

# Water Operators' Partnerships in Asia

## Case Study III

**GWOPA**  
Global Water Operators' Partnerships Alliance

**UN HABITAT**  
FOR A BETTER URBAN FUTURE



Vitens Evides International  
Utrecht, Netherlands

Water Supply and  
Sewerage Authority  
Ulaanbaatar, Mongolia

Water Operators' Partnerships in Asia  
**Case Study III:** Water Supply and Sewerage Authority  
of Ulaanbaatar and Vitens Evides International

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## Introduction

A water operators' partnership (WOP) is any kind of association between water or sanitation operators conducted on a non-profit basis with the aim of developing capacity. These partnerships are being promoted as a way of helping the world's public water and sanitation operators to sustainably deliver adequate water and sanitation for all.

This report presents three interesting Case Studies on water operators' partnerships in Asia. The aim is to provide readable and accessible reports on WOPs in practice – how they work, and what kind of difference they make. The authors have looked at how the partnerships were set up, implemented and monitored; the changes and improvements they brought about in the partner utilities; and their impact – both achieved and anticipated – on service delivery, future investment, and replication.

These studies were conducted for the Global Water Operators' Partnerships Alliance (GWOPA), hosted by UN-HABITAT, under our obligation as the United Nations city agency to help the world meet the water and sanitation target of the Millennium Development Goals.

As part of our World Urban Campaign for better cities, we consider the partners doing this excellent and vital work as city changers making a real difference on the ground for many, many households and in many countries.

It also forms part of our remit to share and promote knowledge and understanding of water operator partnerships. Together with GWOPA's growing online database of WOP profiles, the case studies help fill the huge knowledge gap around this important and high-potential practice. They aim to shed light on how the partnerships are currently carried out, what works, what doesn't, and how they can be improved for greater impact and wider adoption.

Indeed, the WOPs (including what some refer to as public-public partnerships) are being implemented by a growing number of organizations around the world, and they vary greatly in their scope, form and content.

Those presented here are not meant to be taken as prototypes or best practices, but as a sampling of the diversity of not-for-profit partnerships possible between water and sanitation operators.

It is our fervent hope that the excellent partnerships presented here will inspire more operators to take up the practice, learn some lessons, and also help financial supporters and facilitators build more effective partnerships.

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## Key facts

### Partners

Vitens-Evides International – **the Netherlands**  
Water Supply and Sewerage Authority of Ulaanbaatar City – **Mongolia**

### Facilitator

Netherlands Ministry of Foreign Affairs through the  
Directorate-General for International Cooperation (DGIS)

### Approx. cost

EUR 1.7 million (2007-10) shared equally between the partners and  
DGIS, plus EUR 454,300 from the Water for Life Foundation

### Aim

To improve USUG's operations and help it develop into an  
autonomous and financially sustainable water utility

### Approach

Capacity building, exchange visits, help with master plans,  
Geographical Information Systems (GIS), wastewater  
management, water quality monitoring etc

## Key facts

3 years (and continuing)

**Duration**

Improved performance demonstrated in pilot projects, water quality for over 29,000 residents improved, tariffs increased, new software in use etc

**Results**

USUG now in a better position to plan and take sound financial decisions, investment needed to implement pilot successes on a city-wide basis

**Long-term outlook**

Extension of partnership beyond 2010-11, VEI undertaking new partnerships in Asia and elsewhere

**Success indicators**

## The background

Encompassing over 1.5 million square kilometers, Mongolia, with a population of around 2.9 million people, is one of the most sparsely populated countries in the world. There is little arable land (1 per cent officially) and much of Mongolia is covered by arid steppes. There are mountains in the north and west. The Gobi Desert lies in the south. About 30 per cent of the country's population is estimated to be nomadic or semi-nomadic. Average temperatures are freezing or below for 7 months of the year.

Ulaanbaatar, the capital, is an independent municipality and not part of any province. As well as being the seat of Mongolia's (parliamentary republic) government, Ulaanbaatar is the country's industrial, financial and cultural centre. The population has grown rapidly, from about 600,000 to over 1.03 million in the last 20 years, with the vast majority of new migrants settling in sprawling, unplanned ger areas.

The so-called ger areas are peri-urban informal settlements areas where migrants of mostly poor families from the countryside have settled in gers, the traditional Mongol tent. Some sixty per cent of the Ulaanbaatar population live in these areas.



## The background



Located on the Tuul River in north central Mongolia, the city is about 1,310 metres (4,300 ft) above sea level. It is the centre of the country's road network and is connected to both the Chinese railway system and the Trans-Siberian Railway in Russia.

Rapid urbanization and economic growth is increasing demand for water and better service delivery. Mongolia's public services are preparing for a far-reaching institutional reform in 2012 aimed at improving transparency, service delivery and the partnership between government and people. These developments are putting increased pressure on the water and sanitation utility to improve its delivery, to expand services into newly developed residential and industrial areas and to provide safe, reliable and affordable water services to the entire city population including those in the ger areas ■

## The partners

*Vitens-Evides International (VEI)* is the international joint venture of the two largest public water companies in the Netherlands – Vitens and Evides. Both companies have over 100 years of operational experience and together provide affordable and reliable water services to approximately 7.7 million people. VEI provides knowledge and expertise to water utilities in developing countries and since 2002 it has engaged in water operators' partnerships with water utilities in Mozambique, Yemen, Mongolia, Vietnam and Ghana.

Vitens and Evides make two million euros available to VEI each year for international projects. Indeed, Utilities and local authorities in the Netherlands benefit from a law permitting them to apply up to 1 per cent of revenues for international water, sanitation and hygiene initiatives. Their internal budget is then leveraged by additional project funding from the Netherlands Ministry of Foreign Affairs, or by acquiring public private partnership contracts which VEI carries out on a not-for-profit basis. VEI also makes use of approximately EUR 800,000 every year from the independent Water for Life Foundation, funded by the voluntary donations of its customers.

