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United States Agency for International Development
Greenhouse Gas Pollution Prevention Project
Climate Change Supplement
(GEP-CCS)

Institutional Strengthening of the Financial Sector

Task 2B
Review of Portfolio of Financial Institutions

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1. Background On The Financial Institution Strengthening Tasks Under GEP-CCS

In the planning for the *Institutional Strengthening of the Financial Sector* portion of USAID/India's Greenhouse Gas Pollution Prevention Project – Climate Change Supplement (GEP-CCS) project, it was envisioned that this support would occur through two methods. First, two trainings were scheduled for an audience of Indian financial institutions (FIs), including development banks, commercial banks and credit risk agencies. Second, in-depth technical assistance and portfolio reviews were planned for at least 5 select banking institutions. Ultimately, the goal of all of the GEP-CCS capacity building efforts is to catalyze and value-add clean energy and GHG mitigating projects, to achieve the financial closure of 8 projects before April, 2004.

The first training (CLIN 2C) was completed in April 2001 to an audience of approximately 50 representatives of 18 different Indian FIs. The training was divided into three modules, with international experts/practitioners conducting each section. The modules covered existing debt/equity sources of financing for clean energy projects (CEPs), new opportunities in relation to carbon trading, and, finally a module which looked in detail at project development as it relates to clean energy (carbon avoiding) projects.

1.1 Overview Of This Portfolio Review/Ta Task

Between July 30 and August 1, a Louis Berger Group team consisting of Mr. Ted Yoder, Mr. Vinay Deodhar and Mr. Craig O'Connor, President Global Financial Solutions, LLC, performed the next stage in the financial institution strengthening process: a portfolio review and technical assistance task with ICICI and the Infrastructure and Development Finance Company (IDFC), two of the leading Indian FIs involved in environmental lending. The program book put together for this exercise is enclosed in Annexure 1.

The specific objectives of this task were two-fold.

First, it was designed to provide value-added assistance to the FIs by looking in-depth at representative carbon producing projects in their portfolios. This is the opportunity cost-analysis that is referenced in the milestones agreed to by USAID/India and the Louis Berger Group (LBG), the prime contractors for GEP-CCS. Specifically, then, this task sought to identify what project risks do the FIs face by not addressing carbon/climate change impacts in their financial decision-making. Similarly, what cost/benefits should the FI take in consideration when developing a carbon mitigating project that has "potential" future carbon sale opportunities. Therefore, the TA team looked to:

- Identify portfolio projects with highest GHG emissions = highest future potential risks
- Relay current status of international climate change negotiations

- Update the FI on the status of international equity buyers of carbon reducing projects
- Identify strengths/weaknesses of specific projects and recommended restructuring
- Sift through the portfolio for the best carbon mitigating projects which might involve possible future carbon sales

Secondly, this task served as an important feedback loop for the next FI training, tentatively scheduled for Winter 2002. Therefore, the TA team targeted institutions that attended the April training. The TA team hopes to elicit the cooperation of very prominent Indian FIs whose experiences will provide valuable insight for other FIs, who may have more limited time and resources. These FIs will be highlighted in the next training, using their real-life experiences as case studies. Therefore, the TA team sought to address the following questions as well:

- Did the FI implement any organizational changes based on the April training?
- Are projects being reviewed for their climate change impacts risks?
- Is someone in the organization dedicated to climate change issues?
- Has the FI implemented any train-the-trainer type of activities to its subsidiaries?
- Were there any lingering issues from the training that need to be addressed?
- What areas will need to be stressed or, alternatively, reduced for the next training?

1.2 Summary Of Key Findings

Through our preparatory research, and the interviews conducted during this TA, we have concluded that major assumptions within the GEP-CCS contract, as they relate to project financing, have shifted significantly since project inception. Neither market-based carbon-trading, nor the formation of international environmental equity institutions, represent near-term financial options for Indian FIs seeking to finance clean energy projects in India. Therefore, there are few tools that Indian FIs can avail themselves of at present to push clean energy projects past the "hurdles" that are common to these types of projects.

Potential project investors and lenders, both in India and abroad, consider the significant contract risk in lending to Indian projects (e.g. ENRON Dabhol Power Shut-down) and low Internal Rates of Return (IRRs) as impediments to entering into the Indian clean energy market. Based on these factors, clean energy project developers in India presently face a very difficult task to attract domestic and overseas lenders and investors.

Specifically, grid-based clean energy projects involve cash flow assumptions based on power purchase agreements (PPAs) with state electricity boards, few of which have adequate credit ratings at present. Meanwhile, commercial institutions such as ICICI are already shifting from project finance lending to more balance sheet type of lending. Also, they are working with fewer and fewer new clients, choosing to develop new business with existing clients that have a better credit risk. The contract risk with grid-based clean energy projects, along with the already shifting focus to balance sheet finance, results in few project developers finding receptive ears within the Indian commercial finance sector

Additionally, anticipated revenue streams from the sale of carbon credits have not developed to the degree that was anticipated several years ago. According to Natsource LLC, an environmental brokerage firm, fewer than 100 actual carbon trades have occurred, and most of these have been between firms from Joint Implementation (JI) countries. The Clean Development Mechanism (CDM) remains a controversial point within United Nations Framework Convention on Climate Change (UNFCC). While the compromise agreement at Bonn appears promising, the actual implementation modalities are expected to be finalized early 2002.

Furthermore, international GHG equity funds seeking carbon and/or return on investment have not been very active in the developing world. The most recognizable, the Renewable Energy and Energy Efficiency Fund (REEF), which is capitalized at US$65 million, has not financed a single project to date. Its high requirements for return on investment as well as early exit strategy (by 2006 to 2008) limit the applicability of many Indian projects. Other investment funds, from national governments (e.g. Netherlands) and state governments (e.g. Oregon Climate Trust), have targeted projects closer to their region. The 2000 Netherlands tender, while ostensibly covering JI and CDM projects, in practice ended up financing just JI projects located in Eastern Europe. The Oregon Climate Trust and City of Seattle tenders prioritized carbon reducing projects that occurred locally, though they didn't exclude overseas CDM-like carbon projects.

The absence of a vibrant carbon market, along with the unproven effectiveness of GHG equity funds, limits development institutions such as IDFC to a greater degree than commercial financial institutions. IDFC is well experienced at developing off balance-sheet types of projects, and looks to potential carbon trading as an additional means to get past the financial hurdles existing for some projects. Therefore, they expressed keen interest in positioning for both private and public sector tenders for carbon. ICICI on the other hand, was less interested in the carbon sales benefits, and focused more on gaining more knowledge on the types of GHG mitigation equipment they could sell to existing clients, and innovative financing schemes to purchase this equipment.

Finally, this exercise acted as an important feedback loop for planning the next training of FIs. The feedback from ICICI and IDFC was consistent, recommending that the training focus more on real case studies, using actual cost figures. The FIs also requested that additional orientation be provided as to the industry sectors where GHG mitigation can best be achieved, what technologies can be employed, and what companies are providers of those technologies. The FIs also recommended that the training be shortened, to 3 days, which allows staff more freedom to attend.

2. Background and Comments From The ICICI Portion Of The TATask

The TA team met with representatives of ICICI at their offices in Mumbai, from July 30 to August 1, 2001. The following represent general findings and observations about the organization, as it relates to GHG mitigation risk assessment and GHG mitigation project financing. Because of issues of confidentiality, ICICI did not open their projects for direct portfolio review. Therefore, the conclusions on the ICICI portfolio are drawn from anecdotal descriptions of representative projects in the ICICI pipeline.

2.1 The ICICI Organization And Coverage Of GHG Issue

The primary divisions in attendance that cover the GHG mitigation project portfolio included Relationship, Risk Management, Credit Operations, Technology, Environment, Government and Institution Group (GIG), Structured Products Group (SPG), Oil and Gas, and ICICI Bank

Three Relationship representatives participated, including staff covering Chennai, Hyderabad and the Western Regional Office (WRO). Each provided valuable perspective of the front-line issues and interactions with ICICI clients, especially as it pertains to environmental and GHG mitigation risk.

The Technology and Environment Groups interact closely in the area of the three international lines of credit that ICICI manage relating to the environment (see portfolio section). The Technology Group is instrumental in vetting new technologies, by operating a technology commercialization assistance program that seeks to identify potential market winners. Most notably, the Technology Group funded REVA electrical vehicles demonstration at an early stage in REVA's business development cycle. REVA just recently rolled out their first electric vehicle for public sales. Additionally, the Technology Group is responsible for donor agency contracts and relationships.

As an organization, ICICI is highly evolved in understanding environmental risk and, in particular, risk as it relates to the carbon subject. Specifically, there exists very good awareness about the international negotiations covering GHG, and the resultant downstream potential of a carbon market. ICICI is eager to tap into this opportunity, but awaiting firm rules and conditions to be in place.

As a leading Indian FI, with most recent quarterly returns of 13%, ICICI is clearly highly sophisticated in utilizing various financial mechanisms for projects such as leasing, securitizations and lending for technology demonstrations and research and development.

Internal communications, especially relating to international lines of credit, are excellent. This internal marketing expertise places ICICI in a highly competitive position to negotiate future international lines of credit that will target CEP GHG Mitigation specifically.

2.2 ICICI Lending Operations

Consistent with many Indian commercial FIs, ICICI is shifting focus from project finance lending, where repayment for the loan is based on project cash flows without recourse to the project sponsors, to more traditional corporate balance sheet lending where the borrower is directly responsible for repayment of the loan. This has a clear impact on the types of GHG mitigating projects that ICICI will pursue in the near future. Most greenfield clean energy projects rely on power purchase agreement (PPA) revenue flows (off-balance sheet financing). While the LBG team could not have a detailed meeting with the Infrastructure Industry Group, it is understood that the thrust on power projects like those of the IPPs is expected to decline as a result of set backs from some recent experiences. Therefore, in the near future, ICICI is most likely to pursue GHG mitigation projects that reflect process improvement (e.g. energy efficiency), which mitigate GHG emissions while enhancing the client's bottom-line.

Participants expressed a keen interest in leasing as a tool for increasing GHG mitigation project activities, especially to support smaller projects and as a way to finance ESCOs. This was somewhat tempered by recent tax changes whereby the lessee in a financial lease is entitled to depreciate the leased clean energy equipment asset rather than the lessor (or financial institution). Leasing, therefore, has become a more attractive for the client than the FI. However, regardless of whether the lessor or the lessee receives the 100% depreciation, this tax law still provides an attractive incentive for clean energy equipment, the lease option remains attractive as a vehicle for CEPs.

ICICI has access to three key international environmental credit lines, one of which (World Bank) could capture GHG mitigating energy efficiency projects that fall under the IPP umbrella:

- World Bank: Industry Pollution Prevention (IPP) (US$ 5 million max per project)
- Asian Development Bank: Urban Environmental Infrastructure
- Japanese Bank for International Cooperation: Industrial Pollution Control (1billion yen max)

ICICI has developed very good expertise at tapping these lines, with at least 24 projects, funded at over US$100 million, closed over the past year. As stated previously, while these credit lines do not directly deal with GHG mitigation per se, the World Bank IPP would include energy efficiency projects. Therefore, while the World Bank credit line may not make a significant impact on ICICI GHG mitigation portfolio, it does position ICICI well for utilizing future international donor lines that will almost certainly target GHG specifically.

2.3 The ICICI Portfolio

Much of ICICI's portfolio reflects lending to the major client sectors in cement, steel, textiles, chemicals, oil and gas, power, and agribusiness. As per the Annual Report of ICICI for the year ended March 31, 2001, approvals during Fiscal 2001 highlighted the top sectors outside of services were: Power (11.5%); Oil and Gas (10.7%); Chemicals (7.1%); General Infrastructure (5.5%); Telecom (5.2%); Iron & Steel (3.8%); and Cement (3.4%). Significantly, within the services sector, retail financing has increased as a percentage of disbursements from 2.2% in 1999 to 10.8% in Fiscal 2001. This was consistent with ICICI interviews that indicated a shift to universal banking.

Most of the companies comprising these sectors are heavy energy users so projects that reduce energy consumption and promote energy efficiency would be quite attractive.

Balance sheet financing will drive ICICI to focus on manufacturing process changes that result in modernization, increased efficiency and productivity thereby achieving GHG the with a co-generation heat recovery project that was implemented as part of an overall modernization effort. That type of project will likely be representative of ICICI's near-term GHG mitigation portfolio. On the other hand, stand-alone Clean Energy Projects that are predicated on a project finance construct, will likely not be a specific focus for ICICI in the near future.

A particular area that ICICI might avoid in the near term is wind farming. Past Government of India incentives drove increased investment in this area but site locations in past have been questionable, resulting in several non-performing assets that were written off of ICICI's books.

The following represent key stages in the ICICI lending appraisal process. This process reflects an internal focus on credit-worthy borrowers. The impact on the GEP-CCS project is that the areas of opportunity will lie with ICICI's existing client base, and among other credit-worthy companies.

2.4 ICICI Credit Cycle

1. Industry appraisal – the overall health of the applicant's industry is considered. Specific areas of review include efficiency of firms in the industry, current and future demand levels for the industry's products or services, and overall market share in comparison to international competition.
2. Company appraisal – the company is compared to other firms within its industry in terms of its competitive position and future prospects.
3. Financial analysis – the company's financial condition is appraised to determine its overall financial health. The appraisal considers such areas as leverage, liquidity, cash flow, profitability, and revenue generation.
4. Management appraisal – the quality and experience of the firm's management is considered. The appraisal looks at the ability of the firm's top management to run the ongoing business as well as shape the company's future prospects.
5. Project appraisal – if the loan being requested is to finance a specific project, the appraisal considers the impact of the project of the company's business and financial position. The appraisal also checks whether the needed regulatory approvals, if required, are in place.
6. Negotiation of the loan – once the appraisal process has been concluded and a favorable opinion regarding the loan request is given, the specific terms and conditions of the loan are outlined. The terms would include repayment term, interest rate, and security or collateral conditions.

2.5 ICICI Outreach To Promote CEPs And Other GHG Mitigation Projects

In the absence of a vibrant carbon trading market, the participants emphasized the importance of targeted marketing to clients, to raise the profile of bottom-line benefits of CEP and GHG mitigation projects.

GHG projects have become fundamentally more attractive to companies because of the increase in world energy prices and an increased focus among companies in the area of operational efficiency and waste reduction. A GOI Law requiring companies to report annually on measures taken to conserve energy (included in the companies' Annual Report) can also act as a spur to energy efficiency projects. Finally, the reduction of tariffs under India's liberalization program has reduced the cost for imported GHG equipment that in turn lowers the cost of GHG projects using such equipment.

