# COMPARATIVE ANALYSIS OF CHINESE BOT PROJECTS IN WATER SUPPLY

Chen Chuan, Research Assistant, The Pennsylvania State University

John I. Messner, Ph.D., Assistant Professor, The Pennsylvania State University

## ABSTRACT

China has been testing the Build-Operate-Transfer (BOT) delivery method for the development of infrastructure since 1984. However, there has been a varying degree of success on BOT projects, and the Chinese government continues to shift and revise their delivery approach to improve the potential for success based on the lessons learned from these projects. This paper compares the delivery of three BOT water projects in China, and provides insight into the BOT process diversification and evolution. This analysis focuses on governmental initiatives in project structuring. Critical lessons are drawn from the comparative study to determine the impact of the changes made to the delivery process of the projects. These lessons can be used to improve BOT viability in China and provide valuable information to other countries that are currently structuring policies for private participation in infrastructure.

*Keywords: Build-Operate-Transfer (BOT), water sector, governmental support, tariff, approval, dispute.*

## INTRODUCTION

The ongoing environmental and development challenge to supply clean and safe portable water to 1.3 billion Chinese people has left the Chinese policy makers no choice but to bolster the water supply industry. Out of 668 cities in China, 400 lack an adequate water supply, and 110 face severe water shortages. During the 1990's, water supply grew at an annual rate of only 3%, substantially lower than the double-digit growth of the economy. The water supply shortage stems from scarce and unevenly distributed water resources; lax enforcement of environmental regulations and standards; contamination; minimal investment; and leakage from distribution systems.

To compound the problem, water consumption driven by further urbanization and industrialization is expected to further increase as the economy grows. By 2030, urban industrial water consumption is projected to increase from the current 37 billion cubic meters per year to 66 billion, and the urban residential water consumption is projected to increase from the current 26 billion $m^3$ to 66 billion $m^3$. The total annual urban water consumption is projected to increase by 70 billion $m^3$ to 132 billion $m^3$.

There are many new factors influencing the growth and changes in China's water treatment market. They include, but are not exclusive to, changes in environmental regulations; increased enforcement of environmental regulations; priority given to water projects by international lending institutions such as the World Bank and Asian

Development Bank; a move to market price water; changes in water project financing; and a growing awareness of water pollution.

Water supply has climbed considerably on China's list of infrastructure priorities over the last several years (Silk and Black 2000). Foreign investment in water treatment plants is "encouraged" in the Catalogue of Directing Foreign Investment in Industries ("Catalogue", 1997 version) and water distribution network has just become "allowed" in the latest version of the Catalogue (2002 version). The State Council enacted a tariff setting administration framework in 1998, giving cities the authority to set tariffs without central government approval. Municipal water utilities can now formulate tariff systems enabling them to earn reasonable returns in addition to recovering costs, and attract foreign and local private participation. Foreign participation in the industry is on the increase and the industry is responding to this influx of capital and expertise. Nevertheless, foreign involvement is still limited.

There are different models for foreign participation in Chinese infrastructure projects. Current known modalities involving foreign private sector participation can be broadly categorized as being either: 1) traditional joint venture structures involving public sector entities assuming most of the construction, operation, supply, and off-take responsibilities and risks; or 2) BOT structures involving wholesale private risk-taking, ownership, and control (Silk and Black 2002). Traditional joint venture structures are by far the most extensively practiced and successfully tested approaches in comparison with BOT structures. However, BOT structures entail a higher degree of private participation and give significant benefits to both the public and private sectors compared to traditional joint venture structures. Due to these potential benefits, the BOT approach has recently attracted much attention from industry, government and academia.

## BOT IN CHINA: DEFINITION, TAXONOMY AND APPLICATION STATUS

The typical BOT approach involves the government granting a concession for certain new infrastructure to a private sector entity, a bidding consortium, or a project company. In turn, the concessionaire finances, designs and constructs the infrastructure, and operates it for a certain period of time (generally 10 to 30 years) to pay off the capital debt and earn a reasonable rate of return from the operating revenue. The concessionaire then transfers ownership of the infrastructure to the government free of charge or at an agreed upon price at the end of the concession period.

China's BOT projects can be classified into six types (Chen 2002): Sino-Foreign Cooperative Joint Venture (SF CJV) BOT, Sino-Foreign Equity Joint Venture (SF EJV) BOT, Official Wholly Foreign Owned (WFO) BOT, Non-Official Wholly Foreign Owned (WFO) BOT, Foreign BOT Variants, and Domestic BOT.

Between 1984 and 2000, projects with foreign investment that were widely recognized by the industry and academic circles as BOT projects are listed in Table 1. Among these BOT projects, there are 6 power plants, 4 transportation projects, and 3 water plants.

