



# Vietnam : Drinking Water Treatment Technologies

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## Summary:

The development and management of water resources is a stated priority of the Vietnamese Government. The total market of water supply and distribution is worth approximately USD \$250 million, out of which approximately USD \$120 million is imported equipment and services. The overall drinking water market is growing at 20 - 25 percent annually. The market in Vietnam offers good prospects for the sale of American water resources equipment and services. There are key opportunities in providing engineering design and construction services as well as equipment. Good prospects also exist for engineering consultancy services required for the development of large-scale water resources projects, particularly drinking water treatment systems that use surface water as the raw water supply.

This report provides a market overview and recommendations how to successfully penetrate the market for drinking water treatment technologies and equipment in Vietnam. It covers the market sub-sectors, including technology consultancy services, machinery and equipment. This report also analyzes the competitive strengths of successful players in each market sub-sector.

## Market Data

With an annual population growth rate of 1.7 percent, Vietnam's population will increase by one million people each year. Presently, Vietnam is the second most populous country in Southeast Asia with 82 million people, and is expected to have a population of 155 million by the year 2040. As a result, the demand for clean drinking water will be essential.

One of the most pressing environmental concerns of the government is the lack of clean drinking water. According to the Ministry of Construction, there are only 200 of 689 cities providing clean drinking water through 190 central municipal treatment plants. These potable water treatment plants have an average capacity of 500-3000 m<sup>3</sup>/day. Two-thirds of the potable water is derived from surface water and one-third is from underground water.

Throughout Vietnam, access to safe water supply continues to be a problem. While 78 percent of urban households have piped water, only 44 percent of rural households can be considered to have ready access to safe drinking water. In some remote provinces, this ratio drops to only 4 percent. In addition, Vietnam has many outdated and dilapidated transmission and distribution networks for water. As a result, the average rate of clean water leakage in urban areas is 36 percent and reaches 50 percent in some places. In order to improve the situation, the government issued a development plan for water supply, with the aim of providing clean water for 80 percent of the population by the year 2010. The Vietnam Water Supply and Sewage Association (VWSA) estimates that the total investment for water supply projects will be more than USD \$2 billion for the next ten years.

Urban water supply systems are generally in poor physical condition, further compounded by infrequent maintenance checks. The system is unable to meet the growing demand for safe drinking water. Average per capita water consumption in the large urban centers varies from 50 to 180 liters per capita per day. Operation and maintenance of existing water supply systems is far below what is necessary to maintain an appropriate level of service. Water supply companies are usually unable to meet design and construction standards. They do not have the appropriate equipment, high quality materials, management skills, and financial resources. Because of Vietnam's poor metering systems, 35 – 55 percent of water produced is reportedly unaccounted in urban water supply systems.

"In many parts of the country, the water is picking up pollution from the dirty old pipes," said Mr. Nguyen Nang Than, Director of Phu Hoa Water Supply Branch in Ho Chi Minh City (HCMC). Several attempts have been made to flush the pipes out and clean them, but local newspapers reported that the tap water was "still as black as coffee". Water samples taken by officials of the HCMC Preventive Health Service and the Department of Natural Resources and Environment (DONRE) show that the tap water contains not only sediments but also unacceptably high levels of bacteria.

In parts of HCMC, water pressure is so low that residents use pumps to coax water out of the system, sucking in dirt through the corroded pipes. In the suburbs, residents who lack running water, have to create their own wells and pump out underground water for their daily use.

Clearly, Vietnam could do with better management of its water resources. International development experts advocate foreign direct investment (FDI) as the way forward to address poverty reduction.

Funding for water supply and wastewater projects comes from various sources within the state budget, as well as Official Development Assistance (ODA) loans and grants. ODA financing plays a key role, with multilateral donors such as the World Bank and Asia Development Bank, as well as bilateral donors, i.e., Japan, France, Denmark, the Netherlands, Belgium, Korea, Switzerland, and Sweden.

