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ENVIRONMENTAL SERVICES: THE "WIN-WIN" ROLE OF TRADE LIBERALISATION IN PROMOTING ENVIRONMENTAL PROTECTION AND ECONOMIC DEVELOPMENT

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PREFACE

This document was prepared for and presented to the Joint Working Party on Trade and Environment, as part of the OECD work programme on trade and environment. Prepared by Rachel Thompson and Carole Pellegrino, the report is the final stage of work undertaken since 1998 on trade in environmental goods and services. The entire series of reports have been compiled in a single volume, entitled "Environmental Goods and Services: An Assessment of the Environmental, Economic and Development Benefits of Further Global Trade Liberalisation".

This document is available in English and French on the OECD trade and environment Websites: http://www.oecd.org/env/policies/online-trade.htm and http://www.oecd.org/ech/index_2.htm. It is published under the responsibility of the Secretary-General.

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Introduction

At its meeting on 13-14 April 1999, the Joint Working Party requested the Secretariat to provide concrete examples of how international trade and private investment in environmental services can contribute to "win-win" outcomes for environmental protection and economic development, specifically for developing countries.

The "win-win" potential of further trade liberalisation in the Environmental Goods and Services sectors has been a feature of the Joint Working Party's work in 1998-99 [COM/TD/ENV(98)37/FINAL, COM/TD/ENV(98)128 and COM/TD/ENV(99)29]. In discussing "win-win" issues at the April 1999 meeting, several Delegations expressed interest in knowing whether concrete examples already exist of "win-win" benefits accruing to developing countries from liberalisation of their environmental services markets to permit increased trade and private foreign investment. There was also interest in whether and how such liberalisation contributes to developing countries' export opportunities in this and other sectors. That is, that "win-win" benefits from such liberalisation do not derive solely from increased trade opportunities for firms from industrialised countries.

Accordingly the Secretariat has researched, and presents here, a range of examples of foreign private sector participation in providing environmental services in developing countries. As a starting point, the Secretariat has focused on examples in the water supply, wastewater treatment and solid waste management sub-sectors.

There are four reasons for the focus on these sub-sectors. First, they represent the immediate environmental services priorities for most developing countries.[1] Second, they are the most demanding in terms of financial resources. Third, they are the leading areas of privatisation or part-privatisation initiatives in the environmental sector, and are thus increasingly open to international trade and foreign direct investment. Fourth, much more information is readily available for the water and waste sub-sectors, due to their status as basic services.

This is *not* to say that there is no scope or need for trade liberalisation in services for other environmental media. However, this paper will focus on water treatment although additional examples exist in other environmental media (e.g. air pollution control and remediation, habitat protection and sustainable resource).

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[1] See COM/TD/ENV(98)37/FINAL for a discussion of shifting demand in emerging economies from end-of-pipe and basic services to up-stream, preventive and needs-driven applications. However, in many developing countries demand for environmental services tends to follow a similar progression in priorities: water delivery, wastewater treatment, air pollution control, solid waste services, hazardous waste, pollution remediation.

As noted in COM/TD/ENV(98)37/FINAL, government regulation plays a major role in creating demand for environmental services. Generally speaking then, trade and investment in the environmental services sector arises from deliberate decisions by governments to open up service provision to private actors, and to undertake trade and investment liberalisation to permit and encourage the participation of foreign private actors. Thus there are two elements involved: to decide to encourage private participation and to encourage foreign private participation through trade and investment liberalisation. Without the second element, private participation may be limited to local firms.

The opening of service provision to private participation may take several forms: privatisation (transfer to private ownership) of existing government-owned utilities; leasing them to the private sector to operate; the letting of public contracts to private companies to provide start-up services on a build-operate-transfer (to public ownership) basis; the grant of concessions to private companies to provide private services. Certainly these are the main forms of private participation in water and waste management. For a number of other environmental services, the letting of contracts by governments for services to assist in programme development and implementation, and by private companies for services to implement specific requirements, are the main forms.

For developing countries, the underlying "driver" of decisions to permit private participation is often the compelling nature of the problems faced; e.g. rapid population growth, migration to cities already under environmental stress, and serious budgetary constraints. Private participation in environmental services provision, particularly water and waste management services, is seen as a key way to ease the financial burden on governments of addressing these pressures. As the range of examples presented in this paper shows, when developing country governments decide to open these services to private participation, this usually includes a decision to encourage foreign participation.

Private sector participation in water and waste management infrastructure

Unsafe drinking water and inadequate sanitation are among the most serious problems facing developing countries today. More than a billion people in rural and urban areas around the world lack access to the most basic water and sanitation services. The environmental and social costs especially to women and children are enormous.

According to the UNDP-World Bank Water and Sanitation Program (Prospectus and Toolkits), the achievement of significant improvements in water and sanitation services in many developing countries will, in most cases, require more efficient operation of water utilities and investments in rehabilitating and extending supply systems. Consequently, many central and local governments in developing countries are turning to the private sector to help finance and implement these needs. In such "public-private partnerships", the private sector involvement may take a number of forms. The extent to which objectives are met depends on three core factors: whether local circumstances are taken into account, whether the regulatory environment is suitable, and how well the selected approach responds to the concerns of those affected. Governments are also encouraged to seek independent advice by experienced professional firms in designing their investment models.[2]

The most common forms of private participation in water and waste management infrastructure projects are set out in Table 1. The main differences are in the allocation of risk and responsibilities, duration of the arrangement and assigning of asset ownership. In practice hybrids of these options may be used, e.g.

[2] http://www.worldbank.org/html/fpd/wstoolkits/Prospectus/pros1.htm. The Toolkits are the product of collaborative work between public and private sectors in World Bank member countries, with financial and advisory support from the UK Department for International Development.

management contracts in which the private sector takes on some commercial risks, or leases in which the private sector undertakes some investments. Some governments start with simpler options such as service contracts and progress to more complex ones involving more risks and responsibilities on the private sector, such as concessions.

Table 1: Main options for private sector participation

Option	Asset Ownership	Operations & Maintenance	Capital Investment	Commercial Risk	Typical Duration
Service contract	Public	Public & private	Public	Public	1-2 years
Public management contract	Public	Private	Public	Public	3-5 years
Private lease	Public	Private	Public	Shared	8-15 years
Build-Operate-Transfer (BOT) contract	Private & public	Private	Private	Private	20-30 years
Concession	Public	Private	Private	Private	25-30 years
Privatisation/ Divesture	Private or private & public	Private	Private	Private	Indefinite (may be limited by license)

According to the World Bank and UNDP, the benefits of private sector participation can include:

- Bringing technical and managerial expertise to the sector
- Improving operating efficiency
- Large-scale injections of capital and greater efficiencies in the use of that capital
- Reducing the need for subsidies
- Increasing responsiveness to consumer needs and preferences.

The specific benefits that a government seeks to achieve will shape the form of private participation that it seeks to attract. For example, if the main goal is efficiency improvements in existing operations, a management contract or lease may be a suitable avenue. If new investment is required, B-O-T contracts, concessions and divestures may be considered suitable. However, these options require the provision of a credible regulatory framework that gives the private sector sufficient incentives to make and recover its investment while assuring that consumer interests will be met. The stability and efficiency of the business climate and of the overall political situation are also important.

It is also worth noting that a range of other services are typically involved in the assessment and selection process for the various options for private sector involvement. For example, engineering services in the assessment of the existing system and how it can be improved, financial and economic analysis services to estimate and test the investment and pricing issues and draw up prospectus and tender documents, legal services to identify and draft contractual agreements, business management services to develop new organisational models in consultation with employees and other stake-holders, and public relations services to assist in explaining the changes to the public. Some of these tasks may be provided “in-house” by the government, or by out-sourcing to specialist providers of the services.