Table 1: Foreign privatly financed BOT projects in China

| Project name | Location | Project cost (US$) | Term (yrs) | Cont. year* | BOT type |
|---|---|---|---|---|---|
| Shajiao B Power Plant | Guangdong | $540m | 10 | 1984 | EJV |
| Guang-Shen-Zhu Highway | Guangdong | $1,150m | 30 | 1987 | EJV |
| Yan'an Donglu Tunnels | Shanghai | $217m | 30 | 1993 | EJV |
| Jingtong Highway | Beijing | $193m | 20 | 1994 | N/A |
| Zhuhai Power Plant | Guangdong | $1.20b | 20 | 1995 | CJV |
| Shanghai Dachang Water Plant | Shanghai | $73m | 20 | 1996 | WFO |
| Laibin B Power Plant | Guangxi | $616m | 18 | 1996 | Official |
| Puqi Power Plant | Hubei | $500m | 20 | 1997 | WFO |
| Tangshan 1 Power Plant | Hebei | $173m | N/A | 1997 | N/A |
| Yichang Bridge | Hubei | $600m | 28 | 1997 | N/A |
| Changsha Power Plant A | Hunan | $700m | 20 | 1998 | Official |
| Chengdu No.6 Water Plant B | Sichuan | $106.5m | 18 | 1999 | Official |
| Beijing No.10 Water Plant A | Beijing | $210m | 20 | N/A | WFO |
| Average | - | $483m | 21 | - | - |

N/A: Not available

Contract year: year in which concession agreement was officially signed

The average water project cost is US$130 million, apparently cheaper than the others. To date, most projects in the list have been successful. In the Chengdu Water Plant Project, construction works were completed two months ahead of schedule. The Guang-Shen-Zhu Highway seems to have incurred a cost overrun; however, the concessionaire can make up for this from very profitable development of the adjacent property (Menheere and Pollalis 1996). The only exception is the Changsha Power Plant Project where the financial arrangement could not be concluded because of the reform in the energy industry. Nevertheless, the development progress of the Changsha project was faster than that of the Laibin B. Despite the great track record of BOT application, the number of real BOT project is still very small and traditional joint venture models are the mainstream for foreign private participation in infrastructure. To promote the BOT method in China, there are still many improvements that need to be performed.

## RESEARCH METHODOLOGY

BOT is an imported concept in China, and therefore the BOT framework successfully tested in other countries, must be structurally adjusted to accommodate the existing social, legal, economic, political, and technological (SLEPT) environments of China. The BOT application in China, a country full of changes, has evolved in an ad hoc manner and a mature Chinese BOT framework has not been established. To expand BOT application and improve the potential for project success, it is important to scrutinize and learn from previous BOT projects.

This paper presents three case studies of BOT projects in the Chinese water supply sector to analyze the governmental initiatives in project structuring and successful strategies implemented by private parties. The methodology for this research is a four-step process: (1) review extensive literature on BOT project structuring and strategic planning; (2) collect general data on BOT applications in China; (3) collect factual data from the three BOT projects in China (the Shanghai Dachang Water Plant, Chengdu No. 6 Water Plant B, and Beijing No. 10 Water Plant A) from a literature review, telephone interviews, and face-to-face interviews with developers, government agencies, consultants, contractors, and subcontractors; and (4) compare the data of the three projects to identify the diversity and evolution of government initiatives in project delivery.

## DESCRIPTION OF CASE STUDY PROJECTS AND ENVIRONMENT

### The Shanghai Dachang Water Plant

A 50:50 joint venture composed of Bovis Construction and Thames Water Overseas Ltd. received the first BOT contract in the water supply sector for the Dachang Water Treatment Plant in Shanghai in 1995. The contractual arrangement of this project is depicted in Figure 1. Among these participants, both Thames Water Overseas Ltd. and Thames Water International Services are subsidiaries of Thames Water; Bovis Asia Pacific is a subsidiary of Bovis Construction; and the People's Bank of China is the central bank of China.

