

# **Privatization of Public Services under Strong Government Guidance**

**- PPP Case Report on Shanghai Pudong-Vivendi Water**

**Corporation Limited**

## **Abstract**

This case report is prepared based on summary and analysis of investigations and interviews of parties concerned in PPP Project of Waterworks Pudong Company by the author, and interviewees include relevant personnel from Shanghai Water Authority, Shanghai Pudong-Vivendi Water Corporation Limited and intermediary agencies involved in this Project.

This document intends to provide a fair assessment on the PPP Project of Shanghai Municipal Waterworks Pudong Co., Ltd. (hereinafter referred to as “Waterworks Pudong”) and some references to the reform of water services in other cities, on the basis of objective reflection of the background, implementation, contract clauses and interests of all parties concerned of this project. The author believes that the PPP Project of Waterworks Pudong is a window project for the reform of public services under the direction of national policies and guidance of Shanghai Municipal People’s Government, so, to some extent, it reflects the **achievement view** of the local government. However, the success of the public bidding also illustrates that the interests of all parties concerned were taken into account in the final PPP agreement, for which, an objective analysis is required. In addition, this project, representing the marketization trend of China’s water

supply industry in many aspects, has profound significance to the reform of water supply industry in other places. However, practically some problems occurred and the effects of implementation in some aspects have yet to be further followed up.

Context of this article will be divided into 9 parts, in which, brief introduction of Shanghai City and water supply industry in Shanghai will be given in Part 1 and Part 2 as the background of the PPP; an analysis of incentive of relevant government agencies on PPP reform of Waterworks Pudong will be given in Part 3; an introduction of investment attraction process and main contents of final agreement will be given in Part 4 and Part 5; a detailed analysis of how interests of all parties are materialized in PPP agreement will be given in Part 6; an analysis of breakthroughs of this Project to existing systems will given in Part 7, a brief summary of operation of joint venture after PPP will be given in Part 8 and conclusions and enlightenment of this Article will be given in Part 9.

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# **1. Introduction of Economic and Social Development in Shanghai**

The Joint Venture Project of Waterworks Pudong is an epitome under the background of urban development in Shanghai and Pudong District. A brief introduction of economic development, urban construction and foreign capital importation is required for the study of this Project.

## **1.1 Introduction of Shanghai City**

Located at 31° 14' north latitude and 121° 29' east longitude, Shanghai is the largest economic center in China with a temperate and humid climate, adequate sunshine and abundant precipitation. Shanghai has a total area of 6,340.5 square kilometers, accounting for 0.06% of gross area of China, which includes urban area of 5,299.29 square kilometers and county area of 1,041.21 square kilometers. It has Chongming Island, Chang Xing Island and Hengsha Island under its jurisdiction.

Shanghai has been in a leading position in economic development in China. Its per capita GDP reached USD 4,912 in 2002, ranking first among all provinces and municipalities directly under the Central Government in China excluding Hong Kong, Macao and Taiwan. The proportion of public-owned economy in its GDP has fallen from 82% in 1985 to 68.1% in 2002 and that of non-public economy has increased from below 18% in 1995 to 31.9% in 2002. In addition to continuous rapid economic growth, its financial revenue also experienced a steady increase, reaching RMB 220.225 billion Yuan in 2002, an increase of 10.4% as compared with 2001. Its local fiscal revenue reached RMB 71.979 billion Yuan in 2002, an increase of 30% as compared with 2001.

Steady economic growth in Shanghai ensures its further investment in urban infrastructure, industry and makeover for old downtown areas. In 2002, total investment in fixed assets increased by 9.6%, reaching RMB 218.716 billion Yuan. Investment in major municipal works amounted to RMB 48.668 billion Yuan, accounting for 22.5% of gross investments. It can be seen from investment orientation that proportion of tertiary

investment has been adjusted to 0.2:33.2:66.6. The investment and financing is developing towards diversification and marketization. In 2002, non-governmental investment amounted to RMB 107.438 million Yuan, increasing by 23.2% as compared with the previous year and percentage in fixed asset investment increased to 49.1% as compared with 43.7% of the previous year. In which, investment by private enterprises reached RMB 30.863 billion Yuan, 1.6 times as much as that of the previous year. According to Shanghai Municipal People's Government Construction and Management Commission, non-governmental capital accounted for 50% of social capital of RMB 23.5 billion Yuan invested in 8 highways and 4 cross-river tunnels. RMB 52.05 billion Yuan in construction of urban railways came from society. Non-governmental capital has accounted for 50% of total investment in urban infrastructure.

Shanghai, as a window of China's opening up to the outside world, has been the focus of attraction of foreign investors. In 2002, 3,012 projects with direct foreign investments were approved, an increase of 22.5% as compared with the previous year. Contracted foreign investment reached USD 10.576 billion, increasing by 43.4%; actually funded foreign investment reached USD 5.03 billion, increasing by 14.5%. By the end of 2002, 27,700 projects with direct foreign investments have been approved in Shanghai, contracted foreign investment reached USD 63.373 billion and actually funded foreign investment reached USD 40.415 billion. With the improvement of operation environment, economic benefits of foreign investors are on a steady increase. In 2002, foreign-funded enterprises generated operating revenue of RMB 588.749 billion Yuan, an increase of 23.8% as compared with the previous year, total profit reached RMB 28.4 billion Yuan, increasing by 21.9%; amount of tax payment reached RMB 23.706 billion Yuan, increasing by 23.5% and year-end foreign balance reached USD 3.08 billion.

## **1.2 Introduction of Pudong District**

Located in a triangle shaped area in the east of Huangpu River and west of Yangtze River Estuary, Pudong District has its unique geographic advantages by adjoining to old urban districts of Shanghai and its vicinity backing on Yangtze River Delta. Pudong New Area has an area of 522.75 square kilometer and a population of 1.7282 million. After over 10

year's development, opening up to the outside world and construction since early 90's of 20<sup>th</sup> Century, Pudong has become a shining pearl at Yangtze River Estuary. Added value of Pudong New Area exceeded RMB 100 billion Yuan in 2001 and reached RMB 125.116 billion Yuan in 2002 from merely RMB 6.024 billion Yuan in 1990, increasing by 7.6 times at an annual rate of 19.6% as calculated by comparable price, accounting for one-fifth of total amount in Shanghai from one-tenth in 1990. Its gross industrial output value has reached RMB 218 billion in 2002 from RMB 17.7 billion in 1990; and its local fiscal revenue increased to 9.5 billion Yuan in 2002 from RMB 553 million Yuan in 1993, accounting for over 10% of total fiscal revenue of Shanghai.

Starting off by urban infrastructure construction to build a modernized multi-functional and radiating framework for new district, investment environment of Pudong keeps on improving. Since 1990, nearly RMB 110 billion has been invested in urban infrastructure construction, with first round of 10 major infrastructure developments focusing on traffic, communication and energy and second round of 10 major infrastructure developments like Pudong International Airport, Pudong International Info-Port, No.2 Metro Line, Waigaoqiao Power Plant and The East China Sea Natural Gas Project have been completed. Total social fixed asset investment reached RMB 58.5 billion Yuan, making 2002 another peak year for investment since the development of Pudong. By the end of 2002, foreign investors from over 80 countries and regions have invested in 8,479 projects in Pudong and contracted foreign investment reached USD 19.121 billion. 56 foreign funded financial institutions registered in Pudong. 6986 enterprises from other provinces and cities registered in Pudong and the total registered capital reached RMB 37.092 billion Yuan. Foreign investment in actual use amounted to USD 1.6 billion in 2002, accounting for over one-third of total amount of Shanghai; export volume has increased from USD 1.2 billion in 1993 to USD 13.6 billion in 2002.

**Brief Summary:** It can be seen from these data that the Economy of Shanghai and Pudong is experiencing a rapid development; heavy investment has been put in urban public facilities. In addition, Shanghai is the window for China's economic reform and opening to the outside world, the proportion of foreign and individually-run sectors is on a steady rise, and more and more non-public sector capital has been invested in urban

infrastructure construction.

## **2. Introduction and Reform of Water Sectors in Shanghai**

### **2.1 Development and Planning of Water Sectors**

#### 2.1.1 Introduction of Water Resources

Bordering the Yangtze River to the north, the Hangzhou Gulf to the south, the Taihu Lake to the west and the East China Sea to the east, Shanghai has a large amount of watercourses and densely covered river networks within its territory. Shanghai has currently 23,787 watercourses and the total length is 21,646.29 km; drainage density is approximately 3.41 km/m<sup>3</sup>. It has 21 lakes covering an area of 59.32 km<sup>3</sup>, total area of rivers and lakes is 59.32km<sup>3</sup>, total water surface is 405.54 km<sup>3</sup>, river surface coverage reaches 8.4% and water surface coverage reaches 6.4%, in which, there are 32 backbone watercourses, total length is 3,202 km, accounting for 14.79% of total length of watercourses in Shanghai.

Shanghai has a gross amount of water resources of 946.717 billion m<sup>3</sup> with an average annual rate of surface runoff of 24.15 m<sup>3</sup>, its annual exploitable groundwater amounts to 142 million m<sup>3</sup>, water from Taihu Lake and main stream of Yangtze River passing through Shanghai amounts to 10.66 billion and 933.5 billion m<sup>3</sup> respectively, totaling 944.16 billion m<sup>3</sup>. Surface water pollution in Shanghai is mainly caused by organic pollutants, like chemical oxygen demand, potassium permanganate index, non-ionic oxygen, petroleum and total phosphorus. According to the monitoring results of main stream of Huangpu River in 2000, some indexes in sections like Dianfeng, Songpu Bridge, Linjiang, Yangpu Bridge and Wusongkou is inferior to Grade II, III and IV surface water quality standard. Organic pollution of tributaries of Huangpu River in downtown area is inferior to Grade V water quality standard. With the exception of few sections of Dianpu River where surface water reach Grade IV of water quality standard, surface water of river sections of all other tributaries of Huangpu River is inferior to Grade IV water quality standard. Most of indexes in Yangtze River Estuary can meet Grade II water quality standard

## 2.2 Introduction of Water Supply

Presently, tap water in central area of Shanghai is supplied by Waterworks Shibe Company, Waterworks Shinan Company, Waterworks Pudong Company and Waterworks Minxing Company, tap water of some regions of Pudong New Area, Minxing District and Baoshan District, most of regions of Jiading District and other districts and counties are supplied by local tap waterworks, water of farms is supplied by their waterworks and some enterprises have their own water source for water supply.

