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**REVIEW OF INVESTMENT OPPORTUNITIES**  
in  
**POWER SECTOR DEVELOPMENT**  
in the  
**PEOPLE'S REPUBLIC OF CHINA**

---

January, 1986

**R.L. Walker & Partners**  
Ottawa

**NIAGARA Consulting Services (1981) Ltd.**  
St. Catharines

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February 17, 1986

Mr. Wayne R. Robinson  
Deputy Director  
East Asia Trade Development Division  
Asia Pacific Branch  
Department of External Affairs  
125 Sussex Drive  
Ottawa, Ontario

Dear Mr. Robinson:

I am pleased to submit our final report on the Review of Investment Opportunities in Power Sector Development in the People's Republic of China.

The report presents a preliminary examination of conditions under which China might attract Canadian equity investment for selected power sector developments. Canadian equity participation would be as a partner in a joint venture enterprise established under the Ministry of Water Resources and Electric Power.

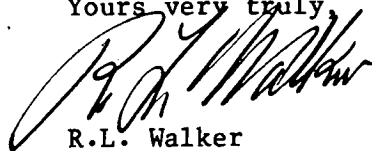
In the absence of a specific framework of policies and regulations providing for foreign participation in power sector development, Canadian organizations from the private sector, with whom the concept was discussed, were not able to be definite regarding their specific interest in considering equity investment in China's power sector, with the exception of Hydro Quebec. Nevertheless, there has been considerable interest in the concept and also significant interest in the potential for project financing in China by the Canadian banking community.

The report illustrates the impact of equity participation through modelling the financing of two major hydroelectric developments: the 13,000 MW Three Gorges and 1,200 MW Gehe Yan projects. Even though the analysis focus upon hydroelectric developments, it is noted that the conditions which would be necessary to attract equity investment would apply equally to the development of any major power facility - hydro, thermal or nuclear.

The rationale for China's consideration of allowing for equity participation in power sector development hinges upon the demonstration effect of applying modern utility management to the development and operation of selected projects, rather than upon the level of financial resources which might be provided in this way. To allow for project financing the creditworthiness of a joint venture enterprise will be judged in significant part on the basis of the experience of the enterprise sponsors. A joint venture enterprise in China established to develop a particular hydro power facility would undoubtedly benefit from the presence in the foreign partnership sponsor of an internationally recognized Canadian utility such as Hydro Quebec.

This review has been carried out by R.L. Walker & Partners in association with NIAGARA Consulting Services (1981) Ltd. We wish to acknowledge the cooperation extended to us by External Affairs and the several departments of government which reviewed a draft of our report. We also wish to acknowledge the useful suggestions offered by Hydro Quebec International and members of the Canadian financial community.

Yours very truly,

A handwritten signature in dark ink, appearing to read 'R.L. Walker', is written over the typed name below it.

R.L. Walker

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Abbreviations and Acronyms

PRC	- People's Republic of China
MWREP	- Ministry of Water Resources and Electric Power
YVPO	- Yangtze Valley Planning Office
GDP	- Gross Domestic Product
GVIAO	- Gross Value of Industrial and Agricultural Output
GIAP	- Gross Industrial and Agricultural Product
MIGA	- Multilateral Investment Guarantee Agency
mTCE	- million tonnes of coal equivalent
kW	- Kilowatt
kWh	- Kilowatt hour
MW	- megawatt (1,000 kW)
MWh	- megawatt hour
GW	- gigawatt (1,000,000 kW)
GWh	- gigawatt hours
TW	- Terawatt (1,000,000,000 kW)
TWh	- Terawatt hour

Energy Conversion Factors

1 ton of coal equivalent	=	7.0	million kilocalories
1 ton of oil	=	10.2	million kilocalories
1 ton of coal (mine average)	=	5.0	million kilocalories
(export)	=	6.5	million kilocalories
1,000 cubic meters of natural gas	=	9.31	million kilocalories
1,000 kWh electricity	=	2.89	million kilocalories (thermal replacement value)

SUMMARY

This report presents the results of a preliminary examination of the case for consideration of Canadian equity participation in the development and operation of selected major power supply facilities in the People's Republic of China.

The study of the prospects for direct participation by the Canadian private sector in such developments arose from discussions in November 1984 between External Affairs and the Ministry of Water Resources and Electric Power, exploring opportunities for Sino-Canadian cooperation in China's power sector development. Madam Qian Zhengying, Minister of Water Resources and Electric Power, in reviewing the Ministry's requirements for foreign financing of developments inquired as to the possibility of Canadian joint venture cooperation in development of some key projects, particularly in large hydroelectric developments.

Although China has in recent years opened the door to foreign investment in its industrial sector, at this time the MWREP has not established policies, nor is there enabling legislation and a regulatory framework which would allow for foreign participation as a joint-venture partner in the development of power facilities. Nevertheless, it was agreed by External Affairs that a preliminary examination of the conditions under which China might attract Canadian equity participation and an initial reading of Canadian private sector interest in such would provide a useful contribution to any future consideration of this approach to power project developments.\* The Ministry's interest in understanding the implications of this approach was confirmed during discussions in October 1985.

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\* R.L. Walker & Partners in association with Niagara Consulting Services (1981) Ltd. were retained by External Affairs in September 1985 to carry out this review of investment opportunities in China's power sector development.



China's power sector grew from some 2,000 MW capacity in 1949 to over 80,000 MW in 1984. Despite this remarkable achievement, there are significant power shortages in most regions of China. The Ministry faces a tremendous task in expanding electric power supplies to meet the aggregate demand projected under China's national economic target of quadrupling its gross industrial and agricultural output between 1980 and 2000. It is projected that power generating capacity may have to increase to nearly 300,000 MW by the year 2000.

China has vast resources of thermal coal and undeveloped hydroelectric potential which are the primary sources of future electric power supplies. However, the major coal reserves are principally located in north eastern China and the major developable hydroelectric potential is in the south and western regions while the major centers of demand are concentrated along the eastern coastal region. Much new capacity development will require the construction of large central hydro and thermal generating stations remote from the major power consuming areas. These projects will require long distance, extra high voltage transmission facilities. Major interconnections between China's several large power systems will also be necessary to achieve economies in sector development.

MWREP anticipates requiring substantial foreign financial support for its power systems expansion. In the course of expanding its systems, the Ministry and China's heavy electrical industries need to acquire up-to-date technologies, both in equipment design and production as well as in construction management and system operations.

While equity participation could provide some small portion of the Ministry's foreign exchange financing needs, the basic rationale for consideration of joint venture participation in development hinges upon the Ministry's needs to acquire expertise and experience in the management of development and operation of major power supply facilities. The application of modern utility approaches to the development and to operations of selected major facilities could demonstrate greater efficiency in individual project development than has been possible under the approaches adopted in the past. This

demonstration effect could, in turn, contribute significantly to the acceleration of other power sector developments in line with national targets.

In the absence of a satisfactory framework of policies and regulations, the study attempts to illustrate the impact of Canadian equity participation through examination of the financing requirements of hypothetical joint venture enterprises as applied to two hydroelectric developments which Minister Qian indicated might be candidates for future joint venture cooperation. These are the 1,200 MW Gehe Yan and the 13,000 MW Three Gorges projects. Both these projects are multipurpose water control developments with significant hydroelectric potential. The financial analysis of development has, however, been modelled on the basis of the cash flows generated by power revenues only.

Although hydroelectric developments have been selected to illustrate the impact of equity participation on the cost of development, and to outline a framework of conditions which would allow for such, it should be recognized that the conditions under which equity participation in hydro development could be attractive to China and to foreign investors would apply equally to the development and operation of large scale nuclear or thermal generation facilities, or to a complex of facilities to be developed under public ownership through a regulated "power utility enterprise" which would be licenced to develop supply facilities within a designated service area.

The Gehe Yan development falls under the responsibility of the Hubei Provincial Power Bureau. The project is located on the Quian Jiang River, a tributary of the Chang Jiang (Yangtze River). It is proposed as the first of a sequence of cascade developments which have been identified for exploitation of the power potential of this river. A feasibility study of the Gehe Yan project was completed in November, 1985 by the Yangtze Valley Planning Office (YVPO) of the Ministry in cooperation with Hydro Quebec International and CIPM Ltd and provides comprehensive details of project costs and implementation.

The Three Gorges project is located on the main stem of the Chang Jiang near the border of Hubei and Sichuan Provinces. The reservoir created by the Three Gorges dam would extend some 250 km upstream into Sichuan province near Chongqing and allow for extending deep sea navigation some 2,100 km inland from the port of Hangzhou. Power from Three Gorges would be fed into the Central and Eastern China Regional power systems.

The Three Gorges development has been under study by the YVPO for many years. Canada, the U.S.A. and several other countries are assisting the YVPO to complete investigations of key components affecting final project design. At this time, however, only provisional information concerning the estimated capital cost of development and schedule for development are available.

It was agreed by the Ministry that for the purpose of this preliminary examination a hypothetical joint venture Three Gorges Development Corporation should include the existing Gezhouba hydroelectric development as part of its asset base. This 2,715 MW run-of-river project is located some 40 km downstream from the Three Gorges damsite. It is being developed by the Ministry as a central government project and will be fully commissioned in 1988.

Financial modelling of each project has been based on the concept of a stand-alone joint venture enterprise which would be responsible for the development and operation of the power facility and would market the output as a supplier of bulk power.

The modelling illustrates the impact on project development costs through comparison of cases "with" and "without" equity participation. In addition, for the joint venture enterprise, the case studies illustrate the risk inherent in projecting financial costs under conditions of uncertainty. Such risk is inherent in any capital investment, but is particularly significant for long gestation developments of hydroelectric power facilities.

The results of the financial modelling for Three Gorges and Gehe Yan are illustrated in Figure 1 and 2 which summarize the case studies of the joint-venture enterprises on project completion. It may be noted that for each project Case A represents development by MWREP agencies without foreign equity participation. Case B1.01 for Three Gorges and Case B1.02 for Gehe Yan are base cases including equity participation, with all other cases representing the risk of cost variances as indicated in the Figures.

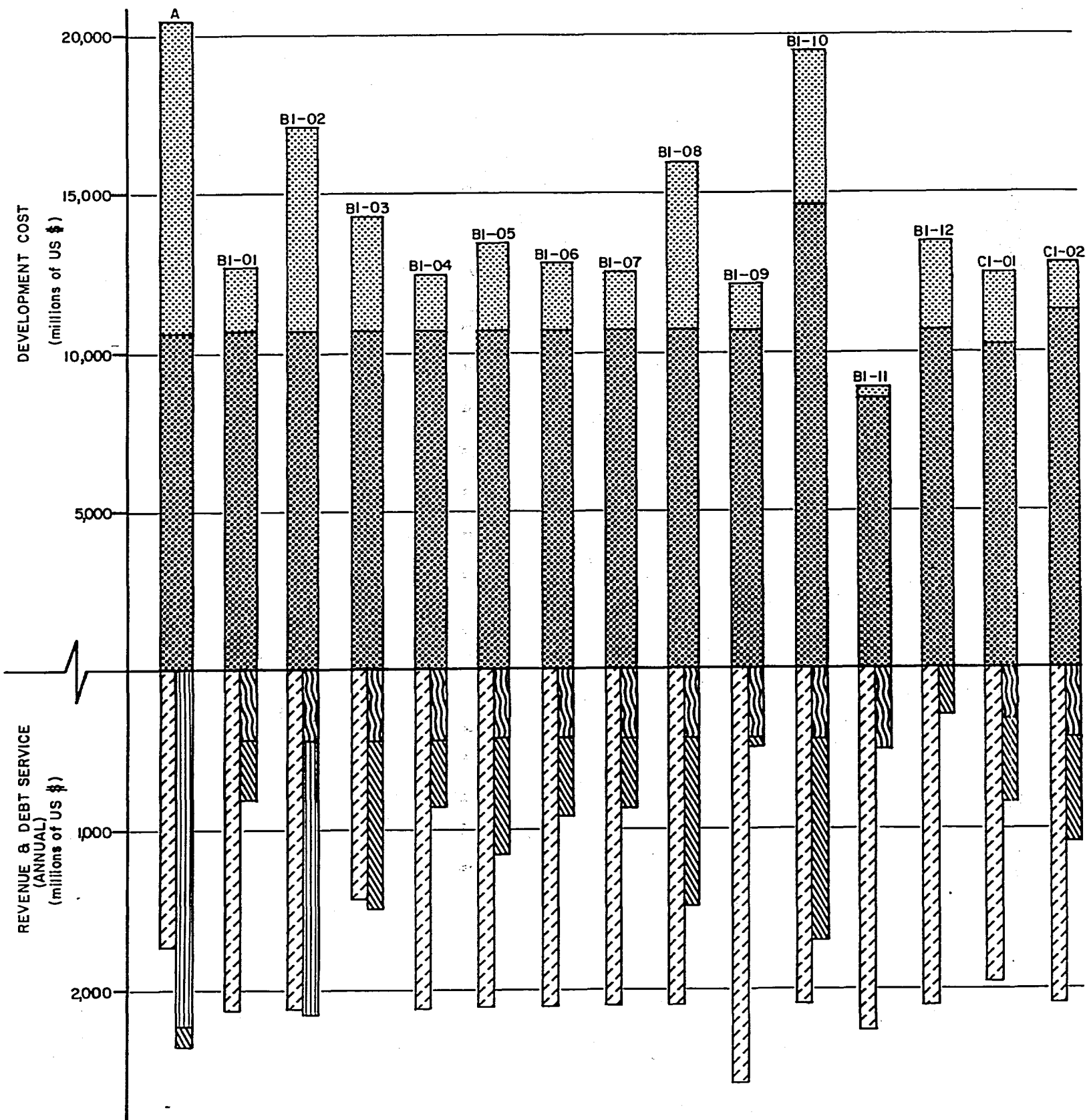
The analysis serves to demonstrate the key principles, constituting a framework of conditions, which would have to be adopted by China to allow for attracting not only equity participation, but also the significant levels of foreign exchange borrowings which would be required on a project basis. Even though no such framework exists at this time, Canadian private sector interests representing potential investors, financiers and power utilities have expressed considerable interest in the conceptual approach.

The analysis suggests that equity participation in a few selected projects may be warranted as effective demonstrations of how China could establish self-financing public sector power utility enterprises.

Concurrent with these studies, the Vice-Governor of Hubei Province visited Canada in December of 1985 to explore possibilities of Canadian financing for the Gehe Yan project. During discussions sponsored by External Affairs it was agreed that HQI/CIPM and the YVPO would explore the availability of Canadian concessional and commercial financing to support project development. It was also agreed that the Canadian and Chinese sides would each set up a study group and cooperate in examining approaches to provide for Canadian equity participation in development of the Gehe Yan project.

The analysis herein suggests the crucial issues affecting consideration of Canadian equity participation will relate to China's willingness to establish conditions assuring an appropriate project revenue base and guaranteeing access to foreign exchange to service

project debt. As indicated by the responses of the private sector financial community in Canada to this study, the credibility of the project joint venture enterprise will also be most important in establishing its creditworthiness.



**LEGEND**

- Case A
  - without Gezhouba
  - no foreign equity
  - borrowings - foreign loan @ 10% interest
  - domestic loans @ 3.6% interest
  - base cost 50% domestic cost 50% foreign exchange cost
  - no equity
  - power revenues not convertible
  - tariff 4.6 fen/kWh, escalated
- Case BI.01
  - include Gezhouba in asset base
  - foreign equity equal to 1/3 of Chinese equity (25% of joint venture equity capital)
  - borrowings - foreign loans at 10% interest
  - domestic loans at 3.6% interest
  - base cost 50% domestic cost 50% foreign exchange cost
  - US\$ 1 = RMB 2.8
  - all power revenues convertible to foreign exchange as required to meet investment costs and debt retirement
  - tariff 4.6 fen/kWh, escalated
- Case BI.02
  - as BI.01 except: power revenues not convertible to foreign exchange
- Case BI.03
  - as BI.01 except: foreign exchange conversion charged at US\$ 1 = RMB 4
- Case BI.04
  - as BI.01 except: base cost taken at 60% domestic 40% foreign exchange
- Case BI.05
  - as BI.01 except: base cost taken at 40% domestic 60% foreign exchange
- Case BI.06
  - as BI.01 except: foreign loans at 12% interest
- Case BI.07
  - as BI.01 except: foreign loans at 6% interest
- Case BI.08
  - as BI.01 except: domestic loans at 8% interest
- Case BI.09
  - as BI.01 except: tariff 5.5 fen/kWh escalated
- Case BI.10
  - as BI.01 except: capital cost increased to US\$ 10.4 million
- Case BI.11
  - as BI.01 except: capital cost RMB 15.95 billion and annual investment requirement for Three Gorges and Gezhouba output as defined by YVPO
- Case BI.12
  - as BI.01 except: no foreign equity participation
- CI.10
  - as BI.01 except: overall schedule compressed to 15 years, with first power in Year 10.
- CI.02
  - as BI.01 except: annual investment requirements as defined by YVPO

- Interest During Construction
- Capital Cost
- Annual Revenue
- Foreign Equity Retirement
- US \$ Loan Retirement (10 years)
- Yuan Loan Retirement (10 years)

**FIGURE 1**

**Case Studies  
of  
Three Gorges Water Control Project**

NOTE: ALL COSTS AND REVENUE VALUES ARE IN US \$ AND ESCALATED TO THE YEAR OF PROJECT COMPLETION.

## 1.0 INTRODUCTION

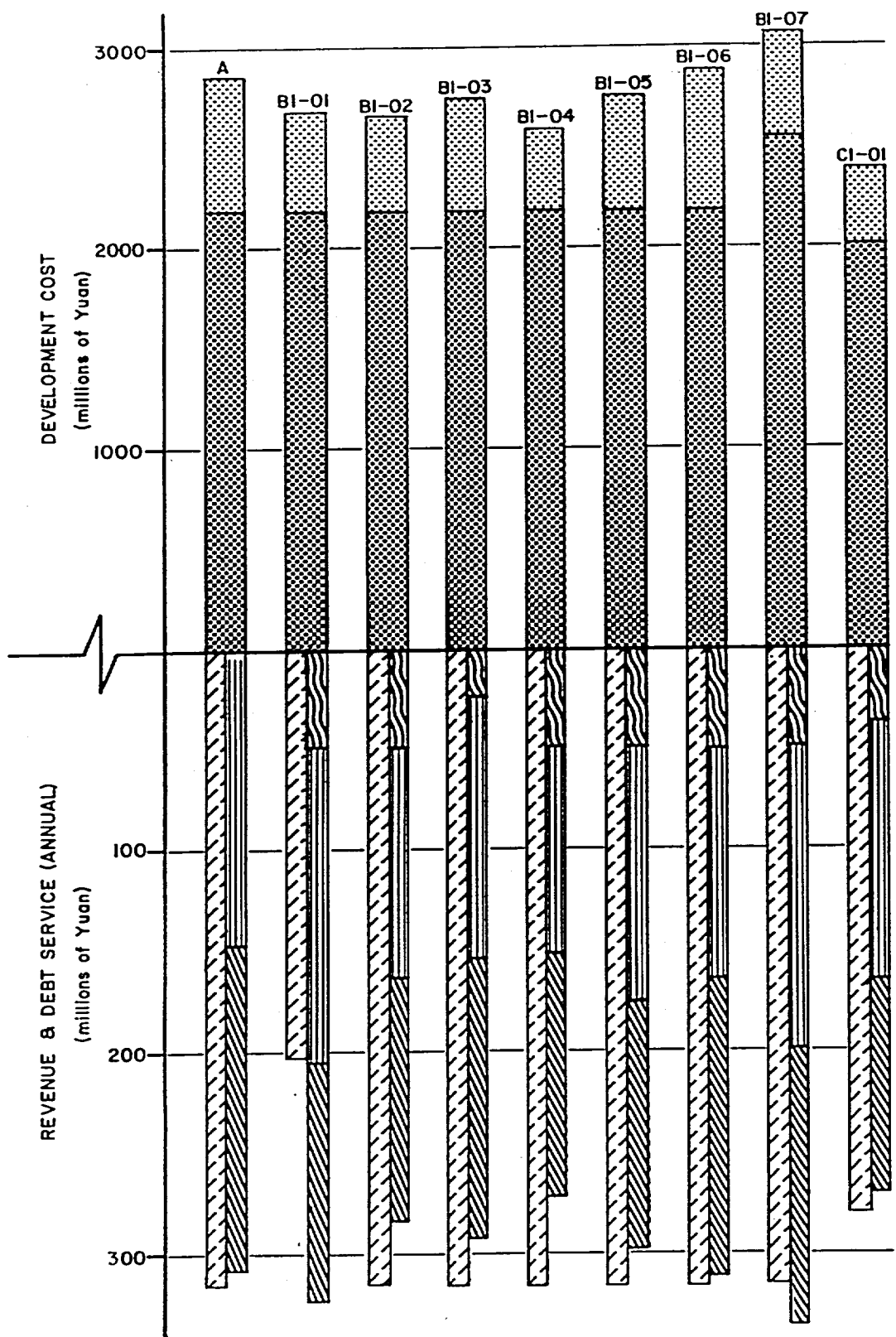
China's Ministry of Water Resources and Electric Power is seeking ways to increase capacity more rapidly than is possible even under the increased level of funding which has recently been allocated to this sector by central authorities\*. During a visit to Canada in January 1984, Premier Zhao Zhiyang invited Canadian cooperation in the development of China's power sector and, in particular, suggested cooperation in the development of large hydroelectric projects such as the Three Gorges development on the Yangtze River.

Following-up Premier Zhao's invitation, the Department of External Affairs organized a hydroelectric power delegation which visited China in November 1984 to present information on Canadian capabilities and ascertain China's requirements for Canadian cooperation. At that time the MWREP signed a Memorandum of Understanding with Canada under which Canadian support for investigation and design of aspects of several large hydro projects and EHV transmission facilities was requested and China's interest in obtaining financial support for power sector development was noted.

---

\* During 1985 it was announced that China's first major nuclear power station, the 1800 MW Daya Bay project, will proceed under the Guangdong Nuclear Power Joint Venture Company which comprises the Hong Kong Nuclear Investment Company (a subsidiary of Hong Kong's China Light and Power Company) and the Guangdong Nuclear Investment Company.

In May of 1985, the Chinese government announced its intention to have foreign corporations finance and construct a number of coal-fired thermal power plants, and established the Hulang International Electric Power Development Company to arrange and manage these investments. It was reported that agreements covering up to 5,000 MW of new thermal generating capacity outside the Plan Program were expected to be concluded during 1985.



LEGEND

- Case A - No equity
- Case BI.01 - Foreign equity equal to one-third of Chinese equity (25% of joint venture equity capital). Borrowings - domestic loans at 3.6% interest. Foreign exchange loans at 10% interest cost.
- Case BI.02 - As BI.01 except: tariff base increased 50% to 6.9 fen/kWh.
- Case BI.03 - As BI.02 except: debt/equity ration taken at 9:1.
- Case BI.04 - As BI.02 except: foreign loans at 8% interest cost.
- Case BI.05 - As BI.02 except: foreign loans at 12% interest cost.
- Case BI.06 - As BI.02 except: domestic loans at 8% interest cost.
- Case BI.07 - As BI.02 except: capital cost increased by 15%.
- Case CI.01 - As BI.02 except: implementation schedule revised to 8 years with first power in Year 7. Cash flow profiles adjusted in accordance with data from feasibility report.







-  Interest During Construction
-  Capital Cost
-  Annual Revenue
-  Foreign Equity Retirement
-  US \$ Loan Retirement (10 years)
-  Yuan Loan Retirement (10 years)

FIGURE 2  
Case Studies of  
Gehe Yan Water Control Project



Madam Qian Zhengying, Minister of Water Resources and Electric Power, in an address to the Canadian hydroelectric power delegation indicated a willingness to consider any serious proposal for co-construction of the Three Gorges hydro development. Minister Qian commented further that, while there is no framework in place at this time to facilitate such joint investment, this should not be considered as a barrier to the Chinese side giving consideration to any reasonable proposal.\*

Minister Qian led a delegation of senior Ministry officials on a visit to Canada in October, 1985. At that time the authors of this study had an opportunity to discuss the concept of equity participation in project development with the Minister and her delegation and to review a series of assumptions which had been assembled for the purpose of modelling the financing of the Three Gorges project.

The Minister expressed considerable interest in the concept. It was understood that these conceptual studies should not be constrained by China's current development policies but rather would explore the conditions which would be required to facilitate such an approach to the development of selected projects.

The Minister requested and it was agreed that, in addition to examining the application of a joint venture to development of the Three Gorges project, the study should also examine application to a smaller project. The Gehe Yan development, which has recently been the subject of a comprehensive feasibility study by the Yangtze Valley Planning Office (YVPO) in collaboration with Hydro Quebec International and Canadian International Project Managers Ltd. was suggested as a suitable example.

---

\* In a foreword to the recently published "Electric Power Industry in China, 1983", Minister Qian writes "We hope, on the basis of equality and mutual benefit, to make use of overseas investment for speeding up construction of our nuclear plants and hydroelectric stations which are very capital intensive".

Canadian consultants are participating in the investigations and designs of the Gehe Yan (1200 MW), Longtan (4,000-6,000 MW) and Three Gorges (13,000 MW) hydroelectric projects. In addition, Canadian consultants have assisted in the design of China's first major HV/DC transmission facility which is currently being constructed between Gezhouba and Shanghai. Canadian heavy electrical equipment suppliers are actively pursuing a number of contracts, and several orders for 500 kV transmission components have been secured.

It is against this background of Canadian involvement in China's power sector that an examination of the conditions and potential for the Canadian private sector to participate through equity investment in development of China's power sector has been carried out.

China can, no doubt, acquire the expertise and technologies to construct and operate its power systems without resort to foreign equity participation. The arguments for such participation are nevertheless worthy of consideration.

The purpose of this study is to examine the principles and conditions under which it may be possible for China to attract significant equity participation in development of some of its major hydro (or thermal) resources. A number of assumptions are made which do not conform to current practice in China. The arguments for and against such changes as may be inferred from these assumptions will be for China's authorities to consider. Our purpose is simply to illustrate certain principles which must be considered and not necessarily to suggest the specific means - although we do comment on one or two policy areas which we believe warrant special consideration.

It is anticipated that a Canadian equity partner would bring to the joint venture, not only equity financing but also the management skills and resources which have been conventionally provided in Canada by electric power utilities and by private sector investors to develop major hydroelectric projects such as Baie James, Kitimat and Churchill Falls.

Some of the principal benefits and issues which require evaluation are summarized hereunder:

### Potential Benefits

#### **China**

- participation by foreign investor could contribute appropriate management skills in large hydro project development and increase the likelihood of reducing the overall schedule and controlling costs.
- increased confidence within international investment community and hence access to adequate financing resources
- early achievement of multipurpose benefits - with payback only from power revenues.
- potential for other joint-venture activities (within China and outside of China) based on successful collaboration.
- increased assurance of acquisition of best technology and application to other projects in China and to exports.
- separating project from conventional sector financing may ensure efficient development

#### **Canadian Investor**

- reasonable rate of return guaranteed by China
- offshore revenues may be tax exempt until repatriated
- positioning for other investments in China

#### **Canada**

- enhanced opportunities for supply of significant level of equipment and services
- Canadian involvement in world-class project could influence level of other power sector exports
- prospect for increasing opportunities for other Canadian investment in China (eg joint manufacture/licensing of high technology power sector equipment; construction equipment exports)
- offset to imbalance in Canada-China trade.

## Issues

- what would be an acceptable rate of return on long term equity investment in China, and would China pay such a premium for potential benefits?
- would China agree to appropriate terms covering repatriation of equity (including coverage for inflation and foreign exchange variations)?
- would China raise power tariffs to cover the cost of service and hence assure project financial viability?
- would China accept foreign involvement in the management of development and operation of public sector projects?
- how could the Canadian government support the private sector?
- will Canada and China join the Multilateral Investment Guarantee Agency (MIGA)?
- could a Canadian investor include a major utility in the project (for management and operation support)?

Before describing the results of the investment modelling and discussing the issues which arise it seems appropriate to review briefly the economic development prospects in China, the resources base and development of its energy sector, and in particular the development and investment requirements of the electrical power sector. These considerations provide a framework within which judgements of the investment climate for direct foreign participation and potentially significant levels of foreign debt financing of power sector developments must be assessed.

Chapter 2 of this report therefore provides some highlights from recent economic reviews and projections of China's economic development, followed by a brief survey of China's energy sector and the role of development of its electric power sub-sector. It may be noted that in recent years China has accorded high priority to expansion of its energy and transport sectors in recognition of the critical bottlenecks which deficiencies in these sectors can impose upon overall economic performance.

Chapter 3 addresses the conditions and policies which would have to be considered to facilitate direct foreign equity participation in the power sector and provides a rationale for considering such an approach.

Chapter 4 describes the investment modelling undertaken, documenting the assumptions and parameters adopted for the financial analyses of the Three Gorges and Gehe Yan projects, and presents the results of the modelling which illustrate the impact on development cost of equity participation. The financial analysis include consideration of some of the main risks of cost variance which would have to be recognized in structuring a joint venture proposal.

Chapter 5 reports upon the interest of selected Canadian investors and financiers to the possibility of participation in China's power development and their reaction to this report.

## 2.0 BACKGROUND

### 2.1 The PRC Economy and Development Prospects

A recent study of China's economic performance and prospects suggests that by the year 2000 China will have a Gross Domestic Product (GDP) roughly equal to that of Japan in 1985<sup>1/</sup>.

As illustrated in Table 2.1, China's GDP has grown strongly from 1980 through 1984. Preliminary data for 1985 indicate a continuation of this strong growth, with GDP expected to register overall growth for the year to about 10 percent. The economic performance over the recent past exhibits a balanced pattern, with agriculture and industry both recovering strongly since the end of 1980-82 "readjustment" period. The output of "Other", which includes service industries as well as construction and transport, was quite weak in the early 1980's but registered 15.5 percent growth in 1984 and continued strongly in 1985.

Table 2.1

CHINA'S GROSS DOMESTIC PRODUCT, 1981-1985  
(Percent Annual Growth)

	Agri- culture	Indus- try	Other	GDP Total	GDP Per Capita
1981	8.1	2.5	7.7	6.5	5.1
1982	13.1	6.8	-1.2	8.1	6.5
1983	9.5	11.7	4.8	9.0	8.0
1984	12.9	15.8	15.5	14.2	13.1
1985	4.2	19.4	12.8	10.0	8.7

SOURCES: Official State Statistical Bureau data and RCR calculations.

Source: Rock Creek Research, op.cit.<sup>1</sup>

A projection by Rock Creek Research of GDP to 2005 is presented in Table 2.2. This overall projection has been based upon detailed sectoral analysis and relatively conservative assumptions concerning

<sup>1/</sup> China Projection Report, Fall 1985, Rock Creek Research, Washington DC.

China's continued reliance upon mobilization of domestic savings to finance development. Rock Creek Research note that GDP could increase even more rapidly if China were to adopt a strategy of increased borrowing to acquire foreign technology and if these technologies could be productively absorbed.

During 1985 there is already evidence that China has elected to accelerate development in its power sector through increased use of foreign borrowings.

Table 2.2

CHINA'S GROSS DOMESTIC PRODUCT, 1980-2005  
(Billion Constant 1980 U.S. Dollars\*)

	Agri- culture	Indus- try	Other	GDP Total	GDP Per Capita
1980	119.8	63.5	56.1	239.3	242
1985	188.4	107.2	81.4	377.0	360
1990	261.3	176.4	142.3	580.0	525
1995	332.2	254.5	210.9	797.6	683
2000	438.8	349.1	292.7	1,080.7	876
2005	624.7	464.8	380.5	1,470.0	1,128

\* NOTE: Except for per capita GDP, which is in U.S. dollars.  
SOURCES: Official State Statistical Bureau data and RCR calculations.

Source: Rock Creek Research, op.cit.<sup>1/</sup>

The World Bank has recently completed a major review of long term development issues and options for China<sup>2/</sup>. Its conclusion, that over the next two decades China - now a low income country - will become a middle income country, is supported by detailed sectoral and macro-economic analysis and comparisons with sustained economic growth patterns from other industrialized countries.

Per capita national income in the industrial countries is roughly 10 times higher than in China in terms of purchasing power. To catch up to the industrialized countries by 2050, the Bank estimates China's per capita income would have to increase at between 5.5 and 6.5 percent per

<sup>2/</sup> China, Long Term Development Issues and Options, The World Bank, John Hopkins University Press, Baltimore, 1985.

year. Such rapid and sustained progress has been rare. Between 1960 and 1982, excluding small oil dominated economies, only South Korea and Greece achieved average annual per capita income growth above 5%. Only one country, Japan, has indisputably caught up with the developed nations of the world from a position of economic backwardness.

Nevertheless, China's past record is encouraging. From 1952-82, despite rapid population growth and periods of severe economic mismanagement, national per capita income grew at an average rate of 4 percent. Since 1978, and following the introduction of economic reforms, per capita income grew at an annual rate of 6.8% up to the end of 1984.

To achieve its basic objective of improvement of living standards and the elimination of poverty, China has set targets of quadrupling the gross value of industrial and agricultural output (GVIAO) between 1980-2000, and increasing per capita national income from about US\$ 300 to US\$ 800. To do so will require a continued investment of about 30% of national income, in line with China's past performance. Assuming reasonable improvements in energy and materials use and that China's population by the year 2000 is close to the official target of 1.2 billion, the Bank studies concluded that quadrupling GVIAO is quite possible and would provide for the attainment of target national per capita income. This conclusion is tempered by caveats that to achieve its targets, China must increase the efficiency with which resources are used and that domestic or international misfortunes do not significantly impact China's economic performance over these decades.

The successful modernization of China's economy requires sustained progress in building upon the structural reforms introduced since the period of the "cultural revolution". Increased access to advanced foreign technologies will make the task easier but will not be sufficient. China's economic prospects depend crucially upon its success in mobilizing and effectively using all available resources.



The World Bank report suggests that it would be wise for China to encourage direct foreign investment, less for the foreign capital and advanced technology it brings, than for the demonstration effect of modern management techniques.

How far China will have risen into the middle income range by 2000 will depend crucially on how successfully the economy is managed. China's past record of economic management, for all its unevenness, is superior to that of other low income countries, both in promoting growth and reducing poverty - but maintaining the past pace of economic progress is likely to require greater efficiency.

Conditions for rapid sustained growth are far from fully met in China, except in agriculture where outstanding progress has been made in recent years following introduction of the production responsibility system. Recognizing this the Central Committee of the Chinese Communist Party, in October 1984, announced a program of urban economic reforms, with invigoration of state enterprises as its central theme.

The pattern of macro-economic growth trends in all sectors have accelerated during 1980-84. Double digit growth (in GVIAO) was recorded during 1984 and the first half of 1985. This high expansion rate has led to serious inflationary pressures. China's authorities are currently moving to slow the pace of growth and mitigate the impact of necessary price adjustments, constraining imports in line with export earnings.

Despite the likelihood that progress in economic reform will be uneven and require continuing adjustments, with some inevitable consequences for year to year economic performance, there is considerable evidence that China will meet or exceed its development goals for 2000 and be positioned to sustain its growth thereafter.