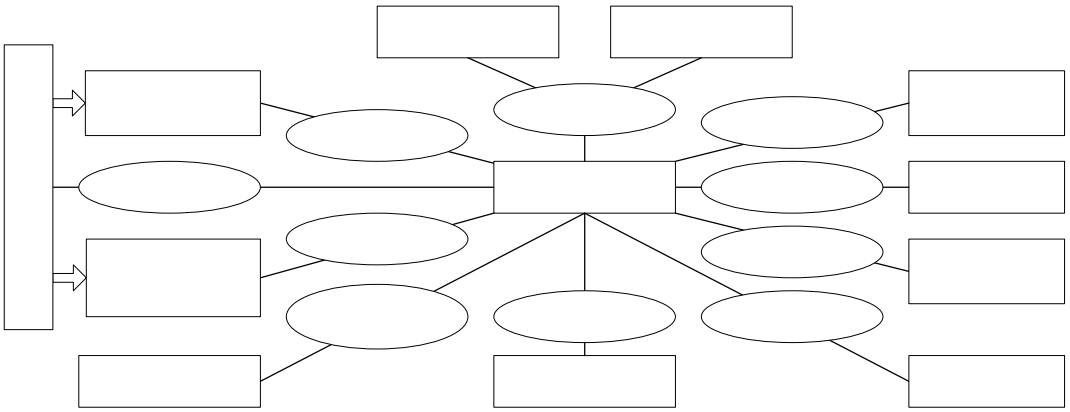

Figure 1: The contractual arrangement of the Shanghai Dachang Water Plant Project

### The Chengdu No. 6 Water Plant B

The Chengdu No.6 Water Plant B is the first BOT project performed under the BOT Circular, therefore, recognized as the only BOT project by the central government. This project was won in a competitive bidding process by the 60:40 Vivendi-Marubeni consortium in 1998 and the 18 year concession agreement was officially signed in 1999 upon financial closing. The contractual arrangement of the project is depicted in Figure 2. The Consortium of Vivendi Affiliates include Campenon Bernard SGE, Omnium de Traitements et de Valorisation, and SADE Compagnie Générale de Travaux d'Hydraulique.

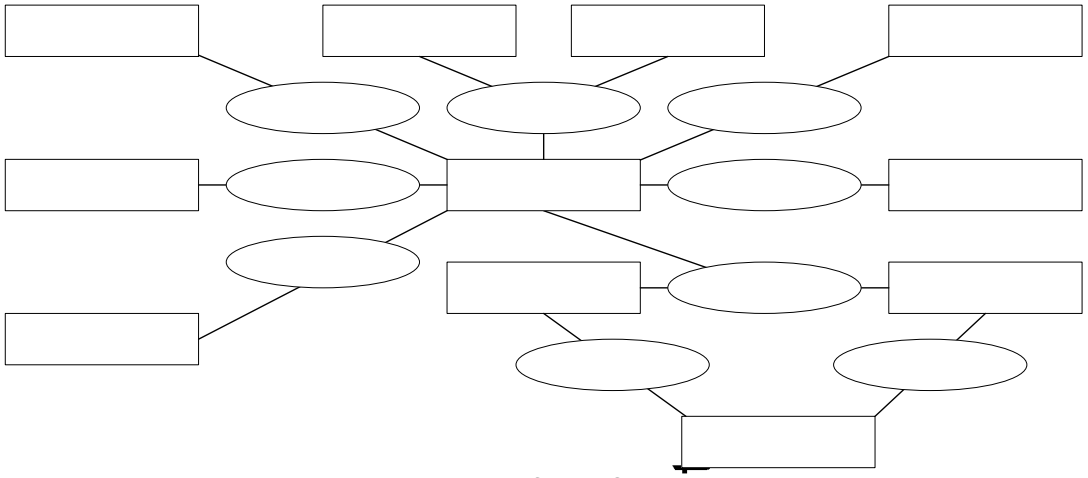

Figure 2: The contractual arrangement of the Chengdu No. 6 Water Plant B Project (adapted from Silk and Black 2000)

**The Beijing No. 10 Water Plant A**

The Beijing No.10 Water Plant was initially granted to Anglian-Mitsubishi Consortium in April 2002. This project of a capacity of 500,000 $m^3$ per day is so far the largest one under BOT structure in Chinese water sector. The contractual arrangement of the project is depicted in Figure 3. Among the participants, Beijing Miyun Water Reservoir Division, Beijing Capital Group, Beijing Municipal Waterworks Company, and Beijing Public Utility Board are subsidiaries of the Beijing Municipal Government.

