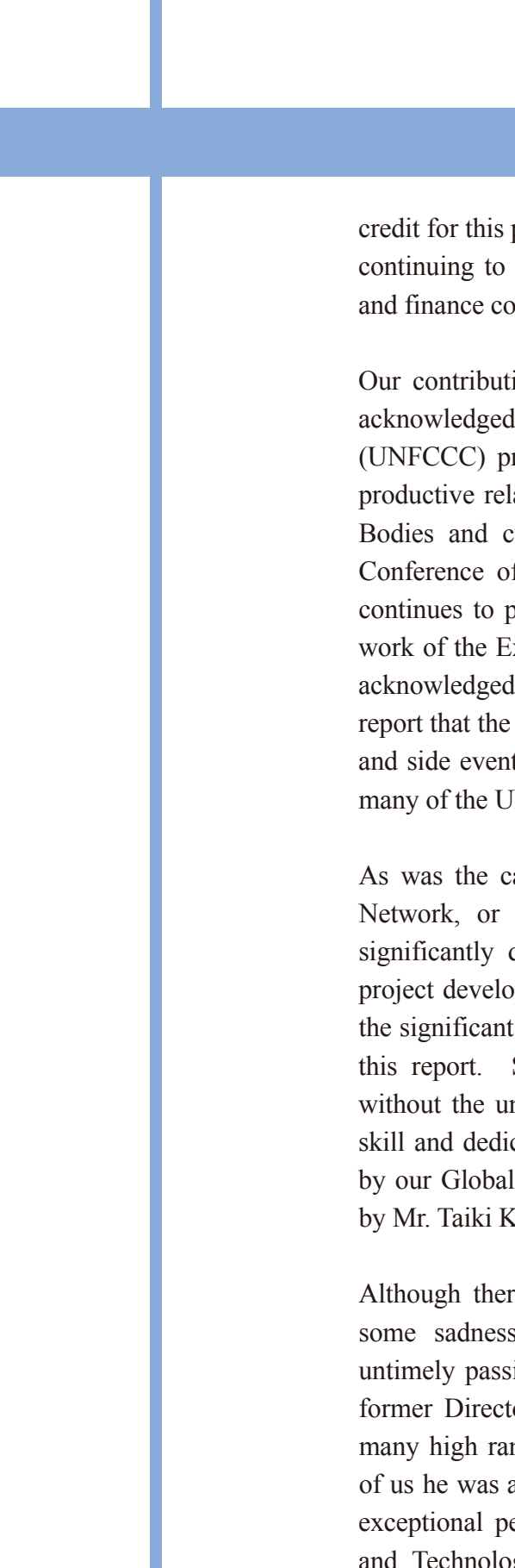
On 22 September 2010, my term as Chair of the Climate Technology Initiative (CTI) will officially come to an end. Although my current term was scheduled to close on 22 September 2009, I was concerned that given the growing scope and complexity of the CTI activities there was merit to providing my successor with some on-the-job training to provide for a smooth transition to new leadership. Given that situation, and after consultation with the Vice Chairs, I made a proposal to the Executive Committee that Mr. Michael Rantil of Sweden succeed me as Chair effective 22 September 2010, which was adopted unanimously by the Committee. I am confident that Michael will make an excellent Chair and will have the full support of the Executive Committee.

As was anticipated when we went to press with the 2008 Annual Report, Australia has become an official member of the CTI International Energy Agency Implementing Agreement. Given Australia's active and constructive engagement in a broad range of issues, including technology transfer, under the UNFCCC negotiations, I am confident that Australia will contribute in a similar manner to the work of the CTI. We are now eleven member-countries strong with invitations to join our implementing agreement issued to several others.

Although the 15th Conference of the Parties in Denmark did not yield the comprehensive package that we had hoped for, there remains optimism that the Copenhagen Accord is an operational agreement and a meaningful step forward by the global community to combat climate change and its impacts. As we have done in the past, the CTI will continue to provide a supportive role, particularly as related to fostering international cooperation for the accelerated development and diffusion of climate-friendly and environmentally sound technologies and practices.

Consistent with past practices, we continued to cooperate during the year with our colleagues in the UNFCCC Secretariat on a variety of activities including the hands-on workshops on the preparation of project financing proposals to enhance the access by project developers to private capital markets.

In recent years, we have been pleased to see a growing involvement of the private sector in the UNFCCC process. Although we cannot claim all the



credit for this positive trend, there is little doubt that the work of the CTI in continuing to cultivate productive relationships with the private business and finance communities has played an important role in this regard.

Our contribution to technology transfer continues to be recognized and acknowledged within the UN Framework Convention on Climate Change (UNFCCC) process with whom the CTI has maintained a longstanding productive relationship. Throughout 2009 at meetings of the Subsidiary Bodies and culminating in Copenhagen during December at the 15th Conference of the Parties (COP15), the constructive role CTI has and continues to play in matters related to technology transfer, including the work of the Expert Group on Technology Transfer (EGTT), was formally acknowledged in conclusions taken by the Parties. I am also pleased to report that the UNFCCC Secretariat participated in several of our activities and side events during the year and the CTI was an invited participant at many of the UNFCCC activities and side events as well.

As was the case during the prior year, our Private Financing Advisory Network, or PFAN, continued to expand and scale up its activities significantly during 2009 where we are successfully bringing together project developers and investors. Details of these activities and some of the significant financial closures achieved are summarized in Section II of this report. Such impressive results would never have been possible without the unyielding commitment of the CTI countries along with the skill and dedication of our network of private financing professionals led by our Global Coordinator, Mr. Peter Storey, with the invaluable support by Mr. Taiki Kuroda of the CTI Secretariat.

Although there were many high points during the year, there was also some sadness among the international climate community with the untimely passing of a true friend of CTI, the Honorable Chow Kok Kee former Director of the Malaysian Meteorological Service and holder of many high ranking leadership positions within the UNFCCC. To many of us he was affectionately known as “Chairman Chow” as a result of his exceptional performance as Chair of the Subsidiary Body for Scientific and Technological Advice. A few years back, as a reflection of his support for the work of the CTI, Chairman Chow was kind enough to provide us with a testimonial that appeared in our prior two annual reports. In honor of our dear friend Chow Kok Kee, and with the endorsement of his loving family, we are again including, among the testimonials, those

words by this respected individual who shall not be forgotten.

In closing, I wish to express my sincere appreciation for the active support of those serving as vice chairs during all or a portion of 2009, specifically Mr. Noriaki Ozawa of Japan, Mr. Franzjosef Schafhausen of Germany, and Mr. Michael Rantil of Sweden. And finally, we recognize the extraordinary level of support and professionalism that is provided on a daily basis by Mr. Taiki Kuroda and Ms. Yoko Hagiwara of the CTI Secretariat under the thoughtful leadership of Professor Morihiro Kurushima, our dedicated Programme Manager.