Table 1: Water Consumption in Shanghai in 2000

Area	Population (10,000)	Amount of Water Supply (10,000 m <sup>3</sup> )	Amount of Water Sold (10,000 m <sup>3</sup> )	Classification of water supply (10,000 m <sup>3</sup> )		
				Water for Industrial Use	Domestic Water	Water for Public Facilities
Downtown Areas	850.3	182954	149993	31956	50391	43865
Towns	158.5	28178	23609	10337	8925	4346
Rural areas	294.5	26274	21693	11010	8848	1437
Farms	16.63	2573	2246	1630	397	218
Total	1320.42	239979	197541	54933	68561	49866

Yearly water supply amounted to 2.399 billion m<sup>3</sup> in 2000, which included 549 million m<sup>3</sup> for industrial use, accounting for 27.8%, 686 million m<sup>3</sup> for living, accounting for 34.7% and 499 million m<sup>3</sup> for public utilities, accounting for 25.2%, production and distribution ratio hit 1.2, details are shown in Table 1. It can be seen from the overall trend of water consumption in Shanghai that water consumption from 1999 to 2001 was on a slight decline and started to increase after 2001, though various water saving measures were adopted to improve the efficiency of water utilization, and it is estimated that water consumption will be on a gradual rise before 2020 as a result of growth of population and industrial development. Details are shown in Table 2.

Table2 Forecast of Water Consumption in Shanghai by 2020 (10,000 m<sup>3</sup>/day)

Type of water consumption	2000	2005	2010	2020
Domestic water	188	204-208	231-240	276-284
Water consumption of public facilities	137	124-145	144-171	169-200
Water consumption for industrial use	150	153	156	166
Others	65	55	37	37
Total water consumption	540	536-561	568-604	648-687
Yearly total water consumption (100 million m <sup>3</sup> )	19.7	19.6-20.5	20.7-22.1	23.7-25.1

According to the forecast of total water consumption in Shanghai, current water supply capacity could meet the demand of plan for 2005; purpose of adjustment of water supply is to achieve a balance between supply and demand in Pudong, Puxi, Punan and three islands. This will require the reconstruction of waterworks by means of expansion and scale down and construction of cross-river pipeline to realize the adjustment of water supply between Pudong and Puxi in a real sense.

### 2.3 Introduction of Water Quality

The Sanitary Standard for Drinking Water GB5749-85 issued in 1985 is currently observed by the water service industry in China. An evaluation of quality of tap water in Shanghai in accordance with this standard shows that besides phenol content, major items that do not meet the standards include sensual index color, content of iron and manganese; however, up-to-standard rates of color, iron and manganese from water sources are different, and tap water from Yangtze River is obviously superior to that from Huangpu River. Up-to-standard rates of waterworks under municipal governments are shown in the table below:

Table 3: Up-to-standard Rates of Waterworks Under Municipal Government

Year	1998	1999	2000
Up-to-standard rate of four items	99.88%	99.92%	99.89%
Overall up-to-standard rate:	99.81%	99.78%	99.84%

However, according to an analysis of these waterworks in accordance with 88 standards

included in 2000 Water Quality Target by the Ministry of Construction issued in 1998, rise of up-to-standard rate as compared with analysis in accordance with GB5749-85 standard, which represented the advanced international level of 80's, is shown in the table below. Major cause of these non-conformities is organic pollution of Huangpu River and it is difficult for these waterworks to make improvements with their existing conventional techniques.

Table 4 Rate of Non-conformity in the Inspection in accordance with 88 Standards Issued by Ministry of Construction in 2000

Item	Ammonia nitrogen	Conductivity	Nitrite	Al	Oxygen consumption	hcb	1,2 dichloromethane	Dichlor-ovos	Mutagenic test
Rate of pass (%)	25.0	19.23	71.80	82.7	90.38	69.23	96.84	96.15	7.69

In general, tap water quality in Shanghai does not match its position as a metropolis; therefore, People's Government of Shanghai sets the target of overall improvement of water quality, which requires that water quality in Shanghai shall meet the EU standard of the corresponding period by 2010 by meeting "Water Quality Target" issued by Ministry of Construction in 2000. To achieve this goal, proportion of water supply from Yangtze River shall be increased, renovation of existing waterworks shall be accelerated, advanced treatment of clear water shall be realized step-by-step and new tubes and pipes should be used for renovation of urban pipeline network, and it is estimated that total investment of over RMB 20 billion is required.

**Brief summary:** Though Shanghai is rich in water resources, the Huangpu River Valley suffered heavy pollution; Shanghai has a high water supply capability, but local adjustment is still required; as tap water quality in Shanghai is poor in general, efforts in many respects and heavy investment are required to achieve the goal of overall improvement of water quality.

## **2.2. Reform of the Water Sector in Shanghai and the PPP Project of Waterworks Pudong Company**

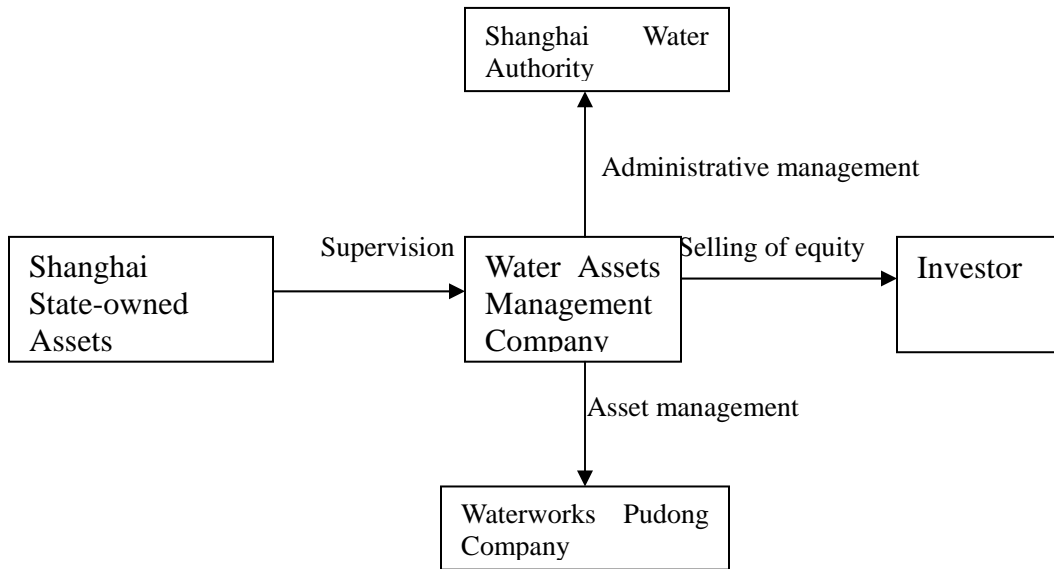
Shanghai Water Authority, established in May 13<sup>th</sup>, 2000, was the first provincial level water authority in China. Its establishment provides a system environment for reform of investment and financing system in water supply industry. Before its establishment, Shanghai had 9 city level departments associated with water management, including Shanghai Construction Committee, Shanghai Water Conservancy Bureau, Shanghai Administration of Public Utility and Shanghai Municipal Engineering Administration Bureau. This pattern is called “Nine dragons for water management”. Due to the limitation of management segmentation of various departments, industries and towns and counties, though all departments concerned had their own water plans, most of them laid more emphasis on single functions and gave little attention to comprehensive functions. As a result, a water plan integrating urban areas and rural areas and covering all industries was unavailable within 51 years between the founding of the People’s Republic of China and the establishment of Shanghai Water Authority. Limitation and delay of planning has not only affected the coordination of construction works of water industry, but also restrained the promotion of urban functions and city image. Establishment of integrated management system of water supply services provided a system guarantee to change this situation. This new agency exercised the supervision over water conservation, water supply and water drainage industries and had competency over urban flood prevention, urban and rural water supply, water drainage, sewage water treatment, ground water management as well as water planning and water saving, creating a new pattern of water supply service management.

It can be seen from the policy background before PPP of Pudong Project that, though policies of competent departments on marketization of water supply services were ambiguous, marketization of public services has become a common understanding of academic society and government and government’s orientation towards marketization in public services has become evident. It is stipulated in Article 2 of “*Notice of Publication of Some Opinions on Promotion and Guidance of Private Capitals*” issued by the State Development Planning Commission in Nov. 2001 that “Fields of investment should be

gradually broadened, preferential policies in any fields are also applicable to private capitals; private investment should be encouraged and guided into the construction of operating infrastructure and public welfare establishments projects in the form of sole investment, cooperation, joint venture, equity participation and concession”. Shortly after the completion of Pudong PPP Project, “Opinions on Acceleration of Marketization of Public Services” was issued by the Ministry of Construction by the end of 2002, which requires for the opening of market for investment, construction and operation in public services and establishment of government licensing operation system. Third Session of the Sixteenth Central Committee of the Party held by the end of 2003 explicitly called for acceleration and improvement of reform of monopolized industries, loosening of restrictions on market access into monopolized industries, introduction of competition mechanism, diversification of subjects of investment in appropriate enterprises and effective supervision over natural monopolized services. Broadening of channels for market access means the diversification of property rights. Under the guidance of government policies, a nationwide reform and restructuring of state-owned water service enterprises is in full gear. It can be concluded that PPP Project of Waterworks Pudong Company took the lead in this reform.