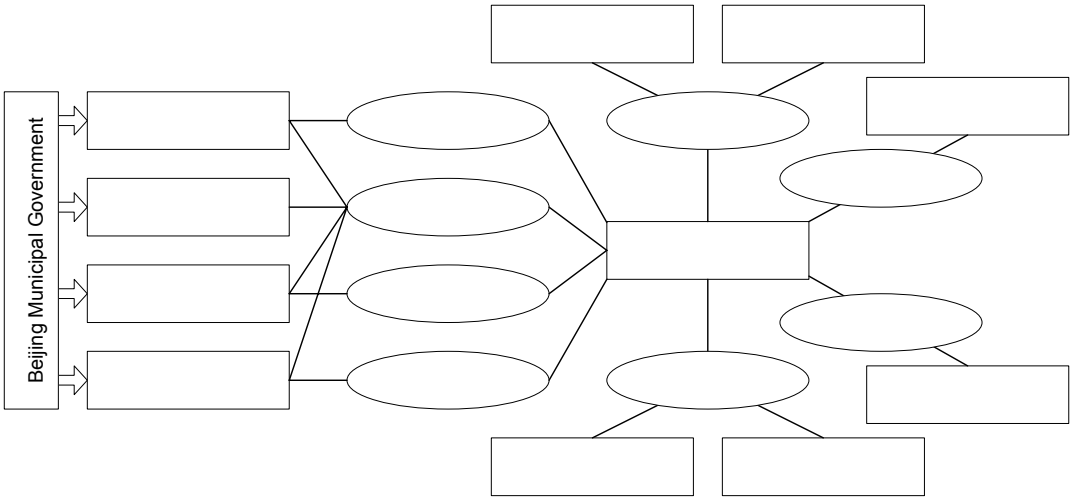


Figure 3: The contractual arrangement of the Beijing No.10 Want Plant A Project (Adapted from Silk and Black 2000)

Major changes in the SLEPT environments related to BOT applications in China are summarized along the timeline of the three projects in Figure 4.

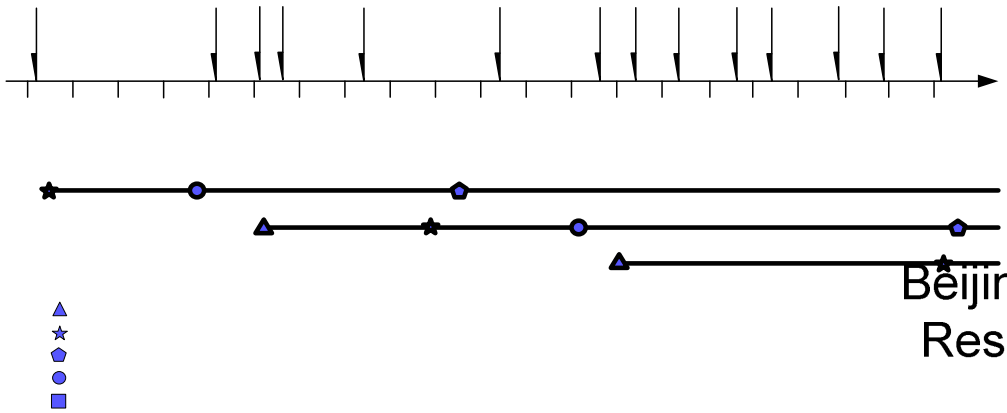


Figure 4: Timeline of the BOT-related environmental changes

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The influences of these changes are roughly summarized in Table 2. It is observed that the Shanghai Project was progressing in an explorative manner before many governing laws and regulations became effective, and it luckily avoided some economic crises; the Chengdu Project was carried out under a stronger legal framework, but experienced an unstable economic environment at the planning, bidding, and finance-raising stages; and the Beijing Project has the best investment environment. The responses to some of these changes from governmental initiatives are discussed in the following sections.

Table 2: Major BOT related environmental changes

| Major changes | Time | Influences |
|---|---|---|
| BOT Circular | Aug-95 | BOT experiment program and Official BOT projects in some sectors |
| Capital accounts administration reform | Dec-96 | Increasing convertibility of foreign currency in China based business |
| Project finance circular | Apr-97 | Constraints on limited recourse financing |
| Asian Economic Crisis | 97 | Decreased foreign direct investment in Asia area |
| Catalog directing foreign investment (1st revision) | Jan-98 | Different constraints on foreign investment in different industries |
| Guangdong Credit & Trust Co. bankruptacy | Jan-99 | Decreased creditworthiness of Chinese governments and their subordinates |
| Contract law | Oct-99 | Governance on contracting |
| Tendering law | Jan-00 | Governance on tendering |
| Circular on foreign investment in urban utilities | May-00 | Governance on foreign investment in urban utilities |
| CIETAC rules | Oct-00 | Governance on Arbitration |
| Western China Development strategy | Jan-01 | Increased attractiveness of western China |
| Beijing Olympic Game winning | Jul-01 | Increased attractiveness of Beijing |
| China WTO entrance | Nov-01 | Increased opening of market |
| Catalog directing foreign investment (2nd revision) | Apr-02 | Different constraints on foreign investment in different industries |

## PROJECT CHARACTERISTICS

The characteristics of the three projects are summarized in Table 3 in a comparative perspective. Diversity and evolution of these characteristics are described below.

The Chengdu Project is the only “official” project endorsed by the central government under the BOT experiment program as a template for future projects. However the Beijing Project is not a copy of this model project, indicating that there are still many obstacles to use the Chengdu Project as a model. The Chengdu Project is the only one carried out in Western China, indicating that BOT approach is viable where the investment environment is less favorable than the East and Coastal area. The concession grantor in the Shanghai and Beijing Projects are not the municipal governments as in the Chengdu Project, rather their administrative subsidiaries. The Chengdu and Shanghai Projects have the same production capacity, however the cost of the former is higher, except for inflation, the Chengdu Project incorporates a greater scope of work, e.g. intake facilities and transition pipeline. The Beijing Project’s cost is nearly double that of the Chengdu Project, one reason is that in the Chengdu Project, there is no pumping station due to its high elevation.

