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MAKING PRIVATE INVESTMENT WORK FOR THE ENVIRONMENT *

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EXECUTIVE SUMMARY

Introduction

Most commercial banks and other financial institutions have traditionally focused their attention on the environmental risks to their investments, to the collateral for them and to their shareholders. Increasingly, however, environmental opportunities are coming to the fore as an area of interest to private investors.

Opportunities for private investment are growing most rapidly in developing countries and countries with economies in transition. Total flows of private capital to these countries quadrupled between 1989 and 1994, reaching a level three times greater than official development assistance (ODA).[1] Because the growth in private financing has so many different roots, it has proved to be resilient (increasing by 5% in 1995, despite the financial crisis in Mexico) and is expected to continue on an improved path.

Attracting private capital is critical to meeting both the economic and environmental goals of developing countries and countries with economies in transition. This is not - or not only - because aid flows are expected to remain flat in the years to come.

More importantly, private finance is often the more appropriate, efficient and effective type of investment. As a result, numerous efforts are under way to achieve environmental improvements through private investment.

Capturing these opportunities will require changes in the ways that the financial community views environmental matters and in the ways that public-sector actors and environmental advocates approach the financing of environmental projects.

A unique opportunity now exists for public- and private-sector actors to build the tools and frameworks necessary for profitable, attractive environmental investment over time. The present study aims to help decision-makers address this challenge.

Given the scale of global environmental needs and that any substantial increase in public-sector aid flows is unlikely, the conclusion is increasingly being drawn that private capital will be the primary instrument for financing and achieving a sustainable future. In order for the private sector to play its full part in reaching this goal, it must be shown that environmental investment is commercially attractive.

Deciding how this is to be done, particularly in the developing countries and countries with economies in transition, starts with consideration of three questions. First, what is an environmental investment? Second, what are the current patterns of private investment in developing countries and countries with economies in transition? Third, what changes are taking place in the traditional views of private investors and financiers towards the environment? These questions are addressed in chapter one.

As global markets for private environmental investment expand, a wide range of private-sector actors are already profiting from the opportunities. Encouraging participation in these transactions by other private parties, especially from the financial sector, is an important goal of public-sector efforts.

The scale of the opportunities for environmental investment is enormous. For example, it is estimated that $300-600 billion will be spent globally by the year 2000 on pollution control goods and services, rivalling investment in the pharmaceutical industry and that the global market for electrical vehicles will grow from virtually nothing in 1994 to $2.5 billion by the year 2000. The opportunities are projected to increase most rapidly in developing countries and countries with economies in transition. At the same time, it is currently projected that the greatest total amounts will be invested in developed countries.

Among the parties profiting from these developments are tens of thousands of publicly and privately held environmental companies, including a growing number of truly global environmental services companies pursuing commercial opportunities in many different parts of the world, such as Lyonnaise des Eaux from France, NorthWest Water from the United Kingdom and WMX Technologies from the United States.

In view of the scope of such opportunities, chapter two concentrates on the market for investments in goods and services that control pollution and increase energy efficiency. Opportunities in two economic sectors, general manufacturing and sustainable forestry, are described. Examples of the current involvement of the private financial sector in environmental investment, such as environmental venture funds, commercial lending and portfolio investment, are also presented.

Offering more opportunities for profit is the key to increasing the amount of private investment in the environment. Given the host of actors and potential environmental investments involved, however, the obstacles to doing so are many and varied. General obstacles to increasing flows of private capital into environmental investment, including those related to five characteristics of any investment (information, location, sector, size and level of government support necessary), are considered in chapter three. This chapter also presents a survey of more specific obstacles facing the following private- and public-sector actors interested in environmental investment: private developers of environmental investment seeking private finance; private financiers seeking profitable investments; host country governments seeking private investment; multilateral financial entities and donor country governments seeking to encourage private environmental investment; and environmental groups seeking to maximize environmental protection.

In addition to overcoming obstacles, there are certain preconditions for a substantial increase in the level of private environmental investment. These are the subject of chapter four. The public sector has powerful incentives to attract such investment, first, as part of the broader effort to shift more investment from governments to the private sector, particularly in infrastructure, and second, to help address the social costs of environmental degradation.

A large array of public-sector actors are working on an even larger array of methods for increasing the level of private environmental investment. All of this is in addition to public-sector support for purely public-sector environmental projects, which are not considered in this paper. Public sector efforts of potential interest to private financiers are described in chapter five.

Chapter 1. Investment in Environmental Regeneration and Development: The Issues

1.1 Environmental Investment: A Working Definition

The term environmental investment means much more than has traditionally been thought. Historically, the focus has been on goods and services for pollution control and clean-up. For example, a 1994 study of the environmental industry for the Government of the United Kingdom looked at products, systems and services in nine specific sectors: (a) air pollution control; (b) water and waste treatment; (c) waste management; (d) contaminated land remediation; (e) energy management; (f) environmental monitoring; (g) environmental services; (h) noise and vibration control; and (i) marine pollution control. Other broadly similar lists have been used in different reviews of the environmental industry or environmental technologies. These somewhat narrow lists are unsatisfactory as definitions, however, given their multiple components.

The lists also exclude the markets for a wider range of goods and services that prevent or reduce pollution before it needs to be controlled or cleaned up. For example, a recent study by the Asian Development Bank[2] added the following to the traditional "end-of-pipe" markets: (a) the market for input-efficiency technologies (also often referred to as clean technologies) which decrease the resources that must be consumed as part of the production or consumption process, e.g., such goods and services as water conservation and recycling equipment and investments in energy conservation; and the market for environmentally benign technologies and products, which substitute for more damaging processes and goods, e.g., solar power and certain mass transit systems are examples of environmentally benign products. To cover these additional markets, broader definitions began to be applied in reviews of the environmental marketplace.

Building on its earlier work, the Organization for Economic Cooperation and Development (OECD) assembled an expert working group in 1995 to prepare a fuller definition of the environmental industry. The following draft definition was suggested: "The environmental industry (activities or businesses) is defined as producing goods and services used for measuring, preventing, limiting or correcting environmental damage to water, air and soil as well as problems related to waste, noise and ecosystems.

"The environmental industry also includes some proportion of the industries that produce clean technologies, processes and products (hardware, software, systems and services) which reduce environmental risk and minimize pollution and material use." [3]

Even this expanded definition of environmental industry or environmental goods and services does not capture all of the opportunities for improving the environment through private investment. In fact, the United States Office of Technology Assessment noted in its review of environmental markets that the "definition of environmental activity has become more and more vague as concern for the environment has developed."[4]

A more useful focus is on the environmental improvements that can arise from a wide range of investments, many of which will be part of the environmental industry, as defined above, while a growing number will be in other areas of economic activity. Such an approach has been taken by the United States Export-Import Bank in offering increased support for exports of environmental goods and services. Instead of focusing on the type of good or service involved, it looks at the expected benefits of the project:

"The Bank offers special enhanced support for environmentally beneficial projects and products in its loan, guarantee and insurance programs. We welcome the opportunity to consider transactions that will provide renewable energy, improve energy efficiency, result in the reduction of greenhouse gases, assist in environmental clean-up efforts, or have other beneficial effects on the environment."[5]

While extremely broad, this approach provides the most accurate picture of the possibilities for private environmental investments and they are immense, not only in monetary terms (see section 2.1) but also in the variety of the actors (public or private) potentially involved, the diversity of the approaches that can be taken and the aggregate level of environmental improvements that can be achieved.

In fact, such an intentionally broad definition is consistent with the more general transformation of environmental considerations into conventional or normal commercial activities and away from the province of specialists or untested business structures. Further expansion of this trend will be necessary in the investment arena if the full potential contribution of private finance to the goal of a sustainable future is to be realized.

For the purposes of this background paper, environmental investments are understood to be those in "any and all goods and services that improve the state of the environment, either by reducing the wasteful use of natural resources - i.e., without regard for their conservation and renewability - or by reducing the discharge of pollutants. In this paper, only those environmental investments will be considered in which the private sector is or could be investing for profit.

This definition does not provide a precise guide to what constitutes an environmentally acceptable instrument in any particular location or situation, or even to what technologies or products are worthy of public-sector support because of their special utility in the environmental arena. On the other hand, it does capture the increasingly inclusive scope of the efforts to involve the private sector in environmental improvement projects.

As a result, environmental investments include those in a number of different sectors, each offering their own opportunities and facing their own barriers. Some of the main sectors touched upon in this paper are: (a) water supply and treatment; (b) renewable power generation; (c) energy efficiency; (d) clean or eco-efficient technologies; (e) waste treatment and disposal; and (f) sustainable forestry systems.

Private environmental investment takes place through four main channels:

(a) environmental companies - privately held or publicly traded companies offering any of the broad range of environmental goods and services, including the rights to particular technologies in fields such as water supply services or renewable energy equipment (section 2.2);

(b) environmental projects - stand-alone investment opportunities arising from specific, (usually infrastructure) projects providing environmental goods or services, such as water supply systems or waste treatment facilities (section 2.3);

(c) environmental improvements - investments designed to improve the environmental effects of existing projects or company activities such as manufacturing processes or forestry (section 2.4);

(d) environmentally efficient companies - companies that are not in the business of providing environmental goods or services but that efficiently manage the environmental risks and opportunities facing their businesses (Section 2.4).

By providing loan or equity finance to support these companies and projects, the private financial sector can play its role in the achievement of a sustainable future. By creating an economic and legal framework that encourages this type of private investment and by offering suitable opportunities, information and other forms of help, the public sector can pave the way for private-sector involvement.

1.2 Private Investment in Developing Countries and Countries with Economies in Transition

Private investment in developing countries and countries with economies in transition sky rocketed in the early 1990s, declined in 1995 in some regions, but is now expected to grow steadily over the next decade in many countries. Focusing on the opportunities for attracting more private capital into environmentally beneficial investments is therefore consistent with global trends in flows of public and private capital.

According to the World Bank, public sector capital flows to developing countries have stabilized at around $55 billion per year.[6] Aside from the unusual 1995 increase to $64.2 billion, attributable to the Mexico rescue package, such funds are expected to remain constant or see only small increases in the short term.

On the other hand, flows of private capital to developing countries and those with economies in transition have quadrupled since 1989, reaching $167.1 billion in 1995. These private capital flows consist of foreign direct investment, private loans and portfolio equity investment[7].

Most of this private capital has gone to East Asia and the Pacific (59% in 1995), Latin America and the Caribbean (20%), and Europe and Central Asia (10%). For example, the top ten recipients between 1990 and 1995 were Argentina, Brazil, China, India, Indonesia, Korea, Malaysia, Mexico, Russia and Thailand.

Notwithstanding the recent financial crisis in Mexico and the fall of the United States dollar in 1995, the World Bank predicts that foreign direct investment in developing countries will continue to grow at 7-10% per year over the next decade[8]. This view is based on the continuing integration of the world economy and reflects factors such as: (a) the acceptance of economic liberalization and reform; (b) export-orientated growth policies; (c) growing capital mobility; and (d) technological innovation. The new President of the World Bank has expressed his conviction that private-sector finance will be the key both to the Bank's future work and to significant progress on poverty reduction in the developing world.

Of particular interest from an environmental perspective, these private investments are often made in projects with immediate environmental implications, such as privatizations of government-owned manufacturing enterprises; concessions to private developers of power, water, transportation and other infrastructure facilities; joint ventures for the operation of existing manufacturing plants or the construction of new ones; and energy and natural resource projects. In fact, one of the main aims of developing countries is to build on this trend by attracting more private capital into infrastructure investment.[9]

At the same time, many of the most cost-effective investments in environmental improvements are to be found in these developing countries and countries with economies in transition. Basic water treatment and supply facilities are in great demand in many developing countries in order to address fundamental human health issues[10]. Opportunities for increasing the energy efficiency of power production and use in the countries of Central and Eastern Europe are widespread. The cost of making substantial improvements to existing environmental conditions in these areas is far less than it would be in much of the developed world[11].

A wide variety of parties are involved in these investments, including: (a) host country governments; (b) developers and operating entities; (c) private financial institutions; (d) multilateral financial institutions; (e) capital-supplying country governments; (f) advisers and service companies; and (g) supplier companies.

In fact, many of the investments in emerging markets involve substantial cooperation between the public and private sectors. For example, a private investment in the concession agreement for a water supply and treatment system will require various contracts between host country governments and the private operator, which will then serve as the basis for attracting private finance, often with the support of bilateral or multilateral financing entities.

Finding ways to build effectively on this experience with public-private endeavours in order to make environmental investments even more commercially attractive is one of the key needs of developing countries and countries with economies in transition.

1.3. From Assessment of Environmental Risk to Assessment of Environmental Investment Opportunities.

From a private investor's perspective, the key effort in the past has been to identify and address the major commercial risks that environmental considerations pose to a given company or project[12]. These may include local environmental issues or requirements, or those imposed by bilateral or multilateral financing entities. Significant attention is often paid to identifying, assessing and mitigating or allocating such risks in the various investment documents[13]. If significant commercial risks or strong company environmental management programmes are not present, however, the environmental aspects of the proposed investment may well not receive substantial consideration.

From an environmentalist's perspective, the key effort has usually been to identify and attempt to mitigate the risks of negative environmental impacts from any particular investment or group of investments. For example, as part of its strategy to combat climate change, Greenpeace has opposed fossil fuel-fired power stations in Europe and New Zealand. Observers of China's rapid growth in coal-fired power stations are concerned about both the environmental and health impacts of individual plants as well as the aggregate impact of multiple, individually acceptable facilities[14].

However, these additional risk perspectives are increasingly being supplemented by consideration of the opportunities created by environmental pressures. This trend is intensified by the fact that the amounts of ODA now available are dwarfed not only by the pool of private capital but also by the level of investment estimated to be necessary for a sustainable future. As part of the 1992 Earth Summit, total global funding levels in the range of $100 billion (plus or minus $50 billion) per year were calculated to be necessary to implement the goal of sustainable development[15].

The disparity between environmental investment needs and available public assistance highlights the critical importance of developing innovative ways to attract a bigger share of the current flows of private capital to developing countries into environmental improvements. The challenge to both public- and private-sector actors is to find ways to do so while increasing the overall level of private investment. Given the growing ease with which the global capital markets function, at the most fundamental level this requires consideration of ways to make it commercially rewarding for private entities to choose to make environmental investments.

In view of the scale of the environmental issues and money at stake, it is not surprising that the past few years have seen a sharp increase in the number of parties who are attempting to meet this challenge. They include: managers of private equity funds that are focused on environmental investments; players in the increasingly global market for environmental goods and

services; multilateral financing agencies; private providers of loan and equity finance; multinational manufacturing and project development companies; donor and recipient country governments; non-profit technical cooperation organizations; and many others. The breadth of their work reflects the extent of both the issues and the opportunities. Their efforts are the focus of chapters 2 and 5.

Chapter 2. Private Investment in the Environment: Scale of Existing Opportunities

2.1 Global Market for Environmental Investments

The opportunities for private environmental investment are enormous. They are projected to increase most rapidly in developing countries and countries with economies in transition. At the same time, it is currently projected that the greatest total amounts will be invested in developed countries.

