

FINAL REPORT

India-EU Trade and Investment
Agreement: Environmental
Services Sector Study

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Contents

Acknowledgments	i
List of Abbreviations	ii
1. Introduction.....	1
1.1 Environmental Services Negotiations and the Sustainable Development Chapter	2
1.2 The Environmental Services Sector and its Classification	2
1.3 Nature of Environmental Policies in the EU and India.....	5
1.4 The EU and India in the Global Environmental Market.....	6
2. Snapshot of the EU and Indian Environmental Sectors	8
2.1 India	9
2.2 Selected EU Member Countries.....	10
2.2.1 Five old EU Member States.....	11
2.2.2 Two New EU Member States	13
3. Extent of Liberalization in Environmental Sector of the EU and India.....	14
3.1 Unilateral liberalization	14
3.2 Multilateral Commitments and Offers in the WTO.....	15
3.3 Liberalization in other bilateral and preferential agreements	18
4. Trade Interests and Actual Trade in Environmental Services.....	18
4.1 Trade Competitiveness of EU and Indian Environmental Firms.....	20
4.2 Actual Trade in Environmental Services in India.....	20
4.3 Actual Trade in Environmental Services in the EU.....	23
5. Market Access Barriers in the Environmental Services Sector.....	24
5.1 Regulatory Barriers in the EU.....	24
5.1.1 Protocol on Services of General Interest, 2007 Treaty of Lisbon.....	24
5.1.2 Regulated Professionals (Directive 1999/42/CE)	25
5.1.3 Restrictions in GATS offer reflect domestic regulations.....	25
5.1.4 Public procurement directives and Non-EU bids.....	25
5.1.5 Regulatory barriers in related sectors	26
5.1.6 Market Access Barriers Perceived by 20 Indian environmental firms (Survey results)	26
5.2 Barriers in India identified by EU firms	27
6. Government Procurement in Environmental Services in EU and India.....	29
7. Assessment and Negotiation Strategy for India	30
8. Concluding Remarks and Domestic Reforms	32
References.....	34

List of Tables

Table 1: Global Environmental Market	7
Table 2: Country Environmental Markets Sizes, 2000-04.....	9
Table 3: Specialization of the Top 10 European Environmental Companies, 2001 ...	11
Table 4: Competitiveness in Environmental Service Segments	20
Table 5: Actual FDI Inflow in Environmental Sector in India, 2000-07.....	21
Table 6: Funds released for Urban Water Supply and Sanitation under Selected Central Government Programs in India.....	22
Table 7: EU Trade in Architectural, Engineering & Other Technical Services (including environmental component) 2000-05	23
Table 8: Specialization and Size of 20 Indian Environmental Firms Surveyed	27
Table 9: Survey Summary of 4 EU Environmental Firms in India	28
Table A1. Foreign Direct Investment Inflows, January 2000-August 2007.....	35
Table A2. Survey Summary of Indian Environmental Service Firms, 2007	36
Table A3. EU Trade in Waste Treatment and De-pollution Services (incidental to agriculture, mining & on-site processing services), 1997-2005.....	45
Table A4. EU Trade in Architectural, Engineering and Other Technical Services (including environmental engineering, design and consulting services in turnkey projects), 1997-2005.....	47

List of Box

Box 1: EU Classification of Environmental Services and Corresponding GATS Segments.....	4
Box 2: Comparison of Latest GATS Offers in Environmental Services, India vs. EC 2005	16

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List of Abbreviations

BIT	Bilateral Investment Treaty
BTIA	Bilateral Trade Investment Agreement
CECA	Comprehensive Economic Cooperation Agreement
EU	European Union
EC	European Commission
EBI	Environmental Business International, Inc
FDI	Foreign Direct Investment
FTA	Free Trade Agreement
GATS	General Agreement on Trade in Services
GPA	Government Procurement Agreement
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
MEAs	Multilateral Environmental Agreements
MRA	Mutual Recognition Agreement
REACH	Registration, Evaluation, and Authorization of Chemicals Directive
RoHS	Restriction of Use of Certain Hazardous Substances
UIDSSMT	Urban Infrastructure Development Scheme for Small and Medium Towns
WEEE	Waste Electrical and Electronic Equipment Directive
WTO	World Trade Organization

1. Introduction

Bilateral preferential and free trade agreements have become a strategic route for opening target country markets, particularly since multilateral negotiations have increasingly begun to falter and delay further liberalization. The European Union (EU) has pursued the path of bilateralism and regionalism with gusto, and has to its account the largest number of preferential trade agreements in the world.¹ Among the EU's developing nation trade partners, Mexico and Chile have service liberalization within their bilateral free trade agreements. The EU, however, does not yet have a free trade agreement in Asia, and its current negotiations with Asian emerging economies like China, India, South Korea, Malaysia, Thailand, and the ASEAN bloc seek to establish deeper strategic and economic ties with the East.

Interestingly, the European Council's strategy adopted in Barcelona on March 11, 2002 seeks to integrate environmental issues in the external relations of the EU and its Member States. The EU is increasingly seen to pursue free trade agreements in developing countries as a means of accessing new markets for its products and investment (Francois et al 2005), as well as a means of exporting its regulations and non-trade objectives (Sally 2007). Among the Asian developing countries, the EU is interested in establishing deeper commercial ties with the emerging economy of India, and the current negotiations on a bilateral BTIA to this end include liberalization goals in both goods and services. Services and investment are priority areas in the agreement, and within the services negotiations the environmental service sector is a key sector where the EU is seeking a more liberal commitment from India.

This paper examines an appropriate negotiation strategy for India in the bilateral negotiations for the environmental services sector in the potential EU-India BTIA. The following subsections briefly discuss the link between the environmental services negotiations and the separate chapter on sustainable development; and define the coverage of the sector, policies affecting the sector, and the global environment market. Section 2 discusses recent developments in the EU and Indian domestic environmental sectors; Section 3 analyzes the environmental segments of trade interest to the EU and India, as well as actual trade in the sector. Section 4 reviews the extent to which the EU and India have liberalized this sector, in terms of commitments made multilaterally and in other preferential trade agreements. Section 5 examines the barriers in the EU environmental sector especially for Indian service providers; Section 6 addresses the issue of government procurement in environmental services in the EU and India; Section 7 provides a negotiation strategy for the current bilateral BTIA negotiations in environmental services; and Section 8 concludes with suggestions for domestic reforms.

¹ The European Commission notifies different types of agreements in the WTO: intra-EU Custom Union accessions; as well as bilateral Free Trade Agreements with countries in Europe, the Mediterranean, Latin America, the Middle East and South Africa. Typically, EC free trade agreements are accompanied by association agreements (EIAs). Besides the EC trade agreements, individual EU members have bilateral FTAs with the EFTA (now consisting of the 4 non-EU countries of Iceland, Liechtenstein, Norway and Switzerland). The EFTA has separate bilateral FTAs with European, Middle Eastern, and Asian countries. See WTO website for details: http://www.wto.org/english/tratop_e/region_e/summary_e.xls.

1.1 Environmental Services Negotiations and the Sustainable Development Chapter

While environmental services is included as one of the sectors within services liberalization, the EU has also begun to incorporate a *chapter* on sustainable development within the new BTIAs, which allows the integration of the EU's non-trade goals in its commercial deals. Sustainable development is a desirable goal for all nations, and particularly for an emerging economy like India it is important to integrate environmental aspects in the economic growth process to ensure that the nation can sustain the growth rate for generations to come. The broad goal of sustainable development can be achieved through targeted environmental programs and policies, and in this context the activities in the environmental services sector fall within the realm of sustainable development. Not surprisingly, the proposed chapter on sustainable development within the EU-India BTIA states that the BTIA's "Market Access chapters could provide commitments to *fast-track liberalisation of environmental goods and services*".²

The language in the chapter seems rather general and innocuous, and does not "seek to harmonise levels of environmental, labour and social protection". Yet it does indicate that the "*FTA could reflect commitments in...a set of core Multilateral Environmental Agreements (MEAs)...the starting point could be recognition of the importance of adherence to and the effective implementation of the specific trade obligations set out in the fourteen core MEAs that have taken part in information exchange sessions under the auspices of the WTO Committee on Trade and Environment.*"³ The chapter also seeks commitment on potential future environmental negotiations by indicating that the EU-India BTIA could include "trade-related regulatory cooperation to achieving climate-change objectives and more generally to ensure protection of sustainable energy and increased energy efficiency *for the post-2012 climate change strategy*" (emphasis added). The broad-based nature of the chapter has infringed on negotiations in other forums like the WTO and the Kyoto Protocol.

Thus, the regulatory and liberalization aspects of environmental and energy services could well be included in the sustainable development chapter within the EU-India BTIA, while the environmental service sector negotiations are conducted separately. Although we recognize that commitments in other proposed chapters of the EU-BTIA might impinge on the environmental services sector, this paper will focus only on the environmental services sector as encapsulated within the services negotiations.

1.2 The Environmental Services Sector and its Classification

Environmental goods and services are defined as those which measure, prevent, limit, and correct environmental damage to air, water, soil, and problems relating to waste, noise, and ecosystems (Eurostat/OECD definition). Given this broad-based definition, several characteristics of environmental services are noteworthy in analyzing it for the current negotiations.

² "Discussion Paper on Sustainable Development for EU-India FTA", EU text dated 17th September, 2007. Emphasis added.

³ *ibid.*

First, environmental services do not fall in the category of a coherent economic sector, like financial or IT services. Rather the sector is dispersed across other traditional sectors of the economy including engineering and design, chemicals, construction, R&D, etc. In other words, this service sector overlaps with other service sectors that are negotiated separately. It is thus possible that while the environmental sector is otherwise not open, liberalization in other sectors form a channel of trade for certain environmental services.

Second, environmental equipment and services are often provided in an integrated manner, especially in segments of water treatment and waste management. For example, technology, design, and engineering of waste treatment systems fall under environmental services, but the provision of these environmental services are typically integrated with the provision of the associated equipment. This makes it difficult to track trade in environmental goods and services separately.

Third, given the above two characteristics of the sector, several environmental firms specialize in multiple segments of the environmental services sector along with the provision of equipment. Often a firm that is otherwise categorized as an infrastructure construction company may well be providing environmental services in turnkey projects building water treatment plants or solid waste incinerators. Thus while a separate environmental sector may not be identified in a country, it could well have environmental service providers that are operating under a different industry heading.

In 1994 environmental services were classified into four distinct segments under GATS: (A) Sewage disposal services (CPC 9401); (B) Refuse disposal services (CPC 9402); (C) Sanitation and similar services (CPC 9403); and (D) Other services. The EU, however, has followed a more disaggregated seven-segment classification, which essentially distinguishes the “other services” into specific components. The seven segments are: (A) Water and wastewater management, CPC 9401; (B) Solid/ hazardous waste management, CPC 9402 and CPC 9403; (C) Protection of ambient air and climate, CPC 9404; (D) Remediation and clean up of soil and waters, part of CPC 9406; (E) Noise and vibration abatement, CPC 9405; (F) Protection of biodiversity and landscape, parts of CPC 9406 not covered under D; (G) Other Environmental and ancillary Services, CPC 9409.

While the Eurostat/ OECD classification seems broader than the GATS categorization, the latter can be easily written in a more expanded form. Indeed, the WTO Secretariat reconciled the differences between the GATS four-segment classification and the EU’s seven-segment classification in 1998, with some reservations for sensitive segments like water for human use, wholesale in scrap, and services incidental to agriculture/ forestry, etc. Box 1 provides the correspondence between the different EU and the GATS environmental segments.

In this paper, while analyzing the EU and Indian environmental sectors, we have followed the extended seven-segment classification of environmental services. Although the EU had used its seven-segment classification in making offers under the Doha Round of negotiations, it continues to table its commitments at the GATS under the four-segment classification as evident from the most recent EC commitment tabled in October 2007 after the accession of Bulgaria and Romania (*Other services* is more elaborately defined to include several subsectors). Thus, when discussing the

WTO commitments and offers in Section 4, we have retained the GATS four-segment classification, which India has followed in its revised offer of 2005.

Box 1: EU Classification of Environmental Services and Corresponding GATS Segments

EU classification	Corresponding GATS classification*
<u>A. Water for human use and wastewater management</u> Waste Water services (CPC 9401)	<u>A. Sewage disposal services</u> CPC 9401 Excludes collection, purification and distribution services of water (in CPC 18000) Excludes construction, repair and alteration of sewers (in CPC 51330) (GATS 3B civil engineering construction services)
<u>B. Solid/ hazardous waste management</u> (CPC 9402) (CPC 9403)	<u>B. Refuse Disposal Services</u> (CPC 9402) Excludes dealing and wholesale in waste and scrap (in CPC 62118 and 62278; GATS 4 distribution services) Excludes R&D services on environment issues (CPC 85; GATS 1C Business services (R&D)) <u>C. Sanitation and Similar Services</u> (CPC 9403) Excludes disinfecting/exterminating services for buildings (in CPC 87401; GATS 1F(o) – Other Business Building Cleaning Services.) Excludes pest control for agriculture (CPC 88110; GATS 1F(f) services incidental to agriculture, hunting and forestry.
<u>C. Protection of ambient air and climate</u> (CPC 9404)	<u>D. Other</u> <i>Cleaning Services of Exhaust Gases</i> (CPC 9404)
<u>D. Remediation and clean up of soil and waters</u> Treatment, remediation of contaminated/ polluted soil and water (part of CPC 9406)	<u>D. Other</u> <i>Nature and Landscape Protection Services</i> (CPC 9406)
<u>E. Noise and vibration abatement</u> CPC 9405	<u>D. Other</u> <i>Noise and vibration abatement</i> CPC 9405
<u>F. Protection of biodiversity and landscape</u> (parts of CPC 9406 not covered under D)	<u>D. Other</u> <i>Nature and landscape protection services</i> CPC 9406 Excludes forest and damage assessment and abatement services (in CPC 881, GATS 1F(f). Services incidental to agriculture, hunting and foresting)
<u>G. Other Environmental and ancillary Services</u> CPC 9409	<u>D. Other</u> Other environmental services nec, CPC 9409

*WTO (1998) document S/C/W/46

1.3 Nature of Environmental Policies in the EU and India

Government policies critically impact the growth of the environmental services sector. These policies can act as both a demand factor as well as a supply factor in the environmental sector. For example, well-enforced stringent environmental regulations increase industrial demand for pollution abatement and prevention services, and government procurement of water and sanitation services increase the demand for infrastructure environmental services.