The government support, procurement method, tariff formulae, approval system, and dispute resolution system of the three projects are the major factors that this research addressed. Government initiatives centered on these five factors in adopting BOT framework in developing private infrastructure in China.

Table 3: Comparison of the characteristics of the three BOT projects in water supply

| Variables | Shanghai Dachang | Chengdu No.6 | Beijing No.10 |
|---|---|---|---|
| BOT type | Wholly Foreign Owned and Non-official BOT project | Wholly Foreign Owned and Official BOT project | Wholly Foreign Owned and Non-official BOT project |
| Location | Shanghai City, the most advanced city in China, East and Coastal Region | Chengdu City, the capital of Sichuan Province, Western Region | Beijing City, the capital of China, the Eastern and Coastal Region |
| Concession grantor | Shanghai Municipal Waterworks Company (SMWC) | Chengdu Municipal Government | Beijing Public Utility Board |
| Construction cost | US$73 million to construct a potable water treatment, storage facilities, water intake facilities, and pumping station. | US$106.5 million for the treatment plant works, equipment and control system, water intake facilities, a discharge pipeline with a total length of 1030 meters, ad a 27 km water transmission pipeline (DN2400 mm) connecting to the urban water transmission | US$ 210 million for the treatment plant works and an extra sum of RMB 2500 million for a 75 km water transmission pipeline (DN2200 mm) connecting to the Miyun Reservoir. |
| Contract year | The concession was awarded in October 1995. Project financing began in November 1995 and took 12 moths to finish. | The concession agreement was initialed in July 1998 and formally signed in August 1999 upon project financing. | The concession agreement was initiated in April 2002. |
| Concession term | 2 years for construction and 20 years for operation | 2.5 years for construction and 15.5 years for operation | 3 years for construction and 20 years for operation |
| Production capacity | 400,000 $m^3$ per day and the peak capacity is 520,000 $m^3$ per day | 400,000 $m^3$ per day | 500,000 $m^3$ per day |
| Government support | Municipal government regulation and Letter of support in offtaking and compensation; no guarantees. People's Bank of China help. | Offtaking and raw water supply, and foreign currency as primary obligor in concession agreement. | Municipal government regulation in offtaking, raw water supply, dispute and compensation. |
| Procurement method | Negotiated project | International open bidding project | International open bidding project |
| Tariff formulae | Cost plus fixed rate of return tariff system. The Shanghai government authority pays the Bovis-Thames company interest on the bank loan, repayment costs of the bank loan capital, repayment of the investors' equity and return on equity at an undisclosed rate | Fixed price tariff system accounting for variations to reflect exchange rate fluctuations and to compensate the consortium in other limited instances. | Fixed price tariff system accounting for variations to reflect exchange rate fluctuations and to compensate the consortium in other limited instances. |
| Approval system | No pre-packaged approvals; no coordination help from government. | Pre-packaged approvals; coordination by Bidding Committee. | Pre-packaged approvals; coordination by Bidding Committee. |
| Dispute resolution process | International arbitration recourse | Domestic arbitration recourse | Domestic arbitration recourse |

## Governmental support

The BOT method features a long term, high investment, complex structure and process with exposure to multiple risks. To promote the BOT application in developing countries, the government must take an active role, which includes not just creating a macro investment environment conductive to private participation, but also supplying necessary securities and coordination on a project level.

Chinese law currently prohibits foreign ownership and management of water and power distribution networks, so the success of a water plant BOT project will depend greatly on the performance of local utilities as raw water suppliers and treated water off-takers. The lack of financial transparency that pervades many Chinese state-owned enterprises and the subsidized, and sometimes inefficient, business conditions under which they operate make issues of credit and performance acute. The method used by the government to enhance the creditworthiness of local utilities is an issue of significant importance to the project. In the Shanghai Project, the Shanghai Municipal Government promulgated the Circular on Dachang Water Plant Administration, speculating the supply and off-taking

responsibilities of related utility companies, and gave the concessionaire a Letter of Support to confirm its commitment and facilitate debt financing. The Beijing Municipal Government will do the same by issuing a specific government regulation spelling the responsibilities of various governmental subsidiaries in concession granting, raw water supply, off-taking, and dispute resolution and compensation. Differently, in the Chengdu Project, the government was directly involved into contracting to take the raw water supply and treated water off-taking obligations as the "primary obligor".