Within the context of overall economic development, transport and energy developments have been singled out as being crucial to sustain growth. The development of the transport sector will influence the

development of the energy sector, particularly the electric power sector, as the major exploitable coal and hydro resources of China are located at considerable distance from the major industrialized centres of demand. Long distance EHV transmission facilities and interconnection between regional power grids will increasingly become economic alternatives to locating new central thermal generation at load centres.

## 2.2 The Energy Sector

China is the world's fourth largest producer and third largest consumer of commercial energy. Coal is by far the most important source of energy supply, accounting for 70% of total production in 1982. Since 1972 oil production has increased rapidly and by 1982 accounted for 22% of commercial energy supplies (and contributed significantly to export revenues, accounting for about one-quarter of total exports). Natural gas, hydroelectric power and small quantities of shale oil and geothermal power contributed the balance of commercial energy supplies. Non-commercial sources supplied the equivalent of about 40% of commercial energy production.

China's achievements in development of its energy resources over the past several decades have been impressive. Coal production increased from some 60 million tons in 1952 to 666 million tons in 1982. (China's output of coal in 1982 was surpassed only by the USA and USSR.) During the same period power generating capacity increased from about 2,000 MW to 72,360 MW. Electricity generation increased at an average rate of 13.6% p.a. from 1949 through 1984, with output reaching nearly 377,000 GWh in 1984. Oil production increased from about 0.1 million tons in 1950 to 106 million tons in 1979. China's major oil fields which account for about 90% of production have peaked and in 1982 production fell to 102 million tons.

### 2.2.1 Commercial Energy Resources

Coal is China's traditional source of energy and currently provides nearly 70% of the demand for commercial energy. Coal and lignite reserves are concentrated in the north and northeast which have about

70% of the estimated total recoverable reserves of 600 billion tons. About three-quarters of coal production is from large mines, each with more than 0.6 million tons annual capacity. Small mines, with between 1,000 and 100,000 tons of annual capacity, number over 20,000. Although there are some modern collieries, most mines are only partially mechanized. Targets for increasing coal production face a major constraint in terms of rail transport capacity.

China's hydro potential is amongst the largest in the world. Its total potential has been estimated at about 680,000 MW of which some 380,000 MW are considered economically exploitable. By the end of 1984 only 25,600 MW, representing 6.7% of the exploitable potential, had been developed. The distribution of exploitable hydro resources is given in Table 2.3.

Table 2.3  
Exploitable hydropower resources of major river systems in China

River system	Installable capacity (MW)	Annual energy (GWh)	Percentage of total (%)
Changjiang	197243.3	1027498	53.4
Huanghe	28003.9	116991	6.1
Zhujiang	24850.2	112478	5.8
Halhe and Luanhe	2134.8	5168	0.3
Huaihe	660.1	1894	0.1
Rivers in Northeast China	13707.5	43942	2.3
Rivers in the Coastal Region of Southeast China	13896.8	54741	2.9
International rivers in Southwest China	37684.1	209868	10.9
Yarlung Zangbo and the other rivers in Tibet	50382.3	296858	15.4
Inland rivers in North China and Xinjiang	9969.7	53866	2.8
Total	378532.4	1923304	100

Note: 1. The hydroelectric sites with the installable capacity of less than 500 kW are not included in the Table.

2. The percentage of the total refers to the annual energy.

Source: MWREP, Electric Power Industry in China, 1983.

Official estimates of oil and gas reserves are not available. Varying estimates of proven recoverable reserves suggest that these range from 1.8 to 2.5 billion tons. Estimates of probable reserves, both offshore and onshore, are by nature speculative and range from 5 to 10 billion tons for the onshore region and 4 to 8 billion tons in offshore areas.

Major non-associated gas fields are located in Sichuan province where recoverable reserves are estimated at 70 billion cubic metres. In addition, there are some minor natural gas fields in the northwestern part of China. Over and above these, about 50 billion cubic metres of associated gas are estimated to be recoverable. The cumulative gas reserves are thus in the order of 130 billion cubic metres, equivalent to more than 110 million tons of oil. As significant areas of China remain to be explored, present estimates of recoverable reserves are probably a mere fraction of the full potential.

Reserves of oil shale in China are reported unofficially to be in the order of 400 billion tons and may be much larger since the geological environment is favourable for their formation in many of the sedimentary basins. Deposits of 100 billion tons or more containing up to 5 to 10 billion tons of oil are reported in Heilongjiang and Hebei. Before 1958 oil shale accounted for almost half of Chinese oil production, but this proportion declined rapidly after the discovery of the Daqing oilfield in 1959. About 300,000 tons of shale oil is being produced annually from mines in Liaoning and Guangdong.

Geological conditions in China exhibit widespread geothermal phenomenon, particularly in the Tibetan plateau. Most occurrences are reported to be low temperature groundwater suitable for space heating; high temperature occurrences suitable for power generation seem to be more frequent in the mountainous southwestern part of the country. Geothermal energy has not yet been developed to any significant extent, although a small geothermal power station is in operation some 50 km from Lhasa and an urban heating system has been developed in the southeastern part of Beijing.

### 2.2.2 Energy Production and Consumption

Commercial energy production grew at 10.5% per year from 1952-1975. For several years thereafter this rapid rate of growth slowed and between 1979-1982 total production declined by 2.1%. This trend reversed in 1982 which saw a 5.5% rise followed by 6.8% growth in 1983 and 7.4% in 1984.

In 1984 total commercial energy production amounted to some 768.9 million tons of coal equivalent (mTCE). Recent projections of energy demand by the World Bank suggest that total commercial energy production required by the year 2000 will lie in the range of 1,200 to 1,800 mTCE. (These projections depend upon a complex of assumptions regarding the mix of demand - particularly of heavy and light industry - improvements in the efficiency of energy consumption in existing plant and the introduction of more energy efficient processes in new plant.) With the exception of the most optimistic production scenario, the Bank studies suggest that the demands in all other scenarios exceed the government target of doubling energy production between 1980 and the year 2000. (The government target required somewhat less than 1,300 mTCE of commercial energy production by the year 2000).

During the past five years China has achieved an impressive reduction in energy use relative to the level of economic growth which has taken place. Energy consumption per unit gross value of industrial and agricultural output (GVIAO) was reduced by 7% from 1979 through 1981. This was followed by a further reduction of 3% in 1983 and 7% in 1984. Technical and operational improvements are credited with about 40% of these energy savings. The balance came initially from the relative decline in importance of heavy industry and the closure of some inefficient plant, but since 1981 has been achieved mainly from structural changes within major industry sub-sectors.

Comparison with other countries indicates an exceptionally high energy intensity of the Chinese economy, particularly in the industrial sector, as illustrated by the data presented in Table 2.4\*.

\* Tables 2.4, 2.5, 2.6, 2.7, 2.8 and 2.9 herein are reproduced from the World Bank Report on Long Term Development Options and Issues, op.cit.2/

Table 2.4

INTERNATIONAL COMPARISONS OF SECTORAL ENERGY CONSUMPTION, 1980  
(%)

	Share in final commercial energy consumption			Share in final total energy consumption /a		Share of transport in final oil consumption (C)
	Industry	Transport (A)	Res/com/pub/b	Industry	Res/com/pub	
<u>Developing Countries</u>						
China	60.4	7.8	19.7	42.6	43.4	24.6
Argentina	35.0	30.6	22.9	36.7	25.6	55.2
Brazil	47.3	26.0	20.0	42.8	25.7	46.4
Mexico	37.4	33.9	18.9	39.2	17.7	56.4
India	55.1	22.2	13.7	30.6	52.5	44.1
South Korea	43.3	12.3	42.8	40.8	46.2	27.7
<u>Developed Countries</u>						
US	31.0	25.2	36.2	-- same as in A --		62.0
Canada	38.4	20.2	35.9	"		51.2
Japan	54.3	14.1	27.0	"		28.6
France	42.8	18.4	33.0	"		34.8
West Germany	41.0	15.7	38.4	"		34.4
Italy	44.7	18.5	30.8	"		35.8
UK	33.3	18.6	43.6	"		52.2

/a Includes biomass.

/b Residential, commercial and public services sectors.

Source: OECD. Biomass consumption figures for South Korea were revised using World Bank sources.

Source: IBRD, op.cit.2/

Comparison of available data of energy consumption per unit of physical output and of end use efficiencies between China and other countries suggest there are several features which contribute to China's exceptionally high energy intensities in industrial production. These include the scale of individual plants, the technologies employed, the raw materials used and the organization and operational practices. In the past the efficiency of energy use, particularly fuel use, received little attention in China's industrial development planning and little regard was given to providing incentives to enterprises to use energy efficiently. The dominance of coal as both an energy source and as feedstock have contributed to the inefficiencies as it is difficult to use coal as efficiently as oil, gas or electricity.

At an aggregate level one of the more important factors underlying the high level of energy consumption in Chinese industry is the preponderance of small scale enterprise in energy intensive industries. As a consequence of inability to realize economies of scale and to adopt more advanced technologies unit energy consumption in small plants tend to be well above the levels in large plants. The comparative production and energy consumption for small and large plants in Table 2.5 illustrate the situation in 1980.

Table 2.5

CHINA: PRODUCTION AND ENERGY CONSUMPTION  
IN SMALL AND LARGE PLANTS, 1980

Industrial product	Small plant share of total production (%)	Energy consumption per ton produced (tons of coal equivalent)	
		Small plants	Large plants
Crude steel	24/a	1.57/b	1.20/b
Synthetic ammonia	55	3.00	1.45/c
Cement	68	0.18/d	0.21/d
Plate glass	n.a.	0.87/e	0.30/e
Coke	n.a.	2.60	1.96

/a Estimate for small- and medium-sized plants under local control, as a percentage of total iron and steel company production.

/b Figures denote "comparable energy consumption" which includes only energy used for the production of iron and steel, and not other types of energy, such as energy consumed in mining, equipment manufacturing, etc.

/c Excludes medium-sized plant production.

/d Comparisons of energy consumption are misleading in that the quality of cement produced in small plants is far lower than that in large plants.

/e Refer to tons of coal equivalent per standard case.

Sources: Mission estimates, based on a variety of Chinese sources.

Source: IBRD, op.cit.2/

Table 2.6 illustrates the energy intensity of China's economy as compared with other developing and developed countries. Although China's industrial output accounts for one-half of GDP - industry and infrastructure typically account for less than 20% of GDP in other low income countries - the share of output for the three most energy intensive major industrial sub-sectors, basic metallurgy, chemicals and building materials, is remarkably similar in China, Japan and South Korea.

Table 2.6

INTERNATIONAL COMPARISONS OF PRIMARY ENERGY CONSUMPTION  
RELATIVE TO GDP, 1980

	Primary commercial energy consumption per unit GDP	Total primary energy consumption per unit GDP /a (kgce/US\$)	Residential/commercial energy consumption per unit GDP /a	Share of industry & infra- structure in GDP/b (%)
<b>Developing Countries</b>				
China	2.13	2.90	1.14	48
Argentina	0.44	0.49	0.10	n.s.
Brazil	0.61	0.88	0.19	37
Mexico	0.80	0.84	0.11	38/c
India	1.05	1.77	0.83	26
Korea, Rep.	1.06	1.12	0.48	41
<b>Developed Countries</b>				
Canada	1.39	1.39	0.45	33
France	0.45	0.45	0.14	36
Germany, Fed. Rep.	0.49	0.49	0.18	n.s.
Italy	0.53	0.53	0.16	43
Japan	0.51	0.51	0.13	41/c
UK	0.57	0.57	0.22	35
US	1.05	1.05	0.35	34

/a Includes biomass.

/b Includes all industry, construction and transport.

/c 1979.

Sources: Energy consumption data: China: Table 1.2.

Others: OECD, Energy Balances of OECD Countries, 1970-82;  
Energy Balances of Developing Countries, 1971-82. Biomass  
consumption estimates for South Korea were revised, based on  
World Bank sources.

GDP data: China: IBRD, China: Recent Economic Trends and Policy Developments  
(March 1983).

Others: IBRD, World Development Report, 1982.

Source: IBRD, op.cit.<sup>2/</sup>

The industrial sector in China accounted for some 60% of final energy consumption in 1980, utilizing almost half of the major fuels and three-quarter of final electricity consumption. Inter-country consumption comparisons as presented in Table 2.7, indicates the relatively high intensity of energy consumption in China. Among developing countries only India exhibits similar characteristics. China's final energy consumption by industry is illustrated in Table 2.8.



Table 2.7

ENERGY CONSUMPTION IN INDUSTRY PER UNIT GROSS VALUE OF INDUSTRIAL OUTPUT IN SELECTED COUNTRIES

Country	Year	Energy consumption per unit output value. (kilograms of coal equivalent per 1980 US\$)		
		Fuel and feedstock	Electricity/a	Total/b
China	1980	0.82	0.23	1.06
France	1980	0.17	0.13	0.30
Germany, F.R.	1980	0.15	0.11	0.26
Japan	1980	0.16	0.15	0.30
UK	1980	0.13	0.09	0.23
US	1980	0.29	0.17	0.47
Brazil/b	1978	0.26	0.14	0.40
India/b	1978	0.71	0.33	1.04
S. Korea	1980	0.30	0.17	0.48
Philippines/b	1979	0.49	0.18	0.66
Turkey	1979	0.24	0.21	0.44

/a Electricity consumption is calculated at a thermal replacement value of 2,900 kcal/kWh for all countries.

/b Includes biomass consumption.

Source: Appendix B, Table B.5.

Source: IBRD, op.cit.<sup>2/</sup>

Table 2.8

CHINA: FINAL ENERGY CONSUMPTION IN INDUSTRY, 1980  
(Millions of tons of coal equivalent)

	Oil	Coal	Natural gas	Electricity	Total
Basic metallurgy	6.6	54.2	1.3	19.1	81.2
Chemicals	12.4	34.3	7.6	21.7	76.0
Building materials	2.0	42.3	0.1	4.7	49.1
Machine building	3.5	14.4	0.7	9.4	28.0
Pulp and paper	0.6	5.4	0.1	2.3	8.4
Textiles	6.0	10.0	0.4	5.4	21.8
Food, beverages and tobacco	0.6	9.7	0.3	2.5	13.1
Other /a	3.0	9.3	0.1	5.0	17.4
Unallocated /b	7.7	9.8	3.3	-	20.8
<u>Total</u>	<u>42.4</u>	<u>189.4</u>	<u>13.9</u>	<u>70.1</u>	<u>315.8</u>

/a Forestry industry, clothing, leather goods and cultural articles (including printing).

/b Includes power industry heat supply credit (see Table 1.2) and any consumption not specified for other sectors.

Source: Appendix A.

Source: IBRD, op.cit.<sup>2/</sup>

Demand for electricity is conservatively projected to grow during the 1980-2000 period at annual rates averaging between 6% and 7.5% per annum. The share of electricity in total final commercial energy consumption is projected to rise substantially, from 18% in 1980 to some 26% to 27% by the year 2000. The share of electricity in final industrial consumption is also forecast to rise from 22% in 1980 to between 31% and 32% by the year 2000.

### 2.3 Electrical Power Supply and Demand

Power development in China registered very high rates of growth over the three decades from 1949-1979. Installed capacity has increased at an average rate of 11.3% per annum since 1949, reaching 80,177 MW by the end of 1984. Generation grew at 13.6% per annum over the same period, with production of 376,991 GWh in 1984. The high rates of sustained growth experienced during the first 25 years since 1949 slowed somewhat during the mid 1970's, and from 1979 through 1984 capacity increased at only 4.9% per year and generation at 6% during this period. Table 2.9 documents sectoral growth and comparative growth indices for Gross Industrial and Agricultural Output, primary energy and electric power generation.

Despite remarkable achievements in power sector development, most regions of China have insufficient supplies of electrical energy to meet demand. This situation has persisted for a number of years and in 1982 the country-wide shortfall was estimated at 10,000 MW in generating capacity and 40,000 GWh in energy supply. This shortfall led directly to an estimated 20% under-utilization of industrial capacity.

Financial constraint has been the primary, if not the only, reason for the shortfall in generating capacity and inadequacy of transmission and distribution facilities. Budget expenditures were severely restricted following excessive investment spending during 1977-78 and all components of the energy sector were affected during the four years up to 1983 as indicated by the investment profiles in Table 2.10.

Table 2.9

**Total annual electric energy generation and installed generating capacity from 1949 to 1983**

Year	Installed capacity		Electricity generation		Growth index		
	Total (MW)	Share of hydro (%)	Total (TWh)	Share of hydro (%)	GIAP	Primary energy	Electricity generation
1949	1848.6	8.8	4.31	16.5	100	100	100
1953	2350	14.2	9.195	16.7	203	218	213
1957	4635	21.9	19.335	24.9	298	415	449
1958	6288.1	19.3	27.531	14.9	394	836	639
1960	11918.3	16.3	59.424	12.5	496	1248	1379
1962	13037.2	18.2	45.795	19.7	307	724	1063
1965	15076.3	20.0	67.604	15.4	476	793	1569
1970	23770	26.2	115.862	17.6	753	1305	2688
1975	43406	30.9	195.84	24.3	1094	2054	4544
1976	47147.4	30.1	203.13	22.5	1112	2121	4713
1977	51450.5	30.6	223.404	21.3	1231	2376	5183
1978	57122.1	30.2	256.552	17.4	1382	2644	5953
1979	63015.9	30.3	281.95	17.8	1499	2719	6542
1980	65869.1	30.8	300.6	19.4	1607	2684	6973
1981	69132.6	31.7	309.3	21.2	1680	2663	7176
1982	72359.6	31.7	327.678	22.7	1884	2812	7603
1983	76444.9	31.6	351.439	24.6	2076	3000	8154
1984	80117	32.0	376,991	23.0	2362 <sup>x</sup>	3277 <sup>x</sup>	8747 <sup>x</sup>

x provisional

GIAP Gross Industrial-Agricultural Products

Source: MWREP, Electric Power Industry in China 1983.

Table 2.10

State Capital Construction in Energy, 1978-84  
(million Yuan)

	Coal Indus- try	Oil Indus- try	Power Indus- try	Total Energy*
1978	3,180	3,112	5,091	11,470
1979	3,186	2,707	5,099	11,098
1980	3,347	3,338	4,814	11,565
1981	2,315	2,795	4,014	9,464
1982	2,985	2,530	4,623	10,223
1983	4,007	2,902	5,746	12,760
1984	--	--	--	16,596

\* NOTE: Total includes coking industry.  
SOURCES: Official State Statistical Bureau data.

Source: Rock Creek Research, op.cit.<sup>1/</sup>

Increases in sector financing allocations since 1983 have led to significant efforts to achieve the output targets of the Sixth Plan (1981-1985) and the national target of 362,000 GWh for 1985 was fulfilled in 1984. Target output, however, has been accomplished through very high plant utilization levels which has placed a heavy burden on existing facilities. Even though the target generation supply has been met, demand management has continued including a regular program of load sharing.

The most crucial issue facing the power sector is how to finance the development and expansion of generation, transmission and distribution facilities to meet long term needs. Up to 1981 all revenue surplus from operations, including much of the depreciation funds of the electric power administrations, were transferred to the State which in turn provided all investment funds for capital construction, including projects for generation and transmission above 100 kV. Under the financial reforms associated with the ongoing economic reform and readjustment process, funds for sector investments are now being provided in the form of loans from the People's Construction Bank of China.

Although no official long-term development program has been prepared for the power sector, the Ministry of Water Resources and Electric Power has projected that generation should rise to about

1.2 million GWh by the year 2000. (This excludes generation from small thermal and hydro plants - small hydro plants are defined as those with capacities under 500 kW and small thermal plants are defined as having capacities of 6 MW or less). This increase in generation would require an average growth rate in total generation of about 7.4% per annum throughout the 1980-2000 period.

The current mix of generating capacity is not expected to change much over the next two decades. Because of the long lead time necessary for development of major hydro and nuclear facilities, it is unlikely that the role of these types of generation will alter substantially before the end of the century. By the year 2000, nuclear power might supply some 4% of total generation and hydro power 18 to 19%. Thermal power will account for the balance as existing oil and gas fired power plants are planned to be phased out gradually.

Most of the additional hydro power to be developed during the 1980 to 2000 period are expected to come from large scale development schemes on the upper Huanghe, the Hongshui, the middle and upper Chiangjiang and the middle and lower Lancang rivers.

Currently 34 hydro projects are under construction representing a total installed capacity of 17,000 MW and 20,000 MW of thermal capacity is under development. China has adopted a step-by-step approach to grid expansion and integration. Existing regional grids will first be strengthened with 500 kV networks (or in the case of the northwestern regional grid, 330 kV networks). Many of the major grids will be interconnected as surplus power becomes available in a given grid. The first such interconnection will be the  $\pm$  500 kV DC line linking the Central and East China Regional Grids. With the completion of the planned power bases during the 1990's, particularly the hydroelectric developments of the Hongshui and Huanghe rivers and coal and power bases in Shanxi and Nei Menggul, an overlay of long distance ultra high voltage lines is anticipated.

The World Bank has prepared two scenarios covering development of the power sector from 1980 through 2000. These are illustrated in Table 2.11 and indicate the need for a dramatic increase in average annual investments if capacity is to be expanded sufficiently to relieve current supply constraints and provide the additional power necessary to sustain rapid economic growth.

Table 2.11

ELECTRICITY DEVELOPMENT SCENARIOS /a					
	1981-85	1986-90		1991-2000	
		Low scenario	High scenario	Low scenario	High scenario
<b>Capital Construction Investment</b> (Y million)	23,000	64,600/b	75,800/b	221,000/b	290,000/b
<b>Generating plant</b>	17,250	46,500	54,600	159,400	209,000
Of which: Hydro	7,000	17,600	18,200	55,000	65,000
Fossil-fired	10,250	25,900	31,400	92,400	125,000
Nuclear	-	3,000	5,000	12,000	19,000
<b>Transmission and substations</b>	4,370	14,200	16,700	48,340	63,600
Other	1,380	3,900	4,500	13,260	17,400
<b>New Generating Capacity Added (MW)</b>	14,000	25,900	30,800	96,000	135,000
Of which: Hydro	3,000	7,300	7,600	24,000	33,000
Fossil-fired	11,000	18,600	23,200	67,000	94,000
Nuclear	-	-	-	5,000	8,000
	1985	1990		2000	
<b>Installed Capacity (MW)</b>	74,470	100,370	105,270	196,370	240,270
Of which: Hydro	19,880	27,180	27,480	51,180	60,480
Fossil-fired	54,590	73,190	77,790	140,190	171,790
Nuclear	-	-	-	5,000	8,000
<b>Energy Generated (GWh)</b>	375,000	500,000	520,000	1,000,000	1,200,000
Of which: Hydro	79,000	97,000	97,000	190,000	220,000
Fossil-fired	296,000	403,000	423,000	784,000	936,000
Nuclear	-	-	-	26,000	44,000
<b>Energy Sold (GWh)</b>	322,500	430,000	447,200	860,000	1,032,000
<b>Gross Fuel Requirements</b> (million TCE):/c	133	173	182	288	339

/a Scenarios were developed in conjunction with MWREP in early 1984. All figures exclude small hydro plants with capacities of less than 500 MW and thermal plants with capacities of less than 6 MW.

/b To improve fuel efficiency, existing medium- and low-pressure thermal units (with a total capacity of about 13,000 MW) should be progressively replaced by larger, higher-pressure units. It is assumed that replacement of 3,000 MW and 10,000 MW by the new additions in generating capacity would be undertaken during 1986-90 and 1991-2000, respectively. The investment cost for replacement is included.

/c Includes heat supplied to consumers outside the power industry, totaling 11.85 million TCE in 1980 and 21.6 million TCE in 2000. Plant utilization factors were assumed to remain stable after 1986: 40% for hydro, 63% for fossil-fired thermal and 59-63% for nuclear.

Source: IBRD Annex E, Appendix F, op.cit.2/

Investment requirements to cover facilities to be commissioned between 1985 and 2000 are estimated to increase to Yuan 13 to 15 billions per annum during 1986 to 1990 and Yuan 22 to 29 billions per annum during 1991 to 2000. Investment in the electric power sector between now and the year 2000 could reach US\$ 131 billions. At the same time related energy and transport investments are estimated to require US\$ 25 billions for oil, US\$ 43.5 billions for coal and US\$ 48 billions for rail transport.

Assuming that economic development beyond 2000 continues in line with China's long range economic objective of catching up with developed countries by about 2050, power sector growth must continue expanding at roughly 7 percent per annum - a rate that implies a doubling of capacity over each succeeding decade.

Although the very distant 2050 future is not of immediate concern, extrapolation of the low and high scenarios presented in Table 2.11 to 2010 suggest that between 45,000 and 67,000 MW of additional hydro capacity and some 134,000 to 218,000 MW of fossil fired and nuclear thermal additions would be required in the decade 2001 to 2010. Bearing in mind the significant gestation period required for development of new power facilities, particularly hydro and nuclear generating capacity, significant investments in addition to those required to meet demand up to the year 2000 will be required during the 1990's to cover facilities to be commissioned during the period 2001 to 2010.

The foregoing projections imply that the share of power sector investment would have to increase from recent levels representing less than 1% of GDP to approximately 2% during 1986 to 2000. Such a rate of investment in power sector development is broadly comparable to that allocated by other major developing countries.

3.0 CONSIDERATION OF CONDITIONS RELATING TO CANADIAN EQUITY  
PARTICIPATION IN POWER SECTOR DEVELOPMENTS IN CHINA

3.1 The Case for Equity Participation

China's current need is to catch up and meet expanding demand for electrical energy. This will, of necessity, concentrate attention on fulfilling its own requirements during the next several decades.

By the end of this century, or shortly thereafter, China will be operating power systems as large as any in the world. These systems will involve projects as large and complex as have been developed elsewhere. Its power sector will have mastered the intricacies of interconnecting its several systems to achieve the efficiencies inherent in large integrated systems operations.

China may, and most likely will, become a significant exporter of heavy electrical equipment and expertise as its power systems mature and its management and industry adapt to international standards. The sheer size of the power sector in China and the complexities inherent in the development of its large hydraulic and thermal resources will inevitably lead to a world class national power system and supporting heavy electrical industry.

It is evident that China will require significant amounts of foreign exchange if it is to meet its targets for expansion. The requirements for development of its power systems will be particularly high relative to GDP during the next several decades. During this period MWREP needs to acquire the management skills and technologies most appropriate to the construction and operation of very large power systems (with many large projects remote from load centres).

Thereafter, China will have the capacity and capabilities to continue its own power sector development with presumably much less need for direct foreign involvement. This is not to suggest that China will necessarily choose to be completely self-sufficient in all areas of equipment supply and resource development - indeed China already appears



to recognize the value of continued involvement with foreign partners within its industrial sector, not only to support domestic demand but also to enhance opportunities for exports.

While it seems unlikely that China would consider involving foreign equity participants in its power sector on an indefinite term, over the next several decades, during which MWREP must expand its power systems rapidly and at the same time acquire new skills and technologies, the use of foreign equity partnership in selected key projects may provide a combination of skills, experience and motivation which would justify the extra cost involved.

Canadian power utilities and the other component entities of the electrical power sector in Canada (manufacturers, consultants and contractors) have traditionally operated within an open economic system which has allowed greater international competition than almost any other major nation. The involvement of one of the large Canadian power utilities together with other investors in a joint venture with a Chinese partner could provide China with the appropriate mix of organizational and management skills applicable to the development and operation of one or more large projects.

It must be pointed out that most Canadian utilities are constrained by their charters to the provision of electric power services within their licensed service areas. It is, moreover, unlikely that any public power utilities in Canada would be granted authority to participate as a sole equity partner in a foreign venture.

Nevertheless, Hydro Quebec has indicated that in principle it is willing to consider equity participation in a configuration wherein it could play a significant role in its area of expertise. Based on its experience in development in some of the largest hydroelectric resources undertaken by a single utility, Hydro Quebec could be an important principal of any Canadian equity partner. Even though Hydro Quebec would likely be able to take only a minor financial position in Canadian equity financing, its participation would fulfill an essential condition meriting China's consideration of allowing for foreign equity participation in its power sector.

In addition to the benefits to China which could accrue through the demonstration effect of applying modern utility management to project implementation, the involvement of an experienced equity partner with a financial interest in the success of the project would add significantly to the creditworthiness of the enterprise in the consideration of foreign lenders - particularly for a very large project such as Three Gorges.

A series of case studies modelling the investment requirement for two projects, the Three Gorges and Gehe Yan hydroelectric developments, have been prepared from the viewpoint of illustrating the financial impact of foreign equity participation in project financing. The cases, presented in Chapter 4, include a number of variations of key parameters - domestic and foreign interest rates, debt/equity ratio, foreign exchange translation costs, overall project cost, schedule and revenue base - which illustrate the risk of potential cost variations which will be of concern to any investor as well as to prospective lenders.

Although the examples dealt with are both hydroelectric projects, the same principles and conditions would apply equally to a large central thermal or nuclear generating plant, or to a combination of power projects to be developed by a "power utility enterprise".

### 3.2 Conditions Affecting Consideration of Foreign Participation in a Joint-Venture Power Development Enterprise

Conceptually project financing, as understood by western financial institutions, offers lenders limited recourse to the project sponsors. The source of debt servicing is from project revenues and the security of the loan consists of the project itself. Because of a lack of familiarity with Chinese sponsoring entities and because China does not formally recognize the legality of mortgages over fixed assets or real property, projects externally financed to date have not been on the foregoing project finance basis. Project loans in the industrial and tourism sectors have usually been limited or with no recourse to the foreign sponsor, but have retained recourse to the Chinese side by requiring a guarantee from the Chinese sponsor or another Chinese entity such as the Bank of China or the sponsor's parent corporation.

In the future it may be that some classes of projects in China will be developed on the basis of "true project finance". However, in the case of public enterprise developments in the power sector, additional guarantees will likely be required. Even if China moves to reintroduce recognition of a mortgage system, the physical assets of a power utility are immovable and not saleable. Hence, the guarantee of the Chinese sponsor's parent organization and the establishment of a framework for regulation of power utilities, including mechanisms for review and rate setting, would be essential. Also, because power revenues would not directly generate foreign exchange, a guarantee of provisions of access to foreign exchange through revenue convertibility or other means would be essential to meet foreign debt service obligations.

For purposes of illustration, a stand-alone joint venture enterprise has been assumed. It is further assumed that this joint venture enterprise would be relatively autonomous with respect to financing and managing the development, although subject to appropriate regulation of its operations as a bulk supplier of power and of its tariff schedule. The joint venture while conceptually an autonomous enterprise would, nonetheless, be a public sector enterprise of the Government of China and it is not foreseen that its shares would be marketable. Thus foreign equity participation in such a public sector enterprise is considered as an interim measure to support efficient development and operation.

A joint venture enterprise would be responsible for providing the management services necessary to arrange all additional project financing, for administration and for overall organization and control of project implementation. It is presumed that most design and construction management services as well as construction forces, equipment and materials supply would be contracted for, either under international competitive bidding arrangements open to Chinese and approved foreign services, or negotiated arrangements if it were advantageous to the enterprise to take advantage of concessional finance for some parts of the project.

Essentially, the foreign equity participation is seen as means of enhancing the creditworthiness of the enterprise through the direct involvement of an experienced partner and as a means of MWREP enterprises acquiring the managerial skills appropriate to China's power sector program through the demonstration of modern power utility management to the development and operation of a few selected projects. Thus the foreign equity financial participation has been treated as a kind of preferred share arrangement - that is to say one which will be guaranteed retirement through the acquisition of the shares of the foreign partner by the Chinese partner over time on the basis of project revenues.

We assume that with appropriate guarantees of an adequate return on investment the foreign partner would be willing to defer repayment on its investment until after such time as the project begins to generate a return. In the case studies presented herein, it has been assumed that the foreign partner's equity would be retired over 20 years following initiation of power generation.

Both projects considered are multipurpose developments. We do not have the detailed information which would be necessary to carry out a cost allocation analysis of the overall project costs between purposes nor the economic data required for the justification of these additional costs in terms of the benefits to be achieved. We have accepted that the benefits accruing to China's economy in terms of flood damages avoided, the improvement of navigation and the potential benefits to irrigated agriculture and other purposes arising from flow regime improvements are, together with the power benefits, sufficient to justify the full cost of development. At the same time, we have assumed that the full cost of development would be borne by the power revenues generated.

This simplification may indeed overstate the need for upward adjustment of power rates. However, flood damages avoided accrue to the benefit of the overall economy. It would be difficult, if not impossible, to establish an effective basis of charging the direct beneficiaries. Similarly, improvements of the flow regime and

conditions affecting navigation will presumably be treated as a public good which benefits the economy through lower transport costs "with" the project than would be a case "without" the project.

As an essential service the development cost for electric power production will, no doubt, have to be supported by the power rates. The subsidization of other purposes through the power rates, simply substitutes for direct allocations by government of the additional costs necessary to achieve these other benefits.

The capital cost considered for each project, therefore, includes all facilities required to support multipurpose development, but in terms of its direct revenue earning potential is treated as a single-purpose project.

Conceptually it may be argued that the additional benefits which accrue to the economy in general would justify special treatment of the joint venture with respect to taxation until such time as the joint-venture enterprise has paid off all indebtedness, including retirement of the foreign partners investment. As information on China's tax regime as applied to its power sector, is not available, the analyses do not include consideration of taxes on the income of the joint-venture enterprise.

Before dealing with the specific case studies of the two projects considered, a number of key assumptions regarding the conditions applicable to a joint-venture enterprise and key parameters adopted for the analysis require some explanation.

#### Joint Venture Participation

In accordance with the law of the People's Republic of China on Joint Ventures using Chinese and Foreign Investment (approved July 1, 1979 by the Fifth National People's Congress of the PRC)\*, the joint venture is assumed to take the form of a limited liability company. In the registered capital of the joint venture, the proportion of the investment contributed by the foreign participant(s) is taken to be 25 percent.

### Debt Equity Ratio

As there is as yet no experience basis for suggesting the minimum equity position desirable for a power sector joint venture enterprise in China, the experience of Canadian (and North American) utilities in general has been adopted. This suggests that to be creditworthy in the international financial marketplace a power utility enterprise should maintain its debt to equity ratio at between 4:1 and 9:1.

In the cases considered for Three Gorges we have taken the Chinese contribution to equity as consisting of the asset value of the Gezhouba plant plus a capitalized value of Gezhouba revenues during the years preceding first power generation for the Three Gorges plant. This leads to a debt equity ratio of approximately 2:1.

### Chinese and Foreign Equity Participation

The Chinese partner's equity participation may consist of financial capital, physical assets and, as considered in the case of Three Gorges, power revenues from its asset base which has been considered to include the existing Gezhouba development.

The foreign equity contribution would essentially consist of an appropriate financial contribution of fully convertible foreign exchange, taken herein at 25% of the capital of the enterprise. However, this capital contribution should be linked, within the joint venture agreement, to the provision of appropriate management skills and experience which would be directly applied to the organization and management of project development and operations.

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\* See Annex C.