As discussed in section 1.1, attempting to define precisely the scope of the opportunities for environmental investment is an impossible task. So too is any effort to estimate the total amount of investment that is likely to be made. Estimates have, however, been prepared of the markets for some of the sectors which constitute part of the range of possible environmental investments, such as pollution control and energy efficiency. While it is beyond the scope of this paper to catalogue all these estimates, some global and regional examples are provided below.

Traditional Environmental Markets

Various sources have estimated the size of the traditional market for pollution-control goods and services, globally, including:

(a) a 1994 study for the Government of the United Kingdom, which found that the global market totalled approximately $210 billion in 1992 and was forecast to increase to $320 billion by the year 2000 and to $570 billion by 2010 ("ECOTEC Report")[16];

(b) a 1994 review for the United States Congress, which reported estimates ranging from $300 billion by the year 2000 to $426 billion by 1997 (the "OTA Report")[17];

(c) a 1992 report by the International Finance Corporation (IFC), the private-sector lending arm of the World Bank, which estimated that the market would exceed $600 billion a year by the year 2000[18].

By way of a rough comparison, the ECOTEC Report noted that its projections were "comparable to the aerospace or pharmaceutical" markets. Similarly, the OECD has estimated that the chemical industry is worth $500 billion and the aerospace industry $180 billion.

Although OECD countries currently account for 80% of this global demand, the markets for traditional environmental goods and services are growing most rapidly in other parts of the world. This is a result of both faster rates of economic growth, particularly in parts of Asia, and greater efforts to address pollution issues. Examples of some of the regional markets are provided in box 2.1.

Box 2.1. Selected Regional Markets for Pollution-Control Goods and Services

East Asia

One of the world's fastest growing markets for environmental goods and services. Air pollution-control market in Asia: $5.5. billion in 1994 (37% of world market) compared with $4.8 billion in Africa and Europe combined, and $4.7 billion in North and South America combined. China, Hong Kong, Singapore and Taiwan are expected to spend in excess of $2 billion per year on air pollution control by the year 2000. The market for air pollution-control equipment in China alone is estimated to reach $1 billion by 2000. Waste-water treatment market in the ASEAN countries: estimated at $470 million as early as 1992[19]For the United Kingdom alone, the environmental export market in East and Southeast Asia is expected to quadruple by 2010, from about $50 million in 1992. In Taiwan, the Environmental Protection Administration reported a 20% increase in the environmental market in 1993 and expected similar growth in 1994[20].

Latin America

Environmental services market estimated at $3.5-7.0 billion in 1993, concentrated mostly in air and water pollution control, roughly 80% in Brazil, Chile and Mexico; demand for a wide variety of services is growing in most countries. The United States' Overseas Private Investment Corporation expects the South American environmental market to expand by up to 30% per year over the next decade[21]. Mexico's environmental services market: $1.7 billion in 1994 and expected to increase, even in the face of the peso crisis, to $3.2 billion in 1996[22]. Water-pollution control by far the largest segment, with a predicted annual growth rate of 24%. Others expect the Mexican market to grow to $6.5 billion by the end of the decade.

Central and Eastern Europe

Environmental market estimated at $5 billion in 1995, with expectations of growth to around $9 billion by the year 2000 and $23 billion by 2010[23]. Major areas of need include water supply and waste-water treatment as well as air pollution control. Main barrier to market development has been the lack of available finance.

When one moves beyond these traditional pollution-control markets to other sectors in which environmental investments are being made, the potential size of the market expands dramatically. This is particularly true in the power sector.

Power Sector

The World Bank estimates the financing needs for the power sector over the period 1993 to 2000 at approximately $600 billion in OECD countries but $800 billion for developing countries and $200 billion for the economies in transition in the former Soviet Block [24]. Tremendous opportunities are thus being created for environmental investments - both in renewable energy and in energy conservation - to respond to this demand for power.

As a result of continuing reductions in cost and increases in efficiency, renewable energy sources, including wind, geothermal and solar, are expected to capture significant portions of this market. For example, Shell International Petroleum Co. predicts that the market share of renewable sources of electric power will rise to 20% by the year 2020 and 32% by 2040.

Energy conservation, which covers energy-efficient technologies for industry and for domestic lighting as well as energy conservation services, will also be a major source of investment opportunities. Approximations of the size of this market have been made as follows:

(a) the United States Agency for International Development (USAID) has estimated that the global market for energy conservation will be $250 billion over the next twenty years[25];

(b) a report on the export markets for energy-efficiency goods and services prepared for the United States Department of Energy projected sales of $8.4 billion annually between 1990 and 2000, doubling to $16.8 billion annually for the period from 2000 to 2010, with approximately one half of this market expected to be in developing countries[26];

(c) a 1995 analysis estimated the current market for energy-efficiency goods and services at over $80 billion per year, with much of the expected growth in non-OECD countries[27].

Consumer Products

Consumer products represent another area that offers increasing opportunities for environmental investment. For instance, Japan's Environment Agency has estimated that the global market for electric vehicles will sky rocket from virtually nothing in 1994 to $2.5 billion by the year 2000 in part because of the Government's decision to invest in fuel-cell research[28].

These estimates still exclude certain areas of actual and potential environmental investment, such as clean production technologies and a wide range of environmentally being products. However, they do demonstrate that the opportunities for profitable, private environmental investment are real and substantial. While they vary from sector to sector and location to location, examples of some of the specific contexts in which they arise are provided in the following sections.

2.2 Environmental Companies

Among the parties profiting from these developments are tens of thousands of environmental companies, including a growing number of truly global companies that are pursing environmental investment opportunities in many parts of the world.

Environmental companies vary extensively in size and type, reflecting the breadth of the markets described in the preceding section. In the mid-1990s, for example, there were estimated to be approximately 57,000 companies providing traditional pollution-control goods and services in Europe, Japan and North America, with almost 2 million employees and gross revenues of approximately $200 billion[29]. Germany, Japan and the United States are the leaders in supplying such goods and services although other countries have a significant share of the market. Trade associations are useful sources of information on companies involved in these sectors, such as the Water and Waste-water Equipment Manufacturers Association in the United States, the Environment Management Industry Association of Australia and the World Energy Efficiency Association.

The investment needs and financial relationships of these companies are the same as those of companies in any business sector. Some publicly traded companies have substantial portfolio investors and well-established links with commercial and merchant bankers. Smaller, privately held companies may be looking for venture capital or sources of commercial loans. Companies that specialize in arranging environmental projects (see next section) may be looking either for direct capital infusions or for participants in their various projects.

A growing number of environmental companies are actively looking for business in non-OECD countries as a result of the more rapid rates of growth of environmental investment noted above and the relative absence of local competitors for many such goods and services. This is leading to a rapid rise in the number of truly global environmental companies, particularly in the energy, water and waste sectors. For example, a 1994 report for the French Government on international companies involved in providing urban services, such as water supply and waste collection, covered over 125 companies from around the world, excluding France[30].

While these companies come from many backgrounds, they are pursuing many of the same opportunities. For example, some of the largest European-based participants in the global market have grown out of the private operation of water supply and treatment facilities in France and the United Kingdom[31]. Brief descriptions of some of these companies are provided in box 2.2.1.

Box 2.2.1. European Water Companies

NorthWest Water (NWW) located in the United Kingdom [32]
Has been expanding internationally since its privatization in 1989. Fiscal year 1995 revenues totalled over 1 billion pounds sterling. Sees the growing need for infrastructure around the world as an opportunity to increase shareholder value. As a feature of its disciplined approach to risk, NWW focuses on securing long-term operating contracts of up to 30 years and building partnerships with overseas enterprises. International business, still new, is not yet a net contributor to Group earnings because of up-front development costs charged to profit and loss accounts.

In Mexico City: to provide water- and waste-water related services as part of a joint venture with Aguas de Mexico (of which NWW owns 49%) to 2.5 million people over 10 years. Four international consortia share the contract with the Federal District of Mexico City. NWW negotiated with the Government to protect contract revenues from the collapse of the peso and from the high cost of interest. In Malaysia: involved in privatizing the country's waste-water systems as a partner in the Indah Water Konsortium, which has a 28-year concession for the national sewerage system.

Thames Water
Over the last five years, has substantially built up its international division on the base of strong UK operations. [33] *Has won concessions in Mexico and Turkey and started projects in Malaysia, Spain and Thailand. Important elements of its strategy: focused marketing efforts and development of new products and services for the international market. Holds a 44% interest in a concession to build and operate a new water treatment plant in Mexico City. Total value of the concessions is about $714 million. Has also formed an alliance with Tribasa, a Mexican firm whose holding is another 44% share in the treatment plant, to treat industrial waste-water.*

Lyonnaise des Eaux (LDE)
A large French company involved in a variety of business activities ranging from communications and funeral services to building construction, energy projects and public works, including water delivery, sewerage treatment and waste management.[34] *Construction and public works activities are located in the joint venture Dumez GTM, the result of a stock merger with Dumez in 1990. Holds a 28% stake in Aguas Argentinas, the international private consortium that holds the 30-year concessions to operate Buenos Aires' water delivery and sewerage treatment system.*

In the future, LDE anticipates operating at three levels: as a holding company; as a group, including majority-owned subsidiaries; and as a general partner in international consortia. This range of financing bases is intended to lend LDE the flexibility to reconcile financing requirements with investment opportunities. Is aggressively pursuing opportunities in other international markets, particularly Southeast Asia.

Compagnie Générale des Eaux (CGE)
Once called the largest environmental company in the world. Involved in almost every aspect of the environmental market, from water treatment, city services (such as waste collection) and air pollution control to the development of ozone systems for environmental and industrial applications and energy projects in emerging markets.[35] *One of five international partners involved in upgrading the water supply and treatment system in Mexico City through a concessionary arrangement with the Mexican Government.*

On the other hand, large United States-based entrants into this arena come from the waste disposal (box 2.2.2) and independent power industries (box 2.2.3)

Box 2.2.2. United States Waste Management Companies

WMX Technologies
Grew from a small garbage-hauling operation in Chicago to one of the world's largest waste- handling companies, a $10 billion-a-year concern with many subsidiaries, including Wheelabrator, Waste Management International PLC, Chemical Waste Management and Rust International Inc.[36] *Business of WMX and subsidiaries goes far beyond garbage disposal to include a full range of environmental services, from consulting, design and engineering to construction, management and disposal. Views overseas markets as presenting the greatest opportunities for growth even though the United States garbage disposal business generates 49% of revenues and 59% of operating income. Sees Asia as an especially promising market since spending on environmental clean-up and waste disposal is expanding rapidly.*

Waste Management International (WMI)
Headquartered in the United Kingdom. Provides solid and hazardous waste services in Argentina, Asia, Europe and elsewhere. Chosen in 1995 to operate the first major industrial waste treatment project in Thailand. Hazardous waste treatment centre in Indonesia, opened in May 1995, is owned jointly with PT Bimantara Citra and the Indonesian Government[37].

Browning Ferris Industries (BFI)
Described as a "seamless system from collection, to processing, to ultimate disposition, be that disposal or back into commerce through recycling".[38] *Profitable overseas recycling: it runs Australia's largest recycling programme. Views international operations as a significant opportunity for growth.*

Box 2.2.3. United States Independent Power Producer

Charter Oak Energy Inc.
A subsidiary of Northeast Utilities of Connecticut. Involved in the development of independent power projects around the world.[39] Recognizes that no power generation effort will ever be completely environmentally benign yet strives for the environmental compatibility of projects. This strategic view, incorporating the principles of environmental compatibility and sustainability, is exemplified by Charter Oak's partial ownership of an 1800 megawatt(MW) combined-cycle gas turbine power station in northern England and a 20-MW wind power project in Costa Rica.

Zond International Development Corporation
One of the largest wind power plant operators in the world. Also manufactures wind turbine generators for its own use and for sale.[40] A California company, with offices in the United Kingdom and New Dehli, developing projects and selling equipment in Chile, Egypt, Greece, Italy, Mexico, Pakistan, Peru, the United Kingdom and elsewhere. Benefits from tied-aid financing in China and India through the United States Export-Import Bank. Wind power provides countries with a hedge against fossil fuel increases because despite high up-front capital costs are high, operating costs are quite low relative to fossil fuel facilities.

California Energy Company, Inc. (Cal Energy)
Largest independent geothermal power producer in the world.[41] Focuses on opportunities in the international sector, where it believes the greatest growth in demand for new generating capacity will occur for the foreseeable future. Has an ownership interest in three geothermal power projects in the Philippines, and additional projects with executed contracts in that country, in Indonesia and California. International strategy: to participate on an equity basis with local partners in joint ventures utilizing fixed-price, turnkey construction contracts, with financing support from multilateral lenders, such as the World Bank and export credit agencies.

New World Power Corporation
Produces electric power generated from renewable energy sources, primarily wind.[42] Offices spanning the Americas from Canada to Chile, in England and Ireland, along with joint venture offices in China and the Philippines. One of the largest developers of new wind farms in foreign markets. Joined by Westinghouse in a strategic alliance to help build and market renewable energy products around the world. Also joined forces with China's sixth largest industrial group to develop renewable power plants in that country.[43]

In addition, a myriad of other large and small environmental companies are seeking to sell their equipment or services in connection with environmental projects in developing countries and countries with economies in transition. Included in this group are a growing number of locally traded environmental companies in developing countries, such as Prime Utilities in Malaysia, soon to be the parent of the Indah Water Konsortium (IWK), the holder of the national waste-water treatment concession.[44] *Also of growing interest are energy services companies (ESCOs) which enter into energy performance contracts with end-users of power. Under such a contract, the ESCO implements energy-efficiency, conservation and cost-reduction measures and is paid out of the reductions in the user's power costs.*[45]

Examples of the types of environmental projects now being undertaken by these and other companies are provided in the next section.

2.3. Environmental Projects

Investments in environmental projects are another way in which private financiers are increasingly entering the global environmental market. For example, as more developing countries successfully attract private capital into infrastructure projects - particularly in water supply and treatment, energy conservation and renewable energy sectors - lessons are learned and opportunities for private investment increase still further.

These opportunities frequently arise as part of the process of privatizing government-owned companies and operations. By allowing private-sector actors to provide such services, governments are seeking to increase the efficiency of management and quality of service through the application of commercial incentives as well as investment in the system by enhancing access to international capital markets.

A growing number of environmental infrastructure projects are financially attractive to the private sector because of their large size, predictable revenue streams and strong government backing. These features can lend themselves to non-recourse project financing in certain cases, in addition to more traditional recourse loans. Of course, significant project[46] *or country*[47] *risks may confront any particular transaction.*

Examples of environmental projects in water supply and treatment, energy conservation and renewable energy as well as solid waste treatment and disposal are provided below.

