2008 – UN International Year of Sanitation

It is time for business to act

Sanitation is such a huge and global issue that the private sector has a responsibility to be part of the solution. A lack of sanitation has an economic impact on business through reduced work time, productive capacity and purchasing power due to disease. 2008 – the International Year of Sanitation – is an excellent time for companies to get involved and make a positive difference.

World Business Council for
Sustainable Development

Lack of sanitation, poor hygiene and unsafe drinking water cause at least 1.8 million deaths per year, among them 1.5 million children under five. This is nearly 10 times the death toll from the 2004 Indian Ocean tsunami, which triggered massive international relief efforts.

Background

An estimated 2.6 billion people, 41% of the world's population, do not have access to "improved" sanitation. In the least developed countries, 64% of people lacked such access in 2004. The majority of these people are in South and East Asia, and in Africa.

Achieving the Millennium Development Goals

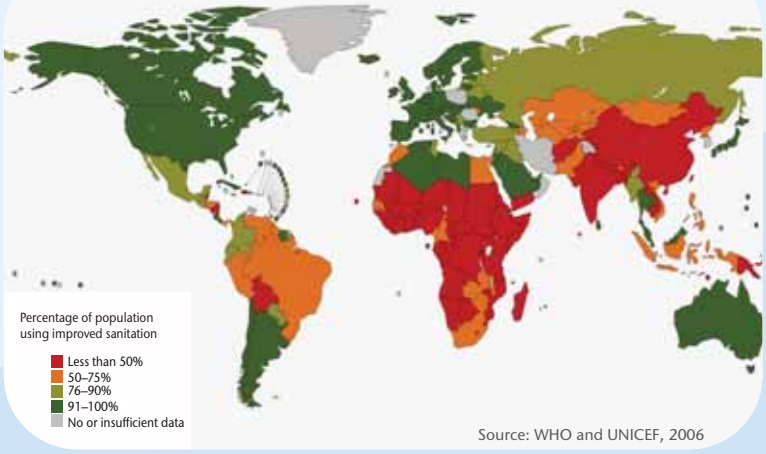
Target 10 of the Millennium Development Goals (MDG) is to "halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation." At current trends, the world is expected to fall short of meeting the sanitation target by more than 560 million people and would still leave 1.8 billion people with inadequate sanitation if the goal is met.

This is a call for business to take action internally and to influence others, including governments, to act urgently to give improved sanitation the priority it needs.

The estimated economic return from improved sanitation is about US$ 10 for every US$ 1 invested.

Improve sanitation – it's good for business

Coverage with improved sanitation in 2004



Source: WHO and UNICEF, 2006

Where are your opportunities?

If any of your company's sites, members of your supply chain or customers are in the red or orange countries shown on the map, you may well be missing business opportunities.

The WBCSD's Global Water Tool (www.wbcsd.org/web/watertool.htm) maps out company sites and compares them to water data, and importantly, sanitation coverage.

Providing access to improved sanitation is good business

Sanitation means the provision of facilities and services associated with the collection, transport, treatment, recycling and safe disposal of human waste, wastewater, storm water and garbage, not just toilets.

The economic benefits from improved sanitation include:

- Improved efficiency and motivation of a fit and healthy workforce
- Lower costs for the health sector
- Money saved by those who avoid disease and treatment
- Fewer work days lost due to illness
- Less time lost in caring for the sick
- Economic contribution of lives saved
- Time saved in accessing water and sanitation facilities
- Positive impact on education (in schools), particularly for girls
- Increase in world GDP from greater spending power and consumption of goods and services.

The cost to solve the sanitation problem is modest

In 2007 the World Health Organization and United Nations Development Programme published a detailed cost-benefit study in support of action to meet or exceed MDG Target 10:

- Meeting the sanitation target is estimated to cost US$ 38 billion over 10 years but have an estimated economic benefit of US$ 347 billion over the same period.
- Providing universal improved sanitation coverage would cost an estimated US$ 145 billion but have an estimated economic benefit of US$ 1,631 billion, again over 10 years.

The cost of universal sanitation coverage is equivalent to:

- About 8% of health spending in the US each year alone
- Less than 6 cents per person per day for each person living in Canada, France, Germany, Italy, Japan, the UK and the US.

We have the skills, know-how and capacity to solve the problem

Unlike HIV/AIDS, we do not need to undertake further research to find a cure. We have the skills, know-how and capacity to solve the sanitation problem now. It requires leadership and commitment by the world community to give this issue appropriate priority. The business community has the opportunity to help build commitment and turn it into action.

Borouge and Borealis

Wanganui sewage scheme

In the city of Wanganui, New Zealand, the city engineers used Borouge's modern plastic pipeline materials and the latest installation technology to help them develop their new network. Now their citizens are benefiting from the improvements to the environment.

The 1,000-millimeter polyethylene pipe in position under the Whanganui River

The Whanganui is New Zealand's third longest river and originates high on the volcanic plateau of the North Island and drains into the Tasman Sea at the city of Wanganui, some 290-km downstream.

Like many other cities, the Wanganui sewage system had developed in a piecemeal fashion as the settlement grew. Many of the pipes were old and leaking and there was no separation of the storm water from the sewage, which at times caused the system to overload. The old pipes were in bad condition and there were many untreated industrial outflows discharging directly into the river, significantly reducing the river's water quality.

By the end of the 1990s it was clear that a major upgrade to the system was necessary to reduce leakage and infiltration in the sewage system, to separate the storm water from the sewage and to improve the quality of the river water.

The development of a new system posed a number of major challenges but created a higher quality of life for its citizens and a cleaner and healthier environment.

Planning the city's new sewage system

In 2002, the Wanganui city council developed a comprehensive plan to separate the storm water and sewage and to eliminate the outfalls into the river by installing an 18-km sea outfall off nearby South Beach. This outfall would be served by a pumping station on the city side of the river. Allied to this plan was the design and construction of an interceptor main to convey screened sewage and industrial wastewater to a new treatment plant prior to discharge into the sea.

One of the major problems was that the new treatment plant was across the river from the existing pumping station. There was an existing large-diameter concrete pipe under the river, but this pipe could not withstand the design pressure. Therefore they were faced with three options: build an additional pumping station, upgrade the current submarine pipe or build a new one.

The pipe would need to be *600 meters* long and would weigh *116 tonnes*, but would save the city *US$ 2.5 million* compared to alternative solutions.

After a feasibility study it was decided that the most effective solution would be to insert a welded 1,000 millimeter diameter polyethylene pipe inside the concrete pipe. This pipe could easily cope with the pressure, but it would need to be 600 meters long and would weigh 116 tonnes. There was the added complication of four bends in the existing concrete host pipe, which could mean that the force required to insert the polyethylene pipe would be very high. Although nothing of this magnitude of insertion had been attempted before in New Zealand, the city council decided to go ahead as it was such an attractive solution and had the added benefit that it would save the city US$ 2.5 million compared to alternative solutions.