In the EU, environmental protection has been internalized in economic policy-making. Indeed Article 6 of the Treaty establishing the European Community requires that environmental considerations must be integrated into all Other Community policies. In 2000, the European Council adopted a ten-year program called the Lisbon Strategy aimed at economic, social and environmental renewal. The Lisbon Strategy aims to increase European competitiveness by investing in a knowledge-based and highly productive society. EU environmental legislation is growing rapidly and impinges on virtually every economic activity.

The environmental regulations in the EU are considered to be among the most stringent in the world, and the standards are getting stricter every year. The EU's environmental policy is developed, adopted, implemented and evaluated by the three institutions of the European Parliament, the Council of European Union and the European Commission at the central level.⁴ The national governments of the EU Member states also have the sovereignty to impose additional environmental regulations. The European Commission has been issuing a steady stream of stringent proposals on water quality, air quality, waste management, product stewardship, etc. It is important to note that while the EU Member States are guided by the same principle, the 27 states have discretion in terms of environmental goals, techniques and incentive programs.

By contrast, Indian government environmental policies are aimed at more basic pollution control and natural resource conservation. While EU regulations are now increasingly targeted at product stewardship, whereby an integrated policy approach is taken towards the life-cycle of products and services, Indian environmental standards continue to focus on management of pollution generated at the tail-end. Thus the Indian environmental policy approach sets ambient standards for residential/ industrial/commercial air and water quality, some industry-specific pollution standards and impact analysis, urban waste management, etc. Although Indian environmental regulations have helped in the growth of the domestic environmental services sector, it has failed to be a major driver for the sector since enforcement of these regulations has remained poor.

While EU policies are targeted at protecting the regional environment, the impact of some EU regulations goes beyond its borders. Among the more recent EU regulations that directly impact foreign traders are the Registration, Evaluation, and Authorization

⁴ In the process, they can ask for independent information on the environment from the European Environment Agency in Copenhagen. This agency has 31 member countries — namely the 25 countries of the European Union plus Bulgaria, Iceland, Liechtenstein, Norway, Romania and Turkey. Switzerland and all the Balkan states also collaborate in the Agency's work. *Europe on the Move: A Quality Environment*, <http://ec.europa.eu/publications/booklets/move/55/en.doc>

of Chemicals (EC 1907/ 2006) or REACH, Waste Electrical and Electronic Equipment (Directive 2002/96/ EC) or WEEE, and the Restriction of Use of Certain Hazardous Substances (Directive (2002/95/EC) or RoHS. REACH, effective 1st June 2007, is a chemical policy reform and requires all chemicals produced or imported into the EU in volumes greater than 1 ton/year to be registered with a central European Chemicals Agency, with information on their properties, uses and safe ways of handling them. Industries ranging from automobiles to textiles are expected to be impacted by this regulation. The WEEE Directive, effective 2005, requires makers of computers and other electronic equipment to take responsibility for the full life cycles of their products, while the RoHS Directive, effective July 2006, bans the placing on the EU market of new electrical and electronic equipment containing more than agreed levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl, and polybrominated diphenyl ether flame retardants. WEEE may require a potential exporter to register its products with a WEEE authority; and similarly an exporter may need to provide a due diligence for compliance to the European RoHS enforcement authority. Thus these directives directly increase the responsibility of foreign electronic and computer manufacturers exporting to the EU market in terms of use of banned material as well as disposal of final goods at the end of consumption.

Rules on packaging also impinge on exporters to the EU. For instance, the Packaging and Packaging Waste directive (Directive 2004/12/EC, amending Directive 94/62/EC) is aimed at minimizing packaging waste material, promoting re-use and recycling of packaging, and encouraging energy recovery. This covers all packaging placed on the market in the Community and all packaging waste, whether it is used or released at industrial, commercial, office, shop, service, household or any other level, regardless of the material used. The directive establishes its own definition of the term 'packaging', where its Annex I classifies tea bags as non-packaging, but the film overwrap around a CD case or labels hung directly on/attached to a product as packaging. At the country level, the EC directives are implemented through national regulations. For example, in the UK the packing directive is implemented through the Producer Responsibility Obligations (Packaging Waste) Regulations 2007 and the Packaging (Essential Requirements) Regulations 2003.

Thus even when the export product to the EU market meets environmental stipulations, entry barriers may crop up due to the strict stipulation on packaging material. Product life-cycle responsibility and cost-benefit analysis within the EU is permeating across the borders, and export of goods into the EU will need to be integrated with packaging waste management services.

1.4 The EU and India in the Global Environmental Market

The global environmental market (including equipment, services and technology) is valued at more than US\$650 billion, with the environmental services sector accounting for more than half the total value. The sector grew by more than 15% during 1996-2002, and was estimated to be \$652 billion in 2005 (EBI 2006a). The largest environmental markets are in the US, Japan and Western Europe; however, emerging economies including those of Central and Eastern Europe, Latin America and the Asia-Pacific region (especially China and India) have experienced the most vibrant growth in their environmental markets. In 2005, these emerging economies

accounted for 14% of the global environmental market compared to only 8% in 1994 (EBI 2006a).

While the Indian environmental market is projected to witness double-digit annual growth rate, the Indian market (valued at \$4.7 billion) was less than 3% the size of the EU environmental market (about \$190 billion) in 2004. Thus while the EU may be gung-ho about liberalizing the environmental sector worldwide, there is marked disparity in the market sizes and maturity levels in emerging economies when compared to the EU.

In the global environmental market, the EU is considered to be the pace-setter even though the US is the largest country market in the world. As evident from Table 1, in 2004 the environmental market in the US was larger than the entire European market (including Western, Central and Eastern Europe), although the annual growth of the environmental sector in Central and Eastern Europe has been faster than that of the more mature Western European and American markets. Similarly the Asian environmental sector has been witnessing double-digit annual growth rates.

Table 1: Global Environmental Market

Region	2003	2004	Growth	2003 Exports	2003 Imports
US	228.7	240.8	5.3%	24.7	21.9
Western Europe*	172.4	180.0	4.4%	37.5	30.2
Central & Eastern Europe	11.8	13.0	9.7%	0.3	3.8
Japan	96.1	98.8	2.8%	16.9	5.8
Rest of Asia <i>of which India</i>	33.6 3.9	38.0 4.7	13.1% 10%	1.3 -	9.4 -
Mexico	4.1	4.4	9.1%	0.05	1.64
Rest of Latin America	11.0	12.1	10.3%	0.2	4.4
Canada	16.0	16.5	2.9%	1.65	2.13
Australia/ New Zealand	9.6	10.1	5.3%	1.8	1.1
Middle East	8.3	9.4	13.6%	0.1	2.2
Africa	4.6	5.5	19.4%	0.0	2.1
Total	596.0	628.5	5.5%	85	85

*Notes: Numbers in US\$ billion. *Including intraregional trade within Western Europe (e.g., German sale to Italy is an export and an import).*

Source: EBI (2006b).

The EU is enthusiastic about growth prospects in developing country environmental markets since Europe already has the first-mover advantage in several environmental technologies and services. The EU environmental companies have a competitive edge in several environmental segments. The environment industry in the European Union consists of some of the leading environmental firms in the world; these include the water giants like Vivendi Environnement (France), SUEZ (France, through Ondeo,

SITA) and Thames Water (UK, a subsidiary of RWE); solid waste leader RWE Entsorgung (Germany), etc.

Indeed the growth prospects of Asian developing countries prompted the US to enter into an Environmental Partnership program in the 1990s with various countries including China, Hong Kong, India, Indonesia, Korea, Malaysia, the Philippines, Singapore, Sri Lanka, Chinese Taipei, Thailand, and Vietnam. The domestic environmental industries in these countries are still dependent on imports of pollution abatement equipment and technology from the more advanced markets in the US, Western Europe and Japan, although countries like Korea, Chinese Taipei and China have also become competitive suppliers of the US for certain environmental goods in the Asia-Pacific region.

However, compared to the EU environmental industry, the Indian domestic environmental industry is not an organized sector and has smaller environmental service providers and less-diversified firms. The Indian industry is dominated by small-scale units, where the majority of the enterprises lack the resources to invest in R&D and marketing networks. The limited R&D capability of Indian environmental companies constrains technological improvements, and capital costs for expansion seem prohibitive for the small firms. Moreover, as many of the Indian environmental firms are relatively new, they do not qualify for the large projects funded by multilateral organizations in the country, due to strict eligibility criteria that include past record, experience, turnover, product specifications, and third-party guarantees. With mature large multinational environmental firms having an advantage in the bigger projects in India, the smaller domestic service firms have found a niche in consulting.

2. Snapshot of the EU and Indian Environmental Sectors⁵

As mentioned above, the Indian environmental market is rather small compared to the EU environmental market. The environmental market in the EU, however, is quite heterogeneous since all members are not equally developed nor do they have identical regulations; it is also fragmented by size and language. Table 2 below gives the size comparison of the Indian environmental market and of seven selected EU Member countries. The EU members of Germany, the UK, France, and Italy have the four largest national environmental markets in Europe (rank ordered). Spain has a comparatively smaller market but is expected to have good growth prospects. Among the newer Eastern European EU Members, Poland and the Czech Republic (members since 2004) have rather small markets that are more in league with the Indian environmental sector.

The new EU members, however, are on the fast track for implementing EC environmental directives, as part of their accession condition to the Union. The EU funding for environmental projects is several times the size of the entire Indian environmental sector. Among the different funds is the Cohesion Fund, which is an instrument of EU structural policy, and has a budget of €61.5 billion (2007-2013) that seeks to improve cohesion within the EU by funding transport infrastructure and

⁵ The information in this section is based on the country profiles contained in EBI (2006b). All other information sources are referenced separately.

environmental projects in Portugal, Spain, Greece, and new EU Member States. The projects are usually co-financed by national authorities, the European Investment Bank, and the private sector. Sector-specific EU grants also offer assistance for environmental protection to EU Member States. However, it is important to note that tenders related to these grants (posted on the website of the European Commission) typically restrict participation to EU firms or are tied to EU content (USCS 2007).

Table 2: Country Environmental Markets Sizes, 2000-04

Country	2000	2001	2002	2003	2004	% Share of World Market, 2004
Germany	44.27	44.52	45.26	45.6	46.49	7.4
United Kingdom	25.4	25.96	27.26	28.75	30.29	4.8
France	24.19	24.68	25.52	26.13	27.17	4.3
Italy	15.8	16.4	17.1	17.82	18.69	3.0
Spain	8.6	9.01	9.93	10.93	12.05	1.9
India	2.65	2.96	2.85	3.96	4.67	0.7
Poland	2.92	3.11	3.2	3.43	3.74	0.6
Czech Republic	0.79	0.86	0.89	0.94	1.01	0.2

Note: Numbers in US\$ billion.

Source: EBI (2006b).

2.1 India

Water and air pollution are among the most pressing environmental problems in India, with the water treatment equipment, services and technology segment constituting the bulk of the total environmental market. The Indian water services market is estimated to be more than \$1 billion, with the government sector contributing to more than half this market.⁶ The water market is growing at 10-12% annually, but the wastewater treatment segment is highly fragmented and unorganized. The water transmission and distribution networks in the country are in a poor state of repair. European and American water companies are involved in about 70 projects worth several billion dollars (some funded by international institutions) in 20 Indian cities.⁷ The US environmental firms in particular consider the best business opportunities are in sanitation, urban water supply improvement and municipal waste treatment, namely, infrastructure environmental services, all of which fall in the realm of government procurement.

On the whole, in India two types of environmental firms are observed: large engineering firms offering environmental services as part of their equipment or technology package for pollution treatment; and small (even micro-) firms specializing in analytical environmental services, including environmental management systems facilitation, environmental audits, environmental impact

⁶ US Commercial Country Guide for India 2007, dated June 2007.

⁷ Ibid: page 38.

assessment, and development of environmental standards. The larger firms offer environmental services as an integrated package through large turnkey consulting projects. Such comprehensive project design and management includes the provision of engineering, construction, equipment, and operation and maintenance of general utility facilities, such as water, pollution and waste management systems for industrial clients. These Indian firms are typically well-developed and large in terms of staff and scale of operations. However, large Indian firms remain small when compared to the European environmental multinationals.

The Indian environmental industry has made little investment in R&D over the past decades, with the majority of the processes or technologies employed in the industry being generic with a few modifications. There are hardly any worthwhile patents taken up by the Indian industry on new processes or technologies except in ion-exchange resins and some membranes. However, some companies have made rapid strides in advancing technological capabilities in conventional environmental management. For instance, in renewable energy and wastewater treatment, local firms have strengthened their ability to supply technologically superior products. Much of this has happened through indigenous efforts and through strategic partnerships with foreign companies.

2.2 Selected EU Member Countries⁸

The maturity and size of the national environmental sectors across the EU Member countries are clearly divided along the Western vs Central and Eastern European nations (newer EU members). While the environmental sectors of West European countries are well-developed and have cutting-edge technology in the world market, the environmental sectors of Central and East European countries are small and just beginning to evolve; their environmental regulations are being upgraded, and enforcement remains poor. Their accession to the EU was conditioned on an upgrading of national environmental regulations to stringent EU standards (*Acquis Communautaire*), as well as compliance based on a definitive timetable (EBI 2006b: 8-152). Indeed, the new EU Members are currently in their transition period for several of their environmental programs. The EC estimated an environmental investment need of €80-110 billion, i.e., \$97-133 billion, for the 10 new Members in 2004⁹ (EBI 2006b). This has provided new business opportunities in environmental equipment, service and technology for British, German, French, Dutch and American corporations, which have been traditionally serving the European market. The projects in the new EU Member States to upgrade to EU environmental standards are financed by EU institutions (like Phare and Instrument for Structural Policies for Pre-Accession), international institutions, and bilateral grants, as well as commercial bank loans and FDI.