Against this background, Annex 1 sets out over sixty examples of *foreign* private sector participation in the provision of water and waste management services in developing countries in the past decade. The survey covers the development spectrum from economies in a relatively advanced state of industrialisation through to several of the least developed economies. The examples are organised into four categories: Concessions to private companies, joint ventures between the public and private sectors, build-operate-transfer contracts, and services contracts.

The survey aims to give the flavour of the type and nature of foreign participation (direct investment, institutional shareholdings, operational participation) and the kinds of possible benefits derived in terms of roll-out of services to the population and industry, environmental quality improvements, participation by local firms, provision of local jobs and wider economic benefits such as those derived from the establishment of high-standard environmental facilities in industrial parks, which themselves generate exports and jobs.

In addition, a number of the examples reveal an upward trend in participation by companies from developing countries in the water and waste sub-sectors in other developing countries. These tend to be Asian and Latin American countries which have themselves acquired technological and services capacities, in part, through the experience of joint venture investment in the environmental sector in their own countries.

In terms of potential opportunities for developing countries to extend their exports of these services to OECD markets in some cases developing country firms have tended to focus on water and waste management services markets in their immediate regions. It may be also that OECD markets for water and waste management services are the subject of existing long-term private monopolies or reserved to public sector provision. While it should be recognised that private finance in these sub-sectors is more urgently needed in developing countries, it may be that some OECD countries could also review the openness of their own environmental services markets to foreign private participation.

It should also be noted that, at the recent EMEF Workshop on Barriers to Trade in Goods and Services in the Post-Uruguay Round Context, trade policy representatives from some developing countries indicated the need for undertakings on technology transfer and restrictive business practices in any GATS initiative that sought the opening of their environmental services markets to firms from OECD countries.

"Win-win" outcomes

The examples included in Annex I indicate increased foreign participation in the provision of water and waste management services where such sectors are liberalised. It is beyond the scope of this paper to evaluate the actual environmental and economic impacts of the specific projects. However, overall and in many of the individual examples, a number of "win-win" outcome for developing countries from trade and investment liberalisation (i.e. foreign participation) in the provision of water and waste management services can be seen:

Environmental "wins"

- First and foremost, the roll-out of clean water and waste collection services to much greater numbers of citizens, leading to healthier human environments.

- Reductions in the wastage of and/or inequitable access to scarce water resources (e.g. through leaks and ease of bypass/siphoning associated with old/inadequate pipe infrastructure).

- Increased availability of drinking water from the introduction of recycling of effluent water for industrial use (which also, once established, produces cost-savings for industry).

- Use of waste recycling to create alternative sources of energy (e.g. gas and electricity from garbage recycling systems for use by households, light industry, power stations, fertilisers for small farms).

- In-country presence of foreign firms creates increased opportunities for environmental management education and training, and skills transfer, to other commercial sectors, both for the water and waste media and other environmental services.

- Availability of a larger choice of environmental technologies addressing the environmental problems more appropriately for the country in question which can often mean a move away from end-of-pipe solutions to preventive ones.

- Profits are often reinvested in research and development of new environmental technologies and skills, environmental infrastructure upgrades and new environmental investments.

Economic development "wins"

- Relief of pressure on government budgets, including at state and municipal level. Savings may be reallocated to environmental policy, inspection and enforcement budgets, to other social services and to the overall budget balance.

- Creation of skilled and unskilled jobs for local workers, in design, construction and long-term operation of the facilities.

- Availability of water and waste management systems attracts foreign and local investment to the community, bringing more jobs, stable economic growth and an increased local tax base.

- Local private sector partners extend their experience in big and/or very specialised projects which can be (and are being) exported to other countries with similar needs and operating conditions.

- Build-operate-transfer operations revert to local ownership at a specified time, and comprise significant environmental resources, and sources of jobs, into the future.

Trade "wins"

- Local and foreign companies participating in this trade gain new opportunities to deploy their skills and technologies.

- At a global level, trade and investment liberalisation will improve resource allocation through the application of comparative advantage.

Implementation challenges and potential "losers"

It is frequently cautioned that the fact that trade liberalisation may create "win-win" opportunities for environmental protection and economic development does not mean that related considerations including implementation of win-win policies will necessarily be easy or that there will not be losers. This is the case

for the overall balance of "win-win" benefits from a new WTO Round, or in sectors such as agriculture and fisheries where reductions in existing producer subsidies may pose a threat to the incomes and activities of some recipients. For its part, the environmental services sector is directly involved in the delivery of improved environmental performance, environmental protection and sustainable resource use.

The choice of environmental services projects will primarily reflect national environmental priorities, with a view to improving performance, protection and sustainable resources use. Furthering trade policy objectives, such as the liberalisation of services provision through, for example, the opening of procurement markets to foreign suppliers, can contribute to an overall higher quality of service. This is to be distinguished from governance and environmental oversight, which are not matters of trade policy *per se*. However, once national priorities are established, trade liberalisation can contribute positively to environmental protection.

Previous Secretariat papers for the Joint Working Party have outlined the implementation challenges, relating first and foremost to the need for a credible environmental and commercial policy framework within which private environmental services providers will operate. The capacity to evaluate economic and environmental aspects of proposed projects is also important. A stable and transparent political framework, mechanisms for public consultation on new arrangements, including investment return and pricing options, the "role of the foreigners" and the incentives they will receive and requirements they will face, and open tendering processes are also important factors. Complementary measures, particularly impartial technical assistance in assessing various private sector models, designing the most suitable local one and managing its implementation, are part of the equation. Ongoing assistance with environmental policy development is another. As for potential "losers" from the opening of markets for the water and waste management sub-sectors of environmental services, these may include, variously, the following groups. However, careful design and implementation of market-opening strategies can address most of the potential concerns.

(a) Consumers faced by new or higher fees

Private sector involvement typically leads to the introduction of fees-for-service where there previously have been none (but inadequate service) or significant increases in existing nominal fees for services supplied by the government. Increases, even sharp ones, are typical. Such fees and/or the need to limit service to those able to pay may limit service provision. However, fees are a key part of the trade-off involved in a government decision to itself reduce or cease its direct role as the services provider. Private operators need to charge for the services provided both to cover investment and operating costs and generate profits. Pricing of water, and of waste management, is also critical to the introduction of conservation principles and mindsets in user-households and commercial enterprises.

Price competition may not be feasible in the water supply, sewage treatment and waste collection sub-sectors where single operator concessions are common. It is more feasible for on-site industrial water treatment services. Also, while the issue of limited price competition is mentioned, mention of other potential anti-competitive effects might be considered, e.g., the potential for foreign service providers to dominate the national or global market place. The government needs to take the lead in assessing "fair prices" (i.e. what consumers will reasonably bear) for the level of investment sought, and whether it is willing to fund any "gap" through subsidies to successful operators. This is part of the preparation of a credible tender process, in which market research on consumer attitudes is increasingly common. It is sometimes necessary for successful private operators to seek to renegotiate the fee structure on which they based their bid, either upwards because it was under-estimated, or downwards in light of consumer protests or widespread non-payment. Thus the legal framework for enforcing fees, and the fee levels themselves,

need careful consideration from the outset. Some governments establish water regulatory agencies or ombudsmen to oversee fee structures and deal with consumer complaints.

Entrepreneurs in the "informal sector"

In a lot of developing countries, siphoning off water from decaying or inadequate pipe systems for personal use or re-sale, or making a living from garbage collection and sorting is common. Sometimes a local "Mr Big" may control the process, and corruption and bribery may be involved. More often, it is small entrepreneurs making a living for their families. They need to be seen as stake-holders in the new arrangements (and potential employees as they typically have very useful knowledge and experience).