Inserting the large-diameter polyethylene pipe

To resist the stresses and strains of the installation, high-quality PE100 (polyethylene) material from Borouge was selected for the manufacture of the pipe. Specialist contractors and engineering consultants were appointed to carry out this unique installation.

The insertion of the pipe took place in April 2007 and it went without a hitch. Because polyethylene has a lower density than water, the pipe floated in the flooded host pipe and the pulling forces were significantly lower than initially expected.

The complete network including the new treatment plant was commissioned in July 2007 and today it transports 32,000 m^3 of wastewater every day, which has lead to a great improvement in the water quality of the mighty Whanganui River.

The *complete network*, including the new treatment plant, transports *32,000 m^3* of wastewater *every day*.

Greatly improved river water quality

Polyethylene provided an effective solution to an otherwise difficult engineering problem and saved overall cost. The challenging project was completed without a hitch and this new pipeline forms a key element in the city's upgraded sewage and wastewater network.

The new system deals much more efficiently with the sewage, storm water and wastewater flows, and by removing discharges into the river, it provides a greatly improved environment for generations to enjoy in the future.

Spreading knowledge and best practice

Borouge and Borealis's Water for the World program aims to make a difference in water and sanitation around the world. Water for the World encompasses five strands of activities:

1. Bringing the company's expertise to community field projects
2. Advancing science and best practices through education and training programs on water and sanitation technologies
3. Engaging stakeholders and encouraging sustainable practices, investments and innovations
4. Leveraging business and innovation capabilities
5. Internal engagement. An important part of this program is to spread knowledge and best practice throughout the water and sanitation industry.

Through this project, which used Borouge's materials from the Middle East, the company worked together with the pipe producer and local contractor to publish the scheme as widely as possible. Borouge hopes this will encourage others around the world to use similar products and technology to tackle problems that would otherwise appear to be too difficult or costly.

To learn more about the Wanganui sewage scheme visit www.wanganui.govt.nz

To learn more about Borouge PE 100 Borstar solutions visit www.borouge.com

To learn more about the Water for the World program visit www.waterfortheworld.net

Borealis and Borouge
Water for the World

The plastics industry can make a difference in many of the challenges facing our world – whether climate protection, energy conservation or access to water and food – not only in the way it operates but also how it provides sustainable solutions to global challenges. In the fields of water and sanitation, Borealis and Borouge advanced plastics materials are shaping sustainable solutions across the entire water value chain, from source to network, for food protection, water supply and sewage systems.

For Borealis and Borouge, the 2006 report, *Business in the World of Water – WBCSD water scenarios to 2025*, was a further call for action. "We consider that water and sanitation are the most vital of the challenges facing our world," said Borealis Chief Executive John Taylor. Billions of people around the world lack access to safe water and sanitation, and climate change, urbanization and population growth are deepening the global water crisis.

The challenge is about better managing the resources we have. In rich or poor countries alike, inefficient water systems and unsustainable practices are widespread. The pace of transferring best practices remains slow across value chains and communities, and awareness is too often raised only when a crisis occurs.

The *challenge* is about better *managing* the *resources* we have.

To help manage the challenge, Borealis and Borouge have created *Water for the World* ™, a pioneering program that fosters local knowledge and partnerships throughout the value chain to provide sustainable solutions for the availability of safe water and sanitation.

Water for the World develops five strands of activities:

1. Bringing expertise to community field projects in partnership with Water and Sanitation for the Urban Poor
2. Advancing science and rewarding best practices, notably as co-founders of the Stockholm Water Prize
3. Further engaging all stakeholders to encourage sustainable practices and to develop training programs and standards, such as in the Middle East with the Gulf Plastics Pipe Academy
4. Leveraging the companies' expertise to innovate and increase the offering of sustainable solutions to address local challenges
5. Enhancing operational water efficiency and mobilizing employees and local communities by raising awareness and adopting sustainable practices.

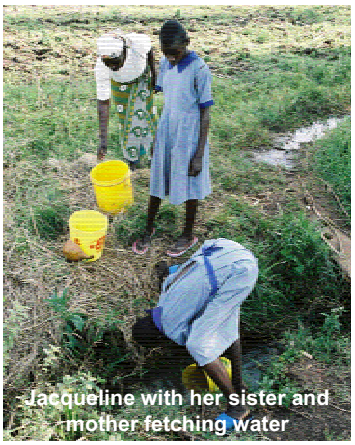
A *pioneering program* that fosters local *knowledge* and *partnerships* throughout the value chain.

"*Water for the World* not only builds upon our market leadership, it goes beyond business," said Borouge Pte CEO Harald Hammer. "By bridging expertise, competencies and resources across the value chain, we can deliver better solutions and make a difference."

The program therefore sets a platform for partnerships that is open to the ideas, comments and projects of all stakeholders. Launched in October, the website, www.waterfortheworld.net, will regularly report on partnerships, knowledge and sustainable solutions in action.

The Coca-Cola Company
Schools for change

Thirteen-year-old Jacqueline used to constantly miss school due to the crippling effects of diarrhea, cholera and typhoid. "We were drinking river and well water that was untreated," she explained matter-of-factly. "I was always vomiting, shivering. I didn't have any appetite."


Jacqueline with her sister and mother fetching water

Today, thanks to an innovative school-based water purification and hygiene education program, Jacqueline is a regular attendee at Kasimba Primary School in Nyanza Province, western Kenya. "Now everybody in our house has safe water, and nobody is complaining about this typhoid anymore," she said with a broad smile.

According to UNICEF, more than half the world's schools lack clean toilets and drinking water, contributing to the waterborne diseases that take two million lives a year, 90% of them children. Young girls lose education and economic opportunity, as female school attendance drops dramatically when clean, safe toilets are unavailable.

Kenya is among the hardest hit countries, with more than half the rural population living without safe water supplies. Schools breed disease due to lack of latrines, inadequate water supplies, and water storage in containers easily contaminated by hand.

In 2006, The Coca-Cola Company's East and Central Africa Division funded one of the country's first schools-based efforts to reduce diarrheal diseases and improve pupil attendance by implementing the Safe Water System developed jointly by the World Health Organization, US Centers for Disease Control and Prevention and the Pan American Health Organization. The pilot project was implemented by the development charity CARE. Coke provided funding, project strategy development and technical expertise, supported development and production of new bottle molds for WaterGuard, the locally manufactured chlorine disinfectant, and acted as liaison to the provincial and national water, health and education ministries.