Based on the current climate for GHG mitigation projects, the recommendations centered on disseminating information to increase awareness of the benefits of specific energy efficiency and clean energy investments. An opinion frequently given was that GHG projects have not

been widely undertaken because of the lack of awareness of the GHG technologies and their potential application in the Indian market. Education is especially critical to promote newer energy efficiency and clean energy technologies. Specific recommendations included:

- Develop case studies on financing GHG mitigating technologies including finance specifics. The emphasis was that GHG technologies should show commercial viability in "real-world" cases.
- Illustrate how GHG technologies and services can contribute to companies' "bottom lines" through cost reduction and increased efficiency.
- Organize a conference/workshop on leading clean energy and GHG mitigation technologies; target attendees for this conference should include top industrial and government companies.
- Develop marketing brochures that concentrate on key business areas such as cement, textiles, steel, fertilizer, sugar, pulp and paper, soda ash highlighting appropriate state-of-the-art technologies.
- Provide brochures to FI loan officers/relationship frontline staff
- Provide outreach to industry and trade associations to market CEP/GHG mitigation projects to their members.

ICICI's recent successes with international environmental credit lines can, at least partly, be attributable to a proactive technology vendor outreach model (i.e. aggressive outreach relationship with equipment vendors who identify potential projects...ICICI then approaches the potential borrower's technical staff to gain more information about the project and to begin to market the advantages of the credit lines, before proceeding to a loan offer). Other success factors include: excellent internal awareness of credit lines and internal communication within ICICI.

2.6 ICICI's Comments On The April, 2001 FI Training In Bangalore And Feedback For Improvements

ICICI trainees were generally very positive on the comprehensiveness of the April, 2001 training in Bangalore. Eight ICICI staff attended the FI training, representing offices in New Delhi, Mumbai and Chennai.

While there was satisfaction with the training, there were areas of improvement that were identified by ICICI staff during the TA/Portfolio review. Specific recommendations:

- Include more detailed case studies within all of the modules, getting at financial bottom-line issues.
- Flesh out the carbon finance model project lock box with real numbers. The ICICI trainees considered it too theoretical to be practical.
- Place more emphasis on balance sheet financing versus off-balance sheet or project finance type lending.

- Provide more orientation on general industry sectors where GHG mitigation can best be achieved, and present some overview of representative technologies within these sectors (and tools to identify or source technology providers).
- Shorten the presentation on traditional finance tools and concentrate on innovative approaches – using detailed financial case studies.
- Shorten the overall training time frame to 3-4 days.

2.7 Conclusions On ICICI And GHG Mitigation Portfolio

Existing country risk and shifting market drivers have forced ICICI to concentrate their future business on existing clientele. While ICICI has a very good understanding on the potential benefits of future carbon sales, they will not focus on this area until they are able to clearly demonstrate bottom-line benefits driven by international laws and standards. To accomplish GHG mitigating projects ICICI will need to concentrate on the fundamental financial benefits of those investments – not the carbon savings per se. To convince clients about the financial benefits, ICICI will need to be fully aware of the most appropriate technologies, within the respective industry sectors, which represent an area of capacity building need for the organization.

3. Infrastructure Development and Finance Company (IDFC)

The TA team met with representatives of IDFC at their offices in Chennai, from August 2- 3, 2001. The following represent general findings and observations about the organization, as it relates to GHG mitigation risk assessment and GHG mitigation project financing. Three portfolio projects were presented to the TA team, as a representative sampling of IDFC pipeline.

3.1 The IDFC Organization

The primary divisions in attendance that cover the GHG mitigation project portfolio included: Policy, Environment, Energy, Urban Infrastructure, Risk Management, Structured Finance and Operations.

The Policy and Environment Divisions focus on ensuring that the environmental and social concerns of potential projects have been considered and that any risks identified in these areas have been properly mitigated.

The Energy Division works with projects on both the generation and efficiency side. The Division seeks to find projects that are financially viable within both sectors.

The Urban Infrastructure Division works with projects in the area of urban solid waste management and transport infrastructure. The Division seeks to finance innovatively structured projects that may have benefits from the inherent GHG abatement.

The Risk Division, based in Mumbai, analyzes the financial risks of any project in which IDFC makes a direct loan or has exposure and recommends measures to mitigate the identified project risks.

The Structured Finance Division considers the capital structure of IDFC's projects, considering both the equity contributions from project sponsors in relation to IDFC's project loan amount.

The Operations Division is responsible for managing IDFC's external funding sources, including a credit line from the Asian Development Bank. This group is particularly interested at looking for other outside funding sources, such as carbon credit sales, to increase the financial viability of projects.

3.2 IDFC Lending Operations And Portfolio

Currently, most projects in the portfolio are focused on energy generation as opposed to energy efficiency. Approximately 44% of the disbursements through March 2001 were to the energy

sector, followed by telecom, integrated transport and urban infrastructure. On an amount (Rs) basis, telecom was the leading sector accounting for just over half of the disbursements at 939 Rs. Crores. The inserted chart was provided by IDFC, and comes from their fourth annual general meeting, July 16, 2001.

Cumulative Approvals and Disbursements till March 31, 2001
Amounts in Rs., crores
(From IDFC July 16, 2001 Press Release)

	Approvals			Disbursements		
Sector	**No.**	**Amount**	**%Total**	**No.**	**Amount**	**%Total**
Energy	30	3655	57.92	12	621	34.91
Telecom/IT	11	1585	25.12	7	939	52.78
Transport	14	976	15.47	5	215	12.09
Urban	5	94	1.49	3	4	0.22
Total	**60**	**6310**	**100.00**	**27**	**1779**	**100.00**

Most of IDFC's portfolio consists of projects financed on a limited or non-recourse project finance basis. Projects supported by IDFC are typically required to have a 30% or greater equity contribution from project sponsors.

IDFC is increasingly favoring mini power projects since many of the large IPPs have been cancelled or stalled. A news item highlighting this shift is enclosed in Annexure 3. The Energy Division noted that it has had difficulty finding financially viable rural electrification and energy efficiency projects. They also indicated that the State Electricity Boards are not able to fund projects to curb losses in transmission and distribution so many good potential projects are not being pursued.

The portfolio team looked at three distinct projects that are being considered by IDFC:

Project 1: Wind Project: Unknown Industry Sector

This project involved an existing IDFC client, who was seeking to augment its captive power generation with the addition of 15MW of wind power, through the purchase of 20 wind turbines rated at 750kW each. The total project cost was Rs. 5400 Lakhs (US$ 11.8 million). The financing scheme involved IDFC as a lessor, providing an operating license to the client (lessee). The initial balance sheet calculations identified a post tax cost of capital result of 11.3%, just over what IDFC could receive in the market. Therefore, IDFC is seeking an additional, moderate source of capital, such as from carbon trading, to push the viability of this project over their hurdle rate.

Project Strengths:

- Proven and reliable technology provided by industry leader.

- 10-year maintenance contract provided by supplier.
- Lessee is apparently a credit-worthy firm.
- Generation capacity is 75% guaranteed by insurance company.
- 100% depreciation benefit realized by IDFC.
- Price of energy generated by turbines is competitive with grid power.
- Ramp up on wind could bring carbon benefits – which would serve to mitigate potential shortfall in energy purchases by end-user.

Project Risks:

- Lack of PPA with end-user: per unit lease payment paid by end-user is based on amount of energy consumed without minimum purchase of energy guarantee.
- Price paid for wind energy is tied to price of electricity available from the grid.
- Negotiating ownership of carbon credits between lessor/lessee and SEB.

PROJECT 2: Polyene Films: Solar Water Pumps for Rural Agriculture

This project involves the leasing of 200 solar photovoltaic pumps for application to rural agriculture. The financials in this case are complicated, requiring a State Government subsidization of farmers who are leasing the equipment. This one-time state supplied lease payment would account for 30% of the project equipment cost. The project depends upon 90% debt support from IREDA at a concessional rate of 1.5% for 10 years. The equipment is rated at 1 kW, for a total power generation of 200 kW, and a total project cost of US$1.5 million.

Project Strengths:

- Creative method of ensuring Equip. Supplier performance for the 10-year life.
- 100% depreciation benefit realized by IDFC (equated at 35% of per unit cost).

Project Risks:

- Deal structure predicated on State Government support to Farmers at no less than 30% of equipment cost.
- Change of tax depreciation laws would significantly undermine project feasibility.
- Unclear baseline for disseminated solar projects.

PROJECT 3: MSW Bio-methanation – Client Unknown

This project involves the creation of a power generation cum bio-fertilizer plant from municipal solid waste (MSW). The project would generate 5.1 MW, and receive an additional revenue stream from production of 75 tons per day of organic manure. The total project cost is estimated at Rs. 76 crores (approx. US$16 million). The project has identified an off-take purchaser of the organic manure and envisages selling power to the state electricity board under a 30-year PPA. Outside interest has lent certain credibility to this project, as Vivendi has signed up as an equity partner, and Ernst & Young Consulting have prepared the detailed project report.

Project Strengths:

- Proven technology.
- Participation by reputable international firms, such as Vivendi who is involved as equity investor and Ernst and Young who prepared project report.
- Project is in PCF pipeline?

Project Risks:

- PPA: The tariff is as per the recent UPERC ruling.
- Escrowable capacity of the state needs to be ascertained. Nature of PPA (Take or Pay) is unclear so is whether 3rd Party Sale is allowed or not.
- Manure sale: The promoters have not tied up with either the state or the central ministry of agriculture/fertilizers.
- Subsidy from GOI for composting portions has not been taken in account.
- Potential for unreliable quality MSW supply has been set off with an agreement.
- CO_2 from the gas engine would be quite pure. Could be a source for possible green house based farming of high value agriproducts. This stream could earn high carbon benefits.

3.3 IDFC Outreach To Promote CEPs And Other GHG Mitigation Projects

IDFC is currently in discussion with the Prototype Carbon Fund (PCF) an instrument created by the World Bank Group for identifying possible carbon mitigation projects in the developing countries for possible funding. IDFC may act as a developer/facilitator of GHG mitigation projects in India for PCF. The arrangements in this regard are yet to be finalized.

3.4 IDFC Comments On The April, 2001 Fi Training In Bangalore And Feedback For Improvements

The meeting with IDFC included only one person who had attended the training in April, Ms. Atiyah Curmally. Her comments on the training were very positive. She viewed the use of case studies during the training as particularly valuable. With respect to feedback on ways to improve future training sessions, she cited the following:

- Focus more on real-world case studies and less on the theory of project development and project finance.

- Focus on how financial institutions can position to take advantage of future carbon credits.

- Highlight the major issues and history of carbon trading.

- Shorten the training to no more than 3 days.

3.5 Conclusions On IDFC And Their GHG Mitigation Portfolio

IDFC is very sophisticated in terms of project risk identification and financial structuring. In view of a possible tie up with the PCF, IDFC was keenly interested in the possibility of carbon sales to improve the financial viability of potential projects. They expressed an interest in LBG presenting several of the portfolio projects to Natsource, LLC, to determine the relative competitiveness in the global carbon trading market.

Overall, IDFC is interested in sources of equity investment in projects as well as other financial contributions to stimulate projects. They showed a strong interest in the Global Environment Fund ("GEF"). In particular IDFC, was interested in learning more about how GEF has stimulated GHG mitigation projects in other countries, and how GEF funds could be accessed to support such projects in India.

Annexure 1
(Program Book)

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B

United States Agency for International Development
Greenhouse Gas Pollution Prevention Project
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Review of Portfolio of Financial Institutions

Program Book

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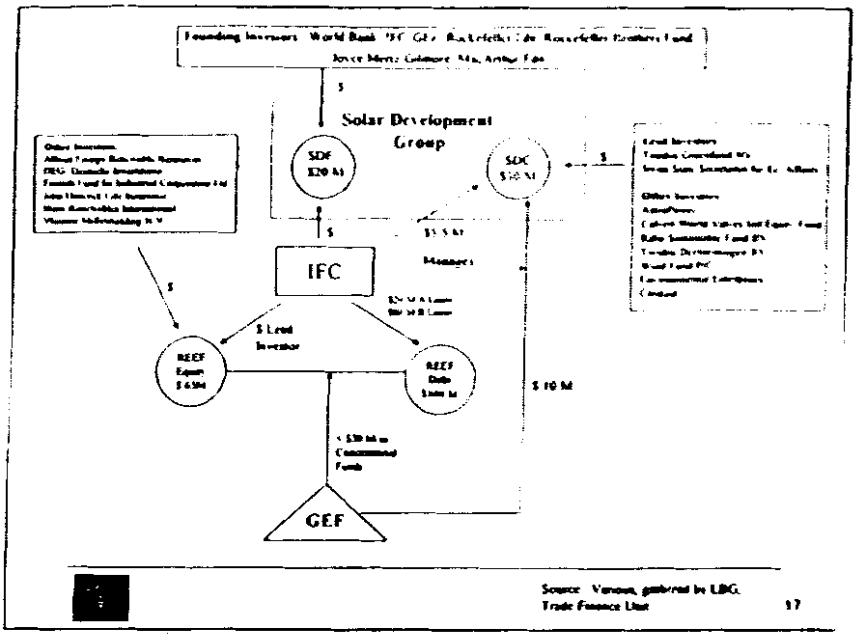
Global equity investment in CEP falls into two camps

- Equity investments seeking $$$$
  - Renewable Energy and Energy Efficiency Fund (REEF)
  - Solar Development Corporation (SCC)
  - Corporación Financiera Ambiental (CFA)
- Project investment seeking carbon returns
  - Prototype Carbon Fund (PCF)
  - Oregon Climate Trust and Seattle City Light Tenders for 5-8 million tons CO2 and 250,000 tons CO2 equivalent, respectively, seeking 5-10 projects closed April 10, 2001)
  - Dutch Government Tender for 3 million tons CO2 (closed July 17, 2000) concentrated on JI purchases in Poland, Romania, Czech Republic

Although the equity funds are financed largely by donor agencies, they are run as private funds

- Essential project criteria required
  - PD track record
  - Use of proven technology favored
  - Meaningful investment exposure by other investors
  - Leverage that is not overly aggressive
  - Credible and credit-worthy customers
- Investment and Returns are aggressive (REEF example)
  - Minimum investment in 26% range
  - Investment range $500K-10 million
  - 20% IRR minimum
- Short fund timeframes impact exit strategy
  - REEF/SDC are ten-year funds ...seeking exits at year 6-8



Regional and sectoral coverage of three active leading CEP equity funds

		REEF	SDC	CFA
Sector				
	Solar PV	Yes	Yes	Yes
	Geothermal	Yes	No	Yes
	Biomass Co-Gen	Yes	No	Yes
	Small Scale Hydro	Yes	No	Yes
	Wind Farms	Yes	No	Yes
	EE	Yes	No	Yes
	Other			
	Other			
Region				
	Africa	Yes	Yes	No
	Asia	Yes	Yes	No
	Central America	Yes	Yes	Yes
	South America	Yes	Yes	No
	Eastern Europe	Yes	No	No

18

Leasing

India Leasing Market Overview

- India is world's 14th largest leasing market.
  - Growth rate of 30% over past 7 years – yearly volume of $3.7 billion
- *Leasing* primarily used for plant and equipment
  - Leasing mostly *financial leases* rather than *operating leases*
- Leasing market became significant in 1983 with the entrance of ICICI and IFC-funded joint-venture leasing companies.
- Growth of leasing companies assisted significantly by funding from banks and financial institutions.
- In 1994, RBI allowed banks to offer leasing facilities directly.
- *So far, banks not big players in India's leasing market*
  - Banks are lease leaders in other markets around the world
- With entry of *GE Capital* an increasing number of foreign companies and banks are interested in India's leasing market.