Managers and employees of monopoly public utilities

When privatisation or opening up to foreign investment of monopoly public utilities is contemplated or proposed, its managers and employees are typically concerned about (a) being seen as not up to the task of providing effective services and (b) job-losses under the new arrangements. While private investment in public monopolies certainly involves a shift to commercial imperatives such as share-holder returns and productivity gains, these typically (a) are a central issue on which bids are made and tenders assessed and awarded and (b) take some time to be achieved. These are issues for negotiation between the government, workers and the private company.

Existing private monopoly utilities

These actors may be concerned that further liberalisation will require them to compete with new entrants. However, in the water sub-sector, such operators have typically been awarded concessions or licenses of reasonably lengthy duration (upwards of 15 years) as exclusive suppliers of their service in a particular city or region. The terms of concessions are typically expensive to overturn. The most that could be required during the concession is transitional arrangements to prepare for new entrants at its conclusion, which may include interconnection rights to existing infrastructure. Again, this is an issue for governments to negotiate with incumbents.

Scheduling of GATS commitments

There is no reason why GATS specific commitments for mode 3 (commercial presence) could not be made on a differentiated basis in the water and waste management sub-sectors to reflect a Member's openness to one or more of the various foreign investment options. For example, a Member could make commitments specifying that the opportunity to bid for participation in -- any or all of -- public management contracts and leases, B-O-T projects and concessions that become available is open to foreign companies and consortia, and any limitations thereon (e.g. joint venture with local partner required, minimum or maximum foreign equity participation, legal form of foreign company, etc). This could of course only be done when the sub-sector is not reserved to public sector operation or an existing monopoly supplier. Where this is presently the case in one part of the country but not in others, this could be noted in the schedule.

ANNEX 1

EXAMPLES OF THE "WIN-WIN" FOR ENVIRONMENTAL PERFORMANCE AND SOCIAL DEVELOPMENT FROM TRADE LIBERALISATION IN WATER AND WASTE MANAGEMENT MARKETS IN DEVELOPING COUNTRIES

(Note on sources: A variety of sources was used for the following case studies. The websites of companies directly involved in water and waste projects were consulted, as well as those of international organisations, and other sites dedicated to water and waste issues. A list of sources can be found in Annex 3).

1. CONCESSIONS

Argentina – water distribution, concession

Further to an international public tendering process, in March 1997 *Aguas Cordobesa* won a 30-year concession-contract for the drinkable water distribution for Cordoba City (the second largest Argentinean city), under which 1 200 000 inhabitants will be serviced. *Aguas Cordobesa* includes *Lyonnaise des Eaux, Aguas de Barcelon*a (Agbar), and five Argentinean companies. The service has been in place since 1 May 1997. *Lyonnaise des Eaux* has responsibility for upgrading the service, improving relations with customers and reducing the rate of unpaid bills. The expected turnover should be around US$50-60 million.

Argentina – water and sewerage, concession

As part of Argentina's extensive privatisation programme of the early 1990's, a concession for operations of the Buenos Aires Metropolitan water and sewerage system was awarded to *Aguas Argentinas* (AA), a consortium led by *Lyonnaise des Eaux*. The concession covers an urban zone of 1 200km² with 9 million inhabitants (including 6 million with drinkable water) and 5 million connected to the network. AA agreed to a 30-year investment plan of US$4 billion to connect 100% of the population in the concession area to drinking water and 90% to sewerage facilities. In 3 years, AA has facilitated connection, either to water or sewerage for 1 million households and increased by 30% the capacity of treatment plants. Drinking water supplies have grown and quality has improved. Increased efficiency has led to economic and environmental benefits through the reduced use of chemicals. Commercial incentives have led AA to check water quality more frequently than required by the regulations and to re-examine wastewater treatment issues.

Argentina – water and waste water, concession

In May 1999, Azurix, an affiliate of the US-based company Enron, was awarded 30-year concessions for water and wastewater in two regions of the province of Buenos Aires. The first region covers the southern

area of the province (including the industrial city of Bahia Blanca) and a population of 430 000; the second covers a population of 1 520 000 (including the provincial capital and industrial centre of La Plata and the rural areas in the interior of the province). Azurix will fund the transaction through a combination of debt financing and equity capital.

Brazil – water, concession

Limeira City awarded a 30-year concession contract to a foreign consortium, *Aguas de Limeira* (which includes *Suez-Lyonnaise des Eaux*) for the development and the management of installation of facilities which remain public property. The network supplies 25 000 inhabitants. Under the concession contract, US$120 million will be invested during a 30-year period, including US$45 million during the first 5 years. The investments aim at extending drinkable water distribution up to 100% of the population and collecting wastewater for 95% of households.

Chile – water, concession

Agbar (*Suez-Lyonnaise des Eaux*) is in charge of a concession of water services in Valdiva (a 120 000 inhabitants city). In 1997, *Agbar* has taken 20% share in a water distribution company in the Quinta region (for about 100 000 inhabitants). Further to a public international tendering, the Chilean government selected *Lyonnaise des Eaux* and *Agbar* for the partial privatisation of the *Aguas de Santiago de Chile* company which includes 44 communes. This concession has no time limit and concerns water distribution for 5 million inhabitants and the upgrading of sanitation in the city. The project includes a 42% participation of the *Suez Lyonnaise des Eaux/Agbar* consortium in EMOS, the *Santiago de Chile* water distribution company, which owns water and sanitation collective installation. The private sector will control the company management. The activity and the turnover are expected to augment quickly due to an investment programme aimed at building sanitation plants.

China – water treatment, concession

In February 1997, *Companie Generale des Eaux* (CGE) obtained a 20-year-contract to upgrade and operate a water treatment plant in Tianjin (third largest city in China with more than 10 million inhabitants). This plant is one of the most important drinkable water production units (500 000m^3 per day). The concession represents $18 million annual turnover and an additional $30 million dollars investment is planned. CGE will upgrade and construct a new 13-kilometre pipeline. CGE Tianjin Waterworks' shareholders are CGE (55%) and its local partner, Tianjin Waterworks Company, which is owned by the Public Utility Office of the Tianjin's municipality.

Gabon – water and electricity supply, concession

In March 1997, CGE won a public tendering for the privatisation of SEEG, the Electricity and Water Society in Gabon. This is a 20-year concession, with 14 billion francs turnover. CGE will ensure drinkable water and electricity production and distribution for the whole country. This contract represents a 700 million francs annual turnover comprising 200 million for water and 500 million for electricity. The Gabonese State has granted 100% of the stake to the CGE. For its part, CGE was responsible for the listing of SEEG on the stock exchange and will eventually transfer 49% of the capital to the public.

Indonesia – water, concession

In June 1997, Thames Water (UK) entered into an agreement with PAM Jaya (the existing public water supply authority in Jakarta) to establish the consortium PT Thames PAM Jaya. For the next 25 years PT Thames PAM Jaya will manage, operate, maintain and develop the water supply system for the eastern half of Jakarta. The concession includes the operation of drinking water treatment facilities and the distribution system. In addition, the concessionaire will reduce non-revenue water, provide more connections, develop the water distribution network and carry out billing and collection activities on behalf of PAM Jaya. The aim of the project is to help to provide water supplies to support Jakarta's continued growth. It will deliver a steady upgrade of the system without capital outlay by the Indonesian authorities, which will continue to set water tariffs.

The main source of untreated water is the West Tarum Canal, which is fed from the Jatiluhur Reservoir. The company will liase with the Indonesian Reservoir and Canal Authority (POJ) to try to reduce the pollution currently entering the West Tarum Canal via nearby rivers. Around 80% of the staff are from PAM Jaya.