Two teachers in each of 45 public primary schools were shown how to treat water with a chlorine-based disinfectant, store the water safely and promote proper hand-washing practices. They then formed safe water clubs for pupils, instructing them in water purification and hygiene techniques and encouraging them to pass the message on to parents. Each school also received locally made clay pots, modified for safe storage with a narrow mouth, lid and spigot, and disinfectant solution, soap and hand-washing water tanks.

In less than a year, an estimated 12,250 students were receiving treated water, and nine in ten schools were storing treated supplies in safe containers. The impact on attendance was impressive, with absenteeism falling by 29%. An estimated 1,258 families of students in the project became users of WaterGuard during the project time period.

More than *half* the *world's schools* lack clean toilets and drinking water.

Coke funded an in-depth expert evaluation of the project by Emory University in Atlanta and the US Centers for Disease Control and Prevention. This enabled the company and its partners to promote schools-based safe water programs to government officials and international donors.

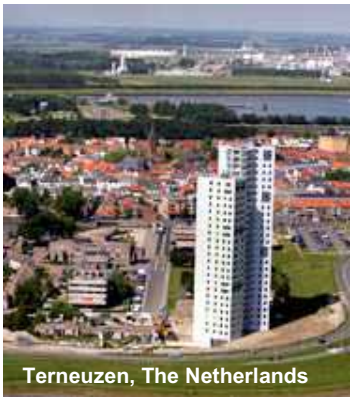
As a result, CARE is implementing a scaled-up program, SWASH+, which will cover 1,500 schools throughout Nyanza Province, funded by the Bill and Melinda Gates Foundation and the Global Water Challenge. The Challenge is a coalition of leading organizations joining forces to catalyze change in the water and sanitation sector. The Coca-Cola Company is a founding member.

"We have more than 70 community water stewardship projects in 40 countries, and the Kenya program The Coca-Cola Company Schools for change exemplifies our approach of seeding initiatives that can be sustained by communities and scaled by other agencies," said Karen Flanders, The Coca-Cola Company's director of corporate responsibility. "We also try to bring added value beyond philanthropy. In Kenya, our public affairs and communications team were actively involved in promoting the project to a wide audience including Kenyan ministries, potential donors and, through a video, an internal audience of Coca-Cola managers."

***Reduce* diarrheal diseases and *improve* pupil attendance by implementing the *Safe Water System*.**

Dow Chemical
Managing wastewater

More people will soon live in cities than in rural areas, and 18 of the 23 mega cities worldwide will be in a river delta or on the coast. As a result, water safety risks will increase, pressure on water systems will grow, and the amount of sewage water will swell.


Terneuzen, The Netherlands

Dow Chemical's Terneuzen manufacturing site in the Netherlands has shown that an innovative approach to wastewater can benefit the company, the community and the environment.

In the past, Dow used water from the local river as its primary source for generating steam and feeding its manufacturing plants. This water was purified and discharged after use. In collaboration with local authorities and a local water producer, the site now accepts more than 9,800 cubic meters of municipal household wastewater every day. The local water producer removes residual contaminants, and Dow then uses more than 70% of this water to generate steam.

"With the new approach, Dow uses household wastewater from the municipality of Terneuzen, which is directed to the sewage water purification plant and converted into industrial water for Dow," explained Lambert Paping, water specialist for Dow Terneuzen. "The water is then used as feed water for several Dow plants and in turn, wastewater from these processes is treated and used as feed water for the cooling tower. This way, the water can actually be reused and recycled multiple times, minimizing the amount of water discharged into the river, preserving the environment," Paping added.

This effort results in *90% less energy use* at this facility compared to *desalinating* this amount of seawater.

Water from the cooling towers eventually evaporates into the atmosphere. Three million tonnes of water per year that were previously discharged into the North Sea after one use is now used two more times. This effort results in 90% less energy use at this facility compared to desalinating this amount of seawater and a reduced need for water treatment chemicals.

There are additional benefits. "Compared to the brackish river water, household wastewater can be purified under lower pressure," noted Niels Groot, Dow Terneuzen wastewater specialist. "This reduces our energy consumption substantially, and saves approximately 500 tonnes of chemicals per year. Consequently, our CO2 emissions are cut by 1,850 tonnes annually."

This water project demonstrates Dow's commitment to the local community and the environment, while showing industry a way to go beyond regulation. It also overcomes the huge prejudice against reusing treated sewage water. The project is innovative in that this is the first time that municipal wastewater is being reused on such a large scale in the industry.

GHD

Improving sanitation in Samoa

Apia, the capital of Samoa, is the country's economic center. It has a population over 60,000 and is growing at 16% per year. As a result of inadequate sanitation and drainage management systems, near-shore marine water and urban stream water quality in area has been significantly degraded. There are significant health concerns and tourism is impacted by smelly and unsightly drains and polluted near-shore waters.

GHD, in association with Samoan consultants Tinai Gordon & Associates, is implementing a project to improve sanitation in Apia for the government of Samoa. The project is being facilitated by the Samoa Water Authority and Ministry of Works, Transport and Infrastructure.

Flooding is a frequent problem due to high rainfall, the location of much of the town on a floodplain, and inadequate drainage systems. This is compounded by poorly controlled landfills, blocked drains and a lack of town planning in the past. Foul water flooding after rainfall poses a health risk due to septage (partially treated waste stored in a septic tank) and latrine wastes being released to the surface environment.

In early 2004, following a number of feasibility studies, the government of Samoa obtained an Asian Development Bank (ADB) loan to address flooding and inadequate sanitation issues in Apia, through the Samoa Sanitation and Drainage Project (SSDP).

The objective of the SSDP is to improve the environment and public health in Apia through:

- Improving drainage and sanitation infrastructure and capacity in urban management
- Reducing frequency of flooding- especially in low-lying areas
- Improving ocean, surface and groundwater quality
- Promoting private sector participation in the provision of urban services

Drainage improvement works

The Gasegase River and two tributary streams provide the original natural drainage of Apia and discharge into Vaiusu Bay. With the increase in human settlement and development activities, the riverbanks have been reclaimed and filled, thereby reducing flood capacity.

The goal of the SSDP project is to rehabilitate these drainage and flood channels to minimize flooding events. An ongoing need to improve storm water drainage in Apia will remain.

Current sanitation issues

Human waste from the majority of households and most commercial business facilities in Apia is discharged into septic tanks and pit latrines. The effluent is untreated and is discharged into overflow soakpits. Some commercial premises and government buildings have small wastewater treatment plants whose treated effluents are discharged into nearby streams or the ocean. Many of these plants are overloaded or perform poorly, and in dry periods there is little dilution of effluent in the streams.

The *objective* of the Samoa Sanitation and Drainage Project is to *improve* the *environment* and *pubic health* in Apia.