Leasing Advantages: India Market

- Lessor's ownership and repossession rights are protected.
  - Courts have upheld lessor's right of repossession even in Sick Industries
- Tax laws respect leasing transactions
  - Financial leases are not capitalized by lessess
  - If *lease*, lessor can depreciate asset
  - If *hire-purchase*, lessee has depreciation rights
- Great opportunities: large, *untapped market potential* especially machinery and infrastructure segments
  - *So far, banks not big players in India's leasing market*, however, banks are lease leaders in other markets around the world

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Leasing: potential mechanism to finance CEP in India?

- 100% depreciation allowance for *energy saving and renewable energy equipment* offers immediate attraction for banks
- End-users can make lease payments from energy savings *without* incurring a debt obligation.
- Can enable smaller-sized renewable energy, cogeneration projects to be structured on BOT basis
- As in South Korea, leasing can be a major source of finance for small and medium-sized business...ESCOs in India?
- Leasing can be a source of medium and long-term project financing while preserving customer's existing bank lines

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Case Study Hotel Industry: *Facileasing, S.A.*

- PNC Bank, Pittsburgh, PA arranged a 5-year loan for *Facileasing, S.A.*, Mexico City, to purchase $1 million in U.S.-made equipment.
- The equipment includes a desalination plant, solar panels, laundry equipment, and golf carts which *Facileasing, S.A* will lease to the Hotel Marival – Cancun on 5-year lease payment terms.
- *Facileasing, S.A,* based in Mexico City, offers both finance and operating leases with payment terms ranging from 12-60 months.
- *Facileasing, S.A.'s* customers include both Mexican and U.S. and other multinational companies, in the food, pharmaceutical, and printing sectors.
- *Facileasing, S.A.* retains title to the leased assets for the entire term of the lease.

Case Study Indian Energy Industry: SREI International

- SREI offered a 6-year finance lease to Tanir Bavi Power Co for a US$ 5.8 million GE Gas Turbine Engine
- First International Bank, Hartford provided 6-year loan to SREI at LIBOR +1.75% + one time fee of 3.68%
- US Export Import Bank provided guarantee to First International
- Profile deal for SREI...Nearly ¾ of their revenues come from capital equipment leasing to SMEs

Structured Project Finance

Financing Projects in Challenging Markets Necessitates Creativity

- Projects that generate hard currency or offshore earnings can be financed, even in difficult markets
- Escrow accounts can provide a firm foundation for project finance in challenging markets.
- Successful projects must have project sponsors, offtake purchasers, contractors, operators, and suppliers who have technical, managerial, financial capabilities to perform their contracts
- Projects often involve inventing new structures to compensate for lack of clear laws, regulations

Case Study: Geothermal Plants in Philippines

- Direct Loan of $49.7 million to the sponsor Ormat Leyte Co. Ltd., to build, own and operate four geothermal plants 530km from Manila.
- Philippine National Oil Company signed a contract with Ormat to purchase power from the new plants, supply power to them.
- Ormat provided 25% in equity totaling $16.7 million with Ex-Im Bank supporting the remaining 75% as the sole senior lender.
- During the construction phase, loans provided by a syndicate of banks with Ex-Im Bank providing a political risk guarantee.

Case Study: Geothermal Plants in Philippines (continued)

- Project has a number of important strengths:
  - The contract between Ormat and the PNOC, whose commercial obligations fully supported by Government of the Philippines.
  - Ormat equipment has a record of reliable performance.
  - The engineering evaluation showed the geothermal fields to be a reliable power source, generating a high capacity of steam.
  - Project's revenues mostly denominated in U.S. dollars to cover dollar-based fixed charges such as debt service.

Securitization of Trade Receivables: A New Approach

- Increasingly used as a means to increase liquidity and raise financing for emerging market companies by converting *illiquid* debt into marketable securities
- Enables the holder of trade finance receivables to *package and sell the receivables as an asset-backed security*
  - Cash now available to fund new business
- Process: the holder creates a *special purpose vehicle* (SPV) which holds the receivables, then issues bonds or notes that use the receivables in the SPV as collateral or *backing*
- The selling price of the SPV determined by the rating
  - Rating determined by the portfolio of receivables in terms of their country, company, and industry diversification.

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Structured Finance Summary

- Limited recourse project finance increasingly used to attract private investment to infrastructure projects in emerging markets
- Enforceable contracts: *the* critical element to successful projects
- Project sponsors, offtake purchasers, contractors, operators, suppliers must have technical, managerial, financial capabilities to perform their contracts.
- Projects must have appropriate allocation of participant risk
- Escrow accounts can provide a firm foundation for project finance in challenging markets.
- Governments have a critical role of creating the conditions under which projects can attract private capital

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CEP Project Development Risk and Mitigation

Single Asset Risk is the major project risk with CEPs

- CEPs are often developed "in isolation"
  - Not associated with diverse group of projects
  - Can't fall back on larger parent company
- When disruption occurs
  - No alternative source of revenue

Risks Facing CEP Project Developers

- The Education Factor: Lack of knowledge and exposure to renewable energy technologies and concepts.
- Project Size: CCMP projects are relatively small
  - Technology constraints usually limit the project size, resulting in projects that frequently have slower growth NPVs, even while the rate of return may meet market standards for an attractive investment
  - Transaction costs of smaller projects are disproportionately high.
- Time: Development time from inception of a project to actual cash flow is long.

Risks Facing CEP Project Lenders

- Assessing the Technology: A proper understanding of the technology being implemented is necessary to insure project success
  - Measuring the value of a technological application requires engineering competence
- Assessing the Client: Projects where cash-flows are dependent on a client base, must be evaluated based on these clients ability to pay
  - The end-user is the virtual credit risk since both the project owner and the lender depend upon their ability to pay over the contract period

Mitigating Risk: Lender's **Perspective**

- Attempts to structure financing that provides:
  - All costs before construction completion are without recourse to the lender
  - Contractor satisfies performance guarantees
  - Recourse to other creditworthy project participants
  - Long-term, predictable revenue streams that covers operating costs and debt service
  - Revenue streams in an easily convertible currency
  - Proper incentives under the operating agreement to ensure maximum revenue and minimum costs, while complying with environmental laws

Courtesy: Econergy International Corporation
www.eic-co.com

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Positioning for Potential Carbon Opportunities

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The UNFCC Meetings in Bonn in July Resulted in a Negotiated Compromise

- Japan's agreement with compromise pushed the parties past the 55% global emissions threshold
- The Japan/EU leadership gives Kyoto market mechanisms valuable momentum
- The reduced 2% reduction targets, however, have been termed by Greenpeace as "kyoto-lite" (versus 5.2% target in Kyoto)
- Controversial carbon sinks are now included
- Details to be worked out in Morocco in October
- Parties hoping for late 2002 ratification

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Carbon investment funds may take awhile to respond, as many are closed or were on-hold during the recent unclear climate

- Key carbon equity tenders are <u>now closed</u> for future business (Prototype Carbon Fund, Oregon Climate Trust and Netherlands Govt.)
  - Additional tranches? (Netherlands indicates yes for October, 2001 but will it still focus on JI in Eastern Europe?)
  - PCF only successfully reached financial closure on 1 project to date – (5 in pipeline- must be operational by December 2003)
- Renewable equity funds have shown limited success
  - REEF in 2nd year of operation and not close to closure on any projects
  - PVMTI first track and secondary track closed in June 2001

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The US meanwhile, maintained their original negotiating position

- U.S. official position is to focus away from Kyoto market mechanisms and concentrate on:
  - Climate Change Research
  - Climate Change Technology Initiative
  - Regional (Canada, Mexico, US) CC market initiatives
  - Rejection of mandatory emissions cuts w/o developing country compliance
- Private sector and states are initiating and testing regional emissions trading systems (e.g. Chicago Mid-Western Exchange)

Indian CEP PDs and FIs are caught in a quickly shifting carbon market

- Annex 1 EITs and developing countries that are signatories could be more attractive targets for JI and CDM projects
  - GOI approval and intent to participate in flexible mechanisms will affect potential investment
- Face tough competition from Eastern European JI projects – early 90s economic downturn gave some former soviet bloc countries significant room to trade

In spite of the uncertainty, FIs should position the very best projects for potential investment from Annex-1 Countries

- UK climate change levy could provide a market for Indian carbon offsets (UK's emissions trading scheme rules are in draft – due April 2002)
- Netherlands carbon regulations cover just Power at present, and runs until 2003…next most likely regulatory scheme that will affect developing country sellers
- Large multinational buyers will still be looking for good CDM opportunities

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Preparing Projects Starts with Simple Check-list that reflects a CDM influence

	Yes	No
Does the project prima facie avoid/reduce GHG emissions?		
Does it satisfy sustainability criteria?		
Have the major risks been identified, quantified and mitigation measures in place?		
Does it meet host country endorsement needs?		
Would the project be implemented in absence of carbon finance?		
Are the transaction costs within reasonable limits?		

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If the check list is ticked then....

- Document the GHG mitigation motive of the project.
- Determine eligibility of project concept, document additionality and secure GOI support
- Choose business model by company or SPV
- Establish baseline methodology, collect data and calculate the baseline emission level
- Establish M&V protocol, identify certifiers, verifiers and accreditors
- Identify investors, funds. Collect their hurdle/criteria

Basic Steps in CEP Development for capturing Carbon Offsets

- Develop a Baseline
- Estimate emissions
- Estimate project emissions
- Estimate emission reductions
- Document the M&V methodology
- Estimate marginal cost of abatement
- Develop pricing scenarios
- Estimate the annual offsets revenue under different scenarios
- Conduct risk analysis

Data required for the CEP

- Both current and projected data:
  - Installed capacity (MW) (*generation projects only*)
  - Annual electricity generation (MWh/yr) (*generation projects only*)
  - Reduction in annual electricity consumption (MWh/yr) (*efficiency projects only*)
  - Type of fuel used (*thermal plants only*)
  - Plant heat rate (GJ/MWh) or plant net thermal efficiency (%) or plant annual fuel consumption (GJ/yr) (*thermal plants only*)
  - Emissions generated by CCMP (t C/yr)

Source: Energy International Corporation

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Marketing of the CEP to investors

- Build risk coverage mechanisms
  - Through contracts and insurance cover
- Prepare the Detailed Project Report
- Prepare information memorandum
- Identify and appoint independent verification agencies and obtain certificates
- Submit applications to the identified funds

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Section III:
Information Needs for Portfolio Review

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Typical Questions for Section Chiefs

- *Do you have a process for quantifying environmental impacts?*
- *Do you have a specialized process for tagging carbon intensive projects?*
- *What are your lending requirements?*
- *What are your credit standards?*
- *What are terms and conditions for loans (for small, medium and large biz)?*
- *How much does your group employ leasing?*
- *What is the institutional review process for CEP?*
- *What existing debt/credit facilities (e.g. MOUs with Donor ECAs) do you have that are available to finance CEPs?*

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Typical Questions for Environment Group

- *What are your environmental criteria for lending?*
- *Has your group begun to incorporate carbon issues into your lending divisions?*
- *Which GOI ministries do you work with on environmental and/or carbon issues?*

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Typical Questions/Requests for MIS Group

- Document requests
  - DPRs from statistical sampling of past financed CEP
  - DPRs from statistical sampling of CEP pipeline projects

Some Key Search Words: Carbon, Environment, Power Purchase Agreement, State Electricity Board, Plant Modernization, Renewable, Solar, Hydro, Biomass, Wind, Oil, Coal, Clean-coal, Ethanol, Hydrogen, Fuel cell, Naptha,Turbine, Boiler, Bagasse, Waste-to-Energy, Co-generation, IGCC, Combined Cycle, Gas Turbine, Waste Heat Recovery

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Outputs

- Project restructuring recommendations to better attract sources of :
  - Domestic and International Debt/Equity
  - International Equity for carbon
- Identification of new product offerings for clients:
  - Consulting on plant retrofit and modernization
  - Innovative finance tools to boost supply (e.g. lease model)
- Enhancement of institutional focus on CEP
- Important feedback for Second USAID-India/GEP FI training, November , 2001

Thank you for your contribution to USAID's GEP-CCS Goals

Review of Portfolio of Financial Institutions

Annexures

UNITED NATIONS
NATIONS UNIES

FRAMEWORK CONVENTION ON CLIMATE CHANGE – Secretariat

CONVENTION - CADRE SUR LES CHANGEMENTS CLIMATIQUES - Secrétariat

PRESS RELEASE

Governments adopt Bonn agreement on Kyoto Protocol rules

Bonn, 23 July 2001 – The 180 members of the United Nations Framework Convention on Climate Change now meeting in Bonn have reached a broad political agreement on the operational rulebook for the 1997 Kyoto Protocol. The meeting will now continue through Friday the 27th and start the process of translating this agreement into more detailed legal decisions.

"Today's agreement will keep up the pressure for early emissions reductions by governments and the private sector in the developed world," said Michael Zammit Cutajar, Executive Secretary of the Convention. "It should also strengthen financial and technological support to developing countries to enable them to take action on climate change. The next step is for developed country governments to ratify the Protocol so that it can enter into force as quickly as possible – preferably by 2002."

Under the agreement, a Special climate change fund and a fund for least developed countries will be established under the 1992 Convention to help developing countries adapt to climate change impacts, obtain clean technologies, and limit the growth in their emissions. In addition, a Kyoto Protocol Adaptation Fund will be established to finance concrete adaptation projects and programmes.

One of the most difficult issues to resolve was how much credit developed countries could receive toward their Kyoto targets through the use of sinks (which absorb carbon from the atmosphere). The meeting agreed that the eligible activities will include revegetation and the management of forests, croplands and grazing lands. Individual country quotas were set; the result is that sinks will account for only a fraction of the emissions reductions that can be counted towards the Kyoto targets.