Orientation of national policies and reform of water supply service management system facilitated the PPP restructuring of Waterworks Pudong Company. After Oct. 2000, the newly established Shanghai Water Authority prepared to set up Water Assets Management Company, which was expected to be a financing platform to boost the investment and financing reform of water services in Shanghai. In the actual operation of PPP of Waterworks Pudong Company, Water Assets Management Company acted as the asset owner of Waterworks Pudong Company, through which, foreign investors purchased 50% of equity of Waterworks Pudong Company to establish a joint venture. Shanghai Water Authority, as the competent authority of Water Assets Management Company, directly guided and participated in this joint venture project; in addition, Shanghai State-owned Assets Supervision and Authority Commission exercised the supervision over maintenance and appreciation of values of state-owned assets. Management system before PPP of Waterworks Pudong Company is shown in the figure below:

Figure 1



### **3. Why PPP Project for Waterworks Pudong Company**

Through interviews to relevant officials of Shanghai Water Authority, we came to know that joint venture of Waterworks Pudong Company, as a project approved by Shanghai Municipal People's Government and managed by Shanghai Water Authority, is a typical project guided by the government and implemented from above to below. However, this should be a kind of natural choice for Shanghai Municipal People's Government under external conditions; therefore, studies on cause of this project should be focused on the considerations of intentions of competent departments concerned. In this way, we have made following summaries on some main issues.

#### **3.1 Why PPP Project in Water Supply Industry**

3.1.1 Orientation of national policies and reform sense of Shanghai Municipal People's Government. As mentioned above, government's orientation towards marketization in public services has become very evident. Under the present administrative system in China, direction of policies of central government and local government is decisive in most of cases, and it can be concluded that direction of policies of central government is followed in the reform of public services including water supply services in Shanghai. According to relevant personnel from Shanghai Water Authority, Shanghai Municipal Committee of CPC and Municipal People's Government have strong sense and resolution of reform, as a result, Shanghai has been keeping ahead in China in both economic development and system reform and it is natural that Shanghai Municipal People's Government is reluctant to lag behind in the reform of public services, which has become the hot spot of China's further development of market economy. In addition, PPP Project of Waterworks Pudong took the lead in this reform, as compared with other major cities in China. From this sense, the joint venture of Waterworks Pudong Company, as window project established by Shanghai Municipal People's Government, shows, to some extent, the attitude of local government towards achievements.

3.1.2 Restriction of fund for construction and development of water supply industry. According to short- term and long-term plans by competent departments of Shanghai for

various stages before 2020, heavy investment is required; fund demand for construction of water services in Shanghai predicted by Shanghai Water Authority is shown in the figure below:

Table 5 Forecast of Fund Demand in Tap Water Industry in Shanghai (Unit: RMB 100 million Yuan)

	Cost of raw water project	Cost of waterworks and pipeline network projects	Cost of water supply project
2005	22.3	41.5	64
2010	10.6	35.5	46
2020	37.1	25.0	62
Total cost	70	102	172

It can be seen from the table above that heavy investment is required; this is particular true for the period before 2005. After the establishment of Shanghai Water Authority, development and supervision of water supply services in Shanghai entered into a new stage. However, Shanghai Municipal People’s Government has explicitly declared that it will not make any investment in public enterprises providing water services in future and these enterprises should take full responsibility for their own profits and losses. Therefore, development of water supply industry shall be subject to the liquidation of remnant assets and reform of system of investment and financing.

3.1.3 Attraction of water supply industry in Shanghai to investors has made PPP feasible and made it the pioneer of reform of public services selected by government departments. Demand for capital for construction of water supply industry described above is the major cause for privatization, but it is not the only cause. According to relevant personnel from Shanghai Water Authority, government authorities, instead of withdrawing from investment in water supply industry completely, will still make large investment when issues concerning security of water quality are involved. For instance, Shanghai government will invest as much as tens of billion Yuan to meet the EU standard on tap water quality. Characteristics of large amount of remnant assets, large operation cash flow and stable return of water supply industry made the introduction of large investment possible and reform of water supply services by the government meaningful.

3.1.4 Advanced technologies from abroad is required in water supply industry in Shanghai. As it described above, Huangpu River and Yangtze River, as major sources of tap water in Shanghai, take up 80% and 20% of water supply of Shanghai respectively, of which, combined index I for water quality of Huangpu River stands at 1.0, indicating moderate pollution, in which, substances like Kjeldahl nitrogen, total phosphorus, dissolved oxygen and chemical oxygen demand and volatile phenol are above 1.0 and ammonia nitrogen is above 2.0, indicating serious pollution; even the combined index I at section of Chenghang Reservoir of Yangtze River which has a better water quality stands at 0.8, indicating low grade pollution. It can be therefore concluded that quality of tap water in Shanghai is rather poor and far below the advanced international level. On the other hand, unnecessary losses like dribbles, emission and leakage are also serious in the course of production and distribution due to low-level production techniques of waterworks. Take Waterworks Pudong Company before joint venture as an example, difference rate between production and distribution exceeds 20%, therefore, economized utilization is becoming more important when water resource is getting increasingly scarce. To this end, introduction of advanced technologies into water supply industry is imminent for both improvement of water quality and production management level; PPP reform is just the right choice for this demand.

3.1.5 Objective of government departments for improvement of corporate management structure and management level. As a natural monopolized industry, water supply industry has been away from marketization process in China for a long period of time. A pattern without a clear line between the functions of the government and enterprises and without well-defined functions has been formed during these years and water service enterprises used to extend their businesses to many competitive fields with the support of government monopoly. It is learned that service sector of Waterworks Pudong Company was huge before PPP, including two level organizations, i.e. organizations under the company and enterprises under waterworks, in which, there are 20 enterprises under the waterworks, covering many fields including production and installation of water pumps, pipe laying and decorations. These enterprises were also responsible for most of supporting projects for main businesses of Waterworks Pudong, forming a large and all-inclusive production and management pattern. It is very likely that complexity and

overstaffing of organizations will lead to low efficiency in operation and management, and it may be more efficient if many functions of the service sectors were exercised through competition. However, longstanding vested interests and the interest allocation pattern make both internal reform and reform from above to below very difficult, and external forces will play a significant role in these reforms. Therefore, the joint venture of PPP will be a good opportunity to solve the problems in corporate management structure.

## **3.2 Why Pudong District is Selected for PPP in Water Supply Industry in Shanghai**

3.2.1 Pudong District is a test field for reform and opening up to the outside in China. Since the new round of economic reform in China starting from early 90's, Pudong, as a window of China's opening to the outside world, has been the focus of strategic investors from China and abroad and has become the nationwide example in many respects. It is the role of pioneer and test field for economic reforms in Shanghai and China that makes relevant departments in Shanghai choose Pudong for PPP reform of public services.

3.2.2 The Attraction of long-term potential of Pudong to investors. According to statistics, the population of Shanghai increased by 3.3958 million during 10 years and 4 months from Fourth Population Census in 1990 to Fifth Population Census in 2000. However, data on registered permanent residence show that population density in downtown districts like Huangpu, Jing'an, Luwan and Nanshi has been on a decline since 1993 and population of surrounding regions has been on a gradual increase, of which, Pudong New Area has the largest new population, followed by Baoshan and Minghang District. According to the objective of Pudong New Area, economic aggregate will double that of 2000 by 2005, accounting for over one fourth of total economic aggregate of Shanghai and per capita GDP of resident population will approach USD 10,000; by 2010, GDP will reach RMB 400 billion Yuan, accounting for one-third of total economic aggregate of Shanghai, average annual growth rate will reach 15%, economic scale and comprehensive strength of modern international metropolis will be achieved. Population growth and economic development will bring about a larger market and more opportunities for water supply industry. The forecast of water demand in Pudong before

2020 by water sector is shown in Table 6.

Table 6 Forecast of Water Consumption in Pudong and Size of Waterworks

Water Supply Areas in Pudong	Total Planned Population	Downtown Area	New Area	Population of Towns	Rural Population	Average Daily Sales Volume	Max. Sales Volume	Size of Planned Waterworks
	(10,000 people)					(10,000 m <sup>3</sup> /day)		
2005	300	150	28	41	80	105	152	168
2010	338	170	42	49	77	129	181	199
2020	408	210	60	77	61	170	234	258

3.2.3 Requirements for development of tap water industry in Pudong. Rapid industrial and commercial development and population growth in Pudong has set higher requirements for the tap water industry in Pudong, therefore, further investment on renovation and construction of infrastructure is required. According to the estimate by Shanghai Water Authority before Pudong PPP project, the cost of waterworks and main pipeline networks is as follows: RMB 48 million Yuan for 2001-2005, RMB 545.2 million Yuan for 2005-2010 and RMB 249 million Yuan for 2010-2020. The introduction of private capital through PPP will be an approach for financing under the circumstance that no government investment will be made on the operation of water supply enterprises.

## **4. Brief Process of PPP Investment Attraction**

Under the direction of Shanghai Municipal People's Government, a leading team for investment attraction and a working team for asset division, personnel arrangement, production and stability were established by Shanghai Water Authority. International practice was adopted and principles of equity, fairness and transparency were followed during the whole process of investment attraction. The assets management process was mainly dominated by Shanghai Water Assets Management Company and supplemented by previous Waterworks Pudong Company under the authorization of Shanghai State-owned Assets Supervision and Authority Commission. Investment attraction of Pudong Project was characterized by its form of public tendering, in which, bid invitation documents were prepared by Chinese side. This form contributed greatly to the selection of foreign investors, definition of scope of investment and minimization of disputes and problems during negotiation and completion of investment attraction of the entire project within a short period of time. Description of whole process of investment attraction on the basis of our interviews is given as below:

### **4.1 Basic Preparations**

A series of preparations have been made after the form of public tendering was confirmed for investment attraction of PPP Project of Waterworks Pudong, including preparation of project-related documents and determination of basic concept of investment attraction, like asset checking, evaluation and considerations of basic requirements of investors. All these contents will be produced into written forms within a short period of time and all information associated with investment attraction will be published online to pass related information to more investors. *Announcement of Pre-qualification* and *Instructions for Pre-qualification* were prepared to ensure a smooth progress of investment attraction. Principles of equity, fairness and transparency have been followed ever since the commencement of this project. For instance, six asset assessment companies bid for asset assessment of Waterworks Pudong and Cairui Assessment Company was selected after qualification review by relevant departments. After asset assessment, the value of Waterworks Pudong Company was assessed at RMB 1.52 billion Yuan and 50% equity

transferred was assessed at RMB 760 million Yuan.