*The Water Supply and Sewerage Authority of Ulaanbaatar City (USUG)* is responsible for drinking water provision and wastewater treatment in Ulaanbaatar, Mongolia. Established in 1959, USUG is a municipally owned organization, whose assets belong to the City Property Department of the Municipality of Ulaanbaatar City. It draws groundwater from pumping stations in four well fields and chlorinates water supplies before distribution. The current extraction rate is within safe yield limits. The Water Supply and Sewerage Authority of Ulaanbaatar City serves about 90 per cent of Ulaanbaatar's total population of approximately 1.03 million people: 40 per cent by piped water supplied mostly to apartments, 20 per cent through pipeline-connected kiosks<sup>1</sup>, and 30 per cent through truck-supplied kiosks where residents buy and fill containers. The kiosks serve mostly the people in ger areas. Private vendors or non-governmental organizations (NGOs) serve the remaining 10 per cent of the city's population.

There are wide differences in consumption among residents. People in apartments consume an average of 262 litres per capita per day while average consumption in ger areas is around 10 litres a day, well below recommended minimums. Tariffs are low and do not permit the Water Supply and Sewerage Authority of Ulaanbaatar City to cover depreciation, interest and non-operational costs from income. The Water Supply and Sewerage Authority of Ulaanbaatar City has about 3,600 "customers", mostly in the form of bulk supply connections to kiosks and apartments. It has 1,480 staff of whom 600 work in kiosk operations.

The facilitator of this Water Operators' Partnership is the Netherlands Ministry of Foreign Affairs through the Directorate-General for International

<sup>1</sup> Kiosk supply is MNT1,000/m<sup>3</sup> (appx. USD 0.75) Even in ger areas where water supply is most expensive, residents spend less than 3% of their revenues on water, even with meager annual incomes of less than 500 USD.



Cooperation which runs the Netherlands Government's official development cooperation programme. Dutch development cooperation policy seeks to help the poorest countries achieve the Millennium Development Goals. The Netherlands annually spends 0.7 per cent of its gross national product on development cooperation. Total water sector spending in 2012 will be EUR 181 million, up EUR 54 million from 2011. This represents an increase in the water sector allocation from 2.4 per cent of the development cooperation budget in 2011 to 4.1 per cent in 2012 ■

### Vitens-Evides International



#### Location

Utrecht, the Netherlands

#### Population Served

7.7 million

#### Services

Water supply

#### Ownership

Vitens and Evides are the two largest public water companies in the Netherlands

#### Special

Experienced WOPs Mentors. Water for Life Foundation and self-financing mechanism for international cooperation.

### Water Supply and Sewerage Authority of Ulaanbaatar



#### Location

Ulaanbaatar, Mongolia

#### Population

1.03 million

#### Services

Water supply and waste water services

#### Service Area

City centre of Ulaanbaatar and informal peri-urban settlements

#### Ownership

City Property Department of the Municipality of Ulaanbaatar City

#### Employees

1480 (of which 600 in kiosks)

#### Water Coverage

40% by piped water

20% by pipeline-connected kiosks

30% by truck-supplied kiosks

#### Source

Groundwater from 4 well fields

#### Challenges

Providing safe, reliable and affordable water services also in low-income areas. Non-revenue water.

## The partnership

The co-operation arrangement between The Water Supply and Sewerage Authority of Ulaanbaatar City and Vitens-Evides International originated in September 2006 when, after several visits of VEI experts to Ulaanbaatar, the companies signed a memorandum of understanding to engage in a Water Operators' Partnership. VEI, as expert partner, would provide management and technical support to the Water Supply and Sewerage Authority of Ulaanbaatar City. The partnership would help enable the water authority to meet the growing demands in Ulaanbaatar and to improve and extend its water services. The concept fitted well with the Municipality of Ulaanbaatar City's policy to improve public services by creating autonomous and financially sound utilities.

In spring 2007 the partners prepared a three-year partnership proposal including a framework of activities to be implemented from November 2007 to October 2010 and their expected results. The proposal was submitted to the Dutch embassy in Beijing which approved the funding for the project in October 2007 through a subsidy arrangement with Vitens-Evides International. The partnership commenced in November 2007 and the partners signed an implementation memorandum on 25 January 2008 in Ulaanbaatar. The Steering Committee formed to oversee the partnership was comprised of the Ulaanbaatar Municipality as Chair of the Steering Committee; the Water

Supply and Sewerage Authority of Ulaanbaatar City as implementing partner and financier; Vitens-Evides International as implementing partner and financier; and the Dutch embassy in Beijing representing the Netherlands Ministry of Foreign Affairs and its Directorate-General for International Cooperation as observer to the Steering Committee and financier.



A water kiosk in a ger area

## The partnership objectives

The aim of the water operators' partnership was to help the Ulaanbaatar water authority become a financially sustainable and autonomous water services utility. Vitens-Evides International would help the Water Supply and Sewerage Authority of Ulaanbaatar improve operational performance, strengthen its financial autonomy and provide affordable and reliable water services.

All three objectives were to be attained within the constraints of sound water resources management and environmental protection.

To achieve the objectives Vitens-Evides International and the Ulaanbaatar water authority planned implementation around five themes (see 'WOP themes' on the right).

Later, Vitens-Evides International also agreed to support The Water Supply and Sewerage Authority of Ulaanbaatar City in donor coordination and the sector reforms set out in *Decree 182*, approved by the Mongolian Parliament on 14 May 2008. These activities were seen to be important in achieving partnership objectives.

