Final Report

SFAA No. DEFC02-98CH10961
"Technical Assistance for Joint Implementation and Other Supporting Mechanisms and Measures for Greenhouse Gas Emissions Mitigation"

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Final Report - USIJI Project Identification and Capacity Building

This report summarizes the activities under SFAA No. DE-FC02-98CH10961, “Technical Assistance for Joint Implementation and Other Supporting Mechanisms and Measures for Greenhouse Gas Emissions Mitigation”.

Overview

Over the past six years, IIEC, a division of the Civil Engineering Research Foundation (CERF), has developed an extensive base of experience implementing activities that support climate action by developing USIJI projects in transitional countries within Asia, Latin America, Central and Eastern Europe and southern Africa. Through regional offices in Bangkok, Johannesburg and London, and project/partner offices in Manila, Beijing, Mumbai, Buenos Aires, Rio de Janeiro, Tblisi and Kiev, IIEC has been able to provide a range of technical and policy assistance to governments and industry in support of sustainable energy use. IIEC continues to work in key countries with local partners to develop and implement energy efficiency policies and standards, develop site-specific projects and assist governing bodies to establish national priorities and evaluation criteria for approving GHG-mitigation projects.

In the Philippines, Chile and South Africa, IIEC has developed projects that have been approved by the USIJI Evaluation Panel. In each of these countries, IIEC’s projects were among the first AIJ projects to be reviewed by the national climate change committees and thus played an important role in developing and shaping the procedures used by those committees. As part of this particular phase of the project, IIEC focused on promoting a series of activities in Thailand and South Africa in order to identify GHG mitigation projects and work within the national approval process of those countries. The following sections outline the activities conducted in each country in order to achieve that goal.
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1.0 Thailand

IIEC has extensive experience with climate related support activities in Asia. IIEC’s Asia Regional Office, based in Bangkok, provided assistance to the governments of Indonesia, the Philippines, China and Thailand in the lead up to Kyoto, helping to identify potential mitigation options, conducting scoping meetings, and reviewing their national action plans.

IIEC also collaborated with several non-government organizations in these countries to gain an understanding of the issues and to engage their governments in policy discussions leading up to the Conference of the Parties meeting in Kyoto. These NGOs included Climate Action Network South East Asia (CANSEA), Pelangi Indonesia, Green Forum (Philippines), and Friends of the Earth (Japan). IIEC’s assistance to these organizations helped ensure that their voices were heard in the policy discussions and negotiations in preparation for and during COP-3.

The activities outlined in the SOW for this phase of the project in Thailand were to be carried out during the period running from September 20, 1999 through September 30, 2001. All the activities we report on below took place in that time frame. We have for clarity’s sake, however, divided the project reporting into two distinct sub-periods, the first reflecting activities done from September 1999 through December 2000 and the second reflecting those that took place between January 2001 and September 2001.

There are several reasons for reporting the project as two distinct phases. First, there was a temporary lull in the work at the beginning of 2000 while the Bangkok office searched for a JI specific project manager. Though that new manager came on board in July and was able to move IIEC’s JI efforts forward, the Thai government’s reluctance to be involved in the JI program while questions about the future remained unresolved, hampered efforts to sell the program to industry there. Several promising leads with specific companies did not end up bearing fruit. At the beginning of 2001, IIEC’s activities had to be redirected to reflect the political reality arising from the Thai government’s very lukewarm reception of the US’s JI Program, the outcome at the Hague, and the new administration’s stance on the Kyoto Protocol. The work plan as it currently stands is progressing well and is designed to promote GHG reduction projects, regardless of the political framework that ends up governing the sale and use of credits.

1.1 Activities occurring September 1999 – December 2000:

In cooperation with utilities, government authorities, NGOs, and private companies, IIEC began to identify potential projects for the USJJI program. IIEC began by meeting with key agencies to assess the current political environment in Thailand and to identify potential projects. IIEC collected information on potential projects and prioritized them according to perceived potential for near-term participation in the USJJI program.
1.1.1 Task 1 – Meetings with Government Officials and NGOs

Federation of Thai Industries (FTI) Meeting on Clean Development Mechanism (CDM)

IIEC gained interest from the Federation of Thai Industries (FTI) to host a half-day meeting in January 2000, at which member industries and relevant Thai government agencies could exchange information and inputs regarding how the Clean Development Mechanism (CDM) might work for Thailand. The procedures and logistics surrounding the implementation of CDM projects were to be discussed in detail at the sixth Conference of the Parties to be held on November 2000. The FTI meeting served as a starting point. Thai industry was able to provide input to the Thai government’s position on CDM procedures.

The Office of Environmental Policy and Planning (OEPP) of the Thai Ministry of Science, Technology, and Environment provided a resource speaker on CDM and other climate change issues for the planned FTI meeting. The Meeting Summary Report is attached as Appendix A.

In terms of relevance to this project, it is important to note that the member industries that participated in the FTI meeting are also prime candidates for submitting AIJ proposals.

Greenpeace Thailand National Roundtable

IIEC assisted the office of Greenpeace Thailand in organizing a National Roundtable on CDM that was held in July 2000. IIEC staff served as a resource and presented a paper on the Greenergy Power Producer concept, also known as Green IPP. The Green IPP is a conceptual framework that combines efficiency and renewable resources into a cost-effective, scalable power resource. IIEC staff also participated in a panel discussion on action points arising from the day’s roundtable discussion. Attendance exceeded expectations. More than 60 participants attended from the private sector, government, NGO and academic communities.

Forum meeting on Energy Efficiency Business

In a related project, IIEC has used funding from the U.S. Department of Energy’s ECEE program to develop a network of energy-efficiency businesses in Thailand. The members of this organization as well are prime candidates for submitting GHG reduction projects.

IIEC joined with The Alliance to Save Energy (ASE), the U.S. based non-profit organization, to host two forum meetings on Energy Efficient Business on July 18 and 19, 2000. Approximately 60 top managers from manufacturers, distributors, consulting firms, ESCO companies and the Federation of Thai Industries (FTI) representatives participated in the meetings. These meetings were held to identify common goals and explore interest in the development of an organization to represent their collective interests. There appeared to be consensus among the business participants that an umbrella energy efficiency business association should be created in Thailand. Participants agreed that an organization of this type could play a valuable role in the following seven areas of concern: consumer awareness, implementation of the government’s existing policies and programs, development of and support for new government policies and programs supporting efficiency, project funding, building
expertise and capacity in the efficiency industry, networking, and industry credibility.

In terms of relevance to this project, it is important to note that the July meetings helped to further the connections between IIEC and manufacturers/suppliers, consulting firms, ESCO companies and the FTI. This business network is a valuable source for prime candidates for companies interested in developing GHG reduction projects. Moreover, it enabled IIEC to work with technology manufacturers/suppliers in order to determine the quantitative potential for GHG reduction.

1.1.2 **Task 2 – Proposal Identification**

IIEC developed our relationship with industry as we met with companies and visited their factories. The majority of the contacts we made were with suppliers and energy service companies.

Two concrete potential projects were identified from among 5-6 possibilities.

1.) A retrofit of the International School of Bangkok. Through a Motorola lighting representative, IIEC met with Honeywell Thailand and Honeywell Singapore representatives about an ISB A/C and lighting retrofit possibility. The client and vendor were quite positive about a potential AIJ Project. Unfortunately, the timing was not long enough to allow for the AIJ process before the retrofit had to start.

2.) **KR Precision Factory Retrofit**

1.1.3 **Task 3 – Priority Project Definition – KR Precision**

Using contacts developed through the Thai business council work, IIEC expanded its contact with energy companies in Thailand. One of these contacts led us to identify a potential project at a factory located in Ayutthaya, Thailand. As mentioned above, the project was a retrofit at the KR Precision factory. This factory, which provides parts to support the semiconductor industry, was interested in pursuing a large-scale energy efficiency upgrade to its factory. Initial meetings with factory management indicated a high level of interest in developing the project as an AIJ project. IIEC had meeting with the Thai JI focal point, the Office of Environmental Policy and Planning to discuss the potential for developing the KR Precision (or other similar projects) as an AIJ project. Unfortunately, due to flagging company interest, work on this project was halted.

1.2 **Activities occurring January – September 2001:**

Over the past year, IIEC has worked to adapt its AIJ program to the realities of the rapidly changing political context. IIEC has proceeded under the assumption that it is reasonable to expect that GHG credits will, at some point in the future, be traded in an international regime or regimes. Credits will appear as additional streams of revenue on projects that, as a result of the technology they employ, can be proven to have reduce the amount of green house gas with respect to an established country baseline. Since it is unlikely, however, that the trading regime will be defined under the umbrella of the Kyoto Protocol, obtaining host country and/or U.S.
government approval for additional AIJ projects, or even CDM projects, is currently extremely difficult.

What can be done, however, is to develop projects in the target countries, that are "CDM ready". "CDM ready" simply means that the projects will be developed to the point that there is a clear and verifiable number of GHG credits from them that could be traded in whatever regime develops over the next couple of years. For such projects to be developed, they must be compared against credible baselines in the country. Thus, IIEC's strategy for effective use of our USIJI funding became to develop a project within Thailand and to develop a credible baseline against which the credits for GHG avoidance can be counted. What follows is a list and explanation of IIEC activities toward these goals.

There are four types of activities that have been carried out in order to move IIEC and our partners toward the goals mentioned above. First, we have worked with the relevant actors, government environmental agencies and industry associations, to build the partnerships and capacity necessary for the development of successful projects. Second, we have met with numerous possible project developers to identify the projects with the greatest potential. Third, once identified, we have continued to work with country partners to take the steps necessary to get the projects "CDM ready".

With IIEC staff changes at the beginning of the calendar year, the new team at IIEC-Asia exerted significant effort to re-establish government, industry and non-governmental contacts, understand the local sensitivities, and continue to build credibility that would allow for the promotion of JI project development in Thailand. With these efforts, the JI-Thailand project has started to gain momentum in meeting its overall goals and project deliverables. Furthermore, under a separate contract and program, the IIEC - Asia Regional Office is ready to carry out activities to raise the number of project studies that have potential in mitigating greenhouse gas emissions in Thailand.

The activities undertaken in Thailand under the JI project can be classified into:

- project development;
- promotion and outreach;
- baseline study

The following sections describe the status of the above-mentioned activities.

1.2.1 Task 1: Project development

Project development has been the core component of the JI-Thailand project. We visited several private organizations and individuals to identify projects that have potential to mitigate greenhouse gas emissions.

At present, the IIEC-Asia Office has collaborated with the Thailand Institute for Scientific and Technological Research (TISTR) to undertake a feasibility and emission baseline study of an ethanol production plant for gasoline fuel blend in Thailand. The plant will mainly use cassava
as feedstock. During the off-season of cassava production, it may also use sugar cane molasses. The proposed project will use the latest technology in producing ethanol.

The selection of the project is timely because with the recent increase of global energy prices, the Thai government is promoting the use of alcohol fuel blend transport fuels. The proposed project is also aimed at helping cassava farmers obtain higher income since, at present, the world market of cassava is depressed.

IIEC and TISTR are in the process of reviewing the draft memorandum of understanding (MOU) for this collaboration. The MOU is attached as Appendix B. The scope of work of the project is attached in Appendix C.

1.2.2 Task 2: Promotion and Outreach

Aside from project development, IIEC-Asia Office has been active in educating the public and the government on the opportunities climate change mitigation projects offer. There are two strands of activities undertaken under this category: public awareness and policy discussions.

1.2.2.1 Public awareness

The IIEC-Asia office is collaborating with the Office of Environmental Planning and Policy (OEPP) of the Ministry of Science, Technology and Environment (MOSTE), Thailand’s focal point on climate change, and the Federation of Thai Industries (FTI), a non-profit organization established by the local industries, to educate the industry decision makers on the opportunities of climate change projects in Thailand.

IIEC Staff visited OEPP in March 2001. The IIEC team met Dr. Wannee Samphantarak, outgoing deputy secretary-general managing the climate change issue in Thailand, and her team, to present IIEC’s support and commitment in promoting climate change activities in Thailand. The meeting was very fruitful since it started an official recognition from the OEPP of IIEC’s willingness to support and promote government activities related to climate change.

A roundtable meeting with industry leaders and government officials is to be organized in mid October 2001. The meeting time schedule however is dependent on the availability of the new OEPP officials. The department is currently in the process of reorganization and the newly appointed officials will be installed in October. The proposed agenda of the meeting is attached in Appendix D.

IIEC Staff finalized the roundtable meeting program of activities and time schedule with Dr. Asadaporn, OEPP’s focal point on climate change and international affairs, last May 2001. Again in this meeting, IIEC expressed an interest to collaborate with OEPP on other activities aside from the planned roundtable meeting. Due to the uncertainty of the climate change negotiations during this period, the OEPP expressed some reservations and advised IIEC to wait for the
outcome of the coming UNFCCC meetings. IIEC Staff visited OEPP several times between June and September 2001 to discuss several issues concerning the roundtable meeting.

IIEC Staff visited the FTI in July 2001 to discuss IIEC's interest in collaborating with the federation especially in the planned roundtable meeting. FTI recognized the mutual benefit on hosting the meeting since they are also interested to know the potential opportunities for industry arising from the climate change negotiations. The roundtable meeting in October is also to be attended by decision makers of the member industries of the FTI. The meeting will be held at the FTI premises.

1.2.2.2 Policy Discussions

IIEC-Asia has also participated in regional and international climate change policy discussions in the past months.

IIEC Staff participated in a regional workshop on climate change organized by the Chulalongkorn University last February 2001 which was attended by several government agencies, the private sector and non-governmental organizations. The workshop discussed the challenges, opportunities and government positions on climate negotiations.

IIEC Staff participated in the Asian Development Bank (ADB) workshop on the Promotion of Renewable Energy, Energy Efficiency and Greenhouse Gas Abatement (PREGA) in April 2001. ADB is promoting these technologies and providing financial support for the demonstration projects of these technologies in its member countries.

IIEC Staff is also participating in a workshop in Amsterdam, Netherlands in September 2001 on facilitating small-scale renewable energy projects in the Clean Development Mechanism (CDM). The workshop examined opportunities for small-scale renewable energy projects to benefit from emerging carbon-offset markets. After reviewing the benefits of small project participation and the need to streamline such processes as baseline setting and monitoring, the workshop will focus on what can and is being done to make the CDM and other carbon offset programs accessible to small-scale renewable energy activities.