## **4.2 Pre-qualification**

After public bidding invitation, 7 companies including Ondeo Industrial Solutions, France's General Water Company, Thames Water from U.K, Earth Tech Inc. from U.S.A, IMPRECILO SPA from Italy, ABB and CLP Holdings from Hong Kong had preliminary contact with the bid invitation department. Investment attraction working team sent prequalification documents like "Announcement of Prequalification" and "Instructions for Prequalification" to these companies on Nov. 14<sup>th</sup>, 2001, from which, qualifications of 3 companies including Ondeo-New World Coalition (Ondeo Industrial Solutions and NWD), France's General Water Company and Thames Water from U.K were certified by Shanghai Property Rights Exchange Center in accordance with the requirements of pre-qualification documents. The above 3 companies, after adequate considerations, submitted reply documents on pre-qualification to investment attraction working team on Nov. 21<sup>st</sup> and other 4 companies withdrew from the bid automatically. A Pre-qualification Review Team comprising of leaders and experts from Shanghai Water Authority, Water Assets Management Company and tap water companies were then established for pre-qualification of above 3 companies. It was concluded by this team that these companies have met the requirements for pre-qualification and were therefore qualified for next round of introduction activities and negotiation on investment attraction.

## **4.3 Introduction Activities on Investment Attraction**

The purpose of introduction activities is to improve the transparency of Waterworks Pudong Company and facilitate foreign investors to prepare application documents, including field survey and inquiry of database materials. According to relevant personnel involved in invitation attraction, 3 companies that passed pre-qualification have shown great interests and competition was therefore extraordinary fierce. For instance, if a company was found that it had one more person present during the field investigation, the other company would protest immediately. We have come to learn that we can only gain the confidence of investors by following the principle of equity, fairness and transparency

in cooperating with these experienced multinationals.

#### **4.4 Finalization of Bid Invitation Documents**

The finalization of bid invitation documents was most important and time-consuming for investment attraction of this project. Bid invitation documents were drafted by the Chinese side and foreign investors could only discuss some details not specified in this document according to the basic requirements of bid invitation documents. As the basic contents and frameworks of this PPP Project were substantially specified in the bid invitation documents, they are therefore particularly important. Thus, investment attraction working team of Chinese side had to give detailed answers to various questions proposed by foreign investors. Both Chinese side and foreign investors employed their own agents and consultants during the public tendering. It is worth mentioning that agents employed by both Chinese side and foreign investors have strong relationship with Shanghai Municipal People's Government in a bid to get some support from Shanghai Municipal People's Government. Among them, Chinese side employed Orient International Tendering Company as its agent and France's General Water Company employed Shanghai State Owned Asset Management Company as its financial company.

Documents like *Instructions for Investment Attraction*, *Draft Contract for Equity Transfer*, *Draft Contract for Joint Venture*, *Draft of Articles of Association of Joint Venture* and *Memorandum of Replies to Questions* were prepared by Investment Attraction Working Team. During this period, documents like *Abstract of Bidding Documents of Three Bidders*, *Check List of Classified Summaries*, *Key Points for Negotiation*, *List of Clarification* and *Standard and Method of Review* were prepared by Project Team to make adequate preparations for next stages.

#### **4.5 Clarification and Negotiation**

The works during this period are conducted in two steps:

The work in the first round mainly includes clarification of principles and preconditions of cooperation specified in various documents of Chinese side and explanation of

commitments.

The work in the second round mainly includes explanation and classification of bid invitation documents to foreign investors and detailed explanations by foreign investors on their requirements. Three groups responsible for negotiation of financial issues, technical issues and services, personnel arrangement and organization framework respectively were established, Shanghai Water Assets Management Company was responsible for negotiation of financial issues, General Manager of Waterworks Pudong Company at the time was responsible for negotiation of technical and service issues and Secretary of the Party Committee of Waterworks Pudong Company at the time was responsible for negotiation of personnel arrangement and organization issues. In the process of clarification, each foreign investor raised over 500 questions; in the meantime, Chinese side also raised over 500 questions to foreign investors and asked foreign investors to prepare memorandums of their replies in written form.

#### **4.6 Submission of Bidding Documents and Review by Experts**

After clarifications and negotiations between Chinese side and foreign investors, three foreign investors submitted their bidding documents to Investment Attraction Working Team of Chinese side for review by expert panel. Experts were asked to mark their scores on five parts included in these bidding documents including offered prices, financial proposals, technical proposals, service proposals, personnel arrangement proposals and management level to give comprehensive evaluation of three bidders, and each part accounted for 20% of total score. Five expert panels on five items under appraisal were established under the principle of strictness and equity. Firstly, experts from all over China recommended by professional organizations and departments of Shanghai formed a expert pool, which has 20 experts for each group; notaries from notary office were employed to work out methods and procedures for appraisal and formal contract with notary office were executed for notarization of whole process of appraisal; lastly, 4 experts for each group were selected at random under the supervision of notary office.

Under the precondition that information on experts participating in appraisal was kept strict confidential, these experts were invited to Suzhou Dongshan Resort for secret

appraisal, location of appraisal was kept confidential and names of bidder of bidding documents under appraisal were also unknown to experts. The appraisal lasted two days, during which, Shanghai Water Assets Management Company and Waterworks Pudong Company, as the organizers of investment attraction activity, was only responsible for giving replies on questions included in bidding documents to these experts and was not directly involved in the appraisal.

Experts came to a conclusion after the bid evaluation that France's General Water Company won the bid. For the transferring price, General Water Company offered RMB 2.026 billion Yuan, Sino French Water Development Company Limited offered RMB 1.6 billion Yuan and Thames Water offered a price only slightly higher than evaluated price. After that, leaders of Shanghai Water Authority made report to Mr. Han Zheng, Vice Mayer of Shanghai Municipal People's Government, who was in charge of water services of Shanghai at the time to make the final decision.

On 15:00 p.m., May 23<sup>rd</sup>, 2002, a signing ceremony of the contract for transfer of part of equity of Waterworks Pudong was held in Pudong Shangri-la Hotel, in which, representatives from Shanghai Water Assets Operation and Development Co., Ltd. and France's General Water Company affixed their signature on the contract. On Aug. 30<sup>th</sup>, after completing all legal procedures and formalities, Shanghai Pudong-Vivendi Water Corporation Limited was officially established.

## **5. Contents and Key Points of PPP Agreement**

As both parties have confidentiality commitments on the contents of PPP Agreement between Shanghai Water Assets Operation and Development Company and General Water Company, we can only get to know the contents and keynotes of PPP agreement through interviews of relevant personnel. It should be noted that as public tendering is adopted for the investment attraction, key contents of PPP Agreement are included in bid invitation documents drafted by Chinese party.

The final legal documents mainly include: *Agreement on Supervision of Accounts*, *Agreement on Transfer of Stock Rights*, *Joint Venture Contract* and *Statute of Joint Venture*, as well as *Restrictive Clauses* for Joint Venture. Key points of the agreements mainly include:

### **5.1 Preconditions for Joint Venture**

5.1.1 Existing major business and sidelines of Waterworks Pudong Company will be separated gradually, and service sectors will be spinned off from the Joint Venture to improve the quality of Waterworks Pudong Company. Over 400 employees were spinned off, of which over 250 employees were actually on the job; in addition, its subsidiaries like Pipeline Construction Company were also spinned off. During the spin-off of sidelines, sidelines will be supported by major business of the Joint Venture within a period of three years.

5.1.2 No commitments will be made on fixed investment return to investors and all risks shall be shared by both parties. After transfer of 50% of equity, a new Sino-foreign joint venture was established, no fixed investment return was guaranteed in accordance with the market rules, and both parties will jointly run the joint venture and share the profits and risks.

5.1.3 Investors are required to acquire the equity transferred by lump payment in cash.

## **5.2 Obligations of the Joint Venture**

5.2.1 Both parties of Joint Venture shall share the investment yields and assume the risks and losses in proportion to their shares.

5.2.2 Operation period of the joint venture will not exceed 50 years, and operation and management of the joint venture shall be subject to Chinese party 3~5 years before the expiry of the operation period.

5.2.3 Members of board of directors of Joint Venture will be designated by both parties, who will appoint board chairman and nominate the general manager by turns on regular basis, meaning that one party appoints board chairman and the other party appoints vice board chairman and nominate the general manager of Joint Venture. Board of directors will also include an independent director appointed by Shanghai Water Authority.

5.2.4 In addition to relevant Chinese laws and regulations, the joint venture shall also be subject to the industry management of Shanghai Water Authority.

5.2.5 Water price (including adjusted price) of Joint Venture shall be in line with that of other waterworks in downtown areas in Shanghai; where price adjustment is required, relevant laws, rules and stipulations of the State and Shanghai Municipal People's Government shall be abided by.

5.2.6 The Joint Venture shall enter into sales contract with raw water providers when using raw water. Where Joint Venture chooses to catch water independently, it shall be restricted to protection areas for water sources of drinkable water designated by Shanghai Municipal People's Government.

5.2.7 Any existing contracts concluded by Waterworks Pudong Company shall be fulfilled by the Joint Venture.

5.2.8 Existing employees of Waterworks Pudong Company shall become full-time employees of the Joint Venture and existing labor contracts shall be binding upon the Joint Venture.

5.2.9 Investors shall commit and guarantee to perform any obligations and free services being performed or to be performed by Waterworks Pudong Company for social welfare undertakings as a part of water supply industry in Shanghai.

5.2.10 The Joint Venture shall give priority to other water service enterprises based in Pudong District under same conditions in establishing partnership relation.

5.2.11 As intangible assets of Chinese party were not included in the asset assessment during equity transfer, they will also be excluded in any asset assessment of the Joint Venture in case of any equity transfer and liquidation of the Joint Venture.

### **5.3 Legal Approaches for the Adjustment of Water Price**

5.3.1 Adjustment of water price must be in accordance with the stipulations of *“Regulations on Water Supply Management in Shanghai”*, *“Measures for the Administration of Urban Water Price”* and relevant laws and regulations. Water price shall be drawn up by Shanghai Water Authority.

5.3.2 Written application for water price adjustment shall be submitted by Shanghai Water Authority to Shanghai Price Bureau.