The partnership was implemented over a period of three years from 1 November 2007 to 31 October 2010. The total cost of implementing the activities under the partnership agreement amounted to approximately EUR 1.7 million, shared between Vitens-Evides International, The Water Supply and Sewerage Authority of Ulaanbaatar City and the Dutch embassy in Beijing. In addition, the Water for Life Foundation contributed EUR 454,300 to partnership activities in the ger-areas ■

## WOP themes

- 1 Operational performance in water supply
- 2 Financial autonomy
- 3 Sustainable water resources management
- 4 Wastewater and sanitation
- 5 Training and capacity building

# Implementing the agreement

## Review and diagnosis

The performance of the Water Supply and Sewerage Authority of Ulaanbaatar City was reviewed by Vitens-Evides International's visiting experts, together with the concerned USUG managers and staff, to define the problems and agree upon recommended solutions. Recommendations variously involved procurement of equipment and software, development of new systems and procedures, preparation of master plans, training in Mongolia and exposure visits to the Netherlands for USUG staff. Some recommendations took the form of policy advice, for example, on tariffs and debt service. The partners were keen to take a comprehensive approach. Implementation would aim to cover all key technical, financial, institutional and organizational aspects of running an efficient water utility. Training and capacity building would be carried out in all activity clusters to ensure gains were sustainable.

## Operational performance in water supply

The review of the water authority's operational performance revealed several important areas for improvement.

- Unsafe and unreliable water. Over 30 per cent of water authority customers get their water from truck-supplied kiosks. In 2009, about 18 per cent of water samples from trucks supplying its water were contaminated. Moreover, the cost of operating water authority kiosks was found to be high and service unreliable.

- Wasted water. Consumption of Ulaanbaatar's apartment residents in 2007 was very high at an average of 285 litres per day per person due to low tariffs and absence of water meters at the household level. Residents of Ulaanbaatar housing corporation (OSNAAG) apartment buildings were paying a very low flat rate tariff.
- Inefficient supply systems. Operations of the central water supply system in Ulaanbaatar's core apartment area were complex and inefficient, with high energy consumption and fluctuating pressure levels.
- Non-revenue water. The water authority's non-revenue water in 2007 was 23.8 per cent of production. This, however, was seen as less significant than the water wasted by apartment residents.

## Operational improvements

To address these issues, the partners designed an improvement strategy for the Water Supply and Sewerage Authority of Ulaanbaatar City. The key was optimizing pumping operations and the distribution network.

In 2009 and 2010 the partners upgraded and standardised the operational control equipment at two of the water authority's six pumping stations. The stations are now automatically operated and monitored in real-time.

A database of operational data from the pumping stations was designed and installed. Monthly data are used for management information, modelling and designing improvements. A calibrated free water distribution hydraulic modeling software package (EPANET) hydraulic model was used twice to analyse options for improving the water distribution network.

To deal with poor water quality, high operating costs and unreliable services from truck-supplied kiosks in the ger areas, the Water Supply and Sewerage Authority of Ulaanbaatar City developed a proposal for the privatisation or outsourcing of kiosk operations. It also connected 26 of the authority's 281 truck-supplied kiosks, serving approximately 29,550 residents, to its central piped distribution network. This was done with funds from the *Water for Life Foundation*.

Vitens-Evides International helped the authority develop a Balanced Scorecard, a widely accepted tool for monitoring, assessing and evaluating the performance of a utility. This gave the water authority's management team better operational performance information for priority setting and decision-making.

The partners prepared an Operational Master Plan for 2010-2020 including recommendations for the development of water services in Ulaanbaatar, prioritising investments, improving planning and operations and continued capacity building.

Domestic water meters were installed in 288 household connections in apartments in a pilot district in Ulaanbaatar. Monthly meter readings from July 2010 showed that consumption had dropped to an average of 100 litres per day per person in the pilot area, encouraging the authority, the housing corporation and the municipality to launch a programme of metering for both domestic and industrial customers.

The partners organized local on-the-job training plus courses and exposure visits for water authority staff in the Netherlands. Visiting Vitens-Evides International experts provided most of the training in Ulaanbaatar and guided water authority staff during training and visits to the Netherlands.

## Financial autonomy

A joint review and analysis of the Water Supply and Sewerage Authority of Ulaanbaatar City's financial position, accounting systems and procedures found that revenues were insufficient to cover operational costs and depreciation in 2009 and 2010. Debt repayments to the World Bank and the Spanish Government due in 2009 remained unpaid.

Vitens-Evides International helped the water authority develop a financial forecasting model to make financial projections, design improvements, such as tariff increases, and calculate the effects. Vitens-Evides International advised that Ulaanbaatar seek to aim for full cost recovery and increase tariffs annually until USUG's costs are covered; that they find a solution to deal with debts; explore ways to increase efficiency by reducing water wastage and energy consumption, improve billing and collection, and reorganize the water authority accordingly. It also recommended that they resolve the issue of accounts receivable from the housing corporation to the water authority which by 2010 had amounted to approximately MNT 3,360 million (EUR 1.65 million).

The partners reviewed the billing and collection procedures of the water authority's customer department and proposed options for improvement. The housing authorities had accumulated arrears to the Water Supply and Sewerage Authority of Ulaanbaatar City over the years because the low, flat rates it was collecting from apartment dwellers did not cover the volumetric charges it was incurring from USUG.

## Implementing the agreement

The Water Operators' Partnership helped improve appreciation of the need for payment of arrears and in 2008, and both sides agreed to a repayment schedule for the over-due accounts. Options included household meters, billing based on actual consumption and the water authority taking on responsibility for billing and collection from all consumers.

Vitens' marketing department helped conduct the first customer satisfaction survey in Ulaanbaatar in spring 2010 for 2,270 customers from the ger areas, apartment buildings, individually metered connections, institutions and industries. An action plan was formulated to address the issues brought up in the survey and implemented in 2011.