Indonesia – water, concession

The Batam Industrial Development Authority (BIDA) awarded a 25-year concession contract to *Adhya Tirta Batam*, the joint venture company between the UK-based company Biwater, and local partners, *Bangun Cipta Kontraktor* and *Syabata Cemerland*, to undertake improvements in water quality in accordance with World Health Organisation recommendations by the end of 1997. The installation of bulk meters and loggers throughout the network and the use of leak detection equipment has already resulted in unaccounted-for-water being reduced by over 18%.

Over the past 24 months, residents of Batam (an island) have benefited from the concession. Substantial refurbishment work has been completed at all five of the island's existing treatment plants, increasing capacity by 40%. New processes and modern, high tech instrumentation and controls have replaced out-of-date equipment. All treated water storage reservoirs are being drained and refurbished and a comprehensive refurbishment program of the water distribution system is underway. With additional industrial and domestic water consumers being connected at the rate of 500 per month, a new computerised billing system has been introduced and a customer service office opened in the main town area.

Malaysia – water concession

In 1997, OTV (*Générale des Eaux*) in association with the Japanese company Hazama, signed a 1.06FF billion contract for the second phase of the drinkable water plant in Sungai, Selangor in Malaysia. This contract has been concluded with Puncak Niaga SDN BHD, the concessionaire company responsible for drinkable water production in Selangor State (4.1 million inhabitants). The plant will have a 1 million cubic meter per day capacity. OTV had previously obtained a 750FF million contract in 1996 for the construction of first phase of this plant, supplying Kuala Lumpur's south-west region.

Malaysia – water concession

In 1998, *Générale des Eaux* took over a drinking water production concession supplying 600 000 inhabitants in the Perak State, for 26 years (i.e. until 2024). *Générale des Eaux* (Vivendi) became the a shareholder with 26% of shares in the Intan Utilities company, concessionaire for the drinkable water production in the Perak State and its suburbs (the "Great Ipoh"). In addition, it will create an exploitation

company, *Kristal Utama*, in which it holds 75% of the stakes, for the different maintenance and equipment contracts.

Malaysia - solid waste concessions

For non-hazardous waste, an Action Plan for a Beautiful and Clean Malaysia was introduced in 1988, to improve local management and planning of waste management in four stages to 2010. This plan co-ordinates the modernisation of the non-hazardous waste infrastructure, which relies on landfill, with attendant problems of illegal dumping, leaching, landfill gases and open burning.

To accelerate the process, the government decided to privatise the solid waste sector and in 1994 announced plans for a National Solid Waste Management program, estimated to cost RM10 billion (US2.9 billion). Thirty companies were invited to bid for the project and more than fifty submitted tender documents. The plan divided the country into four geographic zones to be managed by four different consortia with 20-year concessions for collecting, storage, transport, treatment and recycling of all non-hazardous waste. The plan made clear that domestic control in the businesses operating the concessions would be favoured. The first concession, for the state of Selangor, was awarded to French group *Sita* to provide a modern "sanitary landfill".

The other consortia selected involve mostly Malaysian companies, with foreign providers of technology and methods as consultants or sub-contractors. The start of the privatised operations was delayed when the government decided to review the economics of the program because of complaints about the proposed fees-for-service, as had arisen in the water privatisation scheme. The review involved studying the Selangor project and proceeding on a trial basis with the concessions granted in the Kuala Lumpur and Johor Baru areas. In part, the fees problems arise because economic incentives have not been introduced for waste minimisation, reduction and recycling; such that the charges proposed on collection and disposal are still below actual costs. Accordingly, demand for services to implement waste minimisation, reduction and recovery strategies on-site is forecast to rise sharply.

Although the solid waste concessions are exclusive, opportunities for foreign providers are reported to exist in supporting niches such as small-scale incinerators, on-site waste-treatment facilities for companies and industrial estates, provision of products and services to the recycling industry, and consulting services to national and local government and companies on waste strategy, particularly the economics of the sector.

Morocco – water distribution, concession

In April 1997, the urban community of Casablanca signed a 30-year concession contract with Moroccan enterprise *Lydec*, for water distribution, sanitation and electricity distribution. *Lydec's* shareholders are *Suez-Lyonnaise des Eaux* (35%), *Elyo* (24%), *EDF International* (18%), *Endesar* (18%) and *Aguas de Barcelona* (5%). The project forms part of a general programme implemented by the government to privatised certain public services, in order to assure their efficiency and development.

The contract covers 23 communes (i.e. 450 000 subscribers on 1000 km²), and concerns 3.3 million inhabitants for water distribution and 470 000 subscribers for electricity distribution. It involves total investments of 30 billion dirhams (18 billion FF), a third of which originates in from the consortium, to be allocated as follows: 5 billion DH for potable water, 16 billion DH for sanitation and 9 billion DH for electricity.

In 1999 the number of connections to the drinkable water network is estimated at 75% and should reach 85% in 5 years, 95% in 10 years and 100% after 25 years. Electricity supply is planned to reach the international standard for output of 94% in 5 years, following the agreed extension of the network and the implementation of a programme to optimise energy consumption. The sanitation aspect of the concession involves constructing facilities, including purification plants, to change the current practice of discharging polluted water directly into coastal waters.

Philippines – water and sewerage services, concession

The Metropolitan Waterworks and Sewerage System (MWSS), the water supply, treatment and distribution utility serving the metropolitan Manila, was privatised in August 1997. The utility covers an area of over 11 million people and 37 municipalities. MWSS awarded 25-year concessions to two consortia to assume full operational and investment responsibility for the city's water and sewerage system.

The consortia, the Manila Water Company Inc (MWC) and Maynilad Water Services Inc. (MWS) are expected to spend up to US$7 billion during the concession period to improve and expand the system. MWC is a joint venture of Ayala Corp of the Philippines, United Utilities of the UK and the US-based Bechtel Corp. MWS is a consortium composed of the Philippines industrial group Benpres Holdings Corp. and *Lyonnaise des Eaux.*

Pursuant to the concessions, MWC and MWS divide between them the responsibilities for management and development of the water system in the eastern and northern parts of the city. Before the implementation of the concessions, only two thirds of the population of Manila had access to a piped water supply and only 11% were connected to the sewerage network. More than half of the water that was *treated* to drinkable standards was never billed to customers due to leakage, illegal connections, faulty meters, and poor billing practices. One of the first steps taken in the Manila project was to repair system leaks and install new meters throughout the concession area to improve system efficiency and generate steady revenue.

Philippines – water, concession

The Asian Development Bank agreed for the first time, in 1999, to provide US$170 million (a $45 million loan and a co-financing loan of $126 million) to a privatised utility, Maynilad Water Services, Inc. under a 25-year concession contract for water and sewerage services in Western Metro Manila. This project aims at improving the water distribution system, at expanding water coverage to 98% of the concession area and sewerage and sanitation coverage to 93%. Maynilad is responsible for the renovation and operation of the water system. Maynilad is one of the two concessionaires of the government-owned Metropolitan Waterworks and Sewerage System (MWSS) which has the mandate to provide water and sewerage services to thirteen cities and twenty-four municipalities in Metro Manila, Rizal and part of Cavite. Under this project equity financing of US$135 million will be provided by Maynilad's sponsors (Benpres Holdings Corporation of the Philippines, *Suez-Lyonnaise des Eaux,* and Lyonnaise Asia Water Limited of Singapore).

