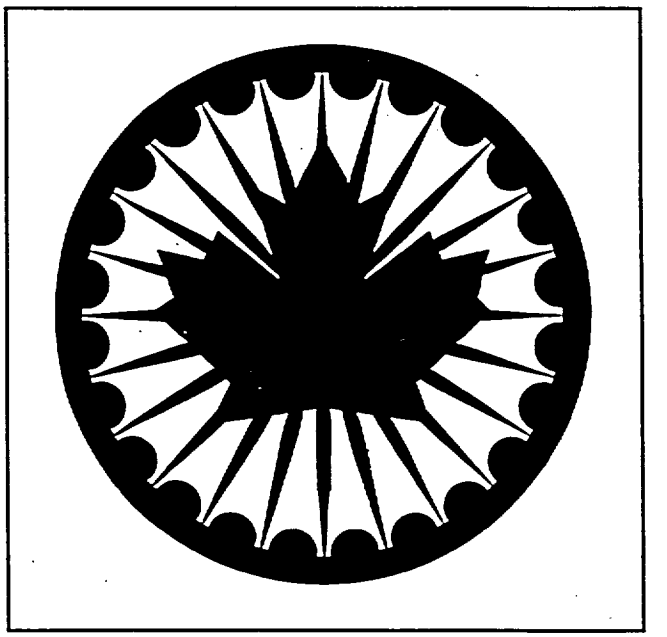
FOCUS INDIA

India's Environmental Sector:

Business Opportunities for Canadians



Prepared on behalf of

Department of Foreign Affairs and International Trade
and
Canadian International Development Agency

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Foreword

This Business Guide is a response to a number of converging trends in international trade markets. First, is the growing importance of the Asia Pacific region to Canadian exporters. Second, economic liberalization in many emerging countries is attracting investment and technology transfer. Third, there is rising interest in the countries of Asia in enhancing environmental standards to preserve dwindling resources and ameliorate air and water quality, particularly in urban areas. Fourth, emerging economies desire to improve industrial productivity and introduce resource efficient technologies and practices.

At the nexus of these trends lies a key new market for Canadian environmental goods, services and technology companies - India. The degree of India's economic transformation over the past five years is nothing short of remarkable. The country has moved up the ladder in importance to Canadian companies due to an increasingly open economy, a desire to upgrade industrial production and a middle class of over 200 million.

In recognition of the opportunities that India represents, the government of Canada has developed the Focus India initiative to develop a Canadian economic and trade development strategy for India. This initiative will integrate the efforts of federal and provincial government and the ideas and interests of the Canadian private sector. The Focus India strategy will clearly identify Canada's trade priorities for the Indian market and determine the policies, actions and programs for participants to pursue in concert to fulfil Canadian trade objectives in India.

This Business Guide has been designed to equip Canadian environmental companies with current, hands-on information to make informed decisions about entering India and doing business in the country. It has been prepared for the CIDA Industrial Cooperation Division and is part of a series of Business Guides prepared by the Department of Foreign Affairs and Trade focusing on the Indian economy. It represents another initiative on the part of the department to assist Canadian companies assess and enter foreign markets.

This Guide has been researched and written by The Delphi Group with the support of the GLOBE Foundation of Canada. Specializing in the environment and clean energy sectors, The Delphi Group provides market intelligence, brokering, financing and intermediation services to assist Canadian environment and energy companies enter India. The GLOBE Foundation is Canada's premier organization dedicated to developing the business of environment, with a particular focus on the Asia Pacific region.

Glossary of Terms and Organizations

BMTPC	Building Materials and Technology Promotion Council
BOD	Biological Oxygen Demand
CEPTs	Common Effluent Treatment Plants
CII	Confederation of Indian Industry
CIDA	Canadian International Development Agency
COD	Chemical Oxygen Demand
CPCB	Central Pollution Control Board
DFAIT	Department of Foreign Affairs and International Trade
FICCI	Federation of Indian Chambers of Commerce and Industries
GOI	Government of India
ICICI	Industrial Credit and Commercial Corporation of India
IDBI	Industrial Development Bank of India
IREDA	Indian Renewable Energy Development Agency Limited
MINAS	Minimum National Standards
MNES	Ministry of Non-Conventional Energy Sources
MoEF	Ministry of the Environment and Forests
MPMF	Montreal Protocol Multilateral Fund
NEERI	National Environmental Engineering Research Institute
PCB	State Pollution Control Boards
SIDBI	Small Industry Development Bank of India
TERI	Tata Energy Research Institute

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1.0 Introduction

1.1 The Purpose of this Guide

The purpose of this Business Guide is to provide Canadian companies with advice and insight into the rapidly growing environmental goods, services and technology markets in India.

India's industrial development and rate of population growth is giving rise to a host of environmental challenges. Indian industry needs to boost productivity and conserve resources. The country's middle class is demanding higher quality air and water, and waste disposal as the standard of living rises. To compete in global markets, Indian businesses must conform with environmental norms such as international environmental agreements.

Consequently, business opportunities for companies that can provide clean and cost-effective technologies are abundant. This Business Guide seeks to give Canadian companies an advantage over the competition by providing:

- An overview of India's economic and environmental profile;
- An analysis of the existing market, including regulatory and economic drivers for environmental technologies;
- A look at opportunities for Canadian environmental companies, segmented by environmental technology, based upon an analysis of market trends;
- Advice on market entry strategies.

The Guide focuses on the market segments of solid and hazardous waste management, air pollution technologies, water and wastewater technologies, clean energy and environmental services.

It serves as an introduction to India's environmental markets. Additional information can be obtained by approaching the contacts included in the Guide.

All currency is denominated in American dollars.

1.2 India Today

India is a land of physical, ecological, social, cultural and linguistic diversity with a population of 920 million. There are 16 languages and a large proportion of the country speaks English. Some of the world's poorest citizens live in India, and yet India also has a middle class of approximately 250 million which is propelling the country's economic boom.

India is the world's tenth largest economy, with a Gross Domestic Product (GDP) of $250 billion. Real annual growth has averaged about 5 percent since 1980. Annual GDP growth in India is expected to exceed 6 percent per annum until the turn of the century.

With qualified low cost labour, the second largest pool of technically-trained manpower in the world and a steadily-growing domestic market, India's potential for growth in the next few decades is almost unlimited.

1.3 India's Political Situation

India has a long history of political stability. It is the world's largest democracy with over 500 million individuals on the voters list. The strength of India's democracy is best illustrated by the relatively smooth transitions that take place with the election of a new government.

Some Canadian companies may be concerned about the results of the recent Indian election. No party received a parliamentary majority, and the Congress Party, the governing party for much of the period since independence, was voted out of office. While this might suggest that the political situation may be unsettled, consider the following. First, the election was remarkably free of disturbances, and all parties have respected the outcome of voting. Second, due process is being followed in terms of forming a government with the party receiving the highest number of seats (i.e. the BJP) being given a chance to form a government, and, if they fail, other parties will be afforded a similar opportunity. Third, the institutions of government and economic management are largely independent of government (e.g. Reserve Bank of India, Securities Exchange Board of India) and for them it is business as usual. There may be an impact on new liberalization initiatives or delays with certain approvals, however, by and large, the path of India's economy is set and there should be no major negative impact due to the political situation.

1.4 An Approach to Environmental Markets in India

There is a critical difference between environmental markets in India and industrialized countries. Regulatory market drivers are significantly less important in emerging economies such as India. Of far greater consequence are voluntary measures which increase profits through greater energy efficiency and reduce the amount of waste; in effect, the process and technologies of eco-efficiency. India views with a much keener eye, environmental goods and services which promote rather than impede economic growth.

When approaching Indian environmental markets, one should consider that small and medium-sized enterprises (SMEs), which constitute the vast majority of companies in India, simply do not have the luxury to opt for cleaner production systems. Many traditional western technologies fail because they are too expensive, consume too much electricity or require too much water or land to operate. Foreign entrepreneurs often do not take sufficient account of local characteristics and constraints.

This is not to suggest that there is no place for regulation, or that the impact of air and water pollution on the health of Indians is of no concern. Witness the forced closure of 60 industries whose corrosive emissions were threatening the Taj Mahal; the country-wide call for the improved treatment/disposal of hazardous solid waste arising from the Bhopal tragedy; and the swift response to the 1994 outbreak of pneumonic plague. These actions, however, are more often the exception than the rule in the rapid drive towards industrialization in which the economic agenda takes priority over environmental concerns.

Like many other developing nations, India needs to modernize by leap-frogging over wasteful and polluting technologies to environmentally and energy efficient technologies. In addition, these technologies must also provide tangible cost savings if they are to obtain wide-spread use by industry.

2.0 India's Economic and Environment Profile

2.1 Economic Reforms

India is becoming a better place to do business. Business people consider it to be one of the world's last major untapped markets. For decades, the government fostered industrial development through policies of import substitution to protect domestic industry. This occurred against a background of strong central planning and state ownership of major industries.

In the mid-1980s India's policy-makers realized that these strategies were no longer practical in an era of increasing economic globalization, rapid technological change and intense international competition. In 1991, the new government, led by Prime Minister Narasimha Rao, introduced fiscal and economic reforms that have spurred on rapid development. The Indian government has implemented broad-based reforms to encourage domestic competition and liberalize foreign trade. New investment policies and ownership regulations have been introduced in order to: attract more foreign capital; free up the use of brand names and trademarks; increase convertibility of the rupee; reduce import tariffs; and, facilitate the removal of most industrial licensing.

India now provides automatic approval for 51 percent foreign equity ownership in over 35 sectors, including the environmental sector. Maximum corporate income tax has been reduced to 40 percent and capital gains tax dropped to 30 percent. Protectionist trade policies have been liberalized with the maximum basic duty at 65 percent.

A number of additional features make the Indian market attractive. For example: the business use of English; an extensive private sector; a reputable and trusted legal system; and a growing consumer market.

All in all, India represents a solid combination for Canadian environmental companies seeking new global markets.

2.2 Environmental Challenges

Since independence in 1947, India has tried to modernize its economy through successive five year plans. The plans have stressed industrial growth and agricultural modernization, both of which have been quite successful, but have had considerable environmental impact.

India's growing industrial base and its rapid population growth have created new environmental problems:

- The pollution of almost all natural waterways from the discharge of domestic and industrial waste;

- Air pollution, from the rapid growth in road traffic and increased industrial emissions;

- Toxic and solid waste management problems.

The industrial sector is comprised of thousands of small factories in addition to the many large factories found throughout the country. These small firms often use obsolete and inefficient production processes. Typically, they do not have capital to invest in expensive pollution control equipment or clean production technologies, yet they contribute a disproportionate amount of pollution and represent huge employment and foreign exchange earnings. They have had little incentive to modernize because they have traditionally enjoyed considerable subsidies and protection.

A lack of access to affordable financing limits the adoption of world-class environmental technologies, particularly for smaller firms. The real cost of capital is very high, with interest rates ranging from 18-30 percent compared with an inflation rate of 8-10 percent.

In order to overcome environmental challenges, India needs a number of key additional inputs:

- A basic regulatory framework that is simple, harmonized between central and state governments, and that includes a manageable and reliable compliance structure;

- Foreign companies with modern, cost-efficient environmental technologies that boost productivity;

- Equity, in both rupee and hard currency, to facilitate joint ventures between off-shore and Indian companies; and, debt financing to finance projects and inventories;

- Export markets for environmental technologies to fuel domestic GDP growth and make the sector even more attractive to the Indian government;

- Development of professional Indian environmental managers within both industry and government to lead the reform of environmental industry;

- Enlightened consumers with greater environmental awareness and education who will demand higher environmental standards.

As one of the world's most rapidly industrializing countries, India faces serious environmental and energy challenges that are creating new markets for Canadian environmental goods, services and technologies.

3.0 Market Drivers

3.1 Regulatory Drivers

Environmental markets exist, in part, due to the existence of regulation. Despite tough legislation on paper, however, authorities are often ill-equipped to enforce regulations. Pollution control is seen by industry as a non-productive expenditure, creating little incentive for compliance. Industry in general is only receptive to technology that may reduce waste, increase efficiency and production, and therefore increase profitability. In recognition of this, the MoEF has moved toward pollution prevention and voluntary measures in a shift away from a traditional command and control system.

3.1.1 Environmental Policy and Legislative Framework

India is the first country in the world to have incorporated protection of the environment as one of the fundamental duties of every citizen in its constitution under Article 48-A.

"It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures."

Several key government agencies orchestrate the path of development in India's environment sector. The Ministry of the Environment and Forests (MoEF) is by far the most important, with other major players including the State Ministries of the Environment, the Central Pollution Control Board (CPCB) and the State Pollution Control Boards (PCB). The MoEF, constituted in 1985, is central to planning, promoting and coordinating environmental programs. A number of enforcement agencies assist the MoEF in executing its assigned responsibilities.

The CPCB has the executive responsibilities for industrial pollution prevention and control, and has statutory authority under the MoEF. State Departments of Environment and State Pollution Control Boards perform these functions at the state level, either independently, or directly linked to the MoEF.

The major environmental statutes include:

- The Water Prevention and Control of Pollution Act (1974) deals with prevention and control of water pollution and maintaining or restoring water quality.
- Water Prevention and Control of Pollution Cess Act (1977) provides for the levy and collection of a tariff on water consumed by persons, certain industries and by local authorities to augment resources for the Pollution Control Boards.
- The Air Prevention and Control of Pollution Acts (1981) concerns prevention, control and abatement of air pollution.

- Hazardous Waste Management Rules/Hazardous Chemical and Substance Rules (1989) applies to the hazardous waste arising out of the operation for ships, wastewater, and exhaust gases and radioactive wastes.

- Environment Protection Act (1986) provides for the protection and improvement of the environment.

- The Public Liability Insurance Act (1991) provides for immediate relief to the persons affected by accidents occurring while handling hazardous substances.

- Forest Conservation Act (1980) provides for the conservation of forests and matters connected therewith.

The first industry specific Minimum National Standards (MINAS) were introduced in 1976 for limiting toxic effluent and emissions. General and industry specific standards are now available and are as strict as those imposed in North America or Europe.

New projects require environmental clearance either from the state, central government, or both; and, industrial units must spend a predetermined percentage of total project costs on pollution control equipment.

The Confederation of Indian Industry has produced *Indian Environmental Legislation: Guide for Industry and Business,* a comprehensive book detailing all environmental legislation and regulations pertaining to businesses in India plus schemes for financial assistance. Published in January 1995.

3.1.2 Compliance

With over 200 enactment's in place to govern pollution control in India, ensuring compliance is a complex task. Enforcement is done primarily on a command and control basis and lies in the hands of the state and municipal authorities, and is not uniform across the nation. Typically it involves ad hoc plant closures, which are often quickly reversed for political reasons.

The annual environmental audit statements required in law often have limited credibility. However, there have been some efforts by the PCBs and other government agencies to enforce the law, with a focus on 17 industry sectors, including chemicals and petrochemicals, that are believed responsible for about 80 percent of India's industrial pollution.

The Supreme Court plays an important role in enforcing compliance. It has ordered the installation of air pollution control equipment and the closure of polluting firms. The Court has also directed industries to move from Delhi to adjoining states in an effort to reduce the effects of pollution on the local population. It is important to note that the cases before the Supreme Court are generally based upon the fundamental duties described in the Constitution and not on environmental legislation.

After having served notice to more than 400 industries, the Uttar Pradesh Pollution Control Board closed down 106 industrial units last year for creating air and water pollution. The majority of them installed effluent treatment plants to avoid closure by the department. There were 742 prosecutions by the PCBs in India between July 1991 and September 1992.

3.1.3 Emerging Legislation

India has tough environmental legislation, but difficulty in enforcing it. In light of this challenge, MoEF policy is now emphasizing pollution prevention through the introduction of cleaner technology and production processes, as opposed to imposing further regulations. Pollution control policy is now flavoured by economic objectives to a greater degree, based on the basic principles of:

- Pollution prevention as a necessary complement to end-of-pipe treatment;
- Improved cooperation and coordination between different levels of government in environmental management;
- Full-cost pricing of resources such as water and electricity;
- Higher penalties for transgressing pollution limits.

Under this new plan, financial incentives will be given to small-scale industry to encourage the installation of treatment plants and cleaner technology. This may include subsidies, greater depreciation allowances, excise relief and custom duty exemptions on equipment import.

3.1.4 Role of Government Agencies

Below are details about the roles and responsibilities of government agencies with environmental jurisdictions.