As I have said before, what makes me so very proud to be part of the CTI is that it is not about process, but about concrete actions that are now having, and will continue to have, important environmental and developmental benefits in the future. It has truly been an honor for me to work alongside so many fine people where our legacy might be succinctly expressed as: “collective efforts making a difference for the future.”

As a closing personal note, let me thank the Executive Committee for giving me the privilege and honor to serve as your Chair during the past several years and the support you have given me along with the commitment and expertise you have brought to our organization. During these years and the past decade, I have watched, along with many of you, the CTI mature into a relevant activity that is recognized internationally for its positive contributions. I look forward to remaining active in the CTI and watching it continue along this pathway to even greater success.

Elmer Holt

Executive Committee Chair

Climate Technology Initiative

Testimonials

“Technology is very much on the forefront of discussions on future action on climate change. We need to realize its full potential to achieve the deep cuts in greenhouse gas emissions that are needed to prevent the worst impacts and to enable people and societies to adapt to changes that will occur nevertheless. Significant reductions in greenhouse gas emissions in the long term will rely, to a large extent, on the development, deployment, diffusion and transfer of new and more efficient technologies.

I thank CTI and its member countries for their active engagement and support to the work of the Expert Group on Technology Transfer in promoting technology transfer activities under the Convention. Progress of work under CTI's pilot project on the Private Financing Advisory Network that seeks to broaden the access to private sector international financing for climate friendly technology and to further engage the private sector in our process is very encouraging. If successful, Parties to the UNFCCC may wish to build on this exercise and broaden its scope. I wish you success in continuing your work.”

Yvo de Boer
Executive Secretary, UNFCCC

“Having worked with the Climate Technology Initiative for many years, I am keenly aware of the significant contribution it has made to technology transfer under the UNFCCC process. In particular, I have appreciated CTI's contributions to the preparation of the handbook on conducting technology need assessments and this handbook's expansion to include technologies for adaptation. Additionally, I commend CTI on its forward thinking in the area of innovative options to finance technology transfer through, in collaboration with the EGTT, establishing the Private Financing Advisory Network that provides assistance to project proponents in developing countries in the preparation of their project financing proposals to meet the standards of the international private finance community. This work has played an invaluable part in advancing an understanding of technology transfer and related issues under the UNFCCC. I encourage the CTI to continue its good work and offer my cooperation in that regard.”

Kishan Kumarsingh
Technical Coordinator
Environmental Management Authority of Trinidad Tobago
Former Chair of the Subsidiary Body for Scientific and Technological Advice
Former Chair of the Expert Group on Technology Transfer (EGTT)

“The Private Financing Advisory Network (PFAN) initiative of the CTI provides an innovative platform for bringing to financial closure technology development and transfer projects identified by countries under their technology needs assessments. The PFAN forms part of a broad financial mechanism for technology transfer.”

William Kojo Agyemang-Bonsu
Vice-President of COP12
Former Chair of the Expert Group on Technology Transfer (EGTT)
UNFCCC Focal Point for Ghana
Environmental Protection Agency of Ghana

“In order to attain sustainable development among all countries and the overall objectives of the UNFCCC, there is a need to accelerate the transfer and development of climate related technology. Many technologies have been developed in recent years that address these pressing issues. International cooperation is the key element in addressing global warming and climate change. To this end, CTI has played an important role in the promotion of climate friendly technology in the last decade. I am confident that CTI, with its capable network, will continue to share valuable experiences, know-how and good practices for the benefit of mankind.”

Chow Kok Kee
Former Chair of the Subsidiary Body for Scientific and Technological Advice
Former Chair of the Expert Group on Technology Transfer (EGTT)

“When I look back to the variety of topics proposed by the organizers of the CTI Seminar, I cannot say that anything has been missed or neglected. There has been constant development of the concepts, ideas and fields to concentrate on next. This in turn means our seminars are in constant movement, well justified to current priorities of development of the world climate mitigation strategy and policy dialogue. I do very much hope we’ll go forward together, all of us, and try to have a thorough look at Kyoto first commitment period and also the post-Kyoto period issues. Continuous support from the CTI has greatly added value for all participants of the seminars.”

Tiit Kallaste
Director for Climate
Energy and Atmosphere Programme,
Estonian Institute for Sustainable Development

“The Climate Technology Initiative (CTI) Industry Joint Seminar in Delhi in March 2007 brought together experts and industry participants from a number of Asian countries who discussed successful cases of climate-friendly technology transfer, as well as policies and measures that have supported such technology transfer. As at other CTI seminars this seminar was too successful in helping to disseminate best practices, and in providing case studies on the effectiveness of new technologies, both to industry as well as to national economies.

The significant feature of the 2007 CTI Industry Joint seminar in Delhi was the session on financial mechanisms, which focused on Energy Service Companies (ESCOs). The seminar served as an extremely effective platform for the sharing of experience amongst various countries. In particular, the strong supportive role of ESCO associations, and the innovative use of risk guarantee mechanisms, provided useful examples of institutional and financial interventions which could enable the large scale implementation of energy efficiency projects through ESCOs.

This CTI seminar, like the many other CTI seminars which I have been associated with in the past, helped in providing industry participants with hands-on examples of successful technology transfer, and thus reduced their perception of uncertainty regarding the adoption of these new climate-friendly technologies. This reduction in perceived risk – of operating costs, performance, and of reliability – accelerates the adoption of climate-friendly technologies; a useful and direct outcome of the CTI Seminar.”

Ajay Mathur
Director General
Bureau of Energy Efficiency
Government of India
Ministry of Power

“CTI’s PFAN has helped us decrease development risk by targeting key risk points in the development process”

George Sorenson
Chairman
FE Clean Energy

“CTI has provided a venue for investment opportunities that would not have seen light in the traditional channels of financing.”

Enrique M. Gallardo, Jr.
Project Manager
Green Machines Enterprises

"During my visit to the National Renewable Energy Laboratory last fall under the CTI Expert Exchange Program, I had the opportunity to meet a number of the scientists responsible for programs and initiatives that NREL is currently involved with to accelerate clean energy deployment. From this exchange, I learned a great deal not only about those programs but also about the difficulties found at each stage of their implementation. I also learned about the partnerships that this institution has established with other scientific and technological institutions and how important it will be to extend these partnerships to other international institutions, in particular from developing countries.

I am grateful to the CTI for having given me the chance to meet knowledgeable and passionate people at NREL that makes me feel hopeful about the future role of the US in the global efforts to combat climate change."