The meeting also adopted the rules governing the Clean Development Mechanism, through which developed countries can invest in climate-friendly projects in developing countries and receive credit for the emissions avoided by these projects. The rules specify that energy efficiency, renewable energy, and forest sink projects can qualify for the CDM, while developed Parties are to refrain from using nuclear facilities in the CDM. An executive board has been set up to oversee the Mechanism.

Other rules address the international emissions trading regime, which enables developed countries to buy and sell emissions credits amongst themselves, and the Joint Implementation regime, under which OECD countries can invest in projects in countries with economies in transition.

The Bonn agreement emphasizes that all three of the above mechanisms should be supplemental to domestic action and that domestic action shall thus constitute a significant element of the effort made by each Party.

The Protocol also includes a compliance mechanism. Compliance with the Protocol will be overseen by a Compliance Committee with a facilitative branch and an enforcement branch. For every ton of gas that a country emits over its target, it will be required to reduce an additional 1.3 tons during the Protocol's second commitment period, which starts in 2013. Additional compliance

The Sixth Session of the Conference of the Parties to the Climate Change Convention was suspended last November in The Hague. It resumed here on 16 July, with the four-day high-level segment opening on 19 July.

The Protocol will enter into force and become legally binding after it has been ratified by at least 55 Parties to the Convention, including industrialized countries representing at least 55% of the total 1990 carbon dioxide emissions from this group. So far, 36 countries have ratified, including one industrialized country (Romania).

The Bonn Conference has been attended by some 4,500 participants from 180 countries, including 88 ministers.

Note to journalists: The agreed text is being posted at www.unfccc.int. For more information, please contact Michael Williams at +49-160-367-5933. For interviews with Executive Secretary Michael Zammit Cutajar contact Carine Richard-Van Maele at +49-160-367-5892.

GHG Policy and Finance

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International GHG Policy

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Emissions Trading Module Outline

- GHG policy
  - International
  - Industrialized country responses
- Role of India
- Potential funding sources

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UN Framework Convention on Climate Change '92

- Negotiated, signed in Rio at UNCED
- Ratified by ~167 countries. Entered into force December '93.
- General commitments: mainly reporting emissions and cooperating
- Annex 1 (developed countries) commitments: attempt to return GHG emissions to 1990 levels by 2000

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Ad Hoc Group on the Berlin Mandate '95

- Reviewed adequacy of commitments
- Initiated negotiation of binding targets
- Reaffirmed no reduction obligations for developing countries
- Known as 1st Conference of the Parties (COP-1)

[redacted]

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Kyoto Protocol '97

- Six gases, denominated in common unit (CO2 equivalent)
- No specific policies and measures
- Multiyear compliance period (2008-2012)
- 3 emissions trading mechanisms defined in principle
- Known as COP-3

[redacted]

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Kyoto Protocol '97

- Binding, differentiated reduction commitments for Annex B (~Annex 1)

	Kyoto Requirements (% below 1990 level)	Projected actual % reduction in 2010	Actual reductions (million tons CO2E)
USA	-7	-27.9	1555
UK	-12.5	-2.4	15
Germany	-21	-2.5	26
Norway	1	-13.8	8
Netherlands	-6	-23.4	48
France	0	-0.4	4
Japan	-6	-22.5	260
Russia	0	4.2	-35

Zhong Xiang Zhang, University of Groningen, 1998

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International Emissions Trading

- Between 2 Annex B countries
- Transfers of Assigned Amount Units (AAUs, i.e. pieces of national caps)
- no underlying reduction - simply trading

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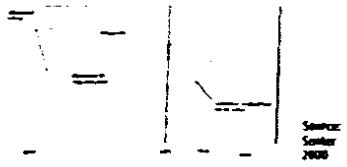
Joint Implementation

- Project-based, between Annex B countries
- Transfer Emissions Reduction Units (ERUs) resulting from projects.
- Project reductions limited to compliance period.



Comparing the Mechanisms

- Trade vs. investment (projects)
- Who's involved
- CDM cost advantage: abatement costs
- CDM cost disadvantage: transaction costs, project risks

Clean Development Mechanism

- Project based, between Annex B country and developing country
- Purposes:
  - help Annex B achieve compliance
  - contribute to sustainable development
- Theoretically creditable from 2000 onwards
- Produces Certified Emissions Reductions (CERs), which can be added to Annex B national caps

Buenos Aires '98

- No major breakthroughs on defining rules
- adopted Plan of Action, setting stage for the Hague in 2000
- COP-4

The Hague '00

- COP-6 - high expectations
- major issues:
  - supplementarity
  - compliance
  - adaptation
  - role of sinks
  - project eligibility
  - CDM model: unilateral, bilateral, other?

[redacted]

- In the end, no deal

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Future meetings

- COP-6 "bis": July 2001, Bonn
- COP-7, Morocco

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Negotiating Blocs

- Umbrella group: maximum flexibility
- Europe: limits to flexibility
- G-77:
  - AOSIS: aggressive cuts
  - OPEC: compensation
  - others: shades of in-between

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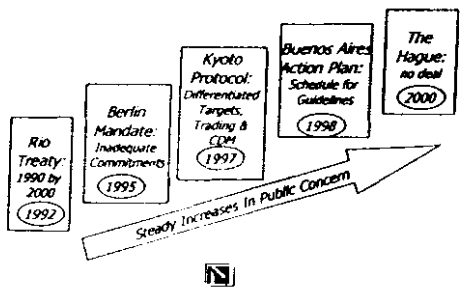
International Climate Negotiations Summary



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Annex B responses

Denmark

- Cap-and-trade for power sector only
- Runs 2001-03
- Buy-out provision at ~$5/ton CO2E

UK

- Most advanced national response
- Introduced major tax on energy consumption
- Business led development of emissions trading system as an alternative
- Three means of participation
  - ~ absolute sector
  - ~ unit sector
  - ~ project sector
- Intended to link with international market
- Market already taking shape

France

- Plans for energy tax and emissions trading scuttled by constitutional court
- Climate Change dubbed a "national priority" by legislature

EU

- Commission advocates pan-European trading by 2005
- Some harmonization of national trading systems
- Call for Kyoto ratification by 2002
- Renewable obligations directive

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Studies, Policy Dialogues Underway in...

- Japan
- Netherlands
- Germany
- Canada
- etc.

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Australia

- No national cap until ratification
- But significant allocation of resources ($, credits) to encourage early action
- First dedicated greenhouse gas office

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US

- 1997 Senate resolution opposed Kyoto-style agreement 95-0
- March 2001 Bush administration announcement of opposition to domestic CO2 regulation and Kyoto Protocol
- Support for technological and market-based solutions.
- More to come?

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Summary of National Responses

- Diverse perceptions of urgency
- Range of domestic policies: taxes, trading, incentives
- Almost universal support for international trading, though some support restrictions

Burden or opportunity?

- Through 2012, emissions reduction obligations are envisaged only for industrialized countries
- Emerging economies would only act as project hosts, recipients of investment
- Large scope for efficiency improvements in India
- Emissions reductions as a new export?

Role of India

Host benefits - country level

- Lure investment
- Lure clean investment
  - parallel reductions of local pollutants
  - reduce climate change
- Private sector technology transfer
- Improve energy, economic efficiency

Host benefits - developer level

- Monetize previously valueless asset (emissions reductions), enhancing project economics
- Forward sales can reduce up-front financing costs

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How big might the market be?

Study	Market Share (%)	Market Value (billion US$/year)
Haites	27-57	9.8 - 21
US Administration	19-46	6 - 8.3
Austin et al.	33-55	5.2 - 17.4

Source: Vrolijk 1996

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Downside?

- Emerging economy projects would substitute, not add to, some OECD domestic emissions reductions
- "Paper" reductions could diminish global climate change efforts

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Project Finance Scenarios

Case 1: 400MW Combined Cycle Gas Turbine in China

CapEx +/- 5%	+/-1.5	+/- 28
Gas Cost +/- 5%	+/-0.7	+/- 18
CO_2 credits at $5	+ 1.2	+ 44
CO_2 credits at $10	+ 2.5	+ 70
CO_2 credits at $20	+ 3.8	+ 110

Source: BP-PWC 2000

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Project Finance Scenarios

Case 2: 400MW Combined Cycle Gas Turbine in UK

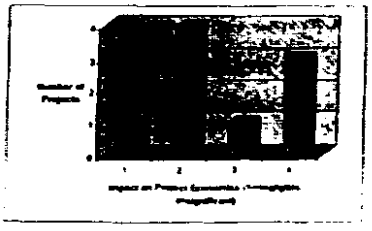
[illegible]	[illegible]	[illegible]
CapEx + 5%	+ 1.2	23
CapEx –5%	- 1.2	21
Gas Cost +/- 5%	+ / 0.7	+ /18
CO_2 credits at $5	+ 0.1	+ 2
CO_2 credits at $10	+ 0.2	+ 4
CO_2 credits at $20	+ 0.4	+ 9

Source: BP-PWC 2000

Government of India stance

- Skeptical through 1997
- Reappraisal in 1999
  - October 26 India Minister of External Affairs and US Secretary of Energy sign Joint Statement of Cooperation in Energy and Related Environmental Aspects (w/ Clinton Administration)
  - March 22 same Minister signs Joint Statement on Energy and Environment with US Secretary of State: affirms desirability of CDM

Not a panacea



Source: BP-PWC 2000

Role of India Summary

- Significant benefits to host countries/credit exporters
- Government of India support
- Boost IRR, but not a panacea

Sources of funding/demand

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Current GHG Market for Verified Emission Reductions

- Activity to date:
  - Approx 100 pre-compliance transactions, mostly option structures, approx 30m tons CO2E underlying
- Current pricing
  - International Emissions Trading:
    - 2000-2007 = US$0.60-1.50
    - 2008-2012 = US$1.25-2.50
  - CDM:
    - 2000 onwards = US$1.50-$3.00

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Pre-compliance commercial market

- Bilateral contracts between private companies
- Buyer motivations
  - hedge risk
  - build trading capabilities
  - contribute to political process
  - public relations
- Examples (more on this later)
  - Epcor (CAN) buys 50,000 tons from Fortum (FIN)
  - Transalta (CAN) sells stream total 210,000 to Murphy Oil (US)

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Tenders

- Buyer issues detailed specifications for reductions
  - usually declares budget
  - often governments, sometimes privates
- Examples
  - Netherlands government (US$22.7 million for JI reductions)
  - Oregon Climate Trust (US$1 + 5.5 million for VERs)
  - Netherlands CDM tender soon to come?

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Funds

- Strategic investments to:
  - capture price appreciation
  - support sustainability, demonstrate greenness
- Types:
  - Pure GHG
  - Mutual fund style
  - Corporate
  - etc.
- Examples:
  - World Bank Prototype Carbon Fund ($145M)
  - UBS ($60-75M)
- Estimated Total capital: $2.5-4 billion

Source World Bank

International Compliance Market

- Once international rules are established, may be possible to create a single, universal CER-style developing-country reduction.
  - Intended to be freely tradable, valid for compliance anywhere
  - But opposition exists

National trading programs

- Domestic markets prior to Kyoto may allow for import of foreign project-based reductions
- Examples:
  - UK
  - Denmark
  - others?
- No rules yet

Sources of Demand Summary

- Rapidly increasing interest and demand
- Trend likely to continue
- But at present, market for reductions is illiquid
- Some opportunities now, but important also to plan for the future

Section 2 summary

- International negotiations move in fits and starts
- Some national governments moving ahead with regulations, incentives
- For foreseeable future, India would have only opportunity, no burden
- Demand for reductions is on the rise

NRDC

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EMISSIONS BROKERAGE DESK

Greenhouse Gas

CDM Project Development Guidelines

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FAX: 212-332-5353
WWW.NATSOURCE.COM

Capturing Value from the CDM

Despite many unresolved issues surrounding the implementation of the Kyoto Protocol's Clean Development Mechanism (CDM), the lure of low-cost greenhouse gas (GHG) emissions reductions in developing countries has motivated many Annex I entities to explore possible CDM transactions before the rules governing its operation are formally established. In these uncertain circumstances, potential buyers of CDM emissions reductions evaluate projects based on the perceived probability that the emissions-reducing activity will meet future CDM criteria. In order to maximize projects' likelihood of CDM certification, as well as the market value of the resulting emissions reductions, project developers should follow the most rigorous methodology possible. The following list, assembled by experienced Natsource emissions brokers, details recommended steps for sound CDM project development.

A. Initiate Paper Trail for Proof of Intention

Participants should anticipate that they will be required to prove that the project was undertaken specifically to mitigate climate change. Therefore, through every stage of project development it is wise to document clearly the intention to seek official recognition as a CDM project. This intent should be expressed in internal project documentation and in any correspondence with government and non-government partner organizations.

B. Determine Eligibility of Project Concept

In the absence of official CDM rules, project developers must attempt to anticipate what types of activities will be eligible for credit in the future. Some guidance already exists. Article 12 of the Protocol specifies that CDM projects must create "real, measurable, and long-term benefits related to the mitigation of climate change;" generate additional, verifiable emissions reductions; and be certified by officially designated entities. Additional guidance is provided by project criteria currently being applied in various international and domestic trading programs.

C. Document Additionality

Prior to the establishment of requirements for certification, participants should use the strictest definitions of additionality in order to increase chances of approval. According to the Kyoto Protocol, reductions should be "additional to any that would occur in the absence of the certified project activity" (*Environmental Additionality*). However, because parties are still negotiating other interpretations of the concept, developers should ideally be able to demonstrate fulfillment of as many standards of additionality as possible, including:

- *Project Additionality*: The project was undertaken specifically to reduce GHG emissions;
- *Financial Additionality (Macro-level)*: The project does not rely on already-committed developmental or environmental assistance (concessional funding); and
- *Financial Additionality (Micro-level)*: The project would not have been feasible without revenue from certified emissions reductions (CERs).

D. Assess Sustainable Development Impacts

In the future, CDM project validation may be contingent upon its ability to promote sustainable development. In addition, such ancillary benefits could motivate investors, international climate change bodies or the host country to look more favorably on one project than another. Therefore, it is important to document (and attempt to quantify) the overall economic and social impact of the project. The following questions should be addressed before the host country government is approached:

- Are there intangible quality of life benefits that make the project more attractive? (such as enhancing or protecting biodiversity)?
- What is the impact of the project on employment levels in the country?
- Will the project result in displacement of economic activities? If so, are there any contingency plans to address this displacement?

E. Secure Support of Host Government

Host-country government approval will most likely be a prerequisite for CDM certification, and should be sought early in the project cycle. Developers should obtain a formal letter of approval from the highest possible level of government. Some developing countries are also in the process of establishing CDM offices to assist project developers. Their functions will range from determining eligibility, ensuring that sustainable development objectives are met, providing technical assistance, and building a supportive local community context.