### Domestic Financing

China's power projects have in the past been financed by capital grants from central and/or provincial authorities. The situation is changing and it is understood that domestic financing is now primarily through loans from the People's Construction Bank and through the power revenues accruing to the development enterprise.

As noted above, for multipurpose projects, the separable costs associated with flood control, navigation and other purposes might be met through direct grants from the central authorities or alternatively, as modelled herein, recognized through appropriate revision of power tariffs to increase the revenue base of the enterprise. Thus, a portion of the power rate might be identified as a tariff surcharge which would be eliminated once the project investment costs have been fully met, or maintained as a basis for internal generation of capital to finance future projects assigned to the enterprise.

### Foreign Exchange Financing

The foreign exchange requirements of project development may be met through a variety of debt instruments including commercial loans, suppliers' credits, concessional loans from international financing institutions (IFI's) and long term bonds. In addition, as examined herein, a special form of equity participation may be considered.

It is not appropriate at this stage of examination to suggest any particular mix of debt financing instruments. For illustrative purposes, an average cost of debt has been adopted. Currently international long term financing is available for sound investments by power utilities at about 10% and this rate has been adopted for the base case analysis. A notional 15% rate of return on equity has also been adopted to reflect the differential which would be associated with risk capital under reasonably secure conditions typical of the power industry in North America.

China will have to make foreign exchange allocations to the enterprise over time to retire foreign debt. Herein we have assumed full convertibility of power revenues as required. Even though such convertibility is not at present allowed, this surrogate method of securing necessary foreign exchange has been adopted in the analysis firstly because it illustrates more clearly the financial viability of the project and secondly because adoption of this principle would, more clearly than any other means of allocating foreign exchange, provide a direct linkage between performance and return on investment.

Compensation trade has been raised by Ministry officials as another potential source of foreign exchange. It is possible to represent compensation trade through a higher cost of foreign debt service. Some further comments on this aspect are presented in Section 4.4.

#### Debt Retirement

Within the models presented herein, debt and foreign equity financing have been represented by the average interest costs applied to these two categories of debt. In general, as the foreign equity finance would command a higher rate of return, priority has been assigned to equity retirement once the project begins to generate revenue.

#### Security

Both foreign debt and equity will require guarantees to ensure the most favourable rates. These may take the form of government guarantees of debt instruments through the Bank of China. In addition, it is suggested that a joint venture power utility enterprise should be able to enter into long term "take-or-pay" contracts covering the sale of power output at the inception of development. Such "take-or-pay" contracts would provide assurance to lenders that the project will generate sufficient revenues to meet all debt obligations. It is implicit in the assumptions adopted for the purpose of these studies that tariff schedules covering the bulk supply of power would be



established in relation to the cost of production and that provision would be made by central authorities for regular rate review and revision to cover the impact of cost escalation as experienced.

It is also likely that the establishment of the Multilateral Investment Guarantee Agency (MIGA) and subscription to this protocol by Canada and by China would significantly influence consideration by any Canadian investor of the rate of return required and the level of equity participation which might be considered in China's power sector.

#### Capital Cost of Project

For both projects 1985 capital cost estimates have been provided. It may be noted that for most of the modelling of Three Gorges a notional capital cost estimate derived from unofficial sources and parametric evaluation has been adopted. Subsequent to completion of most of the case studies, additional information on the costs of Three Gorges and Gezhouba were received. These data have been incorporated in several of the cases and, as discussed in Chapter 4, interpretation of the earlier results can be related to those which include these more authoritative cost data.

#### Foreign Cost and Domestic Cost Base

For the Three Gorges project, specific information on the likely foreign exchange cost base for development is not available. Hence, assumptions of 40 percent, 50 percent and 60 percent foreign exchange costs have been modelled to illustrate the relative impact on overall financing costs of the probable range of foreign exchange financing which would be appropriate to hydroelectric developments. In the case of the Gehe Yan project the foreign exchange and domestic cost estimates as presented in the project feasibility study have been adopted<sup>3/</sup>.

<sup>3/</sup> People's Republic of China, Gehe Yan Water Control Project, Qing Jiang River, Hubei Province, Feasibility Study, Prepared by Yangtze Valley Planning Office (YVPO) in collaboration with Hydro Quebec International and Canadian International Project Managers Ltd., October, 1985.

### Schedule for Construction and Commissioning of Generation

For each project a provisional schedule for the construction and commissioning of generation has been provided. For the Three Gorges project a 17-year schedule has been adopted. Although not supported by

any specific analysis, an overall 15-year schedule has also been modelled to illustrate the impact which such a reduction could have. In the case of the Gehe Yan project an overall 10-year schedule as presented in the feasibility report has been adopted for the base case. In addition, an 8-year schedule suggested in the report has been tested.

### Power Output

For each project 1986 has been assumed as Year 1 of the project implementation schedule, and costs escalated thereafter in accordance with stated assumptions.

For each project a long term average annual power output has been adopted with proportionate output assigned during the years of commissioning of generating units to those units indicated in the schedules as being operational.

### Station Service

A notional 1 percent of gross power output has been allocated to station service.

### Revenues

Electric power tariffs in China have remained relatively unchanged since 1953. They are reported by the World Bank to be reasonably uniform across all power regions except in the northwest where historically they have been lower. Special reduced rates have been introduced from time to time to assist new industrial and agricultural users during an initial period of establishment. In 1982 the national average revenue from the power sector was about 6.6 fen/kWh.

A single bulk supply tariff has been adopted for the revenue base. This tariff was reported as being at 4.6 fen/kWh in 1984 for the Jiangsu Provincial Electric Power Bureau<sup>4/</sup>. Jiangsu province is within the East China power region to which part of the output from Three Gorges will be transmitted.

Information provided by the YVPO suggests a bulk power rate of 10 Y per MWh, equivalent to 1.0 fen/kWh. As is evident from the analyses presented in Chapter 4, a significantly higher tariff is required to ensure financial viability for either project.

#### Operation and Maintenance

A notional operation and maintenance cost has been included based on 1 percent of the investment cost incurred up to completion of the project. This O&M charge has been prorated during the final years of construction in proportion to the percent of plant commissioned.

#### Cost Escalation

The long term inflationary trends which will be experienced in China and internationally during the next 10 to 20 years are impossible to predict. For the Three Gorges project a long term escalation rate had been taken notionally at 4 percent per annum. In the feasibility study of the Gehe Yan project 6 percent cost escalation was adopted as the base case and has been utilized in these studies.

Although it is recognized that cost escalation represents a significant uncertainty to project investors, particularly for long-gestation hydroelectric developments, additional variations of cost escalation were not included in the cases studied herein. The potential impact of changes in cost escalation is examined in the Gehe Yan feasibility study. It is assumed that any joint-venture agreement would have to include appropriate covenants to guarantee equity investors a return net of inflation.

<sup>4/</sup> Staff Appraisal Report, Second Power Project, August 1984, IBRD Report No. 5147-CHA.

Foreign Exchange Conversion

The Chinese currency is Renminbi (RMB). It is demominated in Yuan (Y); One Yuan equals 100 Fen. In early 1984 the official exchange rate of the Yuan to the US\$ was about Y 2 = US\$ 1. The internal settlement rate (ISR) of Y 2.8 = US\$ 1 however was used in most transactions. On January 1, 1985 the government abolished the ISR and the official exchange rate at that time was about Y 2.8 = US\$ 1.

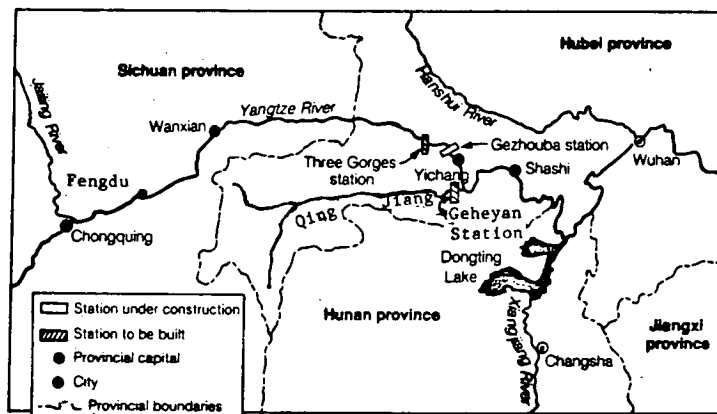
In the analysis herein an exchange rate of Y 2.8 = US\$ 1 has been adopted. The sensitivity to a change in foreign exchange cost has been examined for the Three Gorges project.

In the financial analyses presented in Chapter 4 all costs are denominated in either US dollars or in Chinese Renminbi. It should be noted that within any case study all costs are in either US\$ or RMB. Thus, in the source and application of funds statements presented in Annexes A and B, most cases are denominated in terms of US dollars throughout.

4.0 - INVESTMENT MODELLING OF THREE GORGES AND GEHE YAN  
WATER CONTROL PROJECTS

The investment modelling undertaken of the Three Gorges and Gehe Yan water control projects is described hereinafter. As discussed with Minister Qian and officials of MWREP in October, 1985, for development of the Three Gorges project incorporation of the nearly completed Gezhouba hydroelectric project into the asset base of the Three Gorges Development Corporation has been assumed.

Figure 3 - Location Map



4.1 Case Studies of the Three Gorges Water Control Project

4.1.1 The Project

The Three Gorges development as currently conceived will contain the largest single-site hydroelectric installation in the world. The damsite is located at Sandouping on the main stem of the Yangtze River, some 1,850 km by river upstream from the coastal port of Hangzhou and some 40 km upstream from the existing Gezhouba development. The reservoir which will be created by the Three Gorges dam with a full supply level of 150 m elevation will extend some 250 km upstream to Fengdu at the head of the Yangtze gorges.

The Three Gorges project has been under investigation and study by the Yangtze Valley Planning Office of the Ministry of Water Resources and Electric Power for more than 20 years. A primary purpose of the project is to provide protection against flooding in the lower Yangtze

valley which constitutes the agricultural and industrial heartland of central China. The project will, in addition, provide major sectoral benefits in terms of power generation and navigation.

The YVPO is currently in the process of determining the final height of the dam and the design water level of the reservoir. Alternatives under consideration are a high dam with full supply level at elevation 180 m or a low dam with a reservoir full supply level at 150 m elevation. Either alternative provides for 26 turbine generator units of 500 MW each for a total installed capacity of 13,000 MW. The primary additional benefits of the high dam alternative would be to extend slack-water navigation to the upstream port of Chongqing and afford somewhat more flexibility for flood control operations. (An earlier conceptual high dam design involving a reservoir full supply level at elevation 200 m and 25,000 MW of power capacity was rejected because of the very significant population which would have been affected and other technical considerations.)

The investment analyses which follow are based on preliminary information provided by MWREP and the YVPO concerning the design and schedule for construction of the project for the 150 m fsl elevation design.

This design provides for a concrete gravity dam and spillway, having a total height from the deepest foundation level to the dam crest of 155 m and a crest length between abutments of 1924 m. The general arrangement provides for two powerhouses at the base of the main dam. (See Figure 4). The left bank powerhouse will contain 12 generating units and the right bank powerhouse 14 units. A central gated-spillway provides for control and release of floods. In addition to the power generation facilities, the project includes a double flight of lift locks having a maximum total lift, in three or four locks, of 88 m between tailwater and reservoir water level. These navigation facilities are being designed for the passage of 50 million tons of commodities per year. In addition, a single shiplift is to be provided to maintain navigation during construction and will be used thereafter to provide for rapid transit of passenger craft.

No specific cost estimate was available for Three Gorges at the time these studies were initiated. Based on parametric cost data for other hydro projects in China and global experience as reported by IBRD, a notional capital cost of US\$ 600 per kW of installed capacity was adopted for Three Gorges.

The proposed construction schedule indicates completion of the main works in 11 years, with first power from two units beginning in year 12 and an additional four units being added in years 12 through 17.

The Gezhouba hydroelectric project is a run-of-river development located downstream from the proposed site of the Three Gorges dam. The 2,715 MW development at Gezhouba has been under construction for some years. In 1985 a total of 965 MW of capacity was in service. Completion of the project is scheduled for 1988, with 1,465 MW to be in service in 1986, 2,190 MW in 1987 and the full 2,715 MW in 1988.

It was agreed that the financial modelling of the Three Gorges should consider the Gezhouba project and its power revenues would be included in the asset base of the Three Gorges Development Corporation. Initially a notional asset value of US\$ 500 per kW was assumed for the Gezhouba project and the average annual output taken to be 14.1 TWh, prorated in accordance with the amount of generating capacity assumed to be in service during 1986 through 1988.

At the end of December, 1985 the Yangtze Valley Planning Office (YVPO) provided an estimate of Yuan 15.95 billion (US\$ 438/kW) for the 150 m design for Three Gorges on the basis of domestic investment. The Commissioner of the YVPO advised that the estimate is from a preliminary design report on the Three Gorges project and noted that at the end of 1985 further study to select the final design level for the project is still ongoing. The capital cost for the project may change, through design refinement and if conditions favour increasing the overall dam height. At the sametime additional information on the Gezhouba project was provided which indicated the total investment in this project by 1988 is expected to be Yuan 4.85 billion (US\$ 638/kW).

#### 4.1.2 Case Studies

A series of analyses of Three Gorges was carried out during November and December based upon the assumptions of criteria as detailed hereinafter. Nevertheless, following receipt of more detailed information concerning the costs, schedules and outputs for Gezhouba and Three Gorges, several additional case studies were compiled using these data to facilitate comparison with the other case studies.

To examine the impact of equity financing on the overall cost of project development and the sensitivity of development costs to variations of a number of key financial parameters, a series of cases have been modelled. At the outset a base-case, B1.01, was defined in accordance with the criteria in Table 4.1. Thereafter, a number of variations were tested, changing one parameter at a time to illustrate the effect of such change through comparison with the result of the base-case analysis.

The base case assumes a stand-alone enterprise which would be responsible for the development (and subsequent operation) of the Three Gorges complex. The Three Gorges complex would consist of the existing Gezhouba project and the proposed Three Gorges development located at Sandouping. For the base case it is assumed that the Chinese equity contribution to the joint venture enterprise would comprise the completed Gezhouba development.

Foreign equity participation was, as discussed in Chapter 3, taken to require participation of 25 percent in the capital of the joint venture. The foreign equity contribution has been calculated as the present worth equivalent to the assumed asset value of the Gezhouba plant plus the capitalized value of the Gezhouba power revenues generated during the first 11 years of construction of the Three Gorges development.

In the source and application of funds statements covering the implementation period for Three Gorges, the foreign equity has been indicated as a single contribution in Year 1 (see Annex A). It should



Table 4.1

Three Gorges Joint Venture Company  
Base-Case Criteria

1985 Capital Cost	- Three Gorges US\$ 7.6 billion Gezhouba US\$ 1.3575 billion  Capital cost divided 50% domestic and 50% foreign exchange base cost																								
Generation Capacity	- Three Gorges 26x500 MW = 13,000 MW Gezhouba 2x175 MW + 19x125 MW for a total of 2,715 MW																								
Duration of Project Implementation	- Three Gorges first power Year 12 Total power Year 17 Gezhouba 965 MW in service in 1985; 1465 MW in service in 1986; 2,190 MW in service in 1987; 2,175 MW in service in 1988.																								
Generation	Three Gorges - average annual output 64.4 TWh. For Three Gorges average annual output demand prior to completion prorated by average number of units in service in years 12 through 17. Gezhouba - average annual output 14.1 TWh. Gezhouba output prorated in accordance with generation units in service in Years 1986, 1987 and 1988.																								
Cost Escalation	4% p.a. cumulative.																								
Debt/Equity Proposed	Approx 2:1 (based on assumed equity value of Chinese contribution - Gezhouba plant \$ 1,357.5 million plus \$ 978.9 millions p.v. of 11 yrs of revenues from Gezhouba.																								
Financing Cost	RMB loans at 3.6% p.a. interest. Foreign exchange loans at 10% p.a. interest.																								
Cash Flow Outlay	For Three Gorges a levelized cash flow outlay with 75% of capital cost incurred over Years 1 through 11 and 25% capital cost incurred over Years 12 through 17.																								
Investment Cost	Escalated project capital cost plus interest during construction.																								
Overhead and Maintenance	1% p.a. of escalated capital cost - prorated during commissioning in Years 12 through 17 in accordance with generation plant in service.																								
Unit Commissioning	Three Gorges generating units assume to be in service in accordance with the schedule herein.  <table border="0" style="margin-left: 40px;"> <tr> <td>Year</td> <td>12</td> <td>13</td> <td>14</td> <td>15</td> <td>16</td> <td>17</td> <td>18</td> </tr> <tr> <td colspan="8" style="text-align: center;"><hr/></td> </tr> <tr> <td>Effective Units in Service</td> <td>4</td> <td>8</td> <td>12</td> <td>16</td> <td>22</td> <td>24</td> <td>26</td> </tr> </table>	Year	12	13	14	15	16	17	18	<hr/>								Effective Units in Service	4	8	12	16	22	24	26
Year	12	13	14	15	16	17	18																		
<hr/>																									
Effective Units in Service	4	8	12	16	22	24	26																		
Station Service	Assume at 1% gross generation.																								
Equity Investment	25% foreign, 75% Chinese. Foreign equity assumed to be freely convertible currency. Chinese equity considered to be the Gezhouba project.																								
Return on Foreign Investment	- Guaranteed 15% per year accumulative with retirement of foreign equity over 20 years commencing in year of first power generation (Year 12).																								
Power Revenues	- Power sales at bulk supply tariff of 4.6 f/kWh escalated at cost escalation factor.																								

be noted that this amount represents a present worth value and in reality would likely consist of a series of contributions keeping pace with the capitalized value of the Chinese equity contribution. However, for purposes of illustration the adoption of a single present worth contribution may be more readily conceptualized. This device accounts for the interest earnings credited to the joint-venture enterprise during the initial years of project implementation when the foreign equity contribution exceeds the amount of foreign exchange investment required for project development.

The various cases modelled covering the developments of Three Gorges and the specific variations in assumptions represented are summarized in Table 4.2.

In addition to the base-case, Bl.01, and its variants, Case A has been prepared to demonstrate the cost of development of the project without recourse to foreign equity participation and without the critical assumption of convertability of power revenues. Moreover, in Case A, Gezhouba revenues have been excluded. Case A thus represents the current approach to project development in which financing is approved by the State (now through approvals of credits from central banks rather than direct budget allocations) and is presumed to include provision for appropriate allocations of foreign exchange as necessary to meet debt service costs.

#### 4.1.3 Discussion of the Analyses

Tables 4.3 and 4.4 present proforma income and disbursement statements and balance sheets summarizing for each of the cases the assets and liabilities at the end of Year 17 when the project would be completed.

Comparison of Case A with Case Bl.01 (and all other cases) demonstrates the significant leverage in project financing which is provided by the equity base and the consequent reduction in investment required up to project completion.

Table 4.2

Case Studies of Three Gorges Water Control Project

- Case A
  - without Gezhouba
  - no foreign equity
  - borrowings - foreign loan @ 10% interest
    - domestic loans @ 3.6% interest
  - base cost 50% domestic cost 50% foreign exchange cost
  - no equity
  - power revenues not convertible
  - tariff 4.6 fen/kWh, escalated
- Case B1.01
  - include Gezhouba in asset base
  - foreign equity equal to 1/3 of Chinese equity (25% of joint venture equity capital)
  - borrowings - foreign loans at 10% interest
    - domestic loans at 3.6% interest
  - base cost 50% domestic cost 50% foreign exchange cost
  - US\$ 1 = RMB 2.8
  - all power revenues convertible to foreign exchange as required to meet investment costs and debt retirement
  - tariff 4.6 fen/kWh, escalated
- Case B1.02
  - as B1.01 except: power revenues not convertible to foreign exchange
- Case B1.03
  - as B1.01 except: foreign exchange conversion charged at US\$ 1 = RMB 4
- Case B1.04
  - as B1.01 except: base cost taken at 60% domestic 40% foreign exchange
- Case B1.05
  - as B1.01 except: base cost taken at 40% domestic 60% foreign exchange
- Case B1.06
  - as B1.01 except: foreign loans at 12% interest
- Case B1.07
  - as B1.01 except: foreign loans at 6% interest
- Case B1.08
  - as B1.01 except: domestic loans at 8% interest
- Case B1.09
  - as B1.01 except: tariff 5.5 fen/kWh escalated
- Case B1.10
  - as B1.01 except: capital cost increased to US\$ 10.4 million
- Case B1.11Y
  - as B1.01 except: capital cost RMB 15.95 billion and annual investment requirement for Three Gorges and Gezhouba output as defined by YVPO
  - note: all funds denominated in RMB
- Case B1.11\$
  - as B1.11Y except: all funds denominated in US\$ converted at US\$ 1 = RMB 2.8
- Case B1.12
  - as B1.01 except: no foreign equity participation
- Cl.10
  - as B1.01 except: overall schedule compressed to 15 years, with first power in Year 10.
- Cl.02\$
  - as B1.01 except: annual investment requirements as defined by YVPO
- Cl.02Y
  - as Cl.02\$ except: all funds denominated in Yuan converted at RMB 2.8 = US\$ 1.

Table 4.3

Three Gorges Joint Venture Co.  
Pro Forma Income & Disbursement Statement  
(in millions of dollars) cumulative to end of Year 17

	A	01.01	01.02	01.03	01.04	01.05	01.06	01.07	01.08	01.09	01.10	01.11	01.12	01.01	01.02
<b>Electricity Sales KWH</b>															
Gezhouba	222.4	222.4	222.4	222.4	222.4	222.4	222.4	222.4	222.4	222.4	222.4	222.4	222.4	194.2	222.4
Three Gorges	207.5	207.5	207.5	207.5	207.5	207.5	207.5	207.5	207.5	207.5	207.5	207.5	207.5	207.5	207.5
<b>Total KWH</b>	<b>429.9</b>	<b>429.9</b>	<b>429.9</b>	<b>429.9</b>	<b>429.9</b>	<b>429.9</b>	<b>429.9</b>	<b>429.9</b>	<b>429.9</b>	<b>429.9</b>	<b>429.9</b>	<b>429.9</b>	<b>429.9</b>	<b>401.7</b>	<b>429.9</b>
<b>Operating Revenue</b>	<b>\$5,652.3</b>	<b>\$10,764.8</b>	<b>\$10,764.8</b>	<b>\$7,314.3</b>	<b>\$10,764.8</b>	<b>\$10,764.8</b>	<b>\$10,764.8</b>	<b>\$10,764.8</b>	<b>\$10,764.8</b>	<b>\$13,014.9</b>	<b>\$10,764.8</b>	<b>\$11,730.5</b>	<b>\$10,764.8</b>	<b>\$9,465.4</b>	<b>\$10,764.9</b>
Equity contribution & interest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foreign loans U.S.	\$13,693.9	\$566.3	\$10,736.8	\$1,885.6	\$2.1	\$1,753.1	\$621.3	\$463.3	\$566.5	\$13.7	\$2,824.8	0.0	\$1,508.7	\$1,290.4	\$674.8
Yuan loans	\$4,506.5	\$5,548.9	\$1,123.9	\$8,865.6	\$5,352.2	\$5,954.8	\$5,616.8	\$5,421.6	\$7,794.7	\$4,223.9	\$11,196.1	\$1,950.1	\$5,213.0	\$5,962.9	\$5,562.3
<b>Total Income</b>	<b>\$23,852.7</b>	<b>\$17,505.1</b>	<b>\$23,250.6</b>	<b>\$18,690.6</b>	<b>\$16,760.5</b>	<b>\$19,084.8</b>	<b>\$17,628.1</b>	<b>\$17,274.8</b>	<b>\$19,751.1</b>	<b>\$17,877.6</b>	<b>\$25,391.3</b>	<b>\$14,720.6</b>	<b>\$17,486.5</b>	<b>\$17,329.3</b>	<b>\$17,748.6</b>
<b>Income disbursement</b>															
Project cost	\$10,730.0	\$10,730.0	\$10,730.0	\$10,730.0	\$10,730.0	\$10,730.0	\$10,730.0	\$10,730.0	\$10,730.0	\$10,730.0	\$14,549.4	\$8,400.0	\$10,730.0	\$10,161.6	\$11,293.6
Interest	\$9,834.8	\$1,957.5	\$6,320.0	\$3,437.6	\$1,692.9	\$2,604.7	\$2,033.0	\$1,816.3	\$5,206.0	\$1,289.3	\$4,913.7	\$298.4	\$2,624.3	\$2,262.1	\$1,568.7
Work in progress	\$20,564.8	\$12,687.5	\$17,050.0	\$14,167.6	\$12,422.9	\$13,334.7	\$12,763.0	\$12,546.3	\$15,936.0	\$12,019.3	\$19,463.1	\$8,698.4	\$13,354.3	\$12,423.7	\$12,774.3
<b>Equity repayment</b>	<b>0.0</b>	<b>\$2,604.6</b>	<b>\$2,604.6</b>	<b>\$2,604.6</b>	<b>\$2,604.6</b>	<b>\$2,604.6</b>	<b>\$2,604.6</b>	<b>\$2,604.6</b>	<b>\$2,604.6</b>	<b>\$2,604.6</b>	<b>\$2,604.6</b>	<b>\$3,282.1</b>	<b>0.0</b>	<b>\$1,969.2</b>	<b>\$2,604.6</b>
Loan repayment U.S.	0.0	\$566.3	0.0	\$1,885.6	\$2.1	\$1,753.1	\$621.3	\$463.3	\$566.5	\$13.7	\$2,824.8	0.0	\$1,508.7	\$1,290.4	\$674.8
Loan repayment Yuan	\$3,287.9	\$1,646.7	\$1,123.7	\$32.8	\$1,730.9	\$1,391.6	\$1,639.2	\$1,660.6	\$644.0	\$3,240.0	\$498.6	\$1,950.1	\$2,623.5	\$1,646.0	\$1,695.7
<b>Total Disbursements</b>	<b>\$23,852.7</b>	<b>\$17,505.1</b>	<b>\$20,778.3</b>	<b>\$18,690.6</b>	<b>\$16,760.5</b>	<b>\$19,084.0</b>	<b>\$17,628.1</b>	<b>\$17,274.8</b>	<b>\$19,751.1</b>	<b>\$17,877.6</b>	<b>\$25,391.3</b>	<b>\$13,930.6</b>	<b>\$17,486.5</b>	<b>\$17,329.3</b>	<b>\$17,748.6</b>
<b>Surplus</b>	<b>0.0</b>	<b>0.0</b>	<b>\$2,472.3</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>\$790.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

Table 4.4

Three Gorges Joint Venture Co.  
Pro Forma Balance Sheet at End of Year 17  
(in millions of dollars)

	A	B1.01	B1.02	B1.03	B1.04	B1.05	B1.06	B1.07	B1.08	B1.09	B1.10 End of year 17	B1.11	B1.12	C1.01	C1.02
<b>Assets</b>															
<b>Current</b>															
	\$ 0	\$ 0	\$2,472.3	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$789.4	\$ 0	\$ 0	\$ 0
<b>Fixed</b>															
Plant in service Gezhouba	\$ 0	\$1,400.0	\$1,400.0	\$1,400.0	\$1,400.0	\$1,400.0	\$1,400.0	\$1,400.0	\$1,400.0	\$1,400.0	\$1,400.0	\$1,400.0	\$1,357.5	\$1,357.5	\$1,400.0
Plant in service 3 Gorges	\$20,564.0	\$12,687.5	\$17,050.0	\$14,167.8	\$12,422.9	\$13,334.8	\$12,763.0	\$12,546.3	\$15,936.0	\$12,019.3	\$19,463.1	\$8,699.0	\$13,354.3	\$12,423.7	\$12,774.3
<b>Total Assets</b>	<b>\$20,564.0</b>	<b>\$14,087.5</b>	<b>\$20,922.3</b>	<b>\$15,567.8</b>	<b>\$13,822.9</b>	<b>\$14,734.8</b>	<b>\$14,163.0</b>	<b>\$13,946.3</b>	<b>\$17,336.0</b>	<b>\$13,419.3</b>	<b>\$20,863.1</b>	<b>\$10,888.4</b>	<b>\$14,711.8</b>	<b>\$13,781.2</b>	<b>\$14,174.3</b>
<b>Liabilities</b>															
<b>Long term debt</b>															
Due to Yuan bankers	\$1,218.6	\$3,902.3	\$ 0	\$8,832.0	\$3,621.3	\$4,563.2	\$3,977.7	\$3,761.0	\$7,150.8	\$984.3	\$10,697.3	\$ 0	\$2,589.6	\$4,316.9	\$3,866.7
Due to U.S. bankers	\$13,693.9	\$ 0	\$10,736.8	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
<b>Total Liabilities</b>	<b>\$14,912.5</b>	<b>\$3,902.3</b>	<b>\$10,736.8</b>	<b>\$8,832.0</b>	<b>\$3,621.3</b>	<b>\$4,563.2</b>	<b>\$3,977.7</b>	<b>\$3,761.0</b>	<b>\$7,150.8</b>	<b>\$984.3</b>	<b>\$10,697.3</b>	<b>\$ 0</b>	<b>\$2,589.6</b>	<b>\$4,316.9</b>	<b>\$3,866.7</b>
<b>Equity</b>															
Chinese partners	\$5,632.3	\$7,733.8	\$7,756.1	\$4,306.4	\$7,772.2	\$7,742.2	\$7,733.9	\$7,733.9	\$7,733.8	\$10,005.6	\$7,736.4	\$7,830.4	\$12,122.2	\$7,670.3	\$7,878.3
Foreign partners	\$ 0	\$2,429.4	\$2,429.4	\$2,429.4	\$2,429.4	\$2,429.4	\$2,429.4	\$2,429.4	\$2,429.4	\$2,429.4	\$2,429.4	\$3,038.0	\$ 0	\$1,794.0	\$2,429.4
<b>Total Equity</b>	<b>\$5,632.3</b>	<b>\$10,185.2</b>	<b>\$10,185.5</b>	<b>\$6,735.8</b>	<b>\$10,201.6</b>	<b>\$10,171.6</b>	<b>\$10,185.3</b>	<b>\$10,185.3</b>	<b>\$10,185.2</b>	<b>\$12,435.0</b>	<b>\$10,165.8</b>	<b>\$10,888.4</b>	<b>\$12,122.2</b>	<b>\$9,464.3</b>	<b>\$10,307.7</b>
<b>Total Liabilities &amp; Equity</b>	<b>\$20,564.0</b>	<b>\$14,087.5</b>	<b>\$20,922.3</b>	<b>\$15,567.8</b>	<b>\$13,822.9</b>	<b>\$14,734.8</b>	<b>\$14,163.0</b>	<b>\$13,946.3</b>	<b>\$17,336.0</b>	<b>\$13,419.3</b>	<b>\$20,863.1</b>	<b>\$10,888.4</b>	<b>\$14,711.8</b>	<b>\$13,781.2</b>	<b>\$14,174.4</b>

Comparison of Case A with all other cases also demonstrates the very significant contribution to development which can be provided from the ongoing revenues from an existing project (in principle comparable to conventional utility financing) and the dramatic reduction in cost which would be achieved by a policy allowing for convertability of power revenues. Such a policy would in effect recognize that the foreign exchange earnings from China's exports are dependant upon electric power consumption as an intermediate input - either directly in manufactured products or through the output of basic chemical, metallurgical and construction material industries, as well as through the transport and service sectors which provide the materials and services employed in production of nearly all of China's industrial and agricultural output.

Comparison between cases demonstrates the impact of the specific variation assumed. Detailed statements identifying the source and application of funds for each case covering the implementation period for Three Gorges are presented in Annex A.

A comparison of Case A with Case B1.02 essentially demonstrates the significant impact introducing an equity base and of applying the revenues from Gezhouba to the development of Three Gorges even under the assumption that none of the revenues are convertible to foreign exchange.

Case B1.01 as compared with Case A illustrates the significant impact of foreign equity participation in reducing overall costs and the dramatic impact of the assumption that power revenues would be convertible to foreign exchange as required to meet investment requirements and debt/equity retirement.

Case B1.03 as compared with B1.01 illustrates the cost impact of a devaluation of the RMB from Y 2.8 equals to US\$ 1 to Y 4.0 equals to US\$ 1.

Case B1.04 and B1.05 as compared with B1.01 illustrate the cost impact of changing the foreign exchange component of base cost by - 10% and + 10% respectively.

Case Bl.06 and Bl.07 as compared with Bl.01 illustrate the cost impact of an increase in the cost of foreign exchange borrowings to 12% (Bl.06) or of reducing foreign borrowing cost to 6% (Bl.07). The latter case might be considered representative of the average cost of foreign borrowing if substantial amounts of concessional finance were allocated to development of this project by the State.

Case Bl.08 as compared with Bl.01 illustrates the cost impact of an increase in the domestic borrowing rate from 3.6% to 8.0%.

Case Bl.09 as compared with Bl.01 illustrates the impact of a tariff increase to 5.5 fen/kWh. (It may be noted that in 1984 the IBRD estimated an LRMC (long run marginal cost) of power at 5.3 fen/kWh in Jiangsu province. This province is part of the Eastern Power Region which would be fed from Three Gorges.)

Case Bl.10 as compared with Bl.01 illustrates the cost impact of a 33% increase in capital cost (from US\$ 600 per kW to US\$ 800 per kW). It is worth noting that even under this assumption of increased cost the project remains financially viable and capable of retiring all foreign loans as well as a portion of foreign equity within the overall implementation period.

Case Bl.11 as compared with Bl.01 illustrate the cost impact of a 30% reduction in capital cost and revision of the investment profile in accordance with data provided by the Yangtze Valley Planning Office (YVPO). In Annex A Cases Bl.11\$ and Bl.11Y are identical, with all prices denominated in US\$ and in Yuan respectively, with conversion at 1 US\$ = 2.8 Yuan.

Case Bl.12 as compared with Bl.01 illustrates the cost of utilizing foreign equity in project financing.

It may be noted that a high level of equity financing results from the assumption that the Chinese equity consists of the asset value of the Gezhouba project and the capitalized value of its revenues over a period of 11 years up to generation of first power from the Three Gorges

project. This high level of Chinese equity contribution together with foreign equity participation providing 25% of the enterprise capital leads to a relatively low debt/equity ratio. For development of Three Gorges based on a joint venture equity participation, consideration of a lower level of foreign equity participation might be preferable.

Case Cl.01 as compared with Bl.01 illustrates the cost impact of reducing the overall implementation schedule by two years and advancing first power from Year 12 to Year 10.

Cl.02 as compared with Bl.01 illustrate the impact of rescheduling the investment profile in accordance with the information provided by the Yangtze Valley Planning Office (YVPO) as compared with the levelized investment assumption adopted in Case Bl.01 and its main variants. (Cases Cl.02Y and Bl.11Y in Annex A only are denominated in Renminbi. These presentations are identical to the US\$ denominated case, with conversion at US\$ 1 = Y 2.8.)

Cl.02\$ and Bl.11\$ (or Cl.02Y and Bl.11Y) may be directly compared as Cl.02\$ represents a 30% increase in capital cost over Bl.11\$.