Gabriel Blanco
Coordinador General de la Direccion de Cambio Climatico
Secretaria de Ambiente y Desarrollo Sustentable
Government of Argentina
Member of the Expert Group on Technology Transfer (EGTT)

"The CTI 's PFAN has been helping us structure financing for our small scale bio-mass projects in South Africa and Asia and has given us unique access to an investor and support network that is proving critical in our project development and implementation. PFAN has provided much needed input and help in areas where other institutions and financing instruments are simply not active or available. They have been flexible and responsive to our requirements. There needs to be more of this sort of help to project developers like us! We can thoroughly recommend PFAN to other developers of clean energy projects and hope that the expansion of PFAN is a success."

Dennis Rogers
Managing Director
*EDS Projects**
South Africa

* EDS (Energy Densification Systems) has developed and pioneered a densification technology which produces pellets and briquettes from bio-mass and / or coal dust tailings (dumps); these have high calorific value and can be used in traditional furnaces (sometimes requiring adaption depending on the pellet) to generate "clean" electricity. This technology has been successfully evaluated by Alstom for producing clean fuel for co-firing power stations (biomass and coal) and is also being rolled out in the UK. EDS is working with municipalities, the forest and agricultural and mining industries in South Africa and Asia to establish densification plants. PFAN is supporting EDS in project roll-out and in negotiations with off-takers of the pellets / briquettes. This is South – South / North Technology Transfer and serves to create a better and cleaner environment, employment and economic uplift in small rural communities.

Through CTI Private Financing Advisory Network, our company has found investment leads from all across the globe and developed links to important business partners. We have learned from CTI PFAN that it is vitally important to emphasize the major elements in the business plan that entice the interests of investors, and we have practically rewritten our business plan. The concrete advice and assistance provided by the CTI PFAN helped us reach out to investors in a most effective fashion.

Paul Rodriguez
President and CEO
ASEA One Power Corporation
Winner of the CTI PFAN Philippines Clean Energy Investor Forum

CTI PFAN helped ASEA One Power Corporation develop its business plan, and provided deal facilitation support, which catalysed USD 30M in investment for the company.



ASEA One Power Corporation (AOPC) President and CEO Mr. Paul Rodriguez (center) introduces Aklan Governor Carlito Marquez (right).

We have been an active participant in this event and have found it to be the most useful networking and deal sourcing conference, forum, and network in the region... – AFCEF has been outstanding in providing the most follow up and devoted attention to investors. In fact our first investment in Cambodia with W2E came within two months after their presentation in Singapore at last year's event which I attended. Funds like our's are often pressed to show substantial deal pipeline to our investors, having consolidated project briefs and vetted developers with intermediaries is frankly a perfect gift. It allows me to duplicate my efforts in multiple countries. For us the CTI PFAN event days are some of our most productive for business development and to get the big picture so to say.

*Austin Arensberg
Business Development Manager
Prime Energy Investments Ltd.*

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I . Introduction

The Climate Technology Initiative (CTI) was established at the first Conference of Parties to the United Nations Framework Convention on Climate Change (UNFCCC) in 1995 by 23 IEA/OECD Member Countries and the European Commission. Since July 2003, the CTI has been successfully functioning as an Implementing Agreement of the IEA. The current members of the CTI are: Australia, Austria, Canada, Finland, Germany, Japan, Norway, Republic of Korea, Sweden, the United Kingdom, and the United States of America. Its mission is to bring countries together to foster international co-operation in the accelerated development and diffusion of climate-friendly and environmentally sound technologies and practices. This report, covering the period between 1 January and 31 December 2009, is presented to the IEA in accordance with the Implementing Agreement for the CTI, as well as to stakeholders who may find the CTI activities relevant to their work.

The CTI participating countries undertake a broad range of co-operative activities in partnership with developing and transition countries and other international bodies. The CTI works closely with the UNFCCC process, including its Secretariat and the Expert Group on Technology Transfer (EGTT), relevant IEA Implementing Agreements and other international organisations and initiatives.

The CTI's activities are designed to be consistent with the UNFCCC objectives, in particular the framework for technology transfer incorporated in the Marrakech Accords and adopted at the Seventh Conference of the Parties to the UNFCCC (2001) and subsequently reaffirmed by decisions taken at the Thirteenth Conference of the Parties in Bali, Indonesia during December 2007. As an IEA Implementing Agreement, the CTI has continued to pursue relevant elements of its past programme and to extend it into new areas consistent with its overall objectives as well as the evolving needs of the affected stakeholders.

The CTI has received high praise from the UNFCCC for its contribution to technology transfer, particularly in respect of its collaboration with the EGTT, and been asked by the UNFCCC Secretariat and the EGTT through its Programme of Work to continue its financial and in-kind support for the implementation of the EGTT work in 2010.

II . Principal Activities

II - 1 Technology Needs Assessments

The CTI provides technical assistance to selected countries carrying out technology needs assessments (TNA). It also collaborates with the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP) on technology needs assessment methods training, including workshops. The CTI also develops and disseminates relevant materials and information on lessons learned. The CTI's objectives include advancing the development and use of coherent, and integrated, approaches to conducting technology needs assessments among developing and transition countries. Activities in this area support the development of a flexible methodology for conducting technology needs assessments that can respond effectively to circumstances and priorities of the particular country. Such activities are carried out in partnership with multilateral organisations, country partners and the private sector.

Unique conditions in every country rule out any generic approach to technology transfer. Country circumstances differ widely, and steps, sectors and options that apply in some countries may be inappropriate in others. This diversity of circumstance is often captured in the expression 'one size does not fit all'. However, there are many steps and considerations that are common to all, and an approach can be designed, as far as is practicable, to be modified and adapted to suit a given country's circumstances.

Specific activities include:

- Capacity building for technology needs assessments (TNAs);
- Technical assistance to countries carrying out needs assessments;
- Development of methodological approaches to technology needs assessments in partnership with relevant international organisations and the private business and financial sectors;
- Exchange of experiences about successful approaches to conducting technology needs assessments; and,
- Facilitating interaction between governments, agencies and relevant public and private international organisations on TNAs.

The UNFCCC Secretariat compiled the “Synthesis report on technology needs identified by Parties not included in Annex I to the Convention” presenting information on technology needs for mitigation and adaptation to climate change contained in 23 technology needs assessments (TNAs) and 25 initial national communications submitted by Parties not included in the Annex I to the Convention (non-Annex I Parties). The paragraph 9 and 10 of the synthesis report acknowledged the important role the CTI played in supporting technology needs assessments in the past, which read:

Paragraph 9: To help Parties conduct TNAs, UNDP developed a simplified, user-friendly handbook entitled Conducting technology needs assessments for climate change (hereinafter referred to as the TNA handbook), which provides guidance on identification of needs for technologies for mitigation of and adaptation to climate change. The TNA handbook, produced in collaboration with Climate Technology Initiative (CTI), the EGTT and the secretariat, was made available to Parties in 2004.