5.2.3 Evidentiary hearing attended by deputies to the People's Congress of Shanghai, local member of the CPPCC, representatives of competent departments concerned and users of all walks shall be invited to the evidentiary hearing by Shanghai Price Bureau. The price rate shall be, after being approved in evidentiary hearing, submitted to Shanghai Municipal People's Government for approval and implementation.

### **5.4 Supervision of Joint Venture**

As the administrative authority of water supply industry in Shanghai, Shanghai Water Authority shall exercise the supervision on following issues in accordance with relevant stipulations like *“Regulations on Water Supply Management in Shanghai”*.

5.4.1 Qualification management. As a water supply enterprise, the Joint Venture must be subject to qualification management of Shanghai Water Authority. The Joint Venture shall

only be permitted to water supply operations after obtaining “Qualification Certificate of Urban Water Supply Enterprises” through qualification examination and registration with industry and commerce administration departments.

5.4.2 Planning and construction of water supply services: Planning and construction of the Joint Venture shall be subject to specialized water supply planning by Shanghai Water Authority and urban planning and water supply planning of Pudong New Area.

5.4.3 Water pressure and water quality: Shanghai Water Authority is entitled to supervision over water quality and water pressure of the Joint Venture.

5.4.4 Restriction on on-the-spot water taking. The Joint Venture shall enter into sales contract with raw water providers when using raw water in accordance with relevant stipulations and make full utilization of raw water provided by raw water providers; unauthorized on-the-spot water taking is strictly forbidden.

5.4.5 Water supply management. The Joint Venture shall ensure a smooth water supply, participate in working conference on central dispatching as requested, be subject to emergency dispatching of Shanghai Water Supply Dispatching and Monitor Center and refrain from authorized water supply cutoff. Shanghai Water Authority shall exercise supervision over implementation of work permit system, maintenance of uninterrupted water supply, fulfillment of obligation of notification in case of water supply cutoff and lowering of water pressure, prompt repair in case of failure of water supply facilities, on time completion of report forms of water supply and compliance with water price verified by Shanghai Price Bureau of the Joint Venture. Shanghai water Authority shall, in case of any violations, instruct Shanghai Water Supply Administration to punish in accordance with relevant administrative law.

## **5.5 Supplement to Preconditions**

As a part of water supply industry in Shanghai, the Joint Venture shall assume and fulfill the tasks concerning emergency, public welfare and public services assigned by competent government departments and promote cultural and ideological progress.

Organizations of CPC and Communist Youth League shall be founded in the Joint Venture in accordance with relevant regulations of CPC and Communist Youth League .

## **6. Considerations of All Parties of PPP Agreement**

Though the PPP Project of Waterworks Pudong Company is initiated and guided by the government, success of the public tender shows that interests of all parties concerned are taken into account in the final agreement and balance is reached in a way of game playing. However, some clauses of the agreement were beyond the expectation of some insiders or even some participants of the project, and we believe that considerations of all parties concerned on their own interests are best illustrated in these unexpected clauses, on which, analysis will be made in the following paragraphs.

### **6.1 Foreign Investor: Why Offered Such a High Bid Price**

The bid price of General Water Company for this PPP Project is as high as RMB 2.026 billion Yuan, nearly 2.7 times as much as the evaluated price of RMB 760 million Yuan, which impressed us deeply.. The reason why General Water Company offered such a high price attracted our attention, we have come to the conclusions as follows by summarizing the viewpoints of parties involved in this project:

6.1.1 Development Opportunity of Pudong. It will not be discussed in this chapter as detailed description has been given in the paragraphs above.

6.1.2 Expectation for Participation in the Operation of Pipeline Network and Increase of Water Price. Since the issuance of *Measures for the Control of Urban Water Price* in June 1998, reform on divergence of water price from actual market situation has been gradually on the way, the right to reasonable profit for water supply enterprises was recognized by the government and a price fixing standard of cost plus taxation and reasonable profit was set by means of statutory regulations, in addition, it is stipulated that the average level of reasonable profits of water supply enterprises shall be between 8~10% of profit rates of net assets. Therefore, investors see a huge potential from China's water supply market. According to the surveys conducted in 115 cities, water price adjustment has been made in 62 cities from 1998 to 2000 at an average margin of 20-30%. However, the water price still cannot fully offset the costs in many cities after price adjustment, even those water supply enterprises making profit had only meager profit, as

water supply enterprises used to have large assets, there is still a long way to go to meet the target of 8%-10% of profit rate of net asset, therefore, there is still a large room for the improvement of water price after marketization of water supply industry. On the other hand, the value of tap water as a scarce resource is still far from being fully represented. The water price in Paris is equivalent to RMB 21 yuan/m<sup>3</sup>, even in Canada that is rich in water resources, water price is equivalent to RMB 5 yuan/m<sup>3</sup>, as China has insufficient water resources, the existing water prices seems to be unreasonable from a long run. PPP Project of Waterworks Pudong Company is characterized by its transfer of pipeline network management, as the Joint Venture can therefore charge the end-users directly, adjustment of water price will be critical to profits of the Joint venture. Though it is specified in the PPP Agreement that the water price adjustment shall be subject to specific procedures and evidentiary hearings and similar adjustment by other three waterworks is also required, the rise of water price is a general course of development in a long run. In addition, the contract period of Pudong Water Supply Project is as long as 50 years, Vivendiwater Company will surely be the beneficiary of price rising in a long run.

#### 6.1.3 Considerations and Speculation of Vivendiwater Company on Capital Market.

As introduced by cadres participating in the negotiation, General Water Company had some financial scandals in the European market before its participation in this Project, it is therefore in desperate need for a subject in capital market to rebuild the confidence of investors. Pudong, as a window of China's reform and opening up to the outside and focus of attraction of global strategic investors, best suited to the need of General Water Company. On this account, General Water Company has shown definite resolution in this project, which is best illustrated by its high bid price. It was proved that Pudong Project has made great contributions for General Water Company to turn the tables in European capital market.

6.1.4 For more opportunities in China's market. Vivendiwater Company, as the second largest water service provider in the world, is gradually shifting its global focus to Asia since recently years in a hope to increase the proportion of business revenue from Asia in

its total business revenue from current 3% to 20% within 5 to 10 years, however, its performance in China market is essential for achieving this goal. This project, as the largest project since its entry into China market, will have strong demonstration effects and help Vivendiwater Company in establishing its reputation in China market and finding other opportunities for the cooperation with water enterprises in other cities. High bid price in this project can be fully compensated by larger interests from other projects. As a result, Vivendiwater Company had outstanding performances in China market after its success in Pudong Project. In the end of 2003, Vivendiwater Company acquired 5% of the equities and its joint venture Beijing Capital VW investment Co. Limited acquired 40% of equities of Shenzhen Water (Group) Co. Ltd. This transaction of RMB 3.31 billion Yuan became the second largest acquisition in world's water service industry. Early in Sept. 2003, General Water Company entered into a cooperation contract for an investment of RMB 760 million Yuan in Beijing Lugouqiao Sewage Water Treatment Project, which has become the first sewage water treatment project with foreign investment in Beijing. Just several days before the execution of this agreement, General Water Company, with the approval of the People's Government of Chaoyang District , Beijing, invested RMB 91 million Yuan and established Beijing Jiali Veolia Sewage Water Treatment Co. Ltd specializing in sewage water treatment services and construction and operation of sewage water treatment facilities. Earlier in May 28, 2003, Beijing Capital VW investment Co. Ltd. was co-established by Veolia Water Company and Beijing Capital Group. In Nov. 2002, General Water Company cooperated with China Everbright International Limited in a sewage water treatment project valued at USD 42.8 million in Qingdao.

6.1.5 Uniqueness in financial conditions. General Water Company has its uniqueness in financial conditions as a water service provider from France, as Vivendiwater Company is only a water service provider in French market, amount of its fixed assets is therefore not large in terms of its profit rate. On this account, its financial reports allow Vivendiwater Company to increase its proportion of assets by a big margin.

6.1.6 For the favor of Shanghai and more opportunities in shanghai. As a multinational

with some experiences in China and intention for long-term development in China, Vivendiwater Company has become more and more aware of the significance of establishing sound cooperative relationship with government departments, therefore, it takes Pudong Project as an opportunity to impress Shanghai Municipal People's Government. Though General Water Company has its advantages in water supply services, it is learned that it is also intended to develop other businesses in Shanghai. According to a consulting agency providing consultancy services to Vivendiwater Company, Vivendiwater Company is gearing up to build a large amusement project like Disneyland in Shanghai. If this proved to be true, full support from government agencies is essential for such a big project; Vivendiwater Company shall establish good cooperative relationship with government agencies before launching such a project.

6.1.7 Lobbying from Agents. As this Joint Venture Project was settled through the agency of a tendering company and a financial company, it is very likely that client and its agent have different interests. Though General Water Company needs to consider the cost of acquisition, the sole purpose of its agent is to ensure the success of acquisition of equity of Waterworks Pudong Company and benefit from this transaction. According to relevant personnel involved in this project, the agent persuaded General Water Company to increase its offer to ensure the success of acquisition.

6.1.8 Fierce Competition among Bidders. Ondeo-New World Coalition and Thames Water, which come out of prequalification as successful applicants, are also large multinational water service providers, Suez, mother company of Ondeo Industrial Solutions from France, ranks first in terms of comprehensive strength among water service providers in the world and Thames Water is currently the largest water service engineering company in the world. Therefore, it will be costly to win out in such fierce competition.