#### 4.2 Case Studies of the Gehe Yan Water Control Project

##### 4.2.1 The Project

The Gehe Yan project is located on the Qian Jiang, a tributary of the Yangtze River situated in the southwestern part of Hubei province. The site is located some 62 km upstream of the confluence of the Qian Jiang with the Yangtze.

The Qian Jiang River originates in the Qiyue mountains. Its main stream is 423 km in length with a total fall of 1,430 m. It is proposed to develop the river in a cascade arrangement of four hydroelectric projects, Gehe yan being the second upstream from the confluence with the Yangtze River.



Construction of the Gehe Yan dam would raise the upstream water level from a natural low water level of about 78 m to the selected reservoir full supply level of 200 m. The dam would provide a narrow reservoir that would extend about 80 km upstream. The design elevation for the reservoir was selected after taking into consideration power generation, flood control, navigation, relocation, the value of submerged lands and resources, site geology and cost.

The power installation will consist of four 300 MW units to provide a total capacity of 1,200 MW operating at a net head of 99 m. Proposed new transmission associated with the Gehe Yan project consists of 360 km of new 500 kV line linking the plant with the existing Gezhouba project, with Wuhan and with Hunnan province. The project incorporates a shiplift capable of handling vessels of up to 300 tons. The general arrangement of the dam, powerhouse, spillway and shiplift facilities from the feasibility report is reproduced herein at Figure 5.

The project is expected to provide some measure of flood control on the lower Qian Jiang and to facilitate the development of a commercial fishery in the reservoir and irrigation of some agricultural lands surrounding the reservoir. Offsetting project benefits is a need to relocate and resettle some 19,600 people. The project will also flood some small mines and existing infrastructure and approximately 980 hectares of agricultural land.

#### 4.2.2 Case Studies

For the purpose of examining the application of equity participation to the development of Gehe Yan the full feasibility study of this project completed in October, 1985 by the Yangtze Valley Planning Office (YVPO) in collaboration with Hydro Quebec International and Canadian International Project Managers Ltd. was made available.\* This feasibility report provides a detailed cost estimate for the project separated into foreign exchange and domestic funding

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\* Op. cit. 3/.

requirements, year by year cash flow profiles, a schedule for construction and commissioning of the power generation facilities and an estimate of average annual power generation. These data have been incorporated in the financial analysis.

As for Three Gorges, a base-case, B1.01, was defined in accordance with the criteria in Table B.5 and a series of cases analyzed to illustrate the impact on development cost of changes in base-case assumptions.

Table 4.5

Gehe Yan Water Control Project  
Base Case Criteria

1985 Capital Cost	- Yuan 1,583.43 millions: divided into Yuan 838.893 million domestic component and Yuan 744.5 million foreign exchange component
Generation Capacity	- 4x300 MW, total 1,200 MW
Duration of Project Implementation	- 10 years
Generation	- 600 MW assumed to be in service in Year 9 with average annual energy capability of 2.80 TWh and 1,200 MW in Year 10 and all years thereafter with an average annual capability of 3.04 TWh
Cost Escalation	- 6% p.a.
Debt Equity Proposed	- 4:1
Financing Cost	- RMB loans at 3.6%. Foreign exchange loans at 10%.
Cash Flow Outlay	- Cash flows for domestic and foreign exchange components in accordance with detailed schedules contained in feasibility report (Ref. Tables 10-4, 10-5 and 10-6, Vol. I)
Investment Cost	- Escalated capital cost plus interest during construction
Overhead and Maintenance	- 1% of escalated capital cost
Station Service	- Assumed at 1% of gross generation
Equity Investment	- 25% foreign, 75% Chinese. Foreign equity to be fully convertible currency and Chinese equity in RMB non-convertible
Return on Foreign Investment	- Guaranteed 15% per year cumulative with retirement of foreign equity over 20 years following project completion
Project Revenues	- Net generation sales at average tariff of 4.6 fen/kWh escalated at cost escalation factor.

Again, all cases assume a stand-alone enterprise which would be responsible for the development and operation of the Gehe Yan project. The foreign equity and the Chinese equity contributions are assumed at an appropriate ratio to debt, with capital cost contributions in the

base case, B1.01, assumed at 20% of the capital cost estimate and taken as single sums contributions in Year 1 of development. The equity cash surplus in initial years of implementation is credited with interest earnings (at 8% on RMB funding and 10% on foreign exchange funding) and these interest earnings apply to the investment requirements. This simplification of the equity contribution has been adopted for illustration purposes but it may be noted that proportionate equity contributions provided over several years would have limited impact on the overall cost of the development.

The various cases modelled covering the development of Gehe Yan and the specific variation in assumptions represented are summarized in Table 4.6.

Table 4.6

Gehe Yan Water Control Project  
Case Studies

Case A	- No equity
Case B1.01	- Foreign equity equal to one-third of Chinese equity (25% of joint venture equity capital). Borrowings - domestic loans at 3.6% interest. Foreign exchange loans at 10% interest cost.
Case B1.02	- As B1.01 except: tariff base increased 50% to 6.9 fen/kWh.
Case B1.03	- As B1.02 except: debt/equity ration taken at 9:1.
Case B1.04	- As B1.02 except: foreign loans at 8% interest cost.
Case B1.05	- As B1.02 except: foreign loans at 12% interest cost.
Case B1.06	- As B1.02 except: domestic loans at 8% interest cost.
Case B1.07	- As B1.02 except: capital cost increased by 15%.
Case C1.01	- As B1.02 except: implementation schedule revised to 8 years with first power in Year 7. Cash flow profiles adjusted in accordance with data from feasibility report.

4.2.3 Discussion of Analyses

A summary statement of operating revenue and expenditures for each of the cases for Year 11, following project completion, is presented in Table 4.7. From this table it may be noted that analysis of the base case, B1.01, indicates the project would not be financially viable under the revenue base projected. Hence for all other cases the assumed 1985 tariff of 4.6 fen/kWh was raised to 6.9 fen/kWh. This 50% increase in revenue base is, except for Case B1.07, sufficient to meet all debt service obligations. The small surplus (or deficit as in the case of B1.07) indicates that the balancing cost of service rate would be marginally above or below 6.9 fen/kWh.

Table 4.7

Gehe Yan Joint Venture Co.  
Summary of Operating Station Revenue  
& Expenditures at End of Year 10  
(in millions of Yuan)

Case	A1	B1.01	B1.02	B1.03	B1.04	B1.05	B1.06	B1.07	C1.01
Operating Station Revenue	339.96	226.64	339.96	339.96	339.96	339.96	339.96	339.96	303.55
Less Operations & Maintenance	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00
Net Revenue	317.96	204.64	317.96	317.96	317.96	317.96	317.96	317.96	281.55
10 year Amortization									
Yuan loans	163.07	119.76	119.76	134.56	119.76	119.76	147.25	137.72	108.30
Foreign loans	148.60	154.86	115.13	131.89	103.86	127.34	115.18	149.07	126.04
Sub-total	311.67	274.62	234.89	266.45	223.62	247.10	262.43	286.79	234.34
20 year Amortization									
Foreign Equity	.00	51.17	51.17	25.59	51.17	51.17	51.17	51.17	38.70
Total Expenditures	311.67	325.79	286.06	292.04	274.79	298.27	313.60	337.96	273.04
Surplus (Deficit)	6.29	( 121.15)	31.90	25.92	43.17	19.69	4.36	( 20.00)	8.51

Tables 4.8 and 4.9 are proforma summaries covering the source and application of funds and balance sheets for all cases as to the end of Year 10. Detailed source and application of funds statements covering the implementation period of project development for all cases are presented in Annex B.

Case B1.02 as compared with B1.01 reflects an increase in revenue base as required to service debt obligations. Hence B1.02 becomes a new base case against which all other cases should be compared. Case A represents the situation without equity participation and may be compared with Case B1.02 in which equity has been introduced.

Case B1.03 as compared with B1.02 illustrates the impact of changing the debt equity ratio from 4:1 to 9:1.

Cases B1.04 and B1.05 as compared with B1.02 illustrate the impact on cost of a 2% change in the average cost of foreign borrowings; to 8% in the case of B1.04 and 12% for B1.05.

Case B1.06 as compared with B1.02 illustrates the impact of increasing the cost of domestic borrowings from 3.6% to 8%.

Case B1.07 as compared with B1.02 illustrates the impact of a capital cost increase of 15%, and is considered to be at the upper limit which would be expected within the normal range of reliability of feasibility level cost estimates.

Case C1.01 as compared with B1.02 reflects the impact of reducing the implementation schedule from 10 to 8 years.

Other variations such as may arise from a change in foreign exchange conversion rate or changes in the foreign exchange component of capital cost have not been specifically examined. The general impact of such changes may be inferred from the comparisons presented for the Three Gorges development.

Table 4.8

Gehe Yan Joint Venture Co.  
Source & Application of Funds  
End of Year 10  
(in millions of Yuan)

Case #	A1	B.101	B1.02	B1.03	B1.04	B1.05	B1.06	B1.07	C1.01
Electricity Sales	591.36	379.57	591.36	591.36	591.36	591.36	591.36	591.36	522.45
Chinese Equity	.00	237.52	237.52	158.34	237.52	237.52	237.52	273.13	237.52
Interest Earned	.00	27.21	27.21	14.03	27.21	27.21	27.21	31.29	11.00
Foreign Equity	.00	79.17	79.17	39.59	79.17	79.17	79.17	91.04	79.17
Interest Earned	.00	21.30	21.30	5.25	21.30	21.30	21.31	24.50	10.24
Borrowing Yuan	1,349.92	991.39	991.39	1,113.95	991.39	991.39	1,219.00	1,140.10	896.56
Borrowing Foreign Currency	913.07	951.54	707.74	810.40	638.12	782.41	707.74	915.97	636.33
<b>Total Source of Funds</b>	<b>2,854.35</b>	<b>2,687.70</b>	<b>2,655.69</b>	<b>2,732.92</b>	<b>2,586.07</b>	<b>2,730.36</b>	<b>2,883.31</b>	<b>3,067.39</b>	<b>2,393.27</b>
<b>APPLICATION OF FUNDS</b>									
Capital Expenditures									
Foreign Currency Expenditures	744.50	744.50	744.50	744.50	744.50	744.50	744.50	856.16	744.50
Annual Escalation 6%	352.47	352.47	352.47	352.47	352.47	352.47	352.47	405.34	242.41
Interest during const.	407.46	334.61	302.60	349.63	232.98	377.28	302.60	361.37	261.28
<b>Sub-total</b>	<b>1,504.43</b>	<b>1,431.58</b>	<b>1,399.57</b>	<b>1,446.60</b>	<b>1,329.95</b>	<b>1,474.25</b>	<b>1,399.57</b>	<b>1,622.87</b>	<b>1,248.19</b>
Yuan Expenditures	838.93	838.93	838.93	838.93	838.93	838.93	838.93	964.73	838.93
Annual Escalation 6%	261.09	261.09	261.09	261.09	261.09	261.09	261.09	300.27	175.20
Interest during const.	249.90	156.10	156.10	186.31	156.10	156.10	383.72	179.52	130.95
<b>Sub-total</b>	<b>1,349.92</b>	<b>1,256.12</b>	<b>1,256.12</b>	<b>1,286.33</b>	<b>1,256.12</b>	<b>1,256.12</b>	<b>1,483.74</b>	<b>1,444.52</b>	<b>1,145.08</b>
<b>Total Project Cost</b>	<b>2,854.35</b>	<b>2,687.70</b>	<b>2,655.69</b>	<b>2,732.93</b>	<b>2,586.07</b>	<b>2,730.37</b>	<b>2,883.31</b>	<b>3,067.39</b>	<b>2,393.27</b>

Table 4.9

Gehe Yan Joint Venture Co.  
Balance Sheet  
End of Year 10  
(in millions of Yuan)

Case	A1	B1.01	B1.02	B1.03	B1.04	B1.05	B1.06	B1.07	C1.01
<b>Fixed Assets</b>									
Plant in service	2,854.35	2,687.71	2,655.70	2,732.92	2,586.08	2,730.37	2,883.31	3,067.39	2,393.27
<b>Total Assets</b>	2,854.35	2,687.71	2,655.70	2,732.92	2,586.08	2,730.37	2,883.31	3,067.39	2,393.27
<b>Liabilities</b>									
Yuan loans	1,349.92	991.39	991.39	1,113.95	991.39	991.39	1,219.00	1,140.10	896.56
Foreign loans	913.07	951.54	707.74	810.40	638.12	782.40	707.74	915.97	636.33
<b>Total Liabilities</b>	2,262.99	1,942.93	1,699.13	1,924.35	1,629.51	1,773.79	1,926.74	2,056.07	1,532.89
<b>Equity</b>									
Chinese	591.36	424.46	636.25	648.39	636.25	636.25	636.25	642.97	618.20
Foreign	.00	320.32	320.32	160.18	320.32	320.32	320.32	368.35	242.18
<b>Total Liabilities &amp; Equity</b>	2,854.35	2,687.71	2,655.70	2,732.92	2,586.08	2,730.36	2,883.31	3,067.39	2,393.27

#### 4.3 Observations

The foregoing analyses demonstrate the impacts on the costs of development of utilizing different levels of foreign equity participation for two projects of quite different magnitude - the 13,000 MW Three Gorges and 1,200 MW Gehe Yan Water Control Projects. Within the context of assumptions with respect to costs and financial parameters, the conditions which would be necessary to assure financial viability of the hypothetical joint venture enterprises have been demonstrated.

In order to model the financial implications of a joint venture enterprise which would own and operate bulk power supply facilities, a number of critical assumptions have had to be made concerning China's policies affecting the financing of power developments. The key assumptions are that power revenues would be based on tariff rates which would reflect the actual cost of service, and that the indirect foreign exchange earnings of electric power would be explicitly recognized through according a right to convert revenues to the joint venture enterprise as necessary to meet all of its foreign exchange obligations.

Justification of a policy allowing for power revenue convertibility is based upon evidence of the high rate of consumption of electricity by industry and agriculture, and hence the importance of electrical energy as an intermediate input to nearly all of China's exports. This is likely to be increasingly so as electric power supply is substituted for other forms of energy and direct linkage between costs and revenues in the electric power sector could provide added incentives to increasing overall efficiencies in both development and operation.

Comparison of the results of the case studies for Three Gorges and Gehe Yan highlight the significance of a major difference in assumptions which affect the outcome. In the case of Three Gorges the joint venture enterprise is assumed to be the owner operator of the Gezhouba development as well as of the Three Gorges project. This provides the enterprise with a substantial revenue base from the outset of construction at Three Gorges and significantly reduce the level of



borrowings required for project completion. As illustrated in all cases (except Case A and Case B1.02) all foreign borrowings could be retired within the implementation period leaving only a debt service requirement to retire domestic borrowings and equity after Year 17. In contrast, the case studies for Gehe Yan indicate there would be significant levels of foreign and domestic borrowings outstanding in addition to the foreign equity retirement obligation accumulated upon project completion. Debt service requirements indicate the need for a significant increase in the basic tariff to make the project viable under these circumstances.

The foregoing suggests that the model for Three Gorges provides a more attractive basis for project financing. If Gehe Yan were to be considered as a component of a utility enterprise with an existing revenue and asset base, the outcome of the financial analysis might be significantly improved.

It may be observed that financing of both projects has been modelled at a cost of borrowing in line with current international commercial rates. As the projects appear financially viable at such rates, subject to assumptions regarding tariff adjustments which are not inconsistent with current schedules, the case for application of scarce concessional finance to major power sector developments might be questioned. This issue is raised here simply to note that, assuming a change in internal policies under which power rates will be raised to reflect the actual cost of services, a significant part of China's needs for new generating capacity might well be met without recourse to concessional finance.

China's consideration of the utility of adapting policies to facilitate foreign equity participation in the development of a few selected power projects must take into account a number of potential benefits which at this stage of examination have been identified but cannot be quantified. A major benefit could accrue through the demonstrative effect of applying modern management practices to project implementation. However, even if successful in delivering a project

efficiently, the benefit to China could be greatly enhanced if its application could be adapted to the development of many other projects. How best to acquire and spread these skills is perhaps central to assessing the utility of foreign equity participation.

#### 4.3.1 Discussion of Compensation Trade in Relation to Equity Investment

During the discussions held in October, 1985 with Minister Qian and her delegation, the Chinese side indicated that the Ministry is considering compensation trade as a means of raising foreign exchange to support some of its developments. The question was raised as to whether such an approach would be applicable to repayment of foreign equity participation.

It has not been possible at this preliminary stage to examine the impact of introducing compensation trade into the financial arrangements. However, some general observations may be offered on this concept.

In principle, compensation trade could take the form of a counter-purchase of Chinese goods, either manufactured or agricultural products or resource materials, which the foreign partner would be expected to market outside of China. The net proceeds from the sale of such goods could represent some part of the foreign exchange required to retire the foreign equity (or other debt obligation).

Compensation trade introduces additional risk to the foreign investor (or lender) and, even if acceptable, would undoubtedly increase the cost to China of foreign financing provided either through equity or borrowings. It seems unlikely, although not impossible, that the foreign equity participants would include marketing skills appropriate to handling compensation trade. It is more likely that disposal of counter trade goods would involve one or more specialized trading houses whose fees would have to be factored into the cost of the transaction. It is probable that the Chinese partner of the joint-venture enterprise

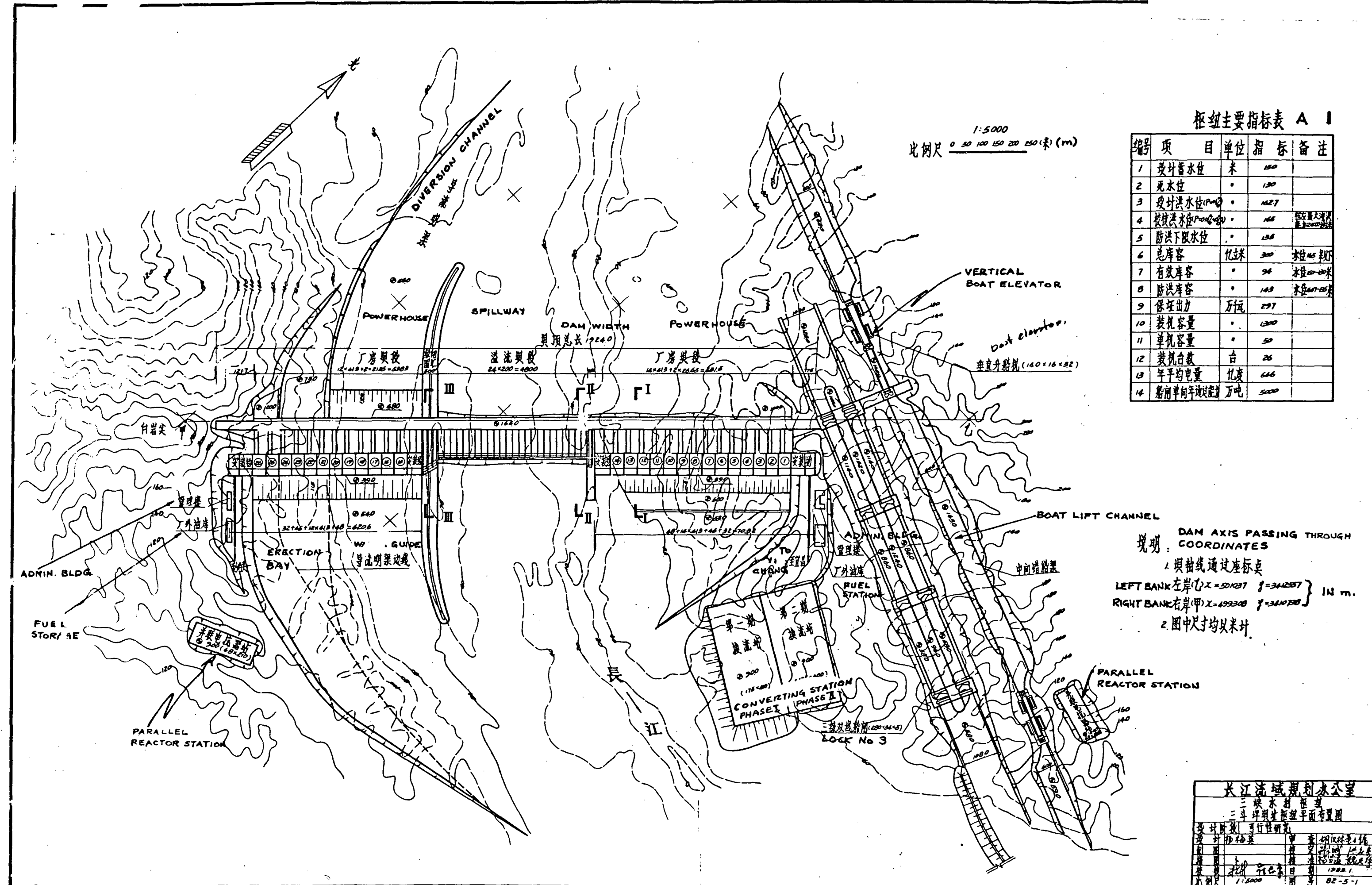
would also incur additional costs to secure and deliver compensation goods as such commercial activities would be outside its normal functions as a power utility owner-operator.

It is not possible to provide any realistic indication of the impact of cost of project development of compensation trade in advance of proposals identifying the specific class of goods offered, the percentage of debt to be financed through this mechanism and other commercial details.

Conceptually, compensation trade could be represented in the financial model by an appropriate premium on the cost of debt service. Comparison of the interest cost of foreign exchange borrowings between Cases B1.06, B1.01 and B1.07 for Three Gorges illustrates the effect of average foreign loan borrowing costs at interest rates of 6, 10 and 12 percent. This comparison, while not directly representative of countertrade applied specifically to equity retirement, does provide an indication of the additional cost of foreign debt service with increasing average rates of interest.

A significant element associated with equity participation, even in the form of preferred shares as adopted herein, is that this financial contribution would provide for deferral of repayment until after project completion. Moreover, repatriation of the foreign equity investment will occur over a longer term than would likely be available under conventional commercial borrowings. It would be difficult, if not impossible, to establish even a sense of the futures market for commodities as far forward as would be necessary to establish countertrade arrangements for repayment of foreign equity participation.

On balance, compensation trade does not appear to be an attractive means of securing equity participation, although it may have more application to other components of project financing.



枢纽主要指标表 A I

编号	项目	单位	指标	备注
1	设计蓄水位	米	150	
2	死水位	"	130	
3	设计洪水位(P=1%)	"	162.7	
4	校核洪水位(P=0.5%)	"	165	对应最高泄水能力
5	防洪下限水位	"	135	
6	总库容	亿立方米	300	水位150米
7	有效库容	"	94	水位135米
8	防洪库容	"	143	水位150-135米
9	保证出力	万千瓦	297	
10	装机容量	"	1300	
11	单机容量	"	50	
12	装机台数	台	26	
13	年平均电量	亿度	64.6	
14	枢纽单向年过船能力	万吨	5000	

说明:  
 1. 坝轴线通过坐标点  
 LEFT BANK 左岸(X=501297 Y=342257) IN m.  
 RIGHT BANK 右岸(X=499308 Y=344728)  
 2. 图中尺寸均以米计

长江流域规划办公室	
设计阶段	可行性研究
设计单位	长江流域规划办公室
设计日期	1988.1
设计比例尺	1:5000
设计图号	82-5-1

A1

No.	Item	Unit		Note
1	Planned water level	m	150	
2	Low water level	m	130	
3	Planned highest level	m	162.7	
4	Checking highest level	m	165	Corresponding highest water release capacity 124,000 m <sup>3</sup> /s
5	Lower level water prevention	m	135	
6	Total reservoir capacity	bln m <sup>3</sup>	30	Water level under 165 m
7	Effective reservoir cap.	"	9.4	Water level under 150-130 m
8	Reservoir capacity against flooding	"	14.3	
9	Guaranteed output	MW	2,970	
10	Turbines capacity	MW	13,000	
11	Single turbine capacity	MW	500	
12	Number of turbines		26	
13	Average yearly output	TWh	64.6	
14	Yearly one-way boat passing capacity	ton	10,000	

FIGURE 4



5.0 - CANADIAN INTEREST IN INVESTMENT OPPORTUNITIES

To obtain a preliminary indication of the extent of potential interest of the Canadian private sector in equity participation in power sector developments in China, a paper outlining the conceptual approach described herein and a simplified illustrative model of Three Gorges was circulated to a selected number of major Canadian investors and to two major power utilities.

Not surprisingly, in view of uncertainties as to China's position with respect to joint-venture developments in its power sector, a somewhat limited response was elicited. Nevertheless, Hydro Quebec did react positively and while it would not consider acting as a sole source of equity participation or even as a major source of equity capital, indicated it would be willing to consider participating as a member of a Canadian equity group and would be in a position to contribute the utility expertise relevant to the management of development and operation. Based upon the involvement of Hydro Quebec International in the preparation of the feasibility study for the Gehe Yan project, Hydro Quebec suggested that a project of this size might be an appropriate venture for initial application of equity participation to development of China's power sector.

Given the possibility that China would be willing to consider adoption of policies and conditions which would make equity financing attractive, a number of major Canadian commercial banks and investment bankers have expressed an interest in this study. Several of these agreed to review and comment on a draft of this report with a view to indicating how these financial institutions would view the prospects for debt financing given Canadian equity participation as assumed herein. A synthesis of the comments and observations of financial institutions follows.

Generally the PRC is considered to have an excellent credit rating. Project financing in the power sector would likely be viewed favourably by Canadian financial institutions given appropriate guarantees and demonstration of project financial viability. Several of

the financial institutions observed that examination of project financial viability and risk is now viewed as an important feature of loan appraisal. Even if borrowings for power sector developments may be fully supported by sovereign guarantees, the capacity of the project to service debt is generally accepted as an essential lending criterion.

The creditworthiness of the enterprise will be judged not only on the basis of the financial viability of the project, but also on the credibility and experience of the enterprise management in undertaking projects of the type and magnitude contemplated. This requires evidence of strong financial as well as technical expertise in enterprise management.

If China were to establish conditions allowing for joint venture development of power projects, equity participation would likely be limited to large corporate investors (in combination with a power utility). The corporate investors would likely have to perceive a long term interest in establishing ongoing relationships within China's power sector and possibly with related energy intensive industrial developments. It is considered unlikely that institutional investors (pension and insurance funds and similar institutional sources of capital) would be attracted to project investment in China.

To support Canadian equity participation, it has been suggested that Canadian and Chinese participation in the Multilateral Investment Guarantee Agency would be advantageous. It may be noted however that the Export Development Corporation does offer and could, in principle, provide similar insurance coverage for Canadian equity investors in China.

At this time it has not been possible to establish any firm sense of how potential Canadian investors would view a specific opportunities to invest in China's power sector. Clarification of MWREP's position with respect to how far it may wish to proceed in establishing a framework to facilitate joint venture cooperation is seen as the next step necessary to further consideration of this approach.

ANNEX A

SOURCE AND APPLICATION OF FUNDS - CASE STUDIES OF THE  
THREE GORGES WATER CONTROL PROJECT



## THREE GORGES JOINT VENTURE CO.

## SOURCE AND APPLICATION OF FUNDS IN MILLIONS OF U.S. (\$2.0 = U.S.\$)

CASE "A"

Year Ended	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total	
<b>SOURCE OF FUNDS</b>																			
Equity 98	.0	.0	.0																.0
Interest Earned 10%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0								.0
Gezuba Revenue	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Three Gorges Revenue												232.8	486.0	761.4	1,059.4	1,381.7	1,731.0	5,652.3	
Total Internal Funds	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	232.8	486.0	761.4	1,059.4	1,381.7	1,731.0	5,652.3	
Borrowing U.S.\$	286.0	326.2	370.5	420.0	474.9	535.6	603.2	678.1	760.8	852.5	954.1	934.4	1,040.2	1,157.1	1,286.1	1,428.5	1,585.8	13,694.0	
Borrowing Yuan	269.4	289.9	311.5	334.4	358.5	383.9	411.0	439.4	469.3	500.9	534.3	204.0	.0	.0	.0	.0	.0	4,506.5	
Total Borrowing	555.4	616.1	682.0	754.4	833.4	919.5	1,014.2	1,117.5	1,230.1	1,353.4	1,488.4	1,138.4	1,040.2	1,157.1	1,286.1	1,428.5	1,585.8	18,200.5	
Total Source of Funds	555.4	616.1	682.0	754.4	833.4	919.5	1,014.2	1,117.5	1,230.1	1,353.4	1,488.4	1,371.2	1,526.2	1,918.5	2,345.5	2,810.2	3,316.8	23,852.8	
<b>Capital Expenditures</b>																			
<u>Phase 1 Three Gorges</u>																			
U.S. Expenditures 8	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	.0	.0	.0	.0	.0	.0	2,750.0	
Annual Escalation 4%	10.0	20.4	31.2	42.5	54.2	66.3	79.0	92.1	105.8	120.1	134.9							756.5	
Interest During Const. 10%	26.0	55.7	89.3	127.5	170.7	219.4	274.2	335.9	405.0	482.5	569.3							2,755.5	
Subtotal	286.0	326.1	370.5	420.0	474.9	535.7	603.2	678.0	760.8	852.6	954.2							6,262.0	
Yuan (U.S.\$) Expenditures	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0							2,750.0	
Annual Escalation 4%	10.0	20.4	31.2	42.5	54.2	66.3	79.0	92.1	105.8	120.1	134.9							756.5	
Interest During Construction 3.6%	9.4	19.4	30.3	41.9	54.3	67.7	82.0	97.2	113.5	130.9	149.5							796.1	
Subtotal	269.4	289.8	311.5	334.4	358.5	384.0	411.0	439.3	469.3	501.0	534.4							4,302.6	
<u>Phase 2 Three Gorges</u>																			
U.S. Expenditures 0												175.0	175.0	175.0	175.0	175.0	175.0	1,050.0	
Annual Escalation 4%												105.2	116.4	128.0	140.2	152.8	165.9	808.4	
Interest During Const. 10%												654.2	748.8	854.0	970.9	1,100.7	1,244.9	5,573.5	
Subtotal												934.4	1,040.2	1,157.0	1,286.1	1,428.5	1,585.8	7,432.0	
Yuan (U.S.\$) Expenditures												175.0	175.0	175.0	175.0	175.0	175.0	1,050.0	
Annual Escalation 4%												105.2	116.4	128.0	140.2	152.8	165.9	808.4	
Interest During Construction 3.6%												156.6	155.2	144.3	122.7	89.2	42.4	710.4	
Subtotal												436.8	446.6	447.3	437.9	417.0	383.3	2,568.8	
Total U.S.\$ Requirement	286.0	326.1	370.5	420.0	474.9	535.7	603.2	678.0	760.8	852.6	954.2	934.4	1,040.2	1,157.0	1,286.1	1,428.5	1,585.8	13,693.9	
Total Yuan	269.4	289.8	311.5	334.4	358.5	384.0	411.0	439.3	469.3	501.0	534.4	436.8	446.6	447.3	437.9	417.0	383.3	6,871.4	
Equity Payments												.0	.0	.0	.0	.0	.0		
Total Application of Funds	555.4	615.9	682.0	754.3	833.3	919.8	1,014.2	1,117.4	1,230.2	1,353.5	1,488.5	1,371.2	1,486.8	1,604.4	1,723.9	1,845.4	1,969.1	20,565.3	
<b>Cash Over (Short) Cumulative</b>																			
U.S. \$	( 286.0 )	( 612.2 )	( 982.7 )	( 1,402.7 )	( 1,877.6 )	( 2,413.2 )	( 3,016.4 )	( 3,694.4 )	( 4,455.3 )	( 5,307.8 )	( 6,261.9 )	( 7,196.3 )	( 8,236.4 )	( 9,393.5 )	( 10,679.6 )	( 12,108.1 )	( 13,693.9 )		
Yuan	( 269.4 )	( 559.3 )	( 870.8 )	( 1,205.1 )	( 1,563.7 )	( 1,947.5 )	( 2,358.5 )	( 2,797.9 )	( 3,267.3 )	( 3,768.2 )	( 4,302.5 )	( 4,506.5 )	( 4,467.1 )	( 4,153.1 )	( 3,531.6 )	( 2,566.9 )	( 1,219.2 )		

Year Ended	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
<b>SOURCE OF FUNDS</b>																		
Equity 00	584.1	.0	.0															584.1
Interest Earned 10%	32.4	8.6	.0	.0	.0	.0	.0	.0	.0	.0	.0							41.0
Gezuba Revenue	106.4	145.1	187.1	232.1	265.1	276.1	287.8	300.0	312.3	325.4	338.9	352.9	367.8	383.0	398.0	415.3	418.5	5,112.5
Three Gorges Revenue												232.8	486.0	761.4	1,059.4	1,381.7	1,731.0	5,652.3
Total Internal Funds	722.9	153.7	187.1	232.1	265.1	276.1	287.8	300.0	312.3	325.4	338.9	585.7	853.8	1,144.4	1,458.2	1,797.0	2,149.5	11,390.8
Borrowing U.S.0	.0	.0	.0	65.8	49.6	55.8	62.4	69.7	78.2	87.3	97.5	.0	.0	.0	.0	.0	.0	566.3
Borrowing Yuan	159.1	135.6	301.8	324.5	348.3	373.4	400.0	428.0	457.6	488.8	521.8	881.8	639.7	88.5	.0	.0	.0	5,548.9
Total Borrowing	159.1	135.6	301.8	390.3	397.9	429.2	462.4	497.7	535.8	576.1	619.3	881.8	639.7	88.5	.0	.0	.0	6,115.2
Total Source of Funds	882.0	289.3	488.9	622.4	663.0	705.3	750.2	797.7	848.1	901.5	958.2	1,467.5	1,493.5	1,232.9	1,458.2	1,797.0	2,149.5	17,505.2
<b>Capital Expenditures</b>																		
<b>Phase I Three Gorges</b>																		
U.S. Expenditures 0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	.0	.0	.0	.0	.0	.0	2,750.0
Annual Escalation 4%	10.0	20.4	31.2	42.5	54.2	66.3	79.0	92.1	105.8	120.1	134.9							756.5
Interest During Const. 10%	.0	.0	.0	6.0	10.5	15.6	21.2	27.6	34.7	42.6	51.5							299.7
Subtotal	260.0	270.4	281.2	298.5	314.7	331.9	350.2	369.7	390.5	412.7	436.4							3,716.2
Yuan (U.S.0) Expenditures	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0							2,750.0
Annual Escalation 4%	10.0	20.4	31.2	42.5	54.2	66.3	79.0	92.1	105.8	120.1	134.9							756.5
Interest During Construction 3.6%	5.5	10.2	20.7	32.0	44.1	57.1	71.0	85.9	101.8	118.7	136.9							683.9
Subtotal	265.5	280.6	301.9	324.5	348.3	373.4	400.0	428.0	457.6	488.8	521.8							4,190.4
<b>Phase 2 Three Gorges</b>																		
U.S. Expenditures 0												175.0	175.0	175.0	175.0	175.0	175.0	1,050.0
Annual Escalation 4%												105.2	116.4	128.0	140.2	152.8	165.9	808.4
Interest During Const. 10%												22.7	.0	.0	.0	.0	.0	72.7
Subtotal												306.3	291.4	303.0	315.2	327.8	340.9	1,884.6
Yuan (U.S.0) Expenditures												175.0	175.0	175.0	175.0	175.0	175.0	1,050.0
Annual Escalation 4%												105.2	116.4	128.0	140.2	152.8	165.9	808.4
Interest During Construction 3.6%												167.5	189.7	192.8	185.6	166.8	135.6	1,038.0
Subtotal												447.7	481.1	495.8	500.8	494.6	476.5	2,896.4
Total U.S.0 Requirement	260.0	270.4	281.2	298.5	314.7	331.9	350.2	369.7	390.5	412.7	436.4	306.3	291.4	303.0	315.2	327.8	340.9	5,600.7
Total Yuan	265.5	280.6	301.9	324.5	348.3	373.4	400.0	428.0	457.6	488.8	521.8	447.7	481.1	495.8	500.8	494.6	476.5	7,086.8
Equity Payments												434.1	434.1	434.1	434.1	434.1	434.1	434.1
Total Application of Funds	525.5	551.0	583.1	622.9	662.9	705.4	750.2	797.8	848.2	901.4	958.1	1,188.1	1,206.6	1,233.0	1,250.0	1,256.4	1,251.5	15,292.1
<b>Cash Over (Short) Cumulative</b>																		
U.S. 0	356.5	94.7	.6	( 65.8)	( 115.4)	( 171.2)	( 233.6)	( 303.3)	( 381.5)	( 468.8)	( 566.3)	( 286.9)	.0	.0	.0	.0	.0	.0
Yuan	( 159.1)	( 294.7)	( 596.5)	( 921.0)	( 1,269.3)	( 1,642.7)	( 2,042.7)	( 2,470.7)	( 2,928.3)	( 3,417.1)	( 3,938.9)	( 4,829.7)	( 5,460.4)	( 5,548.9)	( 5,340.8)	( 4,800.3)	( 3,902.3)	