F. Calculate, Monitor and Verify Potential Reductions

1. Confirm specific and identifiable reduction of emissions

Developers must prove that a specific action was or will be taken to achieve a discrete reduction of emissions relative to a baseline level of emissions that would have occurred in the absence of the action.

2. Quantify with an accepted methodology

Developers should estimate emissions with and without the project using a methodology that has been endorsed by the marketplace through a previous transaction or approval by an international climate change body. An engineering or accountancy firm can validate these projections to provide an extra measure of credibility and enhance market value.

3. Establish a system to monitor and maintain integrity

Emissions reductions must be monitored over the life of a project. A third party may be used to establish a suitable monitoring methodology and to conduct periodic baseline reviews.

4. Engage third party to verify

In the future, claimed reductions may be verified and certified by entities designated by the CDM Executive Board. At this early stage, once the project has been financed and has been operating for some time, developers should employ a credible third party to verify:

- Actual emissions reductions achieved;
- Contributions to sustainable development of the host country;

- Accurate assessment of emissions increases in other areas or sectors due to project activities (leakage) and
- Any other project performance criteria

G. **Establish Clear Ownership of CERs**

Clearly defining title to future reductions will reduce confusion and facilitate their sale in the future. Buyers of reductions will need to verify that sellers indeed own the reductions being offered. Therefore, written agreements should clearly define whether rights to emissions reductions are owned by investors, developers, the host country, or some combination thereof.

H. **Ensure Financial Viability**

The financial integrity and the strength of the project financing are important aspects of the pre compliance/risk management market. In order to ensure that the project is financially viable under current conditions and likely to reach completion, it is imperative to accurately represent all project costs and revenues while planning and marketing a project. This includes applying realistic projections for the future price of the resulting CERs, a crucial measurement for both potential project investors and for potential buyers of forward pre-certification reductions/CERs. For this reason, it may be helpful to contact a market agent, such as an impartial broker, to discover the current sale price for future reductions. Market brokers also may be instrumental in optimizing project revenues by advising on methods to "package" and price the project's reductions/CERs in an attractive and realistic manner.

In addition, potential buyers may measure the financial viability of the project by the creditworthiness of its investors or owners. Project developers should be prepared to provide such information.

I. **Pursue Additional Project Endorsement Through International Entities**

To build an even stronger case for the project, participants should seek approval by an international entity involved in climate change activities. Industry associations, government and multilateral climate change funds and Activities Implemented Jointly (AIJ) offices in some Annex I countries often evaluate and approve GHG emission reducing projects that meet their criteria. Developers should contact these groups to initiate the application process. Preparation of application documents will also assist developers in gathering and presenting the necessary information for future application to the CDM approval board.

CONTACT NATSOURCE GHG BROKERS:

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Natsource LLC
http://www.natsource.com/

NATSOURCE

The Climate Trust and Seattle City Light

2001 Request for Carbon Offset Project Proposals

Phase 1: Project Summary Information

Summary: The Climate Trust (The Trust) and Seattle City Light (Seattle) are soliciting carbon offset projects that 1) directly avoid, displace, or sequester carbon dioxide emissions [or those of other greenhouse gases for Seattle], 2) will be implemented in the future, 3) would not be likely to occur in the absence of offset project funding, and 4) can quantify the Carbon Dioxide Emissions Benefit.

Responses to this request for Carbon Offset Project Proposals will be considered to meet the offset needs of The Trust and Seattle (jointly referred to as the Requesters).

The Climate Trust is seeking from 3 to 10 projects to meet a need of contracting for a minimum of $5,500,000 from projects involving *carbon dioxide offsets only*.

Seattle City Light is seeking from 1 to 4 projects to meet a need of contracting for 247,000 metric tons of carbon dioxide equivalent from offset projects involving *carbon dioxide or other greenhouse gases*.

The Trust is administering the process of solicitation and evaluation of offset proposals on behalf of both organizations. Proposals will be considered jointly by the Requesters. Proposers need not indicate to which organization they are proposing. The Trust and Seattle will make independent decisions regarding the selection of offsets for contracting. Offset contracts might involve either or both of the Requesters, depending on the selections made by each organization. All communications regarding this solicitation are to be with The Trust.

The Requesters have set a goal of signing contracts for offsets by January 31, 2002. **Phase 1 of the process involves a request for project summary information. Responses are limited to ten pages of text, plus a cover sheet and appendices. Responses are due by Tuesday, April 10, 2001.** The Trust will screen the project summaries, select a short list of projects for which to request more detailed Phase 2 project proposals, and work with Seattle to select its short list. Phase 2 will involve evaluation of detailed project proposals, preliminary selection of projects, contract negotiations, and contract awards. For information regarding our previous solicitation, please visit The Trust's web site at www.climatetrust.org.

Disclaimer

This RFP is not an offer by The Climate Trust or Seattle City Light to purchase any rights, goods or services, and submission of project proposals does not create any rights whatsoever. The Trust and Seattle are free to accept or reject any project proposal, and are not bound to accept the economically most favorable proposal, or any proposal at all, and may accept any proposal regardless of whether it conforms to the terms of this RFP. The Trust and Seattle, and their directors, officers, agents, employees or assigns are not liable at law or at equity to any project proposer or participant or any other party for any decision by any of them regarding submission, acceptance, rejection or modification of a proposal, or in any other connection with this RFP. All costs directly or indirectly related to preparation of a proposal or submission shall be the sole responsibility of, and shall be borne by, the developer of the project proposal.

Additionality requirement: The Requesters will only fund projects where mitigation measures would not occur in absence of offset project funding. Projects for which the applicant or other party derives benefits, including financial benefits, other than those relating to carbon dioxide benefits, are eligible.

Regulatory surplus: The Requesters will consider only projects where the Carbon Dioxide Emissions Benefit is over and above what is required by law. An emission reduction is surplus if it is not otherwise required of a source by current regulations or other obligations.

Types of projects: The Requesters will consider offsets based on renewable energy, energy efficiency, supply side energy (such as fuel switching), and CO_2 sequestration. Sequestration projects include forest preservation, reforestation, afforestation, and forest management. Agricultural projects which increase soil carbon are eligible, but The Requesters will especially scrutinize how these projects address quantifiability and permanence.

Portfolio diversity: The Requesters consider it important to acquire a portfolio of diverse project types. Projects which help meet this portfolio diversity objective may receive special consideration.

Eligible proposers: The Requesters will accept proposals from non-profit and for-profit corporations, government agencies, national laboratories, individuals, and combinations of the these parties.

Permanence: The Trust prefers projects that permanently avoid or displace emissions of carbon dioxide, such as energy-related projects, over projects that temporarily sequester carbon. *Seattle requires projects that permanently avoid, displace, or sequester emissions of carbon dioxide and other greenhouse gases.*

Guarantees: The Requesters prefer projects that provide guarantees, especially carbon benefit guarantees. Guarantees are especially important for sequestration projects, and would provide important support for any project proposal. Carbon Dioxide Emissions Benefit guarantees must meet an additionality test, and are preferred over money back guarantees. The Requesters would consider the use of a pay-for-performance approach, where The Requesters pay a fixed amount per ton of CO_2 delivered over a specified period of time, as a form of guarantee.

Portfolio price range: The Requesters plan to use cost effectiveness as the primary selection factor for offsets, while achieving a balance between the desire to acquire the least expensive reasonably assured offsets available with the desire to acquire a diverse portfolio of projects. The Trust is currently in negotiations for an offset portfolio with an average price of approximately \$1.50/metric ton of CO_2 with funding provided by a prior Oregon power plant. The Trust received funding for this current solicitation on the basis of a \$0.68/metric ton of CO_2 cost figure (2000 dollars). The Trust is unlikely to acquire individual offset projects that have a price exceeding \$10/metric ton of CO_2. *Seattle would fund its offsets from utility revenues, and does not receive funding at \$0.68/metric ton as does The Trust.*

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Replicability and expandability: The Requesters may consider the ability to replicate a project in other locations with economics of scale or to expand a project at the original site to be beneficial in project evaluation.

Geographic limitations and preferences: The Trust is open to considering offsets in Oregon, the United States, or internationally. It is important that The Trust acquire some offsets in Oregon. The Trust will give some preference to projects located in Oregon, and is more likely to consider projects with funding levels of less than $250,000 if they are located in Oregon. *Seattle is open to considering offsets located either in the United States or internationally. Seattle anticipates establishing the following geographic order of preference: Seattle, the greater Puget Sound region, and Washington state. Seattle will give some preference to projects located in these geographic areas. International projects have the same requirements as for The Trust.* Both Requesters require an international project to have both a strong U. S. partner and a strong international partner in the host country. The U. S. partner must co-sign the proposal and any offset contract. Host country approval for international projects is strongly encouraged.

Leverage of The Requesters' funding: The Requesters will evaluate the cost effectiveness of proposed projects on the basis of the cost to The Requesters per metric ton of Carbon Dioxide Emissions Benefit: Projects for which The Requesters provide partial funding, and/or that employ financial leverage, such as revolving loan pools and loan guarantees, are encouraged to apply.

Co-benefits: The Requesters prefer projects with environmental, health, and socioeconomic co-benefits, and will request information on co-benefits from proposers. Special consideration may be given to projects with excellent co-benefits.

Retirement of credits: The Requesters plan to "retire" the offsets they acquires, holding them in perpetuity for the benefit of the citizens of Oregon and Seattle, respectively. The Requesters may use these credits in any manner allowed under any future greenhouse gas regulatory system that may be put into place. The proposer will not be eligible to receive allocation or credit in the future in another regulatory setting for the offsets acquired by The Requesters. The Requesters will not consider offsets that have already been allocated or awarded credit for carbon dioxide or greenhouse gas emissions benefits in another regulatory setting.

Assignment and sale: While the primary goal is to "retire" credits, The Requesters reserve the right to assign or sell Carbon Dioxide Emissions Benefits acquired as a result of this request for proposals. The Trust has received a number of requests from business, government, and non-profit organizations to provide offsets under our Greenhouse Gas Partnership Program. These request are incremental to the needs described in this solicitation. The Trust may seek to satisfy these requests by acquiring incremental offsets from the proposals submitted in response to this solicitation.

Quantification of the Carbon Dioxide Emissions Benefit

Proposals must address the following considerations when quantifying the Carbon Dioxide Emissions Benefit and when planning for monitoring and verification. *For Seattle, emissions benefits resulting from mitigation of other greenhouse gases are to be converted into the Carbon Dioxide Emissions Benefit as described under "Units of measurement" below.*

Additionality: Proposals must demonstrate that the mitigation measures installed by the project would not occur in absence of offset project funding. Projects which do not meet this requirement will be deemed to have no Carbon Dioxide Emissions Benefit and will not be evaluated.

Baselines: Proposals must describe a Without Project Baseline and a Project Case and describe the assumptions and methodologies used to quantify each. The difference between the two is the project's Carbon Dioxide Emissions Benefit. Proposals must use dynamic baselines when establishing the Without Project Baseline, to the extent that changes from business as usual are anticipated to occur during the project life. The Requesters will review the proposed Without Project Baseline and the Project Case, and may use its judgment to modify them for the purposes of evaluating projects.

Leakage: Leakage is the extent to which events occurring outside of the project boundary tend to reduce (typically) a project's Carbon Dioxide Emissions Benefit. Proposals must describe how carbon dioxide benefit leakage is addressed by the project, both in terms of project activities to minimize leakage and in terms of adjustments to the project's carbon dioxide benefit calculations to reflect leakage. Proposals can propose to include emissions reduction from positive leakage, but The Requesters will require a strong justification for such reduction. The Requesters will review and may use their own leakage factors when evaluating projects.

Range of uncertainty: Proposals must describe important risks and risk mitigation strategies, and provide an estimate of the range of uncertainty around the expected carbon dioxide benefit. The Requesters may use adjustment factors other than those proposed by the developer's emissions reduction estimates.

Term of Carbon Dioxide Emissions Benefits: Carbon Dioxide Emissions Benefits will be evaluated over the period of time for which The Requesters receives rights to this benefit. This period of time must be equal to or less than the anticipated life of a project.

Units of measurement: All CO_2 emissions reduction figures are to be presented in metric tons of CO_2. See Appendix A for conversion factors to be used. Proposals must justify any variation from these figures. The Requesters reserves the right to apply its own conversion factors for the purpose of proposal evaluation. *For Seattle, for projects involving other greenhouse gases, use the 100-year Global Warming Potentials provided by the International Panel on Climate Change.*

Monitoring and verification: Proposals must include a monitoring and verification plan. The purpose of this plan is to define how the carbon dioxide benefit will be quantified. The quality of the proposed monitoring and verification plans is a component of project evaluation. The cost of monitoring and verification should be included in the project cost bid to The Requesters and specified in the project budget. Monitoring and verification are the responsibility of the proposer, not The Requesters. The use of third party verification is preferred. Please describe 1) procedures to be employed, 2) how the ongoing monitoring and verification will be funded, 3) the time frame and frequency over which the monitoring and verification will occur, and 4) whether a third party has been identified to audit and confirm the source data used to quantify the benefit, and if so, whether the party is under contract.

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Evaluation of Proposals

The Requesters will employ a two-step evaluation process for evaluating proposals. **The Requesters reserve the sole right to use its judgment when applying or modifying this evaluation approach.** See the disclaimer on page 1.

Step 1: Essential screening criteria: Projects must meet these tests to be eligible for further evaluation:

Size of Project (See "Size of Projects," page 3.; smaller projects may be considered)
Timing of Project Implementation (See "Timing of project implementation," page 3.)
Additionality (See "Additionality requirement," page 4 and "Additionality," page 6.)
Regulatory Surplus (See "Regulatory surplus," page 4)
Quantifiability (See "Quantifiability of offsets," page 3.)
U. S. Partner for International Projects (See "Geographic limitations and preferences," page 5.)

Step 2: Evaluation criteria:

Primary selection factor: The Requesters plan to use one primary selection factor.

Cost effectiveness: Cost will be the primary selection factor, after factoring in uncertainty. The measure of cost effectiveness will be defined as U. S. dollars per metric ton of reasonably assured, additional Carbon Dioxide Emissions Benefit. The Requesters reserve the right to suspend project evaluation and/or negotiations if the price of CO_2 offsets varies materially from that initially proposed.

Additional selection factors: The Requesters plan to use the following additional selection factors in selecting projects.

Reliability of project concept: In evaluating the reliability of the emissions benefit, The Requesters will consider the quality of the project concept and design, and the performance of similar projects. The Requesters reserve the right to suspend project evaluation based upon this evaluation criterion.

Reliability of project partner: The Requesters will consider the qualifications of the proposer, the proposer's past experience with similar projects, and the qualifications of any organizations cooperating with the project. Note that proposers will be required to demonstrate their financial and institutional capability to deliver the project that they propose. The Requesters reserve the right to suspend project evaluation based upon this evaluation criterion.