Water Supply and Waste-Water Treatment

As the transformation of many developing countries from rural to urban societies continues, investments in municipal infrastructure become critical components of their development. In 1990, over 1 billion people lacked access to adequate water supplies and 1.7 billion did not have adequate sanitation facilities.[48]

Private involvement in the provision of water services increasingly takes the form of long-term contracts (or concessions) under which private operators assume responsibility for operating, upgrading and expanding existing municipal water systems. Regulatory schemes for the pricing of such services are designed to ensure that, while prices stay within politically acceptable limits, the revenues generated are adequate and predictable enough to allow the financing of the long-term investment programme for system upgrades, which can run into billions of dollars. Examples of such projects are included in box 2.3.1.

Box 2.3.1. Water Supply and Water Treatment Projects

Aguas Argentinas
International consortium. Received a 30-year operating concession in 1993 for the Buenos Aires water treatment and sewerage services. Led by Lyonnaise des Eaux and including participants from Argentina and Europe, the consortium is expected to invest over $4 billion in upgrading and expanding the system. The IFC which has also taken an equity interest in the project, has been heavily involved in securing the first two tranches of finance from international commercial banks.

Indah Water Konsortium (IWK)
In 1993 was awarded a 28-year concession to assume responsibility for the 144 sewerage districts in Malaysia. Primarily owned by the Berjaya Group (a Malaysian conglomerate); NorthWest Water from the United Kingdom also has an interest. Is confronted with a major investment programme to double the number of urban households served from 46% to 92% at a cost of $2 billion.

Lyonnaise des Eaux, Compagnie Générale des Eaux, NWW and Severn Trent Water
Were awarded four 10-year operating concessions by the Mexican government, each operating in conjunction with Mexican partners, for municipal water services in Mexico City. Modernization investments required under the concessions are expected to total between $1.5 billion and $2 billion.[49]

Energy Conservation and Renewable Energy

Similar developments are occurring in the power sector. Private parties are increasingly involved in owning or operating power stations in developing countries, either through the privatization of existing, government owned facilities or through the construction of new, independent power projects.

At the same time, the privatization of other government-owned enterprises and the expansion of multinational manufacturing investment in developing countries increase the

commercial incentives for companies to reduce their energy costs through reductions in electricity use. Many of the manufacturing and other processes in place today (particularly in the countries with economies in transition in Central and Eastern Europe) are based on older, highly energy-inefficient technologies. Energy prices are now rising in many countries that have eliminated government subsidies and power shortages are increasing, particularly in the rapidly growing Asian economies. The combination of these trends leads to growing markets for environmental projects in the areas of renewable energy (including solar, biomass, and wind power) and energy conservation.

With reductions in costs and increases in efficiency, renewable energy sources are capturing an increasing share of the power generation market. In addition, greater efficiency in the use of input energy in certain types of power stations (particularly combined cycle gas turbine generators) is being achieved with reduced adverse environmental impact. Project opportunities of this type are additional to the traditional market for the installation of air pollution control equipment in conventional power stations. Examples of renewable energy projects are provided in box 2.3.2.

Box 2.3.2. Renewable Power Projects

Zond International Development Corporation
With financing from the United States Export-Import Bank, has entered into a joint venture with an Indian company to provide wind turbines for power production in two Indian states. With partners in Mexico, is also negotiating for financing through Banobras for the purchase of wind-generated electricity. A feasibility study in Mexico was financed by the International Fund for Renewable Energy and Energy Efficiency.[30]

New World Power Corporation
Has joined forces with the China Chang Jiang Energy Co., China's sixth largest industrial group, in a 25-year exclusive joint venture to develop and own renewable power projects in China and to distribute wireless power products there. One example of the alliance at work is New World's 40% equity interest in Fujian I, a 39 MW hydroelectric project, due to have come on line at the end of 1995. New World's ownership is expected to produce $4 million in cash flow annually.[31]

Charter Oak Energy Inc.

Along with Merrill Lynch International, Ltd. and Kenetech Windpower, Inc., is sponsoring Plantas Eolicas, the first commercial-scale wind project in Latin America and the largest private power project in Costa Rica. Financing will be from Charter Oak, which is investing $7 million in the $30 million project, and local Costa Rican partners. Project is part of the United States Joint Implementation Initiative, which reduces Charter Oak's risk and facilitates the exporting of Kenetech's wind turbines.[32]

Projects involving changes in other aspects of power generation may also attract environmental investment both by increasing their commercial return and by gaining the attention of multilateral funding agencies. This is particularly true of the efforts to combine new generating capacity with energy conservation projects as an integrated response to meeting a government's or industrial user's total power needs.

While many of these power generation projects are large enough to attract considerable interest from the private financial sector, the promotion of small-scale renewable energy projects may also yield great environmental gains. Over half of the world's population is without electricity because many countries cannot afford to put a power grid in place. Small-scale renewables, such as flexible, lightweight, roof-top solar panels and solar-powered lanterns, have the potential to meet the demand precisely because of their small scale and quick construction. While suited to the market, their small scale also raises serious financing issues. Financial and legal structures for bundling a number of micropower projects into a larger investment opportunity are needed.

Similar financing issues arise for many energy efficiency projects, especially in emerging economies. These projects offer tremendous opportunities for reducing energy usage with correspondingly high rates of return. Sometimes referred to as demand side management programmes when undertaken by electricity utilities, these projects can take many forms, ranging from the sale of more energy-efficient equipment to end-users, such as industrial boilers or light bulbs, to utility-promoted programmes to educate consumers and make energy- efficient products available to them, to contracts under which independent ESCOs identify and implement ways to reduce a user's energy costs and are paid a percentage of the savings. One example of an energy efficiency project is provided in box 2.3.3.

Box 2.3.3. Energy Efficiency Investment in India[33]

INTESCO-Bhoruka

India's first private energy service company (ESCO). Is a joint venture between the International Energy Services Company (INTESCO) of Philadelphia and the Bangalore-based Bhoruka Power Corporation. Company is managing an energy efficiency project that has boosted the productivity of Bhoruka Steel's mini-mill. Installed a new transformer in place of two older, smaller transformers, which used 8% less energy per unit of steel produced. Project cost: about $265,000; savings from reduced energy costs: expected to reach $115,000 per year, enabling the investment to pay for itself in 2.3 years. Investors share the savings over the seven-year period. The joint venture overcame one of India's principal barriers to increasing industrial energy efficiency - the lack of low-cost capital - by obtaining 80% of the financing through India's Industrial Development Bank and the rest from INTESCO equity.

Given the small scale of many of these projects, success depends on gaining access to local capital or on finding mechanisms for aggregating projects in order to achieve a level of financing that will attract the interest of the international capital markets.[54]

Waste and Other Sectors

Traditional waste treatment and disposal facilities are an important part of the infrastructural needs of developing countries. Increased local concern over the impact of rapid industrialization, combined with pressure from multilateral financing agencies and multilateral manufacturing companies, has led to continued interest in expanding such facilities in many countries.

Some of these projects are large enough to attract the attention of international environmental companies and the international financial community. Examples include:

(a) the $80 million concession awarded to a Danish-Malaysian consortium to develop and operate a national toxic waste treatment and disposal centre in Malaysia;

(b) the proposed privatization of Malaysia's municipal solid waste management system; [55] *and*

(c) a $9 million industrial waste-to-energy facility in Argentina, for which the Chase Manhattan Bank provided partial financing.[56]

The private enterprises involved in environmental projects such as those described above have recognized the opportunities and are structuring investments, loans and other support in the belief that these projects have significant growth potential and will yield competitive rates of return.

The challenge for those who put forward projects such as these is to show that they can be replicated in other countries and other contexts. In order for replication to occur, the projects will have to establish profitable track records and efforts will be needed to tie them in with traditional financial sources and mechanisms.

2.4 Environmental Improvements by Environmentally Efficient Companies

A third major category of environmental investments takes the form of environmental improvements to such activities as manufacturing processes or forestry operations. Companies undertaking this type of investment often constitute the environmentally efficient companies described in section 1.1. Portfolio investors are focusing on them to an increasing extent (see section 2.5.3).

In addition to the need to comply with local environmental laws, there are three other business reasons for the increase in environmental investment in developing countries and countries with economies in transition. First, substantial commercial benefits can accrue to those who install technologies and management systems that, by raising productivity as well as reducing emissions, result in lower operating costs. Waste-water recycling systems in Mexico are a case in point. Eco-efficient or clean practices often turn out to be "win-win" investments in terms of both profitability and favourable environmental impact.[57]

Second, firms that seek to maintain or expand their export markets find themselves under growing commercial pressures to adopt environmental management systems like that being proposed by the International Standards Organization (ISO). As the pressure for green management systems and products continues to build, government and private customers are increasingly seeking assurances about the quality of environmental management programmes run by their suppliers abroad. A growing number of portfolio investors are seeking similar assurances. Third, in order to manage environmental risks and opportunities most effectively, multinational manufacturing companies operating in non-OECD countries need to have environmental managers and waste treatment facilities in countries that do not have a history of providing them.

The opportunities for environmental investment arise from two underlying trends: (a) the increasing level of foreign direct investment in developing countries and countries with economies in transition, particularly by multinational manufacturing companies in the form of manufacturing joint ventures, privatizations or new production facilities; and (b) the expanding influence of environmental issues on exports from developing countries to OECD member states. [58]

Accordingly, environmental investment tends to form part of the overall investment in (a) a particular project, such as a new manufacturing plant, or a transaction, such as the purchase of an interest in a local manufacturing company, or (b) the general operations of a particular company, such as a sustainable forestry concern.

While opportunities for environmental investment are present in many economic sectors, this paper focuses on two: general manufacturing in which foreign direct investment is the principal driving force and sustainable forestry in which the key factor is meeting the environmental demands of export markets.

2.4.1 Manufacturing

The foreign direct investment in manufacturing operations that has been occurring in certain developing countries and countries with economies in transition usually involves either (a) the acquisition of an interest in an existing manufacturing plant through the privatization process (if previously owned by the government) or directly from a private owner or (b) the construction of a new facility designed to meet local environmental requirements and the company's own environmental standards.

While either approach may lead to environmental improvements, foreign direct investment in existing manufacturing facilities offers the greater potential in the short term because of the likely commercial incentives to upgrade production facilities and management systems. New facilities, while often employing more environmentally efficient production technology than local competitors, may also add to the total local environmental problem. In the long run, however, new operations are likely to add to the total local demand for environmental goods and services, which can have spin-off benefits, and, of course, if local manufacturing capacity is likely to be expanded considerably in any event, it is better that this be accomplished with more efficient plants and equipment.

Eco-efficiency and Clean Technologies

Privatization of state-owned enterprises presents one possible route for bringing foreign direct investment to bear on environmental concerns. Private entities operating under commercial principles are generally more efficient than State-owned enterprises.[59] *From an environmental perspective, this is usually favourable since more efficient enterprises reduce the waste of raw materials. To the extent that major investments are made in existing manufacturing facilities, particularly those previously owned by the government, one of the first efforts will be to improve production efficiencies. This frequently involves modernization of production equipment to increase output at a lower cost per unit, as well as the implementation of improved management systems. Furthermore, as countries pass more and tougher environmental regulations, companies need newer, cleaner technologies to comply with those standards. One example of the effects of privatization is provided in box 2.4.1.1.*

Box 2.4.1.1. Environmental Benefits from Privatization

Privatization of the AHMSA steel complex, Mexico, 1991

Substantial quantities of highly acidic waste-water were being discharged into local water courses. Dust was being emitted from old, worn production facilities. In the past five years, the company has been engaged in a major modernization programme that has substantially reduced these emissions, not through the addition of end-of-pipe technology but through better production. For example, the cracks in various furnaces were repaired to improve their performance but the repairs also stopped emissions of dusts and combustion gases. Acidic waste-water was dealt with by installing an acid recycling and regeneration system that also substantially reduced production costs and improved the quality of the product. Significant reductions in dust emissions and oil discharges and increases in the recycling of solid wastes resulted from substantial improvements in job performance and the involvement of employees in environmental and other company concerns.[60]

Similar examples can arise from foreign direct investment in privately owned manufacturing facilities, e.g., through joint ventures between multinational and local manufacturing companies. In these cases, the joint venture company should have access to technical, managerial and financial resources that allow it to increase the eco-efficiency of the production processes, that is, to make them more efficient and less damaging to the environment.

While large manufacturing enterprises often find it easier to identify and implement eco-efficient changes, profitable opportunities are also available to many small, local companies. For example, the non-profit group Promotion of Eco-efficient Latin American Small Business (PROPEL) has successfully implemented profitable eco-efficient projects with the tanning industry in Colombia (see box 2.4.1.2)

Box 2.4.1.2. Eco-efficiency in Small Enterprises

PROPEL
Helped Colombian tannery factories to reduce both their operating costs and their discharges of pollutants. The project involved introducing clean technologies into the hide preservation and tanning process by, for example, switching from deliming with ammonium salts to deliming with carbon dioxide and chilling the hides instead of curing them with salts. Switching to a water-based, solvent-free coating in the finishing process eliminated emissions. These changes in production processes reduced polluting discharges by 50%, lowered costs per hide by over 11% and enabled the factory to increase output. Replication of PROPEL's success elsewhere faces the financing problem common to all small enterprises that has already been mentioned in the context of small-scale electricity generating and energy efficiency projects.[61]

Environmental Management and Certification Systems

Foreign direct investment in manufacturing operations frequently leads to improvements in a local plant's environmental management system for one or both of two reasons: (a) the multinational manufacturing company that is making the investment has a policy of applying its global environmental management systems to its local operations; and/or (b) the plant's customers require assurances regarding both quality and environmental management.

Since the Bhopal disaster in India and the emergence of extensive contaminated land cleanup programmes in Europe and North America (such as the infamous United States Superfund Programme), foreign investors in manufacturing companies have been working to reduce the environmental risks to their businesses and facilities around the world. In some companies, this takes the form of enforcing internal, global environmental standards for emissions and management systems in all their facilities. Other companies limit themselves to identifying local environmental requirements and calling on their subsidiaries to conform to them.

While internal company programmes continue to expand, public attention has recently been focused on the growing use of international standards and certification programmes as evidence of product quality and compliance with environmental standards. Much of this work has been led by the ISO which, through its national organizations, has been at the forefront of developing international standards and methods for certifying the quality of production systems.

The most famous of these are the ISO 9000 series of product quality standards. Increasingly, certification that a production line or facility is in compliance with ISO 9000 is a valuable commercial asset, particularly in export markets. Although certification entails considerable expense, the ISO 9000 series has been widely adopted by businesses around the world since it gives customers good criteria for comparing products. As a result, over 70,000 companies have participated in the certification process.[62]

Similar developments are now occurring in the environmental area. ISO is in the midst of developing the ISO 14,000 series of environmental management standards. With finalization expected in 1996, the standards cover six areas: (a) specifications for environmental management systems; (b) environmental auditing; (c) environmental performance evaluation; (d) environmental labelling: (e) life-cycle assessment; and (f) the environmental aspects of product standards.[63] *Although the ISO 14,000 standards are voluntary, they may become necessary for doing business in many countries, particularly in Europe.*

The purpose of ISO standards is to provide customers with the means to distinguish among competing products on the basis of quality or environmental criteria. They are management guidelines rather than performance directives and are intended to complement countries' environmental regulations, not to supplant them. Because the standards represent a compromise among countries having different environmental requirements and management incentives, it is not surprising that the ISO standards are narrower in scope than the regulations or management standards of some countries. For example, regulation of the European Union (EU) on eco-management and auditing is broader than that envisaged for the ISO 14,000 standards. Some authorities are concerned that if broader EU standards were adopted as part of ISO standards, this would increase the likelihood that the standards would create trade barriers for companies in nations lacking the infrastructure to comply with them.