1.2.3 Task 3: Baseline studies

The IIEC-Asia office is in the process of finalizing the greenhouse gas emissions baseline study for Thailand. This year’s baseline study is focused on electricity efficiency projects. The first part of the study identifies sectors and end-use technologies that may have greater impacts for energy efficiency improvement. It also reviews barriers to energy efficiency implementation. The second part reviews the emission baselines methodology and discusses issues in baseline calculation. The third part simulates emissions baselines for selected energy efficient technologies in Thailand.
1.2.4 Future activities

IIEC-Asia has established links with the relevant government agencies, private organizations and other non-government organizations that are involved or willing to be involved with the climate change activities. Moreover, the Asia team, with its involvement in several activities, has earned respect for its capacity to promote and develop projects, as well its contribution to policy discussions. The IIEC-Asia office is looking forward to continuing support from DOE and plans to use already committed funds to build on the momentum generated by past activities.

Under a separate contract and program, IIEC-Asia plans to continue to pursue its activities in several fronts:

1) *project development*
   IIEC-Asia looks forward to develop more climate change projects in the next fiscal year. Several organizations and projects have already been identified.

2) *promotion and outreach*
   IIEC-Asia would like to sustain its collaboration with the OEPP and industry associations and perhaps engage in more educational activities concerning climate change opportunities. Moreover, the new team is open to participate in regional and international dialogue concerning climate change issues.

3) *baseline study*
   IIEC-Asia is interested in continuing the baselines study. For the next fiscal year, the emissions baseline study will focus on renewable energy technology projects in Thailand.

1.3 Conclusions

In the past months of promoting climate change projects in Thailand, the following are the important sensitivities that must be considered:

- Thailand is sensitive to JI projects. This is because the Japanese government would like to claim emission credits from JI projects.
- CDM projects are more acceptable to the Thai government than JI projects.
- The private sector is interested in collaborating in doing a project study if there is an investment component for project development.
2.0 South Africa

South Africa signed the United Nations Framework Convention on Climate Change (UNFCCC) in December 1997. Though a late comer to the Convention, South Africa's status as the continent's largest greenhouse gas emitter and economic powerhouse, as well as its strong political credentials, should make South Africa the region's natural leader in matters concerning climate change. To date, however, South Africa has proven unable to master the complex issues that surround climate change, to develop a methodology for assessing and approving AIJ/CDM projects, to voice its own opinion in the UNFCCC debate or to lead its African neighbors.

Over the course of this contract, IIEC-Africa directed its USIJI-funded activities at three related objectives:

1. building awareness among decision makers of the pro-growth/win-win climate change opportunities that relate to South Africa;
2. gaining a clear understanding of the needs of different South African stakeholders in the decision making process related to climate change; and
3. investigating South Africa's interest in, and the manner in which they intend to implement, the Clean Development Mechanism.

IIEC's means of achieving these goals were to provide information and technical assistance to the principle focal points for climate change decision making in South Africa:

- the National Committee on Climate Change (NCCC) which brings together government, business, labour and environmental associations to discuss the country's position at the UNFCCC negotiating sessions and to endorse AIJ/CDM projects;
- the Department of Environmental Affairs and Tourism (DEAT) which chairs and acts as the Secretariat for the NCCC as well as serving as the focal point for GEF and CDM/AIJ funding; and
- the Business Council on Climate Change (BCCC) which represents a broad array of industrial concerns at the NCCC and is the most active and aggressive stakeholder within the NCCC.

As previously reported, IIEC made considerable headway in November and December 1999 on the first two tasks of the South African component of its workplan; Developing and Disseminating Profiles (Task 1) and Meeting with Government Officials and NGOs (Task 2). During the last 16 months, IIEC-Africa completed the outstanding work on these two activities as well as initiated and completed Task 3B, Creating a Pro Climate Action Voice in South African Industry.

2.1 Task 1. Developing and Disseminating Profiles

IIEC staff completed four case studies that demonstrated opportunities for South African government, communities and businesses to twin development imperatives with environmental priorities. These case studies focused on incremental changes in policy and approach that offer significant climate change mitigation payoffs while improving service delivery and, in some cases, increasing South African exports. The subjects of four case studies are the:
– provision of financing for energy efficiency improvements to low-income housing projects,
– development of energy performance standards for domestic appliances,
– promotion of passive solar homes, and
– use of low-cost, mobile solar water heaters.

IIEC sent copies of the case studies to all members of the NCCC as well as to other stakeholders in the local climate change debate and to the local press. Copies of the four case studies can be found in Attachments #1-4. In addition to these four case studies specifically developed with funding from USIJI, IIEC also sent the NCCC several additional case studies developed with other program funds.

2.2 Task 2. Meeting with Government Officials and NGOs

In our effort to determine the government's potential needs for technical assistance from IIEC or other parties during the period covered by this report, IIEC had a long discussion with Muriel Dube, the most senior official of the Department of Environmental Affairs and Tourism with direct responsibility for South Africa's climate change strategy. The conversations focused on the country's approach to climate change in general, and on its national priorities in particular.

Ms Dube made it clear that South Africa's priorities for flexible mechanism projects were the same as for any other government undertaking: delivery of basic services to under-served populations, poverty alleviation through economic growth, and environmental management. She also indicated that DEAT was the sole agency responsible for approving flexible mechanism projects and that the NCCC's role in the process was one of advisor.

In addition to meeting with DEAT, IIEC continued its dialogue with the NCCC. The NCCC advises the Department, which makes recommendations to the Minister. Having met with six members of the NCCC in the previous reporting IIEC, for this reporting period, spoke with Vanida Govender of Eskom and Shirley Miller of the Chemical Workers Industrial Union. IIEC's findings from the meetings include the following:

1. South Africa is not interested in developing more AIJ projects. Government, NGOs and the business community alike want to focus on the CDM.
2. Our offer to assist South Africa in developing guidelines for CDM project approval was not met with much encouragement. The NCCC members did not want it to appear that the CDM process was being driven by an NGO.
3. While the provision of housing and other infrastructure for previously disadvantaged communities was an extremely important government priority—most members of the NCCC envisioned the industrial and power generation sectors of the economy as being the most promising climate change mitigation options.²

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¹ Dr. Laurraine Lotter, Chairperson of the Chemicals and Allied Industries' Association and NCCC lead on the South African mitigation analysis, wrote that she would "try and incorporate [IIEC's] ideas into our work on mitigation."

² Please note that this point potentially conflicts with the government's intention to make provision of services and poverty alleviation key flexible mechanism objectives.
4. With only two exceptions, none of the members of the NCCC with whom IIEC spoke had a clear sense for how to develop CDM projects or what the process for approving such projects would look like. Ms Govender sees a large role for Eskom in CDM project development and pointed to Eskom's current initiatives in low-income housing as evidence of potential CDM-able projects that Eskom could develop.

Finally, IIEC engaged numerous government, NGO and business representatives in discussions on the various flexible mechanisms and on their ideas for AIJ/II/CDM projects. As can be seen in attachment #5, these discussion turned up very few project concepts, but suggest that a wide variety of actors are interested in becoming involved in CDM projects.

2.3 Task 3. Create a Pro Climate Action Voice in South African Industry
In response to the findings from Task 2, IIEC decided to pursue Task 3B (Create a Pro Climate Action Voice in South African Industry) instead of Task 3A (Contribute to the Development of Protocols for Assessing and Approving AIJ and CDM Projects). To complete this task, IIEC held discussions with a range of potential members for a South African "Business Council for Sustainable Energy." Attachment #6 contains the notes from these meetings. Based on those conversations, we found that:

- industry is open to the creation of a forum along the lines of the US Business Council on Sustainable Energy and its counterparts in Asia, Latin America and Europe;
- several potentially vocal players within the industry are afraid that Eskom, the large parastatal electric utility, might come to control access to CDM.

Since the interviews were conducted and case studies circulated, the Business Caucus on Climate Change has held additional meetings (IIEC attended the inaugural meeting of this organisation in June 1999), and in particular the Chemicals and Allied Industries Association held an industrial energy efficiency workshop in mid-September 2000. IIEC's entrée to these meetings was facilitated by the outreach to the business community with USIJI's funding, and our participation has brought helped bring a "green" bias as well as a wealth of international experience to the fora.

2.4 Other Activities
In addition to the activities outlined above that directly respond to our workplan, IIEC-Africa carried out a number of smaller actions that complemented our required activities and which we believed fell within the spirit of our contract with USIJI. These actions included:

- participating in a range of workshops at which we provided expert input and commentary; the venues included the South African GEF Country Dialogue Workshop, an NGO retreat focused on developing a civil society strategy for climate change in South Africa and a USIJI Workshop in Gaborone, Botswana (represented by PEER-Africa);
- providing information on IIEC's experience with the AIJ pilot phase to the Energy and Development Research Centre at the University of Cape Town for inclusion in their report to the DEAT on the effectiveness of AIJ in South Africa;
— meeting with Howard Feibus of Elektrotek Concepts to help him refine his concept for a distributed generation AIJ project in South Africa and to supply him with further contacts in the industry;
— participating in an on-going email exchange with experts from around the world on the meaning of additionality within the South African context; and
— becoming a founding member of CAN-South Africa.

2.5 Conclusion
South African government, NGOs and industry have climbed a large learning curve during the three years since the country ratified the UN Framework Convention on Climate Change. As a result, South Africa is well-positioned to take a leading role in developing and championing African. Moreover, many South African stakeholders in the climate change debate are open to the concept that pro-active climate change strategies can help the country meet its development priorities of economic growth and job creation. That said, South Africa still has much to do to make the country better positioned to accept flexible mechanism projects.
Appendices
Appendix A

Meeting Summary

Roundtable Meeting: CDM and Thai Industry’s Role in Climate Change Mitigation

11 January, 2000
Bangkok, Thailand

Sponsored by:
International Institute for Energy Conservation

IIEC

In cooperation with:
Office of Environmental Policy and Planning,
Ministry of Science, Technology and Environment

Organized by:
The Federation of Thai Industries (FTI)

Edited by:
Chainuwat Priyanonda
IIEC-Asia Regional Office
EXECUTIVE SUMMARY

- The roundtable meeting, *CDM and Thai Industries’ Role in Climate Change Mitigation*, was co-organized on 11 January 2000 by the Federation of Thai Industries (FTI) and the International Institute for Energy Conservation (IIEC), with cooperation from Thailand’s Office of Environmental Policy and Planning (OEPP). There were a total of 33 industry participants.

- The main objectives of the roundtable meeting were (1) to provide a forum for Thai industry leaders to learn about the status of the Clean Development Mechanism (CDM) and other climate change issues; and (2) to foster cooperation between the Thai private sector and government on climate change issues.

- The industry participants heard presentations from an international NGO (IIEC), a Thai NGO (the Thailand Research Fund), and the Thai government (OEPP) on key aspects of international climate change issues, including Joint Implementation, the Clean Development Mechanism, and Emissions Trading.

- OEPP encouraged the Federation of Thai Industries to join the Thai delegation to the international meetings leading up to the finalization of the CDM. OEPP also stressed the importance of CDM and related activities providing significant benefits not only to the global community, but also to Thailand at the local level.

- Thailand does not have any commitments to reduce its emissions at the present, but it is possible that this may change in the future. It is therefore important for the Thai private sector to start working with the government in order to provide input to the international negotiations.

- FTI asked the government, private sector, academia, and NGOs to keep abreast of climate change issues, and to all provide input and suggestions to the Thai delegation to the international climate change discussions. FTI requested OEPP to continue to act as the central coordinating agency between the Thai government and private sector. FTI also asked OEPP to increase its public relations and information dissemination regarding climate change issues to the private sector.

- FTI, OEPP, and IIEC will meet and discuss future activities, including organizing periodic roundtable meetings, sending a periodic climate change newsletter to industry, and including representatives from FTI in the future Thai delegations to the international climate change discussion/negotiations.

- FTI and IIEC will also meet to discuss further development of greenhouse gas mitigation projects within Thai industry.
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I. INTRODUCTION

The roundtable meeting on *CDM and the Thai Industries' Role in Climate Change Mitigation* was co-organized by the Federation of Thai Industries (FTI) and the International Institute for Energy Conservation (IIEC) on 11 January, 2000. The venue for the half-day meeting was the Queen Sirikit National Convention Center in Bangkok, Thailand.

A. Objectives of the Roundtable Meeting

Thailand ratified the United Nations Framework Convention on Climate Change (UNFCCC) as a non-Annex I country on 28 March, 1995. The Kyoto Protocol established at the third Conference of the Parties created several mechanisms for countries to cooperate in the mitigation of the global climate change problem. One of these mechanisms is the Clean Development Mechanism (CDM), which goes into effect starting in the year 2000. Therefore, there is a need to disseminate information regarding CDM and other climate change issues to Thailand's private sector in order to increase awareness and participation.

The main objectives of the roundtable meeting were to:
- provide a forum for Thai industry leaders to learn about the status of CDM and other climate change issues;
- provide a forum for Thai industry and government to exchange information and input that the Thai delegation can take to future international discussion and negotiations;
- stimulate more cooperation between the Thai private sector and government in climate change issues;
- improve networking among Thai industries that are interested in implementing energy efficiency projects.

B. Events and Activities

The roundtable participants consisted primarily of representatives from the member companies of FTI, as well as several resource persons from international companies and organizations such as Honeywell Systems, the Kenan Institute Asia, and the United States Embassy in Thailand. There were a total of 33 participants, and the participant list can be found in Appendix I.

Three experts on climate change were invited to deliver presentations. The experts were: Dr. Peter du Pont of IIEC, Dr. Weerawat Chantanakome of the Thailand Research Fund, and Dr. Wanee Samphantharak of Thailand's Office of Environmental Policy and Planning. Chainuwat Priyanonda of IIEC served as the moderator throughout the course of this roundtable meeting.