Year Ended	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total	
<b>SOURCE OF FUNDS</b>																			
Equity 00	584.1	.0	.0																584.1
Interest Earned 10%	32.4	8.6	.0	.0	.0	.0	.0	.0	.0	.0	.0								41.0
Sezuba Revenue	106.4	145.1	187.1	232.1	265.1	276.1	287.8	300.0	312.3	325.4	338.9	352.9	367.8	383.0	398.0	415.3	418.5	5,112.5	
Three Gorges Revenue												232.8	486.0	761.4	1,059.4	1,381.7	1,731.0	5,652.3	
Total Internal Funds	722.9	153.7	187.1	232.1	265.1	276.1	287.8	300.0	312.3	325.4	338.9	585.7	853.8	1,144.4	1,458.2	1,797.0	2,149.5	11,390.0	
Borrowing U.S.0	.0	.0	205.3	342.3	389.4	441.5	499.7	562.3	635.4	714.6	802.3	767.5	856.6	955.0	1,063.9	1,184.1	1,317.0	10,736.8	
Borrowing Yuan	159.1	135.6	108.1	77.1	57.8	60.9	64.2	67.6	71.4	75.1	79.1	167.9	.0	.0	.0	.0	.0	1,123.9	
Total Borrowing	159.1	135.6	313.4	419.4	447.2	502.4	563.9	629.9	706.8	789.7	881.4	935.4	856.6	955.0	1,063.9	1,184.1	1,317.0	11,860.7	
Total Source of Funds	882.0	289.3	500.5	651.5	712.3	778.5	851.7	929.9	1,019.1	1,115.1	1,220.3	1,521.1	1,710.4	2,099.4	2,522.1	2,981.1	3,466.5	23,250.7	
<b>Capital Expenditures</b>																			
<b>Phase I Three Gorges</b>																			
U.S. Expenditures 0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	.0	.0	.0	.0	.0	.0	2,750.0	
Annual Escalation 4%	10.0	20.4	31.2	42.5	54.2	66.3	79.0	92.1	105.8	120.1	134.9							756.5	
Interest During Const. 10%	.0	.0	18.7	49.8	85.2	125.3	170.7	220.1	279.6	344.6	417.3							1,711.5	
Subtotal	260.0	270.4	299.9	342.3	389.4	441.6	499.7	562.2	635.4	714.7	802.4							5,218.0	
Yuan (U.S.0) Expenditures	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0							2,750.0	
Annual Escalation 4%	10.0	20.4	31.2	42.5	54.2	66.3	79.0	92.1	105.8	120.1	134.9							756.5	
Interest During Construction 3.6%	5.5	10.2	14.0	16.7	18.7	20.8	23.0	25.4	27.9	30.5	33.2							225.9	
Subtotal	265.5	280.6	295.2	309.2	322.9	337.1	352.0	367.5	383.7	400.6	418.1							3,732.4	
<b>Phase 2 Three Gorges</b>																			
U.S. Expenditures 0												175.0	175.0	175.0	175.0	175.0	175.0	1,050.0	
Annual Escalation 4%												105.2	116.4	128.0	140.2	152.8	165.9	808.4	
Interest During Const. 10%												487.3	565.2	652.0	748.7	856.4	976.1	4,285.6	
Subtotal												767.5	856.6	955.0	1,063.9	1,184.1	1,317.0	6,144.0	
Yuan (U.S.0) Expenditures												175.0	175.0	175.0	175.0	175.0	175.0	1,050.0	
Annual Escalation 4%												105.2	116.4	128.0	140.2	152.8	165.9	808.4	
Interest During Construction 3.6%												39.0	35.8	22.4	.0	.0	.0	97.2	
Subtotal												319.2	327.2	325.4	315.2	327.8	340.9	1,955.7	
Total U.S.0 Requirement	260.0	270.4	299.9	342.3	389.4	441.6	499.7	562.2	635.4	714.7	802.4	767.5	856.6	955.0	1,063.9	1,184.1	1,317.0	11,362.0	
Total Yuan	265.5	280.6	295.2	309.2	322.9	337.1	352.0	367.5	383.7	400.6	418.1	319.2	327.2	325.4	315.2	327.8	340.9	5,688.0	
Equity Payments												434.1	434.1	434.1	434.1	434.1	434.1	434.1	
Total Application of Funds	525.5	551.0	595.1	651.4	712.2	778.8	851.7	929.8	1,019.2	1,115.2	1,220.4	1,520.8	1,617.8	1,714.6	1,813.1	1,946.0	2,091.9	19,654.6	
<b>Cash Over (Short) Cumulative</b>																			
U.S. 0	356.5	94.6	( 205.3 )	( 547.6 )	( 937.0 )	( 1,370.5 )	( 1,878.2 )	( 2,440.5 )	( 3,075.9 )	( 3,790.5 )	( 4,592.8 )	( 5,360.3 )	( 6,216.8 )	( 7,171.9 )	( 8,225.7 )	( 9,419.9 )	( 10,736.8 )		
Yuan	( 159.1 )	( 294.7 )	( 402.8 )	( 479.9 )	( 537.7 )	( 598.6 )	( 662.8 )	( 730.4 )	( 801.8 )	( 876.9 )	( 956.0 )	( 1,123.6 )	( 1,031.1 )	( 646.2 )	62.7	1,097.8	2,472.3		

Year Ended	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total	
<b>SOURCE OF FUNDS</b>																			
Equity 88	584.1	.0	.0															584.1	
Interest Earned 10%	32.4	8.6	.0	.0	.0	.0	.0	.0	.0	.0	.0							41.0	
Gezuba Revenue	72.5	99.0	127.8	158.6	181.4	189.1	197.3	205.8	214.4	223.6	233.1	242.9	253.3	263.9	275.0	286.5	288.8	3,512.5	
Three Gorges Revenue												155.6	325.5	510.9	712.1	930.2	1,167.5	3,801.8	
<b>Total Internal Funds</b>	<b>689.0</b>	<b>107.6</b>	<b>127.8</b>	<b>158.6</b>	<b>181.4</b>	<b>189.1</b>	<b>197.3</b>	<b>205.8</b>	<b>214.4</b>	<b>223.6</b>	<b>233.1</b>	<b>398.5</b>	<b>578.8</b>	<b>774.8</b>	<b>987.1</b>	<b>1,216.7</b>	<b>1,456.3</b>	<b>7,939.4</b>	
Borrowing U.S. \$	.0	.0	64.7	153.8	156.0	177.3	206.1	225.0	253.2	284.1	318.3	53.1	.0	.0	.0	.0	.0	1,885.6	
Borrowing Yuan	194.3	184.7	385.0	327.7	351.6	376.7	403.5	431.7	461.3	492.6	524.9	886.0	929.5	975.0	1,022.7	998.4	.0	8,865.6	
<b>Total Borrowing</b>	<b>194.3</b>	<b>184.7</b>	<b>389.7</b>	<b>481.5</b>	<b>507.6</b>	<b>534.0</b>	<b>603.6</b>	<b>656.7</b>	<b>714.5</b>	<b>776.7</b>	<b>843.2</b>	<b>939.1</b>	<b>929.5</b>	<b>975.0</b>	<b>1,022.7</b>	<b>998.4</b>	<b>.0</b>	<b>10,751.2</b>	
<b>Total Source of Funds</b>	<b>883.3</b>	<b>292.3</b>	<b>497.5</b>	<b>640.1</b>	<b>689.0</b>	<b>743.1</b>	<b>800.9</b>	<b>862.5</b>	<b>928.9</b>	<b>1,000.3</b>	<b>1,076.3</b>	<b>1,337.6</b>	<b>1,508.3</b>	<b>1,749.8</b>	<b>2,009.8</b>	<b>2,215.1</b>	<b>1,456.3</b>	<b>18,690.6</b>	
<b>Capital Expenditures</b>																			
<b>Phase 1 Three Gorges</b>																			
U.S. Expenditures 0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	.0	.0	.0	.0	.0	.0	2,750.0	
Annual Escalation 4%	10.0	20.4	31.2	42.5	54.2	66.3	79.0	92.1	105.8	120.1	134.9							756.5	
Interest During Const. 10%	.0	.0	5.9	19.9	33.2	50.2	68.4	88.8	111.8	137.7	166.6							682.5	
<b>Subtotal</b>	<b>260.0</b>	<b>270.4</b>	<b>287.1</b>	<b>312.4</b>	<b>337.4</b>	<b>366.5</b>	<b>397.4</b>	<b>430.9</b>	<b>467.6</b>	<b>507.8</b>	<b>551.5</b>							<b>4,189.0</b>	
Yuan (U.S. \$) Expenditures	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0							2,750.0	
Annual Escalation 4%	10.0	20.4	31.2	42.5	54.2	66.3	79.0	92.1	105.8	120.1	134.9							756.5	
Interest During Construction 3.6%	6.0	13.2	23.8	35.2	47.4	60.5	74.5	89.3	105.9	122.6	140.1							719.1	
<b>Subtotal</b>	<b>266.0</b>	<b>283.6</b>	<b>305.0</b>	<b>327.7</b>	<b>351.6</b>	<b>376.8</b>	<b>403.5</b>	<b>431.6</b>	<b>461.3</b>	<b>492.7</b>	<b>525.0</b>							<b>4,225.6</b>	
<b>Phase 2 Three Gorges</b>																			
U.S. Expenditures 0												175.0	175.0	175.0	175.0	175.0	175.0	1,050.0	
Annual Escalation 4%												105.2	116.4	128.1	140.2	152.8	165.9	808.6	
Interest During Const. 10%												171.4	159.8	128.6	74.3	.0	.0	534.1	
<b>Subtotal</b>												<b>451.6</b>	<b>451.2</b>	<b>431.7</b>	<b>389.5</b>	<b>327.8</b>	<b>348.9</b>	<b>2,392.7</b>	
Yuan (U.S. \$) Expenditures												175.0	175.0	175.0	175.0	175.0	175.0	1,050.0	
Annual Escalation 4%												105.2	116.4	128.1	140.2	152.8	165.9	808.6	
Interest During Construction 3.6%												171.7	204.0	237.0	273.4	308.1	306.9	1,501.9	
<b>Subtotal</b>												<b>451.9</b>	<b>495.4</b>	<b>540.9</b>	<b>588.6</b>	<b>635.9</b>	<b>647.8</b>	<b>3,360.5</b>	
<b>Total U.S. \$ Requirement</b>	<b>260.0</b>	<b>270.4</b>	<b>287.1</b>	<b>312.4</b>	<b>337.4</b>	<b>366.5</b>	<b>397.4</b>	<b>430.9</b>	<b>467.6</b>	<b>507.8</b>	<b>551.5</b>	<b>451.6</b>	<b>451.2</b>	<b>431.7</b>	<b>389.5</b>	<b>327.8</b>	<b>340.9</b>	<b>6,581.6</b>	
<b>Total Yuan</b>	<b>266.0</b>	<b>283.6</b>	<b>305.0</b>	<b>327.7</b>	<b>351.6</b>	<b>376.8</b>	<b>403.5</b>	<b>431.6</b>	<b>461.3</b>	<b>492.7</b>	<b>525.0</b>	<b>451.9</b>	<b>495.4</b>	<b>540.9</b>	<b>588.6</b>	<b>635.9</b>	<b>647.8</b>	<b>7,586.0</b>	
Equity Payments												434.1	434.1	434.1	434.1	434.1	434.1	434.1	
<b>Total Application of Funds</b>	<b>526.8</b>	<b>554.0</b>	<b>592.1</b>	<b>640.0</b>	<b>688.9</b>	<b>743.4</b>	<b>800.9</b>	<b>862.6</b>	<b>929.0</b>	<b>1,000.4</b>	<b>1,076.4</b>	<b>1,337.6</b>	<b>1,380.7</b>	<b>1,406.7</b>	<b>1,412.2</b>	<b>1,397.8</b>	<b>1,422.8</b>	<b>16,772.3</b>	
<b>Cash Over (Short) Cumulative</b>																			
U.S. \$	356.5	94.6	( 64.7)	( 218.5)	( 374.5)	( 551.8)	( 751.9)	( 976.9)	( 1,230.1)	( 1,514.2)	( 1,832.5)	( 1,885.6)	( 1,758.0)	( 1,414.9)	( 817.3)	.0	.0	.0	
Yuan	( 194.3)	( 379.0)	( 684.0)	( 1,011.7)	( 1,363.3)	( 1,740.0)	( 2,143.3)	( 2,575.2)	( 3,036.5)	( 3,529.1)	( 4,054.0)	( 4,940.0)	( 5,869.5)	( 6,844.5)	( 7,867.2)	( 8,865.6)	( 8,832.1)		

Year Ended	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total	
<b>SOURCE OF FUNDS</b>																			
Equity \$8	584.1	.0	.0																584.1
Interest Earned 10%	37.6	19.7	.0	.0	.0	.0	.0	.0	.0	.0	.0								57.3
Gerbuba Revenue	106.4	145.1	187.1	232.1	265.1	276.1	287.0	300.0	312.3	325.4	338.9	352.9	367.8	383.0	398.8	415.3	418.5	5,112.5	5,652.3
Three Gorges Revenue												232.8	486.0	761.4	1,059.4	1,381.7	1,731.0		
Total Internal Funds	728.1	164.8	187.1	232.1	265.1	276.1	287.0	300.0	312.3	325.4	338.9	585.7	853.8	1,144.4	1,458.2	1,797.0	2,149.5	11,406.3	
Borrowing U.S.\$	.0	.0	.0	2.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.1
Borrowing Yuan	213.0	192.7	178.5	384.7	392.7	418.3	447.6	478.2	511.1	545.5	581.9	579.9	346.2	81.9	.0	.0	.0	.0	5,352.2
Total Borrowing	213.0	192.7	178.5	386.8	392.7	418.3	447.6	478.2	511.1	545.5	581.9	579.9	346.2	81.9	.0	.0	.0	.0	5,354.3
Total Source of Funds	941.1	357.5	365.6	618.9	657.8	694.4	735.4	778.2	823.4	870.9	920.8	1,165.6	1,200.0	1,226.3	1,458.2	1,797.0	2,149.5	16,760.6	
<b>Capital Expenditures</b>																			
<b>Phase I Three Gorges</b>																			
U.S. Expenditures \$	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	.0	.0	.0	.0	.0	.0	.0	2,200.0
Annual Escalation 4%	8.0	16.3	25.0	34.0	43.4	53.0	63.2	73.7	84.6	96.1	107.9								605.1
Interest During Const. 10%	.0	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0								.2
Subtotal	208.0	216.3	225.0	234.2	243.4	253.0	263.2	273.7	284.6	296.1	307.9								2,805.3
Yuan (U.S.\$) Expenditures	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0								3,300.0
Annual Escalation 4%	12.0	23.7	37.4	51.0	65.0	79.6	94.8	110.5	127.0	144.1	161.9								907.0
Interest During Construction 3.6%	7.4	14.1	20.3	33.7	47.3	61.0	77.4	94.0	111.8	130.7	151.0								749.5
Subtotal	319.4	337.8	357.7	384.7	412.3	441.4	472.2	504.5	538.8	574.8	612.9								4,956.5
<b>Phase 2 Three Gorges</b>																			
U.S. Expenditures \$												140.0	140.0	140.0	140.0	140.0	140.0	140.0	840.0
Annual Escalation 4%												84.0	93.1	102.5	112.2	122.2	132.7	146.7	646.7
Interest During Const. 10%												.0	.0	.0	.0	.0	.0	.0	.0
Subtotal												224.0	233.1	242.5	252.2	262.2	272.7	287.4	1,486.7
Yuan (U.S.\$) Expenditures												210.0	210.0	210.0	210.0	210.0	210.0	210.0	1,260.0
Annual Escalation 4%												126.4	139.7	153.7	168.2	183.4	199.1	215.5	914.5
Interest During Construction 3.6%												171.1	183.1	196.0	176.5	157.4	125.8	99.9	999.9
Subtotal												507.5	532.8	549.7	498.7	550.8	534.9	434.1	3,174.4
Total U.S.\$ Requirement	208.0	216.3	225.0	234.2	243.4	253.0	263.2	273.7	284.6	296.1	307.9	224.0	233.1	242.5	252.2	262.2	272.7	287.4	4,292.0
Total Yuan	319.4	337.8	357.7	384.7	412.3	441.4	472.2	504.5	538.8	574.8	612.9	507.5	532.8	549.7	498.7	550.8	534.9	434.1	8,130.9
Equity Payments												434.1	434.1	434.1	434.1	434.1	434.1	434.1	
Total Application of Funds	527.4	554.1	582.7	618.9	655.7	694.4	735.4	778.2	823.4	870.9	920.8	1,165.6	1,200.0	1,226.3	1,458.0	1,247.1	1,241.7	15,027.5	
<b>Cash Over (Short) Cumulative</b>																			
U.S. \$	413.7	217.1	.0	( 2.1)	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Yuan	( 213.0)	( 405.7)	( 584.2)	( 968.9)	( 1,361.6)	( 1,779.9)	( 2,227.5)	( 2,705.7)	( 3,216.0)	( 3,762.3)	( 4,344.2)	( 4,924.1)	( 5,276.3)	( 5,352.2)	( 5,079.0)	( 4,529.1)	( 3,621.3)		

Year Ended	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
<b>SOURCE OF FUNDS</b>																		
Equity \$0	584.1	.0	.0															584.1
Interest Earned 10%	27.2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0							27.2
Gezumba Revenue	106.4	145.1	187.1	232.1	265.1	276.1	287.8	300.0	312.3	325.4	338.9	352.9	367.8	383.0	398.8	415.3	418.5	5,112.5
Three Gorges Revenue												232.8	486.8	761.4	1,059.4	1,381.7	1,731.0	5,652.3
Total Internal Funds	717.7	145.1	187.1	232.1	265.1	276.1	287.8	300.0	312.3	325.4	338.9	585.7	853.6	1,144.4	1,458.2	1,797.0	2,149.5	11,376.1
Borrowing U.S.\$	.0	.0	165.3	147.3	141.2	159.2	179.0	200.8	225.5	252.4	282.4	.0	.0	.0	.0	.0	.0	1,753.1
Borrowing Yuan	105.3	103.7	240.6	258.6	277.6	297.7	318.9	341.2	364.9	389.7	416.1	794.0	831.9	871.5	343.1	.0	.0	5,954.8
Total Borrowing	105.3	103.7	405.9	405.9	418.8	456.9	497.9	542.0	590.4	642.1	698.5	794.0	831.9	871.5	343.1	.0	.0	7,707.9
Total Source of Funds	823.0	248.8	593.0	638.0	683.9	733.0	785.7	842.0	902.7	967.5	1,037.4	1,379.7	1,685.7	2,015.9	1,801.3	1,797.0	2,149.5	19,084.0
<b>Capital Expenditures</b>																		
<b>Phase I Three Gorges</b>																		
U.S. Expenditures \$	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0							3,300.0
Annual Escalation 4%	12.0	24.5	37.5	51.0	65.0	79.6	94.8	110.6	127.0	144.1	161.8							907.7
Interest During Const. 10%	.0	.0	15.0	28.4	41.3	55.7	72.0	90.3	110.8	133.7	159.4							706.6
Subtotal	312.0	324.5	352.5	379.4	406.3	435.3	466.8	500.9	537.8	577.8	621.2							4,914.3
Yuan (U.S.\$) Expenditures	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0							2,200.0
Annual Escalation 4%	8.0	16.3	25.0	34.0	43.3	53.1	63.2	73.7	84.7	96.0	107.9							605.2
Interest During Construction 3.6%	3.7	7.3	15.6	24.6	34.3	44.6	55.7	67.5	80.2	93.7	108.2							535.4
Subtotal	211.7	223.6	240.6	258.6	277.6	297.7	318.9	341.2	364.9	389.7	416.1							3,340.6
<b>Phase 2 Three Gorges</b>																		
U.S. Expenditures \$												210.0	210.0	210.0	210.0	210.0	210.0	1,260.0
Annual Escalation 4%												126.2	139.7	153.7	168.2	183.3	199.1	970.1
Interest During Const. 10%												150.2	114.8	48.2	.0	.0	.0	313.2
Subtotal												486.4	464.5	411.9	378.2	393.3	409.1	2,543.3
Yuan (U.S.\$) Expenditures												140.0	140.0	140.0	140.0	140.0	140.0	840.0
Annual Escalation 4%												84.1	93.1	102.4	112.1	122.2	132.7	646.7
Interest During Construction 3.6%												135.0	164.7	195.0	206.9	188.9	158.5	1,049.8
Subtotal												359.9	397.8	437.4	459.0	451.1	431.2	2,536.5
Total U.S.\$ Requirement	312.0	324.5	352.5	379.4	406.3	435.3	466.8	500.9	537.8	577.8	621.2	486.4	464.5	411.9	378.2	393.3	409.1	7,457.7
Total Yuan	211.7	223.6	240.6	258.6	277.6	297.7	318.9	341.2	364.9	389.7	416.1	359.9	397.8	437.4	459.0	451.1	431.2	5,877.1
Equity Payments												434.1	434.1	434.1	434.1	434.1	434.1	
Total Application of Funds	523.7	548.1	593.0	637.9	683.9	733.0	785.7	842.1	902.7	967.5	1,037.3	1,280.5	1,296.4	1,283.4	1,271.3	1,278.5	1,274.4	15,939.4
<b>Cash Over (Short) Cumulative</b>																		
U.S. \$	299.3	.0	( 165.3)	( 312.6)	( 453.8)	( 613.0)	( 792.0)	( 992.8)	( 1,218.3)	( 1,470.7)	( 1,753.1)	( 1,627.5)	( 1,182.3)	( 361.7)	.0	.0	.0	
Yuan	( 105.3)	( 209.0)	( 449.6)	( 708.2)	( 985.8)	( 1,283.5)	( 1,602.4)	( 1,946.6)	( 2,308.5)	( 2,698.2)	( 3,114.3)	( 3,908.3)	( 4,740.2)	( 5,611.7)	( 5,956.8)	( 5,438.3)	( 4,563.2)	

Year Ended	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
<b>SOURCE OF FUNDS</b>																		
Equity 88	584.1	.0	.0															584.1
Interest Earned 10%	32.4	8.7	.0	.0	.0	.0	.0	.0	.0	.0	.0							41.1
Gezuba Revenue	106.4	145.1	187.1	232.1	265.1	276.1	287.8	300.0	312.3	325.4	338.9	352.9	367.8	383.0	398.8	415.3	418.5	5,112.5
Three Gorges Revenue												232.8	486.0	761.4	1,059.4	1,381.7	1,731.0	5,652.3
<b>Total Internal Funds</b>	<b>722.9</b>	<b>153.8</b>	<b>187.1</b>	<b>232.1</b>	<b>265.1</b>	<b>276.1</b>	<b>287.8</b>	<b>300.0</b>	<b>312.3</b>	<b>325.4</b>	<b>338.9</b>	<b>585.7</b>	<b>853.8</b>	<b>1,144.4</b>	<b>1,458.2</b>	<b>1,797.0</b>	<b>2,149.5</b>	<b>11,390.0</b>
Borrowing U.S.\$	.0	.0	.0	67.0	51.8	59.2	67.5	76.6	87.4	99.2	112.6	.0	.0	.0	.0	.0	.0	621.3
Borrowing Yuan	159.1	135.7	301.7	324.5	348.3	373.3	400.0	428.1	457.6	488.8	521.7	881.8	705.1	91.1	.0	.0	.0	5,616.7
<b>Total Borrowing</b>	<b>159.1</b>	<b>135.7</b>	<b>301.7</b>	<b>391.5</b>	<b>400.1</b>	<b>432.5</b>	<b>467.5</b>	<b>504.7</b>	<b>545.0</b>	<b>588.0</b>	<b>634.3</b>	<b>881.8</b>	<b>705.1</b>	<b>91.1</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>6,238.0</b>
<b>Total Source of Funds</b>	<b>882.0</b>	<b>289.4</b>	<b>488.8</b>	<b>623.6</b>	<b>665.2</b>	<b>708.6</b>	<b>755.3</b>	<b>804.6</b>	<b>857.3</b>	<b>913.4</b>	<b>973.2</b>	<b>1,467.5</b>	<b>1,558.9</b>	<b>1,235.5</b>	<b>1,458.2</b>	<b>1,797.0</b>	<b>2,149.5</b>	<b>17,628.0</b>
<b>Capital Expenditures</b>																		
<b>Phase 1 Three Gorges</b>																		
U.S. Expenditures 8	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0							2,750.0
Annual Escalation 4%	10.0	20.5	31.2	42.5	54.2	66.2	79.0	92.2	105.8	120.0	134.8							756.4
Interest During Const. 12%	.0	.0	.0	7.2	12.7	19.0	26.3	34.5	43.9	54.5	66.6							264.7
<b>Subtotal</b>	<b>260.0</b>	<b>270.5</b>	<b>281.2</b>	<b>299.7</b>	<b>316.9</b>	<b>335.2</b>	<b>355.3</b>	<b>376.7</b>	<b>399.7</b>	<b>424.5</b>	<b>451.4</b>							<b>3,771.1</b>
Yuan (U.S.\$) Expenditures	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0							2,750.0
Annual Escalation 4%	10.0	20.5	31.2	42.5	54.2	66.2	79.0	92.2	105.8	120.0	134.8							756.4
Interest During Construction 3.6%	5.5	10.2	20.7	32.0	44.1	57.1	71.0	85.9	101.8	118.7	136.9							683.9
<b>Subtotal</b>	<b>265.5</b>	<b>280.7</b>	<b>301.9</b>	<b>324.5</b>	<b>348.3</b>	<b>373.3</b>	<b>400.0</b>	<b>428.1</b>	<b>457.6</b>	<b>488.7</b>	<b>521.7</b>							<b>4,190.3</b>
<b>Phase 2 Three Gorges</b>																		
U.S. Expenditures 8												175.0	175.0	175.0	175.0	175.0	175.0	1,050.0
Annual Escalation 4%												105.2	116.4	128.1	140.2	152.8	165.9	808.6
Interest During Const. 12%												34.2	.0	.0	.0	.0	.0	34.2
<b>Subtotal</b>												<b>314.4</b>	<b>291.4</b>	<b>303.1</b>	<b>315.2</b>	<b>327.8</b>	<b>340.9</b>	<b>1,892.8</b>
Yuan (U.S.\$) Expenditures												175.0	175.0	175.0	175.0	175.0	175.0	1,050.0
Annual Escalation 4%												105.2	116.4	128.1	140.2	152.8	165.9	808.6
Interest During Construction 3.6%												167.5	192.0	195.2	188.0	169.3	138.2	1,050.2
<b>Subtotal</b>												<b>447.7</b>	<b>483.4</b>	<b>498.3</b>	<b>503.2</b>	<b>497.1</b>	<b>479.1</b>	<b>2,908.8</b>
<b>Total U.S.\$ Requirement</b>	<b>260.0</b>	<b>270.5</b>	<b>281.2</b>	<b>299.7</b>	<b>316.9</b>	<b>335.2</b>	<b>355.3</b>	<b>376.7</b>	<b>399.7</b>	<b>424.5</b>	<b>451.4</b>	<b>314.4</b>	<b>291.4</b>	<b>303.1</b>	<b>315.2</b>	<b>327.8</b>	<b>340.9</b>	<b>5,663.9</b>
<b>Total Yuan</b>	<b>265.5</b>	<b>280.7</b>	<b>301.9</b>	<b>324.5</b>	<b>348.3</b>	<b>373.3</b>	<b>400.0</b>	<b>428.1</b>	<b>457.6</b>	<b>488.7</b>	<b>521.7</b>	<b>447.7</b>	<b>483.4</b>	<b>498.3</b>	<b>503.2</b>	<b>497.1</b>	<b>479.1</b>	<b>7,099.1</b>
Equity Payments												434.1	434.1	434.1	434.1	434.1	434.1	434.1
<b>Total Application of Funds</b>	<b>525.5</b>	<b>551.2</b>	<b>583.1</b>	<b>624.2</b>	<b>665.2</b>	<b>708.5</b>	<b>755.3</b>	<b>804.8</b>	<b>857.3</b>	<b>913.2</b>	<b>973.1</b>	<b>1,196.2</b>	<b>1,208.9</b>	<b>1,235.5</b>	<b>1,252.5</b>	<b>1,259.0</b>	<b>1,254.1</b>	<b>15,367.6</b>
<b>Cash Over (Short) Cumulative</b>																		
U.S. \$	356.5	94.7	.6	( 67.0)	( 118.8)	( 178.0)	( 245.5)	( 322.3)	( 409.6)	( 508.7)	( 621.3)	350.0	( 350.0)	.0	.0	.0	.0	.0
Yuan	( 159.1)	( 294.8)	( 596.7)	( 921.2)	( 1,269.6)	( 1,642.8)	( 2,042.8)	( 2,470.9)	( 2,928.4)	( 3,417.2)	( 3,938.9)	( 4,820.6)	( 4,820.6)	( 5,616.8)	( 5,411.1)	( 4,873.1)	( 3,977.7)	

Year Ended	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
<b>SOURCE OF FUNDS</b>																		
Equity \$0	584.1	.0	.0															584.1
Interest Earned 10%	32.4	8.6	.0	.0	.0	.0	.0	.0	.0	.0	.0							41.0
Gezhuaba Revenue	106.4	145.1	187.1	232.1	265.1	276.1	287.8	300.0	312.3	325.4	338.9	352.9	367.8	382.0	398.8	415.3	418.5	5,112.5
Three Gorges Revenue												232.8	486.0	761.4	1,059.4	1,381.7	1,731.0	5,652.3
Total Internal Funds	722.9	153.7	187.1	232.1	265.1	276.1	287.8	300.0	312.3	325.4	338.9	585.7	853.8	1,144.4	1,458.2	1,797.0	2,149.5	11,389.9
Borrowing U.S.\$	.0	.0	.0	63.4	44.7	49.0	52.1	267.5	62.2	67.1	66.5	.0	.0	.0	.0	.0	.0	672.5
Borrowing Yuan	159.1	135.5	301.9	324.5	348.3	373.4	400.0	428.0	457.6	488.8	521.7	882.6	515.9	84.3	.0	.0	.0	5,421.6
Total Borrowing	159.1	135.5	301.9	387.9	393.0	422.4	452.1	695.5	519.8	555.9	588.2	882.6	515.9	84.3	.0	.0	.0	6,094.1
Total Source of Funds	882.0	289.2	489.0	620.0	658.1	698.5	739.9	995.5	832.1	881.3	927.1	1,468.3	1,369.7	1,228.7	1,458.2	1,797.0	2,149.5	17,484.0
<b>Capital Expenditures</b>																		
<b>Phase 1 Three Gorges</b>																		
U.S. Expenditures \$	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0							2,750.0
Annual Escalation 4%	10.0	20.5	31.2	42.5	54.2	66.2	79.0	92.2	105.8	120.0	134.8							756.4
Interest During Const. 6%	.0	.0	.0	3.6	5.6	8.9	11.9	15.1	18.7	22.5	26.6							106.9
Subtotal	260.0	270.5	281.2	296.1	309.8	325.1	340.9	357.3	374.5	392.5	405.4							3,613.3
Yuan (U.S.\$) Expenditures	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0							2,750.0
Annual Escalation 4%	10.0	20.5	31.2	42.5	54.2	66.2	79.0	92.2	105.8	120.0	134.8							756.4
Interest During Construction 3.6%	5.5	10.2	20.7	32.0	44.1	57.1	71.0	85.9	101.8	118.7	136.9							683.9
Subtotal	255.5	280.7	301.9	324.5	348.3	373.3	400.0	428.1	457.6	488.7	521.7							4,190.3
<b>Phase 2 Three Gorges</b>																		
U.S. Expenditures \$												175.0	175.0	175.0	175.0	175.0	175.0	1,050.0
Annual Escalation 4%												105.2	116.4	128.1	140.2	152.8	165.9	808.6
Interest During Const. 6%												9.5	.0	.0	.0	.0	.0	9.5
Subtotal												289.7	291.4	303.1	315.2	327.8	340.9	1,868.1
Yuan (U.S.\$) Expenditures												175.0	175.0	175.0	175.0	175.0	175.0	1,050.0
Annual Escalation 4%												105.2	116.4	128.1	140.2	152.8	165.9	808.6
Interest During Construction 3.6%												168.3	185.5	188.4	181.0	162.1	130.7	1,016.0
Subtotal												448.5	476.9	491.5	496.2	489.9	471.6	2,874.6
Total U.S.\$ Requirement	260.0	270.5	281.2	296.1	309.8	325.1	340.9	357.3	374.5	392.5	405.4	289.7	291.4	303.1	315.2	327.8	340.9	5,481.4
Total Yuan	255.5	280.7	301.9	324.5	348.3	373.3	400.0	428.1	457.6	488.7	521.7	448.5	476.9	491.5	496.2	489.9	471.6	7,064.9
Equity Payments												434.1	434.1	434.1	434.1	434.1	434.1	434.1
Total Application of Funds	525.5	551.2	583.1	620.6	658.1	698.4	740.9	785.4	832.1	881.2	927.1	1,172.3	1,202.4	1,228.7	1,245.5	1,251.8	1,246.6	15,150.9
<b>Cash Over (Short) Cumulative</b>																		
U.S. \$	356.5	94.7	.6	( 63.4)	( 108.1)	( 157.1)	210.2	( 267.5)	( 329.7)	( 396.8)	( 463.3)	( 167.3)	.0	.0	.0	.0	.0	.0
Yuan	( 159.1)	( 294.6)	( 596.5)	( 921.0)	( 1,269.3)	( 1,642.7)	( 2,042.7)	( 2,470.7)	( 2,928.3)	( 3,417.1)	( 3,938.8)	( 4,484.0)	( 5,037.3)	( 5,421.6)	( 5,208.9)	( 4,663.7)	( 3,760.8)	