Whatever their final requirements, the ISO standards will have the effect of driving exporting companies to a common set of environmental management principles. This is likely to result in increased investment in the prevention and control of pollution in developing countries and the installation of cleaner technologies in plants being built. Opinions differ about the costs of implementing the requirements. Clearly some initial costs will be involved although in the long run, increased awareness of the management of environmental issues is likely to result in financial gains for companies. While some sources cite the expenses incurred by large corporations in implementing ISO 9000, it should be remembered that many companies already have environmental management programmes in place.[64] *This is in contrast to the ISO 9000 quality standards, for which fewer companies had pre-existing programmes. Furthermore, since the process for ISO 14,000 certification will probably bear some resemblance to ISO 9000*

certification, ISO 14,000 certification may cost less partly because companies have gone through the ISO certification process before and may even see some overlap between the two sets of standards.

Finally, some people are convinced that the adoption of the ISO environmental management standards will be of great use to portfolio investors and others seeking to invest in environmentally efficient companies. First, and as described in sections 2.5.3 and 2.5.4, obtaining reliable information on the full range of environmental risks and opportunities facing a company is a significant problem for potential investors seeking to assess the company. Certification that a company is meeting the ISO 14,000 standards may provide useful information in this context. Second, the fact that a company has a rigorous environmental management programme in place will go a long way towards reducing the environmental risks and costs facing its operations - a good sign for potential investors or insurers.

Need for Local Environmental Goods and Services

Implementation of clean technologies and international environmental management standards also increases local markets for environmental goods and services. Trained environmental managers are needed to operate the equipment and promote the management systems. Environmental infrastructure services, such as water and waste treatment facilities, are often necessary to meet locally the international environmental standards imposed either by a company or under systems such as those of the ISO.

The expansion of these markets will provide benefits for local companies and governments as well as further opportunities for private environmental investment. As the international nature of business activities demands greater attention to environmental issues, the diffusion of technologies and skills through these local markets will result in improved environmental conditions and an environmental infrastructure permitting effective environmental management.

2.4.2 Forestry

The globalization of the forestry industry, combined with the increased environmental awareness of consumers in certain parts of the world, is building momentum for sustainably produced forest products and an international sustainable-forestry certification system. As a result, the global market for certifiably sustainable forest products is growing rapidly from a small base, particularly in some European countries where certified forest products are the market norm. [65]

Sustainable Forestry Practices

Sustainable Forestry Systems (SFS) is one company seeking to profit from sustainable forestry practices. Its major project, a $60 million managed forest project in Paraguay, has been funded by an institutional investor managing a pension plan serving more than 300,000

people. The investor chose this project after determining that it would be a profitable investment, not simply because it might help forest resources. Although defining sustainable forestry practices is extremely difficult, for SFS it means that the company does not grow trees on plantations (monoculture), will not harvest more than the forest can consistently replace, and strives to ensure that local community conditions are improved while maintaining economically viable operations. Returns on the investment in Paraguay are projected to be about 25%. [66]

Forest Product Certification Programmes

Many investments in sustainable forestry systems are driven by rising consumer demand for sustainable forest products, especially in Western Europe. This has led companies and trade organizations to make a variety of claims about the environmental superiority of their products.

In order to lend some consistency to the information given to customers, efforts are under way to develop international certification programmes for sustainable forest products. Even independent certification, however, can lead to confusion since different organizations certify according to different criteria and may have different definitions of sustainable forestry.[67] *In addition, and as with ISO, to the extent that certification systems can create barriers to trade, some issues may need to be referred to the World Trade Organization (WTO).*

In an effort to harmonize certification programmes, the Forest Stewardship Council (FSC) was created. This organization, based in Oaxaca, Mexico, represents environmental, social and economic interests from 25 countries. Its purpose is to evaluate, accredit and monitor certifiers in order to build up and maintain the credibility of their programmes. The FSC has developed a list of principles for sound forest management with which certifiers are encouraged to comply. These include respect for indigenous peoples' rights, implementation of management plans, conservation of diversity and other practices. The FSC informally tracks at least eight different certifying organizations and doubtless there are more. The organizations are given guidelines emphasizing consistency and transparency in evaluation procedures and sound documentation. [68]

2.5. Private Financial Sector and Environmental Investment

Environmental companies, projects and improvements are being funded by an increasing number of private financial institutions. However, more financiers need to be interested and more profitable environmental investment opportunities need to be offered in order to meet both the commercial goals of the private financial sector and the environmental goals of many countries and regions.

Existing environmental investments by the private financial sector look no different from any of the other investments commonly being made. They consist of (a) equity investments in environmental companies and projects, either through venture capital or portfolio investment, and (b) commercial loans and other types of finance provided to environmental companies and projects as well as to companies involved in environmental improvements.

While some specialist environmental funds have been established to provide financing, the inclusion of environmental instruments in the regular dealings of the financial sector will be necessary to increase substantially the flow of private capital into the environmental sector.

A few examples of the current involvement of the private financial sector in environmental investment are provided in the following sections.

2.5.1 Environmental Venture Funds

It is no surprise that environmental venture funds had their beginnings in the United States and Western Europe when public environmental concern was high and the markets for traditional environmental goods and services were large and growing rapidly.

Many such funds were initially formed in response to a combination of two factors: (a) a belief that environmental investments would provide superior returns and (b) a desire to make private capital available for environmental improvements.

For such funds to survive without government or grant support, rates of return must be the dominant factor that influences the investment decision. Consequently, as rates of growth in the traditional United States and Western European environmental markets have slowed, the attention of private venture capital investors has increasingly turned to companies and projects in the emerging, non-OECD markets.

Examples of some of these environmental venture capital funds are provided in box 2.5.1.1.

2.5.2 Commercial Lending

As commercial banks expand their businesses in emerging markets, an increasing number are becoming involved in large environmental projects and companies. As discussed in section 2.3. above, privatization and the private funding of infrastructure in many developing countries and countries with economies in transition have substantially increased the activities of commercial banks in these markets. [71] *Included are a significant number of opportunities for large environmental investments in upgrading existing production facilities, water supply and treatment, power generation through the use of renewable energy sources and waste treatment and disposal.*

The privatization of the water supply and sewerage system for Buenos Aires, Argentina, for example, calls for a $4 billion investment programme over the next 30 years. [72] *Commercial banks have already participated in this project as: (a) equity investors (Banco de Galicia y Buenos Aires); (b) arrangers of financing (Chemical Investment Bank Ltd., which acted as the arranger of a $100 million Eurobond offering for the project in 1993); and (c) providers of commercial loans (the IFC led a 1994 syndication involving fifteen commercial banks).*

Box 2.5.1.1. Environmental Venture Funds

Global Environment Fund (GEF)

Not to be confused with the publicly funded Global Environment Facility (also referred to as the GEF). Created in 1989 to provide investors with an opportunity to realize substantial capital returns on investments that also promote environmental improvements. By 1995, GEF Management Corporation had three funds, with total assets under management of over $140 million. GEF investments abroad include Compania Boliviana de Energia Electrica (BLP), which operates small hydroelectric plants without damaging rivers or destroying habitat, and NEPC-Micon, the largest manufacturer of wind turbine generators in India, where energy demand is expected to double during the next decade. Also has several United States and United Kingdom environmental companies in its portfolio, offering solutions to various environmental problems.

The Global Environment Emerging Markets Fund, launched in 1994, to support the expansion of commercial opportunities for businesses involved in alternative energy, water treatment, air pollution control, and waste management in the rapidly growing emerging market economies of Africa, Asia, Eastern Europe and Latin America. A total of $50 million in notes was issued in connection with this fund with the backing of the United States Overseas Private Investment Corporation.[69]

Ventana North American Environment Funds (NAEF)

A $50 million private equity fund specifically designed to promote the development of innovative environmental technologies in Canada, Mexico and the United States. Founded in 1974, Ventana currently has over $160 million under direct management. NAEF was jointly developed by Ventana and Nacional Financiera, S.N.C., the largest development bank in Mexico. Ventana's investment strategy for the fund is to provide equity investments in established environmental companies that are expanding rapidly. It targets high-growth environmental opportunities, focusing on air pollution control, alternative energy, hazardous waste management, and water treatment projects.

Since the fund's inception, several companies have been financed, including Thermatrix, Inc., a California-based company that markets products and services based on a patented, flameless thermal oxidation technology and Grupos Fypasa, a water and waste-water treatment company in Mexico, which has entered into a joint venture with RECIMEX, the only plastics recycling company in Mexico City. Mr. Carlos de Rivas Oest, Ventana's director in Latin America, estimated annual sales in the environmental services sector at around $500 million in 1994 with possible growth to $7-8 billion in the next few years.[70]

Other examples of the funding of environmental projects in emerging markets by commercial banks include two by Chase Manhattan Bank. Chase closed the first limited recourse project financing of an environmental project in 1994, a $17 million municipal water treatment plant in northern Mexico. It arranged $9 million in financing with an 8.5 year term.[73] *In 1995, Chase also provided partial financing for a joint venture to build a $9 million industrial waste-to-energy facility in Argentina. The plant will convert organic industrial waste into clean-burning fuel.*[74]

Two special aspects of commercial bank involvement in these projects are worthy of note. First, international commercial banks, whether they intend to be or not, are frequently very effective enforcers of local and international environmental requirements. The conservative nature of many such institutions leads them to make an extensive effort to identify and mitigate significant commercial and l al risks before offering a loan. They seek evidence that the borrower is or will be in compliance with all local environmental laws as well as the environmental requirements imposed by any public financing entities involved in the deal, such as the IFC (see section 3.2.1). The level of scrutiny given to these issues by the banks is often well above that of local environmental enforcement.

Second, virtually all projects involving commercial banks require a high degree of cooperation between the public and private sectors. Particularly for infrastructure projects, the local government has to provide not only the legal right to construct and operate the project but also various other assurances to address banks' concerns over both country and project risks. Additional support for such transactions is increasingly being provided by multilateral (World Bank) or national (United States Export-Import Bank) financing entities. Finding ways to increase the effectiveness of this public-private cooperation and to extend it to smaller-scale projects is critical to expanding the role of private finance in environmental investment.

2.5.3 Portfolio Investors

Many portfolio investors (mutual funds, pension funds, insurance companies and others) continue to view emerging markets as the best place for high returns in the medium and long term.[75] *While the devaluation of the Mexican peso in late 1994 caused a temporary pullout and some Latin American economies are experiencing an associated downturn, exporters are thriving in Brazil and Mexico. Some emerging market funds are even shifting cash from Asia to Latin America on the theory that Asian companies have already done the restructuring that is now on the verge of happening in Latin America and other new markets.*[76]

The flows of private capital into local stock exchanges create opportunities for investment in publicly traded environmental or environmentally efficient companies. Some emerging-market stock exchanges now offer shares in environmental companies. For example, Prime Utilities, soon to be the holding company for IWK - which has the national concession for sewerage services in Malaysia - is listed on the Kuala Lumpur exchange.[77] *All emerging-market stock exchanges offer opportunities for investments in environmentally efficient companies as do the stock exchanges in OECD countries.*

So-called green investing in companies that demonstrate corporate responsibility towards the environment is, by one estimate, an $11-billion-a-year industry in the United States. [78] *Officials at the United States NASDAQ exchange report that investors have put $625 billion into funds that screen for environmental and social ethics.* [79] *A recent survey on socially responsible investing (including green investing) found that such funds are worth about 1,680 million ECU in continental Europe.*[80] *In the Netherlands, the amount of money in green investment funds quadrupled during the first half of the 1990s.*[81]

Initially, many such investments were made with the expectation that socially conscientious funds, often rooted in religious ethics (the Pax World Fund, one of the oldest, was started by the Quakers in 1971), would yield lower returns than those offered by conventional investments. Managers invested with caution to allay investors' fears that they might lose their principal.

More recently, however, several studies have suggested that investments screened for good ethics can meet or beat the performance of Standard and Poor's (S & P's) 500-stock index. For example, the performance of the Domini 400, an index of socially screened companies produced by Kinder, Lydenberg, Domini & Co. in the United States beat that of the S & P for several years in the early 1990s.[82]

The same appears to be true for many environmentally responsible companies. For example, a study by the Investor Responsibility Research Centre (IRRC) described more fully in box 2.5.4), found that firms complying with environmental laws also perform well financially, rewarding investors. The study investigated the environmental performance of S & P companies from 1987 to 1991, noting their compliance penalties, toxic releases, environmental litigation proceedings and Superfund sites. Low pollution portfolios outperformed high pollution portfolios 80% of the time.[83] *In general, IRRC found that the best financial returns came from companies that had low environmental risks to begin with, not from those that invested the most in compliance. Similar results were obtained in a study that screened the S & P 500 for environmental performance over a 22-year period beginning in 1971. It concluded that companies that passed the screening averaged an annual price return of 15%, not significantly different from the 14.8% of the equal-weighted S & P 500.* [84]

Environmentally responsible funds are now taking steps to join the move into emerging markets. A Thai investment firm, for example, is setting up a green fund to direct cash to publicly traded firms in Thailand whose practices have been screened, and found acceptable by environmental groups, including the Thailand Environment Institute. [90] *Managers expect to launch the fund with initial capital of $20 million. Reflecting the same trend, the Stock Exchange of Thailand (SET) plans to require certain listed companies to file environmental performance reviews. Its intention is to increase environmental awareness among Thai companies, not to sanction them. The SET has also proposed easing restrictions on environmental companies seeking an exchange listing, allowing them increased access to equity financing through the exchange.* [91]

Box 2.5.4. Profiles of Environmental Rating Organizations

Eco-Rating International
A Zurich-based firm established in July 1992 with a branch office in California. Provides ratings in the form of a numerical score for a company as a whole, or for specific products and processes. Eighty per cent of their clients use the ratings as international management tools and as information for potential investors. Has begun a service for American institutional investors. Subjects of ratings range from the operations of a teak plantation in Costa Rica to a German product used to clean up oil slicks. [85]

Investor Responsibility Research Centre (IRRC)
Provides information about United States companies' environmental liabilities and performance to institutional investors, corporations and others. Company profiles contain information obtained from federal agencies on environmental compliance, regulatory enforcement actions and penalties, estimated annual toxic pollutant releases, spill incidents, and waste clean-up responsibilities. Gathers information from the companies as well as from journal and newspaper articles on corporate environmental policies, practices, policies, disclosures, goals and achievements. [86] *Has rated all the companies in S & P's 500 index (see also section 2.5.3).*

Ethical Investment Research and Information Service (EIRIS)
Based in the United Kingdom. Analyses British companies for both individual and institutional investors who wish to apply ethical criteria to their investments. Recently, introduced new criteria for investors who want to support firms that are improving environmental performance, including environmental reporting, energy efficiency and the proportion of revenue derived from environmental services provided or technology produced.