## **6.2 Water Sectors of the Government: Why Sell Pipeline Networks?**

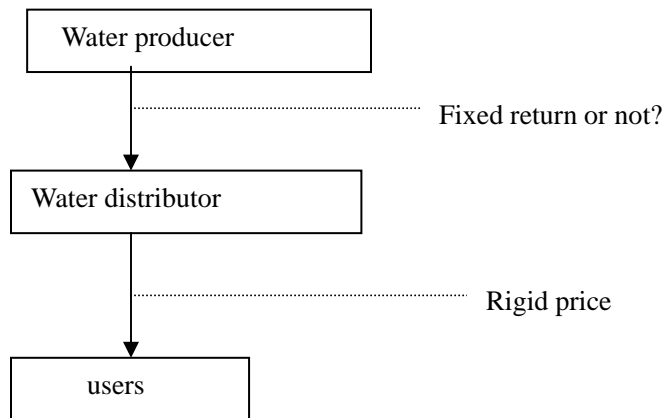
With the respect of laws, according to relevant laws and regulations issued before 2002, the water sector is not authorized to sell the pipeline networks to foreign investors. Although urban networks of telecommunication, combustible gas, heat, water supply and

drainage that were not allowed for foreign investment in the past, they were newly listed for the first time as items open to foreign investment in the “Industry Guidance Directory of Foreign Investment” by State Development Planning Commission on Mar. 4, 2002, albeit as restrictive items. Since the pipeline network, as a monopolized resource, cannot be rebuilt, it is very likely that the private companies that have the control of the pipeline network may put pressure on the government authorities for the increase of price. In turn, the government authorities will find it difficult to exercise effective supervision on the network. As such, why did the water sector sell the pipeline network? The reason why the selling of the pipeline network is possible will be further discussed in Part 6 of this article.

### 6.2.1 Providing Foreign Investors with Larger Spaces for Operation and Development and Avoiding Fixed Return.

It can be seen from the cases of privatization of water services that, if the joint-venture cooperation is only restricted to waterworks instead of the integrated cooperation on production, distribution and sales, it is very likely that foreign investors will be trapped by fixed returns. (Entering into agreement on water price and water purchase). For upstream waterworks, it is difficult to attract the investors with only franchise, BOT or TOT if there is no commitment regarding fixed returns, please refer to the figure below:

Figure 2



When ownership and operation of pipeline networks were separated, foreign investors

were only permitted to invest in upstream water production enterprises. This small area for operation provided foreign investors with little incentive for investment if fixed return and water purchase agreements are unavailable. However, if upstream foreign investors are promised a fixed return on investment, the burden of costs of water purchase will naturally be passed on to downstream tap water distributors. On the other hand, as water price is sensitive to the public, the government would not make drastic adjustment. It is very likely that fixed returns will lead to the losses of state-owned tap water distributors, as a result, all state-owned downstream distributors will have to buy back at high price from upstream water production enterprises, like what has happened to BOT of Waterworks Shenyang Company. Integrated cooperation, however, will give foreign investors sufficient space for imagination. On the one hand, foreign investors will surely become the beneficiaries of the potential rise of water prices; on the other hand, integrated cooperation would greatly enlarge the operation scope of foreign investors, so that they would minimize the cost and improve economic performance with the help of advanced technologies and management. For instance, the different rate between production and distribution of Waterworks Pudong Company before the establishment of the joint venture was as high as 20%, much higher than that of 12% stipulated by Ministry of Construction of the People's Republic of China and 6% and 9% in France and U.S, there is big potential for foreign investors to increase the economic benefits by tapping the latent power. In addition, it is likely that upstream waterworks will pay little attention to the production cost as result of fixed return, only integrated cooperation without fixed return will give foreign investors more incentives in cost control, from this sense, integrated cooperation will lead to a system of incentives and disincentives.

6.2.2 Driving the Water Price Up with Foreign Investors. Though it is generally accepted that water price in most of Chinese cities is on a low level, it is not easy for water sectors to make decision on increase of water price. In addition to complicated procedures of examinations and hearings, local governments are very prudent in making decisions on rise of water price due to its sensitivity to the public and great influence to the society. It is found in our investigation that both water sectors in Shanghai and Chinese party of the Joint Venture have the intention to drive the water price with the involvement of foreign investors and hope that foreign investor may persuade the higher authorities to approve

the price rise with its various resources. We have found in the media reports that there were saying that “Water price will rise when foreign investors come” in the places where Sino-foreign joint ventures in water supply services have been established. It is learned that hearings about rise of water price by competent departments is already on the way in Shanghai.

### **6.3 Competent Department on Supervision and Authority of State-owned Assets: Maintenance and Appreciation of Value of State-owned Assets**

State-owned Assets Supervision and Authority Commission have the responsibility and target of maintenance and appreciation of values of state-owned assets. The appreciation of state-owned assets has been fully realized in the final PPP Agreement, by which, the equity of Waterworks Pudong Company was sold at a high but fair price through asset evaluation and bid invitation, which is not necessary to be discussed in detail.

### **6.4 Interests of Managerial Team of Chinese Party have been Substantially Guaranteed**

As Shanghai Water Authority managed the PPP of Waterworks Pudong under the guidance of Shanghai Municipal People’s Government, the management team of Waterworks Pudong Company only played supplementary roles in the whole project instead of making changes of the decisions on the establishment of the Joint Venture. However, members of this team were properly placed before and after the establishment of the Joint Venture and their interests were duly guaranteed. The management team of previous Waterworks Pudong Company was comprised of 7 members, 3 of them were paid on yearly basis after they became members of board of directors of the Joint Venture, other 4 members were replaced to other important positions in water sectors of Shanghai.

### **6.5 Interests of Workers have been Documentarily Guaranteed**

Though ordinary employees of previous Waterworks Pudong Company have little say in

the decision-making of the project , most of employees have concerns about reform, joint venture restructuring and lay-off. It is specified in the bid invitation document prepared by Chinese party that the interests of workers must be properly guaranteed for the purpose of the stability of work force and society; which was reflected in the final PPP Agreement. According to this agreement, no full-time employees of previous Waterworks Pudong Company (1205 existing workers) shall be laid off and annual income of workers shall increase by 10% every year on the basis of the level of 2001. It can be concluded that interests of workers have been documentarily guaranteed.

## **7. Breakthrough of the Existing System by the Project**

What impressed us most is the breakthrough made by Waterworks Pudong Company to the existing system which is shown in the following respects: firstly, percentage of shares of foreign investor, which reached 50%; secondly, sales of pipeline network were included in the joint-venture project of Waterworks Pudong Company. According to “Industry Guidance Directory of Foreign Investment” issued by State Development Planning Commission on Mar. 4, 2002, urban networks of telecommunication, combustible gas, heat, water supply and drainage used to prohibit foreign investment were listed for the first time as the items open to foreign investment. However, it was also stipulated that the Chinese party shall enjoy a controlling stake in above ventures, therefore, the above breakthroughs are not accordance with this stipulation. Analysis by cost-benefit method of institutional economics shows that breakthrough to a system can only realized when benefit is higher than cost. Then, what are benefits from breakthrough to existing system for Pudong Project? What is the cost? The former can be understood as the reason why breakthroughs are necessary and the latter can be understood as why breakthroughs are possible.

### **7.1 Percentage of Shares**

#### **7.1.1 Why Government Departments Propose an Equity Structure of 50%: 50%**

7.1.1.1 Increase the attractiveness to foreign investors. As restrictions on privatization of public services has just started to be loosened and foreign investment in water supply industry had been restricted by regulations like percentage of shares, which has affected foreign investors in both operation model and income distribution. It goes beyond doubt that increasing the percentage of shares of foreign investors to 50% will greatly improve the say of foreign investor. Though percentage of shares of Chinese party decreased only by 1% than 51%, which was once mandatory, a substantial breakthrough has made concerning the nature of this project, benefits of foreign investors in operation and interests are much higher than 1% and attraction to foreign investors has been greatly increased. As 50% equities of foreign investor means a transformation of entry of foreign

investors from an attempt and foreshadowing into a substantial participation in operation and benefit distribution. It can be imagined that if equity offered was reduced to 49%, it is unlikely that so many investors were attracted, offered price of RMB 2.026 billion Yuan could also hardly be possible.

7.1.1.2 Encouraging Foreign Investors to Transfer Advanced Technologies and Management Experiences. With the increase of equity of foreign investors in the Joint Venture, the pattern of benefit distribution is changed, which will encourage foreign investors to transfer advanced technologies for production. At the same time, technologies and management of foreign investors could be realized easily with more voicing rights they have in the production and operation. Theoretically speaking, it is these breakthroughs that encourage foreign investors to adopt their advanced technologies and management experiences in the Joint Venture, which is also one of the motives of Shanghai Municipal People's Government to increase the stake of foreign investors.

#### 7.1.2 Why Restriction on Percentage of Equity Could be Broken

Sufficient reasons are required for playing “edge ball” to the existing system in terms of exceeding the restriction on percentage of equity stipulated by competent departments concerned of Shanghai, on the other hand, they have to assume possible responsibilities arising thereof. Hence, Shanghai's considerations were as follows:

7.1.2.1 Case of Changli. Personnel concerned of Shanghai Water Authority discovered the case of Changli when trying to draw some experiences of water service reforms from other cities; they hope this case could be used to persuade State Planning Commission and ex-Ministry of Commerce. Case of Changli County has following features: firstly, relevant departments of Changli County sold 87% of shares of its waterworks company to foreign investors, who had the exclusive control over the waterworks company; secondly, Changli County is the hometown of Shi Guangsheng, ex-Minister of State Ministry of Commerce, who has given full support to the restructuring of water services by attending the signing ceremony of the project. It would be quite persuasive that the water sectors in Shanghai cited Hebei Changli Case to explain their considerations to the

National Development and Reform Commission and State Ministry of Commerce.

7.1.2.2 Though the percentage of equity of foreign investor has reached 50%, water supply of Waterworks Pudong Company only takes up 20% of total water supply for Shanghai. For percentage of equity of foreign investors, it is stipulated in “Industry Guidance Directory of Foreign Investment” issued in 2002 that “Construction and operation of pipeline networks of fuel gas, heating and water supply and drainage with foreign investment in large and medium size cities must be controlled by Chinese party”. However, these stipulations are ambiguous without explicitly indicating whether Chinese party must have control over a waterworks or water supply service of a city. Water supply in Shanghai has three levels, first level includes four waterworks affiliated with Shanghai government, namely, Waterworks Shi’nan Company, Waterworks Shibe Company, Waterworks Pudong Company and Waterworks Minging Company; second level includes 10 waterworks affiliated with district or county governments, mainly located in those districts that were formerly counties; third level includes those waterworks which are still operating under township government. Total water supply capacity in Shanghai is 10.64 million ton/day and water supply capacity in downtown areas is 7.16 million ton/day, however, Waterworks Pudong Company has a water supply capacity of approximately 1.2 million ton/day, therefore, 50% of its equities only means 10% of total water supply capacity of Shanghai. In this way, selling of 50% of equity of Pudong Waterworks is in accordance with relevant regulations.