Philippines – water, concession

Générale des Eaux has won in 1998 a 25-year concession contract for the drinkable water services and sanitation for the future business area in Manila, Fort Bonifacio which will host 600 000 inhabitants. This contract will generate a 3 billion francs total turnover for the next 25-years. It includes the conception, the construction and the exploitation of drinkable water distribution network and collection system and used

water treatment. The construction of a water treatment plant, a double networks (drinkable – non-drinkable water), a wastewater collection network, and a sanitation plant.

Seychelles – cleaning and waste management, concession

The government of the Seychelles has awarded SITA, a subsidiary of *Lyonnaise des Eaux* a 20-year-contract for the integrated cleaning and waste management of the Island of Mahe. Supported by the EU, SITA will carry out collection, recycling, waste processing, beach and streets cleaning activities. The EU will fund a project to build a burial site on the Archipelago.

South Africa – water and sanitation, concession

Water and sanitation services SA (WSSA), a subsidiary of *Suez-Lyonnaise des Eaux*, manages one of the first water concessions in Queenstown, South Africa. Under the concession, the water network was extended to neighbouring townships, increasing the connections to drinking water from 4 500 to 14 000.

South Africa – water, concession

In August 1999, the UK-based water company Biwater signed a 30-year water and sanitation concession contract for the City of Nelspruit, South Africa. Through the Greater Nelspruit Utility Company, Biwater and its local partner Sivukile Investments Pty Ltd are expected to improve and accelerate the delivery of water and sanitation services in the Greater Nelspruit area. An anticipated investment of R150 million (£15 million) will be made in new and upgraded facilities in the first five years of the project. The signing of the contract by Nelspruit Council and the Greater Nelspruit Utility Company followed a long and complex tendering and negotiation process.

South Africa – water and wastewater services, concession

In February 1997, the Borough of Dolphin Coast advertised a concession, for which four consortia prequalified out of thirteen applicants. In January 1999, the first concession for private management of the supply of water and wastewater services was granted to a consortium led by the SAUR, UK group. Valued at £100 million and for a term of 30 years, the contract was awarded by the Borough of Dolphin Coast, in the province of Kwazulu Natal, north of Durban.

Operations under the contract began with the creation of Siza Water Company Pty Ltd in April 1999. The company is a consortium led by the UK's SAUR Services, which has a 58% shareholding. The second major shareholder is Metropolitan Life Limited, the sixth largest life insurer in South Africa, holding 23%. Other consortium members are South African investment companies WDB Investment Holdings Pty Ltd. Under the contract, Siza Water is responsible for the management of water and wastewater services, the take-over, maintenance and replacement of existing infrastructure, and the financing and construction of new infrastructure needed to supply water to the population. Siza Water's supply region spans an area of 150km^2, serving a population that peaks at 56 000 in high season.

According to the terms of the concession, Siza Water is the service provider and whatever it invests in infrastructure, operations and personnel development will revert to the municipality at the end of the 30-year contract. The municipality should then be in a position to continue the service with an enhanced infrastructure and fully trained staff. Alternatively, it may decide to continue with private sector participation.

Trinidad and Tobago – water, concession

The government of Trinidad and Tobago has adopted a two-phase approach to privatising its water services. In the first phase, a pre-concession or enhanced management contract has been awarded through a competitive bidding process. The second phase involves the private operator's responsibilities for operation and maintenance. A consortium of two British companies - Severn Trent Water International and George Wimpey Caribbean Ltd - was selected and the management contract took effect in April 1996. While the recruitment of the pre-concession operator went forward, the government began a series of initiatives to improve the economic viability of the Water and Sewerage Authority (WASA). In 1994, it granted WASA the right to increase tariffs by 35% for customers receiving water for more than 12 hours a day.

Trinidad and Tobago started reform with limited regulatory capacity and because of a desire to move quickly, the government proceeded with private participation without developing a full-fledge regulatory regime. Instead, it incorporated into the contract some regulatory aspects, such as performance standards. This feature was enough to attract world class operators willing to finance working capital and assume high operational and commercial risks.

West Bank – water, concession

Générale des Eaux in partnership with Khatib and Alami, an environment-consulting firm signed a concession contract in June 1999 for the provision of drinking water and water sanitation services. Covering the Province of Bethlehem (150 000 inhabitants) and that of Hebron (450 000), the contract has a duration of 4 years and involves investments of 42 millions francs. *Générale des Eaux* (Vivendi) will be responsible for ensuring the quality of drinking water and the commercial operations of the network. It will also direct upgrading of facilities and an eventual extension of the network.

2. JOINT VENTURES

Colombia – water service provision, joint venture

Facing huge inefficiencies and poor service, the government of Cartagena liquidated the public water and sewerage utility. In its place, it created a mixed-capital company – *Acuacar* – to serve the city's 750 000 inhabitants. Acuacar is jointly owned by the government of Cartagena and *Aguas de Barcelona*, a Spanish provider of water services. It has been awarded a 26-year operation and maintenance contract, and assumed control of the system in 1995. The City of Cartagena continues as the owner of the system, with sole responsibility for funding expansion. Aguas is to provide operating services and receive a fixed percentage of total revenues and divided distributions from *Acuacar's* profits. Substantial investment in maintenance and rehabilitation have occurred after an 11-year period and water quality has improved.

El Salvador - wastewater treatment, joint venture

A joint-venture design-built project was agreed between San Salvador airport authorities and Delcan, a Canadian company. *Comision Ejecutiva Portuaria Autonoma* (CEPA) and Delcan's services are provided under an internal sub-contract with AQSA, a Salvadorian general contractor. The project involves the design, equipment procurement, commissioning and operator training for a 1 050 cum/d cyclic activated sludge wastewater treatment plant for the international airport.

Philippines – water and waste water, joint venture

Operations Management International Inc. (OMI) began conducting a feasibility study in the province of Cavite in January 1997. The purpose was to identify the immediate and long-term water and wastewater needs of the province and to determine whether it could implement solutions using privatisation techniques. On June 12, 1997, OMI signed a memorandum of agreement with the Province granting the OMI team the exclusive right to develop a final technical proposal and final investment plan. In November 1997, a US$250 million partnership was signed between OMI and the provincial government. In the joint venture agreement, OMI, the province and local water districts agreed to work together to implement a fast-track programme to finance, design, construct and manage new water supply infrastructure. First and foremost, the new water plant will supply water to the people of Cavite. In addition, the design, construction, and long-term operation and maintenance of the system will create some 1 000 new jobs for skilled and semiskilled workers. Finally it is hoped that the availability of water will help attract commercial and industrial developers to Cavite, creating more jobs and contributing to the long-term economic growth and viability of the province.

Taiwan – wastewater treatment, joint venture

The Taipei Sanitary Bureau consulted with the Operations Management Inc (OMI) in order to start up and operate Asia's newest and largest wastewater treatment plant for the initial two-year period. The Pa-Li plant can treat 1 229, 242m3 per day with a 10-year plan to expand to 3 229 242m3 per day. Located in a rapidly expanding section of Taipei, the plant will have a staff of 124 and serve a metropolitan area of 4 million people. Not having the necessary experience for operating such a large wastewater plant, the Taipei Sanitary Bureau specified in its request for proposals (RFP) the several key positions should be filled by expatriates with the right mix of credentials to ensure starting up and operating the facility properly. The RFP also specified that the international partner team with a local firm. For this project, OMI chose a local engineering firm, SuperMax Engineering Enterprise Co Ltd. SuperMax will maintain the collection system.

3. BUILD-OPERATE-TRANSFER (BOT)

China – water treatment, BOT

China's first water supply build-operate-transfer (BOT) project was approved in July 1998, and will be built in Chengdu, capital of Sichuan province. This is the first urban water infrastructure project approved by the government using foreign funds under a BOT plan. The project should help to meet the water supply demand, which is currently increasing by 10 to 15% every year.

