Comité Consultatif Economique et Industriel Auprès de l' OCDE

Business and Industry Advisory Committee to the OECD

IEA
INTERNATIONAL ENERGY AGENCY

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BONN, GERMANY

BIAC/IEA Side-Event

How industry makes investment decisions and transfers environmentally friendly technology

Friday, 29 October 1999, 18:00-19:30

THE FULL TEXT OF THE PRESENTATIONS AND BIAC/IEA KEY MESSAGES IS AVAILABLE AT THE BIAC WEB SITE AT:
http://www.biac.org/framenew.htm

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Fifth Session of the Conference of the Parties
Bonn, Germany

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Context

The transfer of technology and know-how will play an important role in achieving emissions reductions and is essential to enhancing participation of economies in transition and developing countries in the sustainable development process. Foreign direct investment is a major source of finance for infrastructure investments in developing countries and, at the same time, makes a considerable contribution to the transfer of new technologies. While firms are the main drivers of innovation and technology cooperation, governments in both OECD and non-OECD countries can offer framework conditions that encourage business investment in climate-friendly technology in developing countries. Lessons from private sector investment experience in developing countries may provide insight on implications for the design of the CDM as well as how to better achieve technology transfer under the Convention and the Protocol.

Objective

There are many examples of how private investment and the mitigation of greenhouse gas emissions can work in tandem. The objective of this seminar is to illustrate by three specific examples how industry makes investment decisions and transfers technology in today's market-place and how governments can effectively support industry's pre-eminent role in technology cooperation and capacity building. The seminar is intended to further the understanding of how enterprises conduct projects outside the OECD and to analyse the driving forces behind an investor's decision to direct investment to a particular project. The three projects presented at this seminar (electricity, oil, cement) were selected because they make an important contribution to infrastructure investment in the host countries while at the same time introducing cleaner technology.

The meeting will bring industry representatives from both developed and developing countries together with government delegates and other organisations involved in the climate change dialogue to discuss how to orient business investment towards environmentally friendly technologies and to share lessons from private sector investment experiences in developing countries.

Fifth Session of the Conference of the Parties (COP-5),
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Agenda

1. BIAC/IEA introductory remarks

Kristi Varangu, International Energy Agency

Klaus Kohlhase, BIAC

2. Presentation of sector case studies & discussion with the audience

- *Electricity:* *John Novak, Edison Electric Institute*
- *Oil:* *Thomas G. Burns, Chevron Corporation*
- *Cement:* *Michel Picard, Lafarge*

3. BIAC/IEA key messages

Olivier Appert, International Energy Agency

Klaus Kohlhase, BIAC

4. Open discussion

The following questions were considered as guidance for the preparation of the case study reports:

- What is the series of decisions necessary for investing in developing countries? (including the identification of various types of risk/barriers/timing)
- What is the series of decisions necessary for technology selection and implementation? In particular, what will influence investment decisions towards climate-friendly options?
- What role can companies play in building capacity and know-how?

ELECTRICITY SECTOR PRESENTATION

JOHN J. NOVAK - EDISON ELECTRIC INSTITUTE

Background

The international appetite for electricity continues to grow at a rate far greater than that in the U.S. Worldwide electricity demand is projected to grow at an annual rate of 6.7 percent while U.S. growth is estimated to be 1.8 percent. The global market offers U.S. utilities attractive customer and earnings growth opportunities. Utilities can apply their construction and engineering skills to take advantage of the opportunities that arise from privatization efforts and increasing numbers of energy development projects. The global market is attractive not only as a method to add customers, but also because U.S. companies typically can improve efficiency and increase profits. This is especially true in developing countries. According to the World Bank, on average 38 percent of the generating capacity in developing countries is out of service at any one time compared to 13 percent in the U.S. Moreover, transmission system line losses are only 6 percent in the U.S., but typically reach 15 percent and higher for international systems, with the exception of more developed Western European nations.

Since 1995, U.S. electric utility companies have been significant participants in global privatization efforts inclusive of electric and gas transactions. Privatization first focused on generation assets but now has broadened to include all aspects up and down the energy value chain.