From 2007 on, Vitens-Evides International's financial expert visited the Water Supply and Sewerage Authority of Ulaanbaatar City each half year to review the financial figures, income statements and balance sheet for the preceding six-month period. The authority's finance department staff has now had sufficient training, both in Mongolia and in the Netherlands to make the financial analyses themselves.

One of several team-building activities



## Sustainable water resources management

The initial joint investigation by the Water Supply and Sewerage Authority of Ulaanbaatar City and Vitens-Evides International of Ulaanbaatar groundwater resources found that the safe yield from the authority's four major well fields estimated at 255,000 cubic metres per day was sufficient to cover its average extraction rate of 150,000 cubic metres per day. It also found that the authority needed to monitor groundwater levels, temperature and electrical conductivity to assess regularly the availability and sustainability of its yields. It noted that the quality of water produced by the Water Supply and Sewerage Authority of Ulaanbaatar City was fairly good, and that it was using chlorination to disinfect its water supply. However, water needed to be analyzed more often and more parameters considered in the testing.

Some of the measures taken during partnership implementation included groundwater monitoring whereby sensors were installed at USUG's central well field. One engineer was trained in operating the sensors, data processing and interpretation, and was made responsible for continued groundwater monitoring in USUG.

Other measures were Geographic Information Systems (GIS) introduced to USUG with the procurement of GIS licenses and the training of USUG staff in 2008. Up to 2010, Vitens-Evides International continued to train USUG staff in GIS water utility applications including well-field mapping, hydrological analysis and asset management.

Further, a well field protection strategy was developed based on hydrological description and a GIS-analysis of pollution risks. The strategy carries regulations and directives for the conservation of existing groundwater resources and protection from polluting industries and construction activities. Implementation of the strategy required discussion and agreement between the Water Supply and Sewerage Authority of Ulaanbaatar City, the municipality, the Inspection Agency and other stakeholders.

The Water Supply and Sewerage Authority of Ulaanbaatar City has integrated the drinking water and the wastewater laboratories into a single new laboratory. This is helping ensure compliance with Mongolian standards for drinking water and for effluent from its wastewater treatment plant. Vitens-Evides International helped USUG in the specifications for new equipment and the design and layout of the laboratory. Two USUG technicians were trained in a Vitens laboratory in the Netherlands in 2008 and training continued in 2010 at the new laboratory.

Another component of the programme included raising the awareness of domestic and industrial customers on the need to conserve water. Three sets of school booklets were published on subjects of drinking water, wastewater and environmental protection. For industry, two leaflets for industrial wastewater management were produced, one for tanneries and one for dairy industries.

# Implementing the agreement

## Wastewater and sanitation

The structure and mechanical equipment of the Central Wastewater Treatment Plant of Ulaanbaatar had deteriorated severely due to age and lack of maintenance. The plant had reached its maximum hydraulic load and receiving capacity due to industrial waste loading.

**Under the partnership, the following activities were undertaken:**

### Monitoring

The Water Supply and Sewerage Authority of Ulaanbaatar City and Vitens-Evides International started a monitoring routine to assess the plant's monthly performance and the quality of the influent and effluent. Results showed that the plant was not performing well and the treatment process was not being operated effectively. Also treatment plant staff did not have the expertise to operate the plant and control the treatment process properly.

### Modelling

Vitens-Evides International introduced new SOBEK and KIKKER software systems to analyze the sewerage network for the Water Supply and Sewerage Authority of Ulaanbaatar City in terms of flow patterns, discharges, velocities and for storage of asset information. Two engineers were trained by Vitens-Evides International in the application of the software.

### Improvement plans

After assessment of the performance of the treatment plant and the sewerage network, improvement plans were formulated proposing technical measures including repair of equipment, installation of new equipment and repair of concrete works. But funding such measures was well beyond the capacities of the partnership and were included in a proposal to the Asian Development Bank (ADB).

### Wastewater management

With the worsening structural condition of the treatment plant and the expansion of the city and its wastewater production, the performance of the present waste plant is expected to deteriorate further. Vitens-Evides International helped the Water Supply and Sewerage Authority of Ulaanbaatar City prepare a Wastewater Management Plan 2010 – 2020 which contained options and alternatives for a three-phase development of a new treatment plant.

### Sanitation workshop for ger areas

A workshop was convened to address ger sanitation, often consisting of on-site and unimproved facilities. The workshop did not manage to get consensus on a preferred technology among sanitation alternatives presented from a feasibility study carried out by Vitens-Evides International.



## Training and capacity building

To ensure sustainability the partnership offered opportunities for staff of the Water Supply and Sewerage Authority of Ulaanbaatar City to enroll in university programmes and other courses, receive on-the-job training in Ulaanbaatar and to participate in exposure visits to Vitens' offices and facilities in the Netherlands. Examples are:

One Ulaanbaatar engineer has completed an MSc programme on urban water supply at UNESCO-IHE Institute for Water Education in Delft specializing in network modelling and optimization of water distribution networks.

Three employees enrolled at the NHL University in Leeuwarden for short courses in water services management. They successfully completed their courses with final assignments on customer satisfaction surveys, employee appraisal systems, and water balance analyses.

By the end of June 2010, 36 Ulaanbaatar water authority employees had participated in exposure visits to Vitens in the Netherlands. One went to Vietnam. The aim was to expose staff to technologies and methods used in efficient water utilities and to study how to apply them in Ulaanbaatar. The exposure visits were organized in the fields of customer care; human resources management; financial management; operational control and automation; reducing wastage (in Da Nang, Vietnam); laboratory operations; groundwater modelling and monitoring; and the management and institutional aspects of water utilities.

Many practical on-the-job training activities were implemented at the Water Supply and Sewerage Authority of Ulaanbaatar City to provide staff with hands-on, practical and operational skills. Vitens-Evides International also involved two wastewater experts from the Dutch regional authority Groot Salland in capacity development at Ulaanbaatar's treatment plant. For all the training sessions and the exposure visits, Mongolian-English-Mongolian translators, knowledgeable about the specific subjects, were made available.