Some existing commercial and residential septic tanks are not large enough to manage the volume of wastewater they receive. Some have no concrete base and the walls are constructed from lean mix poured concrete or un-grouted masonry, thus making the tank non-watertight. Septic tank installations in many households are the only solution in the absence of a reticulated centralized community sewerage system.

Septage is collected by pump trucks and disposed of in open unlined pits at the local landfill site, but septic tanks and cesspits are only emptied when there is a problem (i.e., overflow or

blockage) and are not pumped out frequently enough to prevent pollution in surrounding residential areas.

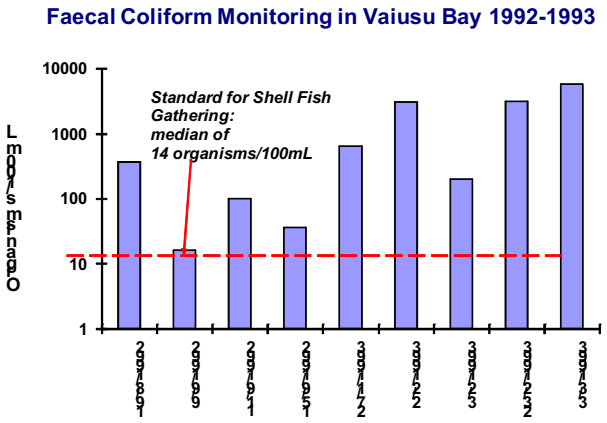
The development of an improved sewerage system for Apia has been extensively studied since the first documented assessment in 1916. However, the government has not had the resources to build the various comprehensive schemes proposed, even with assistance of concessional loans.

Studies show that contamination in drains and near shore areas such as Vaiusu Bay, particularly in the wet season, is on the rise.

Sanitation improvement works

Extensive investigation of options and costs including conventional gravity sewerage, low-pressure pumped sewers, and upgrading of existing on-site systems has been undertaken with the outcome that low-pressure sewers collecting septic tank effluent will form the backbone of the sanitation improvements. A contract for the design and construction of these pressure sewers has now been awarded and construction will start mid-2008. This approach was adopted as it was the most affordable option suited to the poor soil conditions for sewer construction, limited funds and existing cultural preference for water-flushed toilets. In addition, most houses and all commercial buildings already have flush toilets.

The system involves construction of about 150 small pumping stations, of about 1,000 liter holding capacity, to serve individual properties or clusters of properties. These pumping stations will use grinder pumps discharging into small-bore polyethylene pipes that are easily laid and do not have to be graded or buried deeply. Experience with these pumps to date in Australia and elsewhere indicates that they provide a reliable solution provided maintenance is undertaken. The operation and maintenance of the infrastructure will be provided by the Samoa Water Authority.



A separate contract will be awarded for construction of a 1 ML/d wastewater treatment plant designed to meet the stringent discharge quality criteria set under the South Pacific Region Environment Program. Effluent will discharge into the surrounding mangrove area. The sludge will be treated off site at the local landfill site using a biodigester and sludge thickening plant.

GHD is a WBCSD member contributing to improving sanitation through:

- Contributing technical and financial expertise
- Assisting government to find an affordable sanitation solution
- Working with communities to help them understand the sanitation options available
- Managing a project to improve drainage and provide low-cost sewerage.

GHD

Vietnam's urban sanitation program

Improving sanitation in three flood-prone towns in the Mekong Delta in Vietnam is a local priority. The Three Delta Towns Water Supply and Sanitation Project (3DT) aims "to improve the welfare of residents of Bac Lieu, Ha Tien and Sa Dec urban wards and communes by rehabilitating and extending water supply, drainage, wastewater and solid waste management facilities and services and to develop the capacity of local institutions and community groups to manage these systems on a sustainable basis."

GHD has co-managed the 3DT program over the past seven years. External funding for the project has come from AusAID, the Australian government's foreign aid program. Total expenditure on the project by the Australian government by completion in 2008 will be around AUD 50 million, and the government of Vietnam will contribute an additional AUD 28 million.

At the start of the project, 53% of households in Ha Tien (population 40,000) had no toilet. In Bac Lieu (population 135,000), the percentage with no toilet was 33%, and in Sa Dec (population 95,000), that figure was 27%. Excreta disposal methods included open defecation in rice fields or canals and pit latrines with fish pond toilets also being used in Sa Dec. These sanitation approaches are unsanitary, particularly in the wet season.

Facilities provided by the project

The project is providing:

- New and augmented water supply systems, including water source development, water treatment, service reservoirs, transmission, distribution and reticulation pipelines, and service connections
- Drainage, including construction of primary piped and open canal drainage systems with associated control structures, pumping stations and flushing systems for dry weather flows, secondary pipe drains, and tertiary box drains
- Public toilets
- Microcredit schemes for the construction of septic tanks
- Solid waste management facilities including construction of state-of-the-art sanitary landfills with septage collection and treatment systems, tracked loaders, compactor trucks, household and neighborhood collection bins, pedicarts, and septic tank sludge pump trucks.

The provision of new water and sanitation *infrastructure* was strongly *supported* by extensive community development *programs*.

The provision of new water and sanitation infrastructure was strongly supported throughout the project by extensive community development programs for enhancing community understanding of clean water, sanitation and health issues, and institutional strengthening programs for improving the capacity of the local water supply and sanitation agencies.

The sanitation component

Initial investigations and local consultations concluded that reducing the use of unsanitary pit latrines and fish pond toilets could be achieved by promoting the construction of simple two-compartment septic tanks with discharge to soakaways and local drainage systems. This approach fit with longer-term (but currently unaffordable) government of Vietnam plans for providing centralized sewerage and was deemed to be the most cost-effective approach in these low-lying and flood-prone urban areas. A standard septic tank design, developed by the project team, was an improvement over existing systems and was able to be constructed locally at low cost. Specific research was carried out into construction costs, local construction capabilities, household sanitation behavior, repayment affordability and poverty. Most poor households did not have access to a toilet because the initial capital outlay was beyond their ability to pay.

Typical pour-flush toilet connected to a septic tank

The successful financing method

After much consultation, the 3DT project team developed sanitation credit schemes (SCS) in each of the 3 towns as one of the four programs within the community development component of the project. The objective of the SCS program was to establish a sustainable revolving sanitation credit fund at the town's women's union (TWU) level in each town in order to meet the credit needs of poor households to build septic tank systems.

Project staff worked with each town people's committee (TPC) and TWU to establish the SCS parameters so they were suitable for borrowers and lenders, and also acceptable to local administrators. Management arrangements and responsibilities of the project, TPCs, TWUs and other stakeholders were defined, and training was given to TWUs. The schemes were documented, agreed and signed in January 2003 by the project, TWUs, the water supply and environment company, TPCs, ward and commune people's committee, community representatives and volunteers.