Portfolio diversity: See "Portfolio diversity," page 4.

Monitoring and verification: See "Monitoring and verification," page 6. The Requesters reserve the right to suspend project evaluation based upon this evaluation criterion.

Permanence: See "Permanence," page 4.

Guarantees: See "Guarantees," page 4.

Location: See "Geographic limitations and preferences," page 5.

Replicability and expandability: See "Replicability and expandability," page 5.

Co-benefits: See "Co-benefits," page 5

Overview of The Project Selection and Contracting Process

The Requesters plan to use the following process and schedule in the project selection and contracting process. **The Requesters reserve the right to modify the process and schedule.**

February 22 Bidders Conference: Meeting with conference call capabilities. This is an opportunity to ask questions about the RFP and the selection and contracting process.

Meeting time: 10:30 a.m., Pacific Standard Time
Thursday, February 22, 2001
Meeting location: City of Portland Building, 1120 SW 5th Ave., 2nd Fl. Rm. C.

Conference call: Proposers may choose to participate in the Bidders Conference by conference phone. The Trust will provide information about the call to those who register for the call. This information will come by e-mail.

Please register for the Bidders Conference by following the instructions at www.climatetrust.org/reg2001.html. In your response, indicate whether you plan to attend in person or if you plan to participate by conference call. To participate in the conference call, it is essential that you register.

April 10 **Phase 1 proposals are due on Tuesday, April 10, 2001.**

April 12 The Trust will acknowledge receipt of Phase 1 proposals by e-mail.

June 21 The Trust and Seattle will identify a group of preferred projects from which to request more detailed project proposals. The Trust anticipates that this will be approximately 25 projects. *Seattle anticipates that this will be approximately 10 projects.* The Trust will provide Phase 2 proposal instructions, project-specific questions, and proposed contract terms to these proposers.

August 17 More detailed Phase 2 project proposals are due from selected proposers, including descriptions of any exceptions to the proposed standard contract terms and other contractual issues.

November 9 The Requesters will select a negotiating group and an alternate group. The Requesters will conduct negotiations with the negotiating group. Negotiations with a specific project may be terminated and a replacement named from the alternate group. As contract negotiations for a project are complete, offset contracts will be taken to the Board of The Trust and the Seattle City Council for approval. **Execution of contracts is solely dependent on approval by the Board of The Trust and/or the Seattle City Council.**

Jan 31, 2002 The Requesters have a goal of signing contracts for offsets by January 31, 2002.

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Format for Responses

Responses are due on Tuesday, April 10.

Responses are to be transmitted to The Trust in two formats:

> **By e-mail to The Climate Trust at the e-mailbox: info@climatetrust.org.**
> **Please send five hard copies to The Climate Trust, 516 SE Morrison Street, Suite 1200B, Portland, OR 97214-2390.**

Responses are to be limited to a one-page cover sheet plus ten additional pages of text with one inch margins and a twelve-point font. In addition, two appendices are required, one to display the project budget and one to display the project carbon dioxide emissions benefit calculations. **The cover sheet and text are to be transmitted in Microsoft Word 97 or compatible format, while the appendices are to be transmitted in Microsoft Excel 97 or compatible format. Responses must be in English**: We will not accept proposals that are not in English.

Proposals must provide the following information:

One-page cover sheet: Present the following information in this order:

Date
Name of Project
Location of Project
Type of Project
Type of Greenhouse Gas (Choose one: CO_2 only, non-CO_2, both CO_2 and other greenhouse gas)
Measure Implementation Starting Date
Measure Implementation Completion Date

Proposing Organization(s) Name
Proposing Organization(s) Address
Proposing Organization(s) Web Site
Contact Person Name
Contact Person Phone Number
Contact Person Fax Number
Contact Person E-Mail Address

Total Project Cost (U. S. $)
Amount of Money Requested (U. S. $)
Amount of Carbon Dioxide Emission Benefit Proposed (metric tons of CO_2 equivalent)
Price of Carbon Dioxide Emissions Benefit Proposed (U. S. $/metric ton of CO_2 equivalent)

Statement of an authorized person at the proposing organization certifying that the offsets that The Trust or Seattle acquires have not been and will not be allocated or awarded credit for carbon dioxide emissions reduction in another regulatory setting. For international projects, two authorized statements are required, one for the host country partner and one for the U. S. partner.

Up to ten pages of text: Address the following:

Project Description
- Mitigation Measure(s)
- Implementation Approach
- Measure Implementation Schedule
- Implementing Organization(s) and Roles
- Qualifications of Proposing Organization(s)

Carbon Dioxide Benefits
- Description of Project Baseline and Project Case
- Calculation of Carbon Dioxide Benefit
- Additionality
- Leakage
- Uncertainty Range
- Carbon Benefit Permanence
- Monitoring and Verification Plan
- Replicability and Expandability

Co-Benefits

Proposed Financial Arrangements
- Sources of Project Funding
- Leverage
- Ownership of Credits

Appendix A: Present the project budget, specifying specific sources and uses of funding, identifying the capital and operating costs. Include costs for monitoring and verification throughout the project life.

Appendix B: Present the project carbon dioxide emissions benefit calculations, including addressing leakage and the range of uncertainty in the calculation of the project's carbon dioxide benefit.

Issues Raised During Solicitation Period

Clarifications and responses to substantive issues raised by proposers in writing and transmitted by e-mail to the e-mailbox info@climatetrust.org will be posted on The Trust Web site at www.climatetrust.org/2001qa.html. It is the responsibility of the proposer to keep informed regarding clarifications by visiting this Web site. Questions and answers about this offset solicitation are posted there. Please review these Q & A prior to contacting The Trust.

The Climate Trust Contact Information

The Climate Trust
516 SE Morrison Street, Suite 1200B
Portland, Oregon 97214-2390

Phone: 503-238-1915
Fax: 503-238-1953
E-mail: info@climatetrust.org

Primary contact: Mike Burnett — Executive Director, mburnett@climatetrust.org

Alternate contact: Kris Nelson — Program and Operations Manager, knelson@climatetrust.org

Seattle City Light Contact Information

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Appendix A

Conversion Factors for Use in Phase 2 Proposals

Fossil Fuel Conversion Factors

Fuel Type	CO_2 Content*	CO_2 Coefficient (Lb CO_2/Million Btu)	Energy (Mill.Btu/Unit)
Natural Gas	120 lb/10^3cf	117	1.030/10^3cf
Gasoline (conventional)	19.4 lb/gal.	157	5.253/barrel
Distillate Oil/Diesel	22.2 lb/gal.	161	5.825/barrel
Residual Oil	25.8 lb/gal.	174	6.287/barrel
LPG/Propane**	11.8 lb/gal.	139	3.610/barrel
Kerosene/Jet fuel	21.4 lb/gal.	160	5.670/barrel
Anthracite Coal	4,891 lb/short ton	228	21.67/short ton
Bituminous Coal	4,861 lb/short ton	205	23.89/short ton
Sub-bituminous Coal	3,606 lb/short ton	212	17.14/short ton
Lignite Coal	2,742 lb/short ton	215	12.87/short ton

* Carbon dioxide coefficients are calculated by multiplying the carbon content of a particular fuel (for example, 42.8 lb. carbon per million Btu of gasoline) by 3.6667 pounds CO_2 per pound of carbon and multiplying that product (157.0 lb CO_2/million Btu) by the energy content of that fuel (for example, 0.125 million Btu per gallon, given 5.253 million Btu per barrel). Then multiply by the oxidation rate of .99 (accounting for one percent uncombusted carbon) to produce a carbon dioxide coefficient (in this example, 19.4 pounds CO_2 per gallon).

1 pound of carbon in carbon dioxide = 3.6667 pounds carbon dioxide, measured at full molecular weight (CO_2)

** Data are taken from recent Energy Information Agency tables, not Environmental Protection Agency sources.

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Electricity Carbon Dioxide Conversion Factors

CO_2 Intensity Factors for Marginal Electricity Generation for US Regions

	Pounds of CO_2 per kWh
Region 10: OR, WA, ID	1.202
Region 9: CA, AZ, NV	1.240
Region 8: CO, UT, MT, WY, ND, SD	1.244
Region 7: MO, IA, KS, NE	1.404
Region 6: TX, LA, OK, AR, NM	1.186
Region 5: OH, IL, MI, IN, WI, MN	1.988
Region 4: FL, NC, GA, TN, AL, SC, KY, MS	2.215
Region 3: PA, VA, MD, WV, DC, DE	2.096
Region 2: NY, NJ	1.679
Region 1: MA, CT, ME, NH, RI, VT	1.726

CO_2 Intensity Factor for New Natural Gas Fired Electricity Generation

	Pounds of CO_2 per kWh
Combined cycle combustion turbine	0.81

Other Conversion Factors

Weight

1 kilogram = 2.205 pounds
1 short ton = 0.9072 metric tons
1 metric ton = 1.1023 short tons = 2,205 pounds

Volume

Liquid Fuels

1 barrel	42 US gallons
1 barrel	159 liters
1 cubic meter	6.289 gallons

Gaseous Fuels

1 cubic meter	35.315 cubic feet

Energy

Natural Gas
1 cubic foot (cf) = 1,030 Btu
1 therm = 100 cf = 103,000 Btu
1 Mcf = 1,000 cf = 1.03 million Btu

Density

1 thousand cubic feet of methane/natural gas = 42.28 pounds

1 thousand cubic feet carbon dioxide = 115.97 pounds
1 metric ton natural gas liquids = 11.6 barrels
1 metric ton alcohol = 7.94 barrels
1 metric ton liquefied petroleum gas/propane = 11.6 barrels
1 metric ton aviation gasoline = 8.9 barrels
1 metric ton motor gasoline = 8.53 barrels
1 metric ton kerosene = 7.73 barrels
1 metric ton distillate oil = 7.46 barrels

For other conversion factors, please see the Environmental Protection Agency Web site:

www.epa.gov/ttn/chief/eiip/eiip_ghg.htm Vol. VIII link, Tables 1.4

Sources: www.epa.gov/ttn/chief/eiip/eiip_ghg.htm. For CO_2 Intensity Factors: *Regional Electricity Factors Final Report,* US Environmental Protection Agency, Atmospheric Pollution Prevention Division (APPD), November 16, 1998, contract no. 68-W6-0050. For Other Conversion Factors: http://www.eia.doe.gov/oiaf/1605/ggrpt/appendixf.html.

NATSOURCE

For Immediate Release

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Natsource® Launches Asset Management Division

New Investment Fund Led by Former Clinton & Gore Environmental Leader

New York, NY: June 19, 2001 – Natsource® LLC announced today that it has hired Kathleen A. McGinty, Vice President, Natsource, Asset Management. This is a new division established by Natsource to add value for clients by creating environmentally related financial products. The financial products will be aimed at capitalizing on new investment opportunities driven by the need for reliable, clean sources of energy providing air quality and greenhouse gas benefits.

Ms. McGinty, former Chair of the White Council on Environmental Quality, (CEQ) served as President Clinton's and Vice President Gore's principal advisor on domestic and international climate change and sustainable development issues. She will lead the Natsource Asset Management group and assume the title of Vice President, Asset Management.

"The need for reliable power and clean technologies creating environmental value is growing," said Jack Cogen, President of Natsource. "Katie's experience in the domestic and international environmental and energy arenas makes her the perfect candidate to establish this business line for Natsource and create new investment opportunities for our customers."

First among the financial products to be developed under Ms. McGinty's leadership at Natsource is an investment fund targeting companies and technologies that promise robust returns and that generate valuable greenhouse gas reductions. The trading of such reductions has the potential to address the threat of global climate change in a cost-effective fashion.

(more)

In addition, the trading of greenhouse gas reductions has the potential to create further revenue streams. These revenues could be invested in technologies and practices capable of achieving greater emissions reductions. Natsource is a global leader in greenhouse gas emissions markets. Natsource has developed the largest emissions operation in the world with offices in Europe, Asia and the US. In 2000, Natsource brokered first-of-their-kind transatlantic and transpacific greenhouse gas transactions and the largest transatlantic transaction.

Ms. McGinty brings over a decade of experience in the legislative and executive branches of Government. In 1995, Ms. McGinty was appointed by President Clinton as Chair of the White House Council on Environmental Quality. In this capacity, she served as President Clinton's senior advisor on environment, energy, and natural resources issues.

Prior to heading up the CEQ, Ms. McGinty served as Director of the White House Office on Environmental Policy from 1993 to 1995. Before her service in the Clinton Administration, she served as then-Senator Al Gore's senior Legislative Assistant for Energy and Environmental Policy.

Most recently, Ms. McGinty served as Counselor to former Vice President Gore, and as a consultant to energy and manufacturing firms. Prior to this, she was Senior Policy Advisor to the law firm of Troutman Sanders, LLP, where she counseled clients on energy and environmental issues.

Ms. McGinty has a BS in Chemistry from St. Joseph's college and law degree from Columbia University.

The Natsource Asset Management group joins the firm's Strategic Services division as complimentary value-added service to the core energy and environmental brokerage business. The Strategic Services group was formed in March 2000.

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Natsource® LLC is a leading broker of energy related products and participates in the power, natural gas, coal, weather hedging and emission permit markets. Headquartered in New York, Natsource's client base includes over 600 global companies who are leaders in the utility, coal, oil and natural gas markets, as well as the investment and commercial banking communities. With its joint venture partner, Tullett & Tokyo Liberty Plc, Natsource has global reach in all of the world's major financial centers.

TransAlta

For Immediate Rele

News Release

TransAlta and HEW complete world's first trans-Atlantic emissions reduction trade

CALGARY, Alberta (June 16, 2000) – TransAlta announced today the first ever trans-Atlantic trade of carbon dioxide emissions reductions with the German electric company Hamburgische Electricitäts-Werke AG (HEW). The 24,000 tonne emissions reduction trade was brokered by New York-based Natsource® LLC.

"This deal is part of TransAlta's ongoing commitment to reduce our net greenhouse gas emissions and lead the way in proving that market-based mechanisms such as offsets and emissions reduction trading really work," said Dr. Bob Page, TransAlta's vice-president of Sustainable Development.

"If Canada, and indeed the U.S. and Europe, are going to be able to meet Kyoto obligations without unduly harming our economies, making use of market mechanisms such as offsets and emissions reduction trading will be essential."

"The trading mechanism ensures that greenhouse-gas reduction projects are carried out where they are most cost-effective," said Dr. Helmuth-M. Groscurth, head of the project group on environmental certificates at HEW. "At the same time, emissions reduction trading is an interesting new field of business for HEW. It may very well complement HEW's newly developed energy trading activities."