- *Ministry of Environment and Forests (MoEF)* is responsible for environmental policy planning; ensuring the effective implementation of legislation; monitoring and control of pollution; providing environmental clearances for industrial and development projects; research; forest conservation; and coordination with relevant agencies at the national and international levels.
- *Central Pollution Control Board (CPCB)* advises the central government on matters concerning prevention, control and abatement of water and air pollution; co-ordinates and provides technical and research assistance to State Boards; provides planning and execution of nation-wide programs for the prevention, control or abatement of water and air pollution; and ensures compliance with the provisions of the Environment Protection Act, 1986.

- *State Pollution Control Boards (PCBs)* provides for the planning and execution of state-wide programs for the prevention, control or abatement of water and air pollution; advises the state government on prevention, control and abatement of water and air pollution and siting of industries; ensures compliance with the provisions of the relevant Acts; lays down, modifies or annuls the effluent and emission standards; and develops methods for treatment, disposal and utilization of effluents.

- *National Environmental Engineering Research Institute (NEERI)* is a world class engineering research institution with more than 450 scientific and technical staff. NEERI is pursuing work on cleaner technologies, pollution monitoring and control, and related subjects. NEERI's experience with industry has focused on retrofitting industrial plants with end-of-pipe pollution control technologies.

- *Ministry of Non-Conventional Energy Sources (MNES)* administers the renewable energy program which aims to supplement conventional energy supplies and meet decentralized energy needs of the rural sector through the demonstration of renewable energy systems.

- *Indian Renewable Energy Development Agency Limited (IREDA)* was created by MNES to provide financing and encourage private entrepreneurs to undertake investments in the renewables sector. A major role for IREDA is to wean technologies away from heavy government grant subsidies and supply interventions, by providing both energy consumers and producers affordable credits that initially feature concessionalterms but which progressively approach commercial market rates as the technology gains wider acceptance. IREDA has $60 million in funding available for renewables.

3.1.5 Non-Governmental Agencies

Two key non-governmental agencies have a major footprint in India's environmental marketplace:

- *Confederation of Indian Industry*

  The CII has about 3000 member companies from the private and public sectors. It provides information, advisory, consultative and representative services to both industry and government. It has 37 affiliated industry associations, and 22 divisions, including the Environmental Management Division (EMD). The EMD promotes eco-efficiency, the use of clean process technologies, waste minimization, and recycling technologies. It also provides education, training and information about appropriate environmental technologies. Goals include establishing a clean technology centre for each industrial sector, which would be focal points for international environmental cooperation.

The Pollution Monitoring and Control Equipment Division of the CII is the primary forum representing the interests of leading Pollution Monitoring and Control Equipment manufacturers in India. It has 19 members covering 90 percent of the total capacity of this industry.

CII has also set up an Information Centre for Environmental Technologies (INCET) which is a data bank on the environmental technologies available around the world, to be updated periodically.

- *Tata Energy Research Institute*

  Tata Energy Research Institute (TERI) specializes in energy research particularly in the areas of energy policy, technology engineering, and experimentation with alternative energy sources and conservation methods. It has launched GREEN INDIA 2047, a project to document the country's degradation of the environment since Independence and to develop a strategy for its regeneration in the next 50 years. The study will be released in August 1997.

In addition, India has a large and vibrant community of environmental non-governmental organizations (NGOs) which have powerful lobbying potential as well as a great deal of environmental expertise.

3.2 Economic Drivers

A number of economic drivers are boosting demand for environmental goods, services and technologies. They are largely a product of the country's liberalization process, and India's industrial development. These economic factors are only just beginning to drive domestic demand for environmental goods, services and technologies. In the years ahead, CII believes there will be a nine fold increase in the size of India's environmental purchases.

3.2.1 Reduction of Resource and Commodity Subsidies

The scale of India's commodity subsidy system is difficult for many outside the country to appreciate. Literally all major domestic product from water and lumber/pulp to basic food items were subsidized by government, either on a wholesale basis, or for specific populations. Perhaps the greatest economic shock arising from the process of structural adjustment has been the dramatic reduction or virtual elimination of many subsidies. In effect, India's businesses now largely have to pay world market prices for raw materials. For example, water-consuming industries are facing a steep hike in water charges as of 1995-96 to in order to pay for the cost of effluent treatment and promote conservation. As a result, there has been a drive for greater productivity and a search for alternative production processes and eco-efficient technologies which reduce input requirements.

3.2.2 Materials Recovery

India produces very little household garbage. Anything that is of value in solid waste is extracted by ragpickers on the street or at the landfill. The converse is true for many industries. A lack of efficient capital stock, and poor management practices means that many pollutants are not recycled or reused, and find their way into air and water waste streams. The privatization of state industries and pressure to conform with global standards is causing Indian industries to seek out environmental technologies and engineering processes which can recover materials from the production cycles for reuse and recycling.

3.2.3 Energy Consumption

India is a net energy importer with high energy input requirements due to outdated technology, poor engineering and a lack of clean fuels (e.g. natural gas). The country's energy sector relies on low grade coal which is high in ash content, leading to poor combustion efficiencies and significant disposal problems. Clean coal burning technologies and processes to extract natural gas reserves have ready markets. The conversion to these more efficient and environmentally-friendly fuels is promising and beginning to occur.

3.2.4 Environmental Liability Exposure

Environmentally-driven litigation is a relatively recent phenomenon in India. Indian companies now have to account for potential liability claims from those affected by the pollution their industries produce. Both foreign and domestic investors have begun to weigh environmental liability factors in their assessments of loan risk. The State Bank of India has taken the lead by making the screening of a project's environmental parameters a part of their financial appraisal mechanism. Indian companies, particularly those which generate hazardous pollutants as byproducts, are now modifying operations to reduce their liability exposure. This involves both the minimization of polluted effluent and emissions, and management systems which reflect due diligence concern for environmental damage.

3.2.5 Export Driven Standards

Indian companies are becoming more aggressive exporters, and must comply with international environmental standards to overcome trade barriers and enter markets such as the European Community and NAFTA. Many Indian companies are planning to attain ISO 14000 status. The Confederation of Indian Industry (CII) is currently assisting companies such as Indfos, NICCO, ICI, Indian Aluminum and Ranbaxy in developing their own EMS. Companies can seek EMS certification from the Bureau of Indian Standards (IS-13967), which is the ISO's representative body in India, or contact the CII for further information.

4.0 Environmental Market Opportunities for Canadian Companies

4.1 Market Overview

India's environmental market is embryonic. Annual sales are estimated at about $700 million, split in a 85/15 ratio between environmental products and services. It is estimated that imported goods and services comprise 32 percent of the market. The market is expected to grow up to 25 percent every year until the turn of the century. CII projects that the market's size will reach $4.5 billion by 2005.

CII recently analyzed environmental trends in India and reached three broad conclusions:

1. Although public awareness of environmental issues is currently low,especially in rural areas, it will grow and spread throughout the country over the next decade;

2. India's technical and human environmental resources will reach international standards within ten years. This will lead to a dramatic expansion of the domestic environmental products and services industry;

3. Market incentives will replace regulations and the legal system as the principal driving force of environmental improvements. The CII also foresees larger and more focused public participation in establishing and enforcing environmental standards.

The domestic environmental industry currently supplies 60-80 percent of the pollution control equipment market, with production expected to increase dramatically over the next few years. The most common equipment produced is for treating water and controlling air pollution. Due to supply gaps in environmental technologies and products available to Indian manufacturers, opportunities exist to supply materials such as membranes, resins, and activated carbon, as well as specialized technologies including filtration systems, scrubbers and incinerators. There is also a need for consultancy services in equipment design and installation as well as auditing and effluent analysis, particularly for small to medium-sized Indian enterprises.

There appear to be three kinds of suppliers of environmental technology and services in India.

1. Large and more sophisticated firms with joint ventures and licensing arrangements with foreign companies. These suppliers have experts at their disposal and are active in further development of their technologies and processes with Indian industries.

2. Domestic companies that take a *Made in India* approach, and choose to either sell outdated technologies that meets existing minimum requirements, or are researching new technologies. These type of companies tend to be concentrated in agri-food and info-tech industries.

3. A growing number of companies that provide environmental consulting and advisory services including: environmental engineering; auditing; management systems (ISO 14000); and marketing.

To penetrate India's environmental markets, Canadian environmental companies need to consider two things.

First, Indian businesses have historically put a premium on labour over capital. This is due to the relatively low cost of labour, and the difficulty in obtaining foreign currency in the past. While foreign currency is more available today, businesses still take time to make capital stock decisions. Since environmental technology has a heavy capital component, Canadian companies should appreciate this factor in the decision making of potential Indian customers.

Second, the time to enter India's environmental market is now. As market demand takes off, companies are well advised to position themselves to take advantage of this opportunity. A more cautious approach may well result in sacrificing market share to foreign competitors.

4.2 International Environmental Agreements

India is a signatory to a number of international agreements including the Montreal Protocol, the Climate Change Convention and the Basil Convention.

India became a signatory to the Montreal Protocol in 1992 and is committed to a program of phasing out ozone-depleting substances (ODS) by 2010. The Montreal Protocol calls for the complete elimination of the production and consumption of ODS over a set period of time. The MoEF has been assigned as the key coordinating agency to promote India's compliance with the Protocol.

India is eligible to receive money through the Montreal Protocol Multilateral Fund (MPMF), and uses the Industrial Development Bank of India (IDBI) and the Small Industry Development Bank of India (SIDBI) as the implementing agencies for projects that phase out ODS. Progress to date has been marginal. The SME sector accounts for two thirds of ODS consumption and has yet to benefit from the transfer of ODS phase-out technology from industrialized countries.

The Indian government has signed and ratified the United Nations Framework Convention on Climate Change. It has been a diligent contributor to climate change negotiations and participated in all global meetings. While OECD countries and the former Eastern block countries are signatories to reducing greenhouse gas emissions, India, as a developing nation, has committed only to preparing national communications on the different aspects related to climate change. India qualifies for World Bank, Global Environmental Fund and other programs which are promoting the sustainable use of energy and a reduction in carbon emissions.

4.3 Canadian and Other Foreign Competitors in India

The newly liberalized business and trade environment has opened India's markets to foreign suppliers. Several major industrialized countries are among the largest suppliers of technology. Market share by country is as follows:

Country	Market Share (%)
The United States	10
Germany	8
Japan	7
United Kingdom	6

In the arena of environmental technology, Western European countries were quick off the mark. Germany, the United Kingdom, and Switzerland now lead the pack, closely followed by the Netherlands. European firms identified India as an important emerging market in the 1980's. Through historical connections, and a substantial investment of time and money, European companies have made some inroads into India's environmental marketplace.

The major emerging market force is the US. While starting later than others, US companies have been aggressively targeting Indian markets, generally in joint ventures with domestic firms. For example, there are over 25 Memorandums of Understandings (MOU's) between Indian and US companies valued at nearly $1 billion to further Indo-U.S. cooperation in the development of renewable energy technologies in India. The US market presence has yet to pay significant dividends.

Canadian environmental companies have begun to enter the Indian market. Some companies have been active for the last 8-10 years. The market presence of Canadian environmental companies is focused on niche markets, or specific project opportunities. This is a logical approach and Canadian companies should not seek to take foreign competitors head on. There is a large enough market in India, and Canadian firms can carve out specific opportunities.

4.4 International Financial Institutions and Official Development Assistance Agencies

India's environmental market development relies on extensive support from International Financial Institutions (IFIs), and Official Development Assistance (ODA) agencies. The World Bank, the Asian Development Bank (ADB) and International Finance Corporation (IFC) are very active in India, providing grants, equity and debt financing for environmental enterprises and projects. The Canadian International Development Agency (CIDA) is of primary importance to Canadian firms. There is also a significant ODA presence from Japan, USAID, Western European and Scandinavian countries.

IFI capital is driving the capacity development of the country's environmental industry. Funds are most often targeted around specific pollution problems.

Key IFI Initiatives

- *Water and Wastewater Infrastructure*

  The World Bank has approved a loan of $292 million for sewage disposal in Bombay. The project will remove domestic sewage and industrial waste from the inner city's natural water courses, surface water drains, shore line and beaches. A similar facility of $336 million has been recently approved to finance urgent water requirement in Madras.

- *Environmental Management*

  ADB has entered into an arrangement with the IDBI and provided $585,000 to strengthen the management and institutional capability of the Bank to assess and finance energy efficiency and environmental pollution control equipment lending.

- *Hazardous Waste Management*

  India's acute hazardous waste problem has led to the World Bank providing the government with a line of credit of $300 million to support implementation of the country's policy on hazardous materials and hazardous wastes.

- Wardrop Engineering Inc. (Winnipeg, Manitoba) is developing a strategic investment plan and preparing a project for World Bank funding to implement a programme for the management and treatment of industrial hazardous wastes and to monitor surface and ground water quality in the city of Madras. The $1 million project will include formulating a strategy for the handling and disposing of hazardous wastes; development of an investment plan to be implemented over a 20 year period; and the identification of projects and the compilation of preparation documents to meet World Bank requirements.

- *Renewable Energy Development*

  ADB has allocated $150 million to promote renewable energy development for industry. Areas of focus include bio-methanation of industrial effluents, bagasse, solar thermal and wind energy. A major concessional credit line from the World Bank has also supported IREDA's renewable energy work for some time.

- *Environmental Enterprise Development*

  IFC has taken an equity position with Credit Capital Corporation a number of investment and venture capital funds in India including the SARA Fund. These funds, while not explicitly targeted at environmental industries, have placed capital in environmental companies, and represent a source of seed financing for the sector.

- *Industrial Pollution*

  The World Bank has a number of facilities for Indian industries to address specific pollution prevention problems. $155 million has been set aside for loans to industry for improved handling of PCBs. The states of Gujurat, Maharshtra, Tamil Nadu have been allocated $30 million for funding of Common Effluent Treatment Plants (CETPs) for clusters of SME's. The Bank has $200 million for loans to SMEs for pollution prevention and control measures and technologies that also have clear economic benefits.

- *Urban Infrastructure Development*

  In the southern state of Karnataka, the ADB has provided $105 million for improved urban infrastructure, including sewage facilities, in the cities of Mysore, Tumkar, Ramanagaram and Channapatna.

- *Fly Ash Disposal and Management*

  Water and Earth Science Associates Ltd. (WESA) of Ottawa, Ontario, has been retained by the World Bank to complete a study of current practices used in India and alternate technologies used internationally for the environmental management and disposal of fly ash.

The presence of IFIs in India is equaled in commitment, if not fiscal scale, by ODA agreements. India's development challenges are profound. ODA agencies were among the first organizations to appreciate the need to integrate environmental factors into development.

CIDA's strategy for India is a prime example. The Agency's environmental initiatives reflect two main objectives. First, to minimize the negative environmental effects of energy production and consumption, especially through efforts to enhance energy efficiency and conservation. Second, to improve land and water resource management.

CIDA has two main environmental mechanisms that are of interest to Canadian environmental companies, beyond the conventional role of the Agency's Industrial Cooperation Program.

- The India-Canada Environment Facility of $72 million is a counter-part fund set up to support local initiatives in environmental management, with a focus on water and energy management problems related to poverty. There is very limited opportunity for the Canadian private sector in this project.

- The CII Environmental Managment Project aims to assist the CII develop the capacity to porvide advisory services on environmental audit and managment issues to its membership. The Canadian Executing Agency will likely have to contract appropriate Canadian consulting services. A number of opportunities will arise for Canadian companies from this project in the areas of training, technology transfers and the adoption of eco-efficient measures in India.

In addition to CIDA's market presence, Canadian environmental companies can, in some cases qualify for ODA programs supported by other countries such as Japan International Cooperation Association (JICA), USAID and others. Usually this will involve joint venture participation with other foreign countries resident in the relevant country.

5.0 Environment Market Opportunities Segments

Environmental market opportunities in India are concentrated in a number of key business areas. Broad-based market opportunities will arise in the long term. Canadian environmental companies will find a receptive Indian environmental market in the following market segments:

- Solid and hazardous waste management;
- Air technologies;
- Water and wastewater technologies;
- Clean energy (energy efficiency and renewable energy technologies);
- Environmental services.

At the top of the Indian government's list of environmental priorities are cleaner-process technologies, low-waste technologies, and reuse/recycling projects. Major government projects underway include small-scale common effluent treatment plants, sewage treatment plants, river clean-up projects, waste disposal site development, clean energy generation, mass rapid transit systems and industry relocation. An increasingly stringent environmental audit process feeds a growing market for consultancy services, including monitoring, sampling, auditing, laboratory analysis and environmental impact assessments. Major opportunities exist in the design and construction of effluent treatment plants, hazardous waste disposal systems, emission control technologies for industry and vehicles, reforestation, waste minimization and energy-efficient technologies.