The following page displays the meeting agenda.
CDM and the Thai Industry's Role in Climate Change Mitigation

Queen Sirikit National Convention Center
Board Room 3

11 January, 2000
8:30 AM – 1:00 PM

Organized by:
Federation of Thai Industries (FTI) and IIEC

08:30 – 09:00 Registration
09:00 – 09:20 Opening Remarks
Khun Anen Aungaphinant
Chairman, Energy Committee, FTI

09:20 – 09:45 Introductory Presentation: “CDM and Businesses”
Dr. Peter du Pont
Director of Asia Operations, IIEC

09:45 – 10:00 Short Presentation: “Update on Thai Research in Climate Change”
Dr. Weerawat Chantanakome
Thailand Research Fund, Climate Change Steering Committee

10:00 – 10:30 Key Presentation: “Current Status of CDM”
Dr. Wanee Samphantharak
Deputy Secretary General, Office of Environmental Policy and Planning, Ministry of Science, Technology and Environment

10:30 – 11:00 Coffee Break

11:00 – 11:45 Roundtable Questions & Discussion
Moderated by:
Khun Chainuwat Priyawanonda,
Project Manager, IIEC

11:45 – 12:00 Wrap-Up and Closing
Khun Anen Aungaphinant
Chairman, Energy Committee, FTI

12:00 – 13:00 Lunch
II. ROUNDTABLE MEETING SUMMARY

The roundtable meeting was structured so that the three main presentations were made sequentially, and were followed by an hour-long discussion session. The language used in this meeting was predominantly Thai; however, Dr. Peter du Pont elected to deliver his presentation in English. The following sections provide a highlight of the three presentations, opening and closing remarks, as well as the question and discussion section. A hardcopy of the three presentations can be found in the Appendices.

A. Opening Remarks

Anen Aungaphinant
Chairman, Energy Committee, FTI

Khun Anen Aungaphinant declared the opening of the roundtable meeting and provided brief remarks conceding the importance of private sector and government cooperation in addressing the global climate change problem. He also mentioned that it is important for the Thai industry to be aware of the international mechanisms such as the Clean Development Mechanism (CDM) that have been defined by the Kyoto Protocol, since they may have an impact on production and the entire industry as a whole.

B. Introductory Presentation: CDM and Businesses

Dr. Peter du Pont
Director of Asia Operations, IIEC

Dr. Peter du Pont delivered a 25-minute presentation that introduced the concepts of climate change and the international mechanisms that potentially can assist countries to cooperate in the mitigation of the climate change problem. His presentation included the following points:

- The global climate change problem is a reality, and can be witnessed by observing recent trends in storms and floods throughout Asia.
- The Conference of the Parties (COP) meeting in Kyoto established what has become known as the “Kyoto Protocol”. The Protocol legitimizes several international mechanisms for greenhouse gas (GHG) emission mitigation, including Joint-Implementation (JI), the Clean Development Mechanism (CDM), and Emissions Trading (ET).
- The JI mechanism allows developed countries to undertake GHG reduction projects within other developed countries.
- The proposed CDM mechanism will eventually allow developed countries to undertake GHG reduction projects within developing countries.
- The potential benefits to developing countries of participating in the CDM are: funds for sustainable development, technology transfer, and catalyst for the development of sustainable energy technologies.
• Since the details of CDM are still being discussed and negotiated at the international level, there is an opportunity for the private sector to provide input in the following areas: environmental standards for qualifying projects, how to operationalize technology cooperation, how to avoid administrative burdens (such as those experienced by the Global Environmental Facility), and how to mobilize financial resources.

• The local benefits for the private sector in participation in CDM are: cost savings, ecosystem preservation, stronger foreign exchange, less resources consumed, and potential public relations benefits.

• Energy efficiency activities cost much less than the current marginal cost of electricity generation of Thailand. The Thai demand-side management (DSM) Program, which has reduced peak electric demand by more than 250 MW, was held up as a particularly successful example for Thailand and all of Asia.

• IIEC's role is to provide outreach to the Thai industry and to serve as a technical resource to ensure that the industry benefits.

C. Short Presentation: Update on Thai Research in Climate Change

Dr. Weerawat Chantanakome
Thailand Research Fund, Climate Change Steering Committee

Dr. Weerawat Chantanakome delivered a 15-minute presentation on the past and present research concerning climate change in Thailand. The following highlights his presentation:

• The Thailand Environment Institute (TEI) has been working on research work in the field of climate change for the past 5-6 years, and has accumulated much documentation of the international climate change discussion as it relates to Thailand.

• At 1990 levels, Thailand emits approximately 170 million tonnes of CO₂ and 2.9 million tonnes of methane.

• Industrial processes contribute to about 4% of Thailand's total greenhouse gas emission, while all energy use contributes to about 35%.

• The Kyoto Protocol has established Joint Implementation (JI), Clean Development Mechanism (CDM), and Emission Trading (ET) as market-based climate change mitigation mechanisms. JI and CDM involve making direct technology investments in the private sector, while ET operates at the level of national policies and measures.

• A major difference between the three different mechanisms is that JI and CDM may possibly involve significantly higher transaction costs than ET. However, the national implementation cost of ET may possibly be higher than that of JI and CDM.

• The Thailand Research Fund (TRF) has provided a grant to form a Climate Change Research Group that comprises of several major universities in Thailand, including: Chulalongkorn University, the Asian Institute of Technology, Kasetsart University, Khon Kaen University, and the King Mongkut's University of Technology Thonburi. The Group is responsible for creating GHG database and inventories, as well as conducting impact studies. The National Energy
Policy Office (NEPO) of Thailand may also contribute funding to this Group in the future, since CO₂ emissions are directly related to energy consumption.

- The Climate Change Research Group is concentrating on creating an updated GHG inventory for Thailand, as well as researching the impacts of energy efficiency measures and activities.
- In conclusion, it is important to continue support for the Climate Change Research Group, because their work supports and complements the Thai government's position in the international climate change discussion and negotiations.

**D. Key Presentation: Current Status of CDM**

*Dr. Wanee Samphantharak*
Deputy Secretary General, Office of Environmental Policy and Planning, Ministry of Science, Technology and Environment

Dr. Wanee Samphantharak thanked Dr. Peter du Pont and Dr. Weerawat for presenting a complete and concise picture of the international climate change mechanisms in their respective presentations, and she tried to add to what already had been presented.

- The Thai government has sent a delegation to participate in all the Conference of the Parties (COP) international discussion and negotiations since the first one that was held in Germany. Dr. Wanee of the Office of Environmental Policy and Planning has been a member of the delegations to the COP meetings.
- The purpose of CDM is to reduce the global emissions of GHG while helping developing countries toward sustainable development at the same time.
- During the Actions Implemented Jointly (AIJ) program, Thailand participated in four AIJ projects with Japan. The first AIJ project involved Siam Steel Co., Ltd. and a Japanese steel company. The expected energy savings from the process improvement was estimated at 45%, but the post-implementation data indicates that only an energy savings of approximately 30% was achieved. The other three projects involved a cogeneration project in a cement factory, a waste-to-energy project, and improvement of traffic signals at a large traffic intersection.
- Although some of these AIJ projects have been small-scale, the experience from implementing them will be useful in the future once other mechanisms such as JI, CDM and ET come into play.
- Most international experts believe that the private sector (not the government sector) must be involved in order for CDM to be successful.
- Although the Kyoto Protocol indicates that CDM implementation is to start in the year 2000, CDM has yet to be clearly defined at the international level. The Clean Development Mechanism will be fully defined by COP6, which will be held during November 2000. However, before COP6 there will be two major meetings where the international sub-committee on CDM must sort through all sorts of issues, including how to set the baseline, measurement and verification, etc.
- Dr. Wanee would like to encourage the Federation of Thai Industries to join the Thai delegation to the international meetings leading up to the finalization of the CDM. It is important for the private sector to become more involved.
- Dr. Wanee feels that it is important that the CDM and other activities should result
in a benefit not only to the global community, but also to Thailand at the local level as well.

- Although Thailand does not currently have to meet any emission reduction commitments, it is possible that Thailand may fall into the Annex I category in the future. Therefore, there is concern that if Thailand proceeds to implement the low-cost measures, only higher-cost measures and options may be left by the time Thailand must meet emission reduction commitments.

- The Office of Environment Policy and Planning (OEPP) has asked the Climate Change Research to give more attention to developing a project portfolio for CDM projects in order to determine Thailand's potential for GHG emission reduction under the CDM program.

- Dr. Wanee expressed the importance of continuing to organize fora such this meeting so that there is continuity in the discussion and the private sector can become more involved with the international climate change discussion and negotiations.

### E. Roundtable Question and Discussion Session

Moderated by:

*Chainuwat Priyapanonda,*

Project Manager, IIEC

The following captures the questions and discussion that occurred during this session:

- **Question:** (to Dr. Peter du Pont) Please explain more about why nuclear power is not a good option, since this technology does not contribute to the global climate change problem.

  **Dr. du Pont's response:** Nuclear power is a difficult issue. IIEC does not take a position for or against nuclear power or whether it is good or bad for alleviating the climate change problem. However, it is important to note that most industrialized countries have stopped constructing nuclear power plants because it is a risky technology to finance and because of problems dealing with nuclear waste disposal.

- **Question:** Most developing countries have been gearing their industrial sectors towards more exportation of goods to developed countries. The developed countries are exploiting the developing countries as a production base, and the shifting of emissions to developing countries is done in this way. However, the Kyoto Protocol and other international mechanisms for global climate change mitigation tend to load the burden on developing countries to clean up their emissions after the production of goods that mostly end up in the developed countries. Will there be any mechanism that account for this effect?

  **Response by Mr. Terry Oliver:** At the present, the non-Annex I countries such as Thailand do not have any commitments to reduce their emissions. In the foreseeable future, there will not be any penalties for the emissions resulting from the mentioned export-oriented production. IIEC has investigated the problem of second-hand equipment transfer to developing countries from developed countries. IIEC has proposed at the international climate change negotiations for
countries that export second-hand equipment to be penalized and held accountable for the resulting emissions. Countries should also have minimum energy efficiency standards for imported products.

- **Question to Dr. Wanee:** Is there any relation between Thailand Energy Conservation Act and the Kyoto Protocol or CDM?

  **Dr. Wanee’s response:** There is no direct connection, however energy conservation is directly related to emissions reductions. Therefore any amount of energy saved will also result in emissions reductions.

- **Question:** Thailand has demonstrated that it gives high priority to local and global environmental issues by implementing energy efficiency programs. The international community should recognize and give Thailand more funding and support for being a leader.

  **Dr. Wanee’s response:** The Global Environmental Facility (GEF) and the World Bank has granted the Electricity Generating Authority of Thailand (EGAT) funding to implement a demand-side management (DSM) program. GEF has also promoted and disseminated EGAT’s success in implementing the DSM program.

- **Dr. Weerawat’s general discussion of CDM:** Thai industries must emphasize more research and development of technologies that can help to reduce emissions. In this way, if Thai industries can rely on our own technologies to reduce emissions, then Thailand will not have to rely on technology transfer and suffer the ensuing transaction costs resulting from the implementation of the discussed international mechanisms.

- **Question:** Many of the industries are confused about all the different international mechanisms such as AIJ, CDM, etc., and which government organization is leading the effort. It would be more helpful if the government coordinates and unifies its efforts and combine into one agency that takes the lead in climate change and information dissemination to the industries.

  **Dr. Wanee’s response:** It is important for the private sector to work with the government in providing input to the international negotiations, instead of relying on the government to take the lead.

- **Question:** The industries are also concerned about the possibility that the Thai delegation to the international climate change negotiations may agree to commitments that later may be harmful to the Thai industry.

  **Dr. Wanee’s response:** Thailand does not have any commitments to reduce its emissions at the present, but it is possible that this may change in the future. Therefore it is even more important that the private sector start working with the government to provide input to the international negotiations.

- **A general comment by one of the industry participants:** There is also concern that reduction may lead to the lowering of the standard of living or quality of life. It is fine to increase energy efficiency but not to reduce people’s standards of living because it would go against the developing countries’ development goals.
F. Wrap-up and Closing Remarks

*Anen Aungaphinant*
Chairman, Energy Committee, FTI

Khun Anen Aungaphinant made the following remarks before declaring the meeting closed:

- Khun Anen asked the government, private sector, academia, and NGO's to keep abreast with the current climate change issues, and to all provide input and suggestions to the Thai delegation to the international climate change discussions. He asks that the Office of Environmental Policy and Planning (OEPP) continue to act as the central coordinating agency, and the Federation of Thai Industries will be happy to cooperate and assist in any way.

- Before this meeting, Thai industry had a misconception that the Thai delegation to the international climate change negotiations was not taking into consideration opinions and inputs from the private sector. Khun Anen was pleased that OEPP has invited increased participation from the private sector. He also OEPP to increase its public relations and information dissemination efforts to the private sector on the topic of climate change issues.
III. NEXT STEPS

The organizers of this roundtable meeting received positive feedback from the participants after the meeting. In general, many of the participants encouraged FTI and IIEC to continue organizing forums such as this one so that the private sector can become more involved in helping to solve the global climate change problem. IIEC proposes the following next steps and action items in order to continue the momentum that was created at this roundtable meeting:

- FTI and IIEC will distribute this summary documentation to all the participants.

- FTI, IIEC and OEPP will meet and discuss future activities, including organizing periodic roundtable meetings, sending periodic climate change newsletter to the industry, and including representatives from FTI in the future Thai delegations to the international climate change discussion/negotiations.

- FTI and IIEC will meet to discuss further development of AIJ and CDM projects within the Thai industry.


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<tr>
<th>No</th>
<th>NAME</th>
<th>AFFILIATION</th>
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<tr>
<td>1</td>
<td>Anen Aungaphinant</td>
<td>FTI Member</td>
<td>Wongwaiwit Machine Tools Co., Ltd.</td>
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<td>Hin Navawongse</td>
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<td>Adsak Lowchan</td>
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<td>Chureerat Suwanvithaya</td>
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<td>Kanchana Aksorn-Aree</td>
<td>US Government</td>
<td>Embassy of the United States of America</td>
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CDM and the Thai Industry's Role in Climate Change Mitigation

11 January, 2000 – Bangkok, Thailand
APPENDIX II: DR. PETER DU PONT'S PRESENTATION

(Distributed at the Meeting)

APPENDIX III: DR. WEERAWAT CHANTANAKOME'S PRESENTATION

(Distributed at the Meeting)

APPENDIX IV: DR. WANEE SAMPHANTHARAK'S PAPER

(Distributed at the Meeting)
MEMORANDUM OF UNDERSTANDING

between

Thailand Institute of Scientific and Technological Research (TISTR)

and

International Institute for Energy Conservation (IIEC)

TISTR and IIEC agree to work together to undertake a feasibility study of a demonstration project of ethanol production for gasoline fuel blend. Both parties agree that the purpose of the proposed project is to realize savings from petroleum product consumption, economic savings, poverty alleviation, sustainable development, improved local and environmental benefits, including reduction in greenhouse gas emissions.