Through the 1995 through 1997 period, privatization efforts in the United Kingdom, Australia and New Zealand resulted in 15 companies being wholly or partially acquired by U.S. investor-owned electric utilities. U.S. electric utilities now have ownership interests in nine of the 12 regional electricity distribution companies in the U.K and five electricity distribution companies in Australia. Through 1997, $66 billion in energy assets have been privatized according to Cambridge Energy Associates. During 1998, acquisitions by way of limited privatization in South and Central America continued the global trend. Privatization will continue to open up global markets to new owners, as large amounts of government owned energy assets in South America, Europe and Asia become available through privatization.

Privatization typically parallels countries opening their markets, giving more access to suppliers. In Europe, the U.K. market that has privatized extensively, continues to allow for more access for customers to choose their supplier, while the Scandinavian countries already have choice and are now examining the possibility of privatization. Due to the European Directive on Liberalization of the Electricity Market in early 1997, the remaining countries on the Continent will be opening up their markets shortly. This in turn has heightened the interest of global energy players who are especially focused on projects and companies on the Iberian Peninsula and Eastern Europe.

Latin American and Asian countries are attempting to privatize energy assets and companies, but the movement of the sales have been hampered by the economic problems in these regions. Despite the difficulties faced, such as lack of capacity, ineffective regulation, and government interference, these regions are still ripe opportunities for global energy companies based in the U.S. Where the local governments see problems and inefficiencies, U.S. energy companies see systems they can improve and increase in value.

As privatization activity has proliferated around the globe, foreign countries' energy asset selling expertise has increased, and acquirers have gotten better at managing their overseas risk.

Favorable attributes for selecting countries for Foreign Direct Investment --

Stable political environment
- Well-developed legal system (political sovereignty)
- Government support for the integrity of business practices and discouragement of fraudulent practices
- Avoid countries where political corruption is prevalent

Well-established regulations
- Rational regulatory body to handle rate disputes and support expansion of transmission and distribution

Stable economic environment
- Stable currency values and controllable inflation
- Attractive service territories for future growth

General business environment
- Commitment to customer service
- Opportunities for growth
- Nation's future based on viable industries (i.e. technology)

Favorable resources
- Work force has a good base level of education
- Developing middle class
- Low illiteracy rates to support company's personnel needs

Favorable tax structure
- Need to support the economic rational for the investment

Favorable cultural environment
- Lack of communication barriers

Locations where foreign deregulation exists/anticipated
- To ensure that companies can leverage their US operations in a competitive environment

Concentrate in high-density areas
- Opportunities to offer additional products such as district cooling, heat pumps, vendor contracts, etc.

The International Utility Efficiency Partnerships, Inc. (IUEP)

The IUEP is a separately funded activity within the Edison Electric Institute (EEI) formed in February early 1995 to identify international energy project development opportunities that reduce or avoid greenhouse gas emissions and to work with host country government personnel to facilitate project investment. Participation is open to EEI investor-owned electric companies, EEI International Affiliates, EEI Associates, and energy product manufacturers and service providers. The IUEP solicits proposals for review from parties interested in developing and implementing international energy efficiency projects that will reduce and/or avoid greenhouse gas emissions in a credible, creative, and cost-effective manner. Such projects should demonstrate an adequate economic foundation that will allow project developers to recover their investment, as well as an acceptable risk premium for their participation.

Technical Criteria

Feasibility and Completeness of Management Plan (e.g. credible project design, adequate monitoring and contingency plans, 3rd party verification, identification and mitigation of potential leakage)

Accuracy and Credibility of Greenhouse Gas Emissions and Emissions Reductions Calculations (e.g., credibility of method, verifiability of data, accuracy of calculations, inclusion of indirect and secondary effects)

Qualifications of Bidder and Other Project Participants (e.g., experience with implementing similar projects, experience working in proposed country, level of commitment)

Political Acceptance of the Project and Stability of the Region (e.g., degree of local participation, letters of agreement with host-country government and stakeholders, political/economic stability of region)

Other Considerations (e.g., non-greenhouse gas benefits, innovativeness, acceptability under U.S. IJI)

Cost & Return Criteria

Accuracy and Credibility of Cost Calculations (e.g., inclusion of all start-up and O&M costs, credibility of assumptions, accuracy of estimates)

Financial Reliability of Bidder and Partners (e.g., availability and stability of financial resources, stability of currency)

Amount of Funding Secured (e.g., level of commitment from bidder and other members of the project team)

Cost-Effectiveness of the Project (e.g., cost per metric ton of C02-equivalent reduced/sequestered)

Rate of Return of Project (e.g., define the internal rate of return that can be expected by IUEP investors)

Encouraging Investments in Climate-Friendly Technology

In addition to addressing the criteria presented above, countries can provide incentives intended to reduce development risk for private companies to encourage investment in climate-friendly technologies. Examples of incentives include secure purchase power agreements, special loan programs, low fixed fuel price (natural gas), and expedited project-site country approval processes.

Case Study - CAPEX S.A.

The Capex, S.A. electric energy project in Argentina represents the largest electric infrastructure project submitted to the United States Initiative on Joint Implementation (USIJI) in terms of investment (USD $200 million), megawatts (539 MW) and C02 offsets produced (30 million metric tons of C02). The project will commence operation in early 2000.

The Capex, S.A. project is a single-cycle to combined-cycle natural gas fueled electric generation facility located in Neuguen, Argentina. The project expects to produce 30 million metric tons of greenhouse emissions credits over plant life. The current Capex, S.A. power plant comprises five Westinghouse 261B11 gas turbines and one Westinghouse 701D gas turbine, one 132kV substation and three high voltage overhead transmission lines through which the generated energy is supplied to the national grid. As a low cost power generator, this plant is one of the first to be dispatched within the grid. The project includes the installation of one HRS (Heat Recovery System) in each gas turbine exhaust and the steam system to feed one steam turbine rated at 180 MW. This occurs because the combined cycle plant will operate at a lower busbar cost of electricity than existing simple cycle gas fired power plants and will therefore displace less efficient power on the grid. The existing plant rating is 354 MW.

After conversion, the plant will be rated at 539 MW. The project's lifetime is calculated to be 30 years. Thus, offsets are produced by making the plant more efficient, therefore it is technically an "efficiency" project. Furthermore, Capex, S.A. has begun a forestation plan at the site of the project. Capex, S.A. has already begun the process of planting grass and trees around the power plant. This has practical results of reducing the ambient temperature around the power plant which increases the power output. The company intends to continue to reforest property around the plant, such that 100 hectares are reforested per year.

CHEVRON IN PAPUA NEW GUINEA

THOMAS G. BURNS, CHEVRON CORPORATION

Executive Summary

- Chevron leads a consortium of companies to extract oil from the Lake Kutubu region of Papua New Guinea.

- The project produces in excess of 90,000 barrels of oil each day - a major source of revenue for the Government of PNG and the consortium.

- Associated natural gas is reinjected into the reservoir, eliminating the need for flaring, and therefore limiting emissions of greenhouse gases.

- To establish an effective environmental management program, local personnel have been trained.

- Local companies and employees are contracted to work on the project wherever possible. Landowner companies representing all of the ethnic groupings within the nearby communities have been established to perform such contracts as road construction and maintenance, camp catering and maintenance, security and labor hire. Each of these companies are also being helped by Chevron to develop business opportunities independent of the oil development project.

- The development project also supports a Community Affairs Program which provides training, education and materials in the area of health and agriculture to improve nutrition and health in general as well as on basic crafts such as carpentry, welding and metal working. The program also provides financial assistance for landowners to develop businesses that will be sustainable after the finite life of the project.

Background

The Kutubu Development Project was the first successful attempt to produce commercial oil in Papua New Guinea. In 1992, it turned the country into an oil-exporting nation. The project has had a major impact on gross national product and the incomes of the people of Papua New Guinea. Current production is 90,000 barrels per day, producing revenue of more than US$1 million a day. Chevron Niugini Ltd. operates the project on behalf of a consortium of other companies.

The field is located near Lake Kutubu in the Southern Highlands province. Oil is exported through a pipeline to an export terminal located 30 miles offshore in the Gulf of Papua. Both the lake and the river delta support an indigenous community who depends on the ecosystems for transportation and food.

Environmental Management Program – Trained Local Personnel

As part of its policy to minimize impacts on the environment and the local communities, Chevron developed an environmental management and monitoring plan. Local traditions have exhibited strong ties to the surrounding rainforest, reinforcing the need for an effective environmental plan and skilled personnel.

A key element of the plan is the need for equipment and trained personnel available on-site to respond in the unlikely event of an oil spill, and an assessment of socio-economic, cultural and archeological impacts.

Other plans developed and implemented to enhance safety and environmental performance include the Safe Practices and Procedures Manual, the Oil Spill Contingency Plan, the Pipeline Integrity Monitoring Program, the Water Quality Monitoring Program, the Rehabilitation and Monitoring Program and the Waste Management Plan. Government agencies participated in oil spill response drills to gain a better understanding of the system used to respond to spills and how to deploy spill prevention equipment. In addition, agency personnel have been sponsored for professional seminars and overseas training.

Community Involvement

The joint venture intends to mitigate the negative impacts of the project on the local population band to offer positive benefits. Two major priorities are to train and develop oilfield skills for the people of Papua New Guinea, and to enhance the well-being of communities in the area while not adversely changing their traditional lifestyle. The oil field training program covers many areas including the following key components:

- Preference in hiring first to local people, then to people from affected areas and then to Papua New Guinea as a whole;
- An extensive on-site training program to train people in all facets of oil production;
- A scholarship programme both at high school and college level to develop professional disciplines.

Other examples of capacity building in the Community Affairs Program are:

- Building schools, health aid posts and water tanks in the villages;
- Providing training, education and materials in the area of health and agriculture to improve nutrition and health in general;
- Administration of a distance education programme for students in remote villages;
- Providing training on basic crafts such as carpentry, welding and metal working;
- Financial assistance for landowners to develop businesses that will be sustainable after the finite life of the project.

Building and Supporting New Industry

Efforts are being undertaken to foster landowner companies. Iagifu Oil and Gas (IOG), Gobe Field Engineering (GFE), and Kikori Oil Investments (KOI) represent major landowning groups throughout the license areas and have been established to perform contracts during the construction and operations phases of Chevron's licenses in PNG. These companies have developed their contracting capacity over time and are emerging as key contractors in the region for a variety of construction and maintenance work.

Smaller companies and business groups in the project area are pursuing sustainable business opportunities with the support of Chevron and the World Wildlife Fund. A number of small eco-

tourist and eco-forestry operations have been established and small cottage industries such as butterfly farming and handicraft marketing are currently being pursued.

The partnership is now developing a pipeline project that will bring natural gas from Kutubu to Northern Queensland in Australia, replacing coal used for electric generation and industrial fuel and resulting in more efficient and longer-lived oil production and a reduction in total greenhouse gas emissions.

Investing in Developing Countries

The decision to invest in a major project in a developing country will be influenced by the conditions in the host country. Good investment conditions in developing countries include:

- A stable economic system and an attractive investment opportunity for investing partners;
- Transparent and equitable legal and financial structure and sound environmental laws;
- A fair return on capital to investing partners;
- A long term commitment and dedication of resources as a goal for all partners;
- A safe and secure working environment for all employees and contractors;
- No unnecessary barriers to movement of personnel and material.

Technology Selection and Assessment of Climate Friendly Options

A number of factors need to be considered when selecting "climate friendly" technologies, these include:

- How much emissions reduction will the technology provide? Life-cycle analysis of emissions; comparison with an evolving baseline for existing technology; scope for further improvement; applicability for different sizes and locations; permanence of emissions reductions; interactions with other technologies.

- At what cost? Capital investment and on-going operating costs; profitability; impacts/ancillary benefits on sustainability, environmental quality, health and safety; Infrastructure requirements; dependence on scarce resources (including skilled workers); protection of intellectual capital.

- In what time frame? Capital stock turnover requirements.

- Economic implications: Macro-economic impacts; barriers to market entry; market risk.

- Political implications: Administrative burden; consistency with other public policies (including existing environmental, health and safety regulations); Availability of indigenous resources.

- Social implications: Consumer acceptance; equity; public opinion/education; ease of technology transfer.

THE CASE OF THE CEMENT INDUSTRY

MICHEL PICARD, LAFARGE

Introduction

Cement is a quite ubiquitous construction material, which is mainly used in concrete. Various forms of cement have been manufactured for centuries and its usage for buildings, roads and public works is spread throughout the world.
Cement is made primarily from limestone, a rock commonly found on the earth. It is not an expensive product and is generally not shipped over long distances, particularly not by road because of the rapid rise of delivered cost due to the cost of trucking.
For this reason, cement plants can be found almost everywhere on earth and most of the time, they are located close to their markets.

Industry

The cement industry is diverse compared to other heavy industries. It is primarily a local industry composed of hundreds of small players (companies operating a single plant), but also some medium size players (operating in a country or a region) and some larger players like my company Lafarge.
In our industry, large international groups compete on a world-wide basis and they invest in markets where cement consumption is growing or scheduled to grow. On these markets we want to be present with efficient production facilities that manufacture a high quality product at low cost.

Technology

Cement making is an energy intensive activity. It requires kilns with high temperatures to convert crushed stones into cement and substantial electrical energy for grinding to obtain the extreme fineness of the finished product. In addition, decarbonization of limestone releases carbon dioxide to the air. For these reasons, CO2 emissions from the cement industry are an issue and we are concerned with the climate change implications of these emissions.
Cement manufacturing is also a very capital intensive industry, building a new cement plant can cost anywhere from 150 M to 200 M USD, and modernization projects (every 20 years or so) run in the order of 30 M to 100 M USD.
But hardware is not the only component of an efficient cement plant, software is also very important. Cement plants are now becoming quite sophisticated and they require advanced process control systems operated by skilled and well trained personnel.

Investing Abroad

At Lafarge, we invest to maintain our existing base and keep it current with state of the art technology and we also invest to expand it.
We expand primarily where the cement market is growing and this means, very often in developing countries.

The conditions that we require to invest in a developing country are as follows :

- a market economy with free enterprise
- a growing economy
- a mature banking system
- political stability and a clear legal framework

In addition, we need to find an opportunity to enter the market. This can happen through bidding in a privatization process or else we must find a local partner who is willing to enter a joint venture with us or consents to being taken over.
Sometimes we can take over a modern state of the art plant (like recently in Asia), but very often we would acquire an older facility that needs modernizing.

Transfer of Technology

Modernizing a cement plant requires capital, it requires expertise and know-how. Each plant is a special case because of its raw material quality, existing equipment and market.
Whereas suppliers of equipment offer a complete range of solutions, it takes an experienced team of experts to select the most appropriate combination of hardware to upgrade plant performance in a cost-effective way.
Many of the technologies considered when upgrading a plant are climate-friendly inasmuch as they improve fuel efficiency and reduce electrical consumption. This means that they reduce both the production cost and the emissions of CO2.
In fact, there is no real barrier specific to the transfer of climate-friendly technologies in the cement industry. These technologies are readily available, most of them are proven and they can be operated provided the right people are available and are given the right training. The main limiting factor is availability of capital.

We will invest in a cement plant up to a certain point. This point is controlled by several factors like :

- total cost of project
- duration of project
- return on investment
- level of uncertainty relative to the market
- technical risk related to project complexity

Capacity Building

Lafarge also needs to bring substantial human resources into each of its investments, both at the project design and project management stage and in the operation phase, each new project puts an additional strain on our most precious capital that is our people. This is why training of local people is a key element of Lafarge development overseas. In most countries, we find skilled technicians who are able to operate and maintain the heavy equipment but we need to train them to our standards in order to obtain the required quality, reliability and profitability. Technical competence needs to be matched by management skills but we also try to teach “the Lafarge Way”, a participative management style combined with an ethical approach of business, both of which are essential when environmental performance has to be improved. We need to build capacity in all areas of our operations and we have devised special programs for this.
Most of these training programs are delivered locally by Lafarge experts from all over the world, but we also conduct international training programs like the ones for managers that are held in France or the US. In several instances, training is also achieved abroad through complete immersion of one local engineer in a Lafarge plant or in a Lafarge technical center for periods of typically 6 to 9 months.
We are also gradually developing a concept of “skill farm” whereby our most skilled workers can potentially be sent anywhere in the world to help bring any new acquisition up to speed in the shortest time possible. And this greenhouse is not just stocked with French, Europeans or North American personnel, it is totally open to people from the developing world too!

CDM Considerations

As we see it today, there is no additional technology in cement projects; every piece of equipment that we put in has its own rational in both economic and technical terms. What is additional is the extra capital, the extra time and human resources as well as the extra training it takes to add a piece of equipment to the whole project.
For this reason, additionality is a complex issue. Therefore, the definition of additionality in any crediting scheme is crucial to cement companies.

Lafarge, for instance, had to face this issue in 1996 when applying for registration of the modernization of its cement plant in Cizkovice, Czech Republic, as an AIJ project (Activities Implemented Jointly). The thorny issue over additionality was debated extensively by the French Committee for AIJ that met twice in 1997. Decision to approve the project was granted after a very tough bargaining session. Finally, it was agreed that any reduction obtained over and above a given level should be accounted for. This demanding level was determined on the basis of the present performance of the cement industry in the Czech Republic in terms of CO2 emissions.

All in all, it took us over two years to complete the process and obtain full registration of the project with the UNFCCC Secretariat as can be seen on Table 1 below :

Table 1

Project registration timeline	
13th March 1996	First meeting with officials in Prague
December 1996	Meeting with the Caisse Française de Développement
7th Jan. 1997	Czech Republic : possible candidate
17th Mar. 1997	First meeting of the French Committee for AIJ
4th Jul. 1997	Committee meets and approves project
4th Sept. 1997	Official letter of confirmation from the French
28th Nov. 1997	Official approval by Czech Rep.
Summer 1998	Registration with UNFCCC Secrétariat

We think it is very important to have such clear, simple and certain rules if we do not want additionality to become an impassable hurdle for us.

Incentives

In order to be encouraged to invest more in climate-friendly technologies, we need to have these fixed and clear rules that enable us to calculate CO2 credits attached to each alternative of our projects. These incentives must be known early on in order to be fully integrated in our decision making process.
We urge governments to set up the process needed to provide us with quick and clear answers as to how much credit we can derive from a project in a given country. In more concrete terms, we suggest the establishment of country and industry sector emission statistics from which a simple rule can enable an authorized authority to derive an energy efficiency threshold above which credits can start being accounted for by industry for any foreign investment done in the country.
We will then incorporate this element into our choice. We are used to take decision in an uncertain environment and we are ready to take risks on the value of credit. But it is difficult to imagine that industry will make additional CO2 reduction efforts without any fixed rules.

IEA KEY MESSAGES

IEA
INTERNATIONAL ENERGY AGENCY

AIE
AGENCE INTERNATIONALE DE L'ÉNERGIE

OECD
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

OCDE
ORGANISATION DE COOPÉRATION ET DE DÉVELOPPEMENT ÉCONOMIQUES

IEA Key Messages for BIAC/IEA Workshop on *"How Industry Makes Investment Decisions and Transfers Environmentally Friendly Technologies"*

1. Energy is by far the greatest contributor to man-made greenhouse gas emissions. Production, transformation, distribution and consumption of energy, results in over 85% of global carbon dioxide (CO_2) emissions or more than 75% of global greenhouse gas (GHG) emissions. Thus, where energy demand and supply go, so do greenhouse gas emissions. This is because the world continues to be reliant on fossil fuels, whose combustion leads to greenhouse gas emissions – a trend, which the IEA predicts, will not change substantively over the next 20 years under business as usual conditions.

2. In 1999, most governments are still weighing the relative merits of the alternative policy choices available to them to meet their climate change commitments. Many of these will be focussed on the energy sector because of its relative contribution to the problem. Of course as affordable and accessible energy services (e.g. heating cooling, mobility) are important components of many OECD/IEA countries' relatively high standard of living, policy makers are faced with the challenge of efficiently reducing emissions while not compromising energy services and sustained economic growth. Nevertheless, IEA energy forecasts suggest that stronger new policies are needed in the future in order to meet Kyoto goals.

3. Within the discussions on climate change policies and measures, there has been a wide recognition that governments cannot 'go it alone', in reaching their target commitments. They will need the active engagement of the private sector. There is also a realisation that corporate decisions affect much more than just greenhouse emissions from their operations. Companies produce outputs and products that are consumed by the public at large and technology that is used globally. Thus industry's final impact on global greenhouse gas emissions is far greater than their own emissions.

4. The sector case studies presented all illustrate that there are some win-win opportunities: where investments both contribute to the corporate bottom line yet also elevate the level of technical and human capacity where the investment occurred. The Capex electric energy project in Neuguen Argentina, represents potential carbon dioxide offsets of 30 million tonnes by displacing less efficient power on the grid. The Chevron oil production project in Papua New Guinea included a significant community support effort, in order to build capacity and enhance community well-being. Lafarge's modernisation of its cement plant in Cizkovice in the Czech Republic was a lesson to all that simple, certain rules are needed if companies are to take that extra effort in order to make environmentally friendlier investments.

5. It is possible to take a number of more general lessons from these papers and from this session. Perhaps most important is the need for a clear legal framework for investment: without this, it is unlikely that much climate change mitigation technology will ever be developed or transferred. It

is also clear that the magnitude of the transactions costs that companies often face in the technology transfer arena act as significant deterrents. Thus, as policymakers seek to develop guidelines for promoting technology transfer (either directly, or indirectly through such instruments as the CDM), they must seek to minimise such additional and burdensome costs. Finally, it is clear that the capacity building elements of any successful technology transfer effort are critical. Without them, technologies will not be implemented or developed in a way that provides the benefits they promise. Both companies and governments working in this field must incorporate this kind of focus into their work.

6. For the private sector, there has been a growing recognition that taking some actions that help ameliorate climate change may in fact result in greater efficiencies and cost savings, and delay or avoid more interventionist government measures. Taking action on a voluntary basis can arguably reduce compliance and enforcement costs and can provide business with additional flexibility and motivation to tailor implementation to their specific needs and strengths. It is also good public relations.

7. Future efforts – both on the part of the companies represented in these papers, and more broadly, by the governments negotiating at COP 5 – will provide additional insight into some of the problems related to technology development and transfer. It is up to us, collectively, to take advantage of the kinds of solutions we have before us in developing our next steps.

BIAC RECOMMENDATIONS:

TECHNOLOGY COOPERATION AND CLIMATE CHANGE

Business and Industry Advisory Committee to the OECD

Comité Consultatif Economique et Industriel Auprès de l' OCDE

BIAC RECOMMENDATIONS[1]:

TECHNOLOGY COOPERATION AND CLIMATE CHANGE

Since the rate of greenhouse gas emissions is increasing outside the OECD Member states, the OECD should take as a priority increasing cooperation among industrial and developing countries to reverse this trend while preserving economic growth. BIAC believes that technology cooperation is a priority area for such OECD-non-OECD partnership. Since the main vehicle for this form of co-operation has been and will continue to be the private sector, through its day-to-day business activities of technology development, foreign direct investment and technology sales and dissemination, BIAC looks forward to working with the OECD in technology cooperation efforts targeted at addressing climate change.

Industry researches, develops, utilizes, commercializes and shares new and cleaner technologies, processes and products, to increase market share and to decrease its own costs. Moreover, the business sector has extensive experience in project identification and development, in technology management and dissemination in developed and developing countries; in the funding and management of technology investments and joint ventures through which technologies are shared; and in environmental management protection and enhancement.