According to the Circular on Foreign Investment in Urban Utilities, revenues in BOT projects must be dominated in Renminbi, which cannot be freely convertible. Since all the three projects were funded with US dollars, there are risks on profit convertibility and remittance. In the Shanghai Project, the project company entered into a Best Endeavors Cooperative Agreement with the People's Bank of China, the central bank. This provides the project company with access to the Shanghai Foreign Exchange Swap Centre and the China Foreign Exchange Trade System, reducing the consortiums' foreign exchange and transfer risks. In December of 1996, China reduced its foreign capital accounts administration policy and the US$ dominated items under regular items can be freely convertible. Therefore foreign currency risk becomes a problem of approval.

BOT project involves so many parties from both the public and private sector. Coordination is very important as a day by day concern. The project company can be the hub for coordination on the private side, and it is a big advantage if there is a coordinating team on the public side. Fortunately, in the Chengdu Project, there was a bidding committee through the bidding stage and a coordinating committee through the 'build' and 'operate' stages, contributing significantly to the project performance. In the Beijing Project, a similar coordinating arrangement is expected.

**Procurement method**

Most foreign invested infrastructure projects in the 1980's and early 1990's featured exclusive negotiation. The Shanghai Project was a negotiated project, while the Chengdu and Beijing Projects were delivered through an international open bidding process with a prequalification stage.

The adoption of international competitive tendering has led to many significant advantages: transparency, fairness, and a more efficient allocation of resource and expertise. This has allowed bidders to focus on cost the technical factors rather than time-consuming negotiation and political matters (Silk and Black 1999). The complexity involved in the planning stages was supported by experienced consulting companies like Dayue Consulting Co. Ltd. serving the government entities in both projects. The high development cost (US$ 8 million the Chengdu Project and US$ 13 million in the Beijing Project) were repaid by the concessionaire once the concession agreement became effective. The government's criteria for bid evaluation include a financial proposal, technical proposal, response of legal documents, and medium water price (the difference between offtaking prices and raw water prices). Overwhelming priority (weight of 70-80% according to interviews) was given to water price, because: 1) water supply is public welfare; and 2) high quality of treated water is not emphasized because of the mixed and deteriorated distribution networks.

This leads to the bidder giving lowest bid always being the winner in both projects. The bidding processes were very competitive. In both projects, seven consortiums made up of world famous infrastructure developers, global players, and constructors passed prequalification and five of them submitted their bids. The competition resulted in squeezed margins. Table 4 shows the difference between expected and real tariff for the Chengdu and Beijing Projects.

Table 4: Expected and real water prices in the Chengdu and Beijing projects

| | Chengdu project (Yuan/$m^3$) | Beijing project (Yuan/$m^3$) |
|---|---|---|
| Expected base price (before bidding) | 1.50 | 2.60 |
| Real base price (after bidding) | 0.90 | 1.40 |
| Difference | 0.60 | 1.20 |
| Variance of expectation | 66.67% | 85.71% |

Source: Dayue Consulting Co. Ltd. (2002)

Nominated subcontractors appear in the Beijing project contracting, showing the increased tendency of government control of peripheral contract acquisition.

There were apparent benefits to and no strong impediments against governments utilizing open bidding for BOT project procurement. The Circular on Foreign Investment in Urban Utilities promulgated in May 2000 further specified that medium and large sized urban projects should be delivered through selected or open bidding. It can therefore be foreseen that future BOT projects would be acquired through open bidding.

**Tariff formulae**

Perhaps the biggest impediment to growth in the Chinese water market has been the lack of market pricing for water. Water prices have been subsidized by the government, and most areas pay only a fraction of the actual costs for water delivery. Lack of a return on investments has made water projects impractical for foreign and domestic investors alike. That is the reason why fixed return of return tariff was used in the Shanghai project. The Shanghai government authority pays the Bovis-Thames company interest on the bank loan, repayment costs of the bank loan capital, repayment of the investors' equity and return on equity at an undisclosed rate.

A cost plus formulae protected the concessionaire from any commercial risks, and discourage effort in efficiency and cost control. The disadvantage is potentially more serious in a Wholly Foreign Owned BOT projects where the private parties take wholesale control than in JV projects where the Chinese partner takes most of the management responsibilities. The World Bank therefore persuaded the Chinese government to abandon such tariffs for it is not good for both parties in the long run.

In the Chengdu Project, a different tariff formula is suggested. The water price includes four parts: fixed operating tariff, flexible operating tariff (taking into consideration foreign exchange fluctuation), tariff for additional water supply (over 400,000 $m^3$ per day), and raw water tariff. The Monthly payment is the sum of the following items:

(1) (Fixed operating tariff + Flexible operating tariff) × Contracted Quantity,
(2) Additional Quantity × Additional tariff, and
(3) (Contracted quantity + Additional Quantity) × Raw water tariff.