The consortium *Générale des Eaux* – Marubini won the BOT contract for the drinkable water treatment plan of Chendgdu city (3.2 million inhabitants). This 18-year contract aims at the conception, the construction, the exploitation and the maintenance of a water treatment plant with a capacity of 400 000m3 of clean water a day and a 27-km water pipeline. *Générale des Eaux* will also be in charge of the exploitation and maintenance of water connections, which will be transfered back to Chengdu City at the end of the contract.

China – water, BOT

Suez-Lyonnaise des Eaux, associated with the Hong Kong New World Group, through their joint subsidiary *Sino-French*, signed two contracts, in March 1998, for the distribution of drinkable water with Zhonshan City (1.5 million inhabitants), in the Province of Canton. Under these contracts *Sino-French* (66%) and the municipality will take over and manage two drinkable water plants having a capacity of 700 000m^3 per day. Works to extend the capacity up to 1.3 million m^3 per day are planned. *Sino-French* will ensure the exploitation of these units for a period of 22 years. At full capacity, these contracts should represent a turnover of FF100 million.

China – water treatment, BOT

In 1995, the Shanghai Municipal Waterworks company (SMWC) awarded a contract for the design, construction and operation of a drinking water treatment plant to Thames Water's joint venture company in China with Bovis, the British construction company. Construction work began in the north of Shanghai in early 1996 and the plant was completed in 1998. The total capacity of the plant is 400 million litres per day. It will supply two million people in Shanghai.

Colombia – water, BOT

A 20-year development plan has been put in place for Santa Fe de Bogota, with the implementation of three residential water treatment plants. These plants will be developed according to a two-phase strategy: the first phase will consist of the primary treatment of residual/waste water, the final phase will consist of the secondary biological treatment of wastewater. In September 1994, the District of Santa Fe de Bogota granted the concession for the treatment system of the Bogota River to the French consortium *Lyonnaise des Eaux – Degrémont*. The consortium transferred implementation of the first phase to a commercial Colombian company, *Bogotana de Aguas y Saneamiento* (BAS).

The consortium will be responsible for the design and the construction (3 years) and for the plant operation (27 years) and will finance the entire project. After 30 years, the plant will be transferred to the District. During the first three years, there will be no contribution from the district. The city will start paying the consortium a tariff calculated according to the cubic meter of used treated water in the station when the plant begins operations. The construction of the plant started in September 1997.

Hong-Kong, China – construction and operation of a solid waste transfer facility, BOT

Hong-Kong, China has issued a BOT for the construction and operation of its solid waste transfer facilities, which include a transfer station and fleet of transfer trucks. Further to a competitive tendering process to select the winning firm, the station has been built and is currently in operation.

India - wastewater and waste

In 1995, the Municipal Corporation of Greater Bombay (MCGB) awarded R.V. Anderson Associates Limited (RVA) a Canadian environmental engineering and technology management firm, a $3 million contract to upgrade the Corporation's sewerage operation and maintenance services. The project helped raise the capability and efficiency of Bombay's Water Supply and Sewerage Division (WSSD) to operate, manage, and maintain the sewerage collection system. These improvements will also improve the health and safety of the staff involved in the operation of these facilities. The project team carried out technical

assessments for all major facilities including pumping stations, treatment facilities, lagoons, and existing and proposed marine outfalls. These assessments were used to define existing operating water quality and environmental conditions and to prepare an effective program of some improvements. A final report and recommendations are being implemented through training, procurement and monitoring phases that will place the Municipality on a sound footing to meet the pressing environmental challenges.

Malaysia – water treatment, BOT

Suez-Lyonnaise des Eaux has concluded the following three BOT contracts between 1989 and 1992:

1. Taiping, in the Perak State, supplying 300 000 inhabitants with the construction of a drinking water treatment plant, extension of the distribution network and rehabilitation of the existing infrastructure.

2. Johor Bahru, capital of the Johor State, supplying 600 000 inhabitants by rehabilitating of the drinking water production infrastructures, the distribution network and construction of a new water treatment plant.

3. Kota-Kinabalu, capital of the Sabah State, servicing 500 000 inhabitants with the construction of a production water plant and of a dam, management and renovation of the five existing stations.

South Africa – water, BOTT (Built-Operate-Train-Transfer)

The government of South Africa has sought proposals for new rural water systems, including a requirement that local residents be trained on how to run the system once it is built. Implementation of the training requirement is to be monitored by South Africa's Department of Water Affairs.

South Africa – water, BOOT

OTV (a subsidiary of *Générale des Eaux*) will modernise and exploit for a period of 20 years a de-polluting plant for used water in Durban. The aim of this 76 million Euros contract (Build, Own, Operate and Transfer) is the construction of a treatment plant for the recycling of process effluent water. The plant will provide companies, who were previously using drinkable water for their process, with 40 000 cubic meter of water per day for an annual amount of 3.9 million Euros. The Durban municipality will charge a fee for the utilisation of effluents and will use the surplus resources to supply the poorest areas.

Trinidad and Tobago – seawater desalination, BOOT

Ionics Inc. and Hafeez Karamath Engineering Services Ltd have entered into a joint venture to build, own and operate a $120 million, 109 090 cubic meter per day seawater desalination plant. Under a 23-year contract with the Water and Sewerage Authority of Trinidad and Tobago (WASA) the joint-venture company, Desalination Company of Trinidad and Tobago Ltd (Desalcott) will supply water to Trinidad's Point Lisas Industrial Park, in order to make available for other purposes the water supply currently being used by the Industrial Park.

Vietnam - waste, BOT

Ho Chi Minh City authorities have commissioned three foreign companies to undertake BOT projects for the treatment of the city's rubbish. US-based Premiere International Trading and Consulting Inc. is performing a pre-feasibility study on producing gas and fertiliser from garbage. The US $70 million project will use garbage as fuel for power plants. Canada's Pourslo System Inc. will use rubbish to generate electricity and Netherlands' Official Development Assistance will upgrade the Go Cat Rubbish Treatment site.

Vietnam - water, BOT

Two 100% foreign-invested water projects are underway in Ho Chi Minh. The first project, the Binh An Water Plant, is being implemented by a Malaysian company in the form of a BOT. The plant has US$35.8 million invested capital and a design capacity of 100 000 cubic meters of water per day. The city's existing water plants are able to supply an estimated 800 000 cubic meters per day; below the current demand of more than one million cubic meter. The Binh An water treatment plan began supplying treated water to Ho Chi Minh in August 1999. Vietnam's first BOT project will supply 85% of its 100 000 cubic meter a day capacity to the State-owned Thu Duc Water Supply Plan during its first year of operation. The project will contribute to reducing the shortage of water. The corporation is expected to recover its capital investment within 12 years.

A larger water project, the Lyonnaise Vietnam water plant is fully owned by the French *Lyonnaise des Eaux* Group, with a US$12 million investment capital. The Lyonnaise Vietnam Water Company Ltd, a Joint Venture between Suez *Lyonnaise des Eaux* and Pilecon Engineering Berhad of Malaysia, will provide Ho Chi Minh with a daily volume of 300 000 cubic meter of treated water under a contract signed in July 1999. The contract falls within the framework of a BOT project set up in 1997. The US$135 million project includes the construction of a pumping station, a water treatment plant and a 25-kilometre pipeline. It also calls for the operation and maintenance of the facilities of the BOT water treatment system and sets strict rules for the quality and reliability in the production. The project is expected to create more than 60 local jobs. The Lyonnaise BOT contract is one of a few water supply projects aiming to supply Ho Chi Minh, which requires some 1.1 million cubic meters of treated water per day.