Year Ended	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
<b>SOURCE OF FUNDS</b>																		
Equity \$0	584.1	.0	.0															584.1
Interest Earned 10%	32.4	8.6	.0	.0	.0	.0	.0	.0	.0	.0	.0							41.0
Gezhuaba Revenue	106.4	145.1	187.1	232.1	265.1	276.1	287.8	300.0	312.3	325.4	338.9	352.9	367.8	383.0	398.8	415.3	418.5	5,112.5
Three Gorges Revenue												232.8	486.0	761.4	1,059.4	1,381.7	1,731.0	5,652.3
Total Internal Funds	722.9	153.7	187.1	232.1	265.1	276.1	287.8	300.0	312.3	325.4	338.9	585.7	853.8	1,144.4	1,458.2	1,797.0	2,149.5	11,390.0
Borrowing U.S.\$	.0	.0	.0	65.9	49.6	55.8	62.5	69.7	78.2	87.3	97.5	.0	.0	.0	.0	.0	.0	566.5
Borrowing Yuan	165.9	148.6	328.9	367.4	409.4	455.2	505.4	559.9	619.5	684.5	755.3	1,171.4	979.9	459.7	183.7	.0	.0	7,794.7
Total Borrowing	165.9	148.6	328.9	433.3	459.0	511.0	567.9	629.6	697.7	771.8	852.8	1,171.4	979.9	459.7	183.7	.0	.0	8,361.2
Total Source of Funds	888.8	302.3	516.0	665.4	724.1	787.1	855.7	929.6	1,010.0	1,097.2	1,191.7	1,757.1	1,833.7	1,604.1	1,641.9	1,797.0	2,149.5	19,751.2
<b>Capital Expenditures</b>																		
<u>Phase 1 Three Gorges</u>																		
U.S. Expenditures 0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	.0	.0	.0	.0	.0	.0	2,750.0
Annual Escalation 4%	10.0	20.4	31.2	42.5	54.2	66.3	79.0	92.1	105.8	120.1	134.9							756.5
Interest During Const. 10%	.0	.0	.0	6.0	10.5	15.6	21.3	27.6	34.7	42.6	51.5							209.8
Subtotal	260.0	270.4	281.2	298.5	314.7	331.9	350.3	369.7	390.5	412.7	436.4							3,716.3
Yuan (U.S.\$) Expenditures	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0							2,750.0
Annual Escalation 4%	10.0	20.4	31.2	42.5	54.2	66.3	79.0	92.1	105.8	120.1	134.9							756.5
Interest During Construction 8%	12.3	23.3	47.7	74.9	105.2	138.9	176.4	217.8	263.7	314.4	370.4							1,745.0
Subtotal	272.3	293.7	328.9	367.4	409.4	455.2	505.4	559.9	619.5	684.5	755.3							5,251.4
<u>Phase 2 Three Gorges</u>																		
U.S. Expenditures 0												175.0	175.0	175.0	175.0	175.0	175.0	1,050.0
Annual Escalation 4%												105.2	116.4	128.1	140.2	152.8	165.9	808.6
Interest During Const. 10%												26.1	.0	.0	.0	.0	.0	26.1
Subtotal												306.3	291.4	303.1	315.2	327.8	340.9	1,884.7
Yuan (U.S.\$) Expenditures												175.0	175.0	175.0	175.0	175.0	175.0	1,050.0
Annual Escalation 4%												105.2	116.4	128.1	140.2	152.8	165.9	808.6
Interest During Construction 8%												457.1	529.7	563.8	577.4	567.0	530.0	3,225.0
Subtotal												737.3	821.1	866.9	892.6	894.8	870.9	5,083.6
Total U.S.\$ Requirement	260.0	270.4	281.2	298.5	314.7	331.9	350.3	369.7	390.5	412.7	436.4	306.3	291.4	303.1	315.2	327.8	340.9	5,601.0
Total Yuan	272.3	293.7	328.9	367.4	409.4	455.2	505.4	559.9	619.5	684.5	755.3	737.3	821.1	866.9	892.6	894.8	870.9	10,335.0
Equity Payments												434.1	434.1	434.1	434.1	434.1	434.1	
Total Application of Funds	532.3	564.1	610.1	665.8	724.0	787.2	855.7	929.7	1,010.1	1,097.1	1,191.6	1,477.7	1,546.6	1,604.1	1,641.9	1,656.7	1,645.9	18,540.6
<b>Cash Over (Short) Cumulative</b>																		
U.S. \$	356.5	94.7	.5	( 65.9)	( 115.5)	( 171.3)	( 233.8)	( 303.5)	( 381.7)	( 469.0)	( 566.5)	( 287.1)	.0	.0	.0	.0	.0	
Yuan	( 165.9)	( 314.5)	( 643.4)	( 1,010.8)	( 1,420.2)	( 1,875.4)	( 2,380.8)	( 2,940.7)	( 3,560.2)	( 4,244.7)	( 5,000.0)	( 6,171.4)	( 7,151.3)	( 7,611.0)	( 7,794.7)	( 7,654.4)	( 7,150.8)	

Year Ended	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total	
<b>SOURCE OF FUNDS</b>																			
Equity 88	584.1	.0	.0															584.1	
Interest Earned 10%	32.4	8.6	.0															41.0	
Gezuba Revenue	128.5	175.2	225.8	280.1	319.7	332.9	346.8	361.4	376.2	391.8	408.0	424.7	442.5	460.6	479.5	499.3	503.1	6,156.0	
Three Gorges Revenue												283.1	590.7	924.7	1,285.9	1,676.1	2,098.4	6,858.9	
Total Internal Funds	745.0	183.8	225.8	280.1	319.7	332.9	346.8	361.4	376.2	391.8	408.0	707.8	1,033.2	1,385.3	1,765.4	2,175.4	2,601.5	13,640.1	
Borrowing U.S.\$	.0	.0	.0	13.7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	13.7	
Borrowing Yuan	136.2	183.6	252.6	320.8	342.6	352.1	376.6	402.3	429.8	458.7	489.2	428.9	130.5	.0	.0	.0	.0	4,223.9	
Total Borrowing	136.2	183.6	252.6	334.5	342.6	352.1	376.6	402.3	429.8	458.7	489.2	428.9	130.5	.0	.0	.0	.0	4,237.6	
Total Source of Funds	881.2	287.4	478.4	614.6	662.3	685.0	723.4	763.7	806.0	850.5	897.2	1,136.7	1,163.7	1,385.3	1,765.4	2,175.4	2,601.5	17,877.7	
<b>Capital Expenditures</b>																			
<b>Phase I Three Gorges</b>																			
U.S. Expenditures 8	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	.0	.0	.0	.0	.0	.0	2,750.0	
Annual Escalation 4%	10.0	20.4	31.2	42.5	54.2	66.3	79.0	92.1	105.8	120.1	134.9							756.5	
Interest During Const. 10%	.0	.0	.0	1.2	.0	.0	.0	.0	.0	.0	.0							1.2	
Subtotal	260.0	270.4	281.2	293.7	304.2	316.3	329.0	342.1	355.8	370.1	384.9							3,507.7	
Yuan (U.S.\$) Expenditures	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0							2,750.0	
Annual Escalation 4%	10.0	20.4	31.2	42.5	54.2	66.3	79.0	92.1	105.8	120.1	134.9							756.5	
Interest During Construction 3.6%	4.7	8.3	10.6	28.3	40.2	52.4	65.5	79.5	94.4	110.3	127.3							621.5	
Subtotal	264.7	278.7	291.8	320.8	344.4	368.7	394.5	421.6	450.2	480.4	512.2							4,128.0	
<b>Phase 2 Three Gorges</b>																			
U.S. Expenditures 8												175.0	175.0	175.0	175.0	175.0	175.0	1,050.0	
Annual Escalation 4%												105.2	116.4	128.0	140.2	152.8	165.9	808.4	
Interest During Const. 10%												.0	.0	.0	.0	.0	.0	.0	
Subtotal												280.2	291.4	303.0	315.2	327.8	340.9	1,858.4	
Yuan (U.S.\$) Expenditures												175.0	175.0	175.0	175.0	175.0	175.0	1,050.0	
Annual Escalation 4%												105.2	116.4	128.0	140.2	152.8	165.9	808.4	
Interest During Construction 3.6%												142.2	146.8	139.6	119.4	84.6	34.2	666.8	
Subtotal												422.4	438.2	442.6	434.6	412.4	375.1	2,525.2	
Total U.S.\$ Requirement	260.0	270.4	281.2	293.7	304.2	316.3	329.0	342.1	355.8	370.1	384.9	280.2	291.4	303.0	315.2	327.8	340.9	5,366.1	
Total Yuan	264.7	278.7	291.8	320.8	344.4	368.7	394.5	421.6	450.2	480.4	512.2	422.4	438.2	442.6	434.6	412.4	375.1	6,653.2	
Equity Payments												434.1	434.1	434.1	434.1	434.1	434.1	434.1	
Total Application of Funds	524.7	549.1	573.0	614.4	648.5	685.1	723.5	763.8	806.1	850.4	897.0	1,136.7	1,163.7	1,179.8	1,183.8	1,174.2	1,150.1	14,623.9	
<b>Cash Over (Short) Cumulative</b>																			
U.S. \$	356.5	94.6	.0	(13.7)	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	
Yuan	(136.2)	(239.8)	(492.4)	(813.2)	(1,155.8)	(1,507.9)	(1,884.5)	(2,286.8)	(2,716.6)	(3,175.3)	(3,664.5)	(4,093.4)	(4,223.9)	(4,018.3)	(3,436.8)	(2,435.7)	(984.3)		

Year Ended	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total	
<b>SOURCE OF FUNDS</b>																			
Equity 00	584.1	.0	.0																584.1
Interest Earned 10%	21.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0								21.5
Gezhuba Revenue	106.4	145.1	187.1	232.1	265.1	276.1	287.8	300.0	312.3	325.4	338.9	352.9	367.8	383.0	398.8	415.3	418.5		5,112.5
Three Gorges Revenue												232.8	486.0	761.4	1,059.4	1,381.7	1,731.0		5,652.3
Total Internal Funds	712.0	145.1	187.1	232.1	265.1	276.1	287.8	300.0	312.3	325.4	338.9	585.7	853.8	1,144.4	1,458.2	1,797.0	2,149.5		11,370.5
Borrowing U.S.\$	.0	1.4	232.9	224.4	228.8	258.4	291.1	327.3	367.8	412.5	462.0	18.2	.0	.0	.0	.0	.0		2,824.8
Borrowing Yuan	271.7	407.0	437.5	469.9	504.0	539.9	581.3	618.2	660.5	705.4	752.5	1,023.4	1,074.7	1,128.3	1,184.6	837.2	.0		11,196.1
Total Borrowing	271.7	408.4	670.4	694.3	732.8	798.3	872.4	945.5	1,028.3	1,117.9	1,214.5	1,041.6	1,074.7	1,128.3	1,184.6	837.2	.0		14,020.9
Total Source of Funds	983.7	553.5	857.5	926.4	997.9	1,074.4	1,160.2	1,245.5	1,340.6	1,443.3	1,553.4	1,627.3	1,928.5	2,272.7	2,642.8	2,634.2	2,149.5		25,391.4
<b>Capital Expenditures</b>																			
<b>Phase I Three Gorges</b>																			
U.S. Expenditures 0	354.5	354.5	354.5	354.5	354.5	354.5	354.5	354.5	354.5	354.5	354.5	.0	.0	.0	.0	.0	.0		3,899.5
Annual Escalation 4%	14.2	28.9	44.3	60.2	76.8	94.1	112.0	130.7	150.1	170.2	191.2								1,072.6
Interest During Const. 10%	.0	.0	21.3	41.7	62.5	86.0	112.4	142.2	175.6	213.1	255.1								1,109.9
Subtotal	368.7	383.4	420.1	456.4	493.8	534.6	578.9	627.4	680.2	737.8	800.8								6,082.0
Yuan (U.S.\$) Expenditures	354.5	354.5	354.5	354.5	354.5	354.5	354.5	354.5	354.5	354.5	354.5								3,899.5
Annual Escalation 4%	14.2	28.9	44.3	60.2	76.8	94.1	112.0	130.7	150.1	170.2	191.2								1,072.6
Interest During Construction 3.6%	9.4	23.6	38.8	55.1	72.6	91.4	114.8	133.1	156.0	180.6	206.7								1,082.1
Subtotal	378.1	407.0	437.6	469.8	503.9	540.0	581.3	618.3	660.6	705.3	752.4								6,054.2
<b>Phase 2 Three Gorges</b>																			
U.S. Expenditures 0												216.8	216.8	216.8	216.8	216.8	216.8		1,301.0
Annual Escalation 4%												130.3	144.2	158.6	173.7	189.3	205.5		1,001.6
Interest During Const. 10%												256.8	233.2	179.6	90.8	.0	.0		760.4
Subtotal												603.9	594.2	555.1	481.3	406.1	422.4		3,063.0
Yuan (U.S.\$) Expenditures												216.8	216.8	216.8	216.8	216.8	216.8		1,301.0
Annual Escalation 4%												130.3	144.2	158.6	173.7	189.3	205.5		1,001.6
Interest During Construction 3.6%												242.2	279.6	318.8	360.0	389.0	371.7		1,961.3
Subtotal												589.3	640.6	694.3	750.5	795.1	794.1		4,263.9
Total U.S.\$ Requirement	368.7	383.4	420.1	456.4	493.8	534.6	578.9	627.4	680.2	737.8	800.8	603.9	594.2	555.1	481.3	406.1	422.4		9,145.0
Total Yuan	378.1	407.0	437.6	469.8	503.9	540.0	581.3	618.3	660.6	705.3	752.4	589.3	640.6	694.3	750.5	795.1	794.0		10,318.1
Equity Payments												434.1	434.1	434.1	434.1	434.1	434.1		
Total Application of Funds	746.8	790.5	857.6	926.2	997.7	1,074.5	1,160.2	1,245.6	1,340.7	1,443.2	1,553.3	1,627.4	1,669.0	1,683.4	1,665.9	1,635.3	1,650.5		22,067.7
<b>Cash Over (Short) Cumulative</b>																			
U.S. \$	236.9	( 1.4)	( 234.3)	( 458.7)	( 687.5)	( 945.9)	( 1,037.0)	( 1,564.3)	( 1,932.1)	( 2,344.6)	( 2,806.6)	( 2,824.8)	( 2,565.2)	( 1,975.8)	998.9	.0	.0		
Yuan	( 271.7)	( 678.7)	( 1,116.2)	( 1,586.1)	( 2,090.1)	( 2,630.0)	( 3,211.3)	( 3,829.5)	( 4,490.0)	( 5,195.4)	( 5,947.9)	( 6,970.3)	( 8,046.0)	( 9,174.3)	( 10,358.9)	( 11,196.1)	( 10,697.1)		

Year Ended	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
<b>Source of Funds</b>																		
Equity	2,058.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	2,058.0
Interest Earned 10%	203.3	205.5	183.0	136.9	91.4	33.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	854.0
Gezhuo Revenue	380.5	575.2	687.9	788.0	821.6	855.9	892.4	930.3	968.9	1,009.7	1,051.9	1,095.5	1,141.9	1,189.1	1,238.5	1,289.9	1,343.6	16,260.8
Three Gorges Revenue	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	152.1	1,410.1	2,423.5	3,197.9	4,318.6	5,082.6	16,584.8
<b>Total Internal Funds</b>	<b>2,641.8</b>	<b>780.7</b>	<b>870.9</b>	<b>924.9</b>	<b>913.0</b>	<b>889.8</b>	<b>892.4</b>	<b>930.3</b>	<b>968.9</b>	<b>1,009.7</b>	<b>1,051.9</b>	<b>1,247.6</b>	<b>2,552.0</b>	<b>3,612.6</b>	<b>4,436.4</b>	<b>5,608.5</b>	<b>6,426.2</b>	<b>35,757.6</b>
Borrowing U.S.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Borrowing Yuan	.0	.0	.0	.0	.0	.0	.0	.0	107.8	963.3	729.7	2,500.3	1,159.2	.0	.0	.0	.0	5,460.3
<b>Total Borrowing</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>107.8</b>	<b>963.3</b>	<b>729.7</b>	<b>2,500.3</b>	<b>1,159.2</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>5,460.3</b>
<b>Total Source of Funds</b>	<b>2,641.8</b>	<b>780.7</b>	<b>870.9</b>	<b>924.9</b>	<b>913.0</b>	<b>889.8</b>	<b>892.4</b>	<b>930.3</b>	<b>1,076.7</b>	<b>1,973.0</b>	<b>1,781.6</b>	<b>3,747.9</b>	<b>3,711.2</b>	<b>3,612.6</b>	<b>4,436.4</b>	<b>5,608.5</b>	<b>6,426.2</b>	<b>41,217.9</b>
Capital Expenditures	(.30%)	(2.1%)	(4.8%)	(6.9%)	(6.1%)	(6.6%)	(6.5%)	(7.5%)	(8.1%)	(8.2%)	(7.0%)	(8.1%)	(7.5%)	(6.8%)	(5.5%)	(4.5%)	(3.5%)	100%
<b>Phase 1 Three Gorges</b>																		
U.S. Expenditures 0	24.0	167.5	383.0	550.0	486.5	526.5	518.0	598.0	646.0	654.0	558.5	.0	.0	.0	.0	.0	.0	5,112.0
Annual Escalation 4%	1.0	13.7	47.9	93.5	105.6	139.5	163.7	220.7	273.3	313.9	301.0	.0	.0	.0	.0	.0	.0	1,673.8
Interest During Construction 10%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
<b>Sub-total</b>	<b>25.0</b>	<b>181.2</b>	<b>430.9</b>	<b>643.5</b>	<b>592.1</b>	<b>666.0</b>	<b>681.7</b>	<b>818.7</b>	<b>919.3</b>	<b>967.9</b>	<b>859.5</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>6,785.8</b>
Yuan Expenditures	24.0	167.5	383.0	550.0	486.5	526.5	518.0	598.0	646.0	654.0	558.5	.0	.0	.0	.0	.0	.0	5,112.0
Annual Escalation 4%	1.0	13.7	47.9	93.5	105.6	139.5	163.7	220.7	273.3	313.9	301.0	.0	.0	.0	.0	.0	.0	1,673.8
Interest During Construction 3.6%	.0	.0	.0	.0	.0	.0	.0	.0	3.7	37.2	62.6	.0	.0	.0	.0	.0	.0	103.5
<b>Sub-total</b>	<b>25.0</b>	<b>181.2</b>	<b>430.9</b>	<b>643.5</b>	<b>592.1</b>	<b>666.0</b>	<b>681.7</b>	<b>818.7</b>	<b>923.0</b>	<b>1,005.1</b>	<b>922.1</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>6,889.3</b>
<b>Phase 2 Three Gorges</b>																		
U.S. Expenditures 0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	646.0	598.0	542.5	438.3	359.0	279.0	2,863.0
Annual Escalation 4%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	388.2	397.7	397.1	351.2	313.4	264.5	2,112.1
Interest During Construction 10%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
<b>Sub-total</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>1,034.2</b>	<b>995.7</b>	<b>939.6</b>	<b>789.7</b>	<b>672.4</b>	<b>543.5</b>	<b>4,975.1</b>
Yuan(U.S.0) Expenditures	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	646.0	598.0	542.5	438.5	359.0	279.0	2,863.0
Annual Escalation 4%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	388.2	397.7	397.1	351.2	313.4	264.5	2,112.1
Interest During Construction 3.6%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	149.5	189.8	189.2	148.3	55.2	.0	732.0
<b>Sub-total</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>1,183.7</b>	<b>1,185.5</b>	<b>1,128.8</b>	<b>938.0</b>	<b>727.6</b>	<b>543.5</b>	<b>5,707.1</b>
<b>Total U.S. Requirements</b>	<b>25.0</b>	<b>181.2</b>	<b>430.9</b>	<b>643.5</b>	<b>592.1</b>	<b>666.0</b>	<b>681.7</b>	<b>818.7</b>	<b>919.3</b>	<b>967.9</b>	<b>859.5</b>	<b>1,034.2</b>	<b>995.7</b>	<b>939.6</b>	<b>789.7</b>	<b>672.4</b>	<b>543.5</b>	<b>11,760.9</b>
<b>Total Yuan Requirements</b>	<b>25.0</b>	<b>181.2</b>	<b>430.9</b>	<b>643.5</b>	<b>592.1</b>	<b>666.0</b>	<b>681.7</b>	<b>818.7</b>	<b>923.0</b>	<b>1,005.1</b>	<b>922.1</b>	<b>1,183.7</b>	<b>1,185.5</b>	<b>1,128.8</b>	<b>938.0</b>	<b>727.6</b>	<b>543.5</b>	<b>12,596.4</b>
Equity Payments	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	1,530.0	1,530.0	1,530.0	1,530.0	1,530.0	1,540.0	9,190.0
<b>Total Application of Funds</b>	<b>50.0</b>	<b>362.4</b>	<b>861.8</b>	<b>1,287.0</b>	<b>1,184.2</b>	<b>1,332.0</b>	<b>1,363.4</b>	<b>1,637.4</b>	<b>1,842.3</b>	<b>1,973.0</b>	<b>1,781.6</b>	<b>3,747.9</b>	<b>3,711.2</b>	<b>3,598.4</b>	<b>3,257.7</b>	<b>2,930.0</b>	<b>2,627.0</b>	<b>33,547.3</b>
<b>Cash short/over</b>																		
U.S.	2,236.3	2,260.6	2,012.7	1,506.1	1,005.4	373.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Yuan	355.5	749.5	1,006.5	1,151.0	1,380.5	1,570.4	1,472.7	765.6	(107.8)	(1,071.1)	(1,800.8)	(4,301.1)	(5,460.3)	(5,446.1)	(4,267.4)	(1,588.9)	2,210.3	

Year Ended	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
<b>Source of Funds</b>																		
Equity	735.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	735.0
Interest Earned 10%	72.6	73.4	65.4	48.9	32.6	12.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	305.0
Gezuba Revenue	135.9	205.4	245.7	281.4	293.4	305.7	318.7	332.3	346.0	360.6	375.7	391.3	407.8	424.7	442.3	460.7	479.9	5,807.4
Three Gorges Revenue	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	54.3	503.6	865.5	1,142.1	1,542.4	1,815.2	5,923.1
<b>Total Internal Funds</b>	<b>943.5</b>	<b>278.8</b>	<b>311.0</b>	<b>330.3</b>	<b>326.1</b>	<b>317.8</b>	<b>318.7</b>	<b>332.3</b>	<b>346.0</b>	<b>360.6</b>	<b>375.7</b>	<b>445.6</b>	<b>911.4</b>	<b>1,290.2</b>	<b>1,584.4</b>	<b>2,003.0</b>	<b>2,295.1</b>	<b>12,770.6</b>
Borrowing U.S.	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Borrowing Yuan	.0	.0	.0	.0	.0	.0	.0	.0	38.5	344.0	260.6	893.0	414.0	.0	.0	.0	.0	1,950.1
<b>Total Borrowing</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>38.5</b>	<b>344.0</b>	<b>260.6</b>	<b>893.0</b>	<b>414.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>1,950.1</b>
<b>Total Source of Funds</b>	<b>943.5</b>	<b>278.8</b>	<b>311.0</b>	<b>330.3</b>	<b>326.1</b>	<b>317.8</b>	<b>318.7</b>	<b>332.3</b>	<b>384.5</b>	<b>704.6</b>	<b>636.3</b>	<b>1,338.5</b>	<b>1,325.4</b>	<b>1,290.2</b>	<b>1,584.4</b>	<b>2,003.0</b>	<b>2,295.1</b>	<b>14,720.7</b>
<b>Capital Expenditures</b>																		
(.30%)	(2.1%)	(4.8%)	(6.9%)	(6.1%)	(6.6%)	(6.5%)	(7.5%)	(8.1%)	(8.2%)	(7.0%)	(8.1%)	(7.5%)	(6.8%)	(5.5%)	(4.5%)	(3.5%)		100%
<b>Phase 1 Three Gorges</b>																		
									.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
U.S. Expenditures 9	8.6	59.8	136.8	196.4	173.8	188.0	185.0	213.6	230.7	233.6	199.5	.0	.0	.0	.0	.0	.0	1,825.7
Annual Escalation 4%	.4	4.9	17.1	33.4	37.7	49.8	58.5	78.8	97.6	112.1	107.5	.0	.0	.0	.0	.0	.0	597.8
Interest During Construction 10%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
<b>Sub-total</b>	<b>8.9</b>	<b>64.7</b>	<b>153.9</b>	<b>229.8</b>	<b>211.5</b>	<b>237.9</b>	<b>243.5</b>	<b>292.4</b>	<b>328.3</b>	<b>345.7</b>	<b>307.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>2,423.5</b>
Yuan Expenditures	8.6	59.8	136.8	196.4	173.8	188.0	185.0	213.6	230.7	233.6	199.5	.0	.0	.0	.0	.0	.0	1,825.7
Annual Escalation 4%	.4	4.9	17.1	33.4	37.7	49.8	58.5	78.8	97.6	112.1	107.5	.0	.0	.0	.0	.0	.0	597.8
Interest During Construction 3.6%	.0	.0	.0	.0	.0	.0	.0	.0	1.3	13.3	22.4	.0	.0	.0	.0	.0	.0	37.0
<b>Sub-total</b>	<b>8.9</b>	<b>64.7</b>	<b>153.9</b>	<b>229.8</b>	<b>211.5</b>	<b>237.9</b>	<b>243.5</b>	<b>292.4</b>	<b>329.6</b>	<b>359.0</b>	<b>329.3</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>2,460.5</b>
<b>Phase 2 Three Gorges</b>																		
									.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
U.S. Expenditures 0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	230.7	213.6	193.8	156.6	128.2	99.6	1,022.5
Annual Escalation 4%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	138.6	142.0	141.8	125.4	111.9	94.5	754.3
Interest During Construction 10%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
<b>Sub-total</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>369.4</b>	<b>355.6</b>	<b>335.6</b>	<b>282.0</b>	<b>240.1</b>	<b>194.1</b>	<b>1,776.8</b>
Yuan (U.S.\$) Expenditures	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	230.7	213.6	193.8	156.6	128.2	99.6	1,022.5
Annual Escalation 4%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	138.6	142.0	141.8	125.4	111.9	94.5	754.3
Interest During Construction 3.6%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	53.4	67.0	67.6	53.0	19.7	.0	261.4
<b>Sub-total</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>422.8</b>	<b>423.4</b>	<b>403.1</b>	<b>335.0</b>	<b>259.9</b>	<b>194.1</b>	<b>2,038.3</b>
<b>Total U.S. Requirements</b>	<b>8.9</b>	<b>64.7</b>	<b>153.9</b>	<b>229.8</b>	<b>211.5</b>	<b>237.9</b>	<b>243.5</b>	<b>292.4</b>	<b>328.3</b>	<b>345.7</b>	<b>307.0</b>	<b>369.4</b>	<b>355.6</b>	<b>335.6</b>	<b>282.0</b>	<b>240.1</b>	<b>194.1</b>	<b>4,200.3</b>
<b>Total Yuan Requirements</b>	<b>8.9</b>	<b>64.7</b>	<b>153.9</b>	<b>229.8</b>	<b>211.5</b>	<b>237.9</b>	<b>243.5</b>	<b>292.4</b>	<b>329.6</b>	<b>359.0</b>	<b>329.3</b>	<b>422.8</b>	<b>423.4</b>	<b>403.1</b>	<b>335.0</b>	<b>259.9</b>	<b>194.1</b>	<b>4,498.7</b>
<b>Equity Payments</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>546.4</b>	<b>546.4</b>	<b>546.4</b>	<b>546.4</b>	<b>546.4</b>	<b>550.0</b>	<b>3,282.1</b>
<b>Total Application of Funds</b>	<b>17.9</b>	<b>129.4</b>	<b>307.8</b>	<b>459.6</b>	<b>422.9</b>	<b>475.7</b>	<b>486.9</b>	<b>584.8</b>	<b>658.0</b>	<b>704.6</b>	<b>636.3</b>	<b>1,338.5</b>	<b>1,325.4</b>	<b>1,285.1</b>	<b>1,163.5</b>	<b>1,046.4</b>	<b>938.2</b>	<b>11,981.2</b>
<b>Cash short/over</b>																		
U.S.	798.7	807.4	718.8	537.9	359.1	133.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Yuan	127.0	267.7	359.5	411.1	493.0	560.9	526.0	273.4	( 38.5)	( 382.5)	( 643.1)	(1,536.1)	(1,950.1)	(1,945.0)	(1,524.1)	( 567.5)	789.4	.0

Year Ended	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
<b>SOURCE OF FUNDS</b>																		
Equity \$6	.0	.0	.0															.0
Interest Earned 10%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0							.0
Gezuba Revenue	106.4	145.1	187.1	232.1	265.1	276.1	287.8	300.0	312.3	325.4	338.9	352.9	367.8	383.0	398.8	415.3	418.5	5,112.5
Three Gorges Revenue												232.8	486.0	761.4	1,059.4	1,381.7	1,731.0	5,652.3
Total Internal Funds	106.4	145.1	187.1	232.1	265.1	276.1	287.8	300.0	312.3	325.4	338.9	585.7	853.8	1,144.4	1,458.2	1,797.0	2,149.5	10,764.8
Borrowing U.S.\$	169.0	154.7	135.9	112.4	100.2	111.4	93.7	134.0	149.0	165.2	183.2	.0	.0	.0	.0	.0	.0	1,508.7
Borrowing Yuan	269.4	289.8	311.5	334.4	358.5	384.0	411.0	439.3	469.3	501.0	527.4	444.9	472.5	.0	.0	.0	.0	5,213.0
Total Borrowing	438.4	444.5	447.4	446.8	458.7	495.4	504.7	573.3	618.3	666.2	710.6	444.9	472.5	.0	.0	.0	.0	6,721.7
Total Source of Funds	544.8	589.6	634.5	678.9	723.8	771.5	792.5	873.3	930.6	991.6	1,049.5	1,030.6	1,326.3	1,144.4	1,458.2	1,797.0	2,149.5	17,486.5
<b>Capital Expenditures</b>																		
<u>Phase 1 Three Gorges</u>																		
U.S. Expenditures \$	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	.0	.0	.0	.0	.0	.0	2,750.0
Annual Escalation 4%	10.0	20.4	31.2	42.5	54.2	66.3	79.0	92.1	105.8	120.1	134.9							756.5
Interest During Const. 10%	15.4	29.4	41.8	52.0	61.1	71.2	82.5	91.9	105.5	120.5	137.2							778.5
Subtotal	275.4	299.8	323.0	344.5	365.3	387.5	381.5	434.0	461.3	490.6	522.1	.0	.0	.0	.0	.0	.0	4,285.0
Yuan (U.S.\$) Expenditures	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0	250.0							2,750.0
Annual Escalation 4%	10.0	20.4	31.2	42.5	54.2	66.3	79.0	92.1	105.8	120.1	134.9							756.5
Interest During Construction 3.6%	9.4	19.4	30.3	41.9	54.3	67.7	82.0	97.2	113.5	130.9	142.5							789.1
Subtotal	269.4	289.8	311.5	334.4	358.5	384.0	411.0	439.3	469.3	501.0	527.4							4,295.6
<u>Phase 2 Three Gorges</u>																		
U.S. Expenditures \$												175.0	175.0	175.0	175.0	175.0	175.0	1,050.0
Annual Escalation 4%												105.2	116.4	128.0	140.2	152.8	165.9	808.4
Interest During Const. 10%												120.7	76.1	.0	.0	.0	.0	196.8
Subtotal												400.9	367.5	303.0	315.2	327.8	340.9	2,055.2
Yuan (U.S.\$) Expenditures												175.0	175.0	175.0	175.0	175.0	175.0	1,050.0
Annual Escalation 4%												105.2	116.4	128.0	140.2	152.8	165.9	808.4
Interest During Construction 8%												164.7	181.1	198.4	145.6	109.8	60.9	860.5
Subtotal												444.9	472.5	501.4	460.8	437.6	401.8	2,718.9
Total U.S.\$ Requirement	275.4	299.8	323.0	344.5	365.3	387.5	381.5	434.0	461.3	490.6	522.1	400.9	367.5	303.0	315.2	327.8	340.9	6,340.2
Total Yuan	269.4	289.8	311.5	334.4	358.5	384.0	411.0	439.3	469.3	501.0	527.4	444.9	472.5	501.4	460.8	437.6	401.8	7,014.5
Equity Payments												.0	.0	.0	.0	.0	.0	.0
Total Application of Funds	544.8	589.6	634.5	678.8	723.7	771.5	792.5	873.4	930.7	991.5	1,049.4	845.8	840.0	804.5	775.9	765.3	742.7	13,354.7
<b>Cash Over (Short) Cumulative</b>																		
U.S. \$	( 169.0)	( 323.7)	( 459.6)	( 572.0)	( 672.2)	( 783.6)	( 877.3)	( 1,011.3)	( 1,160.3)	( 1,325.5)	( 1,508.7)	( 1,323.5)	( 837.2)		.0	.0	.0	.0
Yuan	( 269.4)	( 559.2)	( 870.7)	( 1,205.1)	( 1,563.6)	( 1,947.6)	( 2,358.6)	( 2,797.9)	( 3,267.2)	( 3,768.2)	( 4,295.6)	( 4,740.5)	( 5,213.0)	5,718.2	( 5,028.0)	( 3,996.4)	( 2,589.6)	

Three Gorges Joint Venture Co. Source and Application of funds in millions of U.S.\$ (Y2.8 = U.S.\$)