The implementation of new EU environmental directives is also driving environmental market growth in the older EU States. While West European environmental sectors have low market growth in pollution abatement/ environmental protection services, robust growth is expected in clean technology and resource

⁸ Based on information in different US Commercial Country Guides for the year 2007. All supplementary sources are referenced separately.

⁹ Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia acceded to the EU in 2004.

efficiency. These business opportunities again are a reflection of the level of maturity of the environmental sector in Western EU Members versus the newer Members (and India). This section provides a brief on the environmental sector of seven EU Members-- two new members and five of the older Member States.

Table 3 below highlights the areas of specialization of some of the large European multinational environmental service providers. It indicates that the world's leading diversified environmental firms are from EU Members -- France, Germany, and the UK. French leaders like Vivendi and SUEZ offer a range of diversified services including wastewater management, solid waste, and hazardous waste management, as well as water equipment and chemicals. Similarly, RWE and Severn offer waste treatment services as well as consulting and engineering services.

Table 3: Specialization of the Top 10 European Environmental Companies, 2001

World Rank	Company	Country	Segment	Revenue
1	Vivendi Environnement SA	France	Water/ SW/ HW/ WE&C	17,230
2	SUEZ (Ondeo, SITA)	France	Water/ WE&C/ SW	13,970
5	RWE Entsorgung AG	Germany	Solid Waste/ C&E	4,790
7	Severn Trent	U.K.	Water/ WW/ C&E	2,380
13	Hochtief AG	Germany	EC	1,760
14	AWG plc (Anglian Water)	UK	Water	1,740
18	United Utilities	UK	Water/ WW/Equip.	1,440
20	Vestas	Denmark	Wind Power Systems	1,280
22	Noell GmbH	Germany	APC/ EC/ SW/ RR	1,100
24	Fomento de Construcciones y Contratas	Spain	EC/ Solid Waste	1,040

Notes: SW=Solid Waste Management; HW=Hazardous Waste Management; WE&C=Water Equipment & Chemicals; C&E=Consulting and Engineering; WW=Water treatment works; EC=Engineering Constructing. All figures are in US\$ million.

Source: EBI (2006b).

2.2.1 Five old EU Member States¹⁰

Germany. The German environmental sector (valued at \$47 billion in 2004) is by far the largest among all European nations, with leading firms in engineering construction, waste management and resource recovery. However, the household refuse disposal management segment is still in the realm of the public sector, and local/ regional authorities maintain a monopoly for hazardous and special wastes (EBI 2006b: 9-182). In the former East German region, there is need for deep investment especially in modernizing water and wastewater systems, extending sewage treatment

¹⁰ While Germany, France and Italy have been Members of the EU since 1957, the UK joined in 1973 and Spain in 1986.

plants, and remediation of contaminated sites. The investment disincentive for foreign (as well as domestic) firms are the high marginal income tax rates and labour laws that impede hiring and dismissals in Germany.

France. The water segment is the largest environmental segment in France. Indeed, French water companies (offering integrated environmental services) have established themselves as the market leaders in the world. The two multinational firms of Vivendi and Suez-Lyonnaise des Eaux dominate the French (as well as the world) market. The US Commercial Service estimated the size of the water treatment segment (equipment and services) to be US\$19.2 billion, offering the best prospects for foreign businesses in 2007. To comply with the recent EU directives, France needs to construct major water distribution and wastewater treatment facilities across the country. The range of services expected to see a hike in demand include: construction, operations, maintenance and repairs of small- to medium-sized water treatment plants; wastewater sludge treatment, installation and maintenance of stand-alone sewage treatment tanks; remote monitoring technology; and membranes and water filters. Organic membranes for urban wastewater treatment and reclaimed water have been identified as an emerging market. Membranes capable of treating wastewater discharged into sensitive ecological systems are also in high demand. The US companies, being market leaders in this technology, are focusing on the emerging opportunity in France. Another emerging area is sludge treatment. The French government recommends wastewater sludge for recycling (composting, de-hydration) and re-use (fertilizer in farming, landscaping and re-vegetation). Thus, sludge treatment technology is expected to experience enhanced demand in the foreseeable future.

Italy. The Italian environmental sector is not in the same league as that of France, Germany and the UK. However, the implementation of EU directives is expected to provide an impetus to the domestic market and drive new investment. Air pollution (that is threatening historical monuments) and building water/ wastewater systems are among the priority areas. The US Commercial Service estimates that an overall investment of US\$62 billion will be needed to bring Italy's water and sewage system at par with international standards (EBI 2006b: 9-192).

Spain. In Spain, besides the central government, 17 autonomous/ regional governments issue environmental laws and regulations that are mandatory for their territories. The regional governments incorporate laws issued by the central government as well as EU directives. The government's environmental budget is more than US\$4 billion (comparable to the total market value of the Indian environmental sector!). In 2007, the US Commercial Service estimated the Spanish environmental sector (equipment, services and technology) to be valued at US\$22 billion. Spain is one of the fastest-growing economies in the EU, with a rapidly expanding environmental sector. The water services segment, in particular, is a growing area, and the Spanish government has undertaken large public works programs in the national water system, which is partly funded by the EU. Public investment is expected to focus on water projects (with priority to water treatment, re-use and desalination projects) and natural environment protection, while investment in conventional water infrastructure is on the decline. Spain's socialist government has a liberal commercial policy, allowing foreign investment of up to 100% equity (except for certain sectors like electricity, energy and telecommunications, where the extent of

liberalization varies). In 2005, the OECD countries were the largest investors, accounting for 96.9 % of total FDI in Spain. The largest investor countries were the UK, the US, Mexico, France, Portugal, the Netherlands, Germany, Italy and Switzerland. In 2007, the US Commercial Service identified new business opportunities in engineering, as well as water treatment equipment and services. Although there is no discrimination against public or private firms (in terms of access to local markets, credit, licenses and supplies), American construction companies report that they have not been able to win public sector construction contracts. They have, however, won private sector construction contracts.

United Kingdom. The environmental sector is globally competitive, with key export markets located within the EU, Southeast Asia and North America (EBI 2006b: 9-186). British water companies are among the world leaders (second to the French giants) and include firms like Severn Trent, Thames Water, and North West Water. However, a 2007 report of the British Department of Trade and Industry noted that the UK environmental industry is falling behind its competitors (from France, Germany and the US) and has less than 5% share of the world market.¹¹ It observed that the well-developed domestic market for water and wastewater treatment has given UK suppliers an edge in the overseas markets, and accounts for about 80% of the country's environmental exports (EBI 2006b). Since the UK environmental market demand is strongly dependent on government action, investors are wary and consider it to be a high-risk sector (uncertainty of financial returns) compared to other sectors of the economy. New scope for environmental business is emerging in the city of London, which will be hosting the Olympic and Paralympic Games in 2012. Large public investments are expected to be made in the near future to make the city an environmentally friendly and sustainable site for the Games.

2.2.2 Two New EU Member States

Czech Republic. A 10-year Waste Management Plan was launched in 2003 to improve environmental quality as part of an effort to upgrade to the EC's environmental quality implementation. In 2005, the Czech Ministry of Environment announced an investment of about \$85 million from the state budget and EU funding mechanism to undertake more than a hundred projects, with priority in waste management – especially waste disposal and recycling (EBI 2006b: 8-163). Business opportunities are to be found in both waste management (incinerator modernization, biological waste processing facilities, waste reclamation technology, etc), as well as water and wastewater services. However, even American firms are trying to find a niche in the Czech market in the face of competition from well-established West European and local firms. For example, in the wastewater treatment services segment, Vivendi Water, Ondeo and Anglian Water account for about 65% of the country's operating facilities (EBI 2006b: 8-164).

Poland. The Polish environmental market is relatively mature among the Central and East European countries. Native firms, Western European and American environmental corporations dominate the Polish market. While the environmental legislation has been upgraded vis-à-vis the Acquis Communautaire, implementation is

¹¹“Enabling Business in Resources Management: The Report of the Innovation and Growth Team for Environmental Goods and Services sector”, dated October 2007, website: <http://www.berr.gov.uk/files/file41669.pdf>

still underway. The establishment of the complete regulatory regime has led to rapid growth in environmental consulting and engineering services, especially in the demand for environmental impact assessment, emergency response plan development, and safety auditing and reporting, as well as technologies for pollution prevention, waste minimization and clean development (EBI 2006b: 8-162). Most of the environmental upgrade costs are financed through the EU funding mechanism, but private industry (e.g., petrochemical manufacturing, power generation, cement production, oil refining, and iron and steel) has also increased its demand for environmental services.

Projects in municipal solid waste management, hazardous waste and sludge treatment (especially biotreatment), bioremediation of contaminated soil, and clean energy are identified as offering the best business prospects for US firms. For Indian environmental firms, service providers from Germany, UK, France, US, and the Scandinavian countries are the most formidable competitors besides the native Polish companies.

3. Extent of Liberalization in Environmental Sector of the EU and India

The EU has been particularly keen on India's commitments in environmental services in terms of capital investment through Mode 3 (commercial presence), while Indian interest lies in the further liberalization of the labor flows through Mode 4 (movement of natural persons) in the EU given their respective factor abundance. This section examines the extent of liberalization, particularly in terms of the FDI regime in India and foreign labor entry (independent of commercial presence) in the EU.

3.1 Unilateral liberalization

In India, the existing regime allows foreign direct investment in environmental equipment and services under the automatic route with up to 100% foreign equity holding. Environmental management and consulting is completely open with 100% foreign equity, although foreign investment in infrastructure services has often been routed through the government's Foreign Investment Promotion Board – but even in the latter case automatic FDI approvals are increasingly allowed.¹² However, FDI is limited to 74% for construction and maintenance of waterways, rail beds, hydroelectric projects (clean energy), power plants and industrial plants. In environmental equipment (typically offered with services) too, India allows FDI up to 100% foreign equity under the automatic route. Investment under the automatic route in India signifies that central government approval is not required, and reflects the underlying decentralization and promotion of private participation in infrastructure services at the state and municipal levels. This is also reflected in India's revised GATS offer in 2005, which scheduled the segments of refuse disposal and sanitation services.

In July 2005, the Indian government further opened up the environmental infrastructure services in new township construction with 100 percent equity in “built-up infrastructure and construction development projects... including city and regional

¹² FDI in infrastructure including roads, highways, tunnels, bridges, and ports and harbours is permitted and comes under automatic approval with 100% foreign equity.

level infrastructure” under the automatic route.¹³ Since central government approvals are not required now for foreign investment in certain township construction, this has reduced bureaucratic barriers.

The EU has a completely liberal regime for foreign investment for environmental services. However, it is the reservations for public works and government-approved monopoly in certain infrastructure environmental services that constitute market restrictions. While capital movement is open, foreign labor inflows face restrictions.

The next section discusses the multilateral commitments and offers in environmental services of India and the EC. It is noteworthy that while the actual trade regime in India is quite liberal (as indicated above), the WTO commitments and offers are more restrained. On the other hand, the EC’s commitments and offers in the GATS mirror its actual trade regime.

3.2 Multilateral Commitments and Offers in the WTO

The WTO environmental negotiations (in both goods, services and trade obligations in multilateral environmental agreements) has been led by the EC since the Uruguay Round, and the EC made commitments in environmental services in 1994 under the GATS. At that time India, like most other developing countries, refrained from making any commitments in the sector.

Under the Doha Round of negotiations, India again refrained from offering to open the environmental services sector initially (in 2003). In the second (revised) offer in 2005, however, India offered to open the two environmental segments of sewage services and refuse disposal. On the other hand, the EC’s offer in environmental services sector has been virtually the same as its commitments. Much to the discontent of the developing countries, the EC continues to keep the movement of natural persons “unbound” while foreign investment is completely open. Even in the EC’s latest offer (October 2007) Mode 1 and Mode 4 are unbound for most states.¹⁴ While Modes 2 and 3 are open for most states, these are unbound for the emerging East European Members.

While the EC in the plurilateral request asked India to open Mode 1 wherever feasible, it continues to maintain Mode 1 as unbound in all its offers (except for the states of Estonia, Latvia, Hungary, etc. for some of the environmental subsectors).

Comparing India’s revised offer of 2005 with EC’s conditional revised offer of 2005 in environmental services

Unlike the EC, India has no horizontal reservation for public utilities (national or local) for exclusive rights given to private operators. The EC has however maintained such reservations all through, and this directly impacts market access in environmental services like sewage services, refuse disposal services and sanitation

¹³ The investment is conditional on a minimum size of US\$10 million for wholly-owned subsidiaries and \$5 million for joint ventures with Indian partners. Foreign Exchange Management Regulations 2005: Notification No. FEMA 136 /2005-RB dated July 19, 2005.

¹⁴ WTO (2007) Council for Trade in Services, “Notification from The European Communities and its Member States Pursuant to Article of the GATS”, S/SECRET/11.

services, where local authorities hold a monopoly in providing services to the communities.

Within the two subsectors, CPC 9402 and CPC 9403, that India tabled in the revised offer of 2005 the offers are more liberal than those made by the EC when compared mode by mode. India has put no restrictions in Modes 1 and 2 (unlike EC which has Mode 1 as unbound), and Mode 3 is open, subject to incorporation (but unbound for EC members Cyprus, Malta, Poland, and Romania – markets where new environmental projects have been financed). Mode 4, of course, is unbound for both partners. Box 2 below provides a comparative summary of the offers made by India and the EU in the environmental services sector under the Doha Round.