Paragraph 10: CTI, in collaboration with UNDP, organized three regional workshops to field-test and further develop the TNA handbook. The workshops provided a good opportunity to discuss regional concerns and priorities in assessing technology needs and to further assist Parties in conducting TNAs. CTI also provided support to Bolivia, Ghana, Malawi and the Southern Africa region to carry out TNAs.

The CTI also provided support to UNDP in updating the Handbook for Conducting Technology Needs Assessment for Climate Change (TNA Handbook) to provides a more detailed step-by-step guide for the development and implementation of a TNA and in particular in the development of technology programs and strategies in developing countries.

II - 2 Seminars and Symposia

The CTI has an ongoing programme of seminars and workshops, which are organized in support of the UNFCCC process, in order to facilitate the diffusion of climate friendly and environmentally sound technologies and

practices. Active participation of the private sector, international organisations and financial institutions is regularly sought.

The CTI held the **Asia Forum for Clean Energy Financing (AFCEF)** on 3-4 March 2009 at the Grand Park City Hall, Singapore in cooperation with CTI's Private Financing Advisory Network (CTI's PFAN), the International Center for Environmental Technology Transfer (ICETT), ReEx Capital Asia, the Sustainable Energy Association of Singapore (SEAS), and the USAID ECO-Asia Clean Development & Climate Program (ECO-Asia), and supported by SPRING Singapore and the International Enterprise Singapore. Aimed at bringing together project developers engaged in the development of clean energy businesses in ASEAN countries and investors and financiers interested in such activities, AFCEF served as a platform for the participants to explore business opportunities through presentations and discussions on their project proposals. In the lead-up to the AFCEF, more than 60 clean energy entrepreneurs submitted project proposals, out of which 11 short-listed project developers received one-on-one coaching and support in preparation of project proposals that are financially, socially, and environmentally viable.



AFCEF finalist clean energy entrepreneurs

The AFCEF was organized in two parts: a project development Workshop

attended by the 11 finalists and 10 semi-finalists, designed to provide further input and know-how transfer in the preparation of project proposals using input from outside experts as appropriate; and an investors Forum where each developer had 15 minutes to present his project proposal to a group of investors and a panel of 5 independent judges selected from the investor / financing community in ASEAN. It is noteworthy that over 200 registration applications were received from investors and interested parties to attend the Forum, but the actual attendance was limited to under 100 to ensure that these were investors and financiers deemed important for the event. The panel of judges awarded the CTI and ECO Asia Awards for Clean Energy Financing to the adjudged top three projects against a set of defined criteria. The first place CTI Clean Energy Financing Award went to the Spring-1 Team's Integrated Biogas-to-Energy and Bio-compost Facility, with the ACD Team's Asia Clean Diesel Project and Advon Singapore's Adsorption Desalination System taking second and third places respectively.



AFCEF panel of judges

During the course of the Workshop and the Forum, project developers received, over and above the provided guidelines, constructive guidance and advice from the PFAN consultants and the judges regarding key areas to pay particular attention to address and include in their business plans and presentations which are summarized below:

- Information and data on how the project development has been funded to date and by whom (including contribution of “sweat capital” if appropriate). Specifically investors want to see that the project developers are financially committed to their ideas.
- Scenario / stress analyses which are focused closely on the possible effects of the major identified project risk(s) not generalised, global risks (ie 5 % reduction in turnover unless this is the major specific project risk). There needs to be a qualitative assessment of risks: natural, political, financial, technical, human (loss of key personnel), etc. Where the qualitative risk can reasonably be translated into quantitative terms, it is appropriate to develop alternative scenarios based on them. However, the scenarios should not be offered in lieu of risk analysis.
- The “numbers”: required investment amounts for what share of the business; payback period and returns; underlying assumptions. These should be introduced into the business plan and the Power Point presentation at an early stage to grab the attention and make it clear what segment of the investor audience is being addressed.
- Analysis of the competition and key competitive threats. It is important to demonstrate that you are aware of where the competitive and technology threats to your business plan lie – through new technology developments, entrenched interests, economic changes which may impact your model negatively / benefit a competitor.
- Show that you understand the dynamics of the economic / commercial environment in which you are positioning your project – its key drivers and players and your respective strengths and weaknesses.
- Current development status of your project and where it is on the development path. What has been done and achieved (agreements already in place), what still remains to be achieved before implementation?
- Clear and full overview of what the requested investment funds will be used for. Provision of a source and applications of funds can be very useful in this respect.

- Macro picture / framework in which the investment takes place (external policies or factors affecting the investment environment)
- Keep the technology simple. The proposal should be clear about what is to be offered, and demonstrate briefly that the technology being proposed is proven or independently validated.

II - 3 Implementation Activities

The CTI facilitates technology implementation activities identified during the technology needs assessment process, including:

- Identifying priority clean energy technology sectors in partnership with developing countries;
- Implementing targeted activities in selected priority sectors to foster market development and clean energy technology transfer;
- Evaluating activities, and disseminating lessons learned, to inform market development and country activities in other regions and sectors; and,
- Developing a strategy for eliminating any institutional, informational or other barriers to establishing the necessary enabling environment for effective and lasting technology transfer.

II-3-(1) Private Financing Advisory Network (PFAN)

The CTI has taken a leadership role in exploring innovative options to finance technology transfer because it had become clear that there was not enough public funding to fully address the technology needs of developing and transition countries, thus necessitating the engagement of the private sector. In 2006, the CTI initiated a program called **CTI Private Financing Advisory Network (CTI PFAN)** in cooperation with the UNFCCC Expert Group on Technology Transfer (EGTT) and supported by a number of private sector companies in the financing sectors of the clean / renewable energy and energy efficiency industries (CE / RE / EE). PFAN's objectives are:

- to accelerate technology transfer and diffusion under the UNFCCC;
- increase the access to financing for clean energy / climate friendly technology transfer projects in developing countries and economies in

transition;

- to get more clean energy projects financed; and
- thereby, to reduce greenhouse gas emissions and promote low-carbon sustainable economic development in the transition to a low-carbon economy;

CTI PFAN was established to bridge the gap, which had been established to exist, between investors, financiers and available sources of finance and project developers - to help the parties speak the same language and thereby develop and produce financially viable, bankable business proposals. CTI PFAN is designed to be an “open source” network to fit seamlessly with existing global and regional initiatives and to be inclusive of all stakeholders with an interest in clean energy financing.