Initially the project gave each TWU AUD 38,000 as a seed fund for loan capital, later increasing it to AUD 53,000 in both Ha Tien and Sa Dec. Additional funds were provided for training and awareness materials relating to septic tanks and improved sanitation. The TWUs took full management control of the SCSs and ownership of the seed fund in 2005.

Loans to householders were fixed at VND 1,500,000 (about AUD 190 in 2002) with a repayment term of 15 months. This is sufficient to cover the cost of the essential elements of the septic system: from the toilet pan and slab through to the septic tank treatment system and connection to drains. Loans were not provided for the construction of above ground toilet housing. Borrowers make fixed monthly repayments with an interest rate of 1% per month. 50% of the interest amount is returned to the credit fund to add to the loan capital, with the other 50% used to pay for salaries and overheads.

Examples of toilet buildings constructed by householders and community members

Sanitation outcome

During the past 5 years septic tank coverage has increased significantly in the three towns, with more than 4,500 households, or approximately 22,500 people, having new sanitary toilets at home. According to the TWUs, for every two to three loans disbursed by them, another septic tank is built without financial assistance. This knock-on effect is partly due to more knowledge and awareness about septic tanks, and party due to direct motivation by the TWU for those who can afford to build a septic tank without borrowing money. Active and enthusiastic borrowers have also become motivators for their relatives, friends or neighbors to build septic tank toilets.

Septic tank *coverage* has *increased* significantly, with more than *4,500 households*, or approximately *22,500 people*, having new sanitary *toilets* at *home*.

GHD is a WBCSD member contributing to improving sanitation through:

- Project management
- Sanitation expertise
- Financial management expertise
- Community consultation, training and development

Images and some text based on an article in WaterAid Australia and International WaterCentre. (2008). "Sharing Experiences: Sustainable Sanitation in South East Asia and the Pacific". Brisbane, Australia.

GHD
Improving sanitation in West Java

Many areas of Indonesia lack adequate sanitation and this is particularly the case in rural areas. Efforts to address this situation have been increasing over the last few years, and a change in policy direction by the government of Indonesia has influenced the approach to the problem. An emphasis on decentralization of services and a demand-driven response have directed much of the activity to the communities themselves.

A number of projects funded by donors are supporting this approach. The Second Water and Sanitation for Low Income Communities Project (WSLIC-2) receives support from the World Bank/AusAID, as well as input from the national and district governments and contributions from the communities. It is a community-based initiative with the objectives of:

- Improving the standard of living, quality of life, general health and health services of the people in poor communities in under-served rural villages
- Providing clean water and sanitation facilities that are safe, affordable and easily accessible
- Providing sustainable and effective benefits by empowering the people.

The overall project is directed at poor communities in 2,500 villages in eight provinces in Indonesia.

The project is being implemented through four interrelated components:

1. Community and local institutional capacity building
2. Improving health-related behavior and health services
3. Developing clean water and sanitation infrastructure
4. Project management

GHD's role and approach

GHD is the district-level program manager responsible for ensuring the quality of program implementation in 300 villages in West Java, including the delivery of training and the provision of community facilitators to assist villages. As program manager, GHD is responsible for the management of all project funds approvals and disbursements and the employment and coordination of 70 community facilitators and engineers.

To date, GHD has provided 142 water supplies and initiated sanitation activities in 61 villages. Even more importantly it has worked to empower the communities themselves so they are directly involved in the selection, building and running of their water supply and sanitation systems. This community development aspect of the project is one of its most important outcomes as it empowers the community to continue addressing its own issues whether they be related to water supply and sanitation, health, the environment or other concerns of the village. GHD is one of several program managers implementing WSLIC activities across Indonesia.

To date, GHD has provided *142 water supplies* and initiated sanitation activities in *61 villages*.

GHD's community facilitators support the development of a gender- and poverty-sensitive partnership between villagers and service-providing agencies during planning, implementation and monitoring/sustaining water supply and sanitation for the rural poor. As indicated above, active participation of the community in options assessment and planning is critical to ensure that the community selects systems that meet their local needs and expectations. In many cases, these are relatively simple, low-cost solutions that the communities can build themselves.

The construction of water supplies involves the community's contributing 8% of the capital cost of the water supply. In terms of sanitation, initially the project established a revolving fund that villagers could use to assist with sanitation improvement. However, more recently

there has been a dramatic change in the approach to sanitation throughout the entire WSLIC II program and it has been extremely successful.

The approach is called Community Led Total Sanitation (CLTS) and focuses on taking communities on a journey to discover for themselves why sanitation is so important and to develop a sense of pride that their village is Open Defecation Free (ODF). The active involvement of women in this approach has increased compared to the more traditional approaches and resulted in them emerging as natural leaders in the community.

Community meetings are held in a range of venues. Children are the greatest beneficiaries of improved sanitation.

Once communities understand and demand improved sanitation, they tend to prioritize finding the funds themselves to cover any hardware requirements rather than seeking subsidies. An "Informed Choice Catalogue" has been developed by the WSLIC Team with information on a sanitation ladder of options. Communities may select basic sanitation solutions in the first instance and then upgrade them as additional resources become available. There have been many successes with this CLTS approach, but efforts do need to continue to ensure its sustainability and to develop ways of scaling up the concept to cover greater areas of Indonesia. The GHD team is supporting the overall WSLIC-2 team in finding solutions to these ongoing issues.

Outcomes so far

At the village and community level, there are three main outcomes:

- An improved knowledge and understanding by the community of community health issues and the role of water and sanitation practices in maintaining a healthy community
- The provision of clean water and sanitation infrastructure through community-led construction
- The empowerment and increased capability of the communities to plan, implement and manage their own water supply and sanitation systems.

The provision of *clean water* and *sanitation infrastructure* through community-led construction.

Work will continue to the end of 2008 on these activities in West Java. Ongoing activities are being planned to continue the excellent efforts of the WSLIC-2 program.

GHD is a WBCSD member contributing to improving sanitation through:

- Effectively working with communities
- Empowering communities with knowledge, understanding and resources for improvement actions
- Effective targeting of aid funds.

GHD

Water and sanitation in South Asia

Out of the eight Millennium Development Goals, three are directly linked with sanitation: reducing child mortality, combating diseases, and ensuring environmental sustainability. Although much has been achieved over the last decade, the sanitation picture is still dismal in South Asia. Only 39% of the population in the region has adequate sanitation facilities.

Toilet facility in rural Maharashtra, India
Source: Water and Sanitation Program

The Water and Sanitation Program (WSP) is a multi-donor partnership of the World Bank to help the poor gain sustained access to improved water supply and sanitation services. The Australian government, through AusAID – the Australian Agency for International Development - has extended programmatic support to WSP in South Asia since 2003 aimed at enhancing water supply and sanitation service delivery through institutional reform across the region, particularly targeting Bangladesh, Pakistan, India and more recently Sri Lanka. AusAID contributed AUD 3.7 million to WSP in South Asia (WSP-SA) over a three year period (2003-2006).