## Additional activities

A Mongolian government directive under *Decree 182* of 2008 aims to improve the public water services sector by a process of reform and involvement of the private sector. At the Water Supply and Sewerage Authority of Ulaanbaatar City's request, Vitens-Evides International helped prepare the sector reform process by producing options for institutional arrangements in Ulaanbaatar. A reform proposal was made based on utilities that would be publicly owned but managed according to private sector principles ■

## Partnership outcomes

### Water supply operations improvement

Through the partnership, the Water Supply and Sewerage Authority of Ulaanbaatar City has acquired some tools and capacity to improve operational performance and water service delivery.

USUG can now go forward to improve its operations further using the new Operational Masterplan strategies prepared during the partnership. Some specific outcomes were the upgrading of operational control equipment in the pumping stations, the new pumping station operational database and the use of the EPANET model for water distribution network decision-making. Other useful steps forward were the connection of 26 kiosks to the main distribution system and the introduction of the Balanced Scorecard which enables managers to assess performance against 20 Key Performance Indicators. Metering of 288 household connections in apartments in a pilot district in Ulaanbaatar resulted in reduction of average domestic consumption from 262 litres per day per person to 100. USUG is now considering metering of other household connections.

### Financial autonomy

The Water Supply and Sewerage Authority of Ulaanbaatar City is now better able to make sound financial decisions with the use of the financial forecasting model developed with Vitens-Evides International.

It is already being used not only to make financial projections but also to design measures aimed at increasing financial sustainability, such as tariff increases, and to calculate the effects of such measures. One outcome of Vitens-Evides International's tariff recommendations was seen in August 2010 when tariffs for domestic customers in apartments and ger areas were increased by 50 per cent. Recommendations were made to adjust future tariffs gradually to achieve full cost recovery. The Water Supply and Sewerage Authority of Ulaanbaatar City and the housing authorities have now reached agreement on a schedule of payments for reducing the housing corporation's overdue water bill payments to USUG. Options for improving collection for apartment residents are still under consideration. USUG is implementing a 12-point action plan to improve customer relations based on the results of the customer satisfaction survey conducted in spring 2010. A second survey is planned for 2011.

### Sustainable water resources management

The Water Supply and Sewerage Authority of Ulaanbaatar City is now actively monitoring water production from the central well field in terms of availability and water quality and will move on to monitor groundwater levels at its other wells. Water quality is being monitored with samples being taken from the well fields and several locations in the distribution network. The new laboratory is being operated by USUG staff trained in the Netherlands and on the job in Ulaanbaatar. A GIS engineer in USUG is working with two other engineers responsible for hydraulic water modeling and sewerage network modeling

in field mapping to configure the water distribution and sewerage networks. USUG is using Vitens-Evides International's framework strategy for well field protection. Following the awareness-raising programme, USUG has moved on to discuss pre-treatment of industrial wastes with several industrial companies.

### **Wastewater and sanitation**

Most of USUG's wastewater and environmental sanitation problems are due to the deterioration of the central treatment plant. So they are outside the funding scope of the partnership. But at least USUG was able to improve operations and decision-making to some extent as a result of capacity building and the introduction of analytical tools during the partnership. USUG is using SOBEK (a numerical model) and KIKKER (a GIS-based system) to analyze the sewerage network; the laboratory is functioning well with the new equipment and USUG staff is using their new knowledge and skills both at the laboratory and the treatment plant. The Wastewater Management Plan 2010-2020, prepared with Vitens-Evides International's help, is providing overall guidance.

### **Training and capacity building**

The partnership has provided a considerable amount of new equipment, software, systems and procedures. These were always accompanied by on-the-job training and often exposure visits as well. One outcome has been the need for some reorganization the water authority to take account of new functions and tools.

In 2011 USUG, supported by Vitens-Evides International, undertook a reorganization establishing two new departments for Technical Development & Asset Management, Operational Management & Control and a new division for Project Management. The aim was to enable it to manage a cycle of continuous improvement of technical operations, current asset maintenance and rehabilitation and to plan and implement new infrastructure projects. In late 2011 Vitens-Evides International was continuing to support capacity development for the two new departments and the new division as a follow-up to the main partnership financed jointly with the Netherlands Government.

Other outcomes included an operations reference manual on advanced wastewater treatment translated into Mongolian; the 2011 business plan and a strategic 5-year plan prepared by Ulaanbaatar water authority business analysts and economists and team building activities for the reorganized units to ensure sustainability beyond the partnership period. It is worth noting that most of those trained under the partnership were younger staff. This will help assure sustainability of the partnership initiatives and will stand the Water Supply and Sewerage Authority of Ulaanbaatar City in good stead in the longer term ■

# Impact and next steps

## Increased capacity

The main impact of the Vitens-Evides International – USUG partnership on USUG’s performance is its enhanced capacity, mostly through training inputs, to improve operational efficiency. The Water Supply and Sewerage Authority of Ulaanbaatar City has also been provided with some new equipment, operating manuals, systems and procedures. Things like incentives and the right working environment are also important in the longer term. Those members of USUG staff who have been exposed to European water utilities are better equipped to guide their company on these.

## Performance indicators

Quantifiable targets were not identified at the onset of the partnership, however changes in key performance indicators were tracked from their 2007 baseline until June 2010. Overall, the metric indicators show little change at the utility level. On the one hand, such data points to the inadequacy of metric benchmarking as a tool to measure impact over short time scales. Such measures are insensitive to improvements demonstrated in pilot areas and to nascent changes like strengthened capacity and improved processes that could be expected to bear fruit later.

On the other, the lack of quantifiable change does show that the partnership alone is not enough to lead to significant, measurable performance improvements and points to the need for more time and more investment for changes to be realised.