The Contracted Quantity is a fixed volume at 400,000 $m^3$ per day and the Additional Quantity is the quantity off-taken by the CMG in addition to the Contracted Quantity.

This predominantly fixed price structure, by providing only for variations to reflect exchange rate fluctuations and to compensate the project company in other limited instances, acts as an incentive for the project company to build and operate efficiently to reduce costs. Another benefit of fixed price tariffs in comparison with the cost-plus formula used extensively in the power sector, is to mitigate the tariff approval risk (Silk and Black 2000). Firstly, their application is very objective, facilitating auditing by related authorities. Secondly, the specific pre-approval of the tariff formula in the offtake agreement seeks to

ensure that the scope of further scrutiny by the tariff approval authorities is restricted to verification that the tariff formula is being correctly applied.

**Approval system**

Up to 30 agencies at the central, provincial, and sometimes, municipal levels have approval authority in any given BOT project, and in diverse areas such as macroeconomic planning, foreign-investment policy, commercial registration, sector regulation, foreign exchange, taxation, land administration, sanitation and environmental protection, customs, and construction (Silk and Black 2000). Each regulator operates under different and sometimes conflicting policy constraints. This makes the project approval procedure difficult and full of uncertainties either to the sponsoring government agency or to bidders/concessionaires.

Figure 5 depicts the approval procedure of the Chengdu Project. Before bidding, it was the responsibility of the CMG to get related approvals from the central government. When the draft CA was signed, most of the responsibilities for the remaining approvals were left to the winning consortium. The bidding documents defined all these remaining approvals for the future concessionaire. This "pre-packaging of approvals" approach removed some of the approval uncertainty by providing a clearer regulatory path and reducing on-going regulatory risks, such as the continuance of approvals, tariff adjustment, and foreign exchange issues. In addition, the Bidding Committee, made up of heads from many government departments and subsidiaries, gave great coordination in acquiring those approvals. Nevertheless, the complexity of the approvals systems remains. Figure 5 also indicates a tendency of government agencies to issue approvals in sequence rather than in parallel with obvious implications on project timetables.

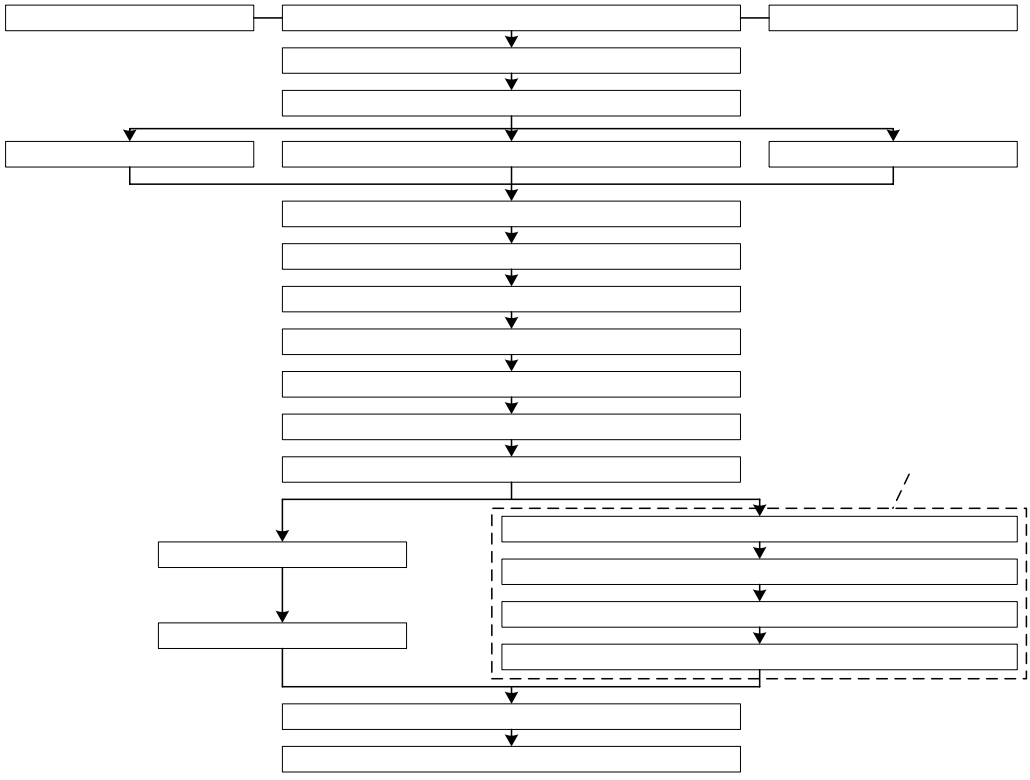
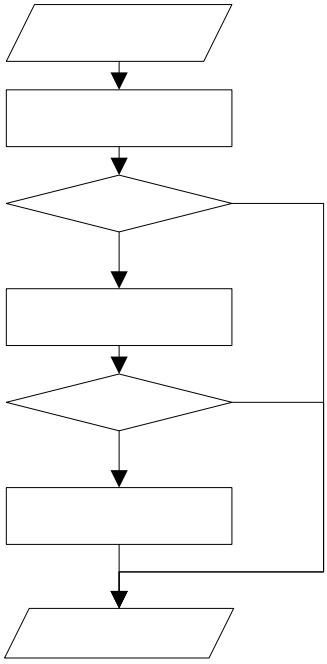