WSP-SA is working directly with partner governments at the local and national level across the countries in South Asia to contribute towards achieving the Millennium Development Goals (MDGs) of halving the proportion of people without access to safe drinking water and adequate sanitation by 2015. To help achieve these goals, WSP-SA provides policy advice and technical assistance to national, state and city authorities to improve the performance of government water and sanitation programs through structural change in both strategy and delivery. The private sector, NGOs, international donors and financial institutions are critical actors supporting the sustainability of these government-led interventions, helping translate improved policy into sustainable outcomes.

Australian government support to WSP-SA targeted institutional and sector reforms, improving access to services for the poor and public-private partnerships in water and sanitation. In 2006, AusAID commissioned an independent review of its three-year partnership with WSP-SA aimed at drawing lessons and experiences from this phase into the preparation of a subsequent 5-year program of A$10 million to WSP-SA and the World Bank.

GHD's input

GHD assembled an independent review team (5 advisors) to undertake this review and in particular: assess the success and benefits to AusAID of the WSP-SA activities undertaken to date under this program, identify lessons learned that could be applied to ongoing funding as well as other related programs (a newly funded AusAID-World Bank Policy Advocacy Facility), and identify any constraints to further success of the program. The assessment was conducted through a series of meetings, presentations, teleconferences and field visits.

The most *vulnerable* and *marginalized* population in both *urban* and *rural* areas has the *least access* to sanitation facilities.

A key benefit to WSP-SA was the flexible nature of the AusAID funds that enabled them to direct much needed support to strategic areas rather than specific countries or sub-sectors. This provided much needed insight into the linkages between different activities in the water and sanitation sector. The review highlighted the strengths of a programmatic approach when working in the decentralized environment to improve service delivery, but also highlighted a number of operational issues that were required to strengthen future activities.

Sanitation and South Asia

The practice of open defecation by the majority of the people in the region is a serious threat to the environment and disease control. Resource allocation for sanitation in many South Asian countries tilts towards capital investment with little or no emphasis on behavior change and meeting safe, sanitary and public health outcomes. Consequently, the most vulnerable and marginalized population in both urban and rural areas has the least access to sanitation facilities.

Community consultations in Bangladesh under CLTS Program
Source: Water and Sanitation Program

Examples of successful sanitation improvements

Regional sanitation
The purpose of this project is to improve sanitation services in all WSP-SA countries through an outcome-oriented approach and to establish a network of key sanitation sector professionals who can support national and local interventions. WSP-SA was instrumental in catalyzing the South Asia Ministerial Conference on Sanitation (SASOCAN) held in Dhaka, Bangladesh in 2003 and in Islamabad, Pakistan in 2006. This project provides support for sanitation reform across the region through a series of networking events. It also facilitates active regional dialogue through an Inter-Country Working Group and the exchange of sector professionals. These regional activities have helped countries design appropriate country policies and make strategic decisions in translating policies into real time action plans. Knowledge sharing has helped raise the profile of sanitation issues in countries throughout the region and has sparked policy improvements. The governments of both Bangladesh and India have commenced implementation of sanitation reforms developed with WSP-SA assistance.

Community-led total sanitation program in rural areas
Community-Led Total Sanitation (CLTS) is based on the principle of triggering collective behavior change in sanitation provision and hygiene behavior to generate improved health benefits. WSP-SA's program helped with the scaling-up of CLTS in Bangladesh and the sharing of experiences with states in India. CLTS solutions have now been adopted as the preferred strategy in one of India's largest states – Maharashtra - as well as in several provinces in Pakistan. CLTS has been able to help discourage the practice of open defecation in Bangladesh, with over 70 million people adopting safe sanitary practices in just five years. This innovative approach is now being explored in Indonesia, following successful piloting through two large-scale projects.

***Progress sanitation* by identifying *improvements* in sanitation programs.**

GHD is a WBCSD member contributing to improving sanitation through:

- Providing expert independent review or technical, financial, social, governance and environmental aspects of national actions and international aid approaches
- Identifying improvements in sanitation programs.

ITT
Quick response to Asian tsunami

The tsunami that struck southern Asia on 26 December 2004 was one of the worst natural disasters in recent history. Besides leaving thousands killed and injured, the wave left many more in danger of contaminated water supplies and waterborne diseases.

Just a few hours after the tsunami hit, ITT began preparing for the delivery of 58 portable water treatment units. Combined, these portable membrane filtration systems are capable of treating more than 380,000 liters of water every hour, or enough safe water for more than 500,000 people. The units are diesel powered – enabling them to operate in areas without electricity – and simple to operate and maintain. They provide the level of treatment necessary to combat waterborne diseases such as cholera and giardiasis, a diarrheal illness caused by a one-celled parasite.

The company targeted Sri Lanka as a place where water filtration systems would be most effective. Working through the US Agency for International Development (USAID) and the Industrial Services Bureau (ISB), a local nongovernmental organization, ITT got volunteers to the scene quickly. ISB got the local assistance needed, helping to quickly install the filtration systems.

“In the wake of the devastation, it was important for us to put together a US-Sri Lanka partnership that could deploy with speed and supply the equipment that best met the needs of tsunami survivors,” said Dr. Ananda Mallawatantri, country director of the US-Asia Environmental Partnership Program of USAID.

Shallow *wells* and *groundwater* supplies, especially on small islands, were *contaminated* with *saltwater*.

According to a UN study, freshwater supplies in countries hit by the tsunami were immediately under serious threat. Drinking water sources had been contaminated by saltwater, sewage, toxic waste and asbestos from buildings, and every well on the coast of Sri Lanka may have been affected. It added that shallow wells and groundwater supplies, especially on small islands, were contaminated with saltwater.

Agricultural land has also been damaged by saltwater, which the study said would affect crops in the short term.

Four product experts from ITT spent more than two weeks in Sri Lanka teaching local people, including the Sri Lankan army and navy, to install, operate and redeploy the equipment, which will remain in Sri Lanka to provide ongoing relief.

In addition to the membrane filtration units, ITT also shipped gas-fed chlorinators to relief organizers in the region. The equipment allows people without electricity to treat contaminated water supplies with chlorine and provide safe, drinkable water. The Sri Lankan navy and ISB are overseeing the equipment and its continuous deployment.

Procter & Gamble

Safe water through a powder

Procter & Gamble's Children's Safe Drinking Water program the signature program for P&G's Live, Learn and Thrive™ corporate cause helps address this critical issue by the use of simple, household-level water treatment technology: PUR™ Purifier of Water.