EC restrictions in other related services

In related service sectors, like *integrated engineering services* (CPC 8673) with application in environmental services like sanitation works (turnkey projects), Modes 1, 2 and 3 are not open for all states. Mode 1 is unbound for Cyprus, Greece, Italy, Malta, Portugal, Poland and Romania; Mode 2 is unbound for Bulgaria, Cyprus, Malta, Poland and Romania; Mode 3 is unbound for Bulgaria, Cyprus, the Czech Republic, Spain, Italy, Malta, Portugal, Poland and Romania. Mode 4 remains unbound for all.

Similarly, in engineering services (CPC 8672), engineering design, advisory, and consulting, Mode 4 is unbound, with Bulgaria, Greece and Hungary requiring nationality/ permanent residency conditions. To the extent that larger Indian environmental service firms have engineering services as their key specialization, market access in the emerging economies of EC is restricted. Since the environmental services sector also overlaps with a wide range of other professional services, any restrictions in those sectors immediately impinge on the openness of the environmental sector.

Box 2: Comparison of Latest GATS Offers in Environmental Services, India vs. EC 2005

<u>India</u>	<u>EC</u>
No such horizontal reservation for public utilities at national or local level	<i>Horizontal restriction:</i> “Public utilities may be subject to public monopolies or exclusive rights granted to private operators, under the horizontal commitments regulatory”- Effectively restricts market access in CPC 9401, 9402 and 9403, even when “None” is reported.
<i>A. Sewage Services (CPC 9401)</i> Not offered	Mode 1 remains unbound in all states (but open in Estonia, Latvia and Lithuania). Modes 2 and 3 open in most (but unbound in Cyprus, Finland, Hungary, Malta, Poland and Romania). Mode 4 is unbound in all states.
<i>B. Refuse Disposal Services (CPC 9402)</i> Mode 1 and 2 open.	Mode 1 remains unbound (but open in Estonia and Hungary). Modes 2 and 3 are open for most (but

Mode 3 open subject to incorporation (and FIPB approval in case of prior collaboration) Mode 4 is unbound.	unbound in Cyprus, Malta, Poland and Romania). Mode 4 is unbound in all states.
<i>C. Sanitation and Similar Services (CPC 9403)</i> Mode 1 and 2 open. Mode 3 open subject to incorporation (and FIPB approval in case of prior collaboration). Mode 4 is unbound.	Mode 1 unbound (but open for Estonia, Hungary and Latvia). Modes 2 and 3 open for most (but unbound in Cyprus, Finland, Malta, Poland and Romania). Mode 4 is unbound .
<i>Protection of ambient air and climate (CPC 9404)</i> Not offered.	Mode 1 unbound (but open for Estonia, Finland, Latvia, Poland, and Romania). Modes 2 and 3 open for most (but unbound in Cyprus, the Czech Republic, Hungary, Malta, the Slovak Republic, and Slovenia). Mode 4 is unbound .
<i>Noise and Vibration abatement – (CPC 9405)</i> Not offered	Mode 1 unbound (but open for Estonia, Finland, Latvia, Poland, and Romania). Modes 2 and 3 unbound (but open for Austria, Bulgaria, Estonia, Finland, Latvia, Lithuania, Poland, Romania, and Sweden) Mode 4 unbound .
<i>Nature & landscape protection services – (CPC 9406)</i> (includes soil remediation, and biodiversity protection) Not offered	Mode 1 unbound (but open for Estonia, Finland, and Romania) Mode 2 and 3 open (but unbound for Cyprus, the Czech Republic, Hungary, Malta, Poland, and the Slovak Republic) Mode 4 unbound .
<i>D. Other environmental and ancillary services (CPC 9409)</i> Not offered	Mode 1 unbound (but open for Estonia, Finland, Poland, and Romania). Modes 2 and 3 open (but unbound for Bulgaria, Cyprus, the Czech Republic, Hungary, Malta, the Slovak Republic and Slovenia) Mode 4 unbound .

In concluding this section, we observe that while the capital- and technology- rich EC has kept Mode 3 completely open in the environmental services sector, and requests the developing countries to match that offer, it continues to restrain Mode 4 and Mode 1 that labour-abundant countries like India have been requesting. With unemployment continuing to haunt some of the European nations, it seems unlikely that the EC would like to open the gates for foreign nationals for short- or medium-term projects. While EU members (like Germany) had to allow the entry of foreign IT-professionals given the need for skilled computer personnel, it has given rise to domestic resistance against such a policy.

3.3 Liberalization in other bilateral and preferential agreements

Only two of EU's bilateral FTAs with developing countries have included services liberalization, namely, those with Mexico and Chile. The EC's offer in the environmental services sector in the WTO, under the current Doha Round, is representative of its commitment in the bilateral agreements with developing countries, as evident in the EU-Chile Association Agreement of 2002. In particular, the EU has explicitly included *water for human use* (as in its revised WTO offer of 2005) with Modes 2 and 3 open, but with Mode 1 and 4 unbound. The developing country partner, Chile, has left Modes 1 and 3 unbound, Mode 2 open, and Mode 4 unbound in environmental services in its bilateral FTA with the EU.

On the other hand, India has committed to services liberalization in only one bilateral agreement, namely the India-Singapore Comprehensive Economic Cooperation Agreement (CECA) 2005. However, the environmental services sector is not included in the schedule of commitments.

Thus comparing the depth of commitments made in the environmental services sector by the EU and India in their respective BTIAs, the EU commitments in the preferential trade agreements are as deep as its WTO offer, while India's WTO offer is deeper than its commitment in the bilateral agreements.

Bilateral Investment Treaties

While the EU does not have a formal Bilateral Investment Treaty (BIT) with any country, the EU Member States have many BITs with external partners. Since BITs are expected to help provide an institutional support structure to address bilateral investment issues, India too has signed 61 such BITs (as of June 2007). Indeed, India's first BIT was signed with an EU Member (UK) in March 1994. In all, India has BITs with 20 EU Members.¹⁵

Although there is no evidence that BITs necessarily lead to greater bilateral investment between the parties, it does provide for an institutional redressal mechanism that is expected to enhance the confidence of foreign investors in the host country.

Considering India has increasingly maintained a liberal FDI regime for environmental services since the mid-1990s (along with greater private participation in infrastructure environmental services), and most EU countries have BITs with India, the regime could be considered to be European FDI-friendly. The next section examines the actual inflows of FDI into India given this regime.

4. Trade Interests and Actual Trade in Environmental Services

Trade interests are driven by the competitive advantages of the environmental sectors of the environmental firms in the EU and India. The EU is home to the largest and

¹⁵ Including Austria, Belgium & Luxembourg, Bulgaria, Cyprus, the Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, the Netherlands, Poland, Portugal, Romania, Slovakia, Spain, Sweden, and, of course, the United Kingdom. *UNCTAD Country Specific Lists of BITs* in <http://www.unctad.org>

most well-developed multinational environmental corporations, which have a comparative advantage in the export of resource-saving and clean technologies, and in technical expertise in the design and engineering of treatment and purification facilities.

Moreover, given the crosscutting nature of the environmental sector, it promises to be one of the fastest-growing sectors of the future. Not surprisingly, the EU in its 2005 service liberalization requests to 103 WTO Members noted that the environmental services sector is a *key sector* for the EC especially since European companies are *world leaders* in this sector (emphasis added). In 2006, plurilateral requests from the developed countries (including Australia, Canada, the EC, Japan, Korea, Norway, Switzerland, Chinese Taipei, and the US) to developing countries specifically asked for the opening up of sewage, refuse disposal, sanitation, cleaning of exhaust gases, noise abatement, nature and landscape protection, and other environmental protection services.

In the current bilateral negotiations the EC will demand that India provide more market access in infrastructure environmental services including water, wastewater/sewage services, and refuse disposal/ sanitation services, which are the most significant segments in terms of market value. These services also fall in the realm of public procurement and, although foreign environmental firms have been granted projects by various municipalities across India, it has taken place out of choice rather than any multilateral commitment to open public procurement for transparent bids. Indeed the EC considers government procurement (defined as purchasing activities of governmental entities, from purchase of paper clips to computer systems, wastewater plants, consulting services, etc.) to be arguably the largest trade sector sheltered from multilateral disciplines. Thus the EC's demand for market access to Indian infrastructure environmental services would be a demand for (environmental) public procurement in India.

On the other hand, the Indian environmental sector is dependent on the import of technology, mostly from the US and the EU. Moreover, with environmental R&D being low in India, there is little scope for Indian service providers to find an export market for clean technology-based services in the EU.¹⁶ However, the Indian environmental service providers are seen to be specializing and exporting (largely to other developing countries) engineering, consulting and analytical services.

For Indian environmental service providers gaining market access in EU countries, independent commercial presence would be more attractive. To this end, India along with several developing countries, made a Mode 4-specific plurilateral request to developed countries, including the EU,¹⁷ for three environmental service segments of sewage, refuse disposal and sanitation services among other indicative service sectors. The collective request sought new and improved market access for contractual service suppliers and independent professionals' categories delinked from commercial presence.

¹⁶ Although some Indian firms are now focusing on developing indigenous technology for bio-sanitizers for water and bio-soil remediation, establishing these in the international market will take a while.

¹⁷ The target group of countries included the US, the EU, Australia, Canada, Japan, New Zealand, Switzerland, Norway and Iceland.

4.1 Trade Competitiveness of EU and Indian Environmental Firms

The Western European countries of France, the UK and Germany have proven to be the most competitive in the global market in the major environmental segments (by value in the world market) - including water and wastewater services, solid waste management, and resource recovery services. While these countries are also good in hazardous waste management, consulting and engineering, the US seems to be the market leader in these two segments. Table 4 below summarizes the competitiveness ranking of the different country environmental segments. While that of India is not available, the general ranking approximated for emerging developing countries has been reported.

Table 4: Competitiveness in Environmental Service Segments

Environmental Service Segment	France & UK	Germany	US	Developing Countries
Water utilities	G-E	M-P	M-P	M-P
Water treatment works	G-E	M	M-P	M-P
Solid waste management	G	O-G	O-G	M-P
Hazardous waste management	O-G	O	G	P
Consulting and engineering	O-G	O-G	G-E	M-P
Remediation/ Industrial services	O-M	O	O	P
Analytical services	O	O	G	M-P
Resource Recovery	O	O-G	O	M-P
Rating*	112	105	108	47

Notes: E = excellent, G = good; O = okay; M = mediocre; P = poor

**Subjective rating based on analysis of basic technology, applied technology, commercial orientation, management skills, global presence, access to finance, government support, etc.*

Source: Exhibit 1-19, EBI (2006b).

The competitiveness ranking in Table 4 may be taken to reflect that Indian environmental service providers (on average) are mediocre by EU standards. However, some Indian firms have established a foothold in the South Asian, Middle Eastern and African markets since they are price competitive (vis-à-vis the European/American/ Japanese firms). But, the EU market remains quite out of bounds since cutting-edge technology in clean production and resource efficiency is not in the realm of Indian industry.

As indicated in the previous section, while new business opportunities abound in Central and Eastern Europe nations (the new EU members like the Czech Republic, Poland, and Hungary), these markets are dominated by mature firms from Western Europe, and the US in addition to their native firms, the latter being comparable to Indian environmental firms (say in Poland or the Czech Republic).

4.2 Actual Trade in Environmental Services in India

India has maintained a relatively open FDI regime in the Indian environmental infrastructure services – including sewage, refuse disposal and sanitation – which are also the target segments that the EC has been formally requesting for liberalization.

The actual FDI inflow in these areas, however, fails to reflect the extent of foreign participation in the Indian environmental infrastructure sector, which falls within the realm of government contractual services.

Given that the private sector recorded foreign investment in the environment sector, a summary of the FDI inflow in different environmental segments in the last seven and half years (January 2000 to August 2007) is reported in Table 5. Since the FDI does not have an official category for “environmental” sector, the reported data is based on appropriate keyword searches within the FDI description field in the DIPP database in December 2007. These keywords included *environment, water treatment, wastewater, solid waste, waste management, hazardous waste, air pollution, soil remediation*, etc. As evident from the table, the major source of environmental FDI during the period 2000-07 has been the US in the water and wastewater management segment. Among EU Members, Germany and France have been the source of FDI in air pollution and noise pollution abatement services.

Table 5: Actual FDI Inflow in Environmental Sector in India, 2000-07

<i>Environmental Segment</i>	<i>Country</i>	<i>Details</i>	<i>Year</i>	<i>FDI (Rs)</i>	<i>FDI (\$)</i>
A. Water and wastewater management, CPC 9401	Austria	Water treatment (acquisition of share)	2006	0.05	0.00
	USA	Oil field, chemical, water treatment	2006	652.30	14.61
	USA	Chemicals, water treatment	2006	0.00	0.00
B. Solid/ hazardous waste management, CPC 9402 and CPC 9403					
C. Protection of ambient air and climate, CPC 9404	France, Singapore	Acquisition of share	2003	0.20	0.00
D. Remediation and clean up of soil and waters, part of CPC 9406					
E. Noise and vibration abatement, CPC 9405	Germany	Sales & services of vibration machines	2006	14.97	0.34
F. Protection of biodiversity and landscape, parts of CPC 9406 not covered under D					
G. Other Environmental and ancillary Services, CPC 9409					
Total FDI Inflow in Environmental Services (in millions)				Rs. 667.52	\$14.95

Note: Numbers are in millions

Source: Based on data from DIPP, December 2007.

To gauge the size of the public sector environmental sector, the actual budget expenditure on various infrastructure environmental projects provides a useful indication of the approximate value of that segment where leading environmental multinational corporations are often awarded the contracts.

