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**DISCUSSION PAPER ON
PRIVATE FINANCING AND THE ENVIRONMENT**

INTRODUCTION

This Discussion Paper introduces briefly some of the issues of relevance to the relationship between private sector and the environment. It is prepared for the forthcoming meeting of the Joint Public Advisory Committee (JPAC)¹ of the Commission for Environmental Cooperation of North American (CEC), to be held in Monterrey, Mexico on 9 December 2002².

The full version of this paper will be available at the end of January 2003, serving as one of the background papers for a meeting of CEC and the United Nations Environment Programme (UNEP) on issues related to financing and the environment. Issues raised at the December JPAC meeting will, wherever possible, be incorporated into the full version.

In the past decade, there has been a growing recognition of the key role of the private financial services sector in supporting environmental actions. The core focus of work within the financial industry involves the use of risk assessment and risk mitigation/management tools of relevance to environmental issues. Examples include auditing and other due diligence provisions to screen potential environment-related liabilities, particularly when real estate transactions are involved; disclosing environmental liabilities as part of more general contingent liability disclosure; tracking potential shareholder action involving environmental concerns; and addressing current and future insurance claims arising from environmental damages. (For example, immediate payments related to the sinking of the oil tanker Prestige off Spain's coast in November 2002 are in the range of US\$25 million. Intermediate insurance costs are estimated to be US\$180 million. However, the longer term costs of clean-up will be much higher. Total payments related to the Exxon Valdez are now running at US\$2.5 billion, and several court cases are still pending.)

¹ JPAC is composed of fifteen members, five from each of the three countries, who are appointed by their respective governments. It acts as a single, transnational body. Its members act independently and their responsibility is to provide the Council (composed of the environment ministers of North America) with their advice on all matters within the scope of NAAEC.

² This paper has been prepared by Scott Vaughan of the Carnegie Endowment for International Peace. Views expressed herein are those of the author, and do not reflect official views of JPAC, the CEC Secretariat or its parties.

Managing risk is the main aspect of work within mainstream financial industries that deal with environmental issues. However, the other side of the finance-environment nexus – stimulating private investment in environmental activities – is obviously important. Each year, billions are spent on the environment. Expenditures in mature markets in industrialized countries remain roughly flat, while estimates suggest that most new investment opportunities are to be found in emerging country markets.

The environmental agenda is also creating opportunities for investors to use new products, including risk transfer and risk hedging instruments, particularly in response to the climate agenda.

This brief paper does not examine risk instruments used by the industry. Instead, it focuses on some issues related to measuring private investments in the environmental goods and services sector. It is organized as follows. Section One describes the scope and performance of “environmental” or green investment funds. Section Two introduces more generally the composition of the environmental sector. Section Three summarizes some issues related to the financing in the environmental sector, and raises some issues about how to close information gaps in this area. Section Four notes some general trends in private capital flows, with an emphasis on developing countries. Section Five notes some examples of innovative private-public sector financing partnerships. Section Six notes two areas of importance in the finance-environment nexus: water and renewable energy.

SECTION ONE: ENVIRONMENTAL FUNDS

Among the most visible parts of private financing of the environment involves funds that include one or more environmental screening provisions. Examples include Jupiter’s Asset Management “Ecology Fund,” Fidelity Select-Environmental Insurance, Calvert Managed Growth funds, Storebrand-Sudder Environmental Value Fund and Dreyfus Third-Century Fund. Environmental or green funds are generally seen as part of a broader category falling under the rubric of “socially-screened” funds. Since the environment often falls within the “social issue” category of many companies, financial markets generally view environmental issues as being well outside of mainstream financial market operations. However, Michael Porter argues the case of integrating such issues into core operational strategies thus:

“It is becoming more and more apparent...that treating broader social issues and corporate strategy as separate and distinct has long been unwise, never more so than today. Seeing strategy narrowly leads to missed opportunities and bad competitive choices. It can also cause managers to overlook potential competitive advantages³.”