Case C 1.01

Year Ended	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
<b>Source of Funds</b>																
Equity	584.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	584.0
Interest Earned 10%	26.6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	26.6
Gezhuaba Revenue	106.4	145.1	187.1	232.1	265.1	276.1	287.8	300.0	312.3	325.4	338.9	352.9	367.8	383.0	398.8	4,278.8
Three Gorges Revenue	.0	.0	.0	.0	.0	.0	.0	.0	.0	213.3	445.5	697.7	972.0	1,269.8	1,588.3	5,186.6
<b>Total Internal Funds</b>	<b>717.0</b>	<b>145.1</b>	<b>187.1</b>	<b>232.1</b>	<b>265.1</b>	<b>276.1</b>	<b>287.8</b>	<b>300.0</b>	<b>312.3</b>	<b>538.7</b>	<b>784.4</b>	<b>1,050.6</b>	<b>1,339.8</b>	<b>1,652.8</b>	<b>1,987.1</b>	<b>10,076.0</b>
Borrowing U.S.	.0	.0	172.3	155.1	150.1	169.2	190.3	213.7	239.7	.0	.0	.0	.0	.0	.0	1,290.4
Borrowing Yuan	218.9	239.1	372.6	400.2	429.5	460.2	492.8	527.3	563.4	741.7	779.1	738.1	.0	.0	.0	5,962.9
<b>Total Borrowing</b>	<b>218.9</b>	<b>239.1</b>	<b>544.9</b>	<b>555.3</b>	<b>579.6</b>	<b>629.4</b>	<b>683.1</b>	<b>741.0</b>	<b>803.1</b>	<b>741.7</b>	<b>779.1</b>	<b>738.1</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>7,253.3</b>
<b>Total Source of Funds</b>	<b>935.9</b>	<b>384.2</b>	<b>732.0</b>	<b>787.4</b>	<b>844.7</b>	<b>905.5</b>	<b>970.9</b>	<b>1,041.0</b>	<b>1,115.4</b>	<b>1,280.4</b>	<b>1,563.5</b>	<b>1,788.7</b>	<b>1,339.8</b>	<b>1,652.8</b>	<b>1,987.1</b>	<b>17,329.3</b>
Capital Expenditures	(.302)	(2.17)	(4.821)	(6.97)	(6.12)	(6.62)	(6.52)	(7.52)	(8.12)	(8.22)	(7.02)	(8.12)	(7.52)	(6.82)	(5.52)	1002
<b>Phase 1 Three Gorges</b>																
U.S. Expenditures \$	305.0	305.0	305.0	305.0	305.0	305.0	305.0	305.0	305.0	.0	.0	.0	.0	.0	.0	2,745.0
Annual Escalation 4%	12.2	25.1	38.2	51.9	66.3	81.0	96.5	112.7	129.2	.0	.0	.0	.0	.0	.0	613.1
Interest During Construction 10%	.0	.0	15.7	29.8	43.4	58.8	76.1	95.5	117.3	.0	.0	.0	.0	.0	.0	436.6
<b>Sub-total</b>	<b>317.2</b>	<b>330.1</b>	<b>358.9</b>	<b>386.7</b>	<b>414.7</b>	<b>444.8</b>	<b>477.6</b>	<b>513.2</b>	<b>551.5</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>3,794.7</b>
Yuan Expenditures	305.0	305.0	305.0	305.0	305.0	305.0	305.0	305.0	305.0	.0	.0	.0	.0	.0	.0	2,745.0
Annual Escalation 4%	12.2	25.1	38.2	51.9	66.3	81.0	96.5	112.7	129.2	.0	.0	.0	.0	.0	.0	613.1
Interest During Construction 3.6%	7.6	15.9	28.9	42.8	57.7	73.7	90.8	109.1	128.7	.0	.0	.0	.0	.0	.0	555.2
<b>Sub-total</b>	<b>324.8</b>	<b>346.0</b>	<b>372.1</b>	<b>399.7</b>	<b>429.0</b>	<b>459.7</b>	<b>492.3</b>	<b>526.8</b>	<b>562.9</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>3,913.3</b>
<b>Phase 2 Three Gorges</b>																
U.S. Expenditures \$	.0	.0	.0	.0	.0	.0	.0	.0	.0	175.0	175.0	175.0	175.0	175.0	175.0	1,050.0
Annual Escalation 4%	.0	.0	.0	.0	.0	.0	.0	.0	.0	84.0	94.3	105.2	116.4	128.1	140.2	668.2
Interest During Construction 10%	.0	.0	.0	.0	.0	.0	.0	.0	.0	101.1	59.7	.0	.0	.0	.0	160.8
<b>Sub-total</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>360.1</b>	<b>329.0</b>	<b>280.2</b>	<b>291.4</b>	<b>303.1</b>	<b>315.2</b>	<b>1,879.0</b>
Yuan(U.S.\$) Expenditures	.0	.0	.0	.0	.0	.0	.0	.0	.0	175.0	175.0	175.0	175.0	175.0	175.0	1,050.0
Annual Escalation 4%	.0	.0	.0	.0	.0	.0	.0	.0	.0	84.0	94.3	105.2	116.4	128.1	140.2	668.2
Interest During Construction 3.6%	.0	.0	.0	.0	.0	.0	.0	.0	.0	154.5	181.6	243.7	199.2	180.5	150.0	1,109.5
<b>Sub-total</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>413.5</b>	<b>450.9</b>	<b>523.9</b>	<b>490.6</b>	<b>483.6</b>	<b>465.2</b>	<b>2,827.7</b>
<b>Total U.S. Requirements</b>	<b>317.2</b>	<b>330.1</b>	<b>358.9</b>	<b>386.7</b>	<b>414.7</b>	<b>444.8</b>	<b>477.6</b>	<b>513.2</b>	<b>551.5</b>	<b>360.1</b>	<b>329.0</b>	<b>280.2</b>	<b>291.4</b>	<b>303.1</b>	<b>315.2</b>	<b>5,673.7</b>
<b>Total Yuan Requirements</b>	<b>324.8</b>	<b>346.0</b>	<b>372.1</b>	<b>399.7</b>	<b>429.0</b>	<b>459.7</b>	<b>492.3</b>	<b>526.8</b>	<b>562.9</b>	<b>413.5</b>	<b>450.9</b>	<b>523.9</b>	<b>490.6</b>	<b>483.6</b>	<b>465.2</b>	<b>6,741.0</b>
Equity Payments	.0	.0	.0	.0	.0	.0	.0	.0	.0	328.2	328.2	328.2	328.2	328.2	328.2	1,969.2
<b>Total Application of Funds</b>	<b>642.0</b>	<b>676.1</b>	<b>731.0</b>	<b>786.4</b>	<b>843.7</b>	<b>904.5</b>	<b>969.9</b>	<b>1,040.0</b>	<b>1,114.4</b>	<b>1,101.8</b>	<b>1,108.1</b>	<b>1,132.3</b>	<b>1,110.2</b>	<b>1,114.9</b>	<b>1,108.6</b>	<b>14,383.9</b>
<b>Cash short/over</b>																
U.S.	292.0	.0	( 172.3)	( 327.4)	( 477.5)	( 646.7)	( 837.0)	(1,050.7)	(1,290.4)	(1,111.8)	( 656.4)	.0	.0	.0	.0	
Yuan	( 218.9)	( 458.0)	( 830.6)	(1,230.8)	(1,660.3)	(2,120.5)	(2,613.3)	(3,140.6)	(3,704.0)	(4,445.7)	(5,224.8)	(5,962.9)	(5,733.3)	(5,195.4)	(4,316.9)	

Three Gorges Joint Venture Co. Source and Application of funds in millions of Yuan

Case C1.02 V

Year Ended	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
<b>Source of Funds</b>																		
Equity	1,635.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	1,635.5
Interest Earned 10%	160.2	152.1	109.9	34.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	457.1
Bezhuba Revenue	298.0	406.3	523.9	649.9	742.3	773.3	805.8	840.0	874.4	911.1	949.0	988.1	1,029.8	1,072.4	1,116.4	1,162.8	1,171.8	14,315.3
Three Gorges Revenue	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	651.8	1,360.8	2,131.9	2,966.3	3,868.8	4,846.8	15,826.4
<b>Total Internal Funds</b>	<b>2,093.7</b>	<b>558.4</b>	<b>633.8</b>	<b>684.8</b>	<b>742.3</b>	<b>773.3</b>	<b>805.8</b>	<b>840.0</b>	<b>874.4</b>	<b>911.1</b>	<b>949.0</b>	<b>1,639.9</b>	<b>2,390.6</b>	<b>3,204.3</b>	<b>4,082.7</b>	<b>5,031.6</b>	<b>6,018.6</b>	<b>32,234.3</b>
Borrowing U.S.	.0	.0	.0	.0	.0	126.8	127.4	303.2	442.8	518.5	368.5	.0	.0	.0	.0	.0	.0	1,887.2
Borrowing Yuan	.0	.0	.0	.0	283.4	930.6	986.6	1,211.1	1,393.4	1,510.8	1,414.8	2,966.2	3,020.9	1,856.9	.0	.0	.0	15,574.7
<b>Total Borrowing</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>283.4</b>	<b>1,057.4</b>	<b>1,114.0</b>	<b>1,514.3</b>	<b>1,836.2</b>	<b>2,029.3</b>	<b>1,783.3</b>	<b>2,966.2</b>	<b>3,020.9</b>	<b>1,856.9</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>17,461.9</b>
<b>Total Source of Funds</b>	<b>2,093.7</b>	<b>558.4</b>	<b>633.8</b>	<b>684.8</b>	<b>1,025.7</b>	<b>1,830.7</b>	<b>1,919.8</b>	<b>2,354.3</b>	<b>2,710.6</b>	<b>2,940.4</b>	<b>2,732.3</b>	<b>4,606.1</b>	<b>5,411.5</b>	<b>5,061.2</b>	<b>4,082.7</b>	<b>5,031.6</b>	<b>6,018.6</b>	<b>49,696.2</b>
<b>Capital Expenditures</b>	<b>(.30%)</b>	<b>(2.1%)</b>	<b>(4.8%)</b>	<b>(6.9%)</b>	<b>(6.1%)</b>	<b>(6.6%)</b>	<b>(6.5%)</b>	<b>(7.5%)</b>	<b>(8.1%)</b>	<b>(8.2%)</b>	<b>(7.0%)</b>	<b>(8.1%)</b>	<b>(7.5%)</b>	<b>(6.8%)</b>	<b>(5.5%)</b>	<b>(4.5%)</b>	<b>(3.5%)</b>	<b>100%</b>
<b>Phase 1 Three Gorges</b>																		
U.S. Expenditures \$	31.9	223.4	510.7	734.2	649.0	702.3	691.6	798.0	861.8	872.5	744.8	.0	.0	.0	.0	.0	.0	6,820.2
Annual Escalation 4%	1.3	18.3	63.8	124.8	140.8	186.1	218.5	294.5	364.5	418.8	401.4	.0	.0	.0	.0	.0	.0	2,232.8
Interest During Construction 10%	.0	.0	.0	.0	.0	11.5	23.1	50.7	90.9	138.0	171.6	.0	.0	.0	.0	.0	.0	485.8
<b>Sub-total</b>	<b>33.2</b>	<b>241.7</b>	<b>574.5</b>	<b>859.0</b>	<b>789.8</b>	<b>899.9</b>	<b>933.2</b>	<b>1,143.2</b>	<b>1,317.2</b>	<b>1,429.3</b>	<b>1,317.8</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>9,538.8</b>
Yuan Expenditures	31.9	223.4	510.7	734.2	649.0	702.3	691.6	798.0	861.8	872.5	744.8	.0	.0	.0	.0	.0	.0	6,820.2
Annual Escalation 4%	1.3	18.3	63.8	124.8	140.8	186.1	218.5	294.5	364.5	418.8	401.4	.0	.0	.0	.0	.0	.0	2,232.8
Interest During Construction 3.6%	.0	.0	.0	.0	.0	42.2	76.5	118.6	167.0	219.5	268.6	.0	.0	.0	.0	.0	.0	892.4
<b>Sub-total</b>	<b>33.2</b>	<b>241.7</b>	<b>574.5</b>	<b>859.0</b>	<b>789.8</b>	<b>930.6</b>	<b>986.6</b>	<b>1,211.1</b>	<b>1,393.3</b>	<b>1,510.8</b>	<b>1,414.8</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>9,945.4</b>
<b>Phase 2 Three Gorges</b>																		
U.S. Expenditures \$	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	861.9	798.0	723.5	585.2	478.8	372.4	3,819.8
Annual Escalation 4%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	517.1	330.7	528.9	468.2	417.5	352.7	2,815.1
Interest During Construction 10%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	162.6	72.7	.0	.0	.0	.0	235.3
<b>Sub-total</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>1,541.6</b>	<b>1,401.4</b>	<b>1,252.4</b>	<b>1,053.4</b>	<b>896.3</b>	<b>725.1</b>	<b>6,870.2</b>
Yuan(U.S.\$) Expenditures	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	861.9	798.0	723.5	585.2	478.8	372.4	3,819.8
Annual Escalation 4%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	517.1	330.7	528.9	468.2	417.5	352.7	2,815.1
Interest During Construction 3.6%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	371.7	476.7	541.2	533.3	479.7	376.2	2,778.8
<b>Sub-total</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>1,750.7</b>	<b>1,805.4</b>	<b>1,793.6</b>	<b>1,586.7</b>	<b>1,376.0</b>	<b>1,101.3</b>	<b>9,413.7</b>
<b>Total U.S. Requirements</b>	<b>33.2</b>	<b>241.7</b>	<b>574.5</b>	<b>859.0</b>	<b>789.8</b>	<b>899.9</b>	<b>933.2</b>	<b>1,143.2</b>	<b>1,317.2</b>	<b>1,429.3</b>	<b>1,317.8</b>	<b>1,541.6</b>	<b>1,401.4</b>	<b>1,252.4</b>	<b>1,053.4</b>	<b>896.3</b>	<b>725.1</b>	<b>16,409.0</b>
<b>Total Yuan Requirements</b>	<b>33.2</b>	<b>241.7</b>	<b>574.5</b>	<b>859.0</b>	<b>789.8</b>	<b>930.6</b>	<b>986.6</b>	<b>1,211.1</b>	<b>1,393.3</b>	<b>1,510.8</b>	<b>1,414.8</b>	<b>1,750.7</b>	<b>1,805.4</b>	<b>1,793.6</b>	<b>1,586.7</b>	<b>1,376.0</b>	<b>1,101.3</b>	<b>19,359.1</b>
Equity Payments	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	1,215.5	1,215.5	1,215.5	1,215.5	1,215.5	1,215.5	7,293.0
<b>Total Application of Funds</b>	<b>66.4</b>	<b>483.4</b>	<b>1,149.0</b>	<b>1,718.0</b>	<b>1,579.6</b>	<b>1,830.5</b>	<b>1,919.8</b>	<b>2,354.3</b>	<b>2,710.5</b>	<b>2,940.1</b>	<b>2,732.6</b>	<b>4,507.8</b>	<b>4,422.3</b>	<b>4,261.5</b>	<b>3,855.6</b>	<b>3,487.8</b>	<b>3,041.9</b>	<b>43,061.1</b>
<b>Cash short/over</b>																		
U.S.	1,762.5	1,672.9	1,208.3	384.2	.0	( 126.8)	( 254.2)	( 557.4)	(1,000.2)	(1,518.4)	(1,887.2)	( 1,788.9)	( 799.7)	.0	.0	.0	.0	
Yuan	264.8	429.4	378.8	169.7	( 283.4)	(1,214.0)	(2,200.6)	(3,411.7)	(4,805.0)	(6,315.8)	(7,730.6)	(10,696.8)	(13,717.7)	(15,574.6)	(15,347.3)	(13,803.5)	(10,826.8)	



Year Ended	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total	
<b>Source of Funds</b>																			
Equity	584.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	584.1	
Interest Earned 10%	57.2	54.3	39.3	12.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	163.3	
Gezhuaba Revenue	106.4	145.1	187.1	232.1	265.1	276.2	287.8	300.0	312.3	325.4	338.9	352.9	367.8	383.0	398.7	415.3	418.5	5,112.6	
Three Gorges Revenue	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	232.8	486.9	761.4	1,059.4	1,381.7	1,731.0	5,652.3	
<b>Total Internal Funds</b>	<b>747.8</b>	<b>199.4</b>	<b>226.4</b>	<b>244.6</b>	<b>265.1</b>	<b>276.2</b>	<b>287.8</b>	<b>300.0</b>	<b>312.3</b>	<b>325.4</b>	<b>338.9</b>	<b>585.7</b>	<b>853.8</b>	<b>1,144.4</b>	<b>1,458.1</b>	<b>1,797.0</b>	<b>2,149.5</b>	<b>11,512.3</b>	
Borrowing U.S.	.0	.0	.0	.0	.0	45.3	45.5	108.3	158.1	185.2	131.6	.0	.0	.0	.0	.0	.0	674.0	
Borrowing Yuan	.0	.0	.0	.0	101.2	332.4	352.4	432.5	497.6	539.6	505.3	1,059.4	1,078.9	663.2	.0	.0	.0	5,562.4	
<b>Total Borrowing</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>101.2</b>	<b>377.6</b>	<b>397.9</b>	<b>540.8</b>	<b>655.8</b>	<b>724.8</b>	<b>636.9</b>	<b>1,059.4</b>	<b>1,078.9</b>	<b>663.2</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>6,236.4</b>	
<b>Total Source of Funds</b>	<b>747.8</b>	<b>199.4</b>	<b>226.4</b>	<b>244.6</b>	<b>366.3</b>	<b>653.8</b>	<b>685.6</b>	<b>840.8</b>	<b>968.1</b>	<b>1,050.1</b>	<b>975.8</b>	<b>1,645.0</b>	<b>1,932.7</b>	<b>1,807.6</b>	<b>1,458.1</b>	<b>1,797.0</b>	<b>2,149.5</b>	<b>17,748.6</b>	
<b>Capital Expenditures</b>	<b>(.30%)</b>	<b>(2.1%)</b>	<b>(4.8%)</b>	<b>(6.9%)</b>	<b>(6.1%)</b>	<b>(6.6%)</b>	<b>(6.5%)</b>	<b>(7.5%)</b>	<b>(8.1%)</b>	<b>(8.2%)</b>	<b>(7.0%)</b>	<b>(8.1%)</b>	<b>(7.5%)</b>	<b>(6.8%)</b>	<b>(5.5%)</b>	<b>(4.5%)</b>	<b>(3.5%)</b>	<b>100%</b>	
<b>Phase 1 Three Gorges</b>																			
U.S. Expenditures 0	11.4	79.8	182.4	262.2	231.8	250.8	247.0	285.0	307.8	311.6	266.0	.0	.0	.0	.0	.0	.0	2,435.8	
Annual Escalation 4%	.5	6.5	22.8	44.6	50.3	66.5	78.0	105.2	130.2	149.6	143.4	.0	.0	.0	.0	.0	.0	797.4	
Interest During Construction 10%	.0	.0	.0	.0	.0	4.1	8.3	18.1	32.5	49.3	61.3	.0	.0	.0	.0	.0	.0	173.5	
<b>Sub-total</b>	<b>11.9</b>	<b>86.3</b>	<b>205.2</b>	<b>306.8</b>	<b>282.1</b>	<b>321.4</b>	<b>333.3</b>	<b>408.3</b>	<b>470.4</b>	<b>510.5</b>	<b>470.6</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>3,406.7</b>	
Yuan Expenditures	11.4	79.8	182.4	262.2	231.8	250.8	247.0	285.0	307.8	311.6	266.0	.0	.0	.0	.0	.0	.0	2,435.8	
Annual Escalation 4%	.5	6.5	22.8	44.6	50.3	66.5	78.0	105.2	130.2	149.6	143.4	.0	.0	.0	.0	.0	.0	797.4	
Interest During Construction 3.6%	.0	.0	.0	.0	.0	15.1	27.3	42.4	59.6	78.4	95.9	.0	.0	.0	.0	.0	.0	318.7	
<b>Sub-total</b>	<b>11.9</b>	<b>86.3</b>	<b>205.2</b>	<b>306.8</b>	<b>282.1</b>	<b>332.4</b>	<b>352.4</b>	<b>432.5</b>	<b>497.6</b>	<b>539.6</b>	<b>505.3</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>3,551.9</b>	
<b>Phase 2 Three Gorges</b>																			
U.S. Expenditures 0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	307.8	285.0	258.4	209.0	171.0	133.0	1,364.2	
Annual Escalation 4%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	184.7	189.5	188.9	167.2	149.1	126.0	1,065.4	
Interest During Construction 10%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	58.1	26.0	.0	.0	.0	.0	84.0	
<b>Sub-total</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>550.6</b>	<b>500.5</b>	<b>447.3</b>	<b>376.2</b>	<b>320.1</b>	<b>259.0</b>	<b>2,453.6</b>	
Yuan (U.S.\$) Expenditures	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	307.8	285.0	258.4	209.0	171.0	133.0	1,364.2	
Annual Escalation 4%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	184.7	189.5	188.9	167.2	149.1	126.0	1,065.4	
Interest During Construction 3.6%	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	132.8	170.3	193.3	190.5	171.3	134.4	992.4	
<b>Sub-total</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>.0</b>	<b>625.3</b>	<b>644.8</b>	<b>640.6</b>	<b>566.7</b>	<b>491.4</b>	<b>393.3</b>	<b>3,362.0</b>	
<b>Total U.S. Requirements</b>	<b>11.9</b>	<b>86.3</b>	<b>205.2</b>	<b>306.8</b>	<b>282.1</b>	<b>321.4</b>	<b>333.3</b>	<b>408.3</b>	<b>470.4</b>	<b>510.5</b>	<b>470.6</b>	<b>550.6</b>	<b>500.5</b>	<b>447.3</b>	<b>376.2</b>	<b>320.1</b>	<b>259.0</b>	<b>5,860.4</b>	
<b>Total Yuan Requirements</b>	<b>11.9</b>	<b>86.3</b>	<b>205.2</b>	<b>306.8</b>	<b>282.1</b>	<b>332.4</b>	<b>352.4</b>	<b>432.5</b>	<b>497.6</b>	<b>539.6</b>	<b>505.3</b>	<b>625.3</b>	<b>644.8</b>	<b>640.6</b>	<b>566.7</b>	<b>491.4</b>	<b>393.3</b>	<b>6,914.0</b>	
Equity Payments	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	434.1	434.1	434.1	434.1	434.1	434.1	2,604.6	
<b>Total Application of Funds</b>	<b>23.7</b>	<b>172.6</b>	<b>410.4</b>	<b>613.6</b>	<b>564.1</b>	<b>653.8</b>	<b>685.6</b>	<b>840.8</b>	<b>968.0</b>	<b>1,050.0</b>	<b>975.9</b>	<b>1,609.9</b>	<b>1,579.4</b>	<b>1,522.0</b>	<b>1,377.0</b>	<b>1,245.6</b>	<b>1,086.4</b>	<b>15,379.0</b>	
<b>Cash short/over</b>																			
U.S.	629.5	397.5	431.5	137.2	.0	( 45.3)	( 90.8)	( 199.1)	( 357.2)	( 542.3)	( 674.0)	( 638.9)	( 285.6)	.0	.0	.0	.0	.0	
Yuan	94.6	153.4	135.3	60.6	( 101.2)	( 433.6)	( 785.9)	( 1,218.5)	( 1,716.1)	( 2,255.6)	( 2,760.9)	( 3,820.3)	( 4,899.2)	( 5,562.4)	( 6,481.2)	( 7,429.8)	( 8,866.7)	.0	

ANNEX B

SOURCE AND APPLICATION OF FUNDS - CASE STUDIES OF THE  
GEHE YAN WATER CONTROL PROJECT

GENE YAH JOINT VENTURE CO. SOURCE AND APPLICATION OF FUNDS IN MILLIONS OF YUAN

Case A1

SOURCE OF FUNDS

	1	2	3	4	5	6	7	8	9	10	Total
Electricity Sales	.00	.00	.00	.00	.00	.00	.00	.00	273.40	317.96	591.36
Chinese Equity	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Interest Earned 8%	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Foreign Equity	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Interest Earned 10%	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Borrowing Yuan	17.78	123.04	235.84	90.39	113.95	198.48	215.03	201.76	94.00	59.65	1,349.92
Borrowing Foreign Currency	8.66	16.42	29.39	27.17	138.04	222.73	257.45	304.23	29.17	.00	1,033.26
<b>Total Source of Funds</b>	<b>26.44</b>	<b>139.46</b>	<b>265.23</b>	<b>117.56</b>	<b>251.99</b>	<b>421.21</b>	<b>472.48</b>	<b>505.99</b>	<b>396.57</b>	<b>377.61</b>	<b>2,974.54</b>

APPLICATION OF FUNDS

<b>Capital Expenditures</b>											
Foreign Currency Expenditures	7.64	12.96	21.12	16.11	90.86	132.44	132.70	137.52	127.17	65.98	744.50
Annual Escalation 6%	.23	1.18	3.32	3.64	27.21	58.07	61.13	75.43	81.47	48.79	352.47
Interest during const. 10%	.79	2.28	4.95	7.42	19.97	40.22	63.62	91.28	93.93	83.00	407.46
<b>Sub-total</b>	<b>8.66</b>	<b>16.42</b>	<b>29.39</b>	<b>27.17</b>	<b>138.04</b>	<b>222.73</b>	<b>257.45</b>	<b>304.23</b>	<b>302.57</b>	<b>197.77</b>	<b>1,504.43</b>
<b>Yuan Expenditures</b>											
Annual Escalation 6%	.49	9.89	30.19	13.69	21.65	46.97	56.88	56.68	19.23	5.42	261.09
Interest during const. 3.6%	.61	4.89	13.08	16.22	20.18	27.08	34.35	41.56	44.83	46.90	249.90
<b>Sub-total</b>	<b>17.78</b>	<b>123.04</b>	<b>235.84</b>	<b>90.39</b>	<b>113.95</b>	<b>198.48</b>	<b>215.03</b>	<b>201.76</b>	<b>94.00</b>	<b>59.65</b>	<b>1,349.92</b>
<b>Total Project Cost</b>	<b>26.44</b>	<b>139.46</b>	<b>265.23</b>	<b>117.56</b>	<b>251.99</b>	<b>421.21</b>	<b>472.48</b>	<b>505.99</b>	<b>396.57</b>	<b>257.42</b>	<b>2,854.35</b>
<b>Cash Short/Over Cumulative</b>											
Loan Foreign Currency	( 8.66)	( 25.08)	( 54.47)	( 81.64)	( 219.68)	( 442.41)	( 699.86)	( 1,004.09)	( 1,033.26)	( 913.07)	
Loan Yuan Currency	( 17.78)	( 140.82)	( 376.66)	( 467.05)	( 581.00)	( 779.48)	( 994.51)	( 1,196.27)	( 1,290.27)	( 1,349.92)	

GENE VAN JOINT VENTURE CO. SOURCE AND APPLICATION OF FUNDS : IN MILLIONS OF YUAN

CASE B.101

SOURCE OF FUNDS	1	2	3	4	5	6	7	8	9	10	Total
Electricity Sales	.00	.00	.00	.00	.00	.00	.00	.00	174.93	204.64	379.57
Chinese Equity	237.52										237.52
Interest Earned 8%	17.63	9.59	.00	.00	.00	.00	.00	.00	.00	.00	27.21
Foreign Equity	79.17										79.17
Interest Earned 10%	7.13	6.43	4.63	3.12	.00	.00	.00	.00	.00	.00	21.30
Borrowing Yuan	.00	.00	96.71	80.32	103.52	187.67	203.83	190.16	81.98	47.20	991.39
Borrowing Foreign Currency	.00	.00	.00	.00	92.18	289.98	243.43	288.80	120.52	.00	954.91
<b>Total Source of Funds</b>	<b>341.45</b>	<b>16.02</b>	<b>101.33</b>	<b>83.44</b>	<b>195.70</b>	<b>397.65</b>	<b>447.26</b>	<b>478.96</b>	<b>377.43</b>	<b>251.84</b>	<b>2,691.07</b>
<b>APPLICATION OF FUNDS</b>											
<b>Capital Expenditures</b>											
Foreign Currency Expenditures	7.64	12.96	21.12	16.11	90.86	132.44	132.70	137.52	127.17	65.98	744.50
Annual Escalation 6%	.23	1.18	3.32	3.64	27.21	50.07	61.13	75.43	81.47	48.79	352.47
Interest During Const. 10%	.00	.00	.00	.00	8.38	27.47	49.60	75.85	86.81	86.50	334.61
<b>Sub-total</b>	<b>7.87</b>	<b>14.14</b>	<b>24.44</b>	<b>19.75</b>	<b>126.45</b>	<b>209.98</b>	<b>243.43</b>	<b>288.80</b>	<b>295.45</b>	<b>201.27</b>	<b>1,431.58</b>
<b>Yuan Expenditures</b>											
Annual Escalation 6%	16.68	108.26	192.57	60.48	72.12	124.43	123.60	103.52	29.94	7.33	838.93
Interest During Const. 3.6%	.49	9.89	30.19	13.69	21.65	46.97	56.88	56.68	19.23	5.42	261.09
Interest During Const. 3.6%	.00	.00	3.36	6.15	9.75	16.27	23.35	29.96	32.81	34.45	156.10
<b>Sub-total</b>	<b>17.17</b>	<b>118.15</b>	<b>226.12</b>	<b>80.32</b>	<b>103.52</b>	<b>187.67</b>	<b>203.83</b>	<b>190.16</b>	<b>81.98</b>	<b>47.20</b>	<b>1,256.12</b>
<b>Total Project Cost</b>	<b>25.04</b>	<b>132.29</b>	<b>250.56</b>	<b>100.07</b>	<b>229.97</b>	<b>397.65</b>	<b>447.26</b>	<b>478.96</b>	<b>377.43</b>	<b>248.47</b>	<b>2,687.71</b>
<b>Cash Short/Over Cumulative</b>											
Loan Foreign Currency	78.43	70.72	50.91	34.27	( 92.18)	( 302.16)	( 545.58)	( 834.39)	( 954.91)	( 951.54)	
Loan Yuan Currency	237.98	129.41	( 96.71)	( 177.03)	( 280.55)	( 468.22)	( 672.05)	( 862.21)	( 944.19)	( 991.39)	

GENE YAN JOINT VENTURE CO. SOURCE AND APPLICATION OF FUNDS : IN MILLIONS OF YUAN

CASE B.102

SOURCE OF FUNDS	1	2	3	4	5	6	7	8	9	10	Total
Electricity Sales	.00	.00	.00	.00	.00	.00	.00	.00	273.40	317.96	591.36
Chinese Equity	237.52										237.52
Interest Earned 8%	17.63	9.59	.00	.00	.00	.00	.00	.00	.00	.00	27.21
Foreign Equity	79.17										79.17
Interest Earned 10%	7.13	6.43	4.63	3.12	.00	.00	.00	.00	.00	.00	21.30
Borrowing Yuan	.00	.00	96.71	80.32	103.52	187.67	203.83	190.16	81.98	47.20	991.39
Borrowing Foreign Currency	.00	.00	.00	.00	92.18	209.98	243.43	288.80	12.20	.00	846.59
<b>Total Source of Funds</b>	<b>341.45</b>	<b>16.02</b>	<b>101.33</b>	<b>83.44</b>	<b>195.70</b>	<b>397.65</b>	<b>447.26</b>	<b>478.96</b>	<b>367.58</b>	<b>365.16</b>	<b>2,794.55</b>
<b>APPLICATION OF FUNDS</b>											
Capital Expenditures											
Foreign Currency Expenditures	7.64	12.96	21.12	16.11	90.86	132.44	132.70	137.52	127.17	65.98	744.50
Annual Escalation 6%	.23	1.18	3.32	3.64	27.21	50.07	61.13	75.43	81.47	48.79	352.47
Interest During Const. 10%	.00	.00	.00	.00	8.38	27.47	49.60	75.85	76.96	64.34	302.60
<b>Sub-total</b>	<b>7.87</b>	<b>14.14</b>	<b>24.44</b>	<b>19.75</b>	<b>126.45</b>	<b>209.98</b>	<b>243.43</b>	<b>288.80</b>	<b>285.60</b>	<b>179.11</b>	<b>1,399.57</b>
Yuan Expenditures	16.68	108.26	192.57	60.48	72.12	124.43	123.60	103.52	29.94	7.33	838.93
Annual Escalation 6%	.49	9.89	30.19	13.69	21.65	46.97	56.88	56.68	19.23	5.42	261.09
Interest During Const. 3.6%	.00	.00	3.36	6.15	9.75	16.27	23.35	29.96	32.81	34.45	156.10
<b>Sub-total</b>	<b>17.17</b>	<b>118.15</b>	<b>226.12</b>	<b>80.32</b>	<b>103.52</b>	<b>187.67</b>	<b>203.83</b>	<b>190.16</b>	<b>81.98</b>	<b>47.20</b>	<b>1,256.12</b>
<b>Total Project Cost</b>	<b>25.04</b>	<b>132.29</b>	<b>250.56</b>	<b>100.07</b>	<b>229.97</b>	<b>397.65</b>	<b>447.26</b>	<b>478.96</b>	<b>367.58</b>	<b>226.31</b>	<b>2,655.70</b>
Cash Short/Over Cumulative											
Loan Foreign Currency	78.43	70.72	50.91	34.27	( 92.18)	( 302.16)	( 545.58)	( 834.39)	( 846.59)	( 707.74)	
Loan Yuan Currency	237.98	129.41	( 96.71)	( 177.03)	( 280.55)	( 468.22)	( 672.05)	( 862.21)	( 944.19)	( 991.39)	

GENE YAN JOINT VENTURE CO. SOURCE AND APPLICATION OF FUNDS : IN MILLIONS OF YUAN

CASE B.103

SOURCE OF FUNDS	1	2	3	4	5	6	7	8	9	10	Total
Electricity Sales	.00	.00	.00	.00	.00	.00	.00	.00	273.40	317.95	591.35
Chinese Equity	158.34										158.34
Interest Earned 8%	11.29	2.75	.00	.00	.00	.00	.00	.00	.00	.00	14.04
Foreign Equity	39.59										39.59
Interest Earned 10%	3.17	2.08	.00	.00	.00	.00	.00	.00	.00	.00	5.25
Borrowing Yuan	.00	.00	192.39	83.77	107.09	191.37	207.66	194.13	86.09	51.46	1,113.95
Borrowing Foreign Currency	.00	.00	1.77	21.90	132.24	216.35	250.44	296.52	20.69	.00	939.92
<b>Total Source of Funds</b>	<b>212.40</b>	<b>4.82</b>	<b>194.16</b>	<b>105.67</b>	<b>239.33</b>	<b>407.72</b>	<b>458.10</b>	<b>490.65</b>	<b>380.18</b>	<b>369.42</b>	<b>2,862.44</b>
<b>APPLICATION OF FUNDS</b>											
<b>Capital Expenditures</b>											
Foreign Currency Expenditures	7.64	12.96	21.12	16.11	90.86	132.44	132.70	137.52	127.17	65.98	744.50
Annual Escalation 6%	.23	1.18	3.32	3.64	27.21	50.07	61.13	75.43	81.47	48.79	352.47
Interest During Const. 10%	.00	.00	.16	2.15	14.17	33.84	56.61	83.57	85.45	73.67	349.63
<b>Sub-total</b>	<b>7.87</b>	<b>14.14</b>	<b>24.60</b>	<b>21.90</b>	<b>132.24</b>	<b>216.35</b>	<b>250.44</b>	<b>296.52</b>	<b>294.09</b>	<b>188.44</b>	<b>1,446.60</b>
<b>Yuan Expenditures</b>											
Annual Escalation 6%	.49	9.89	30.19	13.69	21.65	46.97	56.88	56.68	19.23	5.42	261.09
Interest During Const. 3.6%	.00	.00	6.69	9.60	13.32	19.97	27.18	33.93	36.92	38.71	186.31
<b>Sub-total</b>	<b>17.17</b>	<b>118.15</b>	<b>229.45</b>	<b>83.77</b>	<b>107.09</b>	<b>191.37</b>	<b>207.66</b>	<b>194.13</b>	<b>86.09</b>	<b>51.46</b>	<b>1,286.33</b>
<b>Total Project Cost</b>	<b>25.04</b>	<b>132.29</b>	<b>254.05</b>	<b>105.67</b>	<b>239.33</b>	<b>407.72</b>	<b>458.10</b>	<b>490.65</b>	<b>380.18</b>	<b>239.90</b>	<b>2,732.92</b>
<b>Cash Short/Over Cumulative</b>											
Loan Foreign Currency	34.89	22.83	( 1.77)	( 23.68)	( 155.92)	( 372.27)	( 622.71)	( 919.23)	( 939.92)	( 810.40)	
Loan Yuan Currency	152.46	37.06	( 192.39)	( 276.15)	( 383.24)	( 574.61)	( 782.27)	( 976.40)	( 1,062.49)	( 1,113.95)	