For example, the Accelerated Urban Water Supply Programme (AUWSP), launched in 1993-94 by the Government of India provided Central assistance to State Governments on a 50:50 matching basis between the Centre and the States for implementation of water supply projects in small towns having populations of less than 20,000 as per the 1991 census (and subsequently in the 2001 Census). The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) was launched in 2005 to invest in urban infrastructure services in target cities (63 selected cities). It was estimated that the Urban Local Bodies require a total of Rs 1,20,536 crore over a seven-year period beginning 2005. The annual investment requirement was estimated to be Rs 17,219.5 crore. Meanwhile, the AUWSP was subsumed in a recent scheme called the Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT), which covers facilities like water supply, sewerage, storm water drainage, and roads in towns not under JNNURM. The UIDSSMT provides funding for infrastructure environmental services in towns not covered by the JNNURM. Earlier the Accelerated Urban Water Supply Programme (started in 1993-94) provided matching central fund assistance to States for water supply projects.

Table 6 below details the funds released by the Central government for urban water and sanitation services under three of its programs. In 2006, the Central funds released for water and sanitation in these programs amounted to Rs 1129.5 crore or US\$282 million. Considering that Central government funds are supplemented with state funds, the actual annual urban investment in water and sanitation services can be approximated at US\$500 million or half a billion. The annual investment is set to increase manifold since the sanctioned funds for urban environmental infrastructure under JNNURM come to Rs 17219.5 crore or US\$4 billion annually. Thus the government procurement sector projects (of about US\$15 million in 2006) have not been reflected in Table 5 and are much more significant than the private sector environmental investment.

Table 6: Funds released for Urban Water Supply and Sanitation under Selected Central Government Programs in India

Program	2004-05	2005-06	2006-07
Accelerated Urban Water Supply Program	146.00	44.24	32.62
Solid Waste Management in Airfield Towns	39.76	58.96	6.00
Jawaharlal Nehru National Urban Renewal Mission		90.10	1090.90
<i>Total expenditure in these programs (Rs crore)</i>	<i>185.76</i>	<i>193.3</i>	<i>1129.52</i>

Note: Numbers are in Rs. crore.

Source: Ministry of Urban Development *Annual Report 2006-07.*

4.3 Actual Trade in Environmental Services in the EU

Tracking the environmental services trade in the EU is also challenging since the OECD-Eurostat services trade data does not report the environmental trade under a separate heading (except for clean-up services incidental to agriculture and mining – segments that are not included in the GATS negotiations but, nevertheless, reported in the Annexure at the end of this paper). Another sector with an embedded environmental component is “architectural, engineering and technical services” considered below.

Table 7: EU Trade in Architectural, Engineering & Other Technical Services (including environmental component) 2000-05

Trade Coverage	Transactions	2000	2001	2002	2003	2004	2005
Total EU 25 Trade (including intra-EU 25 trade)	Net	-	-	-	9191	10288	8940
	Credits	-	-	-	27597	32447	33699
	Debits	-	-	-	18406	22158	24759
Extra-EU 25 Trade (excluding intra-EU 25 trade)	Net	-	-	-	7868	8982	9802
	Credits	-	-	-	14755	17538	19334
	Debits	-	-	-	6887	8556	9532

Note: Numbers are in US\$ million.

Source: OECD-Eurostat (2007).

Environmental engineering and consulting services are also of particular interest to Indian environmental firms. Table 6 shows that during 2000-05 the trade in general architectural, engineering and technical services (which includes environmental engineering and consulting services) in the EU was approximately half the trade in intra-regional trade. Moreover, a nation-wise decomposition shows that most of the services trade (see Annexure Table A4 for details) is generated in Germany, the UK, Italy, and Norway, i.e., the more developed and mature EC markets.

Thus the prospects of Indian environmental firms finding a foothold in the EC market are rather small due to the dominance of large mature and diversified corporations. Moreover, given that the environmental services market in the EC is driven by new technology, most Indian firms find it unfeasible even to enter this market (since they are dependent on older technology imported from the EC/ US).

4.4 Potential for Trade between India and the EU in Environmental Services

Several European environmental corporations, including Vivendi, SUEZ and Ondeo have had operations in India during the past ten years, but the market data does not capture these operations since they include government projects under public-private partnership and contractual engagements.

In India infrastructure environmental services (under government procurement) is as large as the size of the value of market transactions recorded, but it is not reflected in the market value. For example, in one program called the Jawaharlal Nehru National

Urban Renewal Mission, launched in December 2005 (where the government investment is based on the needs of 63 Indian cities), Rs 10,047 crore or **US\$2.2 billion was sanctioned for water supply, sewerage and solid waste management projects in 2006-07**. The JNNURM program estimated that annual investment in these environmental services will be about Rs 17219.5 crore or US\$4 billion, so we can expect government procurement for water and sanitation to grow. *Indeed the government procurement sector for environmental services in India is probably as large as the total environmental market estimate of US\$4 billion.*

Multinational environmental corporations, including EU firms like SUEZ Degremont and Veolia, have been invited to execute most of these projects in India – with no financial risk and assured return in these government procurement projects. In January 2008, SUEZ Degremont was awarded two government projects worth \$127 million to build a drinking water plant in Mumbai and a wastewater treatment and reuse facility in Delhi. Being world leaders in environmental services of water utilities, wastewater treatment, and refuse disposal services, EU firms have a ready clientele in India (in both the government and private sectors) among those who can afford their services. This is especially evident in the government procurement sector in India, where EU firms have been granted several large infrastructure projects given their expertise.

On the other hand, there is little trade potential for Indian environmental firms in the EU (even in the less mature markets of Eastern Europe). In the EU environmental market, Indian environmental firms find that they lack cutting-edge technology as well as the corporate reputation and project history required to successfully bid for projects. Besides the domination of European environmental corporations, there is also competition from US environmental firms which are world leaders in environmental consulting, engineering and analytical services. Moreover, given the regulatory barriers in the EU, the export of labour-intensive environmental services is also restricted. A few Indian firms, however, have begun to work for EU environmental firms in other Asian and African countries (response from firm survey reported in the next section) where relatively cheaper Indian skills are employed by the large multinationals – but not for projects in the EU.

5. Market Access Barriers in the Environmental Services Sector

5.1 Regulatory Barriers in the EU

5.1.1 Protocol on Services of General Interest, 2007 Treaty of Lisbon

This Treaty was signed by 27 Members on 13th December 2007 and is expected to be ratified in 2008. Services of *general economic interest* include services subject to specific public service obligation and include, among others, waste management, water supply and wastewater treatment. These services are not subject to a “self standing regulatory regime at EU level”, but specific Community rules such as public procurement and environmental and consumer protection legislation apply to certain aspects of this service.¹⁸ The EU allows *a wide discretion for national, regional and local authorities in providing, commissioning and organizing services of general*

¹⁸ EC Communication on "Services of general interest, including social services of general interest: a new European commitment", 20th November 2007, COM (2007) 725 Final.

economic interest as closely as possible to the needs of the users (Article 1 of the Protocol). Thus a country-by-country market entry approach would be required by Indian environmental firms in order to enter the EU.

5.1.2 Regulated Professionals (Directive 1999/42/CE)

In the European Commission Internal Market, several professions are regulated under the General System Directive,¹⁹ where access is subject to legal, regulatory or administrative provisions to the possession of a specific qualification (regulated at the EC level as well as individual country level). The environmental professionals regulated include:

- i environmental auditor
- ii environmental engineer
- iii environmental consultant/ policy consultant/ environmental assessor
- iv environmental health officer,
- v water service manager
- vi water and sewer system technician/ pipe and drainage technician
- vii agriculture and forestry advisor/ expert
- viii architectural and environmental curator
- ix air conditioning technician/ heating installer/ repairer
- x regional development and planning engineer/ physical planner
- xi soil analyst

The regulation of the above environmental professionals directly impinges on the ease of entry of potential Indian service providers (Mode 4) seeking work on a contractual basis without capital investment.

5.1.3 Restrictions in GATS offer reflect domestic regulations

The EC has maintained horizontal reservation for public utilities (national or local) and for exclusive rights given to private operators in the GATS offers (including the revised 2007 offer). (India does not have an equivalent horizontal condition in its GATS offers). This horizontal restriction also reflects the underlying public procurement policies in vogue in the EU, and impacts market access in environmental services like sewage services, refuse disposal services and sanitation services, where local authorities hold a monopoly in providing services to the community.

5.1.4 Public procurement directives and Non-EU bids

Each EU Member State has developed its own procurement law, which is not regulated by the EU public procurement Directives, although the general principles of the EU Treaty regarding non-discrimination and free movement of goods apply even below the thresholds. The two EU public procurement Directives are: **Directive 2004/18/EC** on Coordination of procedures for the award of public works, services and supplies contracts, and **Directive 2004/17/EC** on Coordination of procedures of entities operating in the utilities sector, which covers water, energy, transport and

¹⁹ European Commission Internal Market Regulated Professionals: Website last accessed November 10, 2007: http://ec.europa.eu/internal_market/qualifications/regprof/index.cfm

postal services. Although most tenders are open to all firms following the WTO Government Procurement Agreement, the *Utilities Directive 2004/17/EC* allows EU contracting authorities in these sectors to either reject non-EU bids where the proportion of goods originating in non-EU countries exceeds 50% of the total value of the goods constituting the tender, or are entitled to apply a 3% price difference to non-EU bids in order to give preference to the EU bid. The EU content requirement applies to water (production, transport, and distribution of drinking water), energy (gas and heat), urban transport, and postal services, unless there is an international or reciprocal bilateral agreement.

5.1.5 Regulatory barriers in related sectors

As noted earlier, restrictions of EU states in related sectors like *integrated engineering services* (CPC 8673) which have application in environmental services like sanitation works (turnkey projects), translates into barriers for the environmental services sector. Cyprus, Greece, Italy, Malta, Portugal, Poland and Romania have Mode 1 unbound; Bulgaria, Cyprus, Malta, Poland and Romania have Mode 2 unbound; and Bulgaria, Cyprus, the Czech Republic, Spain, Italy, Malta, Portugal, Poland and Romania have Mode 3 unbound. Mode 4 remains unbound for all. Similarly, in *engineering services* (CPC 8672), engineering design, advisory, and consulting in Mode 4 is unbound, with Bulgaria, Greece and Hungary requiring *nationality/ permanent residency conditions*. To the extent that larger Indian environmental service firms have engineering services as their key specialization, market access in the emerging economies of EC is restricted. Since the environmental services sector overlaps with a wide range of other professional services, any restrictions in those sectors immediately impinge on the openness of the environmental services sector.

5.1.6 Market Access Barriers Perceived by 20 Indian environmental firms (Survey results)

As indicated earlier, Indian environmental service firms consist mostly of small firms that provide ancillary environmental services (including environmental consulting, analytical services, auditing, and certification) and larger engineering firms that offer turnkey project services. Thus the firms surveyed in this study covered both engineering firms offering environmental turnkey projects sometimes along with analytical services, as well as firms offering only analytical services.

Among the twenty firms covered in the survey, most operate exclusively in India and, while some have operations abroad, they have never provided services in EU markets. *Most do not even consider the EC as a viable market for them to enter* because the West European environmental markets are too mature, while in the less mature East European economies, West European and American corporations have a strong foothold. Moreover, corporate networking, firm reputation, and project history make it virtually impossible for Indian businesses to venture into the EC environmental market.²⁰

²⁰ Seema Arora, Head, CII-ITC Centre of Excellence for Sustainable Development, November 13, 2007.

Interestingly some of the surveyed Indian environmental firms do projects for EU companies abroad, but do not want to set up operations in the EU since market opportunities there are limited. They however would like to continue to do more projects both in Europe as well as in East Asia, Africa and the Middle East for these EU firms.

Indian firms have indicated that they *perceive* restrictive labour laws as the major barrier in the EU country markets. The Indian environmental firms also indicate that it is India's labor cost advantage that makes them competitive in developing countries since otherwise they lag behind the technology used by the European firms.

Technological collaboration with European corporations is common among larger Indian environmental firms, but the latter see such technical upgrading only as a means of improving their market image in Indian and other developing country markets and not as a tool to enter EC markets.

Table 8: Specialization and Size of 20 Indian Environmental Firms Surveyed

Primary Specialization	Large	Medium	Small	Micro
Water and wastewater management, CPC 9401	4		1	4
Solid / hazardous waste management, CPC 9402 & 9403	1		1	
Protection of ambient air/ climate, CPC 9404		1	1	
Other ancillary services, CPC 9409, Engineering consulting	2	1	2	2
<i>Total number of firms (20)</i>	7	2	5	6

Note: Firm survey interviews conducted during October 2007 through January 2008.

The conjunction of regulatory barriers, nature of environmental service demand (high technology-based) in the EU and dominance of the northern firms inhibit the entry of Indian firms in the EU environmental sector.

5.2 Barriers in India identified by EU firms

Some of the leading environmental services firms have Indian operations since the environmental sector here has good growth prospects. Four European environmental multinational provided their detailed perspectives of the Indian environmental sector. The respondents included Degremont (parent company SUEZ, France), Veolia Water (parent company Veolia Environment, France), ERM (parent company ERM, UK) and Agrinergy Consultancy (parent company Agrinergy, UK). Table 9 below summarizes the responses of the European firms on their expectations of the Indian environmental sector, as well as the barriers and problems faced in India.

Some of the European firms have been active in India for several decades, while others have entered the market more recently. It is noteworthy that all the firms found that entry into India is easy with no problems in obtaining visas, licenses or approvals.

The common complaint was regarding bureaucratic delays and bureaucratic corruption (with bribery being used to obtain contracts).