To what extent higher rates of environmental performance at the firm level determine comparative advantage remains the source of debate. Some argue that companies that undertake voluntary corporate environmental reporting are ahead of their more opaque counterparts. Transparency beyond statutory requirements is thus viewed as a strategic decision by companies looking to win front-runner returns.

One commentator notes that “the main reason for reporting in the future will not be to position the reporting company as a responsible corporate citizen. It will be to secure the company’s competitive position⁴.” In a similar vein of argument, there is some evidence that social screened funds that are under professional management perform either at comparable rates, or outperform, their mainstream counterparts. Estimates suggest that such funds either performed as well as the market average, or outperformed the market average considerably. The *2001 Nelson’s Directory of Investment Managers* estimates that while the average performance of all professionally managed investment assets in the U.S. increased between 1999 and 2001 by 22 percent -- from \$16.3 trillion to \$19.9 trillion – during the same period socially screened assets under professional management grew by 36 percent.

³ Michael Porter (2002), in *Tomorrow’s Markets: Global Trends and Their Implications for Business*, World Resources Institute, UNEP, World Business Council for Sustainable Development, Paris.

⁴ Deloitte Touche Tohmatsu International, (1993), *Coming Clean*, London.

At the end of 2001, according to the *Social Investment Forum's 2001 Report*, more than 230 socially screened, professional funds existed in the United States alone. The total value of those funds with one or more social screening criteria grew from US\$1.49 trillion in 1999 to over \$2 trillion in 2001. Nearly one out of every eight dollars under professional management in the US is now involved in socially responsible investing⁵.

While green funds are worth noting, it is important to bear in mind that they are niche products that exhibit weak links with mainstream global financial markets. Most green funds are centered in the United States, Canada and some European countries. Financing from them is often concentrated in a few environmental activities, such as solar and wind power. They therefore constitute a small fraction of total expenditures going into the environmental goods and services industry.

SECTION TWO: THE ENVIRONMENTAL GOODS AND SERVICES SECTOR

A prerequisite for estimating the source of private financing of environment-related activities is first defining exactly the kind of activities one is talking about. The classification of environmental activities is complicated and potentially contentious.

The question of classification of goods and services produced within the environmental industry has assumed greater importance following the November 2001 Doha Ministerial declaration of the World Trade Organization (WTO). WTO members have agreed to commence formal negotiations towards reducing or eliminating all tariffs and non-tariff barriers affecting trade in environmental goods and services⁶. For negotiations on accelerated trade liberalization to proceed, a clear product and service classification system that feeds into customs codes needs to proceed. To date, the Harmonized System (HS) customs codes are deficient in delineating the breadth of goods and services within the environmental sector.

A useful reference point in classifying environmental goods and services is the (1999) manual of the *Environmental Goods and Services Industry*, prepared by OECD and the Statistical Office of the European Communities⁷. The main groupings of environmental goods and services, as well as examples within those categories, are noted below.

CATEGORY A: POLLUTION MANAGEMENT GROUP	
<i>Air Pollution Control</i>	
Air-Handling equipment	Catalytic converters
Chemical recovery systems	Dust collectors
Separators, precipitators	Incinerators, scrubbers
<i>Wastewater Management</i>	
Aeration systems	Chemical recovery systems
Biological recovery systems	Gravity sedimentation systems
Oil/water separation systems	Screens, strainers
Sewage treatment	Water pollution control
<i>Solid Waste Management</i>	
Hazardous waste storage	Waste collection equipment
Waste disposal equipment	Waste handling equipment
Waste separation equipment	Recycling equipment
<i>Remediation/clean-up soil and water</i>	

⁵ Social Investment Forum, <http://www.socialinvest.org>

⁶ World Trade Organization, Doha Ministerial Declaration, Paragraph 31 notes the opening of negotiations covering, among other items, the "reduction or, as appropriate, elimination of tariff and non-tariff barriers to environmental goods and services."

⁷ OECD (1999), *The Environmental Goods and Services Industry*, Paris.