In an emissions reduction trade one company earns 'credits' for carbon dioxide emissions that are either not released or are removed from the atmosphere. These credits can then be sold to companies who will record them as a reduction of their own net emissions.
HEW's carbon dioxide emissions reductions are from wind energy facilities in Hamburg.

This purchase of emissions reductions is in keeping with the proposed guidelines of the Kyoto Protocol and will be verified by an independent monitoring organization to ensure that an actual reduction in atmospheric concentrations of carbon dioxide has occurred.

TransAlta Corporation • 110-12th Avenue S.W. • Box 1900 • Calgary, Alberta • T2P 2M1
www.transalta.com

TransAlta has already reduced its net Canadian emissions more than three million tonnes below 1990 levels. In March, TransAlta unveiled a proposal to reduce its Canadian net emissions of greenhouse gas to zero by 2024. The proposal, titled "Beyond Kyoto", shows how a combination of new technology, renewable resources, emissions trading and offsets can achieve emissions reductions well beyond the Kyoto target.

Copies of the proposal can be downloaded from TransAlta's Web site at www.transalta.com.

TransAlta is an international electric energy company with about $6 billion in assets. The company is focused on achieving strong earnings growth and enhancing its competitive edge as a low-cost operator of generation and transmission assets, and a successful developer of gas-fired independent power projects. The company is concentrating its growth in Canada, the United States, Australia and Mexico. TransAlta owns and operates more than 8,000 megawatts of generation plus significant transmission assets in Alberta.

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NATSOURCE

TransAlta/Hamburgische Electricitäts-Werke AG
Greenhouse Gas Emission Reduction Trade
Background
June 16, 2000

Buyer:
TransAlta: The Calgary-based utility is an international electric energy company with about C$6 billion (US$4.02 billion) in assets. TransAlta owns and operates more than 8,000 MW of generation plus significant transmission assets in North America.

Seller:
Hamburgische Electricitäts-Werke AG (HEW): The Hamburg-based utility has about DM8.4 billion (US$17.22 billion) in assets. HEW is working on concepts to develop new markets for innovative energy applications. HEW owns and operates more than 4 million kWh of wind power generation in plants at the Georgswerder landfill site and the Neuland wind park.

Broker:
Natsource® LLC: The New York-headquartered firm is a leading broker of energy related products and participates in the power, natural gas, coal, weather hedging and emissions allowance credit markets. Natsource has global reach in all of the major financial centers through its affiliation with international bond and currency broker Tullett & Tokyo Liberty.

Credits:
Greenhouse gas emission reduction credits produced by HEW through an increased use of wind generation.

Terms of the Trade:
TransAlta will purchase from HEW 3,000 tons of greenhouse gas emission reductions each year for the next seven years.

Ground Breaking Transaction:

- This is the first trans-Atlantic GHG transaction. The buyer is financing actual emission reductions that can be made at lower cost in a different country. This trade moves beyond theory to practice and pioneers cross-border execution.

- The amount of transacted emission reductions is relatively small but it is significant that the transaction runs out several years and explores the contractual issues involved in transacting between different entities in different countries. These details were not likely to have been executed a few months ago

Commenting on the transaction, Garth Edward greenhouse gas emissions broker at Natsource LLC said:

"This transaction is truly a glimpse at the future of greenhouse gas emissions trading. The anticipated $100 billion global market in greenhouse gas emissions trading will pay little heed to borders. Corporations, environmental organizations, and countries will look for the most efficient source of emissions reductions, and as TransAlta and Hamburg Electric have proven these need not be on your own continent."

NEWS RELEASE **November 09, 2000**

EPCOR Announces World's Largest Trans-Atlantic Greenhouse Gas Emissions Trade

EDMONTON – EPCOR Utilities Inc. and Fortum today announced the world's largest trans-Atlantic trade of carbon dioxide emission reduction credits. EPCOR's purchase of 50,000 tonnes of CO_2 credits was made possible when Fortum, a European energy company, made a fuel switch to biomass at one of its Finnish power plants.

The trade concerns emission reduction credits created in 2000. The deal brokered by Natsource®LLC, a New York-based broker of energy and environmental related products, will see the credits transferred to EPCOR on January 31, 2001.

"EPCOR believes the best way to promote an active and effective emissions trading market is to prove to others that it can be done successfully, not just at the national or North American level but internationally," said Don Lowry, President and CEO of EPCOR Utilities Inc. "Managing greenhouse gas emissions is a global challenge that requires countries, companies, communities and consumers to work together."

"This emissions trade with EPCOR is an excellent fit to our 'learning by doing' approach with respect to the climate issue. Our Climate Initiative, launched in the beginning of this year, includes both climate benign actions at our own facilities and activities promoting emissions trading type of operations and this agreement combines both," said Heikki Niininen of Fortum, Corporate Vice President, Climate and Emissions Trading.

The 50,000 tonnes of carbon dioxide credits that EPCOR is gaining in the trade is the equivalent of reducing greenhouse gas emissions by removing 50,000 cars from the world's roadways for one year.

This transaction is a glimpse into the future of the global greenhouse gas market notes Garth Edward, a broker at Natsource. "EPCOR and Fortum have worked together to establish strong verification standards, exploring the legal basis of international transactions and raising awareness of how this market can deliver solid environmental benefits to the global community," said Edward.

EPCOR has met and surpassed greenhouse gas reduction targets since 1994 through innovative programs ranging from sustainable building retrofits, fly ash sales, wood pole recycling, and landfill gas operations. Their environmental leadership was recognized by Canada's Voluntary Challenge Registry when they awarded EPCOR with two awards the 1999 VCR Gold Award for Reporting and the 1999 Leadership Award in the electric utilities class.

"We hope that defining rules for emissions trading will be one of the issues brought to the table as the member nations begin negotiations next week at the sixth Conference of the Parties," said Dr. David Lewin, Senior Vice President, Sustainable Development for EPCOR. "EPCOR strongly supports the development of national and international regulations governing emissions trades." Members of the Conference of the Parties (COP) are those international governments that were involved in drafting the Kyoto Protocol in 1997. COP-6 will be meeting in The Hague from November 13 to 24.

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NOTE TO NEWS EDITORS AND ASSIGNMENT EDITORS: Additional information on EPCOR's environmental initiatives are available through their website, www.epcor.ca. Copies of their environmental report, The Essential Balance, can be obtained by calling Lynn Hutchings-Mah at (780)412-3194.

***EPCOR** is an Alberta-based company with $2.8 billion in assets. EPCOR generates 1,782 MW power in Alberta; operates transmission and distribution networks; builds and operates water and wastewater treatment plants; operates Canada's third largest water distribution network; and sells essential elements for living - power, water and natural gas - to customers across Canada. EPCOR also markets commercial electric services such as landfill gas management, street lighting, electrical and water meter services. More information about EPCOR can be found on our Website at www.epcor.ca.*

Fortum Corporation – founded in 1998 in the merger of the IVO Group (power and heat) and the Neste Group (oil and gas) is one of the leading Nordic energy companies, covering the entire energy chain, from production, refining, distribution and marketing of oil and gas to engineering, sales and distribution of electricity and generation of power and heat. A network of more than 1,000 service stations operates in Finland, the St. Petersburg area, the Baltic countries and Poland. In 1999, the net sales totaled US $8200 million. The number of employees is 14,000. Fortum is listed on the Helsinki Stock Exchange. More information about the company can be found on Fortum's Internet pages http://www.fortum.com/

Natsource®LLC is a leading broker of energy related products and participates in the power, natural gas, coal, weather hedging and emissions allowance credit markets. Headquartered in New York, Natsource's client base includes over 600 global companies who are leaders in the utility, coal, oil and natural gas markets, as well as the investment and commercial banking communities. With its joint venture partner, Tullett and Toyko Liberty Plc, Natsource has global reach in all of the major financial centers. www.natsource.com

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EMISSIONS TRADING FACT SHEET

"EPCOR believes that for emissions trading to work effectively, the federal government must implement rules for trading and underwrite the currency to be traded."

David Lewin PhD, P. Eng
Vice President, Government, Environment & Regulatory Affairs

What is Emissions Trading?

Emissions trading is a market-based tool to address climate change. It is a flexible mechanism for reaching greenhouse gas reduction targets. One can purchase emission reductions to offset their own greenhouse gas emissions. Conversely, they can sell emission reductions to fulfil the needs of others.

What is an Emission Reduction?

The currency to be traded is an emission reduction. The value of the emission reductions is derived from the cost of reductions of emissions from a set baseline, measured in tonnes.

Why is EPCOR involved in emissions trading?

1. Learn by doing.
2. Demonstrate the effectiveness of trading.
3. Influence government decision and policy makers.
4. Help establish trading models and contract language.
5. Gain a fundamental understanding of emission reductions market pricing.
6. Ultimately use market forces as one tool for the management of greenhouse gas emissions.

What are the Criteria for an Emission Reduction?

All emission reductions must meet the following criteria in order to be recognised:

Real – Must be the result of an action that actually reduces emissions.

Measurable – Must be able to quantitatively measure the size of the reduction.

Verifiable – Third party verification of the emission reduction is required.

Additional – Must be additional to any reductions required by a regulatory agency or by law.

Defined ownership – Requires indisputable ownership of the emission reduction by the seller.

Are emissions trading recognised by the government?

It must be clear that no credit for the emission reduction exists until the Regulator (most likely the federal government) agrees that certificates created, as the result of a trade can be cashed-in against a regulatory obligation.

What types of trades has EPCOR completed?

EPCOR is involved in three types of trading systems for emission reductions:

1. *Bi-lateral Trades* – A third party broker negotiates a trade between both a Buyer and a Seller. EPCOR has successfully completed transactions resulting in the purchase of 70, 000 tonnes of emissions reductions to date.
2. *Commodity Exchange* – EPCOR is a founding member of KEFI Exchange Inc., and Alberta internet-based emission reduction trading exchange.
3. *Joint Ventures* – Through a not-for-profit organization, the Greenhouse Emissions Management Consortium (GEMCo) EPCOR has been party to some significant trades, resulting in over 600,000 tonnes of emission reductions.

Who else is trading?

Nationally and internationally companies are negotiating transactions for emission reductions.

Governments are generally not involved in transactions, unless it is for the Clean Development Mechanism, which results in a trade between a developed and a developing country.

Anyone who wants to buy or is able to sell can currently be active in the emissions trading market. Energy companies still tend to be the biggest players.

What is the Environmental Benefit to Emissions Trading?

Climate change is an issue that affects us globally. Greenhouse gas emissions from human activities are believed to be a contributing factor to climate change. Greenhouse gas emissions are a pollutant with a global effect, no matter where the emissions are generated. The reduction of emissions anywhere in the world results in a net reduction of emissions overall. It is a global solution to a global issue.

TransAlta

For Immediate Release

News Release

TransAlta emission reduction trade with U.S. company billed as a way to help Canada meet Kyoto obligations

CALGARY, Alberta, (Nov. 13, 2000) – TransAlta announced today a unique carbon dioxide (CO_2) emission reduction credit sale to U.S. integrated oil company Murphy Oil. The 210,000-tonne CO_2 emission reduction trade is equivalent to one year's emissions from 27,800 cars. New York-based Natsource® LLC, brokered the deal.

"This transaction proves international emission trading works," says Dr. Bob Page, TransAlta's vice-president of Sustainable Development. "It shows the Canadian government a way to help meet Canada's Kyoto obligations by lowering global carbon levels at minimal cost to Canadian energy consumers."

In an emission reduction trade, a company or an organization that can absorb or reduce greenhouse gases, sells emission credits to another organization that needs them anywhere in the world. The result is a financial incentive to reduce emissions and a net reduction in global concentrations of carbon dioxide. In this case, TransAlta had emission reductions to sell as a result of upgrades to its U.S. operations.

"The beauty of emission trading is that it allows companies to reduce their emissions immediately while they develop the technology necessary for long-term reductions at the source," adds Dr. Page. "International emission reduction trading is going to be a vital element in any plan for a long-term solution to climate change."

In March 2000, TransAlta unveiled a proposal to reduce its Canadian net emissions of greenhouse gas to zero by 2024. The proposal, titled "Beyond Kyoto", shows how a combination of new technology, renewable resources, emission trading and offsets can achieve emission reductions well beyond the Kyoto target.

Copies of the proposal can be downloaded from TransAlta's website at www.transalta.com.

- more-

TransAlta is an international electric energy company with more than $6.6 billion in assets. The company is focused on achieving strong earnings growth and enhancing its competitive edge as a low-cost operator of generation and transmission assets, and a successful developer of gas-fired independent power projects. The company is concentrating its growth in Canada, the United States, Australia and Mexico. TransAlta owns and operates more than 8,000 megawatts of generation plus significant transmission assets in Alberta.

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India – GHG Project Finance Course
April 2001

Checklist for GHG related issues:

Policy:

1. What is India's policy on CDM projects? Which types of investments are eligible for CDM?
2. What are the requirements to file a CDM project with Government of India environmental authorities, if any?
3. Are there any constraints or limitations on ownership of GHG emissions reductions or "carbon credits" in India?

Environmental:

1. Is the project's environmental performance superior to current baseline alternatives in terms of GHG emissions as in the Kyoto Protocol?
2. Are there sustainable development benefits in terms of local job creation and value added? Are these quantified?
3. Has a GHG accounting been carried out for the project and are these calculations valid if submitted to independent review?
4. Are the baseline conditions concerning environmental additionality subject to changes in the future? If so, by how much?
5. Any other issues concerning the parameters or the boundaries for the project's system analysis vis-à-vis GHG emissions?
6. Has a Monitoring & Verification Protocol (MVP) been developed to re-calculate annually GHG emissions reductions?
7. Has a third party certification body been identified to certify results of MVP report? If so, are the costs included in the price for sale of the carbon credits?

Commercial:

1. Are the carbon credits subject to a prior commercial arrangement?
2. Are there any limitations on marketing or commercializing the credits worldwide?

Greenhouse Gas Pollution Prevention Project Training Workshop
Project Developer Questionnaire

This survey questionnaire has been prepared to enable EIC to gauge the current status of the Climate Change Mitigation Projects being developed in conjunction with the Climate Change Centre at Development Alternatives. Please provide as much detail as possible under the appropriate headings. Where information is not yet available or not relevant, please indicate "N/A." All information provided here will be considered STRICTLY CONFIDENTIAL. EIC is grateful for your cooperation and hopes that your participation will facilitate the financing of your project.