There are key sectors in the Indian economy that have specific technology needs and provide good opportunities for Canadian companies. Addresses for Indian companies are listed in Appendix A.

5.1 Solid and Hazardous Waste Opportunities

Solid waste management and disposal is a major environmental problem, particularly in major urban centres such as New Delhi, Bombay, Madras and Calcutta. The volume of garbage has increased with the growth in population and an improved standard of living. Methods for collection however, have largely remained static.

The volume of industrial hazardous waste is increasing rapidly. A growing appreciation of the benefits of eco-efficient technologies, awareness of the destruction of eco-systems, and increasing government pressure is pushing industrial concerns to seek technological and management solutions to these problems.

5.1.1 Solid Waste Management

Market Overview and Current Activities

In Delhi, about 1500 tonnes of solid waste (representing 30 percent of waste generated) is left uncollected every day. Solid waste in India consists of over 90 percent organic matter which cannot be incinerated. Sanitary landfilling exists near the capital, but it is not of a high standard. Ground water protection measures for the sites are inadequate with no distinction made between clay and silt liners. Regular testing of underground water at landfill sites is not carried out, increasing the threat of water-borne diseases. Technologies for composting, pelletization and waste-to-energy technologies using anaerobic digestion are ideal applications for solid waste disposal in India.

India's municipal leaders are beginning to take action.

Indian Solid Waste Initiatives

- Bombay generates approximately 4500-6000 tons per day of solid waste, of which not all is collected. During the plague scare last fall, the Bombay Municipal Corporation (BMC) implemented extra shifts for garbage pickup and fumigated dumping grounds and garbage heaps in residential areas but discontinued once the plague receded from headlines. Given the large volumes of waste generated, and lack of government funds, personnel, and infrastructure, the BMC is actively considering the privatization of waste disposal. This would open this sector to a wide range of equipment, technology, and services. Interested companies should tie-up with Indian recycling and disposal companies.

- Calcutta's garbage will be recycled into fertilizer when a plant for bio-conversion of the city's solid waste goes into production by the end of this year. Executed with technology from Excel Industries of Bombay, the plant and the technology will be replicated gradually in other municipalities of West Bengal.

- The World Bank made capital available to finance a plastic recycling plant that now recycles 2 percent of the nation's polyethylene.

- Rama Newsprint and Papers Ltd. is the *first* company to produce newsprint from old newspapers and magazines.

Technology Opportunities

These innovations merely scratch the surface of India's pent-up solid waste management requirements. India's cities and governments need waste management know-how, technology and capital. Specific business opportunities for foreign solid waste management companies include:

- Waste recovery technologies that reuse and recycle solid waste into secondary products. Several Canadian companies have developed cost-competitive technologies that use a number of separated or integrated solid waste products to make building systems, extruded plastic waste products and wood waste fibre board. All of these secondary products are in high demand in India's booming construction and consumer products sectors. An additional plus is the fact that collection costs in India are a smaller percentage of waste recovery expenses due to lower labour costs.

- Solid waste management systems planning for major urban areas. The outbreak of pneumonic fever in 1994 has prompted Bombay, Ahmedabad, Bangalore and Baroda to reform solid waste collection and disposal. They all require collection, reuse and recycling, incineration and landfill systems.

- Urban sanitation and environmental management in West Bengal where the government of Japan, through its official development assistance agency, is funding $200 million for environmentally sound industrial estates.

Potential Indian Collaboration Partners

SUPPLIER'S NAME	*TECHNOLOGY DEMAND*
Western Paques (India) Limited	Municipal waste handling and transportation systems

Existing Joint Ventures

INDIAN COMPANY	*FOREIGN PARTNER*
Western Paques (India) Limited	Paques B.V. of Holland

5.1.2 Hazardous Waste Management

Market Overview and Current Activity

Hazardous waste management promises huge growth potential in India over the next five to ten years. The estimated market size for hazardous-waste handling equipment in 1993 was $62 million, with a projected 1995 value of $132 million. Almost all the major states have been asked to create one or more hazardous waste landfills by the MoEF. Orderly hazardous waste incineration is carried out only by a few large operators and most disposal is uncontrolled.

Urgent hazardous waste problems are present in a number of industries:

- The Indian chemical industry is a major producer of hazardous waste; both organic and inorganic chemicals for pharmaceuticals, fertilizers, pesticides, textiles, plastics and detergents. India uses 100,000 tonnes of pesticides a year, much of which contain compounds banned in North America. Synthetic chemical fertilizers are a major source of hazardous waste, with increasing levels of nitrates found in soil and water.

- Toxic chemicals are also produced and handled in traditional small enterprises such as dyeing, textile printing, leather processing, and metalwork. Many of these smaller industries are located in densely populated urban areas, resulting in growing levels of untreated water, air and solid pollutants. Reliable monitoring technologies for these operations are required in the short term.

- Heavy industries, including automotive, pulp and paper and steel, produce a range of toxic air and water effluent that requires remediation, or process systems that prevent pollution.

India has a limited technological capacity in the field of industrial and hazardous waste treatment. Although chemico-physical treatment processes are available, they are rarely used in the treatment of hazardous wastes.

Risk assessments are now included in environmental impact assessments and for projects that require handling of hazardous substances. Efforts are being made to create and maintain a data bank for hazardous chemicals and accidents. Data bases like the Canadian CCINFO, CTEC5 and POISINDEX in microfiche are being used for this purpose.

Technology Opportunities

Indian industry needs assistance with hazardous waste management, toxic materials treatment and disposal, soil decontamination procedures, waste pre-treatment systems and incineration plants. Also, there is a demand for an entire range of know-how with respect to process technology and planning for hazardous waste incineration plants in India, especially for low-capacity (less than 20 t/d) plants. About 34-45 hazardous waste incineration plants are planned for construction within the next ten years.

Canadian firms can provide some specific hazardous waste sector technologies in a number of areas.

- Rapid thermal pyrolysis technology for conversion of waste materials.

- Incineration, stabilization and solvent extraction technology for control of BOD, COD, toxic and hazardous sludges.

- Mechanical process and material handling equipment for industrial and medical waste, as well as for nuclear technology.

- Fly ash and blast furnace slag treatment remediation.

- Solvent recovery systems in dyes and chemical units, pesticide and agrochemical units, and technologies for recovering metals from effluents particularly in the tannery and electroplating industries.

- Electrodialysis technology for control of heavy metals in metal processing and finishing industries and ion exchange technology for control of heavy metals, cyanides and fluorides in the metal finishing, pulp and paper, distillery, and electronics industries.

- Incineration of volatile organic compounds and application of electro-coagulation technology for control of BOD and COD in the textiles and paper industries.

- Hazardous fly ash disposal technologies including: hazardous waste incineration; fly ash utilization; mechanical dewatering; disposal site technology; treatment of dusts; sludge conditioning; waste-to-energy technologies, including anaerobic treatment for gas recovery and utilization sought by pharmaceutical plants, sugar and distillation industry and food processing units. The government of India's goal is the utilization of all fly ash within the next 10 years, with only dry ash removal systems to be approved for new power plants. The National Ash Utilization Marketing Corporation has a key role to play in this process.

Both front-of-pipe and end-of-pipe environmental technologies to reduce industrial hazardous waste are major environmental market opportunities in India.

Potential Indian Collaboration Partners

SUPPLIER'S NAME	*TECHNOLOGY DEMAND*
Bass Pollution Control Systems Ltd. Bangalore	Waste pretreatment incineration
Engineers India Ltd., New Delhi	Incineration and treatment systems for refinery and petrochemical sludges
Hindustan Dorr-Oliver Ltd., Bombay	General-purpose incineration system and waste pretreatmnet; refinery sludge treatment

Mysore Kirloskar Ltd., Banagalore	Incineration systems
Paramount Pollution Control Ltd., Vadodara	Advanced burners for waste incineration plants

Existing Joint Ventures

INDIAN COMPANY	*FOREIGN PARTNER*
Thermax Ltd., Pune	Sulzer, Switzerland (through Ghelfi)
Paramount Pollution Control Ltd., Vadodara	Anderson, USA

Potential Joint Ventures and Opportunities

- **Shiriam Engineering Construction** is part of a leading group based in South India. The company is involved in construction of industrial buildings and wastewater treatment plants. They are interested in collaboration with Canadian companies to quote for jobs within India and the middle east.

- **S & S Industries** is a diversified group that manufactures pollution control equipment. They are interested in collaborating for water and wastewater treatment.

- **The Eimco-KCP Ltd.** is a leading manufacturer of chemical process equipment servicing Solids-Liquid Separation Technology viz., rotary vacuum filters, thickeners, clarifers. The company is also a turnkey contractor for water and wastewater treatment plants and is keen to tie-up with Canadian companies to bid for these jobs.

- **SPIC-SMO** is a part of another leading business group involved in turnkey projects, power engineering and environmental engineering. They have a specific interest in biotechnology based water treatment systems.

- **Indocan Engineering Systems Pvt. Ltd.** (Pune, Maharashtra), has had a successful joint venture with Peekay Holdings Ltd.(Brantford, Ontario). They are interested in further joint ventures in wastewater and sewage treatment systems.

- **Pollutech (Madras) Limited** has been involved in water and wastewater treatment for the last 15 years and is interested in upgrading its technology.

- **Clear Water Limited** is a turnkey contractor for water treatment plants and is looking for Canadian collaboration to upgrade its technology.

Canadian Technology in Action

Chemical Recovery

- **Eco-Tec Inc.** (Pickering, Ontario) supplied the Steel Authority of India, Salem Steel Plant (Tamil Nadu) with a state-of-the-art acid purification system to purify, recover and recycle the nitric and hydrofluoric acids used in stainless steel pickling. The turnkey project, financed through the World Bank, was signed in late 1993 and started up in mid 1994. Eco-Tec recently signed an exclusive distributorship with India's Thermax Ltd. Areas of interest are steel and aluminum finishing, electroplating and water deionization for the power generation industry.

5.2 Air Pollution Technologies

Market Overview and Current Activity

Air pollution in India is severe, particularly in the country's most congested urban centres. Of the 10 cities in the world suffering from the highest levels of air pollution, three are in India - Bombay, Calcutta and Delhi. Over 2,000 tonnes of pollutants are emitted daily in New Delhi alone, 70 percent of which is produced by vehicles.

Industry is another major source of India's air pollution, with power generation and cement manufacturing comprising the bulk of polluting activities. Over 45 million tonnes of coal ash are produced annually by a wide range of industries and could reach 100 million tonnes by 2007.

Emission standards for air pollutants are set out in the Air Prevention and Control of Pollution Act. Major polluting industries affected by these regulations include integrated iron and steel, oil, fertilizer, chloralkali, thermal power, cement, sulphuric and nitric acids.

India's coal-driven power plants are the largest sources of suspended particulate matter (SPM). Coal-fired thermal power plants that have pollution control equipment use high-maintenance, low-efficiency electrostatic precipitators (ESPs). The cement industry is another major producer of SPM from coal burning and limestone crushing. Some 20 percent of Indian cement plants have no pollution control equipment due to cost or space restrictions. Only about 3 percent of all limestone quarries have installed equipment.

The transport sector accounts for the largest portion (70 percent) of urban pollution and is the fastest growing source of air pollution in the country. The two primary solutions to this are to convert two-stroke engines to four-stroke methodology. The government now requires that all four-wheeled vehicles sold in metropolitan centres be equipped with catalytic converters. Strict lead control standards will be enforced beginning April 1, 1996. There are also now 154 unleaded gasoline retail outlets in major India centres. The installation of natural gas fuel systems for vehicles may also have potential.

Mining, quarrying and stone-cutting operations are the main source of air-borne inorganic toxins. Toxic organic dust is chiefly produced in textile mills, ginning plants, sawmills, jute and hemp processing plants, and coir retting and processing. Asbestos is also still used in India.

Technology Opportunities

The air pollution control equipment (APCE) industry requires large private sector investments to meet the increasing demand. It is estimated that the market will increase from $120.27 million in 1992 to $293.6 million by 1996, at an annual growth rate of 15 percent. Existing demand for air technologies and products in India include:

- Specialized Incinerators
- Flue gas desulphurization
- Platinum
- Fabric filters
- Gas measuring devices
- Cyclones
- SPM Reduction Processes
- Gas Desulphurization/Filtration
- Dry scrubbers and technology
- Sophisticated bag filters
- Wet electrostatic precipitators
- Waste gas coolers

Potential Indian Collaboration Partners

SUPPLIER'S NAME	*TECHNOLOGY DEMAND*
MIL Industries Limited	State of the art air pollution control systems.
Titanium Tantalum Products Pvt. Ltd.	Automobile catalyst Cathodic protection

Existing Joint Ventures

INDIAN COMPANY	*FOREIGN PARTNER(S)*
Thermax Ltd.	Zurn Industries, US GE Environmental, US
Batliboi & Company	Peabody Holmes, UK Control Systems, US
Bharat Steel Tubes Ltd.	Air Industrie Environment, France
Hindustan Development Ltd.	James Howden & Co., UK C.E. Air Preheater, US United Megill Corp., US

Larson and Toubro Ltd.	F.L. Smith, Denmark Radian Corp., US John Zink, US
Triveni Engineering	Envirex Inc., US
Madras Industrial Linings (MIL)	Environmental Elements, US

Canadian Technology in Action

Canadian companies currently have a relatively minor position in India's nascent air pollution industry although they are among the best in the world.

Air Purification

- Esco Engineering (Kingsville, ON) formerly Ledge Engineering Inc., has a loose collaboration agreement with S. K. Systems Pvt. Ltd. of New Delhi for air purification equipment, primarily fume scrubbers. Ledge sold a set of designs and drawings to S.K. Systems in 1988 to manufacture the equipment locally and has since provided ongoing support service.

Environmental control equipment

- Babcock & Wilcox, Cambridge Ontario, has been active in India for over 50 years. In 1989 they formed a joint-venture manufacturing company with a well known large industrial company called Thermax to form Thermax Babcock & Wilcox, to pursue the industrial boiler market. Last fiscal year sales for Thermax Babcock & Wilcox exceeded $40 million. A major market for B&W is environmental control equipment for power and industrial plants and industrial users .

5.3 Water and Wastewater Technologies

The demands placed upon available sources of water in India is severe. The size of the country's population coupled with burgeoning consumer and industrial growth outpaces the supply. In large measure, this is a consequence of poor management, out-dated technology and inefficient systems.

There is both industrial and consumer demand for improved water supply and quality, and wastewater services. Municipal discharges represent two-thirds of India's wastewater effluent - industrial pollutants contribute the remaining third. As part of its reforms, the government is liberalizing water prices, which it hopes will lead to an improved national water and wastewater system.

5.3.1 Industrial Requirements

Market Overview and Current Activity

Indian industry needs clean water for a range of industrial operations and is being pressured by the Central Pollution Control Board and the courts, to improve water discharge quality. Wastewater is commonly discharged into lagoons or dumped on low-lying areas without any pre-treatment, contaminating ground waters and salinizing soils. Scarcity of water and tighter pollution control measures have prompted Indian industry to seek alternative systems that reduce, recycle and reuse water in the production process.

Technology Opportunities

There is a need for practical and cost-effective wastewater technologies. Indian industry requires specialized physio-chemical and thermal treatments of wastewater. Flotation technologies, currently used primarily in the pulp and paper industry for material and water recovery, are in demand in the dairy, sugar, textile processing, coal, leather, oil exploration and petrochemical industries.

The Indian environment industry has access to conventional technologies to treat organic wastewater from industrial and municipal sources but has yet to fully implement such systems. Advanced technology is still scarce in areas such as anaerobic treatment of highly organic wastewater from distilleries, food processing and pulp and paper with methane recovery.

Specific water and wastewater technologies that have application in India include:

- Absorption technology for control of BOD and toxic compounds in the textile, paper, and fibres industries, among others;
- Ozonation technology for control of toxic chemical and pathogens in the iron and steel, dye, paper and pesticides industries;
- Reverse osmosis for control of dissolved inorganics for industries requiring water reclamation;
- Ultrafiltration technologies for the control of COD, as well as dissolved polymers and coloidals in the dairy, oil refinery, wood, breweries, paper and paint industries;
- Ion exchange technology for control of heavy metals, cyanides and fluorides for the metal finishing, pulp and paper, distillery, and electronics industries;

- Floatation technologies for the 500-600 flotation plants that will be built within the next ten years, particularly in the mineral oil, pulp and paper, food, tanning and textile industries;
- Electrodialysis technology for control of heavy metals in metal processing and finishing industries;
- Zinc recovery from Rayon wastewaters;
- Oil separators.