7.1.2.3 Local government assumed some responsibilities. Personnel concerned of Shanghai Water Authority admitted that Shanghai Municipal People’s Government also assumed some responsibilities in selling of the equities, foreign investors have asked the competent departments of central government for the approval of 50% equity:

## **7.2 Selling of Pipeline Network (Shanghai Waterworks Shibe Co. Ltd)**

### **7.2.1 Why Sells Pipeline Network**

The reason for selling pipeline network will not be discussed in this chapter as detailed description has been given in paragraph 6.2.

### 7.2.2 Why is It Possible

As it mentioned above, it is very likely that the private-owned companies that have the control of the pipeline network may put the pressure on the government authorities and demand an increase of price. In turn, the government authorities will find it difficult to exercise effective supervision on the network. As such, why can government department sell the pipeline network?

Restriction on water prices due to the comparisons of four major urban waterworks. There are other three water waterworks companies in Shanghai besides Waterworks Pudong Company. Though these companies supply the water to different areas, comparison among them is inevitable. In addition, these waterworks have the same water price and are required to keep the water price in the same level . It is therefore difficult for General Water Company to raise the water price independently; as may also undermine its image as a multinational company.

7.2.2.2 Restrictive clauses defined the power of foreign investors. Water sectors in Shanghai have taken into full account of any possible negative effects that may be caused by sales of Waterworks Pudong Company as a whole and added into final agreement a “Restrictive clauses”, in which, strict stipulations on any possible issues were included. According to personnel concerned of Shanghai Water Authority, all issues in mind and associating with the adjustment of water price were included in the restrictive clauses; therefore, there was little possibility for foreign investor to “rip off” after the establishment of the Joint Venture.

7.2.2.3 Less requirements for confidentiality: In addition to considerations of supervision, another reason for restriction on sales of pipeline networks in the past is the requirement for secrecy of national defense by believing that openness of pipeline networks may result in the disclosure of some military units. However, development of information technology has made the disclosure of information as result of openness of pipeline network negligible, there are fewer requirements for secrecy of pipeline network as far as national defense is concerned.

## **8. Operation of Joint Venture and Comments of Parties Concerned**

### **8.1 Operation of Joint Venture**

#### 8.1.1 Composition of management of the Joint Venture

Board of directors of the Joint Venture is comprised of 7 members, including 3 members from both Chinese and French party respectively and 1 independent director designated by Shanghai Water Authority as representative of competent government departments, the independent director has the veto power over issues on safety of water consumption and social stability. In the first management after the establishment of the Joint Venture, Board Chairman is designated by Chinese party and General Manager from French party, which will be changed the interval of every 4 years or made through consultation. An executive committee, instead of board of directors, is currently responsible for the daily operation of the Joint Venture, which comprises 4 members, 2 from each party. Members from Chinese party include board chairman and a deputy general manager; members from the French party include a general manager and a deputy general manager. Managerial personnel of Chinese party admitted during the interviews that both parties often come to a deadlock when divergences occur as result of this organizational structure.

#### 8.1.2 Operation and Production

8.1.2.1 External services. According to managerial personnel of Chinese party of the Joint Venture, after the establishment of the Joint Venture, the service areas keeps on expanding, reaching 320.05 square kilometers; serviced population increases steadily, reaching 1.7 million; number of water meters in use increases by 70,000, reaching 660,000 and length of pipeline network increases by 121,400 meters, reaching 2,065,383 meters. Size of the Joint Venture has been expanded. However, they also admitted that expansion of services of the Joint Venture mainly attributes to the development of urban construction of Pudong District and the increase of urban population and has little

connection with the purchase of equity by foreign investors and PPP Project.

8.1.2.2 Reconstruction of Pipeline Network. It is found in the general investigations on urban water supply pipeline network in 2001 that there were 57,110 meters of DN75~500mm water supply pipelines without inner lining inside the service area of the Joint Venture, accounting for 4.2% of total length of 1,376,700 meters of DN75~5000mm pipelines in its service areas. As pipelines without inner lining is susceptible to scale formation, which will result in narrowing of pipe diameter and reduction of velocity of flow, thus seriously affecting the water quality and raising the turbidity of water. In order to solve the problem of secondary pollution in water supply fundamentally, the Joint Venture, in accordance with meeting of “Plan of Urban Water Supply Pipeline Network Reconstruction” of Shanghai Water Authority, invested RMB 46.716 million Yuan in the reconstruction of pipelines of DN100mm×24416m, DN150mm×9311m, DN200mm×6527m, DN300mm×5985m and DN500×10840m, totaling DN100 ~ 500mm×57079m of pipelines without inner lining and took lead in eliminating the pipelines without inner lining.

However, there is scarcely any change in source of funds for construction of pipeline network after establishment of joint venture. Main sources of funds include: firstly, depreciation funds of the Joint Venture; secondly, users applying for new water meters share some expenses for construction of pipeline networks; thirdly, loan for construction of new pipeline networks.

8.1.2.3 Slight Improvement of Water Quality. According to Chinese party of the Joint Venture, Preparation Team for Water Quality Department and Water Quality Center Laboratory was established in 2003 after establishment of the Joint Venture and General Manager from French party was directly responsible for the quality of water, the manning and management of water quality were therefore strengthened. In order to use the management experiences of internationally advanced laboratories, a water quality study group paid a visit to Lyon Central Lab in France. As a result, water quality has been greatly improved after the establishment of the Joint Venture, in which, up-to-standard rate of manganese content and NTU also improved greatly, up-to-standard rate of 4 items

reached 100%, and details are shown in the Table 7.

Table 7 Comparison of Water Quality before and after the Establishment of Joint Venture

	NTU of ex-works water	NTU of pipeline water	Up-to-standard rate of NTU	Average residual chlorine of pipeline water (Mg/1)	Up-to-standard rate of 4 items (%)	Up-to-standard rate of manganese content (%)	Up-to-standard rate of 3 items (%)
Before establishment of Joint Venture	0.20	0.41	98.55	1.27	99.97	95.74	98.53
After establishment of Joint Venture	0.11	0.33	99.57	1.32	100	99.19	99.68

Managerial personnel of Chinese party gave us the example of Waterworks Lingqiao Company for the role of French party in improvement of water quality. Water reserve of Waterworks Lingqiao Company is located in 2 km of downstream of Huangpu River, manganese content of ex-works water did not conform to the standard from time to time in spring of 2002. The Joint Venture paid great attention on this problem and adopted simple and practical potassium permanganate pretreatment techniques that conform to features of raw water used through technical argumentation. After completion and operation of Lingqiao Potassium Permanganate Pretreatment Project in the beginning of 2003, water quality has greatly improved and up-to-standard rate of manganese content has risen from 61.11% in May 2002 to 99.23% in 2003. In 2004, manganese contents of most of waterworks using raw water from Huangpu River failed to meet the standard, while, up-to-standard rate of manganese content of Waterworks Water Company of the Joint Venture is as high as 100%.

## 8.2 Comments of Parties Concerned

During our interviews, all parties concerned spoke highly of PPP Project of Waterworks

Pudong Company. Positive comments from parties involved shows that their intentions detailed in Part 2 and Part 5 have been duly achieved in the project. However, comments of both parties on the problems occurred in the course of PPP and after the operation of Joint Venture are summed up below.

#### 8.2.1 Management of Chinese Party

8.2.1.1 Friction in management between both parties as result of 50%: 50% percentage of equity: As the result of equal percentage of equity, each party has the equal say in the management and operation of the Joint Venture, this is also evidenced by 2 members from each party in the executive committee. As the members of management of Chinese party are appointed by Shanghai Water Authority, they have to take into account of both the opinions of competent government departments and the interests of the JV. It is also likely that both parties have different opinions on the interests and objectives of the JV. In addition, managerial personnel of French party have differences with managerial personnel from Chinese party in management methods, culture and habits. Therefore, some frictions have occurred during the cooperation. Dispute between both parties on some decisions often last a long period of time as result of equal say of both parties, thus greatly affecting the efficiency of decision making. To sum up, conflicts between both parties during the cooperation are inevitable, equal equity of both parties is adverse to prompt settlement of disputes.

8.2.1.2 Role of Orient International Tendering Company in the project. Board Chairman from Chinese party, who gets involved in this Project from beginning to end, believes that employing Orient International Tendering Company by Chinese party during the bid invitation activity is a mistake. He holds that water supply industry is a highly specialized industry, most of tendering companies have no experience in acquisitions in water supply industry, nor do they have expertise in this industry, therefore, these companies are unable to function properly in preparation of bid invitation documents and evaluation plan and drafting of relevant documents. On this account, he believes that expert panel can be employed to replace the tendering company in similar projects in future. It is beyond doubt that the purpose of employing Orient International Tendering Company

which has the background of state-owned enterprise is to make use of its influence on competent departments concerned. However, he believes that expert panel can do the same job.

## 8.2.2 Competent Department on Water Supply Services

8.2.2.1 Supervision and management became more difficult. Planned Water Consumption Management Department of Shanghai Water Authority responsible for dispatching and coordination of water supply in Shanghai found that supervision and management over the Joint Venture became more difficult. This is caused, on the one hand, by the system of administrative management, as Shanghai Water Authority used to have the absolute right of management over Waterworks Pudong Company, which also includes the right of personnel arrangement. It is easier to settle the problem through administrative orders when dispute over interests arises. However, after the establishment of the Joint Venture, it is impractical for it to give the administrative orders to the Joint Venture, and this is particularly true for the coordination with foreign investors. Though relevant clauses of PPP agreement has, to a great extent, restricted the behaviors of the Joint Venture, however, an agreement can never be all-inclusive, some issues not anticipated in the agreement will make the coordination of competent departments more difficult. Due to the differences between Chinese party and foreign party in language and culture, settlement of a problem that was deemed as very simple may be time-consuming.