1. Name of Project
2. Contact Name and Title
3. Company Name
4. Type of Organization
5. Mailing Address
6. Telephone
7. Fax/Telex
8. E-mail Address

9. Typical Financial Performance Indicators: (in the case of new companies or Special Purpose Companies, please give details of promoters)
10. Track Record with Banks/FIs (credit rating/ lead bankers)
11. Objective in Undertaking Development of Project

II: Project

12. Description of Proposed Project
13. Status of Development
14. Project Location

15. Technology, Status of Suppliers
16. Technical Details of Emission Reductions
17. Project Cost (detailed break-down to the greatest extent possible)
18. Type of Financing Proposed (Leverage)
19. Status / Percentage of Financing Secured

20. Key Operational Requirements and Status (e.g. [illegible] Agreement etc.)
21. Financial Parameters of the Project
22. Carbon Emissions Baseline & Additionality Considerations
23. Sustainable Development Considerations

Cervecería Cuauhtémoc Moctezuma Breweries
Mexico

Project Summary

Project Type:	Three Industrial Energy Efficiency Projects
Contract Type:	Energy Savings Performance Contracts
Location:	Mexico
Project dollar value:	CCM: $175,000; Osel: $75,000; Masterpak: $120,000
Project Developer:	Empresas ESM, SA de CV
Sources of Financing:	Econergy International Corporation and other sources

Project Narrative

1. Introduction

While the Energy Service Company (ESCO) concept is relatively new in Mexico, this approach to deploying energy efficiency technologies is well tested as a viable means of reducing both energy costs and carbon emissions. For Mexican ESCOs, the concept represents a relatively untapped business opportunity, however, regulatory, financial and institutional barriers to implementing energy efficiency projects has hindered development of a viable ESCO market in Mexico and slows the implementation of such projects.

Mexico has tremendous potential for energy efficiency, especially improvements implemented as smaller projects in larger industrial enterprises. This potential was a contributing factor in the development of the Mexico Carbon Portfolio. The individual projects developed under the umbrella of the Mexico Carbon Portfolio are intended to address this factor and to capitalize on current market signals that indicate the initial formation of a carbon market in Mexico.

The portfolio of projects entails energy efficiency measures introduced into the manufacturing processes of three industrial entities in Mexico. The primary participant in each of the projects is a Mexican host company and the project developer (an energy service company), Empresas ESM, S.A. de C.V. (EESM). The U.S. participants include Econergy International Corporation (EIC), to provide subordinated debt financing, financial advisory services, and/or technical services related to greenhouse gas emissions reductions associated with the projects, and various other organizations providing debt financing.

2. Program Descriptions

The Mexican Carbon Portfolio includes three energy efficiency projects at four sites.

CCM Brewery Project

In 1998-1999, EESM in association with EIC completed a ground breaking example of energy efficiency performance contracting in Mexico. The project was undertaken at two brewing facilities (located in Sonora and Baja California) operated by one of Mexico's largest beer companies, Cerveceria Cuauhtemoc Moctezuma (CCM), part of the publicly traded FEMSA Group (NYSE:FEMSA).

The project includes energy efficiency measures to better manage electricity load during peak hours. The total peak demand is reduced by using electrical equipment for process cooling on a sequential or staggered schedule rather than simultaneously and continuously. Refrigeration needs increase during summer months as much as six times that of winter months, so this approach can yield significant savings.

EESM also installed efficiency measures in the brewing processes. The equipment used includes controls on motors, fans, pumps and other electric devices, as well as improving the efficiency of back-up cooling systems. As part of the load management project, many of these motors can be turned off temporarily without disrupting production.

Osel Project

Pinturas Osel owns and operates the manufacturing facility located in Monterrey, which manufactures and distributes paints. The Project involves automation of paint-filling equipment, enhancements in the compressed air system to avoid paint leakage and better manage electricity load during peak hours, and installation of controls to monitor and improve the efficiency of the paint filling processes.

The automation of the paint can filling machinery involves the installation of an electronic control system in the vinyl paint area. This includes installation of sensors and electronic signal valves, which will provide greater precision in the amount filled and will reduce spillage. In addition, a sweeper piston will be installed to capture deposits and leaks of paint, which will reduce the amount of time taken up by the filling process.

The efficiency enhancements proposed for the compressed air system include two measures: elimination of leaks of compressed air in the system and substitution of the three 15-HP reciprocating compressors by a screw compressor.

Masterpak Project

Masterpak is part of the Packaging Division of CYDSA, one of the leading chemical groups in Mexico. The project will be implemented in two general areas: (1) efficiency improvements to the compressed air system to allow the plant to have a continuous supply of high quality compressed air with less energy consumption; and (2) the installation of variable frequency equipment in the coagulation machinery, which will allow the plant to obtain efficiency levels of 95-96% with less energy consumption.

Each of the projects is designed to demonstrate the positive effects that industrial energy efficiency can have on emissions of greenhouse gases. In each case, efficiency measures implemented at industrial facilities in Mexico will result in lower emissions from power

plants serving the local grids, particularly during periods of peak demand. In addition each project will produce carbon offset credits that will be quantified and submitted for certification by the U.S. and Mexican Governments.

The projects are structured as a shared savings, performance-type contract, with quarterly lease payments made by each facility owner to EESM based on actual savings measured by the end user. The contract provisions stipulate that ESM will receive a percentage of the savings generated by the project over a number of years, with the facility owner obtaining the remaining benefits generated. From the end of the contract period onwards, the facility owners receive 100% of the benefits generated.

The contracts assign carbon offsets generated by the project to EESM, who in turn, shares ownership of the carbon credits with EIC, the U.S. participant. The additional potential value of carbon offsets derived from the project enabled the facility owners to obtain the services of EIC as an "in kind" contribution to the project.

Under the terms of the contract between EESM and EIC, EIC is awarded ownership of the carbon credits, which may be traded or sold in the future. The carbon purchases will also be executed under a performance-based contract to help minimize the risk that the offsets are not delivered on time or in the agreed amounts. EIC invested in these projects based on an estimated future value of carbon credits generated by the project. In anticipation of the future value of those credits, EIC provided subordinated debt financing on concessional terms and carried many of the transaction costs associated with the projects. Financial closure was, therefore, accelerated for projects that would otherwise have been difficult to complete.

3. Obstacles and How They Were Overcome

The relative lack of precidence for energy efficiency project implementation, contracting and financing mechanisms in Mexico required EESM to address several crucial obstacles:

- *Project Financing.* Small projects have large development costs associated with them and large projects are often considered too risky to contemplate using an unproven energy performance contract model. Despite the fact that energy is a significant cost for industrial enterprises, energy efficiency projects in Mexico face severe competition for budget resources to finance the up-front cost. Modernization projects are normally a higher priority.

  The performance contracting approach helped to resolve barriers to securing reasonably priced financing and transferring carbon rights from the projects to investors and/or project developers helped to offset the financing costs and the risks of new financing methods.

  Performance contracting allows clients to budget for regular lease payments as part of their operations and maintenance budgets (where energy costs are normally budgeted

Empresa Eléctrica del Norte
Sugarcane Bagasse-Fired Generation and Sugarmill Cogeneration Project
El Salvador

Project Summary

Project type:	Industrial cogeneration and separate biomass/fuel oil-fired thermal generation station
Finance type:	On-balance sheet investment by host company /Project finance
Location:	Suchitoto, Departamento de Cuscatlán, El Salvador
Project dollar value:	US$20,000 (cogeneration facility) and US$ 7.5 million (generation station)
Project implementer:	Ingenio San Francisco (El Salvador)
External financing:	US$ 3.3 million
Sources of financing:	Private investors and regional development banks (BMI and BCIE)
Estimated emissions reductions:	N/A

Project Narrative

1. Introduction

Ingenio San Francisco (San Francisco Sugar Mill) is a private company located near Suchitoto in the Cuscatlán Department of El Salvador. San Francisco has had a cogeneration facility in operation since 1995, and since late 1999 has been the site of a dedicated biomass/fuel oil thermal station serving the country's principal transmission and distribution company, Compañía de Alumbrado Eléctrico de San Salvador (CAESS).

During the 1994/1995 milling season, San Francisco undertook technical modifications at the mill to permit increased power production and sales to the national grid based on a nameplate generation capacity of 3.3 MW. The initial investment required was limited – $25,000 for interconnection hardware. Since then, San Francisco has exported over 5.5 GWH of electricity, with an average annual output during the milling season of about 1.5 GWH over 140 days of cogeneration.

The favorable results of the cogeneration facility at San Francisco allowed the Mill to attract private investment and loans necessary to construct a 10 MW generation station called Empresa Eléctrica del Norte, which uses 90% sugarcane and 10% bunker C fuel oil to generate power under a long-term power purchase agreement with CAESS. The project will be completed in two phases, the first of which was completed in December, 1999, with a nameplate capacity of 5 MW, all of which may be exported to the grid.

2. Project Descriptions and Technical Approach

The development of these projects reflects the efforts of San Francisco to improve its efficiency and competitiveness through the use of an important, locally available energy resource. The process by which the projects have been developed was iterative, with the success of the first phase established as a criterion for continuation with second phase.

San Francisco Cogeneration Project. The sugar mill has a capacity to crush 3,800 tons of cane a day, which is used as fuel after crushing in three bagasse-fired boilers that produce a total of 167,000 pounds of steam per hour (lb/hr) at 300 pounds per square inch (PSI) and 285° F. The steam is used to generate power in three turbogenerators with a total nameplate capacity of 3.3 MW. Energy production is limited to the crushing season, which ranges from four to five months a year. Table 1 presents data for milling, cane processing and generation for the plant.

Table 1: Ingenio San Francisco Cogeneration Project Output Data

	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999
Cogeneration Days	34	84	126	155	144
Tons Cane / Year	326,798	379,018	450,392	493,839	497,466
KWH Exported	350,000	926,000	1,581,500	1,742,000	1,210,754

San Francisco undertook the project with its own resources, which were sufficient given the relatively limited investment required to bring the facility on line. The project was implemented to take advantage of an incentive offered by the national electric company at that time, CEL, to purchase power from new sources under one-year, renewable contracts.

Empresa Eléctrica del Norte. The facility has a steam generation capacity of 100,000 lbs/hr, at a design pressure of 475 PSI and a working temperature of 760° F. Power generation is provided by two turbogenerators of 5 MW each. Construction will occur in two phases, the first of which was completed in December, 1999. In the second phase, an additional 5 MW of nominal generation capacity will be added to the facility, with total exportable capacity rising to 8 MW and potential electricity production of 50 GWH a year. A bagasse dryer will also be added in this phase of the project.

The plant consumes excess bagasse from San Francisco, complemented by bunker C fuel oil. However, other agricultural wastes may also be used once the necessary test-firing and fuel handling arrangements have been perfected.

Power sales are to CAESS under a long-term (ten-year) power sales agreement, at $0.053/kWH, which is lower than current spot-price values, which range from $0.85 to $0.10/kWH.

The total cost of the project is about $7.5 million, for both phases. Investment capital was provided by El Salvador-based Grupo Industrial Nottebohm (also a major investor in Ingenio San Francisco) and Empresas Ambientales de Centroamérica (EACA), an investment fund affiliated with Environmental Enterprises Assistance Fund (EEAF) of the U.S. Long-term financing was provided by the Banco Multisectorial de Inversiones (BMI) and the Banco Centroamericano de Integración Económica (BCIE). The project's leverage is very low at 50%.

3. Obstacles and How they were Overcome

The principal obstacles to the development of these projects may be classified as financial, regulatory, and access to information. These have largely been overcome, and the project has been implemented. How successful EEN will be in El Salvador's deregulated and highly competitive electric sector remains to be seen however. Preliminary indications suggest that the project may not enjoy the financial returns that were originally anticipated.

- *Access to financing.* Access to capital was less of an issue for the initial cogeneration project since sugar mills traditionally use bagasse after crushing to produce thermal energy requirements and often their own electricity. Sales to the grid of excess power therefore require a relatively small investment that was within the reach of San Francisco without the need for additional debt.

  In the case of EEN, however, the San Francisco did face a more substantial challenge, and the process of securing investors and debt for the project took just under a year to complete. The lenders required the corporate guarantee of the shareholders, and proved unwilling lend more than 50% of the total cost of the project. Further, the loan maturity is relatively short – 6.5 years – at a commercial interest rate. In the end, equity requirements were provided by a local industrial group, already a major investor in San Francisco, together with a fund established in the early 1990s with precisely the objective of directing investment capital to projects of this type. The experience of San Francisco demonstrates the potential results of continued and increased availability of capital resources for investment in emerging sectors such as renewable energy.

- *Regulatory issues.* San Francisco and EEN benefited from the regulatory opening implemented in El Salvador in the period since the end of the conflict in the 1980s. The process of reconstruction in the country required large amounts of capital that the government could not supply without leveraging private resources.

  As in numerous other cases throughout the region, the electric sector has provided an attractive prospect for investors, and deregulation has made it possible for the government to focus its resources on a smaller segment of the electric sector rather than the entire system, with its extensive needs in terms of rebuilding and expanding transmission and distribution systems, expanding generation capacity, and improving the quality and variety of customer services. Since deregulation

and privatization, several international investor groups, including AES of the U.S., Electricidad de Caracas from Venezuela, and investors from Chile have entered the Salvadoran market.

However, as the Salvadoran electric sector becomes more competitive, renewable energy projects will face tough competition from traditional thermal generation technologies. The primary factor will be one of cost: renewable technologies, though substantially more competitive than they have been in the past, remain more costly than new and rapidly developing natural gas- and diesel-fired generation technologies. Furthermore, the time needed to bring renewable generation technologies on-line puts them at a disadvantage with respect to conventional equipment, often available in package units that can be installed and operational rapidly. The longer lead-time required for even the most proven renewable technologies reflects the fact that the arrangement of financing tends to be more time-consuming, and that engineering requirements, especially for cogeneration applications, may be more complicated.

The obstacle to continued and more rapid deployment of renewable technologies in the future may be addressed in part by specific regulatory measures designed to level the playing field between conventional, fossil-fuel based generation technologies and renewable technologies. Measures might include portfolio requirements for the distribution companies that would establish target shares of renewable resources in the overall resource portfolio, more effective treatment of renewable resources for the purposes of calculating capacity charges, tighter emissions controls for fossil-based generation, or other mechanisms that establish an economic value for the environmental benefits provided by renewable energy resources. Clearly, some may be affected in different ways by the various regulatory options available – biomass generation must also address concerns about some forms of air pollution, especially particulates, and will face different considerations regarding capacity availability than wind or small-scale hydroelectric facilities.

3. Lessons Learned

There are several important conclusions that may be drawn from the experience of San Francisco and EEN.

- Competitive electricity markets can provide a needed stimulus for renewable energy development.
- Renewable energy resources may fall victim to competitive forces in deregulated markets unless environmental benefits are given adequate consideration.
- Capital is available to renewable energy projects when they meet investment criteria.
- Information on renewable energy technologies, and access to them, is not a significant hurdle.

IDFC Participants: (indicates attendees of April 2001 FI Training)**

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Annexure 3
(News item on IDFC)