Canadian companies have a strong position in the industrial water and wastewater sector in India. They are well-placed to pursue a range of opportunities and assume a significant share of the market.

Potential Indian Collaboration Partners

SUPPLIER'S NAME	*TECHNOLOGY DEMAND*
EIMCO-KCP Ltd., Madras	Anaerobic wastewater treatment with biogas production. Belt filter presses. Separation of oil from wastewater.
KEC International Ltd., Pune	Easy to operate anaerobic wastewater treatment system for low-pollution wastewaters from the food industry, pulp and paper industry as well as dairies. Belt filter presses. Separation of oil and solids by combining dissolved air flotation with polyelectrolyte dosing; recovery of chemicals and water; treatment of wastewaters from coal benefication plants.

Geo-Miller & Co. Ltd., New Delhi	Upflow anaerobic sludge blanket (UASB), technology for the treatment of high-pollution wastewaters. Aerobic plant packages according to the submerged aerator principle or as simultaneously stabilizing activated sludge plant. Separation of oil from wastewaters from oil wells, refineries and the petrochemical industry.
Mysore Kirloskar Ltd., Bangalore	Belt filter presses. Aerobic plant packages as simultaneously stabilizing activated sludge plant; system should be fitted with diffused air aeration.
Paramount Pollution Control Ltd., Vadodara	Rotary flters and belt filter presses. Sludge thickening.

Existing Joint Ventures

FOREIGN COMPANY	*INDIAN PARTNER*
Degremont, France	Degremont India Ltd.
Dorr Oliver, USA	Hindustan Dorr-Oliver Limited
EIMCO, USA	Navbharat Envirotech Pvt. Ltd./ EIMCO-K.C.P Ltd., Madras
Inka Systems, U.K.	KEC International Ltd.
Larson International Inc. USA	Reva Enviro Systems Pvt. Ltd.
Linde, Germany	Mysore Kirloskar Ltd.
Peekay. Holdings Ltd. Canada	Indocan Engineering
Pennwalt, USA	Pennwalt India Limited

Canadian Technology in Action

- Indocan Engineering Systems Pvt. Ltd. (Pune, Maharashtra), has had a successful joint venture with Peekay Holdings Ltd.(Brantford, Ontario) since 1983. Indocan makes large water purification systems for heavy industry clients such as utilities, refineries, steel mills etc. It manufactures the systems in India and imports some parts and expertise from Canada. It has had success in selling influent systems, and has sold some effluent systems. Recently the company signed a technical collaboration/licensing agreement with M/S Nippon Rensui Co., a subsidiary of Mitsubishi Chemical Industries.

- ADI Systems Inc. (Fredericton, New Brunswick) entered into a technical collaboration agreement with UEM (India) Private Limited in 1985 for ADI's anaerobic treatment with biogas generation. Out of the over 25 anaerobic systems executed by UEM with technical input from ADI, the most notable is the McDowell Group, one of the largest distillers in India, that has adopted ADI anaerobic technology (ADI-BVFÆ) for several of its distilleries. Also, Reliance Industries will be using an ADI-Hybrid technology for anaerobic treatment of its plant wastewater in Hazira.

5.3.2 Water and Wastewater Infrastructure

Market Overview and Current Activity

The market for water and sewage infrastructure in India is staggering. More than 300 million people have no access to safe drinking water, and more than 700 million live without proper sanitation. In major urban centres, less than 5 percent of total wastewater generated is collected and less than 25 percent is treated. Only 21 of India's 3,245 larger towns and cities have partial or full sewerage and sewage treatment facilities.

It is estimated that $100 billion will be needed to install standard wastewater collection and treatment infrastructure in Indian cities. To supply clean water an additional $22 billion would have to be added to the bill. Given the dimensions of this challenge and other pressing infrastructure demands, particularly in the transportation sector, demand for water and wastewater infrastructures and services will grow gradually in the short term. However, the commitments of IFIs to clean water, sewers and wastewater treatment infrastructure is creating an attractive market for Canadian water companies.

In the medium to long term, the market's prognosis is excellent. Rising standards of living, and heightened concerns of water quality and human health will likely result in large fiscal allocations for improved water infrastructure at the municipal and state level.

- A new concept of municipal sewage treatment has been developed by the Karnal Agricultural Research Institute. Sewage is pumped into a plot of land where eucalyptus trees are planted and can be used for commercial purposes. The MoEF is looking to repeat this innovation in other cities.

Technology Opportunities

India's local planners are looking to foreign companies for the transfer of water and wastewater management skills and technical know-how. Domestic companies, particularly engineering firms, are seeking joint venture arrangements. Also, state governments are making overtures to attract water infrastructure debt financing, either on market or concessional terms.

India's water infrastructure technology interests are fairly straightforward:

- Sludge dewatering systems;
- Sewer construction;
- Aeration systems;
- Anaerobic, aerobic, ozonation, ultrafiltration and reverse osmosis water purification and wastewater treatment systems.

Penetration of India's water and wastewater market over the short term will likely be through systems planning, training and technical upgrading contracts. This is one strong suit of Canada's vigorous water-based engineering, management and technology sector. The country's municipalities are keen to establish an understanding of their needs through relationships with off-shore firms, prior to approving major infrastructure expenditures.

Canadian Technology in Action

- R.V. Anderson Associates Ltd. (Ottawa, Ontario) reached an agreement with the Municipal Corporation of Greater Bombay to improve operations of the Bombay sewage system. The company will provide technical and engineering expertise, as well as training and development of manuals and operations procedures. The 6-year $2 million project is funded by the World Bank, and is the foundation of a potential water infrastructure project in Bombay. The Ontario Clean Water Agency, the Regional Municipality of Ottawa-Carleton are a part of R.V. Anderson's team.

Over the longer term, Canadian water infrastructure technology and service companies may wish to explore joint venture partnerships with other foreign partners in the construction, project management and financial service industries to market comprehensive turnkey solutions to the Indian market.

5.4 Clean Energy

Environmental preservation is inter-linked with the provision of more sustainable sources of power. It will be increasingly difficult for India to address its air pollution and hazardous waste problems without a transition to more efficient forms of energy. Energy efficiency and the introduction of Renewable Energy Technologies (RETs) are, therefore, environmental market opportunities with great potential. Clean energy is a front-of-pipe solution to many environmental problems such as climate change.

5.4.1 Energy Efficiency

Market Overview and Current Activity

India has an existing energy shortfall and massive energy requirements over the next several decades. The country has plans to add 5,000-6,000 Megawatts (MW) of power generation capacity annually in the next decade. Even with this growth, the nation will still face energy shortages of about nine percent, and peak power shortages of 20 percent. There are business opportunities to bridge this power gap (totaling 30,000 MW) through participation from the private sector and foreign investment in energy efficiency. These opportunities are becoming more attractive as energy prices rise through the liberalization process.

Technology Opportunities

India requires energy efficiency technologies in the following areas:

- Heavy and small-scale manufacturing;
- Buildings and building systems;
- Transportation;
- Energy generation and distribution.

The use of outdated technologies and practices in India's industries results in energy waste. India's buildings are not equipped to manage large energy loads, and air conditioning and other buildings systems are rife with energy loseses. The Building Materials and Technology Promotion Council (BMTPC) under the Ministry of Urban, has commissioned a research program on "Energy in Building Materials" which is being executed by Development Alternatives. The country's truck and bus fleets run largely on diesel fuel, and existing reserves of natural gas have not yet been exploited.

There are strong incentives to promote energy efficiency as a cost-effective alternative. With nearly 40 percent of energy lost during the distribution process, immediate opportunities lie in modernizing current generation and delivery systems. Major investment is required in technology upgrading for the efficient generation, transmission and utilization of commercial energy.

Indian government and industries are seeking technologies to improve energy conversion efficiency. Fluidized-bed combustion of India's low-quality coal can reduce SO2 and NOx emissions. Advanced gas turbines are an attractive technology, whose high operating efficiencies, small modular size, and short construction lead times are best suited to private power producers with limited capital.

5.4.2 Renewable Energy

Market Overview and Current Activity

The Indian government has introduced incentives for the alternative energy sector. These include an accelerated depreciation on machinery, low import duties on equipment and spare parts, free access to technology through imports and tie-ups, and remunerative prices for power channeled through existing power grids. India's Ministry of Non-Conventional Energy Sources (MNES), through the government-owned Indian Renewable Energy Development Agency (IREDA), is financing joint-venture RETs projects.

MNES has proposed to install 42,000 MW of power generation through renewable energy sources by 2007, subject to financial resource mobilization and appropriate technology development and upgrading.

Technology Opportunities

Some sources of renewable energy under consideration are municipal solid wastes, sewage sludge, wind pumps, energy plantations, solar thermal systems, and distilled wastes. Wind turbines and photovoltaics are now viable sources of energy for the 50 percent of India's vast rural population that currently remains without electricity. In addition, there is a potential of 16,000 MW from agro-waste and rural biomass.

The estimated potential for wind power is around 20,000 MW. There has been exponential growth in the wind power sector in the last two years as it has caught the imagination of the private sector. Some 306.5 MW have been installed and another 300 MW is in various stages of implementation. A good infrastructure for manufacturing and the installation of wind power generation systems and equipment have been created in India.

The Indian photo-voltaic (PV) market is now estimated to be the largest in the world with seven to nine MW/year in new capacity, and a potential market of 140 MW for high income users. Existing applications and markets are primarily for radio phones, street lights, water pumps, and portable lanterns. A number of manufacturers are planning to use India as a base for exporting technology to other Asian countries. Canadian firms could explore niche market opportunities in on the rapidly growing PV powered wireless telecom market.

Canadian energy, environmental and industrial process companies are experienced in providing energy efficiency and RETs solutions. They should look to India as a major emerging market.

Potential Joint Ventures and Opportunities

SUPPLIER'S NAME	*TECHNOLOGY DEMAND*
Titanium Tantalum Products Pvt. Ltd.	Solar energy

- **M.K. Sanghi Group** proposes to establish a plant for the manufacture of non-conventional energy equipment including windmills, solar equipment, bio-gas generators, etc. They are looking for identification of product, technology tie-ups.

Indian PV Manufacturers

EXISTING FIRMS	*NEW PLANTS*
CEL (1.8 MW)	Siemens Solar
REIL (1.2 MW)	Solec/Pentafour
BHEL (1.2 MW)	Udhay/EPV
Tata BP (1.0 MW)	Bharat
RES (0.5 MW)	

Canadian Technology in Action

- Statpower Technologies Corp. (Burnaby, British Columbia) is negotiating with TataBP of Bangalore on a joint venture to locally manufacture invertors for solar panels.

5.5 Environmental Services

Market Overview and Current Activity

The services segment of India's environmental market is relatively untapped. As the market takes off, the small environmental services capacity is likely to be a major bottleneck to the growth of the industry in the country. IFIs have come to appreciate this situation, and have supported a large number of capacity-building initiatives focused on environmental services.

Opportunities

Environmental audits are now mandatory which should add about $3.57 million to the consultancy sector currently estimated to be worth about $8.92 million. Compulsory environmental impact assessments for large projects are also a growing business area.

Environmental services opportunities are a first rate way for a Canadian environmental company to enter India. The good news is that funds have been earmarked for many projects, either by IFIs or the Indian government.

Canadian Companies in India

Canada has a potent environmental services industry. Engineering and scientific-oriented firms, information technology companies, environmental and management consulting companies are some key services in which Canada has world class capability.

- *Pollution Abatement Planning*

  Stanley Associates Engineering Ltd. (Edmonton, Alberta) recently completed their first project in India: the development of an industrial and hazardous-waste pollution abatement program for Tamil Nadu State. The $500,000 technical assistance project, funded by the Asian Development Bank, was completed in cooperation with the Mott MacDonald Group (UK), Alberta Special Waste Management Corporation, and local partner M. N. Dastur & Company.

- *Environmental Management Planning*

  Norwest Mine Services Ltd. (Calgary, Alberta) is preparing an environmental management plan for Bharat Coking Coal Ltd. in the Jharia Coal Field in Bihar State. The 21-month $2.1 million project is funded by the World Bank. Some 70 coal fires are currently burning in the area, creating severe strain on the local environment and approximately two million people living nearby. Norwest is working with two Vancouver-based sub-consultants on the project, the ARA Consulting Group Inc. and Cirrus Consultants, as well as two local partners in India.

- *Environmental Auditing*

  O'Connor Associates Environmental Inc. (Calgary, Alberta) is performing an environmental audit for a major state oil company in India. The project is being funded by the client and implemented by Canadian engineers. The company is currently negotiating a second project in India.

- *Environmental Information Systems*

  ESSA Software Ltd. (Vancouver, British Columbia) has entered into a joint venture with Tata Consulting Services in Pune to manufacture environmental applications software. The ADB-financed project totaling $1 million is nearing completion with testing expected to commence in July 1995. The software will constitute a decision-support system to assist the ADB, government agencies, and companies in conducting environmental impact assessments.

SUPPLIER'S NAME	*TECHNOLOGY DEMAND*
TMT (India) Limited	Paper mill equipment, finishing house and coating equipment, chemical recovery systems for paper mills pollution control equipment.

- Kinetics Technology India Ltd., a manufacturer of process equipment for chemical and petrochemical industry is intersted in Canadian companies who could offer co-generation equipment and air blowers.

Existing Joint Ventures

INDIAN COMPANY	*FOREIGN PARTNER*
Flakt India Limited	ABB Environmental Services of the U.S.A.
MIL Industries Limited	Environmental Elements Corporation, USA

Major Indian Consulting Firms

- National Environmental Engineering Research Institute
- Engineers India Limited
- R.P.G. Enterprises Limited
- Metallurgical and Engineering Consultants (India) Limited
- Project Development India Limited (PDIL)
- Hindustan Dorr-Oliver Limited (HDOL)
- Tata Consultancy Engineers (TCE)

5.6 Key Industry Sectors

The Indian department of the environment (1991) has placed specific industries considered to have a particular impact on the environment on priority list:

- Cement mills over 200 t/d
- Distilleries
- Sugar
- Oil refineries
- Sulpheric acid production
- Petrochemicals
- Tanneries
- Dye and dyestuff intermediates
- Copper smelting plants
- Thermal power plants
- Fertilizer
- Iron and Steel mills
- Pulp and paper
- Caustic soda production
- Pesticides
- Pharmaceuticals
- Zinc smelting
- Aluminum smelting plants

The three industries that have the most potential for foreign collaboration and that could be realized within a short time period on a private-economy basis are thermal power plants, the foundry and pesticide industries.

Thermal power plants

Thermal power plants produce a significant amount of waste and have a negative environmental impact in terms of wastewater and air emissions. Huge amounts of fly ash byproduct is the most significant pollution problem. Existing capacities for thermal power plants will expand significantly in the near future, and the Indian government is applying significant pressure for action in the following areas, each of which require technology solutions:

- Fly ash utilization
- Coal benefaction
- Upgrading/retrofitting of existing power plants
- Fluidized bed firing (for small power plants and for the utilization of residues from coal benefaction)
- Primary measures for nitrogen oxide removal
- Flue gas desulphurization
- Fabric filters (for smaller blocks)
- Continuous waste gas measuring devices (SO2, NOx, dust, CO, CO2, O2).

Iron and Steel Foundries

Foundries emit significant levels of pollution including solid hazardous wastes and air emissions. They are considered to be an export-oriented growth industry, and therefore modernization of the existing plants is necessary, and supported by special measures in several states. Pollution prevention equipment can be integrated into new production technology as it is introduced. This will require technology solutions in the following areas:

- Semi-automatic moulding machines for mechanization in small foundries
- Sand regeneration
- Automated core production processes
- Coated electrodes for electric arc furnaces
- Hot gas filtration
- Efficient sand coolers
- Improved sand mixers
- Heat recovery for heat treatment furnaces
- Metal filters
- Spectrometers
- Full mould casting processes.