Centre for the Study of Financial Innovation (CSFI)

London-based. Produces a bond-style rating taking into account both a company's financial strength and environmental performance. [87] *Recently piloted an approach to environmental risk-rating in an assessment of Scottish Nuclear, a state-owned power utility facing possible privatization. Environmental risk was construed to include the usual measures of liabilities from pollution but also risk-mitigators such as management capability and financials, as well as the regulatory and political context of nuclear power and tax consequences. Imitated conventional credit-rating style, establishing a seven-point scale of environmental risk that ranged from AAA to C. Scottish Nuclear received an A, signifying "a company with large but well-identified environmental liabilities, and sufficient financial and management strength to absorb all but exceptional risks."* [88]

Eco-Risk: '21
A newly established company. Evaluates both the financial and environmental performance of companies. Draws its portfolio from the S&P 500, the FTSE 100 and the IFC's Investible Fund Index, which covers 20 emerging-country markets. Focuses on a combination of hard and soft data to evaluate the performance of companies with the greatest exposure to environmental risk (the pulp, paper and chemical industries) and companies with the greatest opportunities in the environmental area (water treatment and renewable energy). Joins forces with Innovest Group International, a global consulting group specializing in the environmental industry, Visia Environmental Information, which owns the largest proprietary database in the United States on corporate environmental performance, and Knight-Ridder, a leading marketer and distributor of financial information. [89]

Among OECD-based investment firms, at least one Progressive Asset Management (PAM) in the United States has been formed to focus on environmentally responsible investing in the developing world. Established in 1987, PAM now handles $350 million in investments. It combines social and environmental investing with a focus on emerging economies in Latin America through its sustainable development initiative Earth Trade, offering marketing, purchasing, consulting and networking services to developing-country enterprises. [92]

2.5.4 Environmental Investment Ratings.

All environmental investments, whether by venture capitalists, commercial banks or portfolio investors, are critically dependent on access to good information. Such information takes many forms, including those relating to:

(a) trends in market driving forces for environmental investment in particular countries and sectors;

(b) the financial performance of environmental companies, privately held or publicly traded: and

(c) the expected performance of environmental projects, including risks and rates of return.

The sources of information are equally varied, ranging from detailed analyses by potential investors to publicly funded surveys of market conditions (see section 3.3). One growing area of activity is the provision to the financial sector of more sophisticated analyses of companies' environmental performance as part of their investment ratings.

Environmental rating systems have their earliest roots in attempts to measure the social responsibility of companies. For example, the CERES Principles, formerly called the "Valdez Principles", which were drafted by the Coalition for Environmentally Responsible Economics (CERES) in response to the Exxon Valdez' Alaskan Oil Spill in 1989, consist of a code of conduct for corporate environmental performance and public accountability. Firms endorsing the Principles take on an obligation to act with transparency, i.e., to make information on their actions available to the public. In 1994, General Motors Corporation became the first Fortune-500 company to adopt the Principles. [93]

Subsequent environmental rating efforts reflect a more systematic consideration of the financial risks posed to company operations by environmental requirements and liabilities. Such systems include more detailed information on a company's expected expenditure on pollution control equipment, fines and penalties for failing to meet environmental requirements, and liabilities for cleaning up contaminated sites or damage caused by emissions of pollutants.

The latest efforts to prepare environmental rating schemes go even further to include broader commercial information on the risks and opportunities posed by environmental issues to both a company's operations and products. The goal is to provide financial markets with a more sophisticated basis for valuing a company's performance, and hence the value of its debt and equity, by evaluating its risk of environment-related losses or potential for environment-related gains.

Examples of some of the organizations providing environmental ratings and environmental credit-risk analysis are provided in box 2.5.4.

Experts in investors' rating services suggest that environmental ratings may be transitory, eventually becoming incorporated into established credit ratings. Whether the environmental ratings stand alone or become part of established rating schemes, the financial sector's need for easily assimilated, packaged environmental information is growing in step with the increasing importance of environmental considerations in determining international competitive advantage. Environmental efficiency is becoming an increasingly important factor in many issuers' core business activities and profitability.

Chapter 3. Obstacles to Increasing the Amount of Private Environmental Investment

3.1 General Obstacles to Private Environmental Investment

Different environmental investments in different contexts face a large variety of obstacles. For example, a multinational manufacturing company seeking to install waste-water recycling equipment in its home country faces totally different financing issues when it is seeking to install dispersed sources of solar power in a developing country. Five general categories of obstacles affect every environmental investment: information, location, sector, size, and level of local government support required.

3.1.1 Information

Lack of adequate data on many aspects of environmental investment opportunities can present a barrier even to initiating discussion on particular investments, let alone obtaining finance for them.

Some private financiers are unwilling to consider environmental investment at all. The usual reasons are that they lack information on:

(a) the increasing number of market forces. As noted throughout this paper, environmental investment is no longer driven solely by compliance with legal requirements and the avoidance of liability for pollution but by a broader array of motives related to efficiency, marketing and competitiveness;

(b) the experience with environmental investment that has accumulated, including the number, size, performance history and profitability of projects;

(c) the opportunities and structures for making profitable environmental investments in particular sectors and countries;

(d) the other institutions that might be interested in providing finance and their terms for doing so;

(e) the track records of individual developers with projects of this type, especially with new types of environmental projects in developing countries; and

(f) the risks facing environmental investment and how they should be weighted.

Many financial institutions have yet to conclude that environmental investment should form part of their normal research, analysis and dealing functions (see below). As a result, most have not built up their in-house capacity to analyse the issues involved nor has their level of interest been sufficient to support a large number of commercial suppliers of information and analysis. As noted in section 2.5, however, this situation is starting to change.

3.1.2 Location

Assuming that there is a need for a particular environmental investment in a particular country, many country-specific obstacles to the investment may still arise. Country risks vary from region to region. They include: (a) political stability; (b) macro-economic conditions; (c) development of the legal system and property rights; (d) tax issues; (e) convertibility of currency; and (f) ability to expatriate local profits.

Special country risks facing environmental investment may include: (a) the level and consistency of enforcement of existing environmental requirements; (b) the pricing regimes for energy, water and other public goods; (c) the willingness and ability of the general public to pay for environmental benefits; and (d) the availability of local capital.

Access to local capital sources will be a major issue for medium and smaller environmental investments, which are unlikely to attract the attention of the international capital markets. Local capital sources are limited in many developing countries and countries with economies in transition. Even where local capital sources exist, they may be hesitant to lend to or invest in environmental projects because of a lack of familiarity with them.

3.1.3 Sector

Obstacles to financing environmental investment also vary by sector. For example, the hurdles facing investment in clean manufacturing technologies differ considerably from those facing the construction of a hazardous waste treatment plant.

While it is necessary to consider the financing obstacles facing any particular sector on its own in order to decide how they should best be addressed, some of the main differences between sectors include:

(a) whether capital or operating costs predominate: wind power facilities, for example, have a relatively high capital cost whereas gas-fired generators have ongoing fuel costs;

(b) the extent to which the investment is driven primarily by government or commercial requirements, e.g., the cleanup of historically contaminated sites compared with reducing the amount of raw materials used to manufacture a particular item;

(c) the likely customer base, for example, a few, large industrial customers for waste-water treatment plants compared with millions of consumers for water services; and

(d) the likely level and type of public opposition to hazardous waste facilities, for instance, or large hydroelectric schemes.

In order to put these issues in perspective, examples of the main obstacles to private investment in energy efficiency are set forth in box 3.1.3. Similar lists can be assembled for other categories of environmental investment, such as water projects, clean technologies, renewable energy projects and sustainable forestry systems. [94]

Box 3.1.3. Major Financial Barriers to Energy Efficiency Investments

According to the Manual on Financing Energy Efficiency Projects prepared by the World Energy Efficiency Association (August 1995), the major financial barriers include:

(a) Lack of experience with energy efficiency investments;
(b) Limited internal expertise with energy efficiency investments;
(c) Low priority of energy efficiency investments;
(d) Data collection hindered by low priority;
(e) Cash constraints;
(f) Concerns about company debt ratios;
(g) Competition for capital;
(h) Restricted access to conventional financing sources;
(i) Energy subsidies and uncertain future energy prices;
(j) Uncertain energy savings;
(k) Company payback and discount rates;
(l) Small size of projects;
(m) Tax rates, import tariffs and other governmental obstacles;
(n) Mismatch between who pays for the investment and who gets the benefit.

3.1.4 Size

The size of the projected environmental investment is a critical issue. Large investment projects are the most attractive to developers, financiers and government agencies for a number of reasons, including: (a) the possibility of greater profits; (b) the ability to offset the delays and transaction costs associated with the investments against the profits; (c) the greater ease of constructing and operating a few large facilities rather than multiple smaller ones; and (d) the increased ability to point to a particular facility as evidence of economic and environmental progress.

Unfortunately, smaller, dispersed investments face great financing obstacles, even though they are often the most environmentally beneficial. For example, installing energy-efficient light bulbs in thousands of homes may be more cost-effective in terms of total capital cost than building new generating capacity, but it is much more difficult to finance.

In the absence of some mechanism for aggregating such investments into attractive packages, access to international capital markets for smaller projects is unlikely. This is a problem particularly in countries with poorly developed local sources of capital.

3.1.5 Level of Government Support Required

The easiest private environmental investments to make are those that are profitable without the active support of public authorities. These might include the installation of more efficient process equipment, where the avoided energy costs are sufficient to provide a short payback period. In these cases, the main difficulties lie in locating and accessing appropriate sources of private capital.

Much more difficult - but also more common in developing countries - are potential environmental investments that require substantial cooperation between public and private sector actors. The public and private sectors speak different languages and have different goals. As a result, many private financiers and government authorities tend not to like, trust or understand one another. Some private companies decry the lack of a businesslike attitude on the part of government entities, citing factors such as the length of time required to accomplish anything and the influence of rather vague notions of politics on the ultimate decisions made. In turn, some public-sector actors worry that private companies are taking advantage of the public trust by earning profits on public funds or services or creating political difficulties by their headlong pursuit of profits. Working together takes time and imposes costs that private investors would just as soon avoid if alternative investments that did not involve active government participation were available.

Almost by definition, if private financiers do decide to enter into joint projects, the cost of solving these problems means that most of the joint environmental investments are very big - for example, the growing number of water and renewable power projects now under way with support from large commercial and merchant banks - or, in a few cases, very small, e.g., the development of renewable energy sources in dispersed power systems through grants from private foundations. In either case, the replicability of the investments is greatly diminished.

Finally, environmental investments that are socially desirable enough to attract substantial government support but not profitable enough to attract significant private-sector involvement should be left to the public sector. Public-sector investments should, however, be designed from the beginning with a view to attracting the interest of venture capitalists by indicating the possibility of an offering to the private sector of an equity in the project at some future date.

3.2 Obstacles Facing the Main Participants in Environmental Investment.

In addition to the general obstacles facing private environmental investment, it is useful to consider the specific difficulties facing the main participants. It is only through the efforts of these parties to meet their needs that the obstacles to increasing private investments in environmental projects will be overcome.

3.2.1 Private Developers of Environmental Investments Seeking Finance

One of the main difficulties faced by private companies seeking finance for environmental investment is the lack of familiarity of the capital markets with the current range of potential opportunities. Many people in financial institutions are sceptical of investments labelled environmental.

Environmental issues are usually viewed as risks, not opportunities. To the extent that such investments are considered, they are often seen either as motivated by reasons of morality, not profit, or as the product of an era of government regulation that is now coming to an end.

Environmental investments also are not part of the mainstream activities of finance houses, which limits the number of institutions willing to consider them seriously. One reason for this is the low replicability of many environmental projects, which means that costs and delays tend to be associated with each individual transaction. Improved replicability of such projects is fundamental to their chances of joining the mainstream of financial dealings.

Other common obstacles to particular investments are: (a) the size of either the developer or the potential investment; (b) access to local sources of capital; (c) the need for government support; and (d) other normal financial factors, such as the cost of capital, the terms of available finance and currency risks.

3.2.2 Private Financiers Seeking Profitable Investments

The lack of familiarity of much of the financial sector with the full range of opportunities for environmental investment poses the converse problem for private financiers who are looking for profitable investments: they tend not to think of them. Even if a decision is taken to target environmental investment, significant effort must be made to develop information systems. Few financial institutions have either well developed, regular means for identifying or tracking environmental investment opportunities or clear standards against which to evaluate the commercial aspects of potential environmental investments and the means to compare them with other investment opportunities. Developing this internal expertise to a level where it is comparable with other investment sectors takes considerable time and effort.

Other major obstacles include: (a) the cloud over environmental projects created by concerns about direct lender liability for a borrower's environmental problems; 160 (b) the size of potential environmental investments; (c) financial-sector wariness of relying on government involvement; and (d) normal commercial factors, such as expected return, level of company or project risk, level of country risk and availability of other, more profitable investments.

3.2.3. Host Country Governments Seeking Private Investment

In addition to the obstacles facing the general efforts of governments in developing countries and countries with economies in transition to increase private investment, efforts to do so in the environmental sector face several specific obstacles.

The most important is the tendency of many Ministries of Finance or Development to view environmental considerations as a drain on the economy rather than as a key component of the development process - not just in public health terms but also in terms of immediate economic gains. Clearly, not all environmental investments bring economic gains, for example, the clean-up of historically contaminated sites at which people are not exposed to risk.

At the other extreme, however, there are opportunities for environmental investments that both improve environmental conditions and meet government criteria for economic development, including: (a) substitution of renewable energy sources or energy conservation techniques for a portion of planned increases in fossil-fuel generating capacity; (b) reductions in emissions from existing manufacturing processes through the use of more efficient production technologies in modernization programmes; and (c) improvements in the quantity and quality of water supplies through privatization of municipal water systems.

The tendency to view environmental issues as a hindrance to, rather than an opportunity for, private investment leads many governments to exclude them from the priority areas of their economic development programmes. This means that (a) other sectors, such as power or manufacturing, are targeted for the government's efforts to attract private investment and that, even where opportunities to make productive environmental investment exist in the targeted sectors, such as in energy efficiency, they receive little, if any, attention or support from the government.

This view of the Finance and Development Ministries, combined with their political power in most countries, affects governments' willingness and ability to take broader steps to increase markets for environmental investment in their countries. Efforts consistently to enforce existing environmental standards or to impose new taxes or charges on industrial emissions meet with powerful opposition.

Even if a country were to target environmental investment as a priority area, other obstacles would exist, including: (a) the ability of government to support particular, desired investments, through economic or regulatory means and (b) the public's ability and willingness to pay for some types of environmental improvements, such as waste-water treatment systems.

3.2.4 Multilateral Financial Entities and Donor Country Governments Seeking to Encourage Private Environmental Investment

Lack of experience in working with private investors is one of the main obstacles to the efforts of much of the international aid community to increase the level of private environmental

investment. This manifests itself in a number of ways, including: (a) institutional ambivalence as to whether it is appropriate to use aid money to support private investment, particularly since the profits go to the private sector; (b) a relative lack of understanding of what types of support would be of the greatest use to the greatest number of private investors; (c) a relative lack of replicable, easy-to-use and timely tools for supporting particular transactions - either with information or financial assistance.