Vietnam – water, BOT

Ho Chi Minh authorities have granted a license for the second phase of the Saigon River Water Supply Project to Paragon Holdings of Malaysia. Under the BOT project, Paragon will set up the Grand Imperial Saigon Water Company to construct and run a water plan in the outlying district of Hoc Mon with a daily capacity of 300 000 cubic meters over 25 years. The US$149.3 million project also includes building a pumping station in Hoa Phu Commune, Cu Chi District to pump water from the West Bank of the Saigon River and the installation of a 20-kilometer pipeline. The Saigon River Water Investment Company will be the sole purchaser. Construction is expected to begin in mid-2000, and operations for water supply by early 2003. The construction and operation would be undertaken by Boris and Thames Water, two British affiliates of Paragon. This is the third BOT water supply undertaken by foreign company to be licensed in the city.

Vietnam – water, BOT

A contract for construction and equipment supply for the fourth phase of a water supply project in Hanoi (Ho Chi Minh) has been signed between the Hanoi Water Company and the successful bidder Vikowa (a

joint venture between Kolon Company of the Republic of Korea and the Vietnam Import-Export Construction Corporation, Vinaconex). This phase of the project includes the construction of new water plants (in Tay Ho precincts and Thanh Tri outskirts), the drilling of eighteen new wells and the installation of almost 700 kilometres of water pipes. Total investment is estimated at VND 630 billion (US$48 million) with US$32 million coming from the World Bank loans. The plants are due to be operational in 2001 supplying 60 000 cubic meters of water per day for Hanoi and bringing the city's water output to 490 000 cubic meters per day. The contract for consultation and construction supervision was awarded to a joint venture between GKW of Germany and Plancenter of Finland.

Construction for a water supply factory for the Dung Quat industrial area started in May 1999. The factory is designed to produce 15 000 cubic meters of water per day is being built by the Vietnam Import-Export Construction Corporation (Vinaconex) under a BOT contract. Vinaconex plans to invest an estimated VDN56 billion (US$4.03 million) in the factory which is expected to be operational in the first quarter of 2000. The factory expects to retrieve the invested capital after 7 years operation. The water supply projects in Bac Giang, Bac Ninh, Ha Tinh and Vinh Long provinces have been implemented with financial assistance from the Australian Government. This total investment capital of VND564 billion comes mainly from Australia's non-refundable aid. The five-year project aims to build new water supply facilities for 405 500 inhabitants in the five towns of Bac Giang and Bac Ninh in the northern provinces, Ha Tinh central province and Tra Vinh Long southern province.

Vietnam – water supply, BOT

In March 2000, Vietnam has granted a license to Paragon Holdings of Malaysia for the second phase of the Saigon River Water Supply Project in Ho Chi Minh City. Under the build-operate transfer project, Paragon will set up the Grand Imperial Saigon Water Company to construct and run a water plant in the outlying district of Hoc Mon with a daily capacity of 300,000 cubic meters over 25 years. Construction of the US$149.3 million project was expected to begin in mid-2000. It will begin supplying water by early 2003. The Saigon River Water Investment Company will be the sole purchaser.

4. SERVICES CONTRACTS

Argentina – water and sewage management services contract

A group headed by SAUR International and Enron, a U.S. energy company was awarded a 95-year contract in 1998 for the distribution of water and the management of the sewage system for the town of Mendoza, Argentina, its suburbs and several other towns in the province.

Argentina - waste collection services contract

CGEA-Onix (*Suez-Lyonnaise des Eaux*) won a FF700 million contract for collecting domestic waste and for cleaning of Buenos Aires after a public tendering launched in 1997. The city was divided into four parts, and CGEA-Onix won the second largest area (600 000 inhabitants). The 6-year contract came into force on 1 February 1998.

Brazil – water services contract

In 1998, *Compagnie Générale des Eaux* (Vivendi) was awarded a US$5 million contract by CASA (*Companhia Cartarnense de Aguas e Saneamento*) the Santa Catarina State water distribution company. The contract deals with the supply and the installation of a wastewater sanitation plant in Chapeco City. The plant will treat wastewater for 66 400 inhabitants. OTV's Brazilian subsidiary, in association with IVAI, a local civil works company, will have turnkey responsibility for civil works and the sewer system.

China – water services contract

The consortium OTV Cadagua has won a contract for the construction of a drinkable water plant in Nanjing. This FF42 million contract has been obtained from the Nanjing Water Supply Company. The plant will be built in two-phases: during the first phase, the consortium will provide a 250 000 cubic meter per day plant (pumped from Yangtse Jiang River) which will reach 500 000 cubic meters to supply more than 2 million inhabitants, in the final phase. Construction in the preliminary phase will be the responsibility of the Nanjing Municipality Engineering Design Institute, and will then be completed by OTV, who will provide electromechanical equipment, supervise the installation, the beginning of operations and education of personnel.

Colombia - private sector management of solid waste services

In 1994, Bogota issued four different service contracts for waste collection and street sweeping services for four separate sections of the city. Bogota also issued an operation and maintenance contract for local landfill operations.

Gaza (technical assistance contract)

Suez-Lyonnaise des Eaux has won a contract to manage water services and sanitation in Gaza. This four-year contract include installation management, the network and the station rehabilitation, and personnel education. Financed by the World Bank it had been won in an international tender.

Indonesia – water, project management, technical and procurement services contract

In July 1999, SNC Lavalin, a Canadian company was awarded a C$14 million contract to strengthen the capabilities of the Indonesian government (*Sub-Dinas Pengairan Organization*) in water resources planning design, construction, operation and maintenance and management. The goal of the project is to improve, in a sustainable manner, the effectiveness and efficiency of irrigation operations and water resources development in North Sulawesi. The project to be completed by the year 2000 involves: providing training, procurement, creating and supporting local organisation for operations and maintenance of irrigation facilities, strengthening the provincial institutions and staff and ensuring environmental protection.

Jordan - Lyonnaise des Eaux, water and wastewater, operation, maintenance and services contract

In February 1999, the *Lyonnaise des Eaux* Group, in consortium with Montgomery Watson Arabtech Jadaneh (25% share) won the water and wastewater management contract for Amman, following an international call for tender. The 51-month contract provides for the water and wastewater management

and maintenance for the Great Amman territory, and its 1.6 million inhabitants. The principal target for the project is to improve water distribution by reducing leakage, securing quality supply constancy and operating an efficient customer service. The World Bank has granted a US$55 million loan for the contract duration, to cover investment, to upgrade the existing water plants and networks, and to restructure the water services.

Malaysia – water, services contract

The Malaysian Rural Water Supply Schemes provide a piped water supply on a turnkey basis to 4.2 million inhabitants throughout the country's 13 states over an area spanning 4 000 kilometres. One hundred and thirty four schemes were implemented over 600 individual sites, which included 70 treatment plants, 342 reservoirs, 4 major dams, 48 pumping stations, 67 river intakes, 20 boreholes, 18 maintenance centres, three staff training centres and the shipment of over 93 000 tonnes of products manufactured by Biwater in the UK. In addition, almost 300 kilometres of access roads were constructed.

Mozambique – water, services contract

In September 1999, the *Aguas de Mocambique* consortium and *Fundo de Investimento e Patrimonio do Abastecimento de Agua* (FIPAG) entered into a contract for water supply to Maputo and the four major cities of Beira, Quelimane, Nampula and Pemba in Mozambique. *Aguas de Mocambique* is a consortium led by *SAUR* International (38.5%), *IPE-Aguas* de Portugal (31.5%) and five national investment organisations known as *MAZI Mocambique* (30%). *SAUR* International is part of the *SAUR* Group, a group of companies specialising in the private management of public utilities. *IPE-Aguas* de Portugal is a state-owned company incorporated in the IPE Group and leads a group of water supply and sewage companies, serving 60% of the Portuguese population.