Pesticide Industry

The environmental relevance of pesticide production is strongly influenced by the type of pesticide produced. Process steps like filtration and drying are frequently carried out by outdated machines. Closed dryer systems are rarely used and there are general shortcomings in measuring and control technology. The technical standards of most incinerator plants for hazardous waste disposal are completely inadequate. The Indian pesticide industry is considered to be internationally competitive, though its position can be enhanced with the introduction of a number of key technologies, including:

- Hazardous waste incineration
- Mechanical dewatering
- Closed dryer systems
- Automated measuring and control technology for production plants
- Adsorptive wastewater cleaning
- Ozonation systems for wastewater treatment.

6.0 Environmental Market Penetration Strategies for India

6.1 A Mindset for the Indian Market

There are three basic requirements for Canadian companies considering the Indian market: a niche, an agent, and perseverance.

India is a large and complex country. Most foreigners are shocked at the country's development, business sophistication and technical capacity during their first visit. The commercial centre, Bombay, is not unlike other major business capitals in industrialized and emerging economies. In light of this reality, Canadian environmental companies are well advised to select a market niche, rather than trying to compete on a broader market basis. This requires a substantial allocation of effort to find the best market position for your company.

India's business culture operates on two levels. The vibrancy of commercial activities are reported in the media, and have a high public visibility. On the other hand, most actual business dealings are done privately, often through family connections. It is, therefore, imperative that a market entry strategy into the country connect with the private business world. This is best done either through a representative agent who is well connected, or by utilizing company staff who have family or business relationships in the country.

The pace of business activity in India is rapid. With the exception of some government approvals, decisions by Indian business partners are often made quite rapidly once a company has done its homework. The devil, however, is in the details. In sometimes takes 2-3 years to carve out a market niche. To complete a transaction numerous technicalities have to be ironed out and, inevitably, some government approvals will be required.

Turning the profit corner in an enterprise, and repatriating returns, will take a couple more years. However, once established in India with partners, a Canadian environmental company can look forward to a steady flow of income gains that can be quite impressive. In a rapidly growing emerging economy like India, many entrepreneurs are doing very well.

6.2 Market Intelligence and Analysis

Among emerging economies, India ranks as one of the most open. General business information is readily available. Specific business opportunities are, though, harder to define.

The following Step by Step approach to gathering and analyzing market information is suggested.

Step #1: Monitor the public media. It is possible to gain an understanding of the country and its economy through a regular review of media available in North America such as *India Abroad*, and bi-weekly publications including *Business India* and *Business World.*

Step #2: Use Trade Missions. The high caliber of Canadian and Indian Trade Missions has been very much appreciated by many Canadian business people. The Indian government has Trade Officers in Ottawa, Toronto and Vancouver. They have some first rate information about the country's economic opportunities. Canada has Trade facilitation services in Delhi and Bombay. They are well informed and trusted sources of business intelligence. The GLOBE Foundation of Canada also has an excellent data base on India's environmental markets.

Step #3: Focus your information search. Clipping services can extract market data on specific opportunities from each of India's four superb daily business newspapers. *The Economist Intelligence Unit* (EIU) and the *Times of London* have a number of India business reports and studies. ODA agencies such as CIDA have done several environmental market studies. The Internet can be a valuable tool - a Canadian Guide to Researching the Indian Market (Available from BizInt International, P.O. Box 187, Station D, Scarborough, Ontario, M1R 5B7) provides a roadmap to print and on-line systems.

Step #4: Spend some time in the country. There is simply no substitute for kicking the tires of a business opportunity. A first visit to India should not be a short one - four to six weeks is needed to get a feel for business opportunities. Don't restrict travel to Bombay and Delhi, go to other major cities such as Madras, Calcutta, Ahmedabad and Bangalore. Think of traveling by train.

Step #5; Establish relationships with Indian organizations and key government agencies. Indian business people and bureaucrats are very approachable. Key contacts are: CII, the Federation of Indian Chambers of Commerce and Industries (FICCI), and Department of Commerce, MoEF, MNES, The Ministry of Finance and the Reserve Bank of India. In addition, CIDA has two booklets, *Working with a Canadian Partner* and *Working with an Indian Partner* that can provide advice.

Step #6: Analyze the market intelligence you've gathered. Consult with companies who are already active in India. Organizations such as the Canada-India Business Council (CIBC) and the GLOBE Foundation of Canada are good sounding boards.

When a Canadian environmental company decides to enter India it should do so with commitment and intensity. A laissez faire approach is unlikely to appeal to potential Indian joint venture partners and customers.

6.3 The Right Local Partner

It is important to approach the market with a long-term view and recognize the significance of finding the right Indian partner. As in any business trust, shared interests, complementary skills and a clear definition of the relationship are of critical importance.

Canadian environmental companies have a number of partnering options.

- A local representative or sales agent can advise the principal in the pre-tender period of project activity, evaluate final pricing, negotiate and monitor the time-consuming bureaucratic process. They should have relevant experience, be well connected and possess solid financial resources.

- An informal Strategic Alliance is generally used when there appears to be enough synergy to present a combined marketing face.

- A Joint Venture arrangement is ideal when a non-corporate, but legally binding association is required.

- The creation of a new corporate entity is the most powerful business association, and certainly one that many Indian business people like. It creates a new venture to realize capital gains. It also allows for attractive foreign tax and investment incentives.

Indian businesses are very familiar with all of the above. The normal starting point is the signing of a Memorandum of Understanding (MoU) that sets out the general terms of the relationship.

6.4 IFI Support and Financing

Canadian companies entering India should determine how their market entry strategies and on-going operations fit into, and can be supported by, programs and initiatives of International Financial Institutions (IFIs) such as The World Bank, the Asian Development Bank (ADB), the International Finance Corporation (IFC), and others.

As one of the largest developing countries in the world, India qualifies for a range of IFI programs, several of which are targeted on the environmental sector. The following examples highlight some IFI activities in the country.

- There is an existing World Bank fund operating through IREDA for the development of renewable energy which totals $190 mn. The fund has been well subscribed and has been augmented since it was created.

- The International Bank for Reconstruction and Development (IBRD) and the International Development Agency (IDA) established a fund in 1995 consisting of both loans and credit lines totaling $168 mn for industrial pollution prevention. The purpose of the fund is to improve the quality of urban environments.

- Sectoral or state specific IFI initiatives are also a factor to consider. World Bank programs support: soil reclamation in Uttar Pradesh ($55 mn); Forestry Development and Education in Andra Pradesh ($116 mn); and, Forestry Management in Madya Pradesh ($58 mn).

- The World Bank has also played a major role in the water and wastewater area. It has supported major projects in Madras, Bombay, and Tamil Nadu.

- Through the Global Environmental Facility (GEF), India has received funds for the control of importation and substitution of products which use CFCs.

- ADB has a very active presence in India largely in providing project-based financing for individual ventures. This includes BOT (Build, Operate, Transfer) and BOOT (Build, Own, Operate, Transfer) infrastructure projects.

- The IFC is the biggest source of direct financing for private sector ventures in emerging economies. IFC tends to invest in companies rather than projects or establish loan/credit lines. It seeks to develop the private sector and is, therefore, important to the environmental sector for such things as privatization of facilities, energy efficiency, etc.

New IFI programs for India are often being introduced. To obtain up to date information and learn about the terms of various programs companies should contact IFIs directly. Details on Indian offices for several IFIs are contained in the contacts appendix.

6.5 Minimizing Market Risk

Embarking on a new venture in a country like India naturally carries business risks. A Canadian environmental company puts its reputation, staff time and financial resources on the line when it enters a new market. How can various risks be off set?

Risk	Risk Management Strategy
Gaps in Market Intelligence	Diligently follow the market intelligence gathering and analysis process suggested. Don't scrimp on information expenditures.
Finding the Right Partner	The more sensitivity that is exhibited to cultural differences in India, the greater the chance of cementing a partnership arrangement. Be flexible rather than legalistic.
Negotiating the Fair Deal	Seek sound legal and tax advise before and during the negotiation of an agreement. Tie down the income and capital gains splits on opportunities and projects that are known, and leave other arrangements more open. Utilize tax domiciles and other corporate arrangements where appropriate.
Minimizing Financial Exposure	Leverage any investment of your time or money with rupees from your partners. India is a country of considerable wealth. Use ODA financing to support initial market explorations. For project and equity financing, approach one of the several hundred foreign investors who have targeted India.
In the Event of a Problem	Ensure Indian and Canadian government authorities are fully aware of your business dealings. Place capital and human resources in tranches rather than in one go. Use mediation agents and the courts, if they are fair.

Most business ventures in India between foreign and domestic partners have been productive and mutually beneficial. Protecting your position and mitigating risks is just good business sense.

Appendix A

Programs and Contacts

Canadian Programs and Contacts - Canada

Indian Programs and Contacts - Canada

Canadian Programs and Contacts - India

Indian Programs and Contacts - India

International Programs and Contacts - India

Related Trade Publications - India

Related Trade Publications

Related /End User Trade Associations

Further Sources of Information

Canadian Programs and Contacts - Canada

Department of Foreign Affairs and International Trade (DFAIT)
South Asia Division (PSA)
125 Sussex Drive
Ottawa, Ontario
K1A 0G2
Tel: 613-996-5903 Fax: 613-996-5897

Canadian International Development Agency (CIDA)
South Asia Branch
Industrial Cooperation Division
200 Promenade du Portage
Hull, Quebec
K1A 0G4
Tel: 819 997-0563 Fax: 819 953-5024

Canada India Business Council (CIBC)
55 Metcalfe Street
Ottawa, Ontario
K1P 6N4
Tel: 613-238-4000 Fax: 613-238-7643

Asia-Pacific Foundation of Canada (APFC)
999 Canada Place, Ste. 666
Vancouver, BC
V6C 3E1
Tel: (604) 684-5986 Fax: (604) 681-1370

The Alliance of Manufacturers and Exporters Canada (The Alliance)
Doreen Ruso, Director
Trade Development
75 International Boulevard, 4th Floor
Etobicoke, Ontairo
M9W 6L9
Tel: (416) 798-8000 Fax: (416) 798-8050

Conference Board of Canada
255 Smyth Road
Ottawa, Ontario
K1H 8M7
Tel: (613) 526-3280 Fax: (613) 526-4857

Export Development Corporation (EDC)
15 O'Connor
Ottawa, Ontario
K1A 1K3
Tel: (613) 598-2869 Fax: (613) 598-2503

GLOBE Foundation of Canada
666-999 Canada Place
Vancouver, BC
V6C 3E1
Tel: 604-684-5986 Fax: 604-681-1370

International Trade Centres
Industry Canada & Department of Foreign Affairs and International Trade
Vancouver Office
Tel: 604-666-0434 Fax: 604-666-8330
Toronto Office
Tel: 416-973-5053 Fax: 416-973-8161
Montreal Office
Tel: 514-496-4636 Fax: 514-283-8794

Natural Resources Canada (CANMET)
Energy Diversification Research Laboratory
1615 Montee Ste-Julie
P.O. Box 4800
Varennes, Quebec
J3X 1S6
Tel: 514-652-5254 Fax: 514-652-5177

Ontario International Corporation
Government of Ontario
56 Wellesley Street West, 7th floor
Toronto, Ontario
M7A 2E4
Tel: (416) 314-8245 Fax: (416) 314-8222

Indian Programs and Contacts - Canada

High Commissioner, High Commission for India
His Excellency Gurdip Singh Bedi
10 Springfield Road
Ottawa, Ontario
K1M 1C9
Tel: 613-744-3751 Fax: 613-744-0913

Indian Trade Consulate - Toronto
Mr. R.K. Bhatia, Consul General
2 Bloor St. West, Suite 500
Toronto, Ontario
M4W 3E2
Tel: 416-960-0751 Fax: 416-960-9812

Indian Trade Consulate - Vancouver
Mr. Jawahar Lal, Consul General
325 Howe Street, 2nd Floor
Vancouver, BC
V6C 1Z7
Tel: 604-662-8811 Fax: 604-682-2471

State Bank of India
Mr. N.K. Puri, President and CEO
Suite 500, Royal Bank Plaza, North Tower
Toronto, Ontario
M5J 2J2
Tel: (416) 865-0414 Fax: (416) 865-1735

Canadian Programs and Contacts - India

Bank of Nova Scotia
Alan Stewart, Vice President & Manager
Ground Floor, Mittal Tower, B Wing
P.O. Box 11507, Nariman Point
Bombay 400 021
Tel: 91-22-2875437 Fax: 91-22-2873125

Bank of Nova Scotia
Dr. Gopal Dass Bhawan
18 Barakhamba Rd.
New Delhi 110 001
Tel: 91-11-3312597, 3351523/24/25
Fax: 91-11-3312847

Canadian Consulate Bombay
Andre Vary, Consul and Trade Commissioner
Apurva D. Mehta, Commerical Officer
4th Floor, 41/42 Maker Chambers VI
Jamillionalal Bajaj Marg, Nariman Point
Bombay 400021
Tel: 91-22-2875479 Fax: 91-22-2875514
Internet:consulate.canada@coc.sprintrpg.sprint.com

CESO International Services
Canadian Volunteer Advisers to Business
Girish Talwar, Regional Director - Bombay
Plot # 680, 16th Road
Khar, Bobmay-400 052
Tel: 578-4045/578-2622 Fax: 611-8620

Canadian High Commission
David Summers - Counsellor (Commercial)
Viney Gupta, Commercial Officer
P.O. Box 5208
7/8 Shantipath, Chanakyapuri
New Delhi 110 021
Tel: 91-11-6876500 Fax: 91-11-6875387
Internet: david.summers@delhi01.x400.gc.ca
Internet: viney.gupta@delhi01.x400.gc.ca

Indian Programs and Trade Associations - India

Associated Chambers of Commerce and Industry of India (ASSOCHAM)
Virender Singh, Senior Consultant
2/Fl. Allahbad Bank Bldg., 17 Parliament St.
New Delhi 110 001
Tel: 91-11-351464, 310779, 334350, 3344202 Fax: 91-11-3342193, 3734917

Bureau of Indian Standards (ISO Certified Agency)
Manak Bhavan, 9 Bahadur Sha
Zafar Marg, New Delhi 110 002
Tel: 91-11-3310131 Fax: 91-11-3314062
Major IFI Commitment in India

Central Pollution Control Board (CPCB)
D. Biswas, Chairman
C.B.D.-cum-Office Complex
East Arjun Nagar
New Delhi 110032
Tel: 91-11-2217213 Fax: 91-11-2204948

Confederation of Indian Industry (CII)
23, 26 Institutional Area, Lodi Road,
New Delhi 110 003
Tel: 91-11-4629994,4626164,4625407
Fax: 91-11-4626149,4633168

CII, Environmental Management Division
India Habitat Centre, IVth Fl.
Zone IV, Lodi Rd.
New Delhi 110003.
Tel: 91-11-4601592, 4601593, 4642388
Fax: 91-11-4602524

Export-Import Bank of India
Mr. R.M. Raman, General Manager
Centre One, Floor 21, World Trade Centre
Cuffe Parade,
Bombay 400 005
Tel: 218-5272 Fax: 218-8268

Federation of Indian Chambers of Commerce and Industries (FICCI)
Vijay K Topa, Deputy Secretary-General
Federation House, Tansen Marg
New Delhi 110001
Tel: 91-11-3319251 Fax: 91-11-3721501,3320714

Gujarat Chamber of Commerce & Industry
Girish P. Dani, President
Shri Ambica Mills-Gujarat Chamber Building
P.O. No. 4045, Ashram Rd. Ahmedsbad-300 009
Tel: 337401/384120 Fax: 070-407092

Indian-Canada Cooperation Office
Yves Lafond, Director
D1/5G Vasani Viher
New Delhi-110 057
Tel: 688-4051/688-6076 Fax: 91-11 688-6236

Indian Investment Centre
Mr. K.K. Trivedi, Senior Advisor
Jeevan Vihar Building, Sansad Marg
New Delhi 110001
Tel: 91-11-3733673, 3733679 Fax: 91-11-3732245

Indian Renewable Energy Development Agency Limited (IREDA)
Dr. V. Bakthavatsalam, Managing Director
Reg.d & H.O.: Core-4-A, East Court, India Habitat Centre complex
1st Floor, Lodi Road,
New Delhi, India 110 003
Tel: 011-460-2744 Fax: 011-460-2855

Ministry of Environment & Forests (MOEF)
N. Bagchi, Adviser
Scope Complex, Lodi Rd.
New Delhi 110 003
Tel: 91-11-4360634 Fax: 91-11-4360678

Ministry of Non-Conventional Energy Sources (MNES)
U.N. Panjiar, Joint Secretary
Block 14, CGO Complex
New Delhi 110 003
Tel: 91-11-436-1152 Fax: 91-11-436-1298

National Institute of Science
Dr. Ashock Jain, Director
Technology & Development Studies
Dr. K.S. Krisnan Road
New Delhi, 100 012
Tel: 91 11 574-3227 Fax: 91 11 575-4640

National Waste Management Council
Mr. N.R. Krishnan, Secretary
Ministry of Environment and Forests
Paryavaran Bhawan, C.G.O. Complex Phase II
Lodhi Rd., New Delhi 110 003
Tel: 91-11-4360721 Fax: 91-11-4360678

Reserve Bank of India
External Investment & Operations Division
New Central Office Building, Fort
Bombay 400 023
Tel: 91-22-2861602 Fax: 91-22-2662105

Tata Energy Researach Institute
Dr. Ranjaran Pachauri
Darbari Seth Block, Habitat Place
Lodhi Road
New Delhi - 110-003
Tel: 91 11- 460-1550 Fax: 91-11-462-1770

State Pollution Control Boards (selected states)

Andhra Pradesh
2/Fl, HUDA Complex, Maitrivanum
Ammerpet, Hyderabad 38

Delhi
Old Civil Supply Building (Rm. 5)
Tis Hazari Court Complex
Delhi 110 054

Maharashtra
Sh. Chattrapati Shivaji Maharaj
Municipal Market Bldg., 4/Fl.
2Mata Ramabai, Ambedkar Rd.
Bombay 400 001

Orissa
A-118, Nikantha Nagar, Unit VIII
Bhubaneswar 751 012

Punjab
Oposite State College of Education
Nabha Rd.
Patiala, 147 001

Rajasthan
4 Jhalana Institutional Area
Jhalana, Doongri
Jaipur 302 004

Tamil Nadu
32 Santhorme High Road
3rd & 4th Fl.
Madras 600 004

West Bengal
10 Camac St., Industry House, 2/Fl.
Calcutta 700 017

International Programs and Contacts - India

Asian Development Bank
Richard O'Wada, Resident Representative
India Resident Office
P.O. Box 3019, Lodi Rd. HPO
New Delhi 110 003,
Tel: 91-11 469 2578/469 2589 Fax: 91-11 463 6175
Environmental Project Information at: http//:www.asiandevbank.org.