TISTR and IIEC carry out this agreement on a voluntary and cooperative basis. Both parties agreed to undertake the tasks defined in the scope of work (SOW) shown in Appendix 1. The scope of work may be amended through joint agreement by both TISTR and IIEC. Both parties also agree to exchange necessary information in the preparation of the study.

TISTR and IIEC will provide staffing resources for the feasibility study and will mutually agree on any external personnel that may be required for the study.

IIEC agrees to provide financial assistance up to a limit of Baht 250,000 (two-hundred fifty thousand baht) to meet the financial requirements in undertaking the feasibility study. Costs, direct and labor costs, incurred by IIEC staff in conducting the study, will not be charged to this financial support.

Any party may collaborate with other organizations in order to achieve the expected output and deliverables of the project, provided that such collaboration will not restrict future exploitation of the study results.

The final report of the project will be jointly owned by TISTR and IIEC. TISTR and IIEC agree to either jointly or individually seek funding to implement the project. Funds will be pursued from different institutions private, public, non-profit, etc. and either based-locally or internationally.

If significant progress will be achieved in the future climate change negotiations under the United Nations Framework for Climate Change Convention (UNFCCC), TISTR and IIEC agree to seek project investments from any funding mechanisms such as the Clean
Development Mechanism (CDM) or any similar instruments, *provided* that such mechanisms are consistent with the Royal Thai Government’s policy on climate change.

This agreement may be amended through joint agreement by both TISTR and IIEC at any time. This agreement may be terminated by either party at any time without penalty.

Signed:

Felix Gooneratne  
Managing Director  
IIEC-Asia Office

Dr. Nongluck Pankurdee  
Deputy Governor  
TISTR

Date:

Dr. Teerapatr Srinorakutara  
Project Director  
TISTR

Date:
# Appendix C

## Draft Scope of Work for Ethanol Production Feasibility Study

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
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<tbody>
<tr>
<td>Task 1: Site Identification</td>
<td>TISTR to propose suitable site for ethanol plant and identify community/ies that may potentially host the ethanol plant. <strong>Deliverable:</strong> 1. Short report describing the province/s potential to host the project (TISTR)</td>
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| Task 2: Tapioca Resource Assessment | TISTR to take the lead in conducting the resource assessment of tapioca  
   a) Land area devoted to tapioca production  
   b) Tapioca harvest cycles, production volume  
   c) Cost of transport and storage  
   d) Current use, market and prices of tapioca  
**Deliverable:** 1. Tapioca resource assessment report (TISTR) |
| Task 3: Ethanol Plant Technical Assessment | TISTR to undertake the technical assessment of ethanol plant  
   a) Estimation and selection of optimum capacity  
   b) Basic system configuration and equipment description  
   c) Scope and type of equipment supply  
   d) By-products disposal and environmental considerations  
**Deliverable:** 1. Report containing technical requirements (TISTR) |
| Task 4: Operation and Maintenance of Ethanol Plant | TISTR to assess the requirements related to operation and maintenance  
   a) Manpower and skills requirement  
   b) Operation and maintenance issues  
**Deliverable:** 1. Report summarizing manpower and other O&M requirements (TISTR) |
| Task 5: Financial Assessment | TISTR to conduct the cost investigation and estimation  
IIEC to assist the financial analysis and modeling, sensitivity analysis scenarios, financing schemes  
   a) Project cost investigation and estimation  
   b) Financial analysis and modeling  
   c) Sensitivity analysis of scenarios  
   d) Investigation of possible financing schemes  
**Deliverables:**  
1. Report estimating the costs of the ethanol plant’s components (TISTR)  
2. Financial analysis and financing scheme report (TISTR) |
| Task 6: GHG Emissions Mitigation Potential | IIEC to implement the emissions mitigation study of the project  
   a) Petroleum product savings  
   b) Emission baselines  
   c) Mitigation potential  
**Deliverable:** 1. Report estimating the mitigation potential of the project (IIEC) |
| Task 7: Overview of the alcohol market in Thailand | TISTR to conduct the overview study  
   a) Review of ethanol demand and use  
   b) Review of ethanol supply  
**Deliverable:** 1. Overview report of the ethanol demand and supply situation (TISTR) |
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<th>September</th>
<th>October</th>
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<td>Task 1: Site Identification</td>
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<td>Task 4: Operation and Maintenance of Ethanol Plant</td>
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<td>Task 5: Financial Assessment</td>
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<td>Task 6: GHG Emissions Mitigation Potential</td>
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<td>Task 7: Alcohol Market Review</td>
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<td>Final Report Preparation</td>
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Appendix D

CDM Opportunities for Thai Industries

Queen Sirikit National Convention Center
Board Room 3
17 October 2001

Federation of Thai Industries
Host Organization

Office of Environmental Policy and Planning (OEPP)
Ministry of Science and Technology
Co-sponsor

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Programme

08:30 – 09:30  Registration

09:00 – 09:20  Opening Remarks
   Secretary-General, OEPP, MOSTE

09:20 – 09:30  Welcome Remarks
   Khun Anen Aungaphinant
   Chairman, Energy Committee, FTI

   Mr. Felix Gooneratne
   Director – IIEC Asia Operations

09:30 – 10:00  Current status of the climate change negotiation
   Updates and issues of COP 6.5 and in the preparations for COP 7
   OEPP, MOSTE

09:50 – 10:30  CDM opportunities for energy sector and industries
   Dr. Asdaporn Kairapanond
   OEPP, MOSTE

10:30 – 11:00  Coffee Break

11:00 – 11:40  Thailand’s AIJ experience: lessons learned
   Siam Steel Corporation
   Industrial Estate Authority of Thailand

11:40 – 12:10  National Clean Development Mechanism Strategy Study for the
   Kingdom of Thailand
   Dr. Vute Wangwacharakul
   Project Co-ordinator

12:10 – 13:00  Roundtable Discussion
   Moderator: Dr. Weerawat Chantanakome
   Executive Director, FTI

13:00 – 13:15  Closing Remarks
   Deputy Secretary-General, OEPP, MOSTE

13:15 – 14:15  Lunch
South Africa's mass house building initiative under the Reconstruction and Development Programme (RDP) has been driven by the political need to deliver a large numbers of homes as quickly and inexpensively as possible. This delivery constraint has meant that energy and environmental aspects of the dwellings have been, and are likely to continue to be, ignored. As a result, the outcome of the housing delivery process has been "homes" that are only a marginal improvement over the existing shacks. These dwellings overheat in the summer, become exceedingly cold in the winter, and require excessive amounts of energy (and money) to maintain rudimentary comfort.

By requiring that RDP homes are built according to the principles of energy efficient / passive solar design, South Africa could benefit from: a reduction in household greenhouse gas emissions of as much as 20 million tonnes of carbon dioxide for 1.5 million houses over 20 years; improvements in indoor air quality through the reduction of the combustion of solid fuels for space heating; and a reduction in household expenditure on fuel for space heating.

"The future is in our hands and we must carry forward the work needed to finally liberate ourselves from the evils of apartheid."
— Closing statement of the Reconstruction and Development Programme, 1994

In the SeSotho language, Kutlwanong means "let's understand each other." The people of Kutlwanong—a community located just outside Kimberley, Northern Province—have shown that they not only understand each other but that they also understand how to build the country's best houses. In 1996, this community established itself as a national leader in environmental sustainability with the introduction of the nation's first Energy Cost Optimised (ECO™) affordable houses.

In the intervening years, Kutlwanong's civic organisation has formed a non-profit business with a charter focused on building environmentally friendly, ECO™ houses in historically disadvantaged communities. The insights that they bring to the national housing process include the promotion of ECO™ construction, the integration of energy efficient appliances into homes, greening projects, environmental capacity building and small business development.

The community is in its fourth year of testing and monitoring environmentally friendly houses and other concepts that bring development benefits to homeowners. According to Mr. Thami Eland, Chairperson of the Kutlwanong Civic Executive Committee, Kutlwanong is "starting the development process with the people, and building them up."

Although Kutlwanong's housing project originally was conceived to provide homes, jobs and other social benefits to the community, the project also carries global environmental benefits. The energy-efficient, ECO™ homes require little to no energy to maintain comfortable indoor temperatures and thus have dramatically reduced the community's greenhouse gas emissions. The Kutlwanong story is thus an example of the phenomenon of social priorities synergising with environmentally sustainable practice.
1. The Intervention

The community of Kutlwanong did not develop the ECO™ home concept on its own. PEER Africa, a civil and environmental engineering firm, provided the community with technical expertise. In particular, as a part of their work to promote healthier living through the use of energy efficient housing, low-smoke and clean fuels, and appropriate and adequate public health and sanitation practices and facilities, PEER developed an energy-efficient, cost-optimised housing technology that they named the ECO™ house. These houses cost little more to construct than their inefficient counterparts, yet are cheaper to operate, and provide their owners with a better quality of life.

In Kutlwanong, PEER Africa used its community management skills to empower the residents to manage their own housing project. PEER Africa worked closely with the community to design a home that met their needs and lifestyle, had excellent street appeal, and incorporated passive solar design and thermal efficiency measures. Since the community completed the construction of the initial homes, PEER Africa has promoted the Kutlwanong model as a "show case", demonstrating how housing and energy technology can be a catalyst for economic upliftment of a community as a whole. These two critical components are integrated with small business development to create a cost effective and environmentally sensitive solution to the basic shelter problems in Southern Africa.

2. ECO™ Home Benefits

An informal survey in Kutlwanong in 1997 revealed that the residents of standard houses (i.e., non-ECO™ houses) use, on average, 140 litres of paraffin to meet their winter space-heating demand. National surveys of coal use in the cold interior region of South Africa show that such households use approximately 350 kilograms of coal to meet their winter space-heating demands. The greenhouse gas emissions associated with this energy usage are shown in Table 1.

**Greenhouse Gas Benefits**

Computer-simulated estimates of achievable energy savings through the thermal efficiency improvements of an ECO™ house average 70 percent. This figure is used as the central estimate for the fuel use and greenhouse gas emissions calculations (with a 10% deviation on either side) shown in Table 2.

<table>
<thead>
<tr>
<th>Fuel type (May to August) (May to August)</th>
<th>5-25%</th>
<th>60%</th>
<th>70%</th>
<th>80%</th>
<th>60%</th>
<th>70%</th>
<th>80%</th>
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<tbody>
<tr>
<td>ECO™ Home, Fuel and GHG</td>
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<tr>
<td>Fuel type</td>
<td>Winter space-heating needs</td>
<td>Space-heating contribution to CO₂</td>
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<tr>
<td>Paraffin</td>
<td>140 litre</td>
<td>370 kg</td>
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<tr>
<td>Coal</td>
<td>350 kg</td>
<td>970 kg</td>
<td></td>
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<tr>
<td>Energy savings</td>
<td>60% 70% 80%</td>
<td>60% 70% 80%</td>
<td></td>
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<tr>
<td>Paraffin (l)</td>
<td>84 98 112</td>
<td>222 259 296</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Coal (kg)</td>
<td>212 248 283</td>
<td>582 679 776</td>
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The tables show that for paraffin-using households, energy space-heating requirements can be reduced by 84 to 112 litres over the winter heating season (a four month period from May to August), yielding a carbon dioxide reduction of 222 to 296 kilograms per annum for a single household. In comparison, for coal-using households, a reduction of 582 to 776 kilograms of carbon dioxide per annum can be achieved. Over 20 years and 1.5 million homes, this means that ECO™ homes or other models of energy-efficient, low-cost housing could reduce South Africa's carbon dioxide emissions by 5-25 million tonnes.

**Income-related Benefits**

As mentioned above, during winter, households in Kutlwanong use approximately 140 litres of paraffin per winter for space-heating purposes. With paraffin costing R1.75 per litre, this level of use amounts to an annual cost of R245 for space-heating alone. If the ECO™ house reduces energy use by 70 percent for space-heating requirements, then households will save R170 per year. Reducing energy operating costs of the house releases scarce financial resources for other household needs. As one of Kutlwanong's community leaders, Zombo Jansen, stated: "It means that our people are not going to use a lot of money to heat their homes. They can use the money saved to feed their families, send their kids to school and provide for other needs."

**Other Benefits**

Environmental health and safety issues related to the household use of coal and paraffin are significant in South Africa. Exposure to indoor smoke degrades the body's defence mechanisms, and makes people more susceptible to respiratory infections such as pneumonia and tuberculosis. Studies of indoor air pollution in urban coal-using households in South Africa found that people's exposures to indoor air pollution, especially particulate matter, exceed WHO health guidelines by a factor of two to three in summer and six to seven in win-
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3. The Intervention

South Africa could make great strides towards realising the energy and environmental savings of energy efficient homes by requiring developers to follow several basic principles of passive solar housing design. The Department of Housing’s norms require developers to “take cognisance” of these principles, but do not require that developers actually implement the measures.

The types of no- to low-cost interventions that the Department of Housing could require include:

- the optimisation of dwellings’ solar orientation;
- the correct positioning and sizing of windows;
- the proper sizing of roof overhangs to reduce summer heat gain but allow winter heat gain;
- an internal layout that utilises the solar benefits for comfort and natural lighting;
- using materials to achieve correct building mass;
- the planting of trees for shading;
- the promotion of water conservation measures;
- sealing and weather-stripping the house; and
- the installation of proper exhaust ventilation for fuel burning appliances.

Other structural recommendations that involve slightly higher costs that the government could also consider are the installation/provision of energy-efficient, low-smoke appliances;

- ceilings with insulation combined with appropriate ventilation;
- energy efficient lighting technologies;
- wall insulation; and
- energy efficient water heating systems.

Finally, the Department of Housing could target a series of capacity building interventions such as:

- promoting clean (e.g., solar and LPG) cooking methods in the home;
- the development of community skills—both managerial and construction; and
- the encouragement of environmentally-friendly transport and community gardening schemes.

4. To Learn More

To learn more about the power of efficiency and about ECO™ housing in particular, contact IIEC or PEER.

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This report was made possible by the generous support of the US Initiative on Joint Implementation
Standards and labelling programmes represent an important avenue for promoting energy efficiency in South Africa, and could reduce the country's carbon dioxide emissions by as much as 25 million tons over 30 years. As the South African economy gains strength, its residents will seek and attain higher standards of living, including increased use of residential appliances such as fans, refrigerators and air conditioners. In this environment, increasing the efficiency of end use appliances will be essential to slowing growth in energy consumption.