Overview of the PFAN and its Services

CTI PFAN is an alliance of private sector companies, gathered under the umbrella of the CTI, all experienced in providing financing and financing services to climate-friendly projects. Participants include specialist investment funds, institutional investors, philanthropic and developmental investors, strategic and industrial investors, banks as well as financing advisory consultants, all of whom are interested in triple bottom line investments that account for social and environmental values along with financial returns.

CTI PFAN identifies promising clean energy businesses and projects at an early stage and provides coaching for development of a viable business plan, preparation of an investment pitch and sourcing of investment, significantly enhancing the possibility of financial closure. Projects are selected based on seven key criteria – that they are competently managed, technically viable, economically viable, sustainable, environmentally beneficial, socially responsible and contribute to a reduction in greenhouse gas emissions.

For those clean energy businesses that are selected, CTI PFAN offers a number of specific services, all of which are provided without charge:

- *Advice and Guidance* on overall project structure, financial structuring, sourcing of equity and debt financing, technical project aspects, business growth strategy, preparation and presentation of business plans.

- *Technical Assistance.* Limited funding may be available to selected projects for feasibility and technical studies.
- *Matching Projects with Investors.* Selected projects are introduced to investors via showcasing at Clean Energy Investor Forums organized by CTI PFAN and / or by direct introduction to network investors and other potential investment sources

Early Evolution and Development of CTI PFAN (2006 – 2008)

CTI PFAN activities commenced in early 2006 and were conducted as a small scale pilot programme up to the middle of 2008 which saw some 12 projects being formally inducted into the development pipeline (from 65 reviewed) and 2 projects (a small hydro power plant in Mexico and a bio fuels refinery in Brazil) being guided to financial closure, raising a total of USD 35 million of investment.

Based on this success CTI together with a number of other Funding Partners embarked on a major scaling-up programme to establish CTI PFAN as a major global operation with networks in Latin America, Asia, Africa, CIS and Eastern Europe.

PFAN Funding Partners

In the meantime CTI PFAN activities are funded by the CTI and other Funding Partners including the United States Agency for International Development (USAID), Asia Pacific Partnership (APP) and the Renewable Energy and Energy Efficiency Partnership. In addition the private sector PFAN Members commit matching funds and contributions (in the form of discounted service rates and fees) to the extent of roughly 100 % of the Funding Partners funding.

Highlights of 2009 Activities

- Launch, establishment and build-out of the Asian Regional Network including dedicated country networks in China, Indonesia and the Philippines.
- Successful introduction of the Clean Energy Financing Forum format as a highly effective instrument to identify projects and grab investor attention. 2009 saw the 1st Regional Asia Forum for Clean Energy Financing held in Singapore (for the ASEAN region) and dedicated

country Fora held in the Indonesia, Philippines and China. Some 33 projects were showcased at these Fora selected out of over 110 applications in all and attended by over 400 participants ranging from investors, bankers, project developers, entrepreneurs and policy makers.

- Launch, establishment and build out of the African Regional Network including dedicated country networks in Mozambique and Uganda. Preparations for the launch of the Africa Forum for Clean Energy Financing to be held in July 2010 in Johannesburg.
- Further expansion of the Latin American & Caribbean Network and scale up of project development activities in Brazil, Chile, Columbia and Mexico. Preparations for the launch of the Brazil Forum for Clean Energy Financing to be held in June 2010.
- The Global Network now numbers some 40 fully signed up members, including investors and consultants. Through the Clean Energy Financing Fora we have developed a database of over 250 investors having an interest in clean energy projects.
- Accelerated project identification leading to some 38 new projects being inducted into the global development pipeline. The development pipeline now includes some 46 projects representing a required total investment of USD 1,7 billion.
- Two further financial closings with USD 31,1 million being raised on the back of CTI PFAN work for projects in the Philippines: USD 30 million for a 12 MW biomass plant and USD 1,1 million for a W2E plant using biomass waste from the food processing industry. Both of these projects were identified and developed through the Clean Energy Financing Fora (in the Philippines and the Regional Forum for ASEAN), thereby validating the concept and its usefulness.
- This brings the total of financing leveraged by CTI PFAN to USD 71,1 million.
- Launch of the dedicated CTI PFAN website at www.cti-pfan.net.

Closing Summary

As it expands and evolves CTI PFAN is confirming its initial promise as a highly innovative and effective instrument in raising finance for clean energy projects in developing countries & transition economies and thereby facilitating technology transfer.

2009 was an extremely busy and productive year for the program not least in establishing structures and procedures for the operation of an expanded network which should increasingly start to pay dividends in terms of facilitating increased project identification and development activity, particularly in Asia but also increasingly in Africa and Latin America.

II -3-(2) Energy Efficiency Intervention Program in Gujarat, India

CTI supports an on-going program which aims to reduce the greenhouse gas emissions and improve the environment through energy efficiency intervention in Bhavnagar Rolling Mill Cluster in Gujarat, India. The program started with the survey to better understand composition and functionality of the steel rolling units in Bhavnagar Rolling Mill Cluster which assumes great importance for its energy intensive hub comprising of 60 operational rolling mill units that convert steel ingots to hot rolled bar and flat products. Almost all the units in the cluster are located in either of the two concentration pockets: Bhavnagar and Sihor areas, collectively called “Bhavnagar Rolling Mill Cluster”. With the help of industrial associations, four model units were chosen for conducting energy audit study for understanding the baseline situation and for identifying short, medium and long term options for energy efficiency improvements. In consultation with Bhavnagar and Sihor Steel Re-Rolling Mills association, M/s Vijay was selected as the demonstration unit for conducting further study and implementation of equipment upgrade for the re-heating furnace. Allied Furnace Pvt. Ltd., (AFPL) in cooperation with the Japanese expert, drafted the furnace design with improved energy efficiency for M/s Vijay.

Activities accomplished

1. Procurement of material and equipments as per Bill of Material for Vijay’s furnace.

Based on the Bill of Material received together with the design and drawing details of the furnace, the required materials/equipment were divided into following categories.

- Furnace refractory and insulation;
- Structural steel components for furnace;
- Thermo-electric equipments and instrumentation; and,
- Services of experts for various skilled tasks

2. Construction activities for Vijay's furnace

Furnace construction activities were undertaken at M/s Vijay Steels after closure of production activities on November 2, 2009. The existing furnace was brought to workable temperature by forced air drafts and the furnace was finally dismantled on November 4, 2009. Various activities for furnace construction were monitored on a daily basis. Status reports of various stages were prepared and discussed by the project team on site to review the previous targets and to set the new targets for the next activities of implementation.