8.2.2.2 Shanghai Water Authority was expecting the foreign investor to step up the transfer of technologies. Though management of Chinese party believes that foreign party has made some achievements in improving the water quality after the establishment of the Joint Venture, Shanghai Water Authority believes that transfer of technologies by foreign party is far from sufficient, social development of Shanghai has raised increasingly higher requirements for the technical level of water service, foreign party has a lot to be done in technical transfer. For instance, modular waterworks widely used in Europe will contribute greatly to land saving and ozone active carbon technology in water producing technique will be very helpful for the target of compliance with EU standard on water quality by 2010 in Shanghai. However, transfer of technologies shall

mean more investment, which must be taken into account by the foreign investors. Technical personnel from Shanghai Water Authority don't believe that the higher price offer in the bid, the better, because the bidder of the highest price may reduce its investment in other items.

### 8.2.3 Foreign Party

As we failed to interview any managerial personnel from the French party for this study, we can only get the comments of foreign party on the cooperation in the Joint Venture through relevant personnel from intermediate agencies and Shanghai Water Authority. They are mainly concerned with problems which were not anticipated in the original agreement. Here are two examples: 1. Expenses of cross-river pipeline. Shanghai Water Authority has recently decided to build a pipeline crossing over the river between Pudong and Puxi in accordance with the "design concept of high standard and full coverage of one network that are divided into different sections and integration of urban and rural area", which was obviously not mentioned in the agreement, therefore, dispute over sharing of expenses between both parties arose. 2. Salary of workers. According to PPP agreement, income of workers shall increase by 10% every year on the basis of base number of 2001. However, French party has different opinion over the base number, only salary income appeared in financial statement is accepted by French party. It is understandable that the unique welfare system of Chinese state-owned enterprises are unlikely to be accepted by the French party.

### 8.2.4 Workers

According to the agreement, no full-time employees of previous Waterworks Pudong Company (1205) may be laid off and income of workers shall increase by 10% every year on the basis of base number of 2001. While, it can be seen from the operation of the Joint Venture that this objective can hardly be met and actual incomes of workers are on a decrease, for which, workers are dissatisfied. This is mainly because 40% of income of previous Waterworks Pudong Company was paid from revenue of main business and 60% was paid from operation revenue of sidelines, as sidelines were gradually spinned off, revenues from sidelines were inevitably reduced; in addition, as it mentioned above,

some welfares of workers before the establishment of Joint Venture were not recognized by the foreign party as the base number of income. Due to the decrease of actual income, workers became somewhat dissatisfied, but calmed down shortly as result of following reasons: Firstly, persuasion of managerial personnel of Chinese party; secondly, actual income of workers of the Joint Venture, though decreased by some margin, is still higher than the average level of workers in Pudong District; thirdly, these workers are highly specialized, they could hardly survive in other industries.

## **9. Conclusions and Enlightenment**

### **9.1 Main Conclusion**

9.1.1 PPP Project of Shanghai Pudong Waterworks, as a window project guided by the government, has somewhat shown the attitude of local governments towards management achievements. This project was proposed and initiated by Shanghai Municipal People's Government and managed by water sectors, departments concerned hoped to take this project as the experiment and window of reform of public services in Shanghai. Principle of equity, fairness and transparency was followed and quality and efficiency of government organs in Shanghai were best demonstrated in this project. However, decision-making on the reform of water supply services in Pudong was mainly guided by the national policies instead of a reform triggered by the internal contradictions of water sectors of Shanghai. We believe that introduction of private capital into water supply industry may be a tendency, but situations in different cities are different, water sectors in Shanghai was not compelled by limitations of funds or efficiency to introduce private capital. From this sense, reform of Waterworks Pudong Company by Shanghai Municipal People's Government has somewhat shown the attitude of local governments towards management achievements.

9.1.2 PPP Project of Pudong Waterworks is basically successful, and original intention of all parties has been achieved. On the one hand, this project made a start for withdrawal of state-owned assets from public services and realized the reform of marketization in water supply industry under the condition of maintenance and appreciation of value of state-owned asset; on the other hand, it ensured the stability of top management and workers of previous state-owned enterprise, secured the normal operation of the Joint Venture and achieved the objective of positive reform and stable development.

9.1.3 Success of bid invitation activity of this project mainly lies in the attraction of Shanghai and Pudong to investors. PPP Project of Waterworks Pudong is characterized by its public tendering, in which, bid invitation documents prepared by Chinese party is high restrictive on foreign investors and foreign party has little room for bargaining. From this

sense, though strict restrictions have been imposed on investors in PPP Project of Waterworks Pudong Company, bid invitation activity proved to be successful. This is mainly because of attraction of long term potential of Shanghai and Pudong to international strategic investors.

9.1.4 Participation of foreign investor in the management of pipeline network and 50: 50 percentage of equity constituted a breakthrough to the existing systems. Equal equity structure, while increasing the attractiveness to foreign investors, resulted in some difficulties in the management of joint ventures; this problem shall be long standing for joint ventures. Therefore, top management of Chinese party of the Joint Venture holds that further discussions are required for structure of equal percentage of equity.

9.1.5 Operation of the Joint Venture is comparatively smooth and the advantages of the Sino-foreign joint venture require further observation. Some achievements have been made in the production and operation since one year after the establishment of the Joint Venture and the Joint Venture is basically running smoothly. However, development of water supply capability and pipeline construction is mainly caused by the development demand of Pudong District; it does not illustrate the advantages of the Joint Venture. Foreign party only made a start in the transfer of advanced technologies and management experiences and further observation is required.

9.1.6 This project has profound influence on the reform of water services in Shanghai and all over China. The Joint Venture of Waterworks Pudong Company preludes the reform of water services in Shanghai. On June 5<sup>th</sup>, 2002, Shanghai Youlian Coalition, in which private capital possesses 85% of equity, won the bid in the public tendering for domestic investors and entered into agreement with Water Assets Operation and Development Company under Shanghai Water Authority on concession of Zhuyuan Sewage Water Treatment Plant, the largest sewage water treatment project in Shanghai with a total value of RMB 870 million Yuan, for a duration of 20 years, On Sept. 28<sup>th</sup>, 2003, Yangchen Water Drainage Operation Co., Ltd., the first water drainage operation company with diversified investment in Shanghai, was established, in which, Yangchen Investment Co., Ltd. has 90% of equity and Shanghai Urban Water Drainage Shinan Operation Co., Ltd.

has 10% of equity, it has the assets of Longhua Water Purification Plant, Changqiao Water Purification Plant and Minking Water Purification Plant worth RMB 180 million acquired by its mother company from Shanghai Municipal Water Drainage Co., Ltd. Denationalization of Pudong New Area Waterworks, another waterworks under the government of Pudong New Area, is currently under preparation. In addition, according to Shanghai Water Authority, after the success of PPP bid invitation activity of Waterworks Pudong Company, water sectors from other cities are also learning the experiences of Shanghai. It can be expected that this Project will have profound influences on water reform of Shanghai and other cities.

## **9.2 Enlightenment**

9.2.1 Model of public tendering dominated by Chinese party is not always applicable to other cities. Model of public tendering in which Chinese party prepared the bid invitation documents has improved the efficiency of negotiation. As mutual negotiation is adopted by Shenzhen Water (Group) Co., Ltd. and General Water Company, the progress of their project is much slower. However, strict restrictions have been imposed on investors in Pudong Model, its success in Pudong does not necessarily mean that this model is also applicable in other cities. Therefore, water sectors in other cities shall take full account of their local conditions in learning the experiences of reform of water supply services in Pudong to find out new methods for introduction of private capital.

9.2.2 Opening up of pipeline network in water supply industry will become a trend. Water supply service reform in China basically experienced three stages. During the first stage, foreign investors invested in waterworks projects in urban water service industry in the form of cooperative business operation with fixed returns; second stage is characterized by investment model of BOT (Build - Operate - Transfer) in urban water service industry; Role of the government in the above investment models is to ensure an appropriate return for investors by price and quantity of water. Though these models have gained the investment for local governments in a short run, however, in addition to investment returns that are on a higher level, there exists a major drawback; when these models are adopted, integrity of urban water service industry will be adversely affected, as only

construction and operation of waterworks are involved in these projects, integrated management of urban water system and service optimization for users are inevitably neglected. Under these models, investment returns of social capital are separated and protected by the government and fixed returns are guaranteed by the government directly or indirectly, market principle of risk sharing are not followed; therefore, these models cannot be regarded as reform of property rights in a real sense. Government has withdrawn from the guarantee system in a real sense in the model of transfer of equity of water services, and the joint venture is required to gain investment yields with its services and quality, in which, essential contents of marketization are involved.

9.2.3 Practice of separation of existing major and subsidiary business through PPP Project can be used as references. There exist monopolized businesses and non-monopolized businesses in urban water supply industry; state-owned capital shall gradually withdraw from non-monopolized businesses and further withdraw from competitive services like maintenance, engineering, technical equipment, drinkable water and some other services completely. Supporting sidelines can be selected for major business through market competition. Though separation of major and subsidiary business, as the precondition of PPP Project of Waterworks Pudong Company, may have negative impact on income of workers in a short run, it represents the trend of reform in water supply market in a long run. Pudong Project has made a good example in this regard. Preparation for separation of major and subsidiary business is currently on the way for the water service reform in Nanjing.

9.2.4 New supervision and management system applicable to the privatization of public services shall be sought after and established. As management personnel of public service sectors were mainly appointed by the government in the past, competent government departments can exercise their supervision with the support of their administrative authorities, however, it is beyond doubt that supervision will become difficult after denationalization of public services, this is best demonstrated in the supervision of Shanghai Water Authority over the Joint Venture after PPP. As the water supply industry has the characteristics of embodying both market products and public products, effective management and control of water supply industry will discriminate these functions

properly, in which, control and management of government departments shall only be limited to public products. On the one hand, the social responsibilities of enterprises shall be stipulated by laws and regulations; on the other hand, government shall, instead of completely withdrawing from the water service industry, give financial support to non-operating assets like investment in water resource protection and water savings to achieve social benefits; in addition, some projects which have wide connection and require unified planning of resources like pipeline network projects should be invested in and implemented by the government to give fully play to the advantages of government in coordinating and improving the efficiency.