Absorbents	Water treatment equipment
<i>Noise and Vibration Equipment</i>	
Mufflers, silencers	Vibration control systems
<i>Environmental monitoring/analysis</i>	
Measuring and monitoring equipment	Sampling systems
CATEGORY B: CLEANER TECHNOLOGIES/PRODUCTS	
Cleaner technologies	Cleaner/resource efficient products
CATEGORY C: RESOURCE MANAGEMENT GROUP	
Indoor air pollution	Potable water
Recycled materials	Renewable energy plant
Heat/energy saving and equipment	Sustainable agriculture and fisheries
Sustainable forestry	Eco-tourism

Source: From OECD/Eurostat (1999) Manual for Data Collection and Analysis, Annex Two (Illustrative Categories)

Several issues are worth highlighting with regards the above classification categories. First, a very strong relationship exists between goods and related services. Examples can be found across the board, from wastewater management to the relationship between cleaner technologies and cleaner production strategies and management systems. In terms of total expenditures, estimates suggest that roughly one-half of all environment-related expenditures are directed at capital goods, and the other half at related services.

Second, current classification systems focus primarily on capital equipment and services associated with operating that equipment. This reflects the central role that command-and-control regulations traditionally play in directing environmental expenditures. Indeed, one can track the strong link between the introduction of mandatory pollution targets, and corresponding jumps in total environmental expenditures at the firm level to purchase pollution control equipment like industrial filters, scrubbers, purification systems, etc., to meet these regulatory requirements.

Capital goods marketed exclusively to address pollution are an important part of environment-related expenditures. However, they are not the *sole* part of the environmental goods and services sector. Broadly, the environmental sector is moving in two directions. First, firms are placing more emphasis on pollution avoidance, cleaner production, eco-efficiency, product stewardship and other strategies intended to integrate environmental policies upstream. Capital technologies such as those noted in Category A are essentially about end-of-pipe actions. Upstream or integrated environmental targets often are part of overall efficiency gains, whereby increased productivity corresponds with a reduction in pollution per unit of output.

Given the emphasis that many large companies are placing on upstream integration, coupled with the strong relationship between environmental goods and services generally, it is difficult in practice to disentangle stand-alone environmental investments from investments across the board involving technological innovation, which yield environmental benefits. This in turn poses challenges in estimating existing private finance in goods-service clusters, and identifying ways to increase such financing.

Second, an important area of the environmental sector is good classified in some manner as environmentally-preferable, precisely because of their absence of capital inputs. Examples include sustainable agriculture – which according to classifications used by the World Bank includes organic foods – forestry and fisheries, and eco-tourism. More generally, literally hundreds of products within Category B Cleaner/Resource Efficient products are essentially substitutes for standard products that are less clean or efficient.

Given this breadth of product coverage, the simplest route to differentiating substitute environmentally-preferable products from their standard counterparts is by referring to environmental labeling and certification schemes. Such schemes are well established in many OECD countries, as well as some developing countries. The product range under such schemes is very wide, from organically-grown flowers in South America to sustainably-produced hardwoods in the Asia Pacific region, from organic salmon in New Zealand to cleaner performance standards for a wide range of household and office goods. Canada's Environmental Choice scheme posted total sales of labeled products in the vicinity of CAD\$2 billion in 2001. China's Environmental Labeling schemes, which covers over 1,000 different products from 400 industries, posted equivalent sales of US\$6 billion, also in 2001.

More work is needed in understanding the relationship between product differentiation based on environmental characteristics and the possible differentiation of risk that private investors may use in looking at these products. Already, there are examples of institutional procurement schemes involving public agencies and large companies using products from environmental labeling schemes as the basis for fulfilling some green procurement commitments.

One reason why product differentiation should proceed is again because of the comparative advantage argument noted above. Some products within Categories C fall within a small but highly dynamic export group that is outperforming resource-based exports generally in global markets. UNCTAD notes that the 40 most dynamic products in world merchandise exports in 2000 comprised only 5 percent of all product categories traded, but were the equivalent of almost 40 percent of the net value of total exports. Three manufacturing industries stand out -- electronics, automotive and apparel -- accounting for about half of these dynamic products and for almost one quarter of the total world import value in 2000. Manufactures, especially those *not* based on natural resources, are by far the principal dynamic products⁸.