At the moment, 170 urban water supply projects worth nearly USD \$1 billion are underway to provide clean water nationwide by 2020. In Vietnam's rural areas, there is an ambitious plan to provide 85 percent of the population with access to safe water by 2010, and 100 percent coverage by 2020.

According to the Ministry of Natural Resources and Environment, public and foreign investment in basic water supply and sewage systems amounts to just 60 cents per resident per year while USD \$15 per capita per year is needed.

## Best Prospects & Key Suppliers

### a) Pumps

Local production accounts for just five percent of the total market; 95 percent of pumps in the market are imported. Pumps of low capacity, 3 to 5 cubic meters per hour, for household and civil uses are mostly supplied by imports from China, Taiwan, India, and Korea. Household-size pumps are used in urban and rural areas to increase water pressure supplied from a city's supply system or to source from drilled wells. The market for household pumps is described in the following table:

Household Pump Brand	Market Share, %
Ebara (Italy)	25
Pentax, Pedrollo (Italy) and Wilo-LG (Korea)	30
Shinil Todimax (Korea)	10
Hanil (Korea), Shimizu (Indonesia), Kikawa (Taiwan), Sealand (Italy)	10
Chinese made pumps	20
Local made pumps	5

Pumps imported by ODA projects include the following suppliers: EBARA (Italia), Kubota; Torishima, Iwaki (Japan); Grundfos (Denmark); KSB-Ajax (Australia); Pleuger (Germany); Sta-Rite (US); Goulds (US); Patterson (US); Worthington (Germany); ITT-Flygt (Sweden); Sear, Pentax, Peralo, Matra, Caprari (Italia); Wilden (US); Salmson (France); and DAB (Denmark). Although American pumps are well known in the local market, few are applied in local water projects because of their lack of price competitiveness vis-à-vis European pumps. The main

market for industrial pumps has been ODA-financed water supply systems, sewage and drainage projects, and irrigation projects. Foreign suppliers account for 95 percent of the market demand. U.S. pumps account for five percent of the industrial pump market.

b) Pipes:

Concrete pipes of various diameters are made locally for use in drainage systems. Pressure concrete pipes in large diameters (i.e., greater than 1200 mm) are imported and used for transferring raw water from pumping stations to treatment plants.

Ductile iron pipes (DIPs) are used to develop water main systems. Vietnam can produce DIPs with diameters less than 600 mm. There are only two local manufacturers in the country: Mai Dong Mechanical Enterprise in Hai Phong Province and Dai Viet Ductile Iron Pipe JV Company (Washin) in Bien Hoa City. These two factories with outdated technologies are producing under capacity because their pipe quality does not meet the market's requirements. Local production of DIPs accounts for 14 percent of the market and this figure will keep declining if the product quality does not improve. The remaining balance is imported from China, Japan, Australia, and France, especially for ODA projects. Popular suppliers include Shin Shin Pipes (China), Kubota (Japan), Tyco (Australia), and Pont A. Mousson (France).

There are some local producers of cast iron pipes (CIP), i.e., Tan Long Enterprise, Mai Lam Foundry, and Hai Phong Mechanical Enterprise in Hai Phong Province. Steel pipes also are produced domestically by Saigon Steel Pipes Corporation, a joint venture investment of Waseco (Vietnam) and Posco (Korea), Vinapipe, an affiliate of Vietnam Steel Corporation, and Hoa Phat Company, a privately owned business in Hung Yen Province. Steel pipes are mostly used for residential service water and industrial application. However, demand for CIPs and SPs are gradually decreasing here because of the increasing demand for plastic pipes. Modern pipes made from PE, PVC and u-PVC are preferred for their flexibility, adaptability, precision, non-corrosiveness, and high-pressure application. Local manufacturers including Binh Minh Plastics Company, Tan Tien Plastics Company, Dat Hoa Factory, and Thieu Nien Tien Phong Enterprise can make plastic pipes with diameters less than 450mm (PVC) and 900mm (PE). De Nhat Company is a foreign-invested company from Taiwan that produces only u-PVC pipes. Plastic pipes with diameters of 1200 – 1600 mm procured by ODA projects have been imported from Thailand, Malaysia, Australia, and Holland.