Figure 5: Approval processes involved in the Chengdu Project

The Shanghai and Beijing Projects were not Official BOT projects, rather classified as municipal level projects. This implies less investment credit rating for the project, but also much less scrutiny from the State Development and Planning Committee (SDPC) and more flexibility in approval application on a municipal level. In the Shanghai project, there was no bidding committee, therefore there was not a specific organization for approval coordination for the concessionaire.

**Dispute resolution process**



In China, the legal and regulatory framework governing BOT remains opaque and weak. Lenders and sponsors will have to rely on the terms of the contract as security. Dispute resolution and compensation terms are of great concern. In many early foreign privately financed infrastructure projects including the Shanghai Project, disputes were raised to the Arbitration Institute of the Stockholm Chamber of Commerce as an intermediary. But this takes too long for many investors and no decision is binding (Project & Trade Finance 1994).

The dispute resolution mechanism for the Chengdu Project has a different hierarchical structure including three levels as depicted in the flow chart in Figure 6. Any dispute between the public and private sectors under the Concession Agreement is first sent for amicable negotiation between the members of the Coordinating Committee composed of three representatives from the CGMW and three from the CMG. If the dispute cannot be resolved internally by the Coordinating Committee, it will be submitted to the judgment of the Panel of Experts nominated by the two parties. If any party does not accept the decision of the Panel, the China International Economic & Trade Arbitration Commission (CIETAC) will be the last recourse. The CIETAC is located in Beijing, with branches in Shanghai and Shenzhen. The CIETAC arbitrates in accordance with the Arbitration Rules of the CIETAC. The arbitration award shall be final and binding on all parties. If a party fails to comply with an arbitration award within the stipulated time, the other party may apply to a competent court for enforcement.

No international laws or organizations are involved in this dispute resolution mechanism, but it seemed the concessionaire does not feel uncomfortable about it, indicating that the authority of the local dispute resolution system has been well recognized.

## CONCLUSION

BOT is not a rigid framework. When introduced to a specific country, it must be strategically adapted to accommodate the existing social, legal, economic, political, and technological (SLEPT) environment. China urgently needs more water supply infrastructure to sustain its socioeconomic growth; however the continuous and sometimes radical changes made to the BOT application in this sector progress in an ad hoc manner and a mature framework has not been established. To improve the BOT application, it is important to review and learn from previous projects. This research compared three existing BOT projects in water supply (the Shanghai Dachang Water

Plant, Chengdu No. 6 Water Plant B, and Beijing No.10 Water Plant A) to identify the diversity and evolution of project characteristics.

While it is very difficult to draw definitive conclusions from these case study projects, there are several key differences and possible trends noted through an analysis of the projects. There are different forms of government support provided to the project companies, e.g., promulgation of specific regulation and direct governmental involvement as 'primary obligor', bidding / coordinating committee. It appears that new negotiated water BOT projects will be very few, while an emphasis will be placed on international open competitive bidding to obtain lower priced water resulting in lower profit margins for sponsors. The fixed price tariff system appears to have replaced the cost-plus structure. This system provides incentives for private parties to reduce cost and increase efficiency. The complexity of the approval system remains. However in competitive bidding projects, private parties can get all necessary approvals 'prepackaged' and receive more help from public agencies in obtaining those approvals. The Chinese dispute resolution process seemed to have been recognized by foreign project sponsors.

Two of the three projects are currently in the early operational period, while the third remains in the financing phase. It is therefore difficult to comprehensively measure the performance of the BOT projects and correlate the performance with the governmental initiatives discussed above. Analysis of the three projects will continue to provide insights into BOT project structuring in Chinese water supply.

## ACKNOWLEDGEMENT

The authors would like to thank the Ministry of Construction of PRC, the Chengdu Urban Utility Bureau, the Chengdu Municipal Planning and Development Commission, the Chengdu Generale des Eaux-Marubeni Waterworks Co., Ltd., the Chengdu No.6 Water Plant B BOT Project Coordinating Committee, and the Beijing Urban Utility Board for providing data and advice throughout this research.

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