This latter point makes the case for differentiating environmental products associated with natural resources all the more compelling. International commodity prices generally continue to suffer record price troughs. Labeled products that deliver even a marginal price premium, coupled with the price wedge that would arise from differentiation tariff reductions between environmental and non-environmental products, *should* attract the attention of private investors, since returns on investment for green goods would be greater than non-green counterparts.

More work is needed in making the financial case for environmentally-preferable goods based on natural resources. The CEC's work in sustainable coffee has already provided valuable lessons in this regard. Other commodities in which environmental criteria already exists includes cocoa, bananas, tropical fish, forest products, sustainable tourism and other groupings. These are among the products that developing country exporters face the highest market access distortions. Given the link between liberalization and export performance to help stimulate external finance, work in this area should proceed, in keeping with the Doha ministerial decision noted above.

Clarifying which goods and services fall within the environmental sector is important, if efforts are going to be made to actively attract private capital in this market. The Government of Canada notes that the "environment industry will be able to exploit growth opportunities fully if it has access to a steady flow of capital on reasonable terms. Without capital, a firm is at risk of failure or takeover." The key challenge is therefore to tap into mainstream private capital markets.

SECTION THREE: HOW TO FOLLOW THE MONEY: FINANCING THE ENVIRONMENTAL INDUSTRY

⁸ UNCTAD (2002), Dynamic Products Make for Dynamic Economies, www.unctad.org

Estimates by UNCTAD, OECD and others generally estimate annual environmental industry expenditures as roughly US\$450 billion⁹. However, as noted in Section Two, estimating the size of environmental expenditures is a function of how environmental activities are classified.

There are different estimates of the size and composition of the environmental industry at the national level. Estimates by the European Union (EU) put annual expenditures in what is called the “eco-industry” within Europe at 54 billion Euros. This represents 1.3 percent of the total paid EU labor force, accounting for over 2 million jobs. (Roughly 1.5 million are employed in pollution management activities, and 650,000 in resource management.)¹⁰ The Government of Canada puts its “environmental sector” at more than 6,000 companies, employing more than 220,000 people, with combined annual revenues of CAD\$12 billion.¹¹ Key characteristics of the Canadian sector include water and wastewater treatment; the handling of liquid and solid wastes; air pollution abatement and related technologies; waste remediation systems; emergency response systems (notably oil spill management); environment-related instrumentation; and various capital equipment such as waste incinerators, shredders, compactors and waste recycling equipment.

Estimates of annual expenditures in the United States environmental sector vary, but are generally within the vicinity of US\$170 billion, or two percent of Gross Domestic Product. Among the largest areas of expenditures are water equipment and related chemical treatment (US\$13 billion per year); air pollution equipment and waste management equipment (US\$11 billion each). From environmental goods to environmental services, the two largest areas of total expenditures were solid waste management (US\$31 billion) and water treatment works (US\$25 billion). For Mexico, according to the 1995 National Environmental Program, the environmental sector was measured at US\$2 billion. It was forecast under that program to rise to US\$4.5 billion by the end of 2000¹².

One insight into the characteristics of financing can be found in the general market structure of the environmental industry. Analysis by both the OECD and UNCTAD suggest that the environmental sector is evenly divided on a global basis between large-scale, transnational corporations and small and mid-sized enterprises.

In general, the average size of an industry within the sector may be an important determinant of the source of private financing. One may assume that the financing of capital technologies of goods found within Category A above that are used by large corporations, including transnational corporations, involve a large degree of Foreign Direct Investment (FDI). In general, FDI comes from internal financing arrangements of large corporations, including using retained earnings¹³.