c) Valves:

Valves and fittings are mostly imported as well. Domestic production of valves is quite small and low-tech. Gate valve producers include Lien Phu Duc Company in Ho Chi Minh City and Hai Duong – AVK, a joint venture business between Hai Duong and AVK of Denmark. These locally made valves are used in local small systems. Butterfly valves, gate valves, and accessories are imported in accordance with ODA projects usually from Tyco (Australia/US), Pont A. Mousson (France), OKM (Japan), and Ebro (Germany). Imported valves from China, Taiwan, and Korea service low-end markets, especially in provincial municipalities, because of their cheap prices and medium quality. The Water Supply Company of HCMC has set a precedent by using valves originating from G7 countries on every urban water supply works project. For example, Henry Pratt and De Zurik valves have been in used in many projects in HCMC.

d) Motors:

Along with pumps, motor engines are essential to water conducting systems. Some popular brands of imported motors in the market are Franklin (U.S.), Taisei (Japan), WEG (Brazil), Siemens (Germany), ABB (Sweden), Mitsubishi, Toshiba, and Fuji (Japan), and Brook Creampton (UK/India). Small capacity motors are imported from China, Taiwan, Malaysia, and Korea.

e) Water treatment chemicals:

Commodity chemicals such as limestone, caustic soda, and chlorine used in the water disinfection process are produced locally from the two major chemical plants: the Southern Basic Chemicals Company in Ho Chi Minh City, and the Lam Thao Chemical Plant in the north. These chemicals are also imported from China through border trade, but on a small scale. All chemical specialties such as coagulants and flocculants are imported. The United States and Japan are leading suppliers in the chemical specialty market.

In addition, Vietnam is incapable of making other ancillary components of water supply systems such as chemical feeders, dosing pumps, flow meters, and water meters. Those are entirely imported. Products that are well known to the market include chlorinators (Chlorination Technologies, Norris Cylinder, Sherwood Harsco, and Capital Control); dosing pumps and flow meters (Prominent, Blue White, GLI, Jesco, Alldos, Pulsafeeder, and Milton Roy); water meters (Schlumberger, Thai Ichi, ABB Kents, SPX, and Arab).

f) Water tanks:

Locally made concrete water tanks are used to store water because they are inexpensive and long lasting. Currently, stainless steel has also been used to make small water storage tanks for household application. Today water tanks and towers made from fiberglass (composite) are more durable and hygienic, especially in aesthetic shapes. Obviously, these tanks are more expensive than those made from concrete. Imported tanks are procured only for an ODA project or a foreign direct investment. WACO, a privately owned business in Ho Chi Minh City, has imported fiberglass water tanks from a Malaysian-based company FRP and supplied these tanks to some FDI firms whose production require high quality water stored in tanks. Pressure tanks cannot be made locally and have to be imported.

h) Filtration systems

Filtration systems represent an attractive subsector for U.S. exporters, especially for RO membrane from the United States. Local Vietnamese clients are highly receptive to these products. At present, all leading RO suppliers have a market presence via authorized distributors such as GE Osmonics (USA), Applied Membrane (USA), Toray (Japan), Hydronautics Inc. (USA), US Filter (USA), Pentair (USA), and Seahan (Korea). The total import of RO membranes of Vietnam in 2004 is estimated between USD \$800,000- USD \$1 million.

i) Control and monitoring equipment:

Some local companies are capable of installing the supervisory control and data acquisition (SCADA) systems for water supply projects. However, most equipment and system frames are based on products made by Siemens (Germany), ABB (Sweden), Alan Bretley of Honeywell (U.S.), Omron, Mitsubishi, and Toshiba (Japan). In addition to control systems, lab equipment for sampling, testing, and analysis are also imported. The United States, Japan, and Germany are the three major suppliers for lab equipment for the water industry. Vietnam authorities are now turning to Geographic Information Systems (GIS) as a tool to improve urban water management and to lower water wastage due to unaccounted water use and leakage.