The partners agreed that for the Water Supply and Sewerage Authority of Ulaanbaatar City to achieve significant improvements in such performance indicators would require large-scale investment. The partnership laid the foundations for investment by strengthening management capacity, accountability and financial viability, making the utility more loan-worthy, however capital investment to finance the infrastructure to underpin an efficient water services provider is considered essential.

Next steps, therefore, entail investment. It was with that in mind that on the 50<sup>th</sup> anniversary of the Water Supply and Sewerage Authority of Ulaanbaatar City in November 2009, that it joined Vitens-Evides International and the municipality to hold an international conference. Some 80 participants reflected on 50 years of development of USUG, explored challenges facing Ulaanbaatar’s water supply and wastewater sector, and discussed the inputs of international organizations.

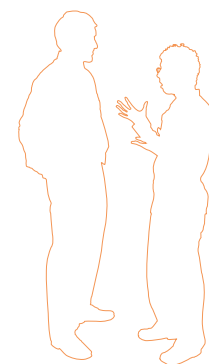
In October 2010, the utility and Vitens-Evides International organized a workshop with relevant stakeholders in the environmental and water sectors of Mongolia to share the results of the partnership including hydrological monitoring, data sharing and the need to protect water resources in Ulaanbaatar and a review existing legislation. These activities have helped raise the profile of USUG in donor circles. In late 2011, Asian Development Bank was preparing a project for water supply and sanitation in Ulaanbaatar ■

## What the Partners say

### Water Supply and Sewerage Authority of Ulaanbaatar

The Water Supply and Sewerage Authority of Ulaanbaatar City said its benefits included new equipment, like pumping stations and the laboratory, plus training in its use; new software for groundwater, water distribution and sewerage network modelling, GIS and Management Information Systems. They also cited new knowledge and skills in operations, software applications,

business planning, finance, customer relations, management and human resources development. Not least, they added, new insights on modern approaches to water supply and wastewater operations as well as to management, finance and human resources development. And finally, exposure to a different culture, way of life, and environment during visits to the Netherlands.



### Partners' contributions

#### Financing Contributions to partnership Activities\*

Expense Item	Contributions (EUR)			
	EKN	VEI	USUG	Total
Human Resources	540,291	648,643	37,003	1,225,937
Goods and Services	139,387	0	0	139,387
Operational	22,473	1,965	54,181	78,619
Training and Courses	160,498	36,353	19,835	216,686
Contingencies	21,206	20,263	0	41,469
<b>Total</b>	<b>883,855</b>	<b>707,224</b>	<b>111,019</b>	<b>1,702,098</b>
Percentage of Total Cost	51.9	41.6	6.5	100.0

\*Note: This does not include the connection of 26 truck-supplied kiosks using funds from the Water for Life Foundation at a cost of EUR 454,300. A further eight kiosks were connected in summer 2011

### Vitens Evides International

Vitens-Evides International were pleased to be able to exercise their corporate social responsibility, and gain experience in another country and a different culture. Their staff gained valuable experience, and they were proud to promote Dutch know-how.

Human Resources Cost refers to the time inputs of Vitens-Evides International experts (67.4 person-months) and USUG staff spent in partnership activities including travel expenses and daily allowances. The goods and services item refers to the cost of procuring equipment and software. The operational expense category covered vehicle procurement, repair and maintenance, fuel, communications, local transport and provision of office facilities. Training and courses included the cost of training activities in the Netherlands and Ulaanbaatar, the exposure visits to the Netherlands and one visit to Vietnam. Contingencies covered the cost of organizing the two-day closing symposium for the partnership ■

## Success factors

The successful collaboration was largely a result of the trust and confidence the partners established over the 3-year period. Partners identified the following key factors that contributed to the success of the WOP:

### **Commitment**

Both partners committed significant financial and human resources to the partnership. The involvement of high-level officials throughout the WOP and the dedication of young staff from both utilities were recognized as assets.

### **Preparation Time**

During the one-year preparation period VEI and USUG officials were able to take part in preliminary exchange visits and invest the necessary time to plan a meaningful collaboration. The partners also carefully prepared each exposure visit with specific objectives, detailed visit programmes, and questions to be answered so that time together would be efficiently spent.

### **Adequate funding support**

Shared, adequate and timely finance was available for the WOP, allowing for more activities to be undertaken. VEI, USUG and the Netherlands Government (represented by the Embassy in Beijing) shared financing of activities, for a total value of EUR €1.7 million. In addition, the Water for Life Foundation contributed a substantial sum for the connections to USUG pipelines and rehabilitation of 26 kiosks in the ger-areas.

### **Capacity building focus**

USUG appreciated the WOP's emphasis on capacity building, and found it a refreshing change from previous partnerships in which staff development was not a priority. The on-the-job training, combined with exposure visits, helped reinforce the adoption of new practices, as shown by the continuation of activities such as GIS, hydraulic and financial modelling, team building, and business planning beyond the WOP period. USUG's strategy of focusing on the training of young staff is expected to go a long way to establish sustainability.

### Communications

English classes were held for participating USUG staff and Mongolian-English-Mongolian interpreters were always available during training activities and exposure visits. The presence of the Resident Project Manager also helped in ensuring that concerns were quickly heard, communicated to the VEI Project Director in the Netherlands, and resolved.

### Flexibility

The reforms sought by Decree 182, announced a few months after the WOP began, gave USUG and VEI a chance to contribute to the sector reform process. More importantly, the partners were able to realign USUG's proposed reorganization according to the new sector reform principles. USUG's request for assistance in donor coordination was also timely since it offered an opportunity for VEI to advise USUG on coordination of programmes and projects proposed in the water supply and sewerage master plans ■

USUG Management Team  
with observer in camp  
outside Ulaanbaatar



## Longer and More Comprehensive Partnerships

This WOP is different from the other two cases studied in this series; it was longer, it achieved more, and it involved greater inputs of time and resources. It also took a comprehensive approach and looked at most aspects of water utility operations – production, distribution, finance, organization and human resources development, water resources management, and customer relations. For each area of operations there were VEI expert advisory inputs and, often, new software and equipment as well. The WOP also enabled broad-based capacity development through training in Ulaanbaatar and exposure visits to the Netherlands.