One issue worth examining is therefore what proportion of total FDI involving transnational corporations are linked to environment-related expenditures. As an empirical question, sources of information include the IMF Balance of Payments annual statistics; the World Investment Report of UNCTAD; the International Statistical Yearbook of OECD; examples of annual reports of companies engaged both in

⁹ UNCTAD estimated that the size of the global environmental sector in 1997 was US\$452 billion in revenues generated by private companies and public-sector bodies. UNCTAD (July 1998), Expert Meeting on Strengthening Capacities in Developing Countries to Develop their Environmental Services Sector, www.unctad.org

¹⁰ European Union (2001), Analysis of the EU Eco-Industries: Their Employment and Export Potential, http://europa.eu.int/comm/environment/enveco/industry_employment/main_report.pdf

¹¹ Industry Canada (2002), The Environment Industry and Innovation: A Response to Canada's Innovation Strategy, <http://strategis.ic.gc.ca/SSG/pg00064e.html#a>

¹² Bradford Gentry (1999), *Private Capital Flows and the Environment: Lessons from Latin America*, Edward Elgar, UK

¹³ In Mexico, the general focus of offshore investments during the 1990s has comprised of (a) direct investments in plant and equipment; (b) portfolio equity investments in publicly-traded companies listed on the stock market; and (c) purchases of public and private bonds. Manufacturing received the largest proportion of FDI. Within those sectors, between 1989 and 1994, FDI decreased in the chemicals, milk products, telecommunications equipment, food preserves, and paper and cellulose industries, and increased in the automotive, food products and beverages sector. Increased FDI also took place in several services sectors during this period, notably communications, real estate, professional services and restaurant industries. Gentry, 1999.

the manufacture and export of environmental technologies; and annual reports of transnational companies within those sectors which regularly rely on such technologies.

A second, and more difficult issue worth exploring is the source of financing of environmental expenditures outside of FDI flows, involving small and mid-sized enterprises. An extensive body of work exists in general on domestic and foreign credit channels. One question is whether general credit and investment patterns for small and mid-sized companies are replicated in the environmental sector. Again, the question of classification is important. For example, if the environmental sector includes farm produce, then credit channels would by definition include various farm credit, rural credit and cooperative credit channels. The difficult question is whether risk involving environmental goods differs from mainstream goods, and if so why.

SECTION FOUR: PRIVATE CAPITAL FLOWS

According to the Bank for International Settlements, the total amount of cross border credit in 2001 was US\$11.6 trillion. International debt securities issues were US\$ 344 billion, and derivative markets were US\$169 billion.

Since the 1980s, many commentators have noted significant changes in financial markets generally, as well as source of financial flows to developing countries. In general, public sector finance to developing countries is now overshadowed, at the aggregate level, by private capital flows. In general, public finance to developing countries has remained relatively flat, hovering around US\$50-\$55 billion per year.

Sources of private capital have been grouped into three broad categories: foreign direct investment (FDI), portfolio equity investment, and debt financing through commercial bank credit.

Of the three, FDI is by far the largest component of private capital flows to developing countries. Between 1981 and 2000, FDI expanded dramatically, by more than 400 percent. It reached its peak of US\$1.4 trillion in 2000. However, in 2001, FDI – which was assumed to be relatively stable compared for instance to portfolio investments – contracted by roughly one-half, to US\$700 billion at the end of 2001¹⁴. This dramatic contraction in FDI was concentrated mainly in developing countries, with a reduction in FDI of almost 60 percent. By contrast, FDI in flows to developing countries decreased by 14 percent over the same period.

The source and destination of FDI remains overwhelmingly in OECD: more than 90 percent comes from developed countries, and more than 70 percent is returned to OECD economies. By contrast, total flows to developing countries decreased in the late 1990s, and remain concentrated on only some developing countries, primarily those in the Asia Pacific Region, which has experienced both the highest rates of FDI increases as well as highest rates of volatility. Regionally, prospects for Africa as a whole remain bleak.

The single most important source of FDI is through mergers and acquisitions, which peaked in terms of asset value in 2000. Although FDI flows have different characteristics, a main feature is the link between financing and exercising managerial control at the firm level.

The second major source of private capital to developing countries is portfolio equity investment, comprised of institutional and other investors entering and exiting pension funds, mutual funds, insurance companies and other funds. While it represents significantly less in absolute levels than FDI, in the last decade portfolio equity inflows to developing countries has grown significantly.