GENE YAN JOINT VENTURE CO. SOURCE AND APPLICATION OF FUNDS : IN MILLIONS OF YUAN

CASE B.104

SOURCE OF FUNDS	1	2	3	4	5	6	7	8	9	10	Total
Electricity Sales	.00	.00	.00	.00	.00	.00	.00	.00	273.40	317.96	591.36
Chinese Equity	237.52										237.52
Interest Earned 8%	17.63	9.59	.00	.00	.00	.00	.00	.00	.00	.00	27.21
Foreign Equity	79.17										79.17
Interest Earned 10%	7.13	6.43	4.63	3.12	.00	.00	.00	.00	.00	.00	21.30
Borrowing Yuan	.00	.00	96.71	80.32	103.52	187.67	203.83	190.16	81.98	47.20	991.39
Borrowing Foreign Currency	.00	.00	.00	.00	90.50	204.35	232.92	272.21	.00	.00	799.98
<b>Total Source of Funds</b>	<b>341.45</b>	<b>16.02</b>	<b>101.33</b>	<b>83.44</b>	<b>194.02</b>	<b>392.02</b>	<b>436.76</b>	<b>462.37</b>	<b>355.38</b>	<b>365.16</b>	<b>2,747.94</b>
<b>APPLICATION OF FUNDS</b>											
Capital Expenditures											
Foreign Currency Expenditures	7.64	12.96	21.12	16.11	90.86	132.44	132.70	137.52	127.17	65.98	744.50
Annual Escalation 6%	.23	1.18	3.32	3.64	27.21	50.07	61.13	75.43	81.47	48.79	352.47
Interest During Const. 8%	.00	.00	.00	.00	6.70	21.84	39.09	59.26	58.82	47.27	232.98
<b>Sub-total</b>	<b>7.87</b>	<b>14.14</b>	<b>24.44</b>	<b>19.75</b>	<b>124.77</b>	<b>204.35</b>	<b>232.92</b>	<b>272.21</b>	<b>267.46</b>	<b>162.04</b>	<b>1,329.95</b>
Yuan Expenditures	16.68	108.26	192.57	60.48	72.12	124.43	123.60	103.52	29.94	7.33	838.93
Annual Escalation 6%	.49	9.89	30.19	13.69	21.65	46.97	56.88	56.68	19.23	5.42	261.09
Interest During Const. 3.6%	.00	.00	3.36	6.15	9.75	16.27	23.35	29.96	32.81	34.45	156.10
<b>Sub-total</b>	<b>17.17</b>	<b>118.15</b>	<b>226.12</b>	<b>80.32</b>	<b>103.52</b>	<b>187.67</b>	<b>203.83</b>	<b>190.16</b>	<b>81.98</b>	<b>47.20</b>	<b>1,256.12</b>
<b>Total Project Cost</b>	<b>25.04</b>	<b>132.29</b>	<b>250.56</b>	<b>100.07</b>	<b>228.29</b>	<b>392.02</b>	<b>436.76</b>	<b>462.37</b>	<b>349.44</b>	<b>209.24</b>	<b>2,586.08</b>
Cash Short/Over Cumulative											
Loan Foreign Currency	78.43	70.72	50.91	34.27	( 90.50)	( 294.85)	( 527.78)	( 799.98)	( 794.04)	( 638.12)	
Loan Yuan Currency	237.98	129.41	( 96.71)	( 177.03)	( 280.55)	( 468.22)	( 672.05)	( 862.21)	( 944.19)	( 991.39)	

GENE YAN JOINT VENTURE CO. SOURCE AND APPLICATION OF FUNDS : IN MILLIONS OF YUAN

CASE B.105

SOURCE OF FUNDS	1	2	3	4	5	6	7	8	9	10	Total
Electricity Sales	.00	.00	.00	.00	.00	.00	.00	.00	273.40	317.96	591.36
Chinese Equity	237.52										237.52
Interest Earned 8%	17.63	9.59	.00	.00	.00	.00	.00	.00	.00	.00	27.21
Foreign Equity	79.17										79.17
Interest Earned 10%	7.13	6.43	4.63	3.12	.00	.00	.00	.00	.00	.00	21.30
Borrowing Yuan	.00	.00	96.71	80.32	103.52	187.67	203.83	190.16	81.98	47.20	991.39
Borrowing Foreign Currency	.00	.00	.00	.00	93.85	215.67	254.23	306.16	31.86	.00	901.77
<b>Total Source of Funds</b>	<b>341.45</b>	<b>16.02</b>	<b>101.33</b>	<b>83.44</b>	<b>197.37</b>	<b>403.34</b>	<b>458.07</b>	<b>496.32</b>	<b>387.24</b>	<b>365.16</b>	<b>2,849.73</b>
<b>APPLICATION OF FUNDS</b>											
Capital Expenditures											
Foreign Currency Expenditures	7.64	12.96	21.12	16.11	90.86	132.44	132.70	137.52	127.17	65.98	744.50
Annual Escalation 6%	.23	1.18	3.32	3.64	27.21	50.07	61.13	75.43	81.47	48.79	352.47
Interest During Const. 12%	.00	.00	.00	.00	10.06	33.16	60.40	93.21	96.62	83.83	377.28
<b>Sub-total</b>	<b>7.87</b>	<b>14.14</b>	<b>24.44</b>	<b>19.75</b>	<b>128.13</b>	<b>215.67</b>	<b>254.23</b>	<b>306.16</b>	<b>305.26</b>	<b>198.60</b>	<b>1,474.25</b>
Yuan Expenditures	16.68	108.26	192.57	60.48	72.12	124.43	123.60	103.52	29.94	7.33	838.93
Annual Escalation 6%	.49	9.89	30.19	13.69	21.65	46.97	56.88	56.68	19.23	5.42	261.89
Interest During Const. 3.6%	.00	.00	3.36	6.15	9.75	16.27	23.35	29.96	32.81	34.45	156.10
<b>Sub-total</b>	<b>17.17</b>	<b>118.15</b>	<b>226.12</b>	<b>80.32</b>	<b>103.52</b>	<b>187.67</b>	<b>203.83</b>	<b>190.16</b>	<b>81.98</b>	<b>47.20</b>	<b>1,256.12</b>
<b>Total Project Cost</b>	<b>25.04</b>	<b>132.29</b>	<b>250.56</b>	<b>100.07</b>	<b>231.64</b>	<b>403.34</b>	<b>458.07</b>	<b>496.32</b>	<b>387.24</b>	<b>245.80</b>	<b>2,730.37</b>
Cash Short/Over Cumulative											
Loan Foreign Currency	78.43	70.72	50.91	34.27	( 93.85)	( 309.53)	( 563.76)	( 869.91)	( 901.77)	( 782.41)	
Loan Yuan Currency	237.98	129.41	( 96.71)	( 177.03)	( 280.55)	( 468.22)	( 672.05)	( 862.21)	( 944.19)	( 991.39)	



GENE YAN JOINT VENTURE CO. SOURCE AND APPLICATION OF FUNDS : IN MILLIONS OF YUAN

CASE B.106

SOURCE OF FUNDS	1	2	3	4	5	6	7	8	9	10	Total
Electricity Sales	.00	.00	.00	.00	.00	.00	.00	.00	273.40	317.96	591.36
Chinese Equity	237.52										237.52
Interest Earned 8%	17.63	9.59	.00	.00	.00	.00	.00	.00	.00	.00	27.21
Foreign Equity	79.17										79.17
Interest Earned 10%	7.13	6.43	4.63	3.12	.00	.00	.00	.00	.00	.00	21.30
Borrowing Yuan	.00	.00	100.81	88.17	116.39	209.54	236.11	233.10	131.83	103.05	1,219.00
Borrowing Foreign Currency	.00	.00	.00	.00	92.18	209.98	243.43	288.80	12.20	.00	846.59
<b>Total Source of Funds</b>	<b>341.45</b>	<b>16.02</b>	<b>105.44</b>	<b>91.28</b>	<b>208.57</b>	<b>419.52</b>	<b>479.54</b>	<b>521.90</b>	<b>417.44</b>	<b>421.01</b>	<b>3,022.16</b>
<b>APPLICATION OF FUNDS</b>											
Capital Expenditures											
Foreign Currency Expenditures	7.64	12.96	21.12	16.11	90.86	132.44	132.70	137.52	127.17	65.98	744.50
Annual Escalation 6%	.23	1.18	3.32	3.64	27.21	50.07	61.13	75.43	81.47	48.79	352.47
Interest During Const. 10%	.00	.00	.00	.00	8.38	27.47	49.60	75.85	76.96	64.34	302.60
<b>Sub-total</b>	<b>7.87</b>	<b>14.14</b>	<b>24.44</b>	<b>19.75</b>	<b>126.45</b>	<b>209.98</b>	<b>243.43</b>	<b>288.80</b>	<b>285.60</b>	<b>179.11</b>	<b>1,399.57</b>
Yuan Expenditures	16.68	108.26	192.57	60.48	72.12	124.43	123.60	103.52	29.94	7.33	838.93
Annual Escalation 6%	.49	9.89	30.19	13.69	21.65	46.97	56.88	56.68	19.23	5.42	261.09
Interest During Const. 8%	.00	.00	7.47	14.00	22.62	38.14	55.63	72.90	82.66	90.30	383.72
<b>Sub-total</b>	<b>17.17</b>	<b>118.15</b>	<b>230.23</b>	<b>88.17</b>	<b>116.39</b>	<b>209.54</b>	<b>236.11</b>	<b>233.10</b>	<b>131.83</b>	<b>103.05</b>	<b>1,483.74</b>
<b>Total Project Cost</b>	<b>25.04</b>	<b>132.29</b>	<b>254.67</b>	<b>107.92</b>	<b>242.84</b>	<b>419.52</b>	<b>479.54</b>	<b>521.90</b>	<b>417.44</b>	<b>282.16</b>	<b>2,883.31</b>
Cash Short/Over Cumulative											
Loan Foreign Currency	78.43	70.72	50.91	34.27	( 92.18)	( 302.16)	( 545.58)	( 834.39)	( 846.59)	( 707.74)	
Loan Yuan Currency	237.98	129.41	( 100.81)	( 188.98)	( 305.37)	( 514.91)	( 751.03)	( 984.12)	( 1,115.96)	( 1,219.00)	

GENE YAN JOINT VENTURE CO. SOURCE AND APPLICATION OF FUNDS : IN MILLIONS OF YUAN

CASE 0.107

SOURCE OF FUNDS	1	2	3	4	5	6	7	8	9	10	Total
Electricity Sales	.00	.00	.00	.00	.00	.00	.00	.00	273.40	317.96	591.36
Chinese Equity	273.13										273.13
Interest Earned 8%	20.27	11.02	.00	.00	.00	.00	.00	.00	.00	.00	31.29
Foreign Equity	91.04										91.04
Interest Earned 10%	8.20	7.39	5.32	3.58	.00	.00	.00	.00	.00	.00	24.50
Borrowing Yuan	.00	.00	111.22	92.36	119.04	215.82	234.41	218.68	94.28	54.28	1,140.10
Borrowing Foreign Currency	.00	.00	.00	.00	125.12	262.50	303.07	357.57	87.14	.00	1,135.39
<b>Total Source of Funds</b>	<b>392.64</b>	<b>18.42</b>	<b>116.54</b>	<b>95.95</b>	<b>244.16</b>	<b>478.32</b>	<b>537.47</b>	<b>576.26</b>	<b>454.82</b>	<b>372.24</b>	<b>3,286.81</b>
<b>APPLICATION OF FUNDS</b>											
Capital Expenditures											
Foreign Currency Expenditures	8.78	14.90	24.29	18.52	104.49	152.30	152.61	158.15	146.25	75.87	856.16
Annual Escalation 6%	.27	1.36	3.81	4.19	31.29	57.58	70.29	86.75	93.69	56.11	405.34
Interest During Const. 10%	.00	.00	.00	.00	9.64	31.59	57.04	87.23	92.61	83.27	361.37
<b>Sub-total</b>	<b>9.05</b>	<b>16.26</b>	<b>28.10</b>	<b>22.71</b>	<b>145.42</b>	<b>241.47</b>	<b>279.94</b>	<b>332.13</b>	<b>332.55</b>	<b>215.25</b>	<b>1,622.87</b>
Yuan Expenditures	19.18	124.49	221.45	69.55	82.93	143.09	142.14	119.04	34.44	8.42	964.73
Annual Escalation 6%	.56	11.38	34.72	15.74	24.90	54.02	65.41	65.19	22.11	6.24	300.27
Interest During Const. 3.6%	.00	.00	3.86	7.07	11.21	18.71	26.86	34.45	37.73	29.62	179.52
<b>Sub-total</b>	<b>19.74</b>	<b>135.87</b>	<b>260.03</b>	<b>92.36</b>	<b>119.04</b>	<b>215.82</b>	<b>234.41</b>	<b>218.68</b>	<b>94.28</b>	<b>54.28</b>	<b>1,444.52</b>
<b>Total Project Cost</b>	<b>28.79</b>	<b>152.13</b>	<b>288.13</b>	<b>115.07</b>	<b>264.46</b>	<b>457.29</b>	<b>514.34</b>	<b>550.82</b>	<b>426.83</b>	<b>269.53</b>	<b>3,067.39</b>
Cash Short/Over Cumulative											
Loan Foreign Currency	90.19	81.32	58.54	39.42	( 106.00)	( 347.47)	( 627.40)	( 959.53)	( 1,018.68)	( 915.97)	
Loan Yuan Currency	273.66	148.81	( 111.22)	( 203.58)	( 322.63)	( 538.45)	( 772.85)	( 991.54)	( 1,085.82)	( 1,140.10)	

GENE VAN JOINT VENTURE CO. SOURCE AND APPLICATION OF FUNDS : IN MILLIONS OF YUAN

CASE C1.01

SOURCE OF FUNDS	1	2	3	4	5	6	7	8	Total
Electricity Sales	.00	.00	.00	.00	.00	.00	240.90	281.55	522.45
Chinese Equity	237.52								237.52
Interest Earned 8%	11.00	.00	.00	.00	.00	.00	.00	.00	11.00
Foreign Equity	79.17								79.17
Interest Earned 10%	6.51	3.73	.00	.00	.00	.00	.00	.00	10.24
Borrowing Yuan	.00	81.57	118.76	190.82	185.03	199.86	70.54	49.97	896.56
Borrowing Foreign Currency	.00	.00	58.92	157.41	242.11	271.21	44.80	.00	774.44
<b>Total Source of Funds</b>	<b>334.21</b>	<b>85.30</b>	<b>177.68</b>	<b>348.23</b>	<b>427.14</b>	<b>471.07</b>	<b>356.24</b>	<b>331.52</b>	<b>2,531.38</b>
<b>APPLICATION OF FUNDS</b>									
<b>Capital Expenditures</b>									
Foreign Currency Expenditures	13.62	31.50	81.70	112.28	154.13	148.64	147.36	55.27	744.50
Annual Escalation 6%	.41	2.89	12.85	25.46	46.30	56.24	67.94	30.32	242.41
Interest During Const. 10%	.00	.00	5.36	19.67	41.68	66.33	70.40	57.85	261.28
<b>Sub-total</b>	<b>14.03</b>	<b>34.39</b>	<b>99.91</b>	<b>157.41</b>	<b>242.11</b>	<b>271.21</b>	<b>285.70</b>	<b>143.44</b>	<b>1,248.19</b>
<b>Yuan Expenditures</b>									
Annual Escalation 6%	2.91	19.11	15.20	32.76	38.11	47.46	12.98	6.67	175.20
Interest During Const. 3.6%	.00	2.83	6.96	13.59	20.02	26.97	29.42	31.15	130.95
<b>Sub-total</b>	<b>99.99</b>	<b>230.10</b>	<b>118.76</b>	<b>190.82</b>	<b>185.03</b>	<b>199.86</b>	<b>70.54</b>	<b>49.97</b>	<b>1,145.08</b>
<b>Total Project Cost</b>	<b>114.02</b>	<b>264.49</b>	<b>218.67</b>	<b>348.23</b>	<b>427.14</b>	<b>471.07</b>	<b>356.24</b>	<b>193.41</b>	<b>2,393.27</b>
<b>Cash Short/Over Cumulative</b>									
Loan Foreign Currency	71.65	40.99 (	58.92) (	216.32) (	458.43) (	729.64) (	774.44) (	636.33)	
Loan Yuan Currency	148.53 (	81.57) (	200.33) (	391.16) (	576.19) (	776.04) (	846.58) (	896.56)	

**ANNEX C**

**THE LAW OF THE PEOPLE'S REPUBLIC OF CHINA ON  
JOINT VENTURES USING CHINESE AND FOREIGN INVESTMENT**

## THE LAW OF THE PEOPLE'S REPUBLIC OF CHINA ON JOINT VENTURES USING CHINESE AND FOREIGN INVESTMENT

Approved on July 1, 1979 by the Fifth National People's Congress of the People's Republic of China at its Second Session

Article 1 With a view to expanding international economic cooperation and technological exchange, the People's Republic of China permits foreign companies, enterprises, other economic entities or individuals (hereinafter referred to as "foreign participants") to incorporate themselves, within the territory of the People's Republic of China, into joint ventures with Chinese companies, enterprises or other economic entities (hereinafter referred to as "Chinese participants") on the principle of equality and mutual benefit and subject to authorization by the Chinese Government.

Article 2 The Chinese Government protects, by the legislation in force, the resources invested by a foreign participant in a joint venture and the profits due him pursuant to the agreements, contracts and articles of association authorized by the Chinese Government as well as his other lawful rights and interests.

All the activities of a joint venture shall be governed by the laws, decrees and pertinent rules and regulations of the People's Republic of China.

Article 3 A joint venture shall apply to the Foreign Investment Commission of the People's Republic of China for authorization of the agreements and contracts concluded between the parties to the venture and the articles of association of the venture formulated by them, and the commission shall authorize or reject these documents within three months. When authorized, the joint venture shall register with the General Administration for Industry and Commerce of the People's Republic of China and start operations under licence.

Article 4 A joint venture shall take the form of a limited liability company.

In the registered capital of a joint venture, the proportion of the investment contributed by the foreign participant(s) shall in general not be less than 25 per cent.

The profits, risks and losses of a joint venture shall be shared by the parties to the venture in proportion to their contributions to the registered capital.

The transfer of one party's share in the

registered capital shall be effected only with the consent of the other parties to the venture.

Article 5 Each party to a joint venture may contribute cash, capital goods, industrial property rights, etc., as its investment in the venture.

The technology or equipment contributed by any foreign participant as investment shall be truly advanced and appropriate to China's needs. In cases of losses caused by deception through the international provision of outdated equipment or technology, compensation shall be paid for the losses.

The investment contributed by a Chinese participant may include the right to the use of a site provided for the joint venture during the period of its operation. In case such a contribution does not constitute a part of the investment from the Chinese participant, the joint venture shall pay the Chinese Government for its use.

The various contributions referred to in the present article shall be specified in the contracts concerning the joint venture or in its articles of association, and the value of each contribution (excluding that of the site) shall be ascertained by the parties to the venture through joint assessment.

Article 6 A joint venture shall have a board of directors with a composition stipulated in the contracts and the articles of association after consultation between the parties to the venture, and each director shall be appointed or removed by his own side. The board of directors shall have a chairman appointed by the Chinese participant and one or two vice-chairmen appointed by the foreign participant(s). In handling an important problem, the board of directors shall reach decision through consultation by the participants on the principle of equality and mutual benefit.

The board of directors is empowered to discuss and take action on, pursuant to the provisions of the articles of association of the joint venture, all fundamental issues concerning the venture, namely, expansion projects, production and business programmes, the budget, distribution of profits, plans concerning manpower and pay scales, the termination of business, the appointment or hiring of the president, the vice-

president(s), the chief engineer, the treasurer and the auditors as well as their functions and powers and their remuneration, etc.

The president and vice-president(s) (or the general manager and assistant general manager(s) in a factory) shall be chosen from the various parties to the joint venture.

Procedures covering the employment and discharge of the workers and staff members of a joint venture shall be stipulated according to law in the agreement or contract concluded between the parties to the venture.

Article 7 The net profit of a joint venture shall be distributed between the parties to the venture, in proportion to their respective shares in the registered capital, after the payment of a joint venture income tax on its gross profit pursuant to the tax laws of the People's Republic of China and after the deductions therefrom as stipulated in the articles of association of the venture for the reserve funds, the bonus and welfare funds for the workers and staff members and the expansion funds of the venture.

A joint venture equipped with up-to-date technology by world standards may apply for a reduction of or exemption from income tax for the first two to three profit making years.

A foreign participant who reinvests any part of his share of the net profit within Chinese territory may apply for the restitution of a part of the income taxes paid.

Article 8 A joint venture shall open an account with the Bank of China or a bank approved by the Bank of China.

A joint venture shall conduct its foreign exchange transactions in accordance with the Foreign Exchange Regulations of the People's Republic of China.

A joint venture may, in its business operations, obtain funds from foreign banks directly.

The insurances appropriate to a joint venture shall be furnished by Chinese insurance companies.

Article 9 The production and business programmes of a joint venture shall be filed with the authorities concerned and shall be implemented through business contracts.

In its purchase of required raw and semi-processed materials, fuels, auxiliary equipment, etc., a joint venture should give first priority to Chinese sources, but may also acquire them directly from the world market with its own foreign exchange funds.

A joint venture is encouraged to market its products outside China. It may distribute its export products on foreign markets through

direct channels or its associated agencies or China's foreign trade establishments. Its products may also be distributed on the Chinese market.

Wherever necessary, a joint venture may set up affiliated agencies outside China.

Article 10 The net profit which a foreign participant receives as his share after executing his obligations under the pertinent laws and agreements and contracts, the funds he receives at the time when the joint venture terminates or winds up its operations, and his other funds may be remitted abroad through the Bank of China in accordance with the foreign exchange regulations and in the currency or currencies specified in the contracts concerning the joint venture.

A foreign participant shall receive encouragement for depositing in the Bank of China any part of the foreign exchange which he is entitled to remit abroad.

Article 11 The wages, salaries or other legitimate income earned by a foreign worker or staff member of a joint venture, after payment of the personal income tax under the tax laws of the People's Republic of China, may be remitted abroad through the Bank of China in accordance with the foreign exchange regulations.

Article 12 The contract period of a joint venture may be agreed upon between the parties to the venture according to its particular line of business and circumstances. The period may be extended upon expiration through agreement between the parties, subject to authorization by the Foreign Investment Commission of the People's Republic of China. Any application for such extension shall be made six months before the expiration of the contract.

Article 13 In cases of heavy losses, the failure of any party to a joint venture to execute its obligations under the contracts or the articles of association of the venture, force majeure, etc., prior to the expiration of the contract period of a joint venture, may result in termination of the contract before the date of expiration by consultation and agreement between the parties and through authorization by the Foreign Investment Commission of the People's Republic of China and registration with the General Administration for Industry and Commerce. In cases of losses caused by breach of the contract(s) by a party to the venture, the financial responsibility shall be borne by the said party.

Article 14 Disputes arising between the parties to a joint venture which the board of

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## Regulations for the Implementation of the Law of the People's Republic of China on Joint Ventures Using Chinese and Foreign Investment

*Promulgated by the State Council on September 20, 1983*

### Chapter I General Provisions

#### Article 1

The Regulations hereunder are formulated with a view to facilitating the implementation of the Law of the People's Republic of China on Joint Ventures Using Chinese and Foreign Investment (hereinafter referred to as the Law on Chinese-Foreign Joint Ventures).

#### Article 2

Joint ventures using Chinese and foreign investment (hereinafter referred to as joint ventures) established within China's territory in accordance with the Law on Chinese-Foreign Joint Ventures are Chinese legal persons and are subject to the jurisdiction and protection of Chinese law.

#### Article 3

Joint ventures established within China's territory shall be able to promote the development of China's economy and the raising of scientific and technological levels for the benefit of socialist modernization.

Joint ventures permitted are mainly in the following industries:

- (1) Energy development, the building material, chemical and metallurgical industries;
- (2) Machine manufacturing, instrument and meter industries and offshore oil exploitation equipment manufacturing;
- (3) Electronics and computer industries, and communication equipment manufacturing;
- (4) Light, textile, foodstuffs, medicine, medical apparatus and packing industries;
- (5) Agriculture, animal husbandry and fish breeding;
- (6) Tourism and service trades.

#### Article 4

Applicants to establish joint ventures shall lay stress on economic results and shall comply with one or several of the following requirements:

- (1) They shall adopt advanced technical equipment and scientific management which enable the increase of the variety of products, the raising of quality and output, and the saving of energy and materials;

directors fails to settle through consultation may be settled through conciliation or arbitration by an arbitration body of China or one agreed upon by the parties.

Article 15 The present law comes into force on the date of its promulgation. The power of amendment is vested in the National People's Congress.

(2) They shall provide benefits in terms of technical renovation of enterprises and result in less investment, quicker returns and bigger profits.

(3) They shall enable the expanded production of products for export and result in increasing income in foreign currency.

(4) They shall enable the training of technical and managerial personnel.

#### Article 5

Applicants to establish joint ventures shall not be granted approval if the project involves any of the following conditions:

(1) Detriment to China's sovereignty;

(2) Violation of Chinese law;

(3) Nonconformity with the requirements of the development of China's national economy;

(4) Environmental pollution;

(5) Obvious inequity in the agreements, contracts and articles of association signed, impairing the rights and interests of one party.

#### Article 6

Unless otherwise stipulated, the government department in charge of the Chinese participant in a joint venture shall be the department in charge of the joint venture (hereinafter referred to as the department in charge). In case of a joint venture having two or more Chinese participants which are under different departments or districts, the departments concerned shall consult the district to ascertain one department in charge.

Departments in charge are responsible for guidance and assistance and exercising supervision over the joint venture.

#### Article 7

A joint venture has the right to do business independently within the scope of the provisions of Chinese laws, decrees, and the agreement, contract and articles of association of the joint venture. The departments concerned shall provide support and assistance.

## Chapter II Establishment and Registration

#### Article 8

The establishment of a joint venture in China is subject to examination and approval by the Ministry of Foreign Economic Relations and Trade of the People's Republic of China (hereinafter referred to as the Ministry of Foreign Economic Relations and Trade). Certificates of approval are granted by the Ministry of Foreign Economic Relations and Trade.

The Ministry of Foreign Economic Relations and Trade shall entrust the people's governments in the related provinces, autonomous regions, and municipalities directly under the central government or relevant ministries or bureaus under the State Council (hereinafter referred to as the entrusted office) with the power to examine and approve the establishment of joint ventures that comply with the following conditions:

(1) The total amount of investment is within the limit set by the State Council and the source of capital of the Chinese participants has been ascertained;

(2) No additional allocations of raw materials by the state are required and do not affect the national balance of fuel, power, transportation and foreign trade export quotas.

The entrusted office, after approving the establishment of a joint venture, shall report this to the Ministry of Foreign Economic Relations and Trade for the record. A certificate of approval shall be issued by the Ministry of Foreign Economic Relations and Trade. (The Ministry of Foreign Economic Relations and Trade and the entrusted office will hereinafter be referred to as a whole as the examination and approval authority.)

#### Article 9

The following procedures shall be followed for the establishment of a joint venture:

(1) The Chinese participant in a joint venture shall submit to its department in charge a project proposal and a preliminary feasibility study report of the joint venture to be established with foreign participants. The proposal and the preliminary feasibility study report, upon examination and consent by the department in charge, shall be submitted to the examination and approval authority for final approval. The parties to the venture shall then conduct work relevant to the feasibility study, and based on this, negotiate and sign joint venture agreements, contracts and articles of association.

(2) When applying for the establishment of a joint venture, the Chinese participant is responsible for the submission of the following documents to the examination and approval authority:

(a) Application for the establishment of a joint venture;

(b) The feasibility study report jointly prepared by the parties to the venture;

(c) Joint venture agreement, contract and articles of association signed by representatives authorized by the parties to the venture;

(d) List of candidates for chairman, vice-chairman



and directors appointed by the parties to the venture:  
(e) Written opinions of the department in charge and the people's government of the province, autonomous region or municipality directly under the central government where the joint venture is located with regard to the establishment of the joint venture.

The aforesaid documents shall be written in Chinese. Documents (b), (c) and (d) may be written simultaneously in a foreign language agreed upon by the parties to the joint venture. Both versions are equally authentic.

#### Article 10

Upon receipt of the documents stipulated in Article 9 (2), the examination and approval authority shall, within three months, decide whether to approve or disapprove them. Should anything inappropriate be found in any of the aforementioned documents, the examination and approval authority shall demand an amendment to it within a limited time. Without such amendment, no approval shall be granted.

#### Article 11

The applicant shall, within one month after receipt of the certificate of approval, register with the administrative bureau for industry and commerce of the province, autonomous region or municipality directly under the central government in accordance with the provisions of the Procedures of the People's Republic of China for the Registration and Administration of Chinese-Foreign Joint Ventures (hereinafter referred to as registration and administration office). The date on which it is issued its business license is regarded as the date of formal establishment of a joint venture.

#### Article 12

Any foreign investor who intends to establish a joint venture in China but is unable to find a specific co-operator in China may submit a preliminary plan for his joint venture projects and authorize the China International Trust and Investment Corporation (CITIC) or trust and investment corporations of a province, autonomous region or municipality directly under the central government, or relevant government department or non-official organization, to introduce potential Chinese co-operators.

#### Article 13

The "joint venture agreement" mentioned in this chapter refers to a document agreed upon by the parties to the joint venture on some main points and principles governing the establishment of a joint venture.

"Joint venture contract" refers to a document agreed

upon and concluded by the parties to the joint venture on their rights and obligations.

"Article of association" refers to a document agreed upon by the parties to the joint venture indicating the purpose, organizational principles and method of management of a joint venture in compliance with the principles of the joint venture contract.

If the joint venture agreement conflicts with the contract, the contract shall prevail.

If the parties to the joint venture agree to sign only a contract and articles of association, the agreement can be omitted.

#### Article 14

The joint venture contract shall include the following main items:

(1) The names, the countries of registration, the legal address of parties to the joint venture, and the names, professions and nationalities of the legal representatives thereof;

(2) Name of the joint venture, its legal address, purpose and the scope and scale of business;

(3) Total amount of investment and registered capital of the joint venture, investment contributed by the parties to the joint venture, each party's investment proportion, forms of investment, the time limit for contributing investment, stipulations concerning incomplete contributions, and assignment of investment;

(4) The ratio of profit distribution and losses to be borne by each party;

(5) The composition of the board of directors, the distribution of the number of directors, and the responsibilities, powers and means of employment of the general manager, deputy general manager and high-ranking management personnel;

(6) The main production equipment and technology to be adopted and their source of supply;

(7) The ways and means of purchasing raw materials and selling finished products, and the ratio of products sold within Chinese territory and outside China;

(8) Arrangements for income and expenditure of foreign currency;

(9) Principles governing the handling of finance, accounting and auditing;

(10) Stipulations concerning labor management, wages, welfare, and labor insurance;

(11) The duration of the joint venture, its dissolution and the procedure for liquidation;

(12) The liabilities for breach of contract;

(13) Ways and Procedures for settling disputes

between the parties to the joint venture;

(14) The language used for the contract and the conditions for putting the contract into force.

The annex to the contract of a joint venture shall be equally authentic with the contract itself.

#### Article 15

The formation of a joint venture contract, its validity, interpretation, execution and the settlement of disputes under it shall be governed by the Chinese law.

#### Article 16

Articles of association shall include the following main items:

- (1) The name of the joint venture and its legal address;
- (2) The purpose, business scope and duration of the joint venture;
- (3) The names, countries of registration and legal addresses of parties to the joint venture, and the names, professions and nationalities of the legal representatives thereof;
- (4) The total amount of investment, registered capital of the joint venture, each party's investment proportion, stipulations concerning the assignment of investment, the ratio of profit distribution and losses to be borne by parties to the joint venture;
- (5) The composition of the board of directors, its responsibilities, powers and rules of procedure, the term of office of the directors, and the responsibilities of its chairman and vice-chairman;
- (6) The setting up of management organizations, rules for handling routine affairs, the responsibilities of the general manager, deputy general manager and other high-ranking management personnel, and the method of their appointment and dismissal;
- (7) Principles governing finance, accounting and auditing;
- (8) Dissolution and liquidation;
- (9) Procedures for amendment of the articles of association.

#### Article 17

The agreement, contract and articles of association shall come into force after being approved by the examination and approval authority. The same applies in the event of amendments.

#### Article 18

The examination and approval authority and the registration and administration office are responsible for supervising and inspecting the execution of the joint venture contracts and articles of association.

### Chapter III Form of Organization and Registered Capital

#### Article 19

A joint venture is a limited liability company.

Each party to the joint venture is liable to the joint venture within the limits of the capital subscribed by it.

#### Article 20

The total amount of investment (including loans) of a joint venture refers to the sum of capital construction funds and the circulating funds needed for the joint venture's production scale as stipulated in the contract and the articles of association of the joint venture.

#### Article 21

The registered capital shall generally be presented in total amount of investment registered at the registration and administration office for the establishment of the joint venture. It should be the total amount of investment subscribed by parties to the joint venture.

The registered capital shall generally be presented in Renminbi, or may be in a foreign currency agreed upon by the parties to the joint venture.

#### Article 22

A joint venture shall not reduce its registered capital during the term of the joint venture.

#### Article 23

If one party to the joint venture intends to assign all or part of his investment subscribed to a third party, consent shall be obtained from the other party to the joint venture, and approval from the examination and approval authority is required.

When one party assigns all or part of his investment to a third party, the other party has pre-emptive right.

When one party assigns his investment subscribed to a third party, the conditions given shall not be more favourable than those given to the other party to the joint venture.

No assignment shall be made effective should there be any violation of the above stipulations.

#### Article 24

Any increase, assignment or other disposal of the registered capital of a joint venture shall be approved by a meeting of the board of directors and submitted to the original examination and approval authority.

for approval. Registration procedures for changes shall be dealt with at the original registration and administration office.

#### Chapter IV. Ways of Contributing Investment

##### Article 25

Each participant to a joint venture may contribute cash or buildings, premises, equipment or other materials, industrial property, know-how, right to the use of a site as investment, the value of which shall be ascertained. If the investment is in the form of buildings, premises, equipment or other materials, industrial property or know-how, the prices shall be ascertained through consultation by the parties to the joint venture on the basis of fairness and reasonableness, or evaluated by the third party agreed upon by