Picture 1



Picture 2

Picture 1 shows the fabrication work for furnace structure components. The fabricator is seen making the neck portion of the beams, which is distinctly visible as the V-shaped component. Picture 2 shows construction for extension of preheating zone and pusher foundation at the charging end of the furnace. The pits in the brickwork are meant for locating the pusher foundation bolts and packing with concrete mixture material for increased strength.



Picture 3



Picture 4

Picture 3 shows the stage of the suspended roof installation activity. This is an inside view of placement of refractory bricks at the neck region which separates soaking and heating zones inside the furnace. Workers adjusted the height from hearth to the furnace roof and the completed neck of the furnace. Picture 4 shows the fabrication and installation of pipe work in the furnace for air and coal flow and fabrication of burners. Separate lines were laid down for coal and airflow and burners were installed at heating and soaking zone respectively.

3. Commissioning activities for Vijay's furnace

Furnace commissioning activities were started after completion of construction activities for all furnace components and subsequent curing of foundation and brickwork. The furnace was fired initially with firewood logs on November 22, 2009. However due to a major disruption in the plant, not attributable to the furnace, the plant was shut down for a few days and commissioning activities resumed on December 1, 2009. As part of the commissioning activity, various operational parameters of the furnace, for example zone temperature, start up time, production output, coal flow etc are being recorded on a regular basis.

4. Post modification Energy Audit for Vijay's furnace

(1) Surface Temperature Study

Surface temperature of the furnace was recorded after the furnace had reached the steady state of operation. The measurements have been averaged out by dividing each zone into a number of sub-zones having almost equal surface area. The surface temperature in respective zone has decreased from 78 °C to 67 °C in preheating zone, from 103 °C to 85 °C in heating zone and from 143 °C to 99 °C in soaking zone. The reduction in surface temperature of the furnace shall be reflected in the

reduction in radiation losses from the surface of the furnace.

(2) Furnace Thermal Efficiency

The heat distribution inside the furnace was monitored by measuring the temperature inside each zone using a contact type thermocouple at regular intervals. The furnace efficiency has increased to 47% after the modification compared to pre-modification value of 28.6%. The improved efficiency is attributable to reduction in dry flue gas loss, which was achieved by reduction in excess air and complete combustion of fuel.

(3) Scale Loss Study

Scale loss study was carried out by the same methodology used for the baseline measurement. Since scale loss is an important parameter for the re-rolling mills, the results were ascertained by conducting greater number of sample trials. The scale loss has been substantially reduced from almost 8% in the pre-demonstration to just 5% after the demonstration activity. The reduction in scale loss is expected to generate significant monetary savings for the industry.

(4) Environmental Performance Study

Monitoring of ambient air composition was carried out at two monitoring points in and around the mill. Since the distance from source of fugitive emissions i.e. the furnace affects the ambient air composition, one monitoring point was located near the furnace – to study the composition of ambient air at the workplace, while the other was located near the storage area in front of the administration building to study the effect of furnace operation on the nearby campus. Suspended Particulate Matter (SPM) has approximately been reduced in half in the working area as well as the nearby locations of the unit. The environmental performance of the furnace in terms of effect on ambient air quality has been improved. Volumetric flow of flue gas has increased through the stack, which reduces SPM and smoke emission from the furnace charging point and thus improve the working environment of the unit. The implemented technology has been proven to be more environmentally-friendly as compared to existing technology in the cluster. There is significant reduction in the amount of unburnt coal both in bottom ash and the particulate matter in the stack.

Future course of action

The project objective in FY2010 is to promote energy efficiency improvement and reduction of GHG emission through dissemination of the technology demonstrated under FY2009 activities of the ICETT and Winrock International India initiative and undertaking other accompanying measures. The main scopes of this project in FY2010 are listed below.

- Effective dissemination of the demonstrated technology;
- Capacity building for engineers in the Bhavnagar rolling mills cluster in the area of energy efficiency improvement;
- Technical discussion by walk-through energy audit and technical consultantation for rolling mills; and,
- Conduating feasibility study of programmatic CDM approach

II-4 Training Courses

Training courses are organised in collaboration with relevant international organisations, with a focus on the special requirements and circumstances of the target countries/regions. Specific activities include:

- Capacity building for technology needs assessment, project planning and assessment, and establishment of institutional settings;
- Information dissemination about environmentally sound technologies and best practices appropriate to the region and circumstances of the target country;
- Identification of financing needs and alternative means of project financing;
- Exchange of experiences in the use of successful environmental and energy policy instruments (e.g. law, taxes, subsidies etc.);
- Professional education and training;
- Initiation and strengthening of networking between agencies/centres for energy saving, energy efficiency and renewable energy; and,
- Facilitating interaction between governments, agencies, and relevant international and other organisations.

The 10th CTI Seminar on Programmatic Approaches of JI and CDM: Business Opportunities for Emission Reduction took place on November 2-3, 2009 in Seehotel Zeuthen, Berlin-Zeuthen, Germany. The seminar was initiated under the framework of the Clean Technology Initiative (CTI) and sponsored by the German Federal Ministry of

Environment, Nature Conservation and Nuclear Safety. It was organized by DIW Econ GmbH in cooperation with the PoA Support Center of the Kreditanstalt für Wiederaufbau (KfW).

The seminar provided an opportunity for policy makers and financial institutions, companies from oil, gas, utilities and agricultural sectors, DNAs and governmental authorities as well as project developers to learn and to exchange existing experience in the field of idea generation, development and implementation of programmatic JI/CDM projects. The goal of the seminar was to raise awareness about existing and potential programmatic JI/CDM project opportunities in East European EU Member States, in Russia and Ukraine, as well as in Azerbaijan and Central Asia, and to promote interest in flexible programmatic mechanisms among large industry representatives, banks and governments of the targeted regions. Furthermore, the seminar was designed to inform the participants about additional business opportunities offered by programmatic JI/CDM projects, best PoA practices, methodologies and options for financing PoA project ideas. The seminar also discussed the challenges of PoAs and the opportunities for overcoming existing barriers.



Seminar participants

During the two-day workshop, participants heard 24 presentations and

were offered an opportunity to set up and to participate in business-to-business meetings to discuss the specifics of their on-going or potential PoA projects with investors, technology developers and PoA experts. The presentations and discussions conducted during the seminar indicated a general agreement about the importance of JI/CDM PoAs as instruments for reducing GHG emissions in the future. The participants expressed optimism about further development of projects under the framework of programmatic flexible mechanisms in the post-Kyoto future. However, they expected the COP 15 in Copenhagen to clarify the direction in which this development should take place and to facilitate approval procedures.