Table 9: Survey Summary of 4 EU Environmental Firms in India

<i>Firm Profile</i>	<i>Reason for entry</i>	<i>Licensing, approval & project bidding</i>	<i>Other problems</i>
<i>Firm 1.</i> Specialists in water and wastewater treatment plants. Established joint-venture with Indian partner in 1986	Market size, better growth prospects, and skilled Indian workforce. Operations here also help in their exports abroad.	<ul style="list-style-type: none"> • No problem in obtaining visas. • Bidding is transparent. • No problem in repatriation of profits. • Bureaucratic procedures long 	<ul style="list-style-type: none"> • Bribery is a problem, and has sometimes given bribes to obtain contracts. • Delays in project commencement result in financial problems for the firm
<i>Firm 2.</i> Specialists in water & wastewater services for public authorities & industrial clients in medium and long term. Indian subsidiary set up in 1999.	Huge market in India with no foreign competition.	<ul style="list-style-type: none"> • No problem in licensing or approval, although norms in 27 state governments are different. • Bidding not transparent. 	<ul style="list-style-type: none"> • Lack of clarity in tax structure. • Bureaucrats corrupt and most of the sanctioned project funds are pilfered.
<i>Firm 3.</i> Specialists in environmental, health and safety management; natural resource management for industrial clients and also government. Wholly-owned subsidiary established in 1995.	Good growth prospects.	<ul style="list-style-type: none"> • No licensing problem • Obtains Indian projects through international competitive bids. • Indian consultancy firms are not in the same league (small, lack international exposure and certification), so no competitive threat 	<ul style="list-style-type: none"> • Local labor laws not conducive to expanding business in India • Multiplicity and/or complexity of taxation (e.g., interstate VAT) and legal enforcement norms
<i>Firm 4.</i> Specialists in climate change services and carbon credit business. First wholly-owned subsidiary, then established joint-venture with Indian partner in 2005.	Good opportunity in Indian market. Carbon services market competitive in India with many firms offering services.	<ul style="list-style-type: none"> • No problem in licensing as client takes care of everything. UN approval required for carbon credit projects. • No visa problems. 	<ul style="list-style-type: none"> • Cultural and linguistic problems.

The European environmental firms also indicated that there is no clarity in taxation and enforcement of norms is poor. Interestingly, all in all the problems highlighted are not particular to foreign operators, but apply to domestic operators too.

In general, the major market challenges faced by foreign investors in India include infrastructure constraints imposed by poor road, railroad, port and airport facilities, disrupted power supply, telecommunications, etc. The US Commercial Service observes that although privatisation and liberalization have been observed in the infrastructure sector, “the absence of a clear policy framework has hindered critical private investment in infrastructure overall.”²¹

6. Government Procurement in Environmental Services in EU and India

The EU is a signatory to the Government Procurement Agreement (GPA) in the WTO and, while its 27 Member States are subject to the GPA, they continue to maintain their independent national practices regarding government procurement. More importantly, there is concern about the lack of transparency in the public procurement process in countries like the Czech Republic, Spain and Italy (USTR 2008). For example, in 2006 more than half of the public contracts awarded were not subject to transparency requirements as they fell below the 6 million Czech koruna threshold, and only a third of the transparent contracts were open to competitive tenders. In Spain, going by the experience of US firms bidding for several desalinization plants, public sector infrastructure projects are virtually closed to foreign construction and engineering firms due to the high bidding costs. On the other hand, Italy’s public procurement sector is marked by lack of transparency and corruption (USTR 2008). Sometimes the EC has used legal suits to address the non-conformity of some Member States with regard to non-transparency in public procurement.

As of now, India is a non-signatory to the GPA of the WTO, and developed countries like the US and the EC consider its public procurement practice to be non-transparent. Yet, as observed here, the public procurement practices of the EU, a signatory to the GPA, remain less than transparent, whereas public sector environmental infrastructure contracts in India, especially in water and waste management, continue to be awarded to leading multinational environmental corporations. Recently, in January 2008, SUEZ Degremont (French) was awarded two government projects worth US\$127 million to build a drinking water plant in Mumbai and a wastewater treatment and reuse facility in Delhi.

Indian environmental firms have little scope for winning any public tenders in environmental projects in the EU even if they are transparent, given the technical edge of the more mature European and American environmental firms.

New EC regulations are geared towards enhancing national and local discretion in infrastructure services. Consider, for example, the Protocol on Services of General Interest under the 2007 Treaty of Lisbon. Services of *general economic interest* include services subject to specific public service obligation and include, among others, waste management, water supply or wastewater treatment. These services are not subject to a “self standing regulatory regime at the EU level”, but specific Community rules such as public procurement, environmental and consumer protection legislation apply to certain aspects of this service. The EU allows *a wide discretion for national, regional and local authorities in providing, commissioning and*

²¹ US Commercial Service, *Country Commercial Guide for India*, dated June 2007.

organizing services of general economic interest as closely as possible to the needs of the users (Article 1 of the Protocol).

Thus, given the existence of non-conformity of some Member States with the GPA and the wide discretion that the 2007 Protocol on Services of General Interest allows to national and local authorities, the EC is in no position to make community-wide commitments in the government procurement sector. A country-by-country market entry approach would be required by Indian environmental firms in order to enter the EU *in case there are any niche opportunities (unlikely as of now)*, since an EC-level agreement is unlikely to yield any true concessions to enter a specific Member State.

7. Assessment and Negotiation Strategy for India

➤ *Limited opportunities in the EC environmental market*

The new business opportunities in the EU environmental market are of two types: *first*, the demand for new resource-saving technology as well as engineering and design in the more mature West European markets; and *second*, demand for more basic environmental services in the new EU Member countries in Central and Eastern Europe. In both sets of markets, the scope for Indian environmental firms is limited.

The analysis in the paper highlighted the presence of several challenges for emerging Indian environmental service provided in the EC including: highly fragmented markets by size, language and local regulations across the Member nations; government restrictions in terms of carve-outs for environmental services in the realm of public monopolies (or private operators with government-granted exclusive rights); regulations for several environmental professionals; intense competition from native companies (especially the mature corporations from France, Germany and the UK that command 60% of the total EU environmental market); and, of course, intense competition from US firms besides the emerging firms from Poland, the Czech Republic, etc.

On the whole, the opportunities for Indian environmental firms are rather limited in the EU, since they continue to depend on technological imports from European firms. While Indian firms have labor cost advantages, restrictions in Mode 4 make it difficult for business visitors and contractual workers to break into these diverse markets due to challenges in networking, and establishing work history/reputation besides, of course, the language problems.

The survey suggests that most Indian firms do not even consider ever venturing into the European market. They have instead focused on establishing a foothold in other developing countries in South Asia, Southeast Asia, Africa and the Middle East.

➤ *Negotiation Strategy*

The EC is likely to request India to make deep commitments in Mode 3 for infrastructure environmental services. Yet, the EC in its bilateral free trade agreements has not made commitments any deeper than those offered in the WTO (as noted in the case of the EC-Chile bilateral agreement). The commitments under Mode

4 and Mode 1 continue to be unbound, and environmental services in the purview of the national or local government bodies have been carved out of the commitments. Exclusive rights given to private players by the government bodies are also carved out. Thus the completely liberal commitments in Modes 2 and 3 in the EC do have conditional exceptions.

It is unlikely that the EC will offer anything deeper than what it has committed to in its other bilateral preferential treaties or committed/ offered in the WTO. Repeated requests for a more open Mode 4 in the GATS have not yielded any positive results from the EC. Moreover, in the face of dismal labor market performance within the EC, a liberal Mode 4 can hardly be expected at this time.

On the other hand, a liberal Indian Mode 3 in infrastructure environmental services (i.e., water, wastewater and solid waste management), which is of primary interest to the EC, has been the ground reality – even though India has not formally offered nor committed in the WTO or in its preferential treaty with Singapore. However, actual FDI inflow has been minimal, reflecting a poor market rate of return in the environmental segments for the EC environmental firms.²² European environmental firms have been granted major infrastructure environmental contracts by various municipalities and government entities across India, which does not get reflected in the market data.

To date India has not made any commitments in the environmental services sector, whether at the WTO or in its bilateral trade/ investment agreements, although its actual regime has increasingly allowed FDI in this sector through the automatic route. Multinational environmental firms have been executing large integrated infrastructure environmental projects awarded by local authorities, which indicate that environmental service imports have been under Modes 3 and 4. *Despite the open regime for environmental investment, in practice actual environmental FDI has been negligible in India.*

Given that India is committed to enhancing and encouraging the growth of the environmental services sector (considering its national environmental policy, Millennium Development Goals and commitments in multilateral environmental agreements), ***one strategy in the current negotiations could be for India to offer an open Mode 3 in sewage/ wastewater treatment and refuse disposal services with all services in the national/ local government bodies carved out, while asking for increasing commitments in Mode 1 and Mode 4 from the EC.*** Such an offer would keep sensitive sectors like ‘water for human use’, and indeed all government services, out of the negotiations.

The EC has consistently maintained an open Mode 2 and 3 only in the non-government services for its developed Members, and at present keeps these modes unbound for newer Members like Poland and Romania. Mode 4 remains unbound for all, and Mode 1 unbound for all developed members (open for a few Central/ East European Members). Thus India’s offer would be more liberal than the EC’s offer,

²² Indeed the late 1990s witnessed the cancellation of several infrastructure environmental contracts in water and waste management services in developing countries across the world (especially in Southeast Asia and Latin America) by major environmental multinationals given the poor returns or public backlash in these countries. See Sawhney (2007) for a summary.

but more restrictive than its actual regime. *It is certainly not advisable for India to open the government procurement sector bilaterally with the EC.* As discussed in Section 6 given the discretion practised (and allowed legally) by EC states and local authorities in government procurement, a country-by-country market entry approach would be required by Indian environmental firms in order to enter the EU *in case there are any niche opportunities (unlikely as of now)*. An EC-level government procurement agreement is unlikely to yield any true access for Indian firms to enter a specific Member State.

Services like environmental consulting, design and engineering, and auditing are amenable to being offered through **Mode 1**, but should ideally be done along with an ecological assessment of the local region. While European environmental firms may be technically advanced, the technologies developed by them are best suited to their resource endowment, regulatory conditions and market trends. While India has been a demander of greater market access through Mode 1 (which is *unbound* in most developed nations) following its comparative advantage in BPO services, in services such as this an “unbound” offer may be judicious. Moreover, since the EC is keen on market access through Mode 3, India can make a conditional offer on commercial presence.

The offer of an open Mode 3 in the major environmental service sectors could be conditioned on encouraging joint ventures with Indian companies in order to enhance the growth of local Indian firms and technology transfer. The Indian environmental firm survey unanimously suggests that local players recognize that EC firms have a technological edge in this field but their service costs are higher; hence the Indian players indicate that they are not threatened by the entry of the multinationals in this field. It is important to add, however, that this survey reflects a rather small group of environmental service providers in India, and the premise underlying their perception is that there will be no uncompetitive market practices (like predatory price-cutting) on the part of large European firms with deep pockets.

Several environmental services segments – including that of water, wastewater, and refusal services – require a strong regulatory institutional framework to curb monopolistic/ anticompetitive practices and encourage competitive growth of the sector. Thus in negotiating this sector India needs to pay as much attention to strengthening the domestic regulatory and institutional framework.

8. Concluding Remarks and Domestic Reforms

In India, the domestic supply of environmental goods and services is supplemented with the import of environmental equipment and technology, but foreign investment remains low. Despite the relatively open regime in place for the environmental sector, actual FDI inflow has been negligible. This reflects the fact that the Indian market has not generated an attractive enough return for foreign investors, and local firms are able to provide many of the services in demand.

A large part of the environmental services continues to be implemented at the state and local levels (infrastructure environmental services), and any decision taken at the centre with regard to this sector impacts the state and local governments. Indeed the operations of European multinational environmental corporations in India are to be

found most notably in government procurement projects for water and waste disposal services. This has two rather important implications. First, the demand in the Indian environmental services market is relatively lower than expected and has not matured to the next level, i.e., beyond pollution abatement to pollution prevention. This also reflects in turn the poor enforcement of environmental regulations on the ground. Second, foreign environmental firms have focused on the minimal-commercial risk business model of taking on public assignments of building municipal water treatment facilities or waste disposal contracts (often through build-operate-transfer contracts).

- *Enhance demand for environmental services through effective enforcement of environmental regulations.* In order to enhance the growth of the environmental sector, it is important to make demand grow in the domestic market. Increasing environmental awareness and enforcement of existing regulations would certainly help enhance the demand for environmental services in India.
- *Expand the supply capacity of environmental services.* Given the low provision of essential (infrastructure) environmental services to the population like clean water and sanitation facilities, India has an urgent need to expand the supply capacity of this sector. However, the experience of several Asian developing countries through the 1990s (encouraging private-public partnerships in water and waste services) suggests that the policies of privatization and liberalization in environmental services by themselves will not be successful in the ultimate goal of building capacity in essential environmental infrastructure (Sawhney 2007). Indeed, the nature of private contract is critical in determining whether and what kinds of actual technology transfer take place in developing countries; the mere presence of leading global environmental service providers in developing countries will not result in the much touted ‘win-win’ situation (Sawhney 2007).
- *Build in preferences for domestic environmental firms.* The growth of environmental infrastructure and domestic service providers in countries like South Korea, Chinese Taipei, and now China has taken place along with strategic government policies and increased environmental expenditure. All three countries followed import-substitution policies along with liberalization to nurture the growth of their domestic environmental service providers. Indeed, through the 1990s, Korea encouraged privatization and liberalization in environmental services with preferences built in for domestic engineering firms. Domestic operators then subcontracted specialized services to foreign companies for, say, advanced technology. This strategy served the twin purpose of boosting the growth of the indigenous environmental firms while upgrading the environmental technology used to build environmental infrastructure in the country at the same time. Having followed promotional policies to develop domestic environmental enterprises for two decades, Korea revised its GATS commitment in 2005 by removing market access barriers under Mode 3 for foreign commercial presence in sewage and refuse disposal services (Sawhney 2007).

Domestic reforms thus need to be geared towards enhancing the demand for environmental services and also building domestic supply-capacity. While negotiating a bilateral trade-investment agreement with the EU, one needs to be cognizant of the long-term goal of building a strong domestic environmental sector in India.