International Finance Corporation
Denise Leonard, Chief, South Asia Regional Mission
No.1 Panhsheel Marg, Chanalyapuri
New Delhi 110021
Tel: 91-11 3011306 Fax: 91-11 3011281

United Nations Industrial Development Organization
Wilfred S. Nanayakkara, Country Director
55, Lodi Estate
P.O. Box No. 3059
New Delhi 110003
Tel: 00891-11-462 8877 Fax: 0091-11-4620913

United Nations Development Program (UNDP)
Ove Bjerregaard
55, Lodi Estate
New Delhi-110003
Tel: 462 8877 Fax: 91-11-462 7612

The World Bank
Richard Cambridge, Principal Environment Officer - India
1818 H St. N.W
Washington, D.C.
20433
Tel: 202 458-0302

The World Bank
Djamal Mostefal, Senior Energy Specialist, Energy Sector
70 Lodi Estate
New Delhi-110003
Tel: 461-0210/461-7241 Fax: 461-9393

Related Trade Publications

Chemical Weekly published by Sevak Publications
Mr. R. Raghavan, Editor Room No. 9, Wellingdon Estate, 3rd Floor
Commander-in-Chief Road, Madras 600 105
Tel: 91 044 -4716592

Chemical Business edited by Mr. R. V. Raghavan, 126-A, Bhuruwadi, Off Dr. Nariman Road, Prabhadevi, Bombay 400 025
Tel: 91 022- 4309318

Electronics Today
4-A Naaz Building
Lamington Road
Bombay 400 004
Tel: 91-22-3860436

Encology
Dr. T.R. Saranathan, Editor
Lavanya Prints Pvt. Ltd.
35 Vaibhav Ind. Est., Off Sion-Trombay Rd.
Near Telecom Factory Deonar
Bombay 400 088
Tel: 91-22-5519890/5559207

Indian Electrical Contractor and Trader
107 Marol Co-operative Industrial Estate

Instruments and Electronics Developments
64 Mahendra Chambers
134/136 D.N. Road, Fort
Bombay 400001
Tel: 91-22-2049567

Related End-User Trade Associations

All India Instument Manufacturers & Dealers Association
Navyug niwas
167 Dr. D. Bhadkamkar Road
Bombay 400007
Tel: 91-22-371868

All India Manufacturers' Organization
Sir. P. Mehta Road, Bombay 400 001
Contact: The National President
Tel: 91 022 2861016/2861272

Chemtech Foundation
22 Maker Chamber VI
Nariman Point
Bombay 400 021
Contact: The Executive Director
Tel: 91 022-2874758

Chemical Industries Association
123 Angappa Naick Street
Madras 600 001
Contact: Mr. S. Krishnaswamy, President
Tel: 91 044 -880713

Further Sources of Information

Canadian Guide to Researching the Indian Market, (Internet) BizInt International, P.O. Box 187, Station D, Scarborough, Ontario, M1R 5B7

CII, numerous titles

Economic Coordination Unit of the Ministry of External Affairs, Government of India, "India Means Business" (six booklet set), 1994

Export-Import Bank of India, "Foreign Direct Investment in India, India's Policy on FDI - An Overview", May 1993

Ernst & Young, "Doing Business in India", 1994

Economist Intelligence Unit (EIU), London, Annual Report

Economist Intelligence Unit (EIU), London, Quarterly Report

India Investment Centre:
- Guidelines for Joint Ventures - September 1995 Newsletter
- Statement of Industrial Policy
- Statement on Trade Policy
- Facilities and Incentives for Non-Resident Indians (June 1994)
- Foreign Investment Policy of the Government of India (June 1994)
- Export Processing Zones of India (November 1994)

India's National Environmental Action Plan (1994). Outlines India's priority environmental issues.

FICCI, numerous titles

Indian High Commission, Ottawa, quarterly newsletter

Focus India: A Business Guide for Canadian Firms on Managing Joint Ventures, Strategic Alliances and Technology Transfers in India.

Appendix B

Trade Shows and Conferences

The following pages list the relevant trade shows and conferences to be held in India in 1996 and 1997.

For further details on shows organised by India Trade Promotion Organisation, please contact:

General Manager (Domestic Fairs Division)
India Trade Promotion Organisation
Tel: (91-11) 3315213/3319581
Fax: (91-11) 3318142/3317896
Tlx: 031-61022/61311 COMX IN

Upcoming Fairs and Trade Shows

Dates	Name of Fair & Products	Organisers
September 4-8, 1996	ELECTRONICS INDIA Electronics hardware and software, industrial applications, new innovations, technologies, entertainment electronics etc.	**India Trade Promotion Organisation** Pragati Bhawan, Pragati Maidan New Delhi-110 001
September 15-18, 1996	HEALTH & MEDICARE'96 Hospital, medical, pharma, surgical, diagnostice equipment etc.	**Intech Trade Fair Marketing Co. Pvt. Ltd.** 122, maker Chambers-V (First floor) Nariman Point Bombay-400 021 Tel: 91-22 223005, 2851839 Fax: 91-22 2851839 Tlx: 085117 NOWI IN Contact person: Mr. Jacob Macwan
September 17-19, 1996	POWER -GEN '96 Fourth Annual Show	**Interads Ltd.** Akash Deep, 26 A Barakhamba Rd. New Delhi 110 001 Tel: 91-11-327324/3260062 Fax: 91-11-3279429/3281015 Contact: Mr. Rajan Sharma, MD
September 25-28, 1996	INFRASTRUCTURE & INVESTMENT, INDIA '96 Power and energy, transportation and communication equipment, social and community development-investment availability and opportunities.	**Wisitex Foundation** 113, Jogani Industrial Complex Bldg. No. 5 Near ATI. Sion Bombay 400 022 Tel: 91-22 5524554, 5524774 Fax: 91-22 5521339 Contact person: Mr. Y.L. Arora
October 17-19, 1996	SHOE FAIR'96 Shoes, shoe-uppers	**India Trade Promotion Organisation** Pragati Bhawan, Pragati Maidan New Delhi-110 001

October 17-19, 1996	SHOE FAIR'96 Shoes, shoe-uppers	**India Trade Promotion Organisation** Pragati Bhawan, Pragati Maidan New Delhi-110 001
October 19-21, 1996	SHOE COMP'96	**India Trade Promotion Organisation** Pragati Bhawan, Pragati Maidan New Delhi-110 001
October 25-29, 1996	POWER & ENERGY Nutec/Oil & Gas India Delhi	**Intech/Nowea** Nowea International 122 Maker Chambers V Nariman Point, Bombay 400 021 Tel: 91-22-2851839/223005 Fax: 91-22-2851839
November 14-27, 1996	INDIA INTERNATIONAL TRADE FAIR'96 All aspects of industry, agriculture, trade, scientific and technological advancement	**India Trade Promotion Organisation** Pragati Bhawan, Pragati Maidan New Delhi-110 001
November 1996	Xth INTERNATIONAL CONGRESS & EXHIBITION Non Conventional Energy Sources, "Emerging Sources of Renewable Energy for Economic Development" New Delhi	**National Foundation of Indian Engineers (NAFEN)** "Shanti Chambers", 11/6B, Pusa Rd. New Delhi 110 005 Tel: 91-11-5731446/5736212/5738104
December 1996 (tentative)	COMMUNICATIONS INDIA'96 Communication systems and related technologies	**Exhibitions India** E-6, Defence Colony New Delhi 110001 Tel: Tel: 91-11 4622710 Fax: 91-11 4633506 Contact Person: Mr. Prem Behl
February 3-7, 1997	RENEWABLE ENERGY-SMALL HYDRO 1st International Conference Hyderabad	**Mr. A.R.S. Rao** Director (Chief Engineer) Central Board of Irrigation & Power Malcha Marg, New Delhi 110 021 Tel: 91-11-3016567 Fax: 91-11-3016347

February 9-16, 1997	INDIA ENGINEERING TRADE FAIR '97 Engineering goods of various industrial sectors, technology transfers, R & D and new innovations	**Confederation of Indian Industry** Trade Fair Department 23, 26 Institutional Area, Lodi Road, New Delhi 110 003 Tel: 91-11-4629994,4626164,4625407 Fax: 91-11-4626149,4633168 Contact Person: Mr. Ajay Khanna
March 2-6/7, 1997	PLAST INDIA'97 Plastics and plastic manufacturing machinery equipment and technology	**Plast India Foundation** 21, Leela Apt. (Ground floor) 355, S.V. Road (Opp. Golden Tobacco) Vile Parle W. Bombay 400 056 Tel: 91-22 6370500 Tlx: 11-79395 PLAF IN
March 5-9, 1997	KISSAN'97 Agricultural products, equipment and machinery	**Asian Trade Fairs** Abhyudaya (Behind Medinova) J.M. Road, 1312, Shivaji Nagar Pune 411 005 Tel: 91-0212 324020 Fax: 91-0212 323239
March 1997	AHARA'97 Food products, food processing technologies and food processing machinery	**India Trade Promotion Organisation** Pragati Bhawan, Pragati Maidan New Delhi-110 001

Appendix C

Indian Companies Seeking Joint Venture Partners

Company:	**Abb Abl Ltd.**
Contact:	Aloke Mookherjea
Title:	Managing Director
Address:	Express Towers, 18th Floor Nariman Point Bombay 400 021
Tel:	011 91 22 202 6610
Fax:	011 91 22 202 3272
Employees:	5200
Yrs. in Bus:	26
Trades with:	India, East Asian and South-East Asian countries
Interest:	Technical Transfer, Product purchase and interested in Fluidised Bed Boilers, FFBC's lox Nox and low SO2 special burners for Multi-Fuel applications
Sectors:	Water
Products:	Bottles which the Power generation and industrial uses up to 500 MW. This company also sells electrostatic precipitators for boilers and cement plants, low nox burners

Company:	**Alfa Consumer Appliances Ltd.**
Contact:	K Gopi
Title:	Managing Director
Address:	Alfa House 26 Wellington Road Secunderabad 500 026
Tel:	011 91 40 804 334
Fax:	011 91 40 801 789
Employees:	800
Trades with:	Gulf & UK
Sectors:	Water, Energy
Products:	Customer durables related to health care, such as Water Purfication, Air purication for bathrooms etc. Planning to diversify into environment related sector.

Company:	**ARM Ltd.**
Contact:	Mr. P. Ramrao Paturu
Title:	President
Address:	7 - 139, Habsiguda Hyderabad 500 007
Tel:	011 91 40 674 400
Fax:	011 91 40 675100/675 600
Employees:	1400
Yrs. in Bus:	7
Trades with:	Malaysia, Tanzania,Guatamala

Interest:	Technical transfer and JV. Presently working with "TIW" Canada on basic telecom services.
Sectors:	Solar Energy
Products:	Renewable energy, photovoltaic solar energy.

Company:	**Batliboi & Co Ltd.**
Contact:	P.J. Shastri
Title:	Deputy GM
Address:	Apeejay House Dr. V.B. Ghandi Marg Fort, Bombay, 400 001
Tel:	011 91 22 287 1903
Fax:	011 91 22 285 1124
Employees:	2050
Yrs. in Bus:	103
Trades with:	Japan, Czechoslovakia, Germany, U.K. , U.S.A. , Switzerland, Italy, France, Spain, Austria, Holland
Interest:	Technological upgrading, substitution, tie-ups, alignments, joint participation in international areas etc. We have local manufacturing and vendoring capability with could provide global sourcing option. We could be additionally interested in Solid Waste Management, Methane Gas Generation , Dual Fuel Engines
Sectors:	Water, Air, Solid waste In the environment sector, presently offer: Municipal Sewage treatment plant with proprietary equipment for sedimentation and aeration. Industrial Air Pollution Control Systems. Project Engineering & Contracting Services for Thermal (Coal) Power Plants.
Products:	Diversified engineering company

Company:	**Bhagwati Designs PVT. Ltd.**
Contact:	Mr. N. N. Bhagwati
Title:	Chairman & Technical Director
Address:	Swastik Chambers, 7th floor, Off Sion-Trombay Road, Chembur, Bombay 400 071
Tel:	011 91 22 522 8265
Fax:	011 91 22 522 8233
Employees:	250
Yrs. in Bus:	14
Trades with:	U.K. and Demark for Power Projects and Cement Projects
Interest:	Joint Venture with investment. Separate company can be formed.
Sectors:	Air, Water Treatment, Waste water treatment, Solid and Hazardous waste and Environmental Assessment
Products:	Civil, Structural, Architectural, Electrical, Mechanical, HVAC and Environ mental engineering, waste water and water treatment *

Treatment Process Design including R & D, Solid and Hazardous waste treatment disposal and reuse * Treatment Process Design including R & D, Environ ment Assessment * Environmental Impact Assessment (Rapid and Comprehensive) for the Industrial and Infra structure projects * Environmental Audit for the industrial projects, Air Pollution * Ambient and Stack monitoring.

Company:	**Bharat Heavy Electricals Limited**
Contact:	R. Siva Subramanian
Title:	General Manager
Address:	Boiler Auxiliaries Plant Indira Ghandi Industrial Park Ranipet 632 406, Tamil Nadu
Tel:	011 91 41 724 4055
Fax:	011 91 41 724 4141
Employees:	2700
Yrs. in Bus:	31
Trades with:	European, American, Middle East, Asian Counties
Interest:	Joint participation in Indian & International Markets.
Sectors:	Air, Water, Energy
Products:	Supply, Erection & Commissioning of Electrostatic Precipitators, Air Preheaters, Fans, Desalination Plants/Systems, Wind Electric Generators, Ash Handling Systems & Coal Handling Systems.

Company:	**BSES Ltd.**
Contact:	R V Shahi
Title:	Chairman & M D
Address:	E-7 MIDC Area Marol, Andheri (E Bombay 400 093
Tel:	011 91 22 8387597
Fax:	011 91 22 821 0470
Employees:	3800
Yrs. in Bus:	66
Sectors:	Electrical energy:supply, generation, transmission, computer.