## Need to scale-up

Though it was comprehensive in its approach, turning USUG into an efficient utility that provides adequate services to all the citizens of Ulaanbaatar, will require that the WOP outcomes are taken to scale. The WOP pilot projects showed how performance could be improved, and WOP recommendations – such as extending individual household metering, improving billing and introducing stepwise tariff adjustments – pointed the way for major improvements. However, the full impacts of the WOP will only be realized when the pilot efforts are applied across the service area and when recommendations made are accepted and put into effect.





## Investment and a regulatory framework

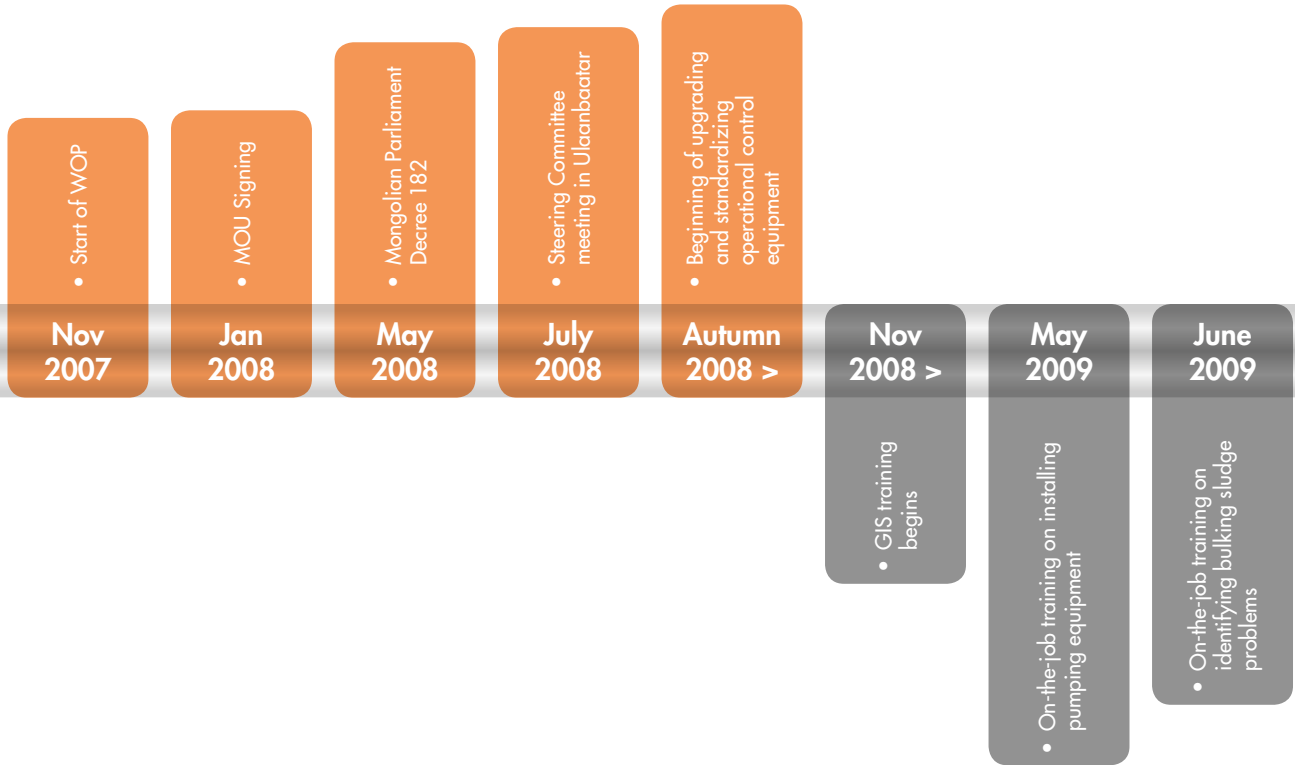
Scaling up entails investment, and the involvement of development banks and donors will almost certainly be needed. Only when investments are made will the WOP improvements reach the whole of USUG's service area, its organization, and production and distribution facilities. The WOP, however, has enhanced USUG's ability to attract investments. The assessments, the measures taken, the operational and master plans will all help funding agencies such as the Asian Development Bank better understand the USUG situation and determine priorities for assistance. Accompanying these investments there should be efforts to develop an improved regulatory framework to consolidate and further improve water services in the city, and a continued dedicated program of capacity development.

The WOP has shown the way and it is a positive indication that the partners are continuing to work together to help USUG achieve its goals, even beyond the initial three-year WOP ■