Overall, 51 participants took part in the seminar. The largest group of participants represented DNAs/NFPs and National Agencies. These institutions are especially relevant for the development of PoAs since a clear political and legal framework for the functioning of flexible mechanisms is needed. Two other important groups of participants were local financial institutions and companies from the energy and agricultural sectors, which have sufficient capacities to become initiators and operators of programmatic JI/CDM projects in the future.

Programmatic approaches to JI and CDM are an interesting and useful instrument for directing additional resources and capacity toward GHG emission reduction. PoAs offer numerous business opportunities for different actors such as municipalities, utilities, banks and other private or public entities. Host parties of a PoA can generate revenues which otherwise could not be attained under standard JI or CDM projects. There is a vast potential for PoAs in all countries whose representatives participated in the seminar.

The seminar provided professional insights into the main requirements of PoAs and allowed participants to share experiences derived from PoA projects that are currently under development. Examples and potential sources of PoA financing were discussed during the seminar as well. Most of the seminar participants highlighted the issue of a shortage of information and a lack of capabilities for PoA development and implementation. Additional capacity building will be necessary in the future in order to ensure that the seminar's target countries are able to access the benefits of programmatic approaches to JI/CDM.

II - 5 Information Dissemination

One objective of the CTI is to facilitate information dissemination among governments, industry, academia and relevant international and other organisations, and to support the diffusion of climate-friendly and environmentally sound technologies and practices.

The CTI also provides support for UNFCCC-organised seminars and workshops, designed to better inform participants on key technology transfer issues, including enabling environments, technology needs assessment, technology information resources and capacity building.

The CTI organizes side events at UNFCCC events to share experiences and lessons learned from CTI-supported technology transfer activities in collaboration with developing and transition country partners.

The following activities were undertaken and completed in 2009:

II-5-(1) The CTI held a side event at the UNFCCC, SB30 meetings in Bonn, Germany on 5 June 2009, led by Mr. Elmer Holt, Chair of the CTI. The event entitled “Implementing & Accelerating Technology Transfer for the Transition to a Low Carbon Economy -- Lessons from the work of CTI and UNDP --” was well attended by over 40 participants from a broad range of stakeholders including national delegates, private sector, international organizations, and NGO representatives. Using a panel format, the event presented an overview of CTI’s recent work, an introduction by the UN Development Programme (UNDP) of the updated Handbook for Conducting a Technology Needs Assessment (TNA), and lessons learned in terms of successful ways to increase access to financing for the deployment of lower carbon technologies.



Mr. Holt opened the side event with an introduction and overview of the CTI, noting the important role the private sector plays in the enhancement of technology transfer activities. As such, the CTI has made the engagement of this key group a particular focus of its efforts. He welcomed that the debate and discussions on technology transfer within the UNFCCC process has shifted in recent years to consider not only the activities inside the Convention but also those outside the process where the majority of actual technology transfer occurs.

The first panelist, Mr. Minoru Takada, UNDP's Head of Sustainable Energy Programme, Environment and Energy Group, Bureau for Development Policy, introduced the updated Handbook for Conducting Technology Needs Assessment for Climate Change (TNA Handbook) noting that the UNDP was tasked by the Parties and the Expert Group on Technology Transfer (EGTT) to work with other relevant organizations to update the TNA Handbook. His comments are as follows. CTI was one of the first organizations to support UNDP in updating the TNA Handbook by providing expertise to the effort. The TNA started in conjunction with the National Communications programme in 2000 with support from UNDP and United Nations Environment Programme. UNDP produced the first TNA Handbook in 2004 learning from the experiences of those conducting TNAs and the methodology developed by the CTI. In response to the calls for enhanced TNAs that prioritizes technologies, practices, and policy reforms that can be implemented in different sectors of a country to reduce greenhouse gas emissions and to adapt to the impacts of climate change by enhancing resilience, UNDP in collaboration with other partners like CTI started to revise the TNA Handbook to incorporate a more analytical approach. The updated Handbook provides a more detailed step-by-step guide for the development and implementation of a TNA and in particular in the development of technology programs and strategies in developing countries. In response to a more rapidly changing climate, prioritization could result in priority technologies that are still in the research and development stage and therefore not available in the short term. Seen in that context, a distinction is made between technologies that are available in the short term, and mid/long term. TNA results need to be fed directly into national visions and strategies for addressing mitigation and adaptation challenges, such as Nationally Appropriate Mitigation Actions (NAMAs) and National Adaptation Plans of Action (NAPAs). In support of the TNA process, an online information exchange system called TechWiki,

and a multi-criteria decision analysis support tool called TNAssess are under development. The TNA Handbook will be field-tested working with several countries after which a refined version will be prepared in time for the COP15 in Copenhagen.

The next panelist, Mr. Peter Storey, the PFAN coordinator, PPL International, presented the outline of CTI's Private Financing Advisory Network (PFAN), focusing in particular on the current activities and plans for the future as follows. PFAN is a multilateral initiative organized under the umbrella of CTI with contributions from CTI member countries, USAID, ICETT, APP, and REEEP which offers a free project financing advisory and investment matchmaking service to project developers to help them raise private sector finance. PFAN programme received endorsement in COP13 decisions (4 / CP.13) for its work during the pilot phase, which led to the expansion of the programme with new funding from USAID, APP and CTI. The PFAN network in Asia is rapidly expanding with administrative support from ECO-Asia in network coordination and project identification. Currently ten projects are in development pipeline with further 26 projects under initial review. Asia Forum for Clean Energy Financing (AFCEF) organised and sponsored by CTI and ICETT attracted 60 submissions out of which 11 projects were shortlisted for coaching and showcasing before investors. The CTI Clean Energy Financing Award was presented to the top three proposals judged by an independent panel of experts from the field of international finance. The Latin America and Caribbean network has extensive coverage of investors and consultants on the ground in Brazil, Chile, Columbia and Mexico. Based on the success of AFCEF, an investor forum is planned in early 2010 in Brazil targeting the whole region. The Africa network is under development starting with dedicated country networks in Uganda and Mozambique from June / July 2009. One of the areas where PFAN adds value is through its early filter role to sort the good projects from the bad, thereby enabling developers to concentrate on projects with investment potential resulting in resource optimisation. There is a great opportunity in the market to involve the private sector due to the recent financial crisis that closed a number of markets, and the risk appetite has shifted towards stable and long-term returns offered by renewable and clean energy businesses. CTI's PFAN currently focuses on mitigation projects, but going forward upstream technology development, adaptation projects, and possibly forestry are envisaged for PFAN support.