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Table A1. Foreign Direct Investment Inflows, January 2000-August 2007

Environmental Segment	Indian Firm	Foreign Collaborator	Country	Details	Year	FDI (Rs)	FDI (\$)
A. Water and wastewater management, CPC 9401	Dauser Water Solutions (I) Pvt Ltd.	Dauser Industry & Water Solutions Ltd.	Austria	Water treatment, (acquisition of share)	2006	0.05	0.00
	Ondeo India Ltd	Nalco	USA	Oil field chemical water treatment	2006	652.30	14.61
	Buckman Laboratories (I) Pvt Ltd	Bulab Holding Inc. (parent of Buckman)	USA	Chemicals, water treatment	2006	0.00	0.00
B. Solid/ hazardous waste management, CPC 9402 and CPC 9403							
C. Protection of ambient air and climate, CPC 9404	LTG Air Engineering Pvt. Ltd.	LTG Air Engg SA, LTG Air Engg PTE Ltd	France, Singapore	Acquisition of share	2003	0.20	0.00
D. Remediation and clean up of soil and waters, part of CPC 9406							
E. Noise and vibration abatement, CPC 9405	Schenck Avery Ltd	Carl Schenck AG, (acquisition of share)	Germany	Sales & services of vibration machines	2006	14.97	0.34
F. Protection of biodiversity and landscape, parts of CPC 9406 not covered under D							
G. Other Environmental and ancillary Services, CPC 9409							
Total FDI Inflow in Environmental Services (in millions)						667.52	14.95

Note: Figures are in millions.

Source: Based on data provided by DIPP (as of December 4th, 2007).

Table A2. Survey Summary of Indian Environmental Service Firms, 2007

Firm profile	Specialization	Markets	In EU or plan to enter EU?	EU barriers	EU firms in India	Indian needs	Recommendation for Indian Govt.
<p>1. Firm L1 Employment: 3500 Public Ltd Co. Had technical collaboration with US firm through joint venture, wholly-owned Indian subsidiary since 2004.</p>	<p>Energy, Water and wastewater treatment, air pollution; and softening chemicals. In energy – boilers and captive power plants.</p>	<p>India, China, Philippines, Japan, Peru, Australia (presence in 56 countries). Southeast Asia and Middle East markets have high growth prospects – currently focusing on Middle East and Europe. Revenue share from foreign market 15% (EU 5%)</p>	<p>Operating in EU for 12 years, as wholly-owned subsidiary (office in UK only for trading activities) for energy services. No plan to expand since <u>EU market is saturated</u>. Projects are acquired through agents in EU. Chillers sold in UK (comptn from China and US). Niche market for boilers in Germany (competition from EU firms).</p>	<p>Only visa problem: Fresh visas for EU have to be issued that is cumbersome, rigid and time-consuming. No other barrier since firm is into engineering operations. Not too many people taken from India to EU - only supervisors. Lower-level work is subcontracted.</p>	<p>EU firms likely to invest.</p>	<p>Technology, particularly R&D and training in air and wastewater management. (Although this firm opts for US technology rather than EU).</p>	<p>MRA in all sectors is advisable. Government should encourage and support the organizations which are going global. Providing information on various foreign markets will help industry players determine entry and exit strategy.</p>
<p>2. Firm L2. Employment: 1200 Technical collaboration with SembCorp Environmental Management Ltd – Singapore (Biomedical Waste), Cimelia Resource Recovery</p>	<p>Solid waste mgt, water and wastewater treatment, testing and consulting. Collaboration has improved quality.</p>	<p>India, Saudi Arabia, and the Gulf</p>	<p>Yes, would like to enter EU to enhance brand visibility in the world market. Would like to enter EU through collaboration, or joint venture in future.</p>	<p>Perceives regulatory barriers in labour, land acquisition or discriminatory issue.</p>	<p>Will enhance competition based on technical and financial parameters, and help develop low-priced technically advanced products. Will test the strength</p>	<p>Support in R&D and training. Scope for India-EU collaboration in R&D to improve quality in hazardous waste treatment, wastewater treatment. Help develop</p>	<p>Use caution in commitment for solid waste management, water and wastewater treatment services. Make regulatory procedures hassle-free.</p>

Firm profile	Specialization	Markets	In EU or plan to enter EU?	EU barriers	EU firms in India	Indian needs	Recommendation for Indian Govt.
– Singapore (E-waste) and Alstom, USA (hazardous waste)					of established Indian firms.	greenbelt products, e.g., reusable sewage water.	
3. Firm L3. Employment: 500 (Wholly owned subsidiary of an Indian infrastructure company) Technical collaboration (project based) with ABS - Singapore, GE - US, SFC-Austria; Keppel Seghers – Belgium; and EMO - France.	Water and wastewater treatment	India, Bangladesh, Sri Lanka, Nepal, Oman, Jordan, Turkmenistan, South Africa, Egypt, Kenya, Algeria and Nigeria.	No. May try to enter in wastewater sector in EU in future through collaboration with EU firm	Indian firms submit bids to Engineers India Ltd, which acts on behalf of EU clients. Bids are selected on technical and financial basis. Problem faced - after short listing EIL asks for a price reduction.	No threat of competition. EU firms expected to provide more technically advanced products (not manufactured in India) which is likely to be high priced.	Indian market is unorganized, with limited purchasing power. EU firms can assist in R&D in India to increase productivity and efficiency of environmental products to control pollution.	MRA not required. In case EU firms enter, proper monitoring of existing norms is required, and raising of existing environmental standards.
4. Firm L4 Estd 1966, incorporated as Indian public limited co in 1984 Rev: Rs 400-500 cr Empl: 150-200 in Rabale unit (Navi Mumbai) <u>Licensing agreements</u> with Butler Mnfng Services (Ireland); Elf Antar SA	Water and wastewater treatment	India, Far East, Middle East, Africa. Best growth prospects in Africa since port and communication problems fixed.	No plan to enter EU market since the mkt is saturated with intense competition. Joint venture with Waterleau Group, Belgium, estd in 2005. Company receives technical assistance, & employees travel for training to Belgium (8-10 days). Belgium firm helps		EU firms better technically, and able to deliver better-quality products. They also have strong organizational skills.	India ought to collaborate with EU for R&D, training, and learning management & organizational skills	Govt commitments should not affect “our financial growth and labor policies”. Devise proper guidelines and regulations for foreign firms in India. “We want healthy competition”.

Firm profile	Specialization	Markets	In EU or plan to enter EU?	EU barriers	EU firms in India	Indian needs	Recommendation for Indian Govt.
(France); Elga Water Systems (UK), Nordic Water Products (Sweden); Eutech Instruments (Singapore) <u>Representative agreements</u> with Norit N.V. (Netherlands), RGF Envl Group (US)			Indian employees get visas.				
5. Firm L5 Estd. 1969 Turnover: Rs 4000 cr Empl: 4000	Effluent treatment plants, specialty and generic chemicals incl. agrochemicals & chemical intermediaries	Operates in Indonesia, Thailand, Vietnam, Bangladesh, etc. US is a big mature mkt, and tough to enter. Europe operations 20% of their exports. Operations across the globe often without establishing offices. Operating in Denmark, Poland, UK, France and	Local brands are trusted abroad and EU, so they acquire companies/ brands (that want to get out of business). In 2006 acquired Cerex Agri in France – agrochemicals and pesticides; in 2007 Advanta in Denmark – seeds. In 2007, Du Pont's global triphenyl hydroxide contact fungicide. Operating under these brand names. No joint ventures, but will do so soon. Looking for more acquisitions in gas detection. <u>Mostly local people work in the offices of</u>	Usually take top officials to Europe. Taking middle- or entry-level employees difficult – visa problems. Sending an employee for the first time, say for training – may not get visa. Frequent travelers get visas easily. Germany & Italy – rigid visa norms (6 months at a time, and leave after expiry); UK better -- 2-5 year visas, renewal in case of	EU firms technologically sound.	Potential maximum in carbon credit trading for EU-India trade.	Feels EU-India trade-investment agreement will help open up European mkt. Suggests MRA in carbon trading. Request to address EU visa norms, and technology transfer.

Firm profile	Specialization	Markets	In EU or plan to enter EU?	EU barriers	EU firms in India	Indian needs	Recommendation for Indian Govt.
		Russia in <u>gas detection</u> and chemicals.	<u>the companies that they have acquired in the EU.</u>	emergency. Certification procedures are NTBs – certification for quality standards from EU organizations required, e.g., ATEX.			
6. Firm L6 Estd: 1962	Engineering consulting Services	Middle East, South Asia, some projects in Europe	No plans to open offices in EU, but still interested in doing projects in EU, since there are other easier untapped markets. Have done projects in the EU, e.g., 18-month project in 2002-03 engineering consulting for water and wastewater management for United Utilities, UK.	Visa problems, stringent regulations with limited period visa available. Language problem and different technical specifications across EU Member States.	EU firms have higher expertise but are high-priced.	India can gain through import of high technology and investment.	Government can help us in overcoming regulatory and visa-related problems.
7. Firm L7 Estd: 1965	Construction and consulting (e.g., in wastewater treatment)	South Asia, Middle East, Europe, etc. Has equipment procurement office in UK for management/design of hydrocarbon and	Not much work in EU. Works for EU clients in developing countries. Entering into a joint venture with Italian firm Techmont to work in African and Middle Eastern countries.	<ul style="list-style-type: none"> Indian firms lack international exposure – and firms fail to qualify in preliminary stage (say, for health and safety guidelines). Visa process 	EU technology superior, but low manpower – so Indian personnel used in developing countries	Technical collaboration will help.	Help us overcome regulatory barriers. Help us with visas. Help formation of joint Indian contingent against EU countries.

Firm profile	Specialization	Markets	In EU or plan to enter EU?	EU barriers	EU firms in India	Indian needs	Recommendation for Indian Govt.
		metallurgical projects. Inspection office in Italy.		is cumbersome. • Language problem; translators needed.			
<p>8. Firm M1 Estd 1980 Rev: 15 crores Empl: 175.</p> <p>Technical tie-up with Principles, UK, for instrumentation.</p>	<p>Environmental monitoring, EIA, envl audit (have laboratories with testing facilities approved by MoEF, Gujarat PCB). Will try to operate in Middle East where norms are not as stringent as in the EU.</p>	<p>India Have done audits for BPCL, Reliance, ONGC, NTPC.</p>	<p>Interested in environmental consultancy projects overseas. Have identified partners: Casella Measurement (envl products) and Signal Instruments, UK (air).. Will remain limited to imports and receiving technical assistance since <u>difficult to achieve EU quality standards and approval from agencies (e.g., USEPA for US & UK).</u></p>		<p>More advanced with large-scale operations, so can sell high quality devices (in small quantities) to Indian customers profitably. But “EU firms do not have the reach of Indian firms” so need to collaborate with Indian firms.</p>	<p>Ambient and stag analysis, gas detection technologies (health, hazard and safety application). Would like to get from EU Gas Chromatographic products and analytical lab instruments for measuring envl. quality.</p>	<p>Yes, MRA for technology vs. skills.</p>
<p>9. Firm M2 Estd: 1993 Rev: 40 cr Empl: 150 employees Associated with South American firm Flex Kleen, latter caters to overseas market.</p>	<p>Air pollution services (supplies equipment to Flex Kleen)</p>	<p>South Asia, China, Malaysia, Thailand, Peru and Chile.</p>	<p>May be later when it grows. Currently too small, and only provides equipment to South American firm.</p>				<p>Assist us to strengthen our platform.</p>
10. Firm S1	Air pollution	India	Yes, would like to		EU firms are	R&D. EU firms	Indian market for

Firm profile	Specialization	Markets	In EU or plan to enter EU?	EU barriers	EU firms in India	Indian needs	Recommendation for Indian Govt.
Employment: 60	control system and ventilation services. (humidification, ventilation and air conditioning)	(imports dust bags from Sweden for India, and sells ventilation units to Middle East & Asia Pacific)	enter EU through JV, as partner can provide information about the modes of operations in the market and assist in obtaining legal documents like licenses in Sweden/ Poland.		more technically advanced but mostly sell outdated technology to India.	should collaborate with India to develop new technology.	ventilation products and services is small since pollution norms are not strictly implemented.
11. Firm S2 Employment: 45. Joint venture with UK firm (50:50 profit sharing)	Environmental and structural consulting, (certifying green/ energy-saving buildings)	India. One project in France (managed by UK office) Plan to enter Middle East.	No, since EU market is saturated.	-	No perceived threat. EU firms are cost-effective, but do not have “one-roof solution”.	Technical collaboration, e.g., in thermal model simulation.	Give fiscal benefits to those undertaking environmental construction, and make such construction mandatory.
12. Firm S3 Employment: 25	E-waste management: collection, pre-processing, manual separation and export to smelters for metal extraction	India (collection & processing). China, Belgium and Australia (waste export to their smelters; payment on consignment basis)	No.		EU companies have good marketing techniques and practices, which pose a threat to Indian firms. Belgium has efficient smelters for high-end metal extraction like gold, silver, etc. (Australia for other metals).	We need investment in smelters, and technology in processing (e.g., automated separation)	Government should provide authentic list of business people with whom we can do business. Also provide subsidy for recycling activities.
13. Firm S4 Employment: 20-25.	Wastewater treatment plants-consultancy and	India, Sri Lanka, Maldives,	Yes, plan to enter some EU markets that are not saturated,	Perceives problem in getting CE	EU firms are technically advanced but	Technological know-how in water and	Commission rates for agents should be flexible and

Firm profile	Specialization	Markets	In EU or plan to enter EU?	EU barriers	EU firms in India	Indian needs	Recommendation for Indian Govt.
Technical collaboration with Danish Water Supply, Denmark.	turnkey projects	Gulf. (India has technical advantage over Asian countries like Thailand, Sri Lanka, Bangladesh and Pakistan. Gulf gets assistance from Europe).	e.g., Poland and Hungary where labour is cheaper, and market more humane than in France or Germany. Have received offers from Ireland and UK due to cost competitiveness.	certificates before starting operations. Expects labor problems in terms of time put in (e.g., in Austria and the Netherlands).	lack manpower. Their rigid workforce is not good in multi-tasking. Our products and services are cheaper.	wastewater treatment, since technology used in India is too old (was used by EU firms in 1970s)	market determined (FERA allows 10% commission to agents for transactions made through agents in foreign country). Congestion in seaports & airports reduce our competitiveness.
14. Firm S5 Estd: 1984 Turnover: Rs 12 crores Empl: 60 Took technical assistance from French firm for bio-remediation.	Design, procurement, industrial treatment, reverse osmosis	South Asia, Bahrain, South Africa.	Would like to enter EU through JV, especially for East European market. Looking for alliance with Italian firm for carbon trading.	EU visa norms are stringent and movement of people from India is a problem. No language problem. But expecting to face problems on policy issues.	EU firms are technically advanced, but are not as cost-effective as Indian firms.	Technology transfer (from equipment providers), and consultancy services.	Indian standards are low, and norms need to be made uniform. Quality issues may arise when dealing with Europeans. Performance certificates should be provided to Indian firms.
15. Firm MC1 Employment: 12.	Clean room testing and validation (e.g., offices, hospitals)	India, Bangladesh, Sri Lanka, Singapore, Qatar, Muscat.	Yes, plan to enter EU through JV with local firm since bids do not work. Talks underway and have applied for certification by local govt (CTCB, Clean Room Testing Control Board) for entry in bio-safety testing and control.	Indian firms are not recognized, and bid/ tender process is not transparent. Applications for bids are never returned. Norms are very procedural and formal.	EU firms are technically advanced but they cannot match our price.	New technology updating is required, but US firms are ahead of EU firms in this regard.	No need for MRA. Customs clearance should be eased (problems faced at our Customs dept. in every transit of testing equipment).