P&G has committed to long-term, not-for- profit provision of PUR in the developing world in an effort to reduce illness and death, particularly in children. The Children's Safe Drinking Water program provides PUR through sustained social markets and for emergency relief.

A 4-gram packet of PUR treats 10 liters of water. PUR effectively kills bacteria and viruses and removes parasites and solid materials. Five clinical studies show that use of PUR can reduce diarrheal illness in children by an average of 50%.

Working with essential and wide-ranging partners, Children's Safe Drinking Water has provided PUR for emergency relief in nearly every major natural disaster in the last three years, including the Southeast Asia tsunami, hurricanes in the Caribbean, floods in the Philippines and Bangladesh, and earthquakes in Pakistan and Indonesia. Most recently, PUR has been provided to victims of flooding and cholera outbreaks in Ethiopia and Kenya.

In collaboration with Population Services International, the US and UK governments, and others, Children's Safe Drinking Water has established social markets in Kenya, Pakistan, Uganda, Malawi, Ethiopia, Democratic Republic of the Congo, Republic of the Congo, Botswana, Indonesia, Haiti, Dominican Republic, and Nigeria. A key component of these social markets is education about the importance of safe drinking water to bring about long-term behavior change. Educational efforts are currently being focused on local school programs and health clinics.

A *4-gram* packet of PUR treats *10 liters* of water.

The two-pronged approach of P&G's Children's Safe Drinking Water program — distribution of PUR in social markets and for emergency relief — has been effective to date. In the last four years, Children's Safe Drinking Water has provided more than 750 million liters of safe drinking water and helped avert more than 30 million days of diarrhea.

Shell
The Waterbox

Many Shell operations in rural areas have no safe drinking water sources nearby. So Shell sought a water purification unit that would provide safe water, be vandalism proof and be essentially maintenance-free, with low-skilled operators able to carry out the limited maintenance tasks necessary.

Shell developed and installed a pilot unit for the production of freshwater from a contaminated source at a retail station in the Karoo Desert in South Africa. This unit, dubbed the Waterbox, replaced freshwater supplied from a town 80 km away. Apart from a contractor located in this town, no skilled personnel were available on site.

Placed in a six-meter isolated sea container, the Shell water purification unit can provide some 20 m^3 of clean drinking water per day (14 liters per minute). The heart of the process consists of novel, low-pressure hollow fiber nano-filtration membranes running in semi-dead-end-mode with an airflush enhanced forward flush with water fed in every 20 minutes to clean the membranes.

Based on the success of this demonstration unit, an improved, low-energy unit will be installed in Morocco, in the small rural village of Ait Chaib, outside the local center town of Afourer, 200 km north of Marrakech, in the Atlas mountain district. This settlement consists of some 500 inhabitants living in about 90 houses. The nearby groundwater sources were less suitable for human consumption due to a high concentration of bacteria.

The Shell *water purification* unit can provide some *20 m^3* of clean drinking water *per day*.

The unit uses no hazardous chemicals; so its environmental impact is virtually zero, unlike other, state-of-the-art membrane systems, which need considerable amounts of acids and bases to keep the membranes clean and to sterilize the drinking water produced. Shell intends to build a commercial model to distribute in Morocco. This would require a significant initial investment cost (120,000 –150,000), which has been obtained by partnering with L'heure Joyeuse (a local NGO), Shell du Maroc Social Investment Fund and ONEP (Morocco's Office of Potable Water).

L'heure Joyeuse will pay 20% of the unit cost and will be the formal owner. The local government will work on getting buy-in from the local population and maintain the unit via a local champion who will be trained in its maintenance. ONEP will perform regular checks on the unit and water analysis, and intends to order more units once the first one demonstrates its success.

Shell has identified some main factors that will help determine how the company moves forward in this area:

- Ensure communication and collaboration with local NGOs and governments
- Healthy people can work, which leads to increased GDP, but to be healthy, they need clean water
- Create curiosity: when one village has the water unit, others follow, demonstrating the importance of getting key people involved, such as teachers, religious figures, government representatives, etc.
- Women's empowerment: in many of these areas, women are the workers and the housekeepers so the focus needs to be on them.

The unit uses *no hazardous chemicals*; so its environmental impact is *virtually zero*.

The success of the Waterbox in Morocco will largely depend on the effectiveness of the partnership. If successful, far more will follow via the link with ONEP, and there is a real chance that the program can be extended to Tunisia and Egypt. Shell Africa will play an active role in bringing it to the attention of other African countries.

Water in rural areas can help develop agriculture, encouraging growth and development. If the new business model is successful, it will also be easily replicable worldwide. And because it does not need major maintenance, it overcomes the difficulty of long-distance monitoring.

But there are challenges associated with such a concept, including the inappropriate use of clean water where it is not necessary: for cattle, house cleaning and washing. Staff also need to be trained to maintain and manage the water unit, and this comes with language, cultural and educational barriers.

Unilever

Fighting disease clean-handed

Diarrhea causes over three million deaths a year worldwide, mostly among children. At a rate of one child every ten seconds, mortality from diarrheal diseases represents one-third of all deaths of children under the age of five in developing countries. Yet a World Bank study estimates that hand washing with soap and water can reduce diarrheal diseases by up to 48%, preventing over one and a half million children from dying each year.

Over 70% of India's one billion inhabitants live in rural areas not reached by television, radio or newspapers. Illiteracy is widespread and there are deep-rooted beliefs about cleanliness that have to be addressed, such as the widely held belief that if hands look clean, they are clean.

Unilever, a major soap manufacturer, believes that one of the best and most sustainable ways it can help to address global social and environmental concerns is through the very business of doing business in a socially aware and responsible manner.

While Unilever has supported hygiene education programs in India for many years, in 2002 the *Lifebuoy* brand team devised a way to have a real impact on reducing diarrheal diseases. *Lifebuoy*, produced locally by Hindustan Lever, is Unilever's biggest brand in India and the country's most popular soap.

The program's objective is to educate 200 million Indians – 20% of the population - to wash their hands with soap after defecating and to achieve this goal within five years. The campaign, called Swasthya Chetna, or health awakening, is the largest rural health and hygiene education program ever undertaken in India. Its objective is to educate people about basic hygienic habits.

It has been developed around the insight that people mistakenly believe "visible clean is safe clean". The program establishes the existence of "invisible germs" and the associated risk of infection. In India this is important, because diarrhea, caused by invisible germs, is the second largest cause of death among children below the age of five. The project helps reduce the incidence of such diseases, by raising awareness of preventive hygienic practices.

Hand washing with *soap and water* can *reduce* diarrheal diseases by up to *48%*.