The third panelist, Mr. Andy Schroeter, Director of Sunlabob Renewable Energy Ltd who participated in the Asia Forum on Clean Energy Financing (AFCEF) presented his experiences as a private energy provider for off-grid areas where residents do not have sufficient resources to pay for the hardware. Under these conditions, the proven models include renting out solar home system for fixed monthly tariffs, selling KWhs in villages with village hybrid grids, selling drinking water purified by solar power, and selling light per hour with portable battery lamps, enable the residents to pay for the services, but not the hardware. The benefits of the solar lantern rental system range from displacement of kerosene lamps to carbon accountability enabled by automated data collection. There is a plan under discussion for solar lantern rental systems in Uganda, Afghanistan and Indonesia where millions of people are without access to electricity, but the same model could work anywhere in the world. The concept and the technology are both tried and tested from ten years of market experience. In closing, Mr. Schroeter emphasized the need for better coordination among the donor community in order not to distort the market for commercial operations and underscored the effectiveness of the AFCEF where project developers had a chance to present project proposals in front of over one hundred private investors.

The final panelist, Mr. Alan Miller, Principal Climate Change Specialist, Climate Change Environment and Social Development Department with the World Bank Group's International Finance Corporation, emphasized the urgent need to redirect private sector investment to clean energy projects in order to achieve the objectives of the UNFCCC. Mr. Miller's remarks included that: The UNFCCC estimates that 86% of all the funds used for mitigation and adaptation will come from private sources. The need to leverage the limited amount of public funds to mobilize private sector investment has been recognized since the creation of Global Environment Facility that made available flexible and highly concessional funding for building models to create sustainable markets for climate friendly projects. Clean energy financing is becoming an increasingly viable model for commercial investment opportunities without concessional funding or carbon financing. The urgent need to scale up the uptake of climate friendly technologies requires programmatic approach, involving private funding sources such as pension funds.

Presentations were followed by a lively period of questions and discussion led by Mr. Holt. In response to a question regarding the side effects of

displacing kerosene dealers in the operating area, Mr. Schroeter noted that the existing dealers are incorporated into the newly created value chain as charging station operators, and it is in the interest of the company to create a sustainable market that is fully commercial. In response to a question regarding the role of carbon financing, Mr. Miller indicated that carbon should be considered just as one part of whole financing package. Additional informal discussions continued for nearly an hour following the allotted time.

Mr. Holt thanked all CTI member countries for their continuing support to the CTI activities. He closed the meeting with appreciation to the panelists and participants for their contribution to the useful discussion that hopefully provided a better understanding of the broad range of activities being pursued by the CTI and its partners in order to facilitate technology transfer and how the lessons learned from those activities are leading to improved access to financing particularly private capital market to accelerate the broader diffusion of environmentally sound technologies.

The presentations are available for download from the CTI website address below.

http://www.climatech.net/events/index_new_detail.cfm?Page=1&EventsID=8007

II -5-(2) The CTI held two side events during the UN Climate Change Conference in Copenhagen. The first event entitled “Mobilizing private sector financing for mitigating climate change and promoting development using CTI PFAN” was organized with USAID and held at the US Center at the Conference and was well attended by over 60 participants; the second event was jointly organized with Energy Research Center of the Netherlands (ECN), National Renewable Energy Laboratory (NREL), and Ecologic Institute and entitled “Accelerating cooperation and financing for climate technology: Innovative programs and experiences” and was attended by over 120 participants. In both cases the participants came from a broad range of stakeholders including national delegates, private sector, international organizations, and NGO representatives. In both events, CTI presented its recent activities in particular the CTI PFAN that is successfully operating in Latin America, Africa and Asia. It was highlighted that CTI PFAN has successfully raised 75 million dollars of investment, and is currently working on over 60 projects representing over 1.7 billion dollars of required investment.

The side events showcased examples of activities in a broad range of developing countries, focusing on Asia, Africa and Brazil.



During the second event, Alvaro Umaña, Costa Rica, and Elmer Holt, CTI Chair, presented the Fiorello H. La Guardia Foundation “One World Award” in recognition of work in clean technology transfer that advances sustainable agriculture. The recipients of the award were Bakir Lozane of Lozane Farms, Maputo, Mozambique, and Jose Roberto Fonseca of Instituto Eco-Engenho, Maceio, Brazil who are implementing projects with support from CTI PFAN. ECN and NREL presented a joint NREL, ECN, Risoe paper on concrete and practical options for clean energy technology cooperation under the UNFCCC. The side event was selected by the UNFCCC secretariat for webcast which is available on-demand from the address below.

http://www7.cop15.meta-fusion.com/kongresse/cop15/templ/play.php?id_kongressmain=1&theme=unfccc&id_kongresssession=2492



Presentation files from both side events can be downloaded from the CTI website address below.

http://www.climatetech.net/events/index_new_detail.cfm?Page=1&EventsID=8121

II - 6 Support Activities

The CTI held its 13th Executive Committee meeting in Stockholm on 23-24 April 2009, and its 14th meeting in London on 15-16 October 2009 to facilitate the efficient functioning and integration of the various activities and tasks under the CTI Programme of Work. One of the key objectives of support activities is the communication and publication of the CTI activities through pamphlets, documents and a well maintained website. CTI Annual Report 2008 in hard and soft copies, and CTI PFAN information pack were produced and distributed at the Bonn Climate Change Talks 2009, and the UN Climate Change Conference in Copenhagen.

III. Financing

The CTI derives all its funding from contributions of participating countries. In 2009, these contributions totalled EUR 864,181. In addition to these financial contributions, CTI members contribute to CTI activities by sending their government officials to meetings, finding appropriate private sector experts, bridging relevant organisations such as UN bodies, and other in-kind activities.

A common fund has been established to carry out programme-wide support activities to facilitate the efficient functioning of the Programme of Work. Included among the actions supported by this common fund is the communication and publication of CTI activities through pamphlets, documents and a well maintained website. Each participating country paid a minimum core contribution of 10,000 EUR.

IV. Publications

CTI publications, available on the CTI website noted below, include the following:

- Methods for Climate Change Technology Transfer Needs Assessments and Implementing Activities: Experiences of Developing and Transition Countries;
- Technology Without Borders: Case Studies of Successful Technology Transfer; and,
- Key challenges in stimulating diffusion of clean technologies in Latin America (also available in Spanish).

V. Website

For more details on CTI activities and an up-to-date list of events, please consult the CTI website <www.climatech.net> and the newly launched CTI PFAN website <<http://www.cti-pfan.net>>



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Climate Technology Initiative

The Climate Technology Initiative is one of the International Energy Agency's Implementing Agreements, within the IEA's Framework for International Energy Technology Cooperation. The CTI's objective is to foster international co-operation for accelerated development and diffusion of climate friendly technologies and practices. For more information - see www.climatetech.net