By creating standards, the South African Government can bolster efficiency gains made possible through advanced technologies. Through labelling, incentives are created that encourage manufacturers to accelerate their efforts to introduce efficient devices. Together, standards and labels could transform the South African market for efficient appliances and significantly reduce appliance-associated emissions.

Dozens of countries around the world have efficiency standards and energy labelling for a variety of appliances. Standards and labelling are a simple and effective strategy for providing guidance to residential consumers in their purchase of household appliances. (These programs can also be used in the commercial and industrial sectors, for instance for packaged air conditioning and motors.)

Standards set a minimum efficiency level that appliance manufacturers must meet in order to sell their wares. Labelling provides information to consumers regarding the energy efficiency and performance of products while encouraging manufacturers to exceed the standards and to use high efficiency ratings as a marketing feature.

Labelling programmes can be of two types: comparison and endorsement. Comparison programmes provide consumers with information allowing them to compare all products within a given category. Endorsement programmes identify and endorse a limited number of products that meet a specified high efficiency standard. Both standards and labelling programmes can be either voluntary or mandatory. There are four steps to establishing a labelling and standards regime.

1. **OECD Examples**

   (1) The United States has six energy labelling programmes in total. Amongst these is the mandatory comparison programme Energy Guide, which was...
established in the 1970s and became effective in 1980 for major household appliances. While aspects of the Energy Guide label have been criticised, the programme has nonetheless had a large impact.

The Energy Guide programme requires certain household appliances sold in the US to carry a label indicating the energy performance or annual energy consumption of the product. The manufacturers test their own products and produce the labels, while manufacturer associations oversee the programme and conduct spot checks of ratings to assure accuracy.

(2) Australia has two comparison labelling programmes, one is mandatory and the other is voluntary. The mandatory comparison labelling programme for electric household appliances has been operated by the Government since 1987. The appliances covered in this programme requiring energy performance labels include refrigerator-freezers, freezers, air-conditioners, dryers, clothes dryers, clothes washers and clothes washers.

(3) Japan has a mandatory comparison labelling programme for refrigerators-freezers and freezers. Furthermore, the Japanese are currently considering labels for air-conditioners, colour televisions, washing machines, microwave ovens, clothes dryers, space and water heaters and lighting equipment.

2. The Philippines' A/C Programme

One of the greatest accomplishments of the Philippine Department of Energy (DOE) with energy efficiency is the Residential Air Conditioner (AirCon) Standards and Labelling program. After years of co-ordination with manufacturers and the Department of Trade and Industry's Bureau of Product Standards, DOE launched the model programme in early 1994. The programme has the potential to become a powerful platform for subsequent energy efficiency efforts not only in the Philippines but also in other Asian countries.

The Philippines AirCon program is similar to appliance standards and labelling programs in the United States and other countries. The standards establish minimum levels of efficiency that all units must meet in order to receive government certification to be sold in the country. These standards can also be tightened over time to continually remove the least efficient products from the market. Meanwhile, the labelling component educates consumers on the benefits of energy-efficient appliances. As consumers become energy-conscious, manufacturers are provided with an incentive to use efficiency as a marketing tool and to outstrip their competition in the production of cost-effective, energy-efficient products. By coupling standards and labelling, the Philippines have been able to promote more efficient units and have begun an important and ongoing transformation of the market for air conditioner units in the country.

The Context

Two factors have driven energy efficiency in the Philippines since the early 1990s: a pronounced dependence on imported oil and the need for a reliable electrical system. The dependence on imported oil has adversely affected the country's ability to build hard currency stocks and has been blamed for slowing growth. Meanwhile severe power shortages in 1992 and 1993 caused Metro Manila, the nation's largest population centre and economic hub, to suffer near daily blackouts that often lasted six to eight hours. Like the importation of oil, the electricity grid's unreliability has had a crippling effect on the country's economic growth.

Program Design

In 1980, the Philippine government passed a law promoting energy conservation, and the Ministry of Energy began to assess means to use energy more efficiently in all sectors of the economy. The government was especially interested in curbing oil imports, but it also began to investigate how to stem the growth in electricity demand, and specifically cited increasing the efficiency of refrigerators, lighting and air conditioners as a means of doing so. Air conditioners were given a high priority because, while only penetrating a small fraction of households, they represented one of the most dramatic areas of increased demand for electricity in the residential sector.

It took the DOE over ten years to implement the Residential AirCon program. Much of this time was spent in the painstaking (though ultimately rewarding) process of bringing the private sector into the negotiations in order to develop reasonable standards that could be improved over time.

The Philippines AirCon program is administered by two government agencies, the Department of Energy and the Department of Trade and Industry. DOE administers the program and runs the Fuels and Appliances Testing Laboratory (FATL). FATL is a key component of the program, serving as an independent testing labora-
The standards and labelling program will offset hun-
ditions. Furthermore, as the Philippines economy
hundreds of millions of dollars of generating capacity ad-
served over 400
resulted in cumulative energy savings of 780 GWh.
The minimum standards established through the program set a
d each level of capacity and energy consumption, is a
program. The
energy savings of roughly 17 GWh. The
monitoring and ENERGY GUIDE
The Energy Efficiency Ratio (EER), a measure of the
efficiency of an air conditioner based on output cool-
ing capacity and energy consumption, is a
critical feature of the program. The
program as an excellent first step, and one that can
be replicated in subsequent efforts. FATL plans simi-
lar programs for other end-uses such as refrigerators,
lamp ballasts, fans, rice cookers, washing machines,
and other household appliances. The success of the
AirCon program has been critical to program planning,
and the program serves as a powerful and positive
template for further initiatives.

Lessons Learned
1. Private sector participation is essential.
The Residential AirCon Program has been a
marked success because it has been a carefully
crafted effort between the public and private sector.
Rather than forcing a tough set of standards down
the throats of the manufacturers, the Philippines
Government established a Technical Committee to
develop the program — headed up by the president
of the trade association of home appliance manu-
facturers — and worked diligently to reach consen-
sus on the most appropriate course of action.

2. The combination of incentives and penalties is ex-
tremely effective.
While manufacturers have had to retool their fac-
tories and invest in designing more efficient units,
they have benefited from using the labels as market
tools. For its part, the government has played an
important role in promoting the labels, raising
awareness of the value of energy-efficient products
and creating a means of product differentiation. As
a result of this collaboration, manufacturers have
recognised that they can develop high quality prod-
ucts that will give them sustained and increasing
revenues through sales in the Philippines and po-
tentially through export to other countries in the re-

3. Establishing test procedures that are agreeable to
government and industry is critical.
The testing and certification aspect of the program
has been the most contentious aspect of the pro-
gram and represents a fertile area for lessons
learned. How can manufacturers be assured that a
government-operated laboratory with restricted
funding will be accurate? Can the government ac-
credit independent laboratories to do this work, akin
to Energy Technology Laboratories in the United
States? What test procedure are to be used? These
have been among the key issues faced by program
planners in the Philippines. They represent only the
tip of the iceberg of lessons learned that can be
used to maximise the effectiveness of subsequent
standards and labelling programs both in the Phil-
ippines and in other countries.

3. Benefits for South Africa
South Africa has no energy performance standards for
household appliances. The South African Bureau of
Standard's requirements only concern issues of health
and safety. Furthermore, South Africa is currently faced with the problem of the dumping of inefficient products from Asian countries. To address these twin problems of poor efficiency levels and dumping, South Africa could introduce performance standards and labelling programmes.

On the greenhouse gas front, researchers at the University of Cape Town's Energy Development and Research Centre (EDRC) estimate that over 30 years the emissions avoidance potential for a standards end labelling regime covering only refrigerators and freezers is ~25 million tons of carbon dioxide.\(^1\)

EDRC's estimate is built on a study conducted by Marbek Resource Consultants that assumes that an average unit efficiency improvement of 30% could be achieved and that 50% of the market would benefit from a labelling and standards programme.\(^2\) The annual emissions reduction per unit (refrigerator or freezer) would stand at 230 kilograms of carbon dioxide.

In addition to the reduction of greenhouse gas emissions, energy efficiency standards and labels for appliances would bring benefits directly to consumers. As EDRC notes, "appliance labelling and standards will help reduce [household] expenditure on energy services...[as well as] non-greenhouse gas emissions in energy supply." Labels also increase consumer awareness and support a consumer's ability to make educated choices.

Any number of South African agencies could take the lead in establishing a standards and labelling regime. The Department of Minerals and Energy (DME) has jurisdiction on matters relating to energy policy. Eskom has a vested interest in investigating strategic load growth options, and the Department of Trade and Industry regulates appliances and supports the South African Bureau of Standards. As for where to begin, a new initiative sponsored by the United Nations Foundation—CLASP (the Collaborative Labeling and Appliance Standards Program)—could provide much needed assistance.

The objective of CLASP is to increase the design, implementation and enforcement of energy efficiency standards and labels for appliances in developing and transitional countries. Where a government can demonstrate the proper motivation, CLASP will:

- provide technical assistance for the development and adoption of national energy efficiency labelling and standards rules, including logistical, policy, analytical, and advocacy support;
- co-ordinate and promote training, education, and compliance programs for manufacturers, government officials, industrial designers, advocacy groups, trade associations, and other stakeholders involved in the implementation of labelling and standards programs;
- disseminate information regarding the importance of energy efficiency labelling and standards programs in helping developing countries meet high growth in energy demand; and
- provide comprehensive and easily accessible technical information and data to stakeholders in developing countries, drawing on the combined strengths of the CLASP team of experts.

## 4. To Learn More

To learn more about the power of efficiency and, in particular, about appliance standards and CLASP contact IIECAfrica.

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This report was made possible by the generous support of the US Initiative on Joint Implementation.

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Simple, mobile solar water heating devices could play an important role in the long-term avoidance of greenhouse gas emissions in South Africa, reducing South Africa's carbon dioxide emissions by at least 4 million tons over 30 years. The low-cost devices could also provide a valuable service—free water heating—to South Africa's poorest citizens, bringing improved hygiene and health. As one survey found, South Africans are already comfortable with this technology.

More than 15.5 million South African's have neither indoor plumbing nor modern electric or gas geyser systems. As a result, what heated water this population group uses generally is heated using traditional fuels at very low efficiencies. Although this group does not currently consume great deals of heated water, as their affluence grows, their demand for this service—and its resulting greenhouse gas emissions—will grow in tandem. Mobile solar water heating devices could address the water heating needs of these people at a much lower cost than the installation of electric or gas geyser systems, while significantly reducing associated carbon dioxide emissions.

Solar thermal devices make use of the sun's radiation for direct heat transfer. Simple devices such as solar cookers and mobile solar water heaters require minimal acquaintance to the product, and in most cases are self explanatory. No technical training or literacy is necessary to use them effectively, and no installation is required.

To test the acceptance of mobile solar water heaters by low-income South Africans, IIEC conducted a consumer survey in Ivory Park, Gauteng. The study’s 30 participating households were a good representation of Ivory Park dwellings, containing both formal houses on formal stands and informal houses on formal stands. The only shortcoming was the lack of any informal houses on unregistered lots. The households mirrored the township’s varying income levels, diverse energy use patterns and range of water supply sources.

The primary objectives of the study were to profile energy use for residential water heating amongst low-income households of South Africa, and collect consumer response to simple, mobile, solar water heating devices. IIEC collected the following information to reach the primary objectives:

- baseline information on residential water heating;
- consumer responses to mobile solar water heating devices and their features, as well as information on conditions under which consumers would use solar water heaters;
- data regarding the conditions under which households that own more than one water heating device would tend to use solar water heating devices; and
- data on consumer willingness to pay for such devices, and conditions under which that willingness might change.

Winrock International commissioned and sponsored this study with generous support from the US Agency for International Development.

1. The Equipment

IIEC's selection criteria for the equipment used in the study was commercial availability, ease of use, sturdiness and affordability. IIEC also gave preference to devices that were locally manufactured. IIEC selected three different devices and tested each of them over a period of three weeks. IIEC obtained thirty (30) devices.
in total, ten (10) of each of the selected products. The devices that IIEC obtained were:

- A 25-litre "wheel barrow" solar water heater, purchased at a cost of R766 per unit at the time of the study, December 1999.

- An 18-litre soft tank shower that cost R60 per unit. This shower also known as a 'pillow case' or 'bladder' device, is made of black soft plastic sheeting on the other side.

- A second 18-litre 'pillow case' solar shower, purchased at a cost of R75 per unit.

2. Study Methodology

IIEC designed a survey tool to gather information from the community and relied on structured face-to-face interviews to gather data. IIEC's rationales for relying on interviews were the multiple languages of the community, the high degree of illiteracy in the target community, and cultural issues such as unfamiliarity with answering surveys or demonstration projects.

Before distributing the solar geysers, IIEC interviewed study participants to gather information on residential energy use and water heating. These interviews provided IIEC with a baseline against which to compare participant's responses to the solar water heaters. The baseline interview sought data (both hard facts and perceptions) of fuel use. Thereafter, each participant was interviewed once a week on their use of that week's solar geyser.

3. Summary of Findings

The baseline interview indicated that:

- All participating households use hot water for bathing, and most also use it for cooking. A small percentage uses hot water for laundry.

- Although all the participating households were electrified, only 13 percent of the participants use electricity as their sole fuel for water heating. Twenty percent rely solely on paraffin for water heating, and the remainder (67 percent) use a mix of fuels to meet their water heating needs.

- Few of the formal households have electric water heaters/geysers. The few households that do have electric geysers do not use them often, or at all, because of the high cost related to their use.

- Households use various appliances such as electric kettles, ordinary kettles and pots to heat water on either electric, coal or paraffin stoves. None of the households used gas.

The survey further indicated that:

- Participants welcomed the energy savings associated with mobile solar water heating devices.

- The solar geysers met almost no resistance in terms of the cultural or status perceptions.

- Many participants were unimpressed with the solar showers. They found the time/volume trade off unappealing.

- Participants were interested in purchasing the "wheel barrow" through a financing mechanism.

- Participants desired to purchase the device through large commercial stores (e.g., department stores) where consumer finance mechanisms are already in place and are well-understood.

- Solar water heaters meet many, but not all water heating needs in low-income households.

4. Greenhouse Gas Avoidance

The potential for greenhouse gas emission avoidance by employing this technology on a wide-scale is enormous. Researchers at the University of Cape Town's Energy Development and Research Centre (EDRC) estimate that the emissions avoidance potential for the technology over 30 years is ~4 million tons of carbon dioxide, or roughly 240 kilograms per solar water heater per year.\(^\text{1}\)

EDRC's estimate is based on the assumptions that:

1. the average emerging market consumer uses 7 litres of heated water per day;

2. the fuels used for water heating in this market are coal (40%), wood (38%), paraffin (20%) and gas (2%).