The campaign has been divided into various phases. In the initial phase, a Health Development Facilitator (HDF) and an assistant initiates contact and interacts with schoolchildren and influencers of the community, like village community representatives, medical practitioners, school teachers etc. A number of tools like a pictorial story in a flip chart format, a "Glowgerm demonstration", and a quiz with attractive prizes to reinforce the message are used. The "Glowgerm demonstration" is a unique tool to make unseen germs visible and emphasize the need to adopt hygienic practices.

The first interaction with schoolchildren is then replicated with the rest of the community. Subsequently, follow-up visits and communication are undertaken at periodic intervals which reinforce the message and learnings. This includes recruiting schoolchildren, parents and other villagers as volunteers to start up health clubs that, in turn, organize events such as community bathing at the pond villagers use for washing.

To help people on low incomes afford to buy soap, an 18-gram bar of *Lifebuoy* soap has been introduced, enough for one person to wash their hands once a day for 10 weeks. This sells for two rupees, equivalent to the price of four cups of tea or enough wheat for a meal for one person.

Started in 2002, the program has covered about 18,000 villages in 8 states (Uttar Pradesh, Bihar, Jharkhand, West Bengal, Orissa, Madhya Pradesh, Chattisgarh and Maharashtra). In its first year, 9,000 villages were visited by 150 teams of outreach workers speaking seven dialects and with leaflets and posters printed in four languages. In 2003, another 9,000 villages were added, and in 2004 the emphasis was on introducing new phases to these 18,000 villages. By the end of 2004 the campaign had reached 70 million people, including 20 million children at a cost to Hindustan Lever of 22.25 million rupees (US$ 2.7 million).

Hindustan Lever has committed to funding Swasthya Chetna for five years at a cost of 24.5 million rupees (US$ 5.4 million), and the company has already started to see a return on its investment. In 2003-4 sales of *Lifebuoy* grew by 20%, with particularly strong sales in the eight states where the program operates.

Discussions are taking place with the Indian government at the national level about extending the program to other states and beyond *Lifebuoy*'s initial five-year commitment.

Swasthya Chetna has also generated interest in other parts of Unilever. Unilever Bangladesh has adopted the Indian model for the past two years and in 2004 close to 3,100 villages had been visited. Additionally, the program has been or is currently being rolled out in Indonesia, Pakistan, Sri Lanka, South Africa, Uganda and Vietnam.

Hindustan Lever's soap factory in Uttar Pradesh, northern India, has simultaneously organized health camps in five local villages, resulting in no outbreaks of disease since 1998.

Be *transparent* about the company's *role* to show that it is not just doing this to *make money*.

Unilever has learned the following lessons from its experiences in India:

- Soap needs to be divided into smaller portions in order to make it affordable for local populations;
- Take into account cultural differences and make them work for you --> washing with soap has become a kind of ritual, i.e., it has been accepted;
- Use multi-stakeholder relationships as a tool to ensure that the social and educational aspects of the project are clear to the public;
- Be transparent about the company's role to show that it is not just doing this to make money;
- Engage local actors to help in the process, they have the influence.

Veolia
Providing technical training in China

In a fast-changing world, providing quality services to customers facing environmental and business evolutions requires promoting staff progress and enhancing skills. Veolia Environnement is acquiring the tools and resources it needs to solidify its ambitious training policy with the deployment its Zhuhai technical training center in China.

Veolia Water's Zhuhai technical training center enables plant and network operators to put theories into practice and learn best practice approaches. Situated on the site of its Zhuhai wastewater treatment plant in Beiqu, this technical training center enables plant and network operators to put theories into practice and learn best practice approaches. Opened in May 2007, the center is run by Veolia Water Asia-Pacific (VWAP) and is Veolia Water's first technical training center in the region. It provides the capacity to meet the growing training needs from the fast expanding workforce. The centre complements Veolia's other classroom training center in Shanghai, and another training center for water treatment and customer services will be opened in Changzhou before the end of 2008.

The Zhuhai center comprises a pilot unit workshop, a network training field, laboratories, classrooms and an auditorium. With these facilities, training is held on:

- Wastewater treatment
- Online wastewater measurements and analyses
- Mechanical repair work
- Simulated wastewater treatment using the ASSIMUL simulator
- Health & safety awareness and maintenance
- Equipment handling
- Emergency procedures

Staff become *more confident* in their work and are able to *develop* the *skills and knowledge* they need on a day-to-day basis.

With this practical training, staff become more confident in their work and are able to develop the skills and knowledge they need on a day-to-day basis in their working environment. Employees from across VWAP attend training session in the Zhuhai technical training center, where interpretation facilities are also available.

"We recreate the tools and processes our employees work with in full-size versions, using technical pilots, platforms and simulators; effective job training requires nothing less. […] Veolia's added value depends on a well-qualified, efficient workforce. So training serves several purposes: recognition for individuals, improved business performance and the cultivation of a competitive edge," says Veolia's Campus Director, Hilaire de Chergé.

Auditorium and Classrooms
Lectures and simulator training are conducted in the classrooms and the auditorium, which can house up to 30 participants.

Laboratories
The laboratories consist of a preparation area, and instrument area, a BOD room (to calculate biological oxygen demand), a heating room and a microbiological area.

Pilot unit workshop
Training in wastewater treatment at the pilot unit workshop uses real wastewater from the inlet of the nearby wastewater plant managed by Veolia Water (Zhuhai) Wastewater Treatment Operations Ltd., and are conducted on specially built pilot units demonstrating Veolia Water's wastewater treatment technologies.

Network training field
Training in network repair works, as well as health and safety awareness, is conducted in the network training field. Other maintenance training is also conducted throughout the site.

Companies are already making a positive contribution

See inside for case studies

What business can do now

There are many actions that you can take immediately, including:

- Help raise awareness of sanitation issues within your organization and with your company's supply chain and networks by communicating the information in this folder
- Provide political leaders in all countries with clear messages about the need for action on sanitation
- Develop linkages with International Year of Sanitation partners and participants to gain maximum benefit for effort
- Assess the need for improved sanitation at and around your company's sites
- Be proactive in the local community around your company's sites
- Consider new markets and new services your company can supply
- Integrate action on sanitation with action on water and on sustainability issues generally within your organization.

About the WBCSD

The World Business Council for Sustainable Development (WBCSD) is a unique, CEO-led, global association of some 200 companies dealing exclusively with business and sustainable development.
www.wbcsd.org

"The sanitation problems facing the world today can be solved. The business community urges all governments to give high priority to sanitation."

Des Whybird, CEO, GHD

"Sanitation is an essential component of a sustainable business environment."

Mark Garrett, CEO, Borealis

"Sanitation is vital for the health and economic livelihood of employees, their families, communities and consumer markets."

Steven Loranger, CEO, ITT Corporation

Find out more at

www.wbcsd.org/web/sanitation.htm