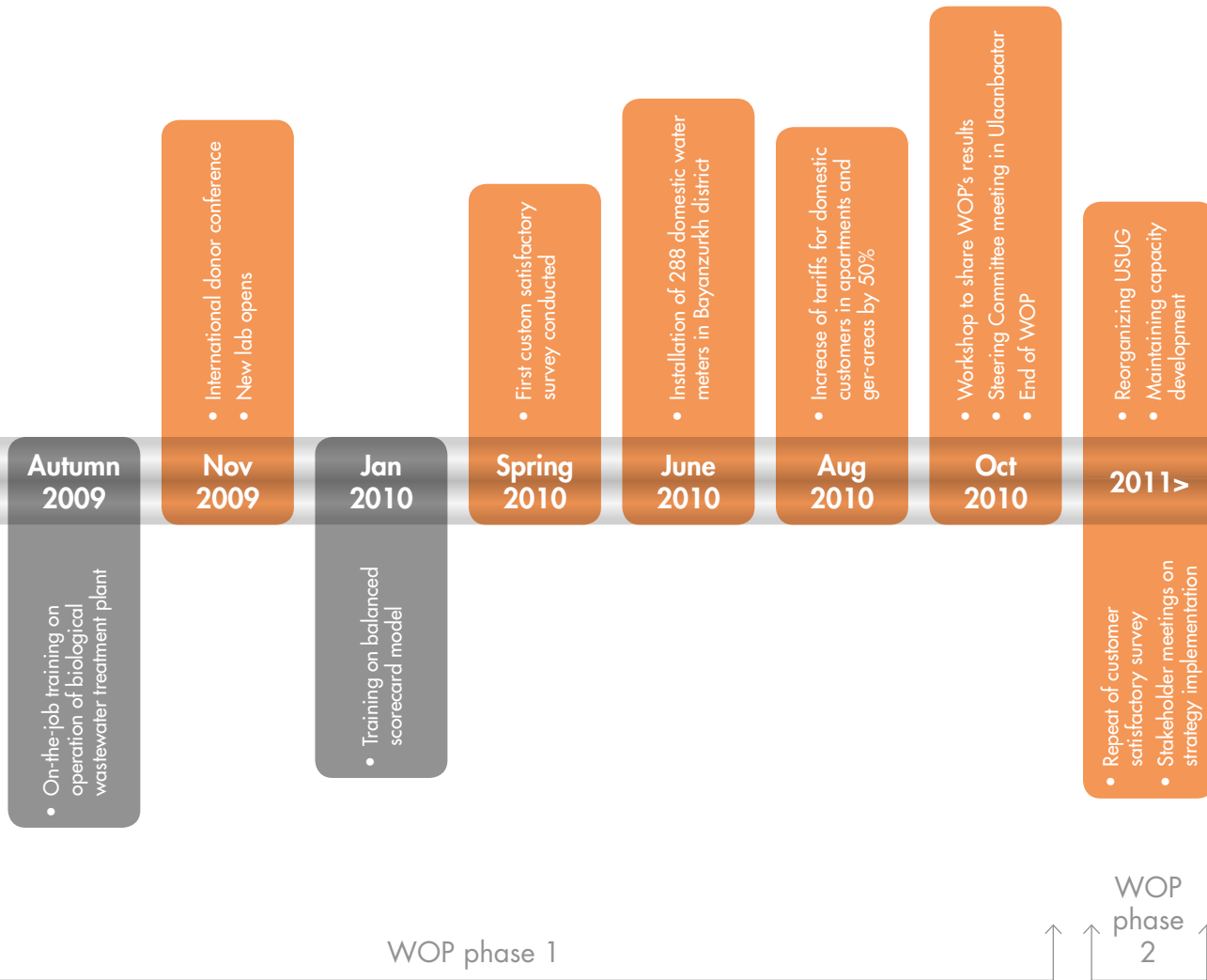
Ulaanbaatar

# Timeline



WOP phase 1

# Timeline



This timeline is not exhaustive, but highlights some key events in the WOP.

## Training activities

### University Programmes, Exposure Visits and Training Activities outside Mongolia, 2008 – 2010

Institute	Number of Participants	Subject
UNESCO-IHE, Netherlands	1	MSc in Water Distribution
NHL University, Netherlands	3	Minor Water Services Management
Vitens, the Netherlands	4 (3 USUG, 1 Municipality of Ulaanbaatar)	Exposure visit by management team of USUG
Vitens, the Netherlands	2	Laboratory Training
Vitens, the Netherlands	3	Exposure visit operational control, automation and information and communication technology
Vitens, the Netherlands	7	Exposure visit financial management
Deltares, Vitens, Eijkelkamp, the Netherlands	1	Exposure visit and training on groundwater & monitoring organized jointly with the Water Authority and Deltares
Vitens, the Netherlands	3	Exposure visit human resource management
Vitens, the Netherlands	8	Exposure visit and training on waste water management
Vitens, the Netherlands	2	Exposure visit customer department
Vitens, the Netherlands	8 (7 USUG, 1 Municipality of Ulaanbaatar)	Technology, design and construction
WaterLinks, Bangkok	2	Conference on Water Operators Partnerships organized by International Water Association, ADB & USAID
Da Nang Water Company, Vietnam	1	Course and Conference on Non-Revenue Water

## Training Activities in Mongolia, 2008 – 2010

Institute	Number of Participants	Subject
Speak English, Ulaanbaatar	40/4	English basic course/ Intensified follow up course
NGIC, Ulaanbaatar	10	Geographic Information System introduction course
VEI, Mongolia	8	Use of Geographic Information System
State Property Committee, Mongolia	8	Introduction to Decree 182 on Sector Reform
VEI, Mongolia	25	Excel
VEI, Mongolia	2	Sewerage modeling – SOBEK and Kikker
VEI, Mongolia	2	Hydraulic network modeling
VEI, Mongolia	20	Business analyses
VEI, Mongolia	6	Bulking sludge examination for waste water
VEI, Mongolia	6	Basic training on waste water management at the WWTP
VEI, Mongolia	2	Laboratory training
VEI and USUG, Mongolia	50	WOP final symposium



Utrecht



Ulaanbaatar



## Abstract

Water Operators' Partnerships (WOPs) are peer support relationships between two or more water or sanitation operators, carried out on a not-for-profit basis in the objective of capacity development. This is one of a series of three impact-oriented case studies conducted on WOPs in Asia. It is intended for water and sanitation service providers, governments, development banks, donors, WOPs facilitators and all who are interested in gaining a better understanding of this solidarity-based approach to helping public operators improve their capacity to sustainably deliver water and sanitation services for all.



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