Firm profile	Specialization	Markets	In EU or plan to enter EU?	EU barriers	EU firms in India	Indian needs	Recommendation for Indian Govt.
16. Firm MC2 Employment: 6	Water and wastewater treatment: manufacturing bio inoculums (bacteria)	India	Yes, would like to enter EU. The demand for bio-chemical for water-treatment is high in Europe.		EU companies have good marketing techniques and practices, which will pose threat to Indian firms.	Indian firms need training in field operations, not technology for bio-treatment of water.	MRA not needed to the extent Indian products are recognized abroad. Indian firms will be adversely affected by EU firms locally. Anti-dumping regulation important.
17. Firm MC3 Employment: 4 Accredited by M/S TUV SUD, Germany in 2007. Joint venture with Malaysian Equipment Procurement Company (for water and wastewater treatment) since 2007.	Water treatment plant, engineering and consulting.	India, Bangladesh. New focus on ASEAN market	Yes, would like to enter EU through JV with a local player in EU market, and through some SEZ. But not financially sound to enter the market	-	EU firms are technically sound and globally reputed – can give better service. They are also financially strong so can compromise on their margin for some time.	We will benefit from technology transfer – since technology is constantly upgraded. Also gain from sharing of knowledge from their experience.	Yes, MRA in the areas of process and procedures. Govt can help us financially.
18. Firm MC4 Employment: 7 to 8. Uses Stormix Aerators (manufactured by Aqua & Co, Italy)	Wastewater and soil treatment – turnkey projects using bioaugmentation technology	India, Bangladesh (demand for effluent treatment plants since installation of ETPs is mandatory.	Yes, would like to independently enter EU in wastewater treatment in future. Currently developing technology for bio-augmentation method.	Perceives color discrimination.	No threat from EU firms since their products are expensive. Indian firms are price competitive. Healthy competition between EU and local firms after	Investment and R&D required in India. We can learn new techniques from EU firms, e.g., technology for deionization of water well-developed in EU (not US) useful	Demand in environmental market will increase if government increases monitoring and enforcement. Non-compliance of polluters and rampant corruption

Firm profile	Specialization	Markets	In EU or plan to enter EU?	EU barriers	EU firms in India	Indian needs	Recommendation for Indian Govt.
					the Indian market develops.	for pharmaceuticals, - can be bought from Norway, Sweden. India can sell electro-coagulation technology.	among inspectors (PCBs) has inhibited the growth of Indian environmental firms.
19. Firm MC5 Estd: 1996 Empl: 15	Environmental planning, assessment, environmental planning system	South Asia, East Asia, Middle East	No operations in EU, and no plan to enter either. They do work for EU clients in East Asia	-	-	Technical inputs in solid waste management and climate projects will help India.	Ease entry for Indian firms abroad.
20. Firm MC6 Estd: 1996 Rev: Rs 1 crore Empl: 20	Bio-sanitizers	India	No. Would like to enter the US market.	-	-	Technical collaboration will help Indian firms.	Government should create more environmental awareness in India, and encourage environmental investment in this sector.

Note: Based on questionnaire responses and interviews conducted October 2007 through January 2008.

Table A3. EU Trade in Waste Treatment and De-pollution Services (incidental to agriculture, mining & on-site processing services), 1997-2005

Country	Transactions	1997	1998	1999	2000	2001	2002	2003	2004	2005
Austria	Net						-21	11	-24	-31
	Credits						14	41	6	11
	Debits						35	29	30	42
Belgium	Net	-	-	-	-	-	-51	34	75	136
	Credits	-	-	-	-	-	84	112	155	211
	Debits	-	-	-	-	-	135	78	81	76
Canada	Net	-40	1	-67	16	10	26	-45	-15	-
	Credits	144	184	127	215	207	257	261	301	-
	Debits	184	183	194	199	198	230	306	316	-
Czech Republic	Net	-	-	-	-	-3	5	6	33	32
	Credits	-	-	-	-	2	6	12	38	34
	Debits	-	-	-	-	4	2	5	6	2
Denmark	Net	-	-	-	-	-	-	-	-	35
	Credits	-	-	-	-	-	-	-	-	58
	Debits	-	-	-	-	-	-	-	-	23
Hungary	Net	-	-	-	-	-	-	-	-3	10
	Credits	-	-	-	-	-	-	-	-	17
	Debits	-	-	-	-	-	-	-	3	7
Italy	Net	-	-	-9	-18	-32	-35	-23	-7	-36
	Credits	-	-	11	6	8	9	14	21	29
	Debits	-	-	19	25	40	44	36	29	65
Luxembourg	Net	-	-	-	-	-	-5	-11	-2	-3
	Credits	-	-	-	-	-	4	6	15	11
	Debits	-	-	-	-	-	9	17	17	14
Netherlands	Net	-	-	-	-	-	-	-10	-9	6
	Credits	-	-	-	-	-	-	-	-	13
	Debits	-	-	-	-	-	-	10	9	7

Country	Transactions	1997	1998	1999	2000	2001	2002	2003	2004	2005
Poland	Net	-	-	1	-	-	-	-	7	9
	Credits	-	-	1	-	-	-	-	10	12
	Debits	-	-	-	-	-	-	-	3	4
Portugal	Net	-4	-1	-10	-5	2		12	-	-
	Credits	1	3	1		3	1	16	-	-
	Debits	5	4	11	6	1	1	3	-	-
Sweden	Net	-	-26	-12	1	17	15	-23	22	12
	Credits	-	23	20	17	22	21	34	30	31
	Debits	-	49	31	16	5	6	57	8	19
UK	Net	-	-	-	-	-	-	-	-	9
	Credits	-	-	-	-	-	-	-	-	9
	Debits	-	-	-	-	-	-	-	-	-
Total EU 25 Trade Including intra-EU trade	Net	-	-	-	-	-	-	-	-	-
	Credits	-	-	-	-	-	-	-	-	-
	Debits	-	-	-	-	-	-	-	-	-

Notes: All figures are in US\$ million; Waste treatment and depollution services (Code 282) are incidental to agriculture, mining and on-site processing services. The services include treatment of radioactive waste, stripping work of contaminated soil, cleaning up of pollution, decontamination services and sanitation.

Source: OECD Statistics on International Trade in Services Volume 1, 1996-2005. OECD-Eurostat (2007).

Table A4. EU Trade in Architectural, Engineering and Other Technical Services (including environmental engineering, design and consulting services in turnkey projects), 1997-2005

Country	Transactions	1997	1998	1999	2000	2001	2002	2003	2004	2005
Austria	Net						210	286	200	37
	Credits						647	893	921	1101
	Debits						437	607	721	1063
Belgium	Net	-	-	-	-	-	56	261	129	101
	Credits	-	-	-	-	-	802	1011	1140	1305
	Debits	-	-	-	-	-	746	751	1011	1204
Czech Republic	Net	-56	-128	-122	-46	-30	-112	-159	-188	-298
	Credits	102	88	96	86	90	78	56	46	48
	Debits	158	216	218	132	120	189	215	235	346
Denmark	Net	-	-	-	-	-	-	-	-	247
	Credits	-	-	-	-	-	-	-	-	901
	Debits	-	-	-	-	-	-	-	-	654
Finland	Net	132	78	75	190	123	171	220	234	240
	Credits	322	187	115	269	204	236	307	348	407
	Debits	190	110	40	79	81	65	87	114	167
France	Net	439	220	271	276	172		318	-	-
	Credits	3 089	2 765	2 147	2112	2087		2697	-	-
	Debits	2 650	2 545	1 876	1836	1915		2379	-	-
Germany	Net	-727	-749	-1 231	-1152	-2032	-1999	1043	1841	2352
	Credits	2 242	2 643	2 700	2709	2971	3047	6855	8358	9761
	Debits	2 968	3 392	3 930	3860	5002	5046	5812	6516	7409
Greece	Net	372	161	80	-30	7	-	-	-	-
	Credits	468	194	220	84	98	-	-	-	-
	Debits	96	33	140	114	91	-	-	-	-
Hungary	Net	-	-	-	-	-	-	-	-26	-15
	Credits	-	-	-	-	-	-	-	84	141

Country	Transactions	1997	1998	1999	2000	2001	2002	2003	2004	2005
	Debits	-	-	-	-	-	-	-	111	156
Ireland	Net	-352	-440	-755	-976		431	142	149	231
	Credits	158	189	164	208		517	262	309	561
	Debits	510	629	919	1185		93	120	160	330
Italy	Net	-113	-120	-337	-377	-237	134	47	97	36
	Credits	1 762	1 776	2 087	1590	1401	1535	1736	1894	2306
	Debits	1 874	1 896	2 424	1967	1638	1401	1688	1797	2270
Luxembourg	Net	-	-	-	-	-	-1	-13	-43	-27
	Credits	-	-	-	-	-	60	66	89	53
	Debits	-	-	-	-	-	61	79	133	81
Netherlands	Net	-131	-179	146	-128	-905	-817	137	-48	412
	Credits	2 126	2 095	2 346	1974	3406	3747	1058	1272	976
	Debits	2 257	2 274	2 200	2101	4310	4564	921	1320	564
Norway	Net	386	402	338	450	559	555	625	666	876
	Credits	499	908	827	838	798	742	825	937	1390
	Debits	113	506	488	387	239	187	201	271	514
Poland	Net	-83	-133	-180	-230	-180	-288	-326	-319	-292
	Credits	136	108	85	93	109	175	150	243	373
	Debits	219	240	265	324	288	463	476	562	665
Portugal	Net	-150	-232	-126	-102	-35	-	-35	-36	-57
	Credits	82	90	119	98	114	173	154	214	228
	Debits	232	323	246	199	150	173	189	250	285
Slovak Republic	Net	-19	-88	-34	-65	-65	-	-	-	-188
	Credits	21	67	51	49	49	-	-	-	56
	Debits	40	155	85	114	114	-	-	-	243
Spain	Net	-33	130	67	99	270	311	-	-	-
	Credits	622	684	722	790	948	992	-	-	-
	Debits	655	554	655	692	677	681	-	-	-

Country	Transactions	1997	1998	1999	2000	2001	2002	2003	2004	2005
Sweden	Net	-32	-605	-793	-968	-1479	-1419	285	503	710
	Credits	334	1 064	1 150	1105	1010	1017	886	1239	1300
	Debits	366	1 670	1 943	2074	2490	2436	601	735	590
UK	Net	3 451	4 117	3 927	3754	4466	5581	6229	6923	5487
	Credits	5 512	6 856	6 137	5523	6654	7579	8711	10107	9078
	Debits	2 061	2 739	2 210	1769	2188	1998	2482	3184	3591
EU 15 Trade (incl. Intra EU trade)	Net	3 166	2 888	2 497	2103	1882	3261	9716	10847	9782
	Credits	18 240	20 439	20 140	18762	22022	23645	27121	31913	32949
	Debits	15 074	17 551	17 644	16659	20141	20383	17405	21065	23166
EU 15 extra EU (excl. Intra EU15 trade)	Net	3 558	3 316	2 676	2411	2534	3443	8162	9273	9894
	Credits	10 127	11 369	10 745	10008	11426	12134	15116	18155	19927
	Debits	6 569	8 053	8 069	7597	8893	8690	6954	8882	10033
Total EU 25 Trade Including intra EU 25 trade	Net	-	-	-	-	-	-	9 191	10 288	8 940
	Credits	-	-	-	-	-	-	27 597	32 447	33 699
	Debits	-	-	-	-	-	-	18 406	22 158	24 759
Extra-EU 25 Trade (excluding intra-EU 25 trade)	Net	-	-	-	-	-	-	7 868	8 982	9 802
	Credits	-	-	-	-	-	-	14 755	17 538	19 334
	Debits	-	-	-	-	-	-	6 887	8 556	9 532

Notes: All figures are in US\$ million; Architectural, engineering and other technical services (Service Code 280) cover resident/non-resident transactions related to architectural design of urban and other development projects; planning and project design and supervision of dams, bridges, airports, turnkey projects, etc.; surveying, cartography, product testing and certification, and technical inspection services.

Source: OECD Statistics on International Trade in Services Volume 1, 1996-2005. OECD-Eurostat (2007).