\(^{1}\) Mark de Villiers & Khorommbi Mabile, Greenhouse Gas Baseline And Mitigation Options For The Residential Sector, January 2000.
3. The efficiency of water heating appliances are gas geyser—84%, paraffin stove—43%, wood stove—25% and coal stove—40%; and
4. 50,000 solar water heaters find their way into the market each year.²

Furthermore, as EDRC notes, a "stand-alone [solar] hot water heater will provide low-income households with more hot water than they would be able to boil on a stove or fire. [The solar heater] will reduce harmful local air pollution such as particulates by reducing fuel consumption. Non-greenhouse gas emissions in energy supply will be reduced. Stand-alone solar water heaters could create demand for labour through the manufacture and installation of solar water heaters."

5. Conclusion and Next Steps

With more than 15.5 million South Africans living without piped water, fossil fuel-based systems are the main source for heating water. Moreover, the scarcity and expense of fossil fuels means that many poorer South Africans make do with inadequate hot water. Finally, the research conducted by IIEC indicates that South Africa's emerging market consumers will purchase and use solar water heating devices and welcome their energy saving benefits.

To help more South African's access heated water, the South African Government may wish to incorporate solar water heaters into the energisation programme. Furthermore, while the EDRC has provided good estimates of solar water heating's potential to avoid carbon dioxide emissions, the government may wish to conduct more in-depth quantification of the potential displacement of fossil fuel consumption through the proliferation of solar water heaters. Such an analysis could support market development activities for the technology under the Clean Development Mechanism of the United Nation's Framework Convention on Climate Change.

Finally, public and private sector agencies may wish to investigate the best marketing techniques and most appropriate distribution channels for solar water heaters. Such efforts would help spur the necessary market transformation to ensure that the potential solar water heating market is realised.

6. To Learn More

To learn more about the power of efficiency and, in particular, about solar water heating devices and other aspects of passive solar design, contact IIEC-Africa.

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This report was made possible by the generous support of the US Initiative on Joint Implementation

² IIEC believes that EDRC's estimate of the potential market for solar water heaters is high. 25,000 units per year might be a more reasonable figure.
South African Keys to a Climate Friendly Future

Green Finance, Money to Make the World Go Round

Prepared by: IIEC-Africa

Date: September 2000
Version 3.0

Many energy-efficiency interventions that can make a new house more affordable, safe and comfortable can be done through no-cost improvements in housing design. Proper solar facing, adequate roof hang, and appropriate window placement and sizing are examples of such no-cost interventions. However, other valuable interventions such as ceiling insulation, solar geysers and energy-efficient lightbulbs do incrementally add to the cost of building a house. This incremental cost discourages many builders and home buyers, whose tendency it is to minimise up-front costs. This situation could be overcome if South African home financing vehicles provided incentives for energy efficiency.

By making "green" financing available for installing energy efficient technologies, South Africa could help secure itself a sustainable housing future and simultaneously help mitigate the threat of global climate change. Even if "green" financing was available for only ceilings, solar geysers and CFLs, the carbon dioxide reduction could top 22 million tons over the period 2000-2015.

The financial situation of many Native Americans in the United States is startling similar to that of blacks in South Africa. More than 40 percent of Native American houses on tribal lands are substandard and 21 percent of the houses are overcrowded. Furthermore, because of the reservations' low population densities and remote locations, the cost of improving the housing is astronomical. The cost of installing water, sewer and road systems runs as high as $17,000 per home.

Although the US government provides grant funding to improve the housing stock on tribal lands, as is the case with the national housing subsidy in South Africa, providing a basic yet durable, high quality and comfortable home is a challenge with only grant assistance. To further require that these homes incorporate low-cost energy efficient technologies creates an additional financial gap. As the US-based Partnership for Advancing Technology in Housing (PATH) demonstrates, however, with creative thinking solutions can be found.

1. The Oglala Sioux Story

"New technologies almost always make housing more affordable over the long run because they are more energy efficient and reduce maintenance. New technologies are also more environmentally friendly, reducing air toxins and gas emissions."

— Andrew Cuomo, US Secretary of Housing and Urban Development

Secretary Cuomo’s words rung true at the 1997 Native American Homeownership and Economic Development Summit on the Oglala Lakota Pine Ridge Reservation in South Dakota. The conference, organised by the US Department of Housing and Urban Development (HUD) and the Oglala Lakota Nation, prominently featured PATH advanced technologies. The confer-
The progress that the Oglala Lakota Nation has made in overcoming financial and other development hurdles is a showcase of what can be achieved through public-private partnerships, especially in the arena of financing. As Secretary Cuomo acknowledged, by mobilizing loans and guarantees, the Pine Ridge reservation "offered important lessons in new training ideas for builders and construction workers, promising technologies and processes for modular and manufactured homes, and exciting, creative financing."

2. Why Green Financing Works

Green financing, also known as energy-efficient mortgages (EEMs), is built on the fact that when energy expenses are added to mortgage payments, the total cost of owning an energy-efficient home can be lower than the total cost for an inefficient home. In other words, the money that homeowners of efficient houses save on paraffin, coal, gas or electricity can be used to meet other financial obligations such as the bond. As a result, these homeowners can be a better credit risk.

Just because efficiency improvements cut operating costs does not, however, mean that all energy-efficient interventions make sense from a financial point of view. Only those measures whose payback in terms of reduced energy bills is sufficiently short to justify the additional capital costs qualify.

Hard data showing that ceiling insulation, solar geysers and compact fluorescent lamps (CFLs) would have short enough payback times to justify EEMs is not yet available, but indications suggest that CFLs are financially viable and that consumers are interested in financing the purchase of mobile solar geysers.2 If all three technologies became financially-viable through the provision of green financing, the 15 year carbon dioxide savings would amount to 22 million tons.3 The assumptions underlying this savings are that 100 000 ceilings, 25 000 solar geyser and 500 000 CFLs would installed each year for the next 15 years.

3. Green Financing in South Africa

At present, the concept of green finance is understood by only a few South African finance institutions. There is, however, evidence of emerging finance packages and programmes that could, with a dedicated effort, be extended to include energy-efficient mortgages. A green finance mechanism in South Africa does not need to be developed from whole cloth, but rather can be a component of existing facilities.

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3 de Villiers & Mathe.
The South African Department of Housing (DoH) is presently one of the financial innovators in the low-income residential sector. There are several major DoH-related finance institutions that currently facilitate almost all low-income housing finance in South Africa.

- The Rural Housing Loan Fund (RHLF) provides wholesale finance to alternative lenders in rural areas. The RHLF puts an emphasis on building lending, extending lines of credit to materials suppliers to get their products into the low-cost housing market place.
- The National Home Finance Corporation (NHFC) provides wholesale finance to lenders and, along with the RHLF, makes finance available to social housing co-operatives.
- The National Urban Reconstruction and Housing Agency (NURCHA) provides guarantees to lenders and to emerging financial organisations. NURCHA has recently launched a programme of individual-level guarantees for savings schemes linked to low-cost housing.

While none of these funds currently entice homeowners to install energy-efficient technologies, with appropriate government support and leadership, these organisations could form the vanguard of EEM lending. Once EEMs have demonstrated their viability in the low-income South African housing market, private sector financing institutions should be willing to investigate the feasibility of integrating green financing into their own financial instruments, which could ultimately benefit all of South Africa's housing stock.

### 4. The Way Forward

In order for energy-efficient mortgages to become acceptable to financial institutions (even to those institutions that are supported by government), international experience suggests that answers/solutions must be provided to three major issues concerns.

1. Lenders should be adequately indemnified against any additional risk assumed in financing the energy-efficient technologies.
2. A nationally recognised standard for determining the energy cost savings of particular interventions must be created.
3. The programme must be simple to administer (i.e., forms, policies and procedures should be uniform) so that the transaction cost do not outweigh the benefits.

To address these issues and others that will likely arise in the effort to create a pilot and eventually a national green financing programme, the Department of Housing (or other government department) may wish to consider undertaking a feasibility study for EEMs containing the following components:

- an investigation of potential sources of funding for third party indemnification of risks taken on by the mortgage-lending community from amortising the full-cost of energy-efficiency improvements;
- a list of environmentally efficient devices, designs and materials appropriate to and available in the South African housing sector; and
- an assessment of international norms with respect to institutional arrangements, capacity requirements, operating costs etc. needed to set up a suitable fund/programme.

In addition, it might be useful to initiate a survey of existing mortgage lenders, both public and private, in cooperation with the South African Banking Council to assess:

- the level of awareness of banks of EEMs;
- the attitude of banks to EEMs; and
- what enticements would best encourage the development of such financing mechanisms.

The participation of all stakeholders is needed to produce a successful, simple and transparent programme to bring finance to residential efficiency efforts.

### 5. To Learn More

To learn more about the power of efficiency and about green financing in particular, contact IIEC.

Tel: (011) 482-5990 Mail: 62A Fifth Avenue
Fax: (011) 482-4723 MELVILLE 2092
Eml: iiec@africa.com

This report was made possible by the generous support of the US Initiative on Joint Implementation.

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5. In 2001, IIEC-Africa will begin work (in conjunction with homeowners, builders and the financial community) to develop a home energy rating system that could serve as the foundation for such a standard.
Appendix I

Interviews with the South Africa NCCC

During the period October 1999 to April 2000, IIEC conducted face-to-face or telephonic interviews with members of the South Africa National Committee on Climate Change (NCCC). The purpose of these meetings was to:

1. build awareness amongst decision makers of the pro-growth/win-win climate change opportunities that relate to South Africa;
2. gain a clear understanding of the needs of different South African stakeholders in the decision making process related to climate change; and
3. investigate South Africa's interest in and the manner in which they intend to implement the Clean Development Mechanism.

More than 40 individuals sit on the NCCC. At the suggestion and with the help of Mr. Festus Luboyera (Deputy Director: Climate Change at the Department of Environmental Affairs and Tourism), IIEC focused its interviews on the 15 NCCC's most active members. The list of the members whom IIEC contacted and the dates of IIEC's interviews with them is presented below.

<table>
<thead>
<tr>
<th>Date</th>
<th>Name</th>
<th>Title: Department, Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct-99</td>
<td>Mr. Festus Luboyera</td>
<td>Deputy Director: Climate Change, DEAT</td>
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<tr>
<td>Nov-99</td>
<td>Dr. John Kilani</td>
<td>Chamber of Mines of South Africa</td>
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<tr>
<td>Nov-99</td>
<td>Dr. Lauraine Lotter</td>
<td>Executive Director: Chemical and Allied Industries' Association</td>
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<tr>
<td>Nov-99</td>
<td>Mr. Richard Sherman</td>
<td>Environmental Justice Networking Forum</td>
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<tr>
<td>Dec-99</td>
<td>Dr. Tshenge Demana</td>
<td>Director: Department of Trade and Industry</td>
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<tr>
<td>Dec-99</td>
<td>Ms Sharon Lewis</td>
<td>Department of Housing</td>
</tr>
<tr>
<td>Dec-99</td>
<td>Mr. Henk Roodt</td>
<td>Terrestrial Environmental Affairs, Department of Foreign Affairs</td>
</tr>
<tr>
<td>Feb-00</td>
<td>Ms Vanida Govender</td>
<td>Corporate Environmental Manager: Eskom</td>
</tr>
<tr>
<td>Mar-00</td>
<td>Ms Shirley Miller</td>
<td>Chemical Workers Industrial Union</td>
</tr>
<tr>
<td>Apr-00</td>
<td>Ms Muriel Dube</td>
<td>Director: Atmospheric Protection and Chemicals Management, DEAT</td>
</tr>
<tr>
<td></td>
<td>Ms Sarah Allan</td>
<td>Department of Traditional and Environmental Affairs</td>
</tr>
<tr>
<td></td>
<td>Adv. Sandea De Wet</td>
<td>Chief Legal Advisor: Department of Foreign Affairs</td>
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<tr>
<td></td>
<td>Dr. Zoë Budnik-Lee</td>
<td>Executive Director: Industrial Environmental Forum</td>
</tr>
<tr>
<td></td>
<td>Ms Laura James</td>
<td>National Union of Mine Workers</td>
</tr>
<tr>
<td></td>
<td>Mr. Jerry Lengoasa</td>
<td>Chief Director: Environmental Quality and Protection, DEAT</td>
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</tbody>
</table>

In order to be able to compare the members' viewpoints on a variety of key issues, IIEC developed a series of questions that we attempted to ask in each interview. Not all questions were asked in all interviews, and not all interviewees choose to respond to all questions. The questions were:

- under what conditions would you support AII/CDM projects?

Ms Allen declined to be interviewed.
† Mr. Roodt indicated that Ms de Wet was not an appropriate contact from the Department of Foreign Affairs.
‡ Dr. Budnik-Lee declined to be interviewed.
§ Ms James left the National Union of Mine Workers and her position had not been filled.
** Mr. Lengoasa indicated that Muriel Dube was the appropriate contact from his department.
IIEC's findings from the meetings include the following:

1. South Africa is not interested in developing more AIJ projects. Government, NGOs and the business community alike want to focus on the CDM.
2. While the provision of housing and other infrastructure for previously disadvantaged communities was an extremely important government priority—most members of the NCCC envisioned the industrial and power generation sectors of the economy as being the most promising climate change mitigation options.
3. With only two exceptions, none of the members of the NCCC with whom IIEC spoke had a clear sense for how to develop CDM projects or what the process for approving such projects would look like.
4. While most NCCC members felt that DEAT should play a leadership role in the NCCC, many members believed that it was industry (Eskom, CAIA and the Chamber Mines) and NGOs that ultimately led the process.

1. Festus Luboyera, Department of Environmental Affairs and Tourism

Mr. Luboyera explained that in late 1999, responsibility for climate change had shifted from the Weather Bureau (a quasi-governmental agency of the Department of Environmental Affairs and Tourism), to the DEAT head office. DEAT (i.e., Mr. Luboyera) remains the Secretariat for the NCCC. The chain of command within DEAT on matter of climate change is:

- Chief Director, Environmental Quality and Protection, Mr. Jerry Lengoasa
- Director, Atmospheric Protection and Chemicals Management, Ms. Muriel Dube
- Deputy Director, Climate Change, Mr. Festus Luboyera

DEAT is still struggling with managing climate change as a whole. Mr. Luboyera is the only person working on climate change issues day-to-day, but he is hopeful to soon have additional support. In light of the shortage of staff, DEAT has contracted the Chemical and Allied Industries' Association (CAIA) to manage interactions with all AIJ/GEF projects and project developers. The only AIJ project that DEAT continues to shepherd is IIEC's Housing for a Healthier Future project.