The contract is valued at US$25 million and comprises two parts: a 15-year lease contract, to manage the water supply and distribution system for Maputo and a five year management contract for water supply and distribution services for the four cities. The contract provides for 2.5 million people to be supplied with water services. *Aguas de Mocambique* anticipates turnover to be approximately US$50 million in the first five years. In addition to water supply services, *Aguas de Mocambique* will be involved in a programme of pipeline refurbishment (around 160kms); refurbishment of connections (approximately 33 000) and fire hydrants; water meter replacement (50 000) and the creation of new connections (54 000). These programmes rely upon financing from the World Bank and will be managed by the consortium.

Puerto Rico – water, services contract

Thames Water is involved in the supply of water to the North Coast area of Puerto Rico, which includes the capital San Juan. Following the drought of 1994, the Puerto Rico Aqueduct and Sewer Authority (PRASA) implemented the "North Coast Superaqueduct Project". Under the project, Thames Water, in co-operation with an American partner, the Dick Corporation, was awarded a design, build and operations contract by PRASA for a new drinking water treatment plant, water storage facilities, and a 60 km trunk pipeline. The contract was worth US$300 million, and was subsequently extended to include the design, construction and operation of five North Coast municipality interconnections.

Water is extracted from the River Arecibo and stored in a 1 300 million litre reservoir which was created for the project. Once treated, the water is piped to the San Juan metropolitan water distribution system, by which it serves twelve municipalities. The aim of the project is to produce drinking water in the most cost-

effective and environmentally sound way possible. Construction of the necessary infrastructure has been undertaken by 80% local suppliers.

Venezuela - waste water, services contract

In October 1999, SNC-Lavalin signed a US$25 million contract with the Venezuelan Ministry of Environment and Renewable Natural Resources to implement the first phase of a US$45 million waste water collection and treatment system to serve the cities of Trujillo and Valera in Trujillo State, in north-western Venezuela. The contract comprises engineering, procurement, construction and project management. Approximately 60% of the project should be completed by 2002 in the first phase, which is set to start in November 1999, with the second phase to follow immediately afterward. Financing has been arranged jointly by SNC-Lavalin Capital Inc. and *Société Générale*, with guarantees from the Export Development Corporation (EDC) of Canada and Export-Import Bank of the United States. This sanitation project is part of the Venezuelan government's master planning to protect the environment and improve the quality of life of the population of Trujillo State. At present, untreated waste water from Trujillo and Valera is discharged directly into the Motatán river basin, a main tributary of the Lake Maracaibo basin.

Venezuela - water management, services contract

Lake Maracaibo has undergone severe degradation over the last century. Delcan was engaged to review the existing legal and institutional framework for pollution ~~is~~ regulation and to make recommendations for strengthening the institutional structure. A pollution control strategy was developed for the urban and industrial areas along the East Coast of the Lake Maracaibo basin. A storm water management study was prepared and the agencies responsible for the operation and monitoring of the water supply and pollution control infrastructure were reorganised. In addition to the environmental study, Delcan provided the following services:

- Reviewed and provided operational guidance for a number of existing plants.
- Designed and procured new pumps and controls for 19 existing raw sewage pumping stations.
- Designed two new biological nutrient removal sewage plants to serve a population of 400 000.
- Designed four large sewage pumping stations and 20 km of forcemain.
- Designed an experimental farm for disposal of treated effluent by irrigation.
- Procured equipment for the plants, pumping stations and maintenance of the system through EDC funding. The total cost of the work amounted to $100 million.

ANNEX 2

GLOSSARY OF DEFINITIONS FOR PRIVATE SECTOR PARTICIPATION IN ENVIRONMENTAL SERVICES MARKETS

(for the purposes of this document)

Operation, maintenance and services contract

The public sector remains the primary provider of the infrastructure and only contracts out portions of its operation to the private organisation. The private sector carries out one or more specified tasks or services for periods from 5 to 7 years, it must perform the service at the agreed upon costs and must typically meet performance standards set by the public sector. The contract is generally awarded through traditional competitive bidding procedures. The private sector is paid a pre-determined fee for the service and does not have a relationship with the end-users, all financial interactions being made directly with the government. The public sector is responsible for funding any capital investments needed to expand or improve the system.

Build-Operate-Transfer (BOT) Contracts

Under a BOT the private sector finances builds and operates a new infrastructure facility or system according to performance standards set by the government. The operation period is usually 10 to 20 years. The public sector retains the ownership of the infrastructure facilities and becomes both the customer and the regulator of the service. The private sector provides the capital to build the new facility. In return, the public sector agrees to purchase a minimum level of output to ensure that the private operator recovers its costs during operation.

Build-Operate-Train-Transfer (BOTT) Contracts

BOTTs are a simplified form of BOTs: substantial private investment is not sought and mixed shareholdings are required in the operating company. The contract is awarded through a government procurement contract. The objective is to build local capacity to operate the new facility at the time of the transfer.

Concession

A private firm (the concessionaire) is awarded full responsibility for the delivery of infrastructure services, in a specified area, including all related operation, maintenance, fee collection, and management activities. It is responsible for any capital investments requiring to build, upgrade or expand the system, as well as for financing investments using the tariffs paid by system users. The public sector establishes performance standards and ensures that the concessionaire meets them. The fixed infrastructure assets are entrusted to the concessionaire for the duration of the contract (25-30 years) but they remain government property.

Joint ventures

Joint ventures are companies jointly owned by the public and the private sectors, in which they assume co-responsibility for the delivery of infrastructure. The public and private sector partners can either hold shares in a new company or assume joint ownership of an existing company, which provides urban infrastructure services. Joint ventures are alternatives to full privatisation.

Community based provision

Community-based provision starts when financial or institutional limitations prevent the government from providing adequate waste and water services to particular sectors of the population, forcing residents to find their own means of meeting their needs. Community-based providers might include individuals, families, or local micro-enterprises. Initial organisational and material costs are often provided by NGOs, private charities, official development assistance, the government or by the community itself. Maintenance costs are generated by local charges or revenues. Community-based organisations often play a key role in organising poor residents into taking collective action and in representing their interests in negotiations with non-governmental organisations and governments.

ANNEX 3

LIST OF SOURCES

a) Companies websites:

(International activities and press releases)
Azurix: http://www.azurix.com
Bechtel: http://www.bechtel.com/
Biwater UK: http://www.biwater.co.uk
Degremont: http://www.degremont.fr/
OTV: http://www.otv.fr/
SITA: http://www.sita.fr/
Saur UK: http://www.saur.co.uk/home.html
Suez Lyonnaise des Eaux: http://www.suez-lyonnaise-eaux.com/
Thames water: http://www.thames-water.com/
Vivendi: http://www.vivendi.com
Delcan: http://www.delcan.com
Trojan Technologies: http://www.trojanuv.com
SNC-Lavalin: http://www.snc-lavalin.com
AGRA: http://www.AGRA.com
Canadian Industry-Environmental Affairs: http://strategis.ic.gc.ca/SSG/ea01338e.html

b) International Organisations websites

The World Bank: http://www.worldbank.org/
International Finance Corporation – World Bank Group: http://ifc.org
UNDP: http://www.wsp.org/ (water and sanitation programme)
The European Investment Bank: http://eib.eu.int

c) Other websites

WWInternational: http://www.wwinternational.com/ (Internet portal for water and waste containing link to online magazines: water world, water and waste water international, worldwide waste management, *prevencion de la contaminacion*)
Waternunc: http://www.waternunc.com/ (Business-to-business website dedicated to the water sector and containing press releases)