Even where the experience and tools do exist or are being developed, as in the IFC or the European Bank for Reconstruction and Development (EBRD), there are obstacles to their use by the public sector. Some result from the hesitancy of much of the private financial community to become involved in transactions in which government actors play a significant role, others from the hesitancy of these same investors to put money into the countries of most interest to aid agencies, which, by definition, cannot attract sufficient private investment on their own.

3.2.5 Environmental Groups Seeking to Maximize Environmental Protection

Whether environmental groups themselves are an obstacle or an encouragement to increased levels of private environmental investment depends upon the group and the project involved. Views about private investment differ widely among the vast number of environmental groups that exist at the local, national and international levels. For some, the private sector is always the villain, with fighting and constant opposition the only way to reduce the impact of its activities on the environment. For others, particular companies (as a result of their cumulative track record on environmental matters) or sectors (as a result of their potential environmental impact) are targets of constant opposition.

Other environmental groups, while still willing to fight where necessary, are also willing to view at least some parts of the private sector as potentially useful in improving environmental conditions. Their efforts tend to fall into several categories: (a) support for increasing the size of the market for private environmental investment through governmental market structuring, such as tighter environmental standards, rigorous enforcement, more accurate pricing of environmental resources and greater disclosure of environmental information; (b) support for particular environmental improvement projects or techniques that involve or could be taken up by the private sector; and (c) use of investment in particular companies to exercise shareholder rights to push for further environmental improvements in the companies' operations.

Lack of access to information and to the actors in the private-sector environmental investment process restricts the ability of many groups to play a constructive role even if they wish to do so. Many private-sector actors are wary of inviting environmental groups into the investment planning process unless they must do so - either because the law requires it or because the groups may effectively have the power to prevent a proposed investment. In addition, many countries give citizen groups only limited rights of access to government-held information or to development review processes.

As environmental and development issues continue to merge, and as private-sector investment in infrastructure grows - with its reliance on the user pays fee structures - the relative lack of mechanisms for gaining popular support for projects is likely to create problems. This is true not only for the environmental aspects of any particular project but also for issues such as the public's willingness and ability to pay for privately financed environmental services.

Chapter 4: Conditions for Increasing the Amount of Private Environmental Investment

4.1 General Conditions

From the survey of the obstacles in the way of private environmental investment presented in chapter 3, it follows that certain general conditions must obtain if a substantial increase in the level of that investment is to occur. Among the more important of these conditions are:

(a) recognition of the environment as a potential investment opportunity;

(b) better information on environmental investment opportunities;

(c) diffusion of replicable structures for environmental investment;

(d) expansion of vehicles for aggregated environmental investments;

(e) increased effectiveness of public-sector assistance to the private sector;

(f) incorporation of environmental investment into broader public-sector support for private investment;

(g) improved design of environmental regulations to attract private environmental investment;

(h) expanded and better-focused fora for communication and joint activities.

4.1.1 Recognition of the Environment as a Potential Investment Opportunity

Recognition by broader segments of the private financial community that environmental issues present business opportunities as well as risks is crucial to increasing the level of private environmental investment. As the level of acceptance expands, it builds on itself, with more attention being paid to (a) establishing the infrastructure for research into environmental investment opportunities, (b) refining techniques for evaluating potential investments and (c) developing structures, forms and other tools that can be replicated in future environmental investment transactions.

Increasing the level of this recognition requires more examples of profitable environmental investments and communication of these examples to the financial community by credible sources. Developers of environmental projects have the key role to play in providing such examples. Public sector aid agencies should provide financial support for their efforts to do so. Broader dissemination within the financial community is best done by the financial press and trade associations.

4.1.2 Better Information on Environmental Investment Opportunities

More "hard-nosed" and concise information on environmental investment opportunities needs to be made available to the private financial community Much of the writing concerning environmental investment needs has approached the subject from the public-sector perspective, based on non-economic reasons (scientific or moral) for making such investments. While valid information presented in this manner does not help financial decision makers to place today's investment bets, information tailored to the financial community's methods of working needs to be increasingly available, both on general market conditions and specific opportunities.

Useful information on general market conditions includes that on: (a) the market forces driving environmental investments, particularly as they continue to expand outside OECD countries and go beyond compliance with legal requirements and hedges against risks of liability; (b) the general areas of opportunity for profitable investment in particular sectors or countries; (c) the general types of risk facing particular sectors or countries; and (d) the trends in the financial performance of different sectors and investment vehicles (such as funds applying an environmental screen).

For specific investment opportunities, the full range of detailed information on company or project risks and expected returns needs to be available, including specifically environmental considerations. Some of this information will increasingly take the form of the environmental rating systems described in section 2.5.4. Other data will need to be assembled in the normal way for any individual investment.

There is clearly a "chicken-and-egg problem" here when this situation is viewed in combination with the recognition issue raised in section 3.3.1. Without greater recognition of the environment as a potential opportunity, the market for private providers of information on environmental investment will remain relatively small. Without broader dissemination of information on profitable investments and available opportunities, the level of recognition will remain relatively low.

Governments can play a useful role in resolving this problem in one of two ways: (a) continuing to sponsor general reviews of market forces, opportunities, risks, trends and performance, tailored as much as possible in both form and content to private-sector actors and (b) providing direct financial assistance for the efforts of environmental companies, project developers and others in passing on information to the financial sector through individual meetings as well as through broader seminars and other events.

4.1.3 Diffusion of Replicable Structures for Environmental Investment

As part of the effort to incorporate environmental investments into the mainstream of private financial activity, attention needs to be paid to opportunities for creating replicable financial and legal structures for these investments. This is true both for investments in particular countries as the levels of private investment increase and for investments in particular sectors or projects that need standard legal and financial terms for renewable power, energy efficiency or water treatment contracts.

The form and content of these structures will vary from sector to sector and country to country. Without such tools, however, the transaction costs for any particular investment in an environmental project are likely to remain high, thereby decreasing the number that will be completed. In addition, the absence of such replicable, uniform structures will impair the ability to aggregate financing for environmental projects.

4.1.4 Expansion of Vehicles for Aggregated Environmental Investments

In order for the maximum amount of private environmental investment to occur, further work needs to be done on vehicles for aggregating environmental investments. This is true both for pools of capital and for bundled environmental projects.

Pools of private environmental capital have already been formed in most OECD countries and, with assistance from the public sector, are growing for developing countries (see sections 2.5.3 and 5.1.3). Their further expansion depends on their financial performance which, in turn, depends on the quality of the investment opportunities being offered in companies or projects and the quality of the information on these opportunities.

Publicly traded environmental companies and large environmental projects already offer attractive targets for investment funds. In order for smaller environmental projects to attract similar attention, ways need to be found to bundle them into a pool of secured obligations, which could then support larger investments. Taking a cue from mortgage-backed securities in the United States, it is possible that, if a large enough number of uniform, small-scale water, renewable energy or other environmental projects could be found in a particular country or sector, they could be bundled together as the basis for a single security large enough to be sold on the international capital market.

4.1.5 Increased Effectiveness of Public-Sector Assistance to the Private Sector

Methods for increasing the effectiveness of public sector support for environmental investment are needed in order to induce the private sector to make such investments. This is especially true given (a) the importance of public-sector support to many environmental investments in developing countries and countries with economies in transition and (b) the reluctance of much of the financial community to enter into investments that rely on substantial government support.

This issue is part of a much broader effort on the part of the traditional public-sector development aid bodies to find their role in a world in which the private sector's importance is growing fast. More ways need to be found to leverage public-sector aid on the back of private capital flows. In order to do so, public-sector actors need to understand better the working methods and needs of private financiers and adapt their own methods and programmes to fit in with them. Private sector entities also need to be willing to invest the time to be active participants in this process. Failure to do so will lead to the design of even more public-sector "assistance" programmes that are irrelevant to the real needs of private developers and investors.

4.1.6 Environmental Investment as Part of Public Sector Support for Private Investment

Incorporation of environmental investment into the mainstream of public-sector efforts to increase overall private investment in developing countries and countries with economies in transition is also needed. This would not only increase the chances that environmental investment would occur; it would also help to address the issues discussed in the previous two sections by (a) increasing the visibility of environmental investments in the financial community; and (b) allowing such investments to benefit from the experience and methods developed by the public sector for successfully attracting private investment. Host country governments, supported by multilateral and national aid agencies, have a role to play in this process (see section 3.2).

4.1.7 Environmental Regulations Designed to Attract Private Investors.

Public-sector efforts to redesign their environmental policies and requirements need to reflect positively the goal of establishing frameworks that will help to generate profitable environmental investment. Traditional regulatory controls on environmentally unacceptable projects will continue to play a useful role in any particular country's environmental policy. At the same time, public-sector environmental policies and requirements must increasingly be designed to help attract more private environmental investments, not merely to stop those that are environmentally damaging. How best to do so will vary from country to country but may include: (a) the appropriate pricing of energy and water use; (b) the imposition of predictable costs for pollution of air, water or land, either directly through discharge fees or indirectly through performance-based regulatory standards and consistent enforcement of those standards; (c) the offering of government-sponsored investment opportunities, such as water projects; and (d) the creation of incentives for the more rapid listing of shares in environmental companies, as proposed in Thailand.

To the extent that government policies are a substantial part of the economic rationale for a particular investment, there also needs to be proof that they will be maintained over the life of that investment. Alternatively, mechanisms need to be provided to help companies to adapt to changed policy conditions. Over time, it may be that combinations of contractual commitments by host country governments to policy instruments together with World Bank or other guarantees of those governmental commitments will be useful tools for particular projects.

4.1.8 Better Communications and Joint Activities

Addressing all of these general needs will require both expanded and more focused discussions and joint activities among the parties involved in private environmental investment. Discussions need to be expanded, both to include more of the parties involved and to be held in a wide variety of locations, contexts and formats. At the same time, the discussions need to be more focused on particular countries, sectors, investment structures and tools in order to contribute useful input to the making of actual environmental investments. More useful than discussions are opportunities to work together on projects, the results of which can be used in later transactions.

Any suggestion of more meetings draws groans from most private-sector participants. The key to enlisting participation in such discussions is to make it clear that there is likely to be an immediate pay-off for businesses. As a practical matter, public-sector entities and trade associations are most likely to have the time and the resources to organize discussions and to draft suitable agenda for them. Developers are interested in opportunities to present information on their successes and needs. Private financiers are interested in rapidly delivered information on new deals or tools that can be of use in their existing flow of activities.

Building on these interests to create a variety of opportunities for working together will go a long way in addressing the general need to increase private environmental investment.

4.2 Role of Host Country Governments

All the parties involved in environmental questions are in a position to take action that will help to raise the level of private environmental investment. A key role can, however, be played by the host governments in developing countries and those with economies in transition. Assuming that the host government in a given country wishes to attract private capital in general, there are a number of steps it can take to attract private environmental investment in particular.

First, host governments need to recognize that environmental investments can be opportunities for economic development and not only drains on the economy. On this basis, priority areas for environmental investment should be incorporated into the host country's existing programme for attracting private investment. They should reflect an assessment of the country's priority environmental needs and of the likelihood of attracting private investment. The full range of investment concessions offered to private investors (including tax, locational and other inducements) should be offered for environmental investment.

The government should also look for ways to structure markets creatively for private environmental investment. These might include:

(a) officially sponsored environmental investments, such as concessions for water supply or waste treatment facilities, or requirements that energy conservation or

renewable power components be included in bids for new generating capacity. Alternatively, reductions in the sale price of a privatized company might be offered in exchange for a commitment from the purchaser to address a pressing environmental issue;

(b) *undertaking pilot projects under the joint implementation provisions of the Convention on Climate Change, thus increasing the pool of potentially available capital for investment in reducing carbon dioxide levels, for example, through increased efficiency of energy use;*

(c) *providing environmental infrastructure as part of the locational concessions for new manufacturing facilities;*

(d) *clarifying regulations covering liability for past and future environmental damage and providing consistency in the enforcement of environmental requirements; and*

(e) *expanding cost internalization programmes, such as the pricing of raw materials, energy, water and emissions.*

Finally, host country governments can play a useful role in expanding local interest in environmental investment by providing information to local developers, financiers and environmental interests on items such as investment needs, public-support programmes and sources of finance, both public and private.

Chapter 5: Encouraging Private Investment in the Environment: The Role of the State

5.1. Financial Assistance for Environmental Investment

The most direct form of public-sector encouragement for private environmental investment is the provision of financial assistance. Such assistance is available from national, regional and international institutions in a wide variety of forms, ranging from grants for basic research and development to equity investments in environmental companies.

This chapter concentrates on the main categories of public assistance programmes designed to work in concert with, rather than instead of, private finance. These programmes come into being when an otherwise socially desirable investment needs financial support beyond that available from the private market. In the environmental context, support may be necessitated by higher up-front costs, longer payback periods, novelty of the investment, or by the normal cluster of risks facing private investors in non-OECD countries. Examples of assistance programmes are provided in the following sections.

5.1.1. Traditional Support for Private-Sector Investments

The increased flows of private capital to developing countries and countries with economies in transition described in section 1.2 have been substantially assisted by a wide range of government programmes.

At the macro level, these include the efforts to provide an attractive economic and legal climate for private investment, such as streamlining regulations, lifting ceilings on permissible rates of return and creating a transparent, non-corrupt public sector. [95] *The World Bank, for example, supports reform to ease constraints on the private sector in many areas. In the financial sector, it seeks to eliminate ceilings on interest rates, ease credit allocation requirements, and strengthen support systems by lending to small businesses and helping to develop securities markets. In the government sector, the Bank encourages broad-based privatization or improvement of public enterprises, particularly those that provide goods and services to private firms. It also seeks to promote freedom from price controls, clear property rights, strong legal mechanisms to resolve disputes, and shrinking government borrowing and expenditure, all of which contribute to a favourable climate for private investment.* [96]

Public support is often provided at the level of individual transactions. It may well start with a decision to sell government businesses to the private sector through the privatization process or to authorize private operation of infrastructure facilities through the granting of long term contracts. Locally granted tax and other concessions designed to attract investment into a particular location will often be coupled with the creation of these new investment opportunities. Bilateral cooperation may be provided through export assistance programmes in supplier countries.

Multilateral financial support is increasingly important to these transactions. With the shift from official development assistance to private investment as the engine of economic growth, most of the multilateral development agencies are asking themselves how they can most usefully support private endeavours.

Traditionally, one of the lead entities in this regard has been the IFC which exists to establish efficient, competitive private sectors in developing countries. It operates under commercial principles and shares all the risks with partners which means that it prices its finance and services in line with the market and does not accept government guarantees of repayment obligations. The IFC offers a range of services, including both equity and loan refinancing. Project capital is mobilized from private sources through cofinancing, loan syndications, securities underwriting, and guarantees, and technical cooperation and advice are provided to many businesses and governments. The IFC also coordinates with other bilateral and multilateral institutions, including its sister organizations within the World Bank Group.[97] *Similar services are provided in Central and Eastern Europe and the former Soviet Union by the ERBD.*

Finally, insurance against political risks, such as expropriation, war and civil disturbance, breach of contract and impediments to currency transfer, entailed in doing business in certain developing countries and countries with economies in transition is available from a variety of international sources such as the Multilateral Investment Guarantee Agency and national sources such as the Overseas Private Investment Corporation in the United States [98].