## Market Entry

Vietnamese Drinking Water Standards are available and follow international norms. These standards do not constitute a significant challenge for U.S. exporters. In sectors where differences exist, Vietnam is trying to match national standards by following international norms.

The import tariff for water supply and distribution equipment varies depending upon the type of equipment to be imported. For example, the tax rate for imported pumps varies from 20 to 30 percent based on the pump capacity; RO membranes enjoy an import tariff of zero percent.

U.S. companies can offer integrated solutions in water supply and distribution. These solutions could include performing feasibility studies, designing, technical consulting and providing operation and online maintenance service. New-to-market firms should contact the U.S. Commercial Service Offices in Vietnam to learn more about the market situation. U.S. products are preferred in Vietnam for their durability and efficiency. However, most U.S. products are less competitive in terms of price. Direct marketing activities must be conducted by a local entity such as a distributor or an agent.

Many U.S. companies set up representative offices and/or distributors and agents to do business in Vietnam. Local agents and distributors can be invaluable for their existing distribution network, technical and sales staff, contacts, and relationships with provincial, municipal, and other governmental officials. It is important to provide local agents/distributors with adequate training so that they are able to provide quality after-sales services to buyers.

### Prospective Buyers & Major Projects

- On September 17, 2005 the World Bank approved a 45.87 million dollar loan for the Red River Delta Rural Water Supply Project that will support the first phase of the rural plan in Hai Duong, Nam Dinh, Ninh Binh and Thai Binh northern provinces.
- World Bank approved another preferential loan of USD \$112 million in July 2005 to provide clean water and sanitation infrastructure to poor people in more than 100 towns in the North and South Vietnam. The project is the first in a possible series of investments that would be designed to conform to and support Vietnam's National Rural Water and Sanitation Strategy. This would contribute directly to achieving the national targets of 85 percent water supply coverage and 70 percent sanitation access in rural areas by 2010. The project is comprised of three components: 1) developing water and sanitation infrastructure; 2) community and local institutions capacity building; and 3) improving health behavior and services. Project preparation is already under way. Consultant services will also be required for project preparation.
- Phuoc Hoa Water Resources Project: In April 2004, a USD \$90 million loan agreement was signed between the ADB and the Government of Vietnam for the development of infrastructure for water resources in southern Vietnam. The project is estimated to cost USD \$164.6 million, of which the ADB will provide a \$90 million loan from its Special Funds resources to finance about 54.7 percent of the project cost. The rest will be financed by the Vietnamese Government (\$35.6 million or 21.6 percent of total project costs), Agence Fraçaise de Development (USD \$34 million or 20.7 percent), and beneficiaries (USD \$5 million or 3 percent). The Ministry of Agriculture and Rural Development is the executing agency for this project, which is expected to be completed by 2010.
- Second Red River Basin Sector Project and Third Provincial Towns Water Supply and Sanitation Project: The Asian Development Bank has signed loan agreements with Vietnam for both water supply and sanitation projects. The ADB has committed to provide USD \$73.5 million and USD \$63.6 million, respectively to projects in each area. These projects are at an early stage of implementation and are expected to be completed by 2008.
- Mekong Delta Water Resources Project: In 1999, the World Bank and the Vietnamese government signed a \$101.8 million credit for the USD \$147.6 million Mekong Delta Water Resources project. The purpose of this project is to increase agricultural productivity, reduce pollution of surface water in the affected areas, and to increase clean water supply to over 280,000 people in the Mekong Delta.

### For More Information

The U.S. Commercial Service in Vietnam can be contacted via e-mail at: [vo.thuy@mail.doc.gov](mailto:vo.thuy@mail.doc.gov); Phone: (84.8) 8250490; Fax: (84.8) 8250491 or visit our website: [www.buyusa.gov/your\\_office](http://www.buyusa.gov/your_office).

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