¹⁴ International Monetary Fund (2002), “Trends in Global and Regional Foreign Direct Investment,” Working Papers, Washington, DC. <http://www.imf.org/external/pubs/ft/seminar/2002/fdi/eng/pdf/wong.pdf>

Debt finance accounts for roughly one-third of total private capital flows to developing countries. Debt takes various forms, although the most common involve commercial loans from banks. Loans are extended both to private companies, as well as public entities. A particularly important area in both segments is acquisition of issued bonds exchanged in international capital markets. Bond markets represent more money than portfolio equity finance.

Gentry notes that different types of private capital flows pose different challenges from an environmental perspective¹⁵. Most FDI involves long-time horizons, usually five or more years. (However, the assumed predictability and non-volatility of FDI is changing, as witnessed by the severe contraction in total FDI from 2000 to 2001. Part of this volatility may be linked to the volatility of mergers and acquisitions within key sectors, notably the telecom sector.) On the other side, portfolio equity investments have shorter – often extremely short – time horizons. In the middle, debt can assume both characteristics. If it involves commercial debt to projects or companies, then tend to resemble time frames of FDI. If debt is channeled into either private or public issued bonds, then resemble portfolio equity investments.

SECTION FIVE: INNOVATIVE PARTNERSHIPS

In the past decade, interest in supporting private-public sector partnerships for development and environmental purposes has intensified. Examples at the project level in which public finance has leveraged private capital have increased, with examples ranging from the use of public finance to offset transaction costs, provide insurance or risk reduction.

One catalyst in moving innovative public-private financing up the agenda in the environmental arena involves the climate agenda. The Climate Change Working Group of UNEP's Financial Initiative identifies various risks and investment opportunities arising from climate projects. Risks that have long been tracked by the insurance industry include property losses linked to the increase in frequency and severity of storms. Opportunities are both fairly concentrated in investment opportunities in renewable energy and low-impact energy, in infrastructure-related projects intended to mitigate storm-related effects, as well as investment opportunities from new markets such as greenhouse gas credit and transfer schemes, and risk hedging and transfer products¹⁶.

At the project level, among the most innovative examples of efforts to leverage private capital is found in the Prototype Carbon Fund, established by the World Bank. Among the partners of the Fund are Deutsche Bank, BP-Amoco, Rabo Bank and Tokyo Electric Power Corporation. In 2001, the Fund financed 26 projects in developing countries to address a variety of climate-related projects, for a total financing of roughly US\$100 million¹⁷. In addition to supporting projects, the Fund is providing valuable lessons of how to structure deals.

As noted above, another area in which to attract private capital involves international trading in carbon markets. Underway since 1996, more than 200 million tons equivalent of carbon dioxide have to date been traded, involving more than 150 transactions. Various estimates of the global emissions trading and offset market exist, but many suggest that it will be in the vicinity of several billion dollars before the end of the decade. Most of this working capital will come from the private sector.

A final example of innovative financing is found in the CEC's recent work in finding ways of establishing a Sustainable Coffee Fund. One of the lessons of this work is the role both of public finance extended directly to small farmers, through for instance subsidies, as well as the role of farm credit and micro-finance institutions generally. Typically, micro-finance institutions extend credit to poorer households and

¹⁵ Bradford Gentry (1999), *Private Capital Flows and the Environment*, Elward Elgar, London.

¹⁶ UNEP Finance Initiative, Report to CEOs by the UNEP FI Climate Change Working Group, http://unepfi.net/cc/ceobriefing_ccwg_unepfi.pdf

¹⁷ World Bank, Prototype Carbon Fund, <http://www.prototypecarbonfund.org>

small and mid-sized enterprises, as well as to provide training and other kinds of support. On a global basis, according to the IMF, roughly 12.5 million people in developing countries rely on micro-finance in some way. Among the countries where micro-finance is most active include Bangladesh, Bolivia, Indonesia as well as what is assumed to be extensive informal rural credit systems throughout Africa.

SECTION SIX: WATER AND RENEWABLE ENERGY

The Johannesburg Summit highlighted both the role of private sector financing, and the urgent need to make progress in the coming decade in two areas: water and renewable energy.