Relevance to Environmental Investments

All of these traditional categories of public sector assistance for private investment are equally applicable to environmental investment. Tax and other locational concessions are just as helpful to a new waste facility as to a new manufacturing plant. Equity or loan financing for a water supply project from the EBRD is just as useful for its bankability as that for a power station.

Applying these traditional investment promotion tools to promote private environmental investment is particularly attractive to governments since they achieve the twin goals of increasing global investment and improving the environment. They are also being used increasingly by multilateral financing entities to encourage such investment. In addition to assessing the environmental impact of the projects in which they are involved, both the IFC and the EBRD have provided special support to the financing of private environmental projects. According to its annual reports, the IFC sees the market for private investment continuing to grow as a result of the high costs of and potential liabilities for environmental clean-up, stricter regulations and increasing public pressure for environmental improvements, consumer demand for green products, more realistic pricing of resources to reflect at least some environmental factors, and the positive connection between eco-efficiency and good management and profitability. In addition, Jannik Lindbaek, the head of the IFC, has pointed out that money spent on environmental improvements in developing countries goes a lot further since little has been done to protect the environment in those countries in comparison with the developed countries. Thus a given amount invested in a developing country will yield greater incremental environmental improvements than the same amount invested in a developed country. [99] *Examples of some of the private-sector environmental projects in which the IFC and the ERBD have been involved are provided in boxes 5.1.1.1 and 5.1.1.2.*

Guarantee Programmes

Even the more traditional development institutions focused on the public sector are now seeking to expand their support for private-sector investment. [102] *For example, while the World Bank can only lend to public-sector borrowers, it has fashioned a guarantee programme that can be used to assist privately funded projects. In the case of a renewable power project, the guarantee would work as follows: (a) the local government would enter into a contract with a private developer to purchase the power produced by the facility; (b) the World Bank would provide a guarantee to the developer that the government would do so; and (c) the government would provide a backup guarantee to the World Bank that it would honour its commitment. The*

arrangement would assure private developers that the debt they incur will be repaid. Guarantee programmes such as this one are designed to help mobilize international capital to finance large-scale infrastructure projects in development countries. [103]

As experience with the World Bank guarantee programme expands, it might be possible to extend its coverage to other situations in which a local government has committed itself to take an environmentally beneficial action entailing a private investment. An example might be a guarantee of a government commitment to reduce the subsidies for certain energy sources, thus allowing the price to rise to a level that would support the development of alternative sources.

The World Bank is exploring other creative ways to marry its public-sector mandate with private-sector activities.

Box 5.1.1.1. IFC Environmental Projects [100]

As one part of its environmental effort, the IFC has approved several projects aimed at process modifications and the introduction of clean technologies, for example:

Edenor S.A.
An electricity provider in Buenos Aires, Argentina. IFC financing will assist to reduce energy loss and improve distribution.

Vetropack Moravia Glass A.S.
Located in the Czech Republic. Will receive financing for modernization and expansion as it undergoes privatization.

Star Petroleum Refining Company, Ltd
Located in Thailand. Approval by the IFC of the financing of a new refinery that will produce "clean, high-quality petroleum products in response to increased domestic demand".

Other environmental projects include private waste-water treatment systems in Puerto Vallarta, Mexico, and one by Aguas Argentinas, the international consortium responsible for operating the water and sewerage systems in the greater Buenos Aires metropolitan area. IFC also approved a loan and equity investment to help finance the modernization of Kunda Nordic Cement A.S., a cement company in Estonia, which is expected to reduce its air polluting emissions by 98%.

Box 5.1.1.2. EBRD Environmental Projects [101]

Tallinn Water and Sewerage Municipal Enterprise (TWSME)
In 1994, approval of a loan to improve water supply and waste-water management. Project objective: to bring financial and management independence to TWSME by linking it with Helsinki Waterworks and freeing it from State and municipal subsidies. Part of the loan supports the completion of a biological waste-water treatment plant that will reduce the phosphorus and nitrogen load discharged into the Gulf of Finland. Upgrades to the plant's infrastructure will improve the reliability of waste-water collection and treatment as well as drinking water quality. Cost savings from improvements in the plant's energy efficiency are estimated at $200,000 a year.

Approval of a loan to renovate the municipal water supply and waste-water infrastructure in five cities in Romania. The project will corporatize local water utilities, eventually enabling them to become creditworthy businesses capable of direct borrowing from the private sector. The environmental benefits include reduced contamination of the Danube River, more efficient household water utilization through home metering and education campaigns, improved sanitation and human health, and reductions in energy usage through energy-efficient pumping upgrades.

5.1.2 Environmental Exports

Efforts to expand the use of traditional development tools for the promotion of environmental investment are also under way in the export promotion area. Northern countries, such as Germany, Japan and the United States, are the current leaders in the production of state-of-the-art environmental technologies for industrial applications. Not surprisingly, each of these countries is also promoting exports of environmental technologies in order to reap commercial benefits as well as to promote sustainable development in recipient countries. For example, Germany is the fourth largest aid donor worldwide and one fifth of its government assistance is reportedly for environmental protection. [104]

Traditional export promotion tools include loan financing and insurance, market information, trade fairs and trade missions, training programmes, data collection and outreach to potential customers and supplier firms. [105] *Many industrialized countries use foreign aid to promote exports. In general, activities in the United States and other OECD countries focus less on providing credit than on improving information and enhancing trade relationships through diplomatic efforts.* [106]

From the perspective of the international financial community, export promotion methods should help to make more bankable environmental projects available, both by defraying part of the up-front costs of putting the projects together and by contributing to the ultimate financing package.

There are many examples of the application of traditional export promotion tools to environmental investment. Some notable efforts are highlighted in boxes 5.1.2.1, 5.1.2.2 and 5.1.2.3.

5.1.3 Environmental Investment Funds

An increasing number of multilateral development institutions and related organizations are establishing dedicated environmental investment funds. In some cases, a portion of these funds may be used for private environmental investment. In others, public and private funds may be commingled in one investment pool. Such funds are frequently administered through other financial intermediaries, allowing a much wider coverage of potential projects, both geographically and in terms of size. Examples of some of these funds are provided below.

Asian Development Bank

The Asian Development Bank (ADB) has proposed to establish an Asia-Pacific Regional Environment Facility (APREF) to act as a coordinating body to encourage and fund sustainable development across the region.[114] The proposal recognizes the necessity of creating the conditions for large scale private investment in environmental projects in the developing market economies of the region. The proposed APREF is expected to undertake measures to encourage private financing in the environmental sector which will assist developing countries to establish laws facilitating foreign investment, support build-operate-transfer (BOT) investments, bolster financial markets and encourage switching to market-based strategies for protecting the environment.

Box 5.1.2.1. Environmental Export Promotion in the United Kingdom

Joint Environmental Markets Unit (JEMU)
Set up by the British government to help United Kingdom firms exploit environmental opportunities. Informs the firms of overseas market opportunities in environmental technology and services and helps them to participate in this growing area. Also assists firms to set up relationships with trade associations and Chambers of Commerce to enhance the share of the global environmental market held by the United Kingdom.

Technology Partnership Initiative (TPI)
Established by the United Kingdom in 1993 to build collaboration between United Kingdom firms and businesses in newly industrializing countries. Focuses on environmentally appropriate technological development. Acts as a clearing house for information about environmental problems and solutions and helps United Kingdom companies to run training programmes for business people from developing countries.
107

Box 5.1.1.1. Environmental Export Promotion in the Untied States

Committee on Renewable Energy Commerce and Trade (CORECT)
United States Government programme administered by the Department of Energy. Fourteen federal agencies and industry representatives from the Export Council for Renewable Energy (ECRE) participate on the Committee. Has directed federal and multilateral funds to promote trade in renewable energy exports. Has been involved in developing new financing mechanisms for the export of renewables. With ECRE, helped to streamline the process for obtaining financing for renewables from several agencies and the United States Export-Import Bank.[108]

United States-Asia Environmental Partnership (USAEP)
A USAID environmental export promotion programme. Promotes sales, licencing and joint ventures with Asian firms, enabling the latter better to meet environmental standards and operate efficiently. Also aims to transfer United States know-how in environmental infrastructure and energy efficiency to government-sponsored utility projects in Asia. Between 1992 and 1994, [illegible]0 people from Asia and the United States participated in exchanges designed to match Asian environmental problems with United States expertise. Provided trade leads to 3,000 United States environmental firms and about $420 million in United States technology and services were transferred to the public and private sectors in Asia.[109]

Environmental Technology Initiative (ETI)
Established by President Clinton in 1993 to boost environmental exports. The United States Environmental Protection Agency (EPA) administers United States Technology for International Environmental Solutions (USTIES), the international arm of ETI. Like USAEP, but with a global reach. Provides United States suppliers and government agencies with information and contacts regarding environmental problems abroad. For example, EPA has been working with the Agriculture Department, United States private firms, universities and Mexican Government officials to demonstrate new, small-scale drinking water systems for three Mexican towns.[110]

United States Export-Import Bank
Has launched a new environmental exports programme to stimulate support for small businesses exporting environmental goods and services. Programme provides six months of insurance covering 95% for commercial risks and 100% for political risks of default with no deductibles. For medium-term (up to five years) insurance for environmental exports, the Bank offers guarantees of up to 15% of the United States contract price and capitalization of interest during construction.[111]

Box 5.1.2.3. Environmental Export Promotion in Japan

The Japanese Ministry of International Trade and Industry (MITI) reportedly plans to spend billions of dollars supporting the export of pollution abatement technology and services, as well as building appropriate research and development projects for the environment, in part by training foreign engineers. In 1992 MITI announced plans to lease anti-pollution devices to help recipient countries to control acid rain. As part of Japan's cooperation package to China, equipment to control sulphur emissions from coal-powered thermal stations was offered.[112] *Japan has also been instrumental in helping to improve air quality in Mexico City. This is one example of Japanese development cooperation that is increasingly orientated towards environmental protection and, not coincidentally, to opening up foreign markets for anti-pollution technology manufactured in Japan.*[113]

The APREF is not conceived as a new institution but rather as a new initiative, administered, at least in the pilot phase, by the ADB. The initial three-year pilot phase, funded at a suggested level of $500 million, is to draw money from a variety of sources, including funds earmarked from taxes and levies, grants and soft loans from higher-income countries in the region, and grants and soft finance from regional and non-regional donors, including a possible grant from ADB's profits.

International Finance Corporation

The IFC is considering several funds for environmental investment, including those for renewable energy and energy efficiency projects as well as one for biodiversity projects. The hope is that IFC involvement in these projects will attract participation from private investors.

The renewable energy and energy efficiency fund would provide investment capital for projects of this type in developing countries.[115] *Its goals are to fund projects that would penetrate new markets with proven technologies and fill a gap in small-enterprise finance. The IFC estimates that by the year 2000, energy demands in developing countries will require $160 billion in finance. Renewable energy projects are a particular target market since they can be less expensive to implement and have shorter lead times, are more flexible with regard to location, can use local resources and often involve less risk for investors. However, private investors have often shied away from such projects since they tend to be smaller, to involve newer technologies about which investors may know little and may take a longer time to prepare actual investment. Similar issues face many energy conservation projects. The IFC fund would address some of these hurdles, allowing investors to profit from the growing demands for energy in developing countries.*

Similarly, the IFC is considering a biodiversity enterprise fund in Latin America. Sustainable forestry would be a central component since it is seen as one of several means by which biodiversity can be preserved.

In addition to establishing its own funds, the IFC has contributed to mixed public and private funds that are pursuing environmental projects. For example, it has approved an $8 million equity investme in the Alliance ScanEast Fund L.P., an equity fund providing fin cing for environmental technologies and improvements and for the promotion of energy efficiency projects in Central and Eastern Europe. The IFC is also considering an investment in a fund to promote water projects in Latin America.

Nordic Environmental Finance Corporation

The Nordic Environmental Finance Corporation (NEFCO) was established in 1990 with initial capitalization of ECU 40 million by the five Nordic countries to support investment in the environment of Central and Eastern Europe. Launched by the Nordic Investment Bank (NIB) as a venture capital programme, it links businesses in member countries with those in the investment countries. It participates in equity joint ventures as a minority investor with generally less than a 35% stake. NEFCO can provide loans, usually at market rates, in addition to equity capital.

Projects in the Baltic Sea and the Barents region are given priority and those that reduce the effects of transboundary pollution on member countries are particularly favoured. Only projects deemed to be commercially sound business ventures are considered. [116]

The original capital has been distributed to about 40 projects of which three quarters involve air and water pollution abatement. All the projects have Nordic country partners. Poland has the greatest number of projects, followed by Estonia. NEFCO's first five years were deemed so successful at engendering environmental cooperation that the NIB proposes to double its capital. [117]

By encouraging joint ventures in neighbouring, less developed countries, NEFCO is setting the stage for long-term technical cooperation, which also results in beneficial trade arrangements for the Nordic countries. For example, Kemira Chemicals, a Finnish company, hentered into a joint venture with Tallinn water and sewerage works in Estonia in January 1995. Each partner holds a 40% stake, with NEFCO and Finnfund each holding 10%. The joint venture will produce ferric sulphate, used to treat drinking and waste-water. The Tallinn partner agreed to buy 80% of the plant's production. The project improves water quality in Estonia and captures new markets for Kemira's business. [118]

Environmental Enterprises Assistance Fund, Inc.

The Environmental Enterprises Assistance Fund, Inc. (EEAF) is a non-profit venture capital fund based in Virginia, the United States, which provides capital to small and medium-

sized environmental projects that would have difficulty in obtaining capital from larger institutions.[119] *EEAF's funders include USAID, many private foundations and American Telephone and Telegraph (A.T. & T.). EEAF's short- and medium-term objectives are: to provide loans or equity capital to environmental businesses serving as local models for the investment community; to establish locally managed, in-country offices to promote environmental entrepreneurship; to provide technical cooperation through workshops and training; to recruit other in-country financial institutions to invest in a local environmental investment fund; and to assist in identifying other financing opportunities for local businesses. EEAF's long-term goals are to build an independent environmental finance network led by the Local Environmental Investment Fund and strong community partners, as well as to replicate these efforts in other countries.*

EEAF funds many projects, among them a programme to supply solar panels to rural households in the Dominican Republic; a hydroelectric project on a reforested watershed in Costa Rica; charcoal and activated carbon manufactured from coconut shell waste; a biomass fuel company in the Philippines; and the purchase of land for Rara Avis, a rain-forest lodge and nature preserve. EEAF evaluates the impact companies have on the environment and invests in six primary areas which, they believe, have the greatest potential for positive impact, namely, renewable energy, energy efficiency, sustainable agriculture and forestry, ecotourism, pollution abatement and recycling.