Company:	**Central Leather Research Institute**
Contact:	Dr. M. Mariappan
Title:	Scientist and Head
Address:	Department of Environment Technology, Adyar, Madras 600 020
Tel:	011 91 044 4911389
Fax:	011 91 044 4916351

Employees:	20
Yrs. in Bus:	48
Trades with:	Europe, North America, Australia, Asia
Interest:	Technical transfer, JVs
Sectors:	Wastewater treatment and disposal, solid and hazardous waste management, energy.
Products:	Tannery wastewater treatment, renewable energy, recovery and reuse of valuable materials found in tannery wastewater. Environmental assessment for siting industries, environmental audits for chemical industries.

Company:	Century Rayon
Contact:	L.S. Mehta
Title:	V.P. (Works)
Address:	Factory: Murbad Road, Shahad 421 103 Maharastra
Tel:	011 91 251 540 064
Fax:	011 91 251 546 570
Employees:	5500
Yrs. in Bus:	1
Trades with:	Countries in Europe
Interest:	Technical transfer, investment,product purchase
Sectors:	Air, Water, Solid Waste,Hazardous Waste Energy
Products:	Product purchase, Environmental Management specifically effluent treatment hazardous waste and air pollution

Company:	Concast (India) Ltd.
Contact:	N. K. Nayar
Title:	Managing Director
Address:	47/48 Jolly Maker Chambers 11 Nariman Point Bombay 400 001
Tel:	011 91 22 202 7576
Fax:	011 91 22 202 0414
Employees:	220
Yrs. in Bus:	23
Trades with:	Vietnam, Indonesia, Bangladesh, West Indies, Kenya
Interest:	Technical Transfer, Investment
Sectors:	Air
Products:	Pollution control -electric arc furnace in steel plants

Company:	**Consulting Engineering Services (I) Pvt Ltd.**
Contact:	S. S. Chakraborty
Title:	Managing Director
Address:	7 Nehru Place New Delhi 110 019
Tel:	011 91 11 646 0409
Fax:	011 91 11 643 1915
Employees:	1000
Yrs. in Bus:	26
Trades with:	Bangladesh, Lao PDR, Maurltlus, Oman, Yemen
Interest:	Technology Transfer; Joint bidding for consultancy services for projects in India and other countries funded by World Bank, ADB etc.
Sectors:	Air, Water, Solid waste, Hazardous Wastes, Energy, Noise, Soil and Socio - Economics.
Products:	Environmental Assessment & Environmental Management Plans - Environmental Audit - Ecological / Bio - Diversity Study - Hazard and Risk Analysis - Waste and Water Treatment - Renewable Energy - Forest Conservation and related projects - Rehabilitation and Resettlement Study - Land use Study through Remote Sensing - Urban/ Industrial Pollution Control - Carrying Capacity Study - Services in Multi - disciplinary fields. Actively involved in all types of infrastructure works, loss reduction studies of electrical distribution systems, Cogeneration and complete detailed engineering services in the industrial and process engineering plants including plant optimisation.

Company:	**D - Ionic India Pvt Limited**
Contact:	Mr. Ramesh Grover
Title:	Chief Executive
Address:	D - Ionic Chambers 50 Rani Jhansi Road New Delhi 110 055
Tel:	011 91 7528376
Fax:	011 91 7773253
Employees:	36
Yrs. in Bus:	20
Trades with:	Asia, Middle East, S.& E. Africa
Interest:	Distribution, investment, technical transfer
Sectors:	Air, Water
Products:	Provide system & plants, undertake turnkey projects, package plant production, consultancy and advisory. Keen to distribute services of drinking water systems (filtration & R.O.)

Company:	**Das Lagerway Windturbines Limited**
Contact:	P.N. Subramanian
Address:	Developed Plot 35 (SP), Guindy Industrial Estates Guindy, Madras 600 032

Tel:	011 91 44 234 8727
Fax:	011 91 44 234 8724
Employees:	300
Yrs. in Bus:	2
Trades with:	The Netherlands
Interest:	Technical transfer, Investment, Product purchase Management Development Research and Development
Sectors:	Air, Solid Waste, Water, Hazardous Wastes, Energy
Products:	Renewable Energy Wind, Solar

Company:	Desein Private Ltd.
Contact:	N. P. Gupta
Title:	President
Address:	Greater Kailash 11 New Delhi 110 048
Tel:	011 91 11 646 9566
Fax:	011 91 11 645 1185
Employees:	530
Yrs. in Bus:	31
Trades with:	U.S.A., U.K., Germany, Kuwait, South Korea, Australia
Interest:	Technical transfer, Investment, Management development Presently no partnership exists, yet we would like to join hands with Canadian partners in the above marked interests
Sectors:	Air, Energy, Dust / Ash in Coal based industries
Products:	We render complete Engineering Services in Design, Erection, Operation and Maintenance of any capacity of thermal Power Stations. We also specialise in designing all sizes and types of Ash Handling Systems for Coal Based Power Projects. We have highly qualified Engineers in all disciplines including Environment and pollution Control etc. We have a separate division for renewable source of energy engineering. A few copy of our Brochures for Engineering and Manufacturing group are enclosed herewith for your ready reference.

Company:	Driplex Water Engineering Limited
Contact:	Mr K. Lall
Title:	Managing Director
Address:	Driplex House I, Panchsheel Community Centre New Delhi 110 017
Tel:	011 91 11 646 6427
Fax:	011 91 11 643 9698
Employees:	200
Yrs. in Bus:	20
Trades with:	Japan, Korea, U.K. , Germany, Austria, Italy, USA
Interest:	Technical transfer, investment
Sectors:	Water, Sewerage, Waste water
Products:	Water & Waste water Treatment

Company:	**Econ Pollution Control Pvt Ltd.**
Contact:	Amiya K Sahu
Title:	Managing Director
Address:	25 Unique Indl Estate Off S V Marg Prabhadevi, Bombay 400 025
Tel:	011 91 22 436 2842
Fax:	011 91 22 437 5363
Employees:	25
Yrs. in Bus:	21
Trades with:	India
Interest:	Technical transfer, R & D
Sectors:	Air, Solid waste, Hazardous waste, Energy
Products:	Environmental monitoring, EIA, Air Pollution, Solid & Toxic waste management, Energy planning, Risk analysis.

Company:	**Elkem Metallurgy P Ltd.**
Contact:	S. R. Sampath
Title:	Managing Director
Address:	66/67 Mahavir Centre Sector 17 Vashi, New Bombay 400 703
Tel:	011 91 22 767 2903
Fax:	011 91 22 767 2901
Employees:	30
Yrs. in Bus:	8
Trades with:	Norway, Sweden, U.K., Australia
Interest:	Metal trading
Sectors:	Air - Bag filters
Products:	Solar Photovoltaic, Bag filters, Smelting furnaces, Secondary steel refining.

Company:	**Ercom Consulting Engineers Pvt Ltd.**
Contact:	Pratap Kumar Ghosh
Title:	Managing Director
Address:	Aman Chambers, 2nd Floor 47/21-22 Old Rajender Nagar New Delhi 110 060
Tel:	011 91 11 573 9719
Fax:	011 91 11575 8621
Employees:	125
Yrs. in Bus:	11
Trades with:	India, Nepal, Bangladesh, Bhutan, Uzbekistan
Interest:	Technical Transfer, Management development, investment We shall be interested in a technical tie-up/collaboration with a Canadian Engineering Consulting Organisation with similar Activity profile.

Sectors:	Air, Solid Waste, Energy
Products:	Technical engineering services to the mineral based industries like Cement, Aluminium, Sponge Iron etc. captive power Projects; Environmental Impact studies; Engineering project monitoring & site management; Environmental engineering energy conservation studies / system design.

Company:	**Esvin Advanced Technologies Ltd.**
Contact:	T.S. Venkatraman
Title:	Managing Director
Address:	Esvin House Perungudi Madras 600 096
Tel:	011 91 44 492 5525
Fax:	011 91 44 492 6074
Employees:	30
Yrs. in Bus:	7
Trades with:	U.S.A. , Canada
Interest:	Technical transfer, investment, Research and development
Sectors:	Water, Solid waste, Hazardous wastes, Energy
Products:	1. Effluent treatment plant for small paper mills - chemical recovery sys - about 60 - 100 tpd 2. Distillery effluent treatment plant 3. Generation of electrical power from biomass, Saw dust, straw, rice husk etc.

Company:	**Geo Miller & Co Limited**
Contact:	S.D. Mundhra
Title:	Director
Address:	91 Nehru Place New Delhi 110 019
Tel:	011 91 11 646 4817
Fax:	011 91 11 643 2521
Employees:	200
Yrs. in Bus:	67
Interest:	Technology transfer
Sectors:	Water, Wastewater & Air
Products:	Wastewater treatment and air pollution.

Company:	**Highlands Power Corporation Limited**
Contact:	Mr. P. Narendran
Title:	Managing Director
Address:	5, III Street, Wallace garden Madras 600 006

Tel:	011 91 44 827 8821
Fax:	011 91 44 827 8808
Employees:	25
Yrs. in Bus:	3
Interest:	Initially for project marketing in wind energy, and technical transfer for manufacturing activities in long term.
Sectors:	Energy
Products:	Consultants for wind power projects, project management services.

Company:	**Hindustan Dorr-Oliver Ltd.**
Contact:	G.K. Apte
Title:	Managing Director
Address:	Dorr-Oliver House, Chakala Andheri (East), Bombay 400 099
Tel:	011 91 22 836 5659
Fax:	011 91 22 832 5541
Employees:	375
Yrs. in Bus:	40
Trades with:	Middle & Southeast Asia and neighbouring countries
Interest:	Technical transfer and investment
Sectors:	Water and waste water
Products:	Water treatment, waste water treatment, water recycle plants with or without reverse osmosis water circuits in steel & power plants, Anaerobic plants, etc.

Company:	**Iaec Industries Madras Ltd.**
Contact:	N K Ranganath
Title:	Director
Address:	Rajamangalam Villiwakkam Madras 600 049
Tel:	011 91 44 499 5762
Fax:	011 91 44 626 0785
Employees:	156
Yrs. in Bus:	37
Trades with:	Dubai, Oman, Nepal, Srilanka, Germany & U.S.A.
Interest:	Technical Transfer, Investment, Research and Development
Sectors:	Air, Water, Solid Waste, Energy
Products:	Biogas burners, Waste, Heat recovery systems, Energy Recovery Turbines, Biomass burning.

Company:	**Indfos Industries Ltd.**
Contact:	Avininder Singh
Title:	Managing Director
Address:	706-707 Surya Kiran 19 Kasturba Gandhi Marg New Delhi 110 001
Tel:	011 91 11 331 6331
Fax:	011 91 11 331 1413
Employees:	550
Yrs. in Bus:	34
Trades with:	USA & Italy
Interest:	Technical transfer
Sectors:	Water Energy
Products:	Renewable Energy, Water Meters & controls for Temperature / Pressure

Company:	**Indocan Engineering Systems Pvt. Ltd.**
Contact:	Mr. A. Parameswaran
Title:	Managing Director
Address:	5 / 2 Jamna Chambers Aundh Road, Kirkee Pune 411 003
Tel:	91 0212 52350/56593
Fax:	91 0212 323203
Yrs. in Bus:	15
Trades with:	Canada, Japan, Mexico
Interest:	Technical transfer, Joint venture. Interested in companies that design sewage treatment systems.
Sectors:	Wastewater, Water, Chemical
Products:	Water and wastewater purification systems, Ion exchange systems, demineralisation plants, condensate polishing systems.

Company:	**J.S. Group**
Contact:	Brig N N Silarma
Title:	Senior Advisor
Address:	D-222/2, TTC Industrial Area MIDC Shiravane, Nerul, Bombay 400 706
Tel:	011 91 22 767 0736
Fax:	011 91 22 763 1555
Employees:	500
Yrs. in Bus:	15
Trades with:	3 JV's with USA & UK co's. The Group's international agency (ING-Tech Eng. Co.) represents a number of int'l companies from countries like Austria, Germany, USA, UK, Italy and Belgium
Interest:	JV with Can. equity in: A) Water Treatment B) Waste water and industrial waste treatment C)Sold waste and hazardous waste treatment

	Interested in representing Canadian Firm(s) as exclusive agents in India by Ing-Tech Engineering Company of our Group in the following areas: A)Water treatment B) Waste water and industrial waste treatment C)Solid waste and hazardous waste treatment D) Pollution monitoring systems
Sectors:	Air, Water
Products:	Instrumentation for process industries; Manufacturing & Marketing of industrial weighing and bagging systems/ speciality industrial burners. - Marketing of process / environmental engineering products through Ing - Tech Engineering Company, an international agency and trading house of JS Group

Company:	**John Fowler (I) Ltd.**
Contact:	M.G. Narasimhan
Title:	Gen. Manager RND
Address:	Sarjapur Road Bangalore 560 034
Tel:	011 91 80 553 3228
Fax:	011 91 80 553 0026
Employees:	344
Yrs. in Bus:	43
Trades with:	U.S.A., Germany, U.K., Korea, Nepal, Denmark
Interest:	Technical transfer, Joint venture could also be considered
Sectors:	Catalytic Convertors
Products:	Industrial and Automotive filters Insulating Oil Conditioning Plants, Industrial Machinery such as tobacco Processing and Seed Processing Equipment

Company:	**Jyoti Ltd.**
Contact:	J S Negi
Title:	Jt Managing Director
Address:	PO Chemical Indl Estate Near Elembic Glass Baroda 390 003
Tel:	011 91 265 337 866
Fax:	011 91 265 338 027
Employees:	2800
Yrs. in Bus:	53
Trades with:	Middle East, New Zeland, Indonesia, Malaysia
Interest:	Technical Transfer, Joint Venture
Sectors:	Water, Solid Waste, Energy, Manufacture of Pumps, Micro / Mini Hydro equipment and complete system engineering and turn - Key projects
Products:	Renewable Energy (Micro/ Mini Hydro) and Switch gear Pumping systems, Sewage Systems

Company:	**Kinetics Technology India Limited**
Contact:	I. Ram Kishore
Title:	V. P. - Sales & Marketing
Address:	Ansal Tower 38 Nehru Place New Delhi 110 019
Tel:	011 11 91 647 1984
Fax:	011 11 91 621 1815
Employees:	250
Yrs. in Bus:	25
Trades with:	Singapore, Netherlands, Italy, USA
Interest:	Technical transfer, Product purchase
Sectors:	Air, Solid & Hazardous waste, Energy
Products:	Engineering services, Goas/petroleum production and processing, petrochemicals, fertilisers, heat transfer systems, environmental control processes, process system services.

Company:	**Mahabal Enviro Engineers Pvt. Ltd.**
Contact:	B. S. Parmar
Title:	Chief Executive
Address:	Tilak Road Bombay 400 081
Tel:	011 91 22 560 4227
Fax:	011 91 22 561 3939
Employees:	210
Yrs. in Bus:	12
Trades with:	India
Interest:	Initially technology transfer & management development. Investment areas where mutally agreeable. Specialized equipment and instruments supply.
Sectors:	Air, Water, Solid & Hazardous Waste.
Products:	Environmental engineering: sampling & anlaysis of emissions; environmental auditing; EIA. Have their own laboratory.

Company:	**Metkem Silicon Limited**
Title:	General Manager
Address:	8 Cathedral Road, Madras 600 086
Tel:	011 91 44 826 9359
Fax:	011 91 44 827 3333
Employees:	120
Yrs. in Bus:	10
Trades with:	U.S.A.
Sectors:	Energy
Products:	We are manufacturing silicon wafers for solar photovoltaic industry which are used in renewable energy.

Company:	**MIL Industries Limited**
Contact:	Rajiv Breadhar
Title:	President
Address:	Plot No. 25-A BIDCO Industrial Estates Ambattur, Madras 600 098
Tel:	011 91 44 625 7583
Fax:	011 91 44 625 8382
Employees:	300
Yrs. in Bus:	25
Trades with:	Japan, Middle East, Far East, East & West Africa
Interest:	Technical transfer, Investment, Joint Venture
Sectors:	Air, Water
Products:	1. Air Pollution Control (Wet Scrubbing Systems) and Solvent Recovery System (Activated Carbon Adsorption Technology) 2. We are also India's leading Anti - Corrosive Company with manufacturing facilities for fabrication, rubber lining & PTFE lining. 3. Consultancy & detailed engineering services for process industries.

Company:	**National Organic Chemical Inds Ltd.**
Contact:	Mr Narayan Dhuldoya
Title:	Vice Chairman & M D
Address:	Mafatlal Centre, Nariman Point 7 Bombay 400 021
Tel:	011 91 22 202 7095
Fax:	011 91 22 202 4226
Employees:	3500
Yrs. in Bus:	30
Trades with:	Japan, China, Thailand, Malayaia, Indonesia, Phillipines, Australia, Bangladash, Srilanka, Parkistan, Nepal, Brazil, U.K., Italy Germany, Iran, Kenya, Tanzania, Uganda, South Africa, Zimbabwe, U.S.A
Sectors:	Air, Water, Solid Waste
Products:	We offer consultancy to Thane-Belapur Industries Association for waste water treatment.