Mr. Luboyera offered to assist IIEC in (a) identifying the 15 most active members of the 40-person strong NCCC and (b) securing a slot in which to make a presentation at a forthcoming NCCC meeting about means in which IIEC could best assist the goals of NCCC through its USIJI funding. [No such meeting ever took place.]

2. Dr. John Kilani, Chamber of Mines

The NCCC initially had a subcommittee on AIJ/CDM. The panel was chaired by Laura James of the National Union of Mine Workers. Subsequently, the NCCC disbanded this panel and has taken the project management approach to shepherding AIJ/CDM projects, using an independent consultant (Mr. Hermann Weichers) to oversee the projects.

††Please note that this point potentially conflicts with the government's intention to make provision of services and poverty alleviation key flexible mechanism objectives.
The Chamber of Mines is in the process of developing an overarching strategy for its industry. Industry participants (drawn from all the large mining houses and a number of independents) have had two meetings. An industry response to climate change will be one of the issues covered by the strategy.

To date, Dr. Kilani's involvement in the NCCC has focused mainly on the negotiations, not on internal issues such as the development of South African AIJ projects. Nonetheless, he feels very well versed on the potential of the various flexibility mechanisms since he has served as the African chair on discussions of the mechanisms at various FCCC events.

With respect to the issue of extending the AIJ pilot phase, Dr. Kilani is of two minds. Even though South Africa has garnered a number of AIJ projects, he realises that Africa has received less than its fair share of projects. Therefore, on the one hand, Dr. Kilani supports those African countries that want to make sure that they get their fair share of AIJ "grant" monies (and to learn if and how the flexibility mechanisms could work). He thus supports a continuation of the pilot phase. On the other hand, he believes that if Africa continues to focus on AIJ and does not invest sufficiently in building CDM projects, then it might lose out on CDM monies just as it lost out on AIJ monies.

As for the issue of AIJ to CDM conversion, Dr. Kilani is likewise of two minds. He realises that allowing AIJ projects to convert would give counties with AIJ projects on the books (such as South Africa) a head-start over other countries and ultimately reduce the number of "new" projects that could come into the CDM. On the other hand, he wants to provide incentives to those individuals and countries who were proactive enough to invest in AIJ.

Ultimately, however, he and South Africa are indifferent to the whether or not the pilot phase is extended and to whether AIJ to CDM conversion is allowed. And regardless of what happens, South Africa will cease to develop new AIJ projects and will pursue CDM aggressively.

Dr. Kilani has a number of ideas on what South Africa can do to promote CDM projects. First, to be able to engage developers, he thinks that it is crucial that the country develop clear guidelines for project developers. Second, Dr. Kilani realises that the NCCC must be able to respond to new project ideas with the speed required by the private sector. Third, since climate change is not a large issue in South Africa, he believes that the government must build awareness among the general public and among potential project developers. Finally, Dr. Kilani believes that the CDM should place as much emphasis on development as on climate change mitigation.

Dr. Kilani believes that the most active and influential members of the NCCC are DEAT's Muriel Dube and Jerry Lengoasa; Henk Roodt from Foreign Affairs; and from the private sector side Dr. Lotter (industry rep), Richard Sherman (environmental rep), Shirley Miller (labour rep) and Vanida Govender (utility rep).

Dr. Kilani left the Chamber of mines in mid-2000.

3. Dr. Laurraine Lotter, Chemicals and Allied Industries' Association
While agreeing to be interviewed, Dr. Lotter asked that her comments not be directly attributed in any report/article/etc.
4. Mr. Richard Sherman, Environmental Justice Network Forum

Mr. Sherman is the lone environmental NGO representative on the NCCC. However, as the representative of the Environmental Justice Network Forum (ENJF) with its several dozen grassroots and advocacy/watchdog members around the country, he feels that his contribution must be taken seriously by the NCCC. However, since June 1999, a group of South African Non governmental organisations (Earthlife Africa Johannesburg, Group for Environmental Monitoring, Mineral and Energy Policy Centre, Energy and Development Research Centre, Global Legislators for a Balanced Environment- SA, and ground-Work) have been working to establish a local node of the global NGO climate change network, Climate Action Network (CAN).†

The overall goal of the Climate Action Network South Africa would be to facilitate civil society organisations participation in responding to climate change at national, regional and international levels, and to promote government, industry and individual action to limit human-induced climate change to ecologically sustainable levels.

In pursuit of this goal, the objectives of Climate Action Network South Africa would be to:

- to co-ordinate information exchange on national, regional and international, climate policies and issues, between civil society organisations;
- to formulate national, regional and international policy options and position papers on climate-related issues;
- to undertake further collaborative action to promote effective NGO involvement in efforts to reduce greenhouse gas emissions and avert climate change; and
- to initiate civil society capacity building and public awareness raising.

Mr. Sherman believes civil society (i.e., NGOs) can be the most important developer of CDM projects in South Africa. That said, he was not able to clearly explain what kinds of projects such NGOs could develop nor how the projects would be marketed or approved.

5. Dr. Tshenge Demana, Department of Trade and Industry

The goals of DTI are to create jobs, encourage direct foreign investment, and stimulate the transfer of new (environmentally-friendly) technologies and skills. Mr. Demana realises that (1) climate change has important technology transfer aspects and that (2) DTI could play an important role in the technology transfer aspect of the various flexibility mechanisms, but he has had a hard time defining this role and committing to the process. He is hopeful that in the future the Technology Promotion Directorate will take a larger role in these issues within the NCCC.

While Mr. Demana has sat on the NCCC for quite some time, he would not call himself (or his department) an active member of the Committee. He does, however, think that the meetings are useful, but wishes that a larger portion of these meetings could be spent discussing projects. As a result, he does not feel that he is well-positioned to answer IIEC's questions.

6. Ms Sharon Lewis, Department of Housing

Ms Lewis expressed that she does not feel well-versed in the subject of climate change. She initially became involved in the NCCC and remains interested in the work of the Committee because she believes

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† CAN-SA was formally established in February 2000, and IIEC-Africa is a member.
that climate change funding could be used to directly support the work of her department: the provision of quality housing to the poor. While she remains hopeful that AIJ/CDM funding will be able to help improve the quality of housing built for South Africa's poor, she doesn't feel that the mechanisms have as yet lived up to this promise.

Ms Lewis hopes that NGOs (such as IIEC) and other members of civil society can become drivers of climate change projects. At present, she thinks that the most important members of the NCCC are the representatives from DEAT, industry, and the EJNF.

7. Mr. Henk Roodt, Department of Foreign Affairs

The Department of Foreign Affairs' involvement in the UNFCCC is based on the Department's responsibility to protect the country's political and economic interests. While the Department does not lead the delegation, he realises that it does play an important role. He does not recommend, however, that I speak to the other DFA member on the NCCC (Sandea de Wet) since it is his (Henk's) duty to deal with political/economic "desk" issues. (Advocate de Wet's job is too provide legal council to the delegation on matters of international law.)

Regarding CDM, Mr. Roodt believes that it is the way forward. He thinks that AIJ is a mechanism of the past. Mr. Roodt commented that the only reason that the South African Government supports a continuation of the AIJ pilot phase is because other African countries want to continue the pilot.

Mr. Roodt thinks that DEAT should take the lead in establishing the ground rules for how CDM projects will be approved in South Africa. He believes that DEAT took too long in setting up such rules for AIJ, and he hopes that they will be more proactive in setting up such rules for CDM. It is his sense, however, that the establishment of these rules may take some time.

Mr. Roodt thinks that the majority of CDM projects will go to energy efficiency in the industrial sector (specifically process change projects) and that South Africa will get a lot of CDM money. This is good since industry currently believes that climate action poses a threat (e.g., decreased coal exports, etc.), and so they must be shown how climate action can benefit them. Mr. Roodt's confidence comes from three facts:

- South Africa is a relatively large emitter of greenhouse gases (top five among developing countries and top 20 among all countries),
- South African industry is relatively inefficient at present, and
- South African industry is coal-dependent (either directly or via its electricity use).

Mr. Roodt thinks that housing and transport projects will also benefit from CDM (though not to the extent of industrial projects). While these projects don't have as convincing economics, they do meet the government's national priorities. Mr. Roodt does not think that renewable energy projects will get much CDM money.

Right now, Mr. Roodt thinks that DEAT should spend the majority of its climate change budget on public education and awareness building. In his eyes, climate change is not yet an issue for the man on the street or even for the average government official. DEAT must therefore engage in an effort to educate the public about (a) the science and threat of climate change and (b) the opportunities inherent in the flexibility mechanisms. He does not know who will seize the opportunity, but believes that Eskom may play a leading role. Before DEAT can engage in such activities, Mr. Roodt believes that they need to build capacity—the current staff is insufficient to the task at hand. He hopes that DEAT uses the monies made available by USAID to build this capacity and then engage in the needed public education.
8. Ms Vanida Govender, Eskom

[Ms Govender was joined one her staff, Wendy Poulton, for the interview.]

According to Ms Govender, South Africa’s national priorities (economic growth, job creation, poverty alleviation and infrastructure extension) must be an integral part of the flexible mechanisms. Ms Govender described a range of climate change projects in which Eskom is involved that meet the country’s national priorities:

- the Efficient Lighting Initiative – An Eskom-GEF project to transform the South African lighting market from using inefficient incandescents to highly efficiency lighting products. Eskom is investing nearly R50 million (~US$ 7.2 million) in the initiative, and the GEF is bringing in an additional US$2.5 million
- a ceiling demonstration program in a township outside of Johannesburg
- a regional vulnerability and adaptation analysis (Eskom is funding this exercise as a member of the Southern African Power Pool).

Regarding the two mitigation projects, Ms Govender realises that the per household energy savings from projects such as these is very small, and that such projects will not be attractive investment opportunities until the numbers of households brought into these programs is large (1,000,000+).

Since Eskom has decided to approach climate change as an opportunity rather than a threat, she sees many new business opportunities coming out of the FCCC. As a result, she thinks that Eskom will be a major player in the AIJ/CDM world. While she believes that other entities will get involved as AIJ project developers, she is not sure who those entities will be.

Ms Govender realises that Eskom plays an important role in the NCCC as a representative of industry, but she does not believe that Eskom can (or should) carry the entire industry agenda. She is therefore happy that industry is learning more about climate change. Already many industries realise that climate change is an issue, but they require more time to figure out how to respond. According to Ms Govender, the most important industry voices include SASOL (the state petro-chemical firm), Mondi and SAPPI (the two large forestry companies), as well as Billiton and Amplats (two of the mining houses).

Ms Govender thinks that the trade associations (CAIA, the Chamber of Mines, the Industrial Environmental Forum) can play an important role in forming this response, and she thinks that the increased participation in the Business Caucus on Climate Change is a sign that industry as a whole is getting more serious about developing a common response.

Ms Govender was not comfortable answering the question about which members of the NCCC were most influential. She did, however, state that she hoped to see more municipal and provincial government participation in the Committee.

9. Ms Shirley Miller, Chemicals Workers’ Industry Association

While agreeing to be interviewed, Ms Miller asked that her comments not be directly attributed in any report/article/etc.
10. Ms Muriel Dube, Department of Environmental Affairs and Tourism

According to Ms Dube, the South African Government regards climate change as an important issue, and they intend to take decisive actions. However, the country's economy is coal-based and as a result, climate change action can be difficult to justify domestically where the focus is on economic growth. As a result, the government looks at climate change through the lens of sustainable development. Any climate change actions that the government takes must address the following needs:

1. delivery of services (electricity, houses, transport infrastructure, etc.) to historically disadvantaged peoples
2. poverty alleviation through economic growth and job creation
3. environmental management

Presently, the Government and the NCCC are looking closely at articles 4.6 and 4.9 of the UNFCCC. They want to understand how South Africa could be reimbursed for any economic distress as a result of developed countries taking binding commitments and reducing purchases of South African coal.

As for CDM, South Africa definitely wants to participate. To be an active and effective player, however, Ms Dube believes that the country requires a lot more capacity building. (She has a particular interest in augmenting school curricula to include issues of energy use, environment and climate change.) To this end, she is working to get a range of government departments more closely involved in issues of climate change. In early 2000, she wrote a memo to key South African government ministers (Minerals and Energy, Water Affairs and Forestry, Trade and Industry, etc.) to ask them to delegate a focal point for climate change. She is particularly interested in getting Trade and Industry on-board since issues of technology transfer will be an integral component of CDM, but she's had difficulty getting their support.

Meanwhile, Ms Dube is trying to get government to look seriously at non-traditional forms of energy. The government is not going to force industry to phase out the use of coal, but she does believe that government could more effectively indicate that they want industry to move towards gas and other "clean" sources of energy where possible.

As for the NCCC, Ms Dube views it as a resource to government, not as a decision making body. Ultimately, decisions concerning climate change will be taken by government, though the NCCC can provide important input into government's decision making process. Regarding the composition of the NCCC, she wants to make sure that neither business nor NGOs dominate the group. On a separate note, she is considering expanding the group to once again include academics as full-fledged members.

According to Ms Dube, AIJ/CDM should be "government led, private sector driven and community based". She blames the government's inability to take full advantage of the AIJ pilot phase on the fact that DEAT was under-capacitated. She believes that this situation is being rectified as three more staff are being brought on to support/assist Mr. Luboyera, and she is looking to this team to lead the country into the CDM arena. Only government, not the private sector (which includes NGO), can be responsible for driving this process.

Ms Dube left DEAT in August 2000.
Appendix J

Interviews with South Africa Business Leaders

During the period October 1999 to May 2000, IIEC conducted face-to-face or telephonic interviews with prospective members of a South African "Business Council for Sustainable Energy". The primary purpose of these meetings was to determine if sufficient interest existed in South African industry to form the nucleus for a pro climate action voice within South African industry. An auxiliary purpose was to determine what capacity/interest existed in the South African private sector to develop AIJ/CDM projects.