Water: Forecasts vary on the amount of working capital that will be needed to address all infrastructure needs in developing countries over the next decade. The World Bank puts the figure at US\$200 billion per year. Of this total amount, investments in water-related infrastructure will be among the most significant.

Given that financing needs for infrastructure alone is four times greater than all public finance to all developing countries, securing private investment for water infrastructure and related projects is essential. Attracting private capital to water infrastructure is difficult enough in OECD countries, and even moreso in developing countries. The General Accounting Office of the US recently concluded that despite some reduction in risk related to developing country investments, private financiers remain “reluctant to invest or operate without public (government or multilateral) guarantees or insurance.”

One of the problems in attracting private capital to water infrastructure is the highly decentralized nature of many water delivery systems. In the US alone, over 55,000 community water systems and 21,000 not-for-profit non-community water systems exist, many serving water markets of less than 5,000 people. Together, new investments in the US alone exceeding US\$150 billion are needed to 2020. Of this total, roughly \$100 billion is earmarked to upgrade aging water distribution facilities.

Financing rating entities like Standard and Poor's or Moody's suggest that investments in water markets offer sound, long-term investment potential. Ratings in the water and sewer revenue bond sector tend to be strong and stable. Over 33 percent of the water and sewer revenue bonds rated by Standard & Poor's are within the 'AA' category, and over 80 percent of the rated water and sewer revenue bonds are rated above the 'BBB' category.

Standard and Poor's notes that almost all 'AA' category enterprises are located in areas characterized by solid, steady growth in a strong and diverse service area. Indicators such as customer growth, balance of customers between residential, commercial and industrial, new connections, income trends (particularly when measured against affordability of rates), and the outlook for economic performance and the ability to withstand economic stresses are important rating considerations for an enterprise.

One area that JPAC may wish to examine in particular is whether lessons from credit ratings and investment trends in the US and elsewhere can be useful to assist Mexico and other countries that are facing staggering costs in the water sector.

Renewable Energy: Renewable energy is forecast to be the fastest growing segment of the energy sector on a global basis, according to the International Energy Agency. Total energy from renewable sources is forecast to more than double by 2020. Already, the EU spends more than 5 billion Euros per year on renewable energy markets. Estimates by some analysts (the Clean Edge group, for instance) suggest that expenditures on renewable energy will reach US\$82 billion by 2010. The areas of the fastest growth are wind and solar, followed by fuel cells.

There are different factors driving renewable energy markets, including efforts to find cleaner energy systems in anticipation of the Kyoto Protocol; the introduction of mandatory renewable portfolio standards; and some evidence of demand-side interest in, and willingness to pay for, renewable energy. In this latter area, a 2001 market survey undertaken by the CEC, the federal renewable energy agency of Mexico – CONAE- -- and Gallup Mexico suggests that approximately 10-15 percent of the most energy-intensive industries in Mexico were willing to turn to renewable energy for part of their total energy requirements, even if they faced marginally higher capital and operating costs.

An extremely useful service provided by UNEP is providing an on-line, searchable inventory of investors and projects in renewable energy.¹⁸ Among the sources of finance listed in the UNEP inventory are debt, private equity, both private and public financing for public-held utilities, export credits (not discussed in this Note), and insurance. The existence of this inventory points to information failures, in which investors and projects remain misaligned.

POSSIBLE NEXT STEPS

This Discussion Paper has touched on only a few of the many issues related to finance. While the above discussions focus on FDI and other external sources of working capital, more work is needed in understanding how much domestic credit channels – broadly defined – are providing investments for environment-related actions. Possible steps to improve our understanding of existing financing flows includes:

- Following financial market responses to regulations;
- Following financial market responses to voluntary initiatives;
- Delineating financial flows between domestic and international capital within the environmental goods and services sector;
- Delineating financing based on sectoral or geographic areas, including for instance free trade manufacturing zones;
- Based on existing flows, identifying barriers to private sector investments, and ways of overcoming such barriers.

¹⁸ UNEP (2002), Sustainable Energy Directory, <http://www.uneptie.org/energy/publ/pdfs/Inventory2002.pdf>