Company:	**NEPC - Micon Limited**
Contact:	Mr. Rajkumar Khemka
Title:	Director
Address:	36 Wallaja Road Madras 600 002
Tel:	011 91 44 852 2553
Fax:	011 91 44 852 5870
Employees:	3000
Yrs. in Bus:	10
Trades with:	Denmark

Interest:	Product purchase, management development, R & D.
Sectors:	Energy
Products:	Renewable Energy: Wind

Company:	**Nippon Denro Ispat Ltd.**
Contact:	S. Sechadri
Address:	Nirmal, 7th floor Nariman Point Mumbai - 400 021
Tel:	011 91 22 285 5519
Fax:	011 91 22 285 5517
Employees:	4000
Yrs. in Bus:	10
Trades with:	Middle East, Far East, South East Asia, U.S.A, South Africa, European Countries
Products:	Steel, Ferro Alloys, Power, Telecommunication, Finance, Shipping Transport, Air Traffic Control Systems, Textiles and Infrastructure Development

Company:	**Pentafour Solec Technology Limited**
Contact:	V. Ramakrishna
Title:	Chairman
Address:	332 - 2 Arcot Road Chitra Towers Madras 600 024
Tel:	011 91 44 483 4517
Fax:	011 91 44 482 4292
Employees:	60
Yrs. in Bus:	2
Trades with:	U.S.A., Singapore, Indonesia and other Far East Countries
Interest:	Nil
Sectors:	Solid Waste, Energy
Products:	1. Solar Photovoltaic modules & Systems Silicon wafers/cells Silicon Crystal Growing (future) 2. Supply, erection & commissioning of Wind Electric Generators 3. Environment friendly Bio - mass Energy production & Systems

Company:	**Pollutech (Madras) Private Ltd.**
Contact:	Dr. K Rajamani
Title:	Director
Address:	11, Patel Street Kodambakkam, Madras 600 024
Tel:	011 91 44 484 3671
Fax:	011 91 44 534 2822
Employees:	15

Yrs. in Bus:	15
Trades with:	India, Singapore
Interest:	Technical Transfer, Investment
Sectors:	Water, aerobic and primary
Products:	Waste Water treatment

Company:	**Polymer Papers Limited**
Contact:	Mr. Sunil Puri
Title:	Managing Director
Address:	12 / 6 Mathura Road Faridabad- 121 003,Haryana
Tel:	011 91 129 277 262
Fax:	011 91 129 275 325
Employees:	250
Yrs. in Bus:	20
Trades with:	U.S.A., U.K., Japan, Germany, Switzerland, England, Sweden, Australia, Mexico, Equador, Chile, Slovenija, Sri Lanka, Bangladesh, Egypt, Russia
Products:	1. Monitoring & Analysis Air/Water/Noise/Solid Waste 2. ETA Study 3. Environment Auditing 4. Consulting for water treatment 5. Analysis of chemical, oil, coal, fly ash, paper, varnish, Pesticides

Company:	**Rallis Indla Ltd.**
Contact:	Vijay Rai
Title:	Managing Director
Address:	21/D Sukhadwala Marg Bombay 400 001
Tel:	011 91 22 204 2995
Fax:	011 91 22 204 8221
Employees:	2500
Yrs. in Bus:	100
Trades with:	Europe, Iran, Saudi Arabia, South East Asia
Interest:	Technology Transfer, Import of Services
Sectors:	Air, Water, Solid Waste
Products:	Agrochemicals, Pharmaceuticals, Fine Chemicals, Project Engineering Services

Company:	**Richardson & Cruddas (1972) Ltd.**
Contact:	V.K. Sinha
Title:	Dy.Gen.Manager
Address:	Sir J J Road, P.B. No. 4503, Byculia, Bombay 400 008
Tel:	011 91 22 373 1491

Fax:	011 91 22 376 6832
Employees:	1571
Yrs. in Bus:	138
Trades with:	Nepal
Interest:	Technical transfer, Investment, R &D. Wish to develop their engineering cell into a leading Indian group.
Sectors:	Engineering. Wastewater.
Products:	Fabrication of steel structures, bridges,tubulars, boiler drums, pressure vessels, rubber mills, extruders, effluent treatment plants, sugar plants, storage tanks, transmission line towers, compressor & condensing units, oils coolers, water coolers, supply & installation of water supply and sewage disposal systems etc.

Company:	**Rpg Enterprises**
Contact:	Sanjeev Goenka
Title:	Vice Chairman
Address:	31 Netaji Subhas Road Calcutta 700 001
Tel:	011 91 33 248 1614
Fax:	011 91 33 220 8515
Employees:	60 000
Yrs. in Bus:	2-80
Trades with:	USA, Vietnam, U.K., Middle East, Brazil, Venezuala.
Interest:	Technical transfer, Investment, R & D. Association with Monenco AGRA Inc. & TransAlta Energy Corp. in Canada.
Sectors:	Energy
Products:	Transmission & Distribution engineering & technology; Operation/maintenance expertise of thermal power plants; Plant life extension of thermal & hydro power plants.

Company:	**Southern Petrochemical Industries Corp. Ltd.**
Contact:	P. Raju
Title:	Chief Manager
Address:	SPIC-Centre, 97,Mount Road,Guindy Madras 600 032
Tel:	011 91 44 235 0015
Fax:	011 91 44 235 0245
Employees:	325
Yrs. in Bus:	12
Trades with:	U.K., USA, Jordan, Kuwait, Singapore, Australia.
Interest:	Technical transfer, Joint bidding for major contracts in wastewater treatment in India and abroad.
Sectors:	Water/wastes
Products:	Design, engineering, construction, commissioning and maintenance of wastewater treatment plants for industries and city sewage, water treatment for industries and city water supply.

Company:	**Subhash Projects and Marketing Limited**
Title:	Managing Director
Address:	Subash House 580, Indiranagar First stage Bangalore 560 380
Tel:	011 91 80 558 8826
Fax:	011 91 80 558 5861
Employees:	800
Yrs. in Bus:	15
Trades with:	Singapore, Korea, U.K., USA
Interest:	Technical transfer, investment, management development. JV for lump sum turnkey contracts.
Sectors:	Air, Water, Solid waste, Energy
Products:	Wastewater treatment, Renewable energy, thermal power, combined cycle/naptha based power projects, environment projects, chemical plants.

Company:	**Tata Consulting Engineers**
Contact:	R.N. Khosla P. Eng
Title:	Senior Consultant
Address:	Veer Savarkar Marg Bombay 400 025
Tel:	011 91 22 437 4402
Fax:	011 91 22 430 2419
Employees:	1400
Yrs. in Bus:	18
Trades with:	Nepal
Interest:	Toxic waste treatment, risk annyde
Sectors:	Water, Solid waste
Products:	engineering services (civil, electrical)

Company:	**Textool Company Limited**
Contact:	Mr. Shanmugam
Title:	Managing Director
Address:	Ganapathy Coimbatore 641 006
Tel:	011 91 42 253 2848
Fax:	011 91 42 253 1271
Employees:	4244
Yrs. in Bus:	50
Trades with:	Germany, Italy, Denmark, Egypt, Canada, USA, Indonesia, Phillippines, Nigeria, Bangladash, Kenya, U.K.
Interest:	Seller of Textile machinery
Sectors:	Air, Water, Solid Waste, Hazardous Wastes
Products:	Renewable Energy - Wind Turbine Generators

Company:	**Thermax Ltd.**
Contact:	S.P. More
Title:	Division Manager
Address:	15 Bombay Pune Road Pune 411 003, Maharastra
Tel:	011 91 212 33237
Fax:	011 91 212 24 883
Employees:	2700
Yrs. in Bus:	30
Trades with:	CIS states, Indonesia, Thailand, U.K., USA, Philippines, Middle East, Kenya, Saudi Arabia.
Interest:	Technical transfer, Investment, R & D.
Sectors:	Air, Water, Solid waste, Hazardous waste, Energy.
Products:	Energy generation -thermal & electric; Biomass based Cogen; GT based Cogen; water treatment; wastewater treatment; air pollution control; hazardous waste incineration; surface coating systems; post harvest equipment; ion-exchange resins; cooling tower water treatment services & chemicals; fuel & water additives for boilers; electronic components; control & automation systems; computer software.

Company:	**TIL Limited**
Contact:	Sumit Mazumder
Title:	Managing Director
Address:	Taratolla Road Garden Reach Calcutta 700 024
Tel:	011 91 33 469 1283
Fax:	011 91 33 469 3732-36/39
Employees:	940
Yrs. in Bus:	50
Trades with:	U.S.A., U.K., Australia, Sweden, Nepal, Singapore, Myanmar (Burma), Bhutan
Interest:	Technical Transfer, investments and Research development
Sectors:	Solid wastes, Hazardous Wastes, Energy, All kinds of Material Handling and Earthmoving Equipments
Products:	Manufacture of Material Handling Equipments, viz Mobile, Forklifts, etc. Trading and Product Support of the entire range of earthmoving Machines manufactured by Caterpillar Inc. USA., Assembly of Diesel Generating sets

Company:	**Triveni Engineering Works Ltd., The**
Contact:	Dhruv M Sawhney
Title:	Chairman & M D
Address:	Kailash, 2nd Floor 26 Kasturba Gandhi Marg New Delhi 110 001

Tel:	011 91 11 331 0117
Fax:	011 91 11 331 6488
Employees:	3500
Yrs. in Bus:	35
Interest:	Technology Transfer, Partnership, Product Purchase
Sectors:	Water / Waste water Treatment
Products:	Water / Waste water Treatment, Hydro Turbines, Wind Turbines, Stream Turbines, Sugar Plant Manufacturing, Sugar Production, Oil & Gas Handling System, Oil Exploration, and Other Specialised Sectors

Company:	**TTG Industries Limited**
Contact:	M. Amjad Shariff
Title:	V.P. Projects
Address:	Vanagaram Road Ayanambakkam Madras 600 102
Tel:	011 91 44 625 7780
Fax:	011 91 44 651592
Employees:	300
Yrs. in Bus:	9
Trades with:	Predominantly within India, European countries to a limited extent.
Interest:	We are working with M/s. Kilborn for Arsenic Treatment system which involves Technology Transfer, including performance guarantee of the system.
Sectors:	A) Gas cleaning system B) Emission control to atmosphere C) Material recovery D) Toxic waste treatment E) Treatment of concentrates and sludges F) Adsorption & scrubbing system G) Acid mist pollution control system H) Flue gas controlling I) Electrostatic precipitators (both wet & dry) J) Acid plants K) Material handling (both mechanical & Pneumatic) I) Smelter/furnaces for steel, copper, zinc, etc. M) Automation in warehouse N) Hydraulic system for application in steel sectors O) Industrial Machineries P) Wind energy generators
Products:	We offer on turnkey basis the following systems for chemical, steel & mineral, non-mineral processing industries, refineries, fertiliser & petrochemical industries

Company:	**Ttitanium Tantalum Products Pvt.**
Contact:	T. Jeyananth
Title:	Ltd. Technical Director
Address:	86 - 1 Vengaivasal Main Road Gowriwakan 601 302 Tamilnadu T. Jeyananth
Tel:	011 91 44 235 5209
Fax:	011 91 44 235 5210
Employees:	105
Yrs. in Bus:	16

Trades with:	U.K., U.A.E., U.S.A., Thailand, Saudi
Interest:	Technical transfer, Investment, R&D
Sectors:	Water, Hazardous Waste
Products:	Wastewater treatment, Renewable energy, Corrosion prevention.

Company:	**Udaya Semiconductors Limited**
Contact:	N. Udayakumar
Title:	Managing Director
Address:	1 / 482 Avanashi Road Neelambur Coimbatore 641 014
Tel:	011 91 42 288 504
Fax:	011 91 42 572 814
Employees:	60
Yrs. in Bus:	12
Trades with:	European Countries
Interest:	Investment, Product purchase
Sectors:	Energy
Products:	Renewable Energy: MFRS. of Solar P.V. Cells, panels lighting, water pumping systems

Company:	**Voltas Ltd.**
Contact:	A H Tobaccowala
Title:	Chairman
Address:	19 J N Heredia Marg Bombay 400 001
Tel:	011 91 22 227 6422
Fax:	011 91 22 261 1469
Employees:	10667
Yrs. in Bus:	42
Trades with:	U.S.A. , U.K. , Germany, Switzerland, Japan, Middle East, Singapore, Denmark, Korea
Sectors:	Water
Products:	Waste water Treatment

Company:	Western Paques India Ltd.
Contact:	Rakash Khanna
Title:	Associate Vice President
Address:	224, Ansal Chambers II6, Bhikaji Cama Place New Delhi 110 066
Tel:	011 91 619 1979
Fax:	011 91 616 6622/6181906
Employees:	250
Yrs. in Bus:	9
Trades with:	Dubai, Bahrain, Vietnam, Singapore.
Interest:	Floating 'Special Purpose Vehicles' and would welcome equity and debt participation.
Sectors:	Water, Solid waste.
Products:	Treatment of industrial effluents and municipal solid waste; production of organic manure; collection and transportation of municipal solid waste.

The following Indian Companies have demonstrated interest in joint ventures with foreign companies in the past.

Bass Pollution Control Systems Ltd. Bangalore
S. Sharma, Technical Director
301, 3rd Floor, House of Lords,
St. Marks Road
Banagalore 560 001

Clear Water Limited
"Clawat House"
B-14/1 Okhla Industrial Area, PhaseII, New Delhi 110 020
Tel: 6916095/6916477
Fax: 6841061
Contact: R.R. Bagri, Managing Director

Engineers India Ltd.
A. Jain, Manager
4, Sansad Marg
New Delhi 110 001
Tel: 3716171/561
Fax: 11-3715059

EIMCO-KCP Ltd., Madras
The Eimco K.C.P. Limited
No. 2, Dr. P.V. Cherian Crescent
P.O. Box 6815, Madras 600 105
Tel: 044-8279445
Fax: 044-8271636
Contact: N.V. Rajagopalan, Deputy General Manager

Flakt India Ltd.
Budge Trunk Road
Maheshtala, 743 352
Tel: 91-033-701811
Fax: 91-033-293 643

Gadgil Western Group
Western Paques (India) Limited
224 Ansal Chambers-II
6 Bhikaji Cama Place, New Delhi 110 066
Tel: 044-602109/6872923/6881906
Fax: 044-6871979
Contact: Rakesh Khanna, Associate Vice President.

KEC International Ltd.
D. Kulkarni, Manager
Maker Chamber, 3, Nariman Point
Bombay 400 021
128/4 Aundh, above SBI, ITI Road
Pune 411 007

Larson and Toubro Limited
32 Shivaji Marg
New Delhi, 110 015

The Mysore Kirloskar Ltd.
Saibal K. De, Manager
87/6 Richmond Road
Banagalore 560 025
Tel: 81-2215424
Fax: 81-2588440

Metallurgical & Engineering Consultancy Services
H 44, South Extension
New Delhi, 110 049
Tel: 91-11-694079
Fax: 91-11-6427522

Paramount Pollution Control Ltd.
R.V. Kadam, Director
Miraj Complex
Gotri Road, Race Course
Vadodara 390 007
Tel: 322390/322383 Fax: 0265-322151

Reva Enviro Systems Ltd.
311-A/66 Abhyankar Nagar
South Ambazari Road
Nagpur, 404 010
Tel: 91-22-33120
Fax: 91-22-524079

S & S Industries and Enterprises Limited
Consumer Products Division
A-3 Main Road
Industrial Estates, Ambattur. Madras 600 05
Tel: 044-652689/6258112/6258214
Fax: 044-6257996
Contact: M.O. Srinivasan, Vice President (Operations)

Shiriam Engineering Construction Company (P) Ltd
304/305 Anna Salai
Guna Buildings, 6th floor
Teynampet, Madras 600 018
Tel: 044-454081/458364/453121
Fax: 044-8276722
Contact: S. Shanker, Managing Director

TMT (India) Limited
T G V Prasad
5-8-113, 2nd Floor
21st Century Complex
Nampally, Hyderabad 1
Tel: 011-91-40-204086
Fax: 011-91-40-203100