The general findings from these interviews are that:

- industry is open to the creation of a forum along the lines of the US Business Council on Sustainable Energy and its counterparts in Asia, Latin America and Europe;
- while all companies interviewed saw the benefits that carbon offsets could have to their business, there was some skepticism about whether such offsets would ever carry financial value;
- roughly half of firms interviewed saw themselves playing an active role in developing AIJ/CDM projects; and
- several potentially vocal players within the industry are afraid that Eskom, the large parastatal electric utility, might come to control access to CDM.

List of Business Sector Interviewees

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<th>Date</th>
<th>Name*</th>
<th>Title: Department, Company</th>
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<tbody>
<tr>
<td>Oct-99</td>
<td>Mr. Hermann Oelsner</td>
<td>Director: Darling IPP</td>
</tr>
<tr>
<td>Oct-99</td>
<td>Mr. Clive Govender</td>
<td>Corporate Manager: Quality, Safety and Environment, ABB</td>
</tr>
<tr>
<td>Oct-99</td>
<td>Mr. Chesney Bradshaw</td>
<td>Communications Manager: ABB</td>
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<tr>
<td>Nov-99</td>
<td>Mr. Henk Spoormaker</td>
<td>Director: Spoormaker &amp; Partners, Inc.</td>
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<tr>
<td>Nov-99</td>
<td>Mr. Nick Buick</td>
<td>Country Manager and Managing Director: Honeywell</td>
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<tr>
<td>Nov-99</td>
<td>Mr. Steve Shannon</td>
<td>Divisional Mgr., Home and Building Controls: Honeywell</td>
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<tr>
<td>Jan-00</td>
<td>Mr. Marius Willems</td>
<td>Director, Rural Area Power Systems</td>
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<tr>
<td>Jan-00</td>
<td>Mr. John de Wet</td>
<td>Policy and Risk Manager, Energy Group: Billiton</td>
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<tr>
<td>Jan-00</td>
<td>Mr. Emil Rorke</td>
<td>Manager, Energy Group: Billiton</td>
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<tr>
<td>Jan-00</td>
<td>Ms Karen Tania</td>
<td>Manager Energy &amp; Materials Management: Iscor</td>
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<tr>
<td>May-00</td>
<td>Mr. Mario Biagi</td>
<td>Consumer Business Manager: GE South Africa</td>
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Unlike the interviews that IIEC held with members of the NCCC, IIEC did not develop a formal structure for the interviews.

* In addition to the individuals listed below, IIEC also met with and interviewed Lauraine Lotter (Executive Director: Chemical and Allied Industries' Association) as well as Ms Vanida Govender (Corporate Environmental Manager: Eskom) as part of our interviews with members of the NCCC.
1. Hermann Oelsner, Director: Darling IPP (nascent independent wind power generator)

Mr. Oelsner explained at the outset of our conversation that he did not think that South Africa needed any more organisations producing policy documents; what was needed was the formation of a strategy for introducing renewable energy projects into South Africa. *[Note: Throughout our conversation, Mr. Oelsner referred almost exclusively to the need to bring renewable energy sources on-line.]* In addition, he felt that players in the South African renewable energy industry were placing too large an emphasis on rural applications. He would want any network of renewable energy providers to be more inclusive (i.e., to push for "grid connected applications which—if successful—will lead to rural solutions").

That said, Mr. Oelsner recommended a South African Business Council for Sustainable Energy should include a wide-range of institutions. In addition to photovoltaic, bulk solar thermal and wind providers, he thought that there should be participation from such far-end members of the business spectrum as firms that deal with net-metering, etc. It was his opinion that any Council would have to be as big as possible to make an impact. Mr. Oelsner also strongly encouraged inclusion of international/transnational corporations into the Council. Mr. Oelsner expressed two reasons for the inclusion of such firms: first international corporations would increase the size and voice of the Council, and secondly, while he felt that local firms had significant expertise in the field of renewable energy and energy efficiency, that knowledge was nevertheless limited. International corporations might be able to bring even more knowledge and experience to the table that might benefit South Africa.

When IIEC posed the question of whether or not Eskom should be a part of the Council, Mr. Oelsner responded that he did not see why they should be excluded. While he feels that at times Eskom has been the "single, largest obstacle to introducing renewable energy in South Africa for decades, it has to be challenged openly to be transparent and made to firmly state their future intentions."

Finally, Mr. Oelsner expressed interest in seeing as many companies developing ALI/CDM projects as possible. He mentioned that his company was aggressively pursuing funding from the GEF, as well as investigating the opportunity to derive a revenue stream through the sale of greenhouse gas emissions credits through one or more of the Kyoto Protocol flexibility mechanisms.

*[Note: In mid-2000, Mr. Oelsner launched a Renewable Energy and Energy Efficiency Council of Southern Africa (RECOSA). According to Mr. Oelsner, RECOSA planned to co-ordinate the various activities of Southern African renewable energy and energy efficiency NGOs. The aims and objectives of the Council were to include promoting and advocating renewable energy development; providing a forum for renewable energy players to work together; championing and advocating the development of economically viable projects; and working with government towards achieving the goals of the South African White Paper on Energy. As of September 2001, IIEC has seen no activity by this organisation.]*

2. Clive Govender, Corporate Manager: Quality, Safety and Environment, ABB

3. Chesney Bradshaw, Communications Manager: ABB (South African subsidiary of international energy systems technology and service providers)

Mr. Govender began by noting that Avea Brown Boveri (ABB) is a very large multi-national concern with long-standing ties in South Africa. They employ 2500 employees in South Africa and are active throughout the energy chain (from extraction to power generation to end-use). Because of this vertical-integration, Mr. Govender described ABB as more a project-oriented than a product-oriented company. In addition, Mr. Govender noted that ABB takes environmental stewardship in general, and climate change mitigation in particular, very seriously. He noted that the company is indeed already engaged in several climate change mitigation projects in other parts of the world.
When asked about ABB South Africa's interest in forming part of a Business Council for Sustainable Energy, Mr. Govender noted that ABB was already a member (and leading voice) of the World Energy Council and several other related organisations. As ABB was already championing these causes in international arena, he did not immediately see how ABB's participation in a South African specific grouping could provide additional benefit, but he was open to further discussions. Ultimately, if the Business Council became the breeding grounds for AIJ/CDM projects and/or an outlet for joint capacity building and social investment opportunities (e.g., energy efficient housing for lower-income ABB provident fund members, electrician training on energy efficiency, etc.) then ABB would likely have a higher level of interest. Mr. Govender closed by iterating that ABB has a strong desire to create business opportunities for industry in climate change mitigation.

4. Henk Spoormaker, Director: Spoormaker & Partners, Inc. (small, private commercial buildings energy system renovation and construction firm)

Mr. Spoormaker began the interview by describing his business as the only Energy Service Company (ESCO) indigenous to South Africa. (Note: In the view of IIEC, there is at least one other ESCO indigenous to South Africa.) In addition, while Mr. Spoormaker was interested in growing the size of the potential market for ESCOs, he was wary of it growing too fast and thus becoming an attractive market for multinational companies (i.e., Honeywell) to seek to expand their existing ESCO activities.

Mr. Spoormaker also expressed consternation that Eskom continually talked about the need to stimulate investments in rationalising energy use in the South African buildings sector, they were doing little to help firms such as his make in-roads into the market. Moreover, Eskom's on-again off-again interest in getting into the ESCO business itself sometimes made it difficult for Spoormaker to attract clients, clients that might prefer to wait until Eskom the deep pockets of Eskom offered both those services and potentially unbeatable finance rates.

Mr. Spoormaker had considerable knowledge of the international negotiations on climate change and realised that those negotiations could help to expand the range of business opportunities open to his firm, but he expressed doubt that climate change would become a driver for business in the near future. Thus, while he was keen for a Business Council on Sustainable Energy to make in-roads in South Africa, he was not sure what - if any - resources a small firm like Spoormaker & Partners could dedicate to such a council.

5. Nick Buick, Country Manager and Managing Director: Honeywell
6. Steve Shannon, Divisional Manager, Home and Building Controls: Honeywell (South African subsidiary of international energy systems technology and service provider)

IIEC began the interview by noting that Honeywell was a founding member of the US Business Council for Sustainable Energy (US BCSE) and asked what Mr. Shannon and Mr. Buick knew of Honeywell's involvement in that body. Neither of them were aware of the existence of the US BCSE. Upon further conversation, it also became clear that neither Mr. Shannon nor Mr. Buick had more than a passing knowledge of the Framework Convention on Climate Change nor thought of their firm as part of an energy efficiency or sustainable energy industry. When the concepts were explained to them, they expressed interest in learning more and potentially joining the proposed Business Council for Sustainable Energy if membership clearly fit within their strategic growth plans.
7. Marius Willemse: Director, Rural Area Power Systems (small, private distributed generation service provider and systems integrator)

Mr. Willemse began the interview by explaining that Rural Area Power Systems (RAPS) was one of seven government-licensed concessionaires working to provide off-grid electrification to rural South Africans. The basic system that RAPS will sell within its concession will consist of a 50-watt photovoltaic (PV) array, three direct current CFLs (integral, not modular, to reduce servicing needs) and a direct current converter plug for use with alternating current appliances. RAPS business model calls for 60% within its concession by the end of 2005. The business model is built on (a) receiving a R2,500 government subsidy for each new connection and (b) the homeowner buying a R40 token from one of RAPS' vendors/stores every month.

While carbon offsets are not built into the RAPS business plan, Mr. Willemse is very interested in helping to create a market—both locally and internationally—for such offsets. He believes that his off-grid PV concession and the other six concessions could be among the first South African projects to benefit from the sale of their mitigated carbon. Any money generated by the sale of such "paper" assets would allow him to market his systems at a lower price and hence achieve even greater levels of penetration than currently envisaged.

Mr. Willemse sees a strong need for the sustainable energy businesses currently operating in South Africa to come together to lobby for their core interests. That said, he and his associated already sit on several similarly-inclined bodies (e.g., SESSA—the Solar Energy Society of South Africa) and are working with Hermann Oelsner to create a larger body. [Note: RAPS is a member of Mr. Oelsner's RECOSA.] Mr. Willemse's main interest in the type of organisation that IIEC proposes for the Business Council for Sustainable Energy is that it promises to bring in a wider audience than currently participate in the other groups. He, however, had reservations about Eskom playing a role in such a grouping, since their diverse interests led them to champion the principles of sustainable energy while simultaneously under-cutting its implementation.

8. John de Wet, Policy and Risk Manager, Energy Group: Billiton
9. Emil Rorke, Manager, Energy Group: Billiton (mining)

Billiton is one of South Africa's largest mining concerns and at the time of this interview was the Chair of the Energy Intensive Users Group (EIUG), a consortium of the countries largest industrial energy users. That said, Mr. de Wet and Mr. Rorke stated at the outset of the interview that the opinions that they were sharing with IIEC were those of Billiton not the EIUG.

Both Mr. de Wet and Mr. Rorke were well-acquainted with the subject of climate change and explained that the company—which had recently moved its headquarters to London—was currently looking at the issue seriously in order to satisfy its northern shareholders that the company was serious about reducing its environmental "footprint." (They believed that Anglo-American, the country's other large mining concern—was also getting serious about such issues in advance of its own listing on London Stock Exchange.)

Mr. Rorke realised that although Billiton facilities were technically advanced, considerable room existed for further improvements in energy efficiency. However, in light of the likely restructuring of South African energy markets (most notably the restructuring and privatisation of Eskom), working on getting better priced energy was of greater concern to him and his team than ferreting out every last wasted BTU. Nonetheless, he actively encouraged facility managers to invest in all cost-effective efficiency improvements in their facilities. If AIJ/CDM monies would make such investments more profitable and/or make a
wider-range of improvements commercially viable, then he could see Billiton (and the rest of South Africa's industrial sector) becoming major players in the carbon offset market.

Regarding a Business Council for Sustainable Energy, Mr. de Wet and Mr. Rorke had slightly divergent opinions. Mr. de Wet did not see Billiton playing a role in such a body—which (as presented by IIEC) would primarily focus on developing a constituency among firms which provide energy efficiency or renewable energy technologies and services, though he understood that the company could benefit from its work. Mr. Rorke (who is Mr. de Wet's supervisor), however, thought that while Billiton would not necessarily be a member of a South African BCSE, the company could serve as an outside catalyst—actively supporting decisions taken by the Council to government.


The state-owned steel company—Iscor—is home to one of only two energy efficiency projects receiving funds from the Global Environment Facility (GEF). While the GEF project had only just got off the ground after several years of delays, Ms. Tania was somewhere between hopeful and confident that the project would set a trend in the South African basic metals industry of leveraging climate change monies for much needed improvements in facilities. She stated that many of Iscor's own facilities employed outdated technologies and would require fairly wide-spread overhauls to remain competitive in the international steel industry in the years and decades to come. While Iscor's capital improvement budget was sufficient to carry-out this work, Ms. Tania acknowledged that the addition of AIJ/CDM funds would make such investments much more attractive. She did not see Iscor as a broker for such projects, but rather as a client. She thought that Eskom or the DME was better placed to actually broker such projects.

Ms. Tania was not interested in discussing a possible role for Iscor in a Business Council for Sustainable Energy. As a government-owned entity, she would have to get clearance from their government liaison officer before entering such a conversation.

11. Mario Biagi, Consumer Business Manager: GE South Africa (South African subsidiary of international energy systems and services provider)

Mr. Biagi is General Electric's (GE) senior marketing manager for a range of consumer technologies, including lighting products. Over the past three years, he has invested considerable resources in growing GE's efficient lighting business. He has worked extensively with Eskom's ElektroWise ("electricity advice for the home") programme as well as its Efficient Lighting Initiative (ELI) and believes that the South African market for this high technology lighting "appliance" is close to fruition. Though a growth in GE's efficient lighting business will cut into the market for its traditional lighting product range, Mr. Biagi is unconcerned, explaining that GE's profit margins on efficient lighting products is "significant", while those for incandescent lamps is "razor thin." In other words, GE can make much more money selling energy efficient lamps than their inefficient technological predecessors.

Mr. Biagi's claimed little knowledge of the issues of climate change, but when the outline of potential AIJ/CDM projects was explained to him, he saw the possibilities that it would open for the marketing of his high value-added, high efficiency product lines. He did not, however, see GE as the developer of such projects. This task he would leave to his customers—the end-users. Finally, though he would have to approach more senior management within GE before making any formal commitments, Mr. Biagi thought that GE participation in a South African Business Council for Sustainable Energy made good sense.