The development, dissemination, application and improvement of a wide range of technologies are already making a significant contribution to reducing emissions of greenhouse gases and the implementation of sustainable development. Thus, a correct understanding of what technology is and how it is transferred, is essential. There continues to be room for improvement and potential for efficiency gains through the increased deployment of both existing technologies and of better ways to manage and maintain them.

As private sector investment levels surpass overseas development assistance, both OECD and non-OECD countries will benefit from the establishment of supportive frameworks, market conditions and incentives for more environmentally-friendly technologies and business practices. With the correct regulatory, legal and economic framework in place, OECD-based companies - applying their experience and expertise in both home and foreign markets - will continue to improve environmental performance and contribute to economic prosperity, while reducing greenhouse gas emissions. In emerging economies, companies will continue their pre-eminent role in technology sharing directly through the increased introduction and use of effective technologies and proven good management practices in joint venture and supplier-contractor relationships.

Consequently, the OECD could contribute to realizing the potential environmental, climate change and economic developmental benefits of new and existing technologies by promoting a better understanding of the respective roles of business, government and society, taking fully into account the need for the proper enabling conditions, capacity and incentives for implementing technology improvements. Technology cooperation and capacity building require trust, long-term

[1] *BIAC policy paper submitted to the OECD in May 1999*

commitment and clearly demonstrated mutual benefits for all partners to support this more integrated approach.

The OECD should seek to determine to what extent opening industrial sectors to private capital, both domestic and foreign, will help accelerate investment in energy-efficient infrastructure. BIAC believes that trade and investment liberalisation promotes an efficient use of resources and sustainable growth, and makes a vital contribution to creating the conditions necessary for environmental improvement and greenhouse gas reduction.

Foreign direct investment (FDI) sustains economic growth in developing countries, the transfer of modern technology and know how, the spread of efficient management practices and better access to external markets, all key building blocks to promoting development based on more climate friendly policies and technologies. The Clean Development Mechanism (CDM), which allows governments or private entities in industrialised countries to implement emission reduction projects in developing countries and to receive credit for these projects in the form of 'certified emission reductions', presents an opportunity to foster technology cooperation and to attract investment from industrial to developing countries.

Trade and investment liberalisation is essential to speed the transfer, adoption and diffusion of environmentally friendly technologies. OECD governments should continue their efforts to work with developing countries to establish appropriate incentives to encourage private investment, which requires a conducive legal framework and a clear definition of investors' rights and liabilities.

Whether as a commercial transaction or as part of an overseas development assistance package, successful technology cooperation is beneficial both for the host nation, by offering economic growth, better training of workforces and improved environmental management, and for the investor, in that it can be an attractive investment opportunity.

OECD governments should set enabling legal, fiscal, economic and social framework conditions for private investment and technology co-operation, including the CDM. A number of conditions have to be met to encourage these activities and foster technology co-operation:

- stable economic, financial and tax systems for investing partners
- a transparent legal and regulatory structure and sound foreign ownership regulations
- flexible and sound labour rules for local workers and key expatriates
- protection of confidential business information and intellectual property rights
- sound environmental laws and standards, based on scientific assessment
- free capital flows and stable rules for foreign currency exchange
- well-functioning administrative structures at the local and national levels
- a stable regulatory framework fostering innovation in a cost-effective manner
- absence of excessive bureaucratic rules and delays
- regular and open communication between government and industry

In addition to these general conditions, incentives should be provided, and GHG emission reductions should be recognised as soon as possible to foster private sector participation in CDM projects. OECD discussions should approach technology improvement and cooperation in a more holistic fashion, including the accompanying technological, commercial and managerial know-how. BIAC should therefore be consulted throughout the OECD's discussions of regulatory and voluntary frameworks, economic conditions and international cooperation to better support industry's pre-eminent role in technology cooperation and capacity building.

LIST OF SPEAKERS

BIAC/IEA Side-Event

How industry makes investment decisions and transfers environmentally friendly technology

List of Speakers

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