5.1.4 Grants and Concessional Finance

While most of the financial assistance described above would be offered at essentially commercial rates - with the exception of some of the project preparation support - there are also some sources of truly concessional public financing available for some environmental investments.

One such source is the Global Environmental Facility (GEF) administered by the World Bank, the United Nations Environment Programme (UNEP) and the United Nations Development Programme (UNDP). Established in the run-up to the 1992 Earth Summit, the purpose of the GEF is to provide financial support for innovative projects in developing countries which address one of four international environmental issues: (a) global warming; (b) biodiversity preservation; (c) pollution of international waters; (d) the phasing-out of the use of ozone-depleting substances.[120] ***Originally established as a $1.2 billion three-year pilot operation in 1991, the GEF was reorganized and replenished in 1994 with $2 billion in pledges from 26 countries. It provides grants and soft loans primarily to developing country governments and NGOs whose projects are approved by their country's government. Countries may receive GEF funding if they are eligible to borrow from the World Bank. GEF funds the environmental increment which it defines as "the difference between the costs of a project undertaken with global environmental objectives in mind, and the costs of an alternative project that the country would have implemented in the absence of global environmental concerns."*** [121]

While most GEF money goes to public-sector or non-profit recipients, it is seeking to increase its involvement with private-sector projects. For example, the GEF and the IFC have been working with privatized manufacturers of compact fluorescent light bulbs (CFLs) in Poland to jump start their introduction into the market through a wholesaler grant programme. Approximately $5 million in grant money is to be provided to the private firms in order to make the retail price of CFLs competitive with their much less energy-efficient, incandescent competitors (see also box 5.2.1.3 for a description of conversion to fluorescent lamps in Mexico) [122].

Not all projects between the GEF, the IFC and private companies have gone smoothly. For example, the GEF withdrew from the ENDESA/BOTROSA reforestation project in Ecuador at a very late stage as a result of local and international concern over the environmental record of the private party that was to have received the financing.

The GEF is currently undergoing a review of its policy towards working with the private sector. On the one hand, it is empowered to do so and doing so is consistent with trends both in development cooperation and in leveraging its limited resources on the back of private investments. At the same time, some participants in the review process are uncomfortable with transferring quantities of their resources to profit-making enterprises.

5.2 Structuring Markets for Environmental Investment

Ultimately, the most powerful way to attract private capital into environmental investment is to structure and maintain market incentives so that private companies receive clear commercial benefits from investing. This involves two main interrelated areas of public-sector activity: (a) "getting the structures right" for private investment in any particular country; and (b) "getting the prices right" for the use of environmental resources.

5.2.1 Getting the structures right

First, a country must have established the economic, legal and other institutional structures that make private investors willing to commit their money to projects in that country. These include creating a transparent government sector, clarifying regulations and easing restrictions on profits. [123]

Government-Sponsored Environmental Investment

Host country governments can then choose to build on that foundation by offering particular, government-sponsored environmental investment opportunities, such as privatizations and infrastructure concession agreements with private investors. For example, the Government of Malaysia has embarked on an extensive programme of privatizing environmental operations, including: (a) the national waste-water treatment system, (b) the national hazardous waste treatment system, (c) the national solid waste treatment system, (d) multiple state drinking water treatment operations, and (e) ambient environmental monitoring services. [124] *Other countries offering similar opportunities include Argentina, Mexico and Thailand.*

Opportunities to promote environmental investment as part of non-environmental government-sponsored transactions are also available. They can take several forms, including (a) environmental action plans to bring privatized facilities into compliance with local environmental laws or (b) requirements that bids for new electrical generating capacity should include investment in renewable power sources or energy conservation.

Finally, opportunities for public- and private-sector actors to work even more closely together in environmental investment are being investigated. One example is set out in box 5.2.1.1

Box 5.2.1.1. Public-Private Partnerships for the Urban Environment

Created by UNDP, working with the non-profit Swiss association Sustainable Project Management (SPM). Initiated in 1995. Supported by the World Business Council on Sustainable Development, the most prominent proponent of private-sector environmental initiatives at the 1992 Earth Summit. Focuses on creating entities that are jointly owned by public and private- sector actors to provide municipal services, such as water [illegible] management and energy conservation, where more traditional private-[illegible] are not commercially attractive. Brings together [illegible] and [illegible] of the type of sector. International and national companies, local companies [illegible] state agencies. A major goal is the partnerships' initial phase of [illegible] ventures that have strong potential for replication elsewhere.

To participate, private companies must contribute to the cost of the proposed project's feasibility studies, invest in the new company, contribute the relevant expertise technically and in the country where the company will operate, and be approved by their own country's development agency.

Over 25 projects identified to date. The partnership in Madras, India, is representative of those in development. The city of Madras suffers from petrochemical, heavy metal and fertilizer contamination from local industry and also experiences severe water shortages that force industrial capacity to be cut in half in order to provide adequate water supplies for residents. The partnership, currently in the company creation and start-up phase, consists of a mixed public-private water-recycling company, which will offer industrial water recycling, liquid effluent treatment and public sewerage services. The main partners are a local association of industries, Metro Water of Madras, and the Confederation of Indian Industries. Madras banking institutions provide local financing. OECF-Japan is funding the first phase of the business plan. [125]

Incentives for Environmental Investment through Stock Exchange Listing Provisions

As stock exchanges expand in number and value in emerging markets, opportunities arise for governments to use the listing requirements to encourage private environmental investment. For example, Securities and Exchange officials in Thailand have proposed two important environmental initiatives, the first, a rule that would require the submission of environmental performance reports by listed companies whose operations may have an adverse effect on the environment. [126] *Under this plan, such firms would have to submit environmental impact assessments to the Exchange and detail their pollution control efforts in their annual corporate reports. The information provided would be designed to assist investors who choose to conduct an environmental screening of their investment decisions (see section 2.5.3).*

Second, the Thai Securities and Exchange Commission has approved a proposal to promote environmental companies by allowing them to apply for listing on the basis of their tangible assets or concession contracts rather than three consecutive years of profitable performance. [127] ***In order to take advantage of the earlier listing, however, the company would need to meet minimum investment requirements and include public entities among its shareholders.***

Related developments are also under way in Malaysia, such as the easing of listing rules and the possibility of requiring industries to include an environmental section in their annual reports to the Registrar of Companies and the Inland Revenue Department. [128]

Environmental Guidelines for Public-Sector Support

Finally, multilateral development institutions have responded to the criticisms of their track records on environmental issues by adopting extensive guidelines for the review of the environmental impacts of projects in which they may become involved. Both traditional environmental impact assessments and standards for acceptable emissions from particular facilities are frequently included. A summary of aspects of the environmental review procedures applied by the United States Export-Import Bank are set forth in box 5.2.1.2

Emissions Trading - Joint Implementation

Another way for a government to sponsor environmental investment is to create new property rights that can then be traded in the market. Applied at a global level, emissions trading has at least the theoretical potential to increase substantially the level of private environmental investment in developing countries and countries with economies in transition.

Referred to as "joint implementation" (or "actions implemented jointly") under the Framework Convention on Climate Change, initiatives are based on the premise that - measured solely in terms of the costs of reducing emissions - much greater levels of reduction in emissions of greenhouse gases will be achieved through investment in non-OECD countries than would be achieved if the same amount of money were invested in OECD countries. [132]

Box 5.2.1.2. Environmental Guidelines Review Procedures Adopted by the United States Export-Import Bank

The environmental guidelines adopted by the United States Export-Import Bank include quantitative and qualitative standards for air quality, water use and quality, management of hazardous and toxic material and waste, natural hazards, socio-economic and socio-cultural effects, ecological effects and noise. Projects not meeting the guidelines are viewed on a case-by-case basis by the Bank's directors. In some instances, financing may be conditional upon implementation of measures to mitigate environmental impacts.

Environmental review procedures apply only to long-term and project financing. Medium-term transactions, credit guarantee facilities, insurance and working capital guarantees are not subject to prior environmental review. Eligible cases involving exports to tropical forests or national parks will require additional environmental assessments.[129]

Similar requirements are now being imposed on bilateral development cooperation programmes. For example, Japan issued guidelines in 1995 mandating that aid recipients who receive yen credits for development projects must take measures to protect the environment. Developers of large-scale projects, such as roads or dams, must submit environmental impact assessments and aid recipients are requested to refrain from using credits to conduct projects in parks and wildlife refuges.[130]

One of the important effects of these environmental guidelines - particularly for minimum emissions standards - is to ensure that environmental requirements are considered early in transactions requiring public-sector support, even in countries that have traditionally chosen not to enforce their environmental requirements.[131] *While this raises a host of sovereignty and related issues, there is no doubt of its practical impact on particular transactions.*

As OECD countries move towards commitments to stabilize or decrease their carbon dioxide emissions, the possibility of receiving credits for the achievement of this commitment through more efficient investment in other countries becomes very attractive. Doing so through private investment by their main national emitters of greenhouse gases in exchange for domestic tax or other incentives is even more appealing.

While joint implementation of national commitments on greenhouse gas emissions raises a host of extremely difficult equity, pricing and administrative issues, it has the potential to lead to a massive hunt by OECD emitters (such as electricity-generating companies) for opportunities to reduce emissions in other countries. These could include improving the efficiency of energy use through the refitting of power stations or industrial facilities, or the conversion of some of the generating pool to renewable power.

In April 1995, the parties to the Framework Convention on Climate Change agreed to a pilot joint implementation phase that will last until the year 2000. During this time, companies undertaking emission-reducing projects are not to receive credit, projects accepted in the pilot phase must show that emission reductions are not a by-product of business as usual - they must be achieved for their own sake. This additionality requirement however, does not necessarily exclude projects that are profitable.[133] *Although generally supportive, industry officials express concern that excluding emission credits for projects set up before the year 2000 will give private companies little incentive to participate in the pilot phase.*[134] *Examples of pilot joint implementation schemes are provided in box 5.2.1.3.*

Box 5.2.1.3. Pilot Joint Implementation Schemes

Switching to compact fluorescent lamps (CFLs)in Mexico

CFLs use a quarter of the energy to produce the same amount of light as an incandescent light bulb and last 13 times longer. Agreement by Ilumex, Mexico's electricity utility, to place 1.7 million CFLs in Guadalajara and Monterrey over a two-year period. Expected to decrease annual emissions of carbon dioxide by at least 100,000 tons.

Total cost: approximately $23 million. Financed by a $10 million Global Environmental Trust (associated with GEF) grant guaranteed by the Mexican government, $10 million from Mexico's Federal Electricity Commission (also the project's main beneficiary and executor), $3 million in cofinancing by the Norwegian government and $250,000 of parallel cofinancing by USAID.

The Commission has calculated that the project could result in a 135% internal rate of return for Mexico's economy. Even if the price of CFLs is deeply discounted to encourage sales, an integral rate of return of at least 32% is guaranteed. Investors may ultimately be able to obtain greenhouse gas reduction allowances in proportion to their investment in the project.[135]

Converting coal-fired heating to natural gas in the Czech Republic

Project site: the city of Decin, in Northern Bohemia. When the heating station switches from lignite coal to natural gas and improves certain process efficiencies, carbon dioxide emissions will decrease by 30-65%. Part of the US Joint Implementation Initiative, this pilot project aims to reduce the severe air pollution. Three private-sector entities, the Wisconson Electric Power Company, the Edison Development Company and NIPSCO Industries, together contributed 40% ($600,000) of the total costs, with the expectation of ultimately being granted regulatory concessions through the Joint Implementation Initiative.[136]

5.2.2 Getting the Prices Right

The second main area of public-sector effort to structure markets for environmental investment involves getting the prices right for the use of environmental resources. Because the use of such resources (air, water and land) costs the user relatively little or nothing but can impose substantial costs on society, governments have historically attempted to control such usage through regulation of emissions to the environment, thus establishing the initial markets for pollution-control goods and services, as well as the basis for the trading systems described above.

Such command and control environmental regulatory schemes (as well as the related environmental liability laws) are expected to continue to play an important role in providing incentives for potential polluters to consider some level of emission reduction. In order to be most efficient and effective, however, standards should (a) specify performance limits but not the means to achieve them, thus leaving emitters free to find the best way to meet the limits and (b) be consistently enforced so as to provide the same level of incentive to all emitters.

An even more direct approach to creating markets for environmental investment is to charge for the use of environmental resources through the imposition of taxes and fees. A number of economic instruments are potentially available to governments seeking to apply such an approach. The more basic, traditional tools include: (a) product charges, e.g., on fossil fuels based on sulphur and carbon content; (b) user charges, normally levied at the municipal level for water, solid waste collection and the like; (c) tax differentiation, e.g., between leaded and unleaded petrol; (d) administrative charges and fees; and (e) deposit-refund systems for re-use and recycling. [137]

The imposition of charges on emissions or effluents is another pricing tool. Sweden has adopted this approach to reduce its emission of carbon dioxide, imposing a carbon tax of 0.25 krone per kilogram of carbon dioxide emitted by fossil fuels and domestic air traffic. [138]

As with joint implementation and other trading schemes, actual implementation of environmental charge schemes raises a multitude of issues. In general, emissions may be reduced if the charge is high enough, but a substantial fee may be politically unacceptable because of its effects on competitiveness or for other reasons.

Imposing environmental charges, however, can substantially increase the return on environmental investment designed to decrease emissions. For example, and as discussed in section 2.4.1, the decision of the AHMSA steel complex to move to zero waste-water discharge was strongly influenced by the fact that the charges imposed on both water used and water discharged made the return on its investment in acid regeneration and water-recycling equipment very attractive.

5.3 Providing Information on Environmental Investment

The third main type of public-sector assistance for private environmental investment consists of programmes to provide information intended to be helpful to the making of such deals. There are as many different information programmes as there are government agencies interested in promoting environmental investment, including: (a) sources of information on providers of environmental goods and services, such as the United States' Green Pages, a directory of United States suppliers of environmental products and services;[139] (b) reports on global markets for environmental goods and services, such as the ECOTEC Report prepared for the Government of the United Kingdom; [140] (c) guides to environmental contacts in different parts of the world, such as Environment Asia/Pacific: The Executive's Guide To Government Resources, prepared for the United States Environmental Partnership [141]; and (d) guides to energy efficiency and renewable energy opportunities, such as the Sustainable Energy Guide, which helps developing country institutions to find resources to conduct energy efficiency projects. [142]

In addition, a wide variety of conferences, seminars and environmental trade missions are sponsored by government agencies. Government-sponsored training programmes have an important role to play in increasing awareness of environmental issues and markets. For example, the IFC and the EBRD have conducted environmental training for local banks and other financial intermediaries in the countries in which they operate. UNDP and UNEP have been working with the International Chamber of Commerce to develop environmental training programmes for local industry and the United States Environmental Training Institute (USETI) has provided over 50 courses on environmental issues and solutions to citizens from non-OECD countries. USETI is supported by both public and non-profit organizations and works with private United States environmental companies to train environmental professionals in technical, management and policy issues. [143]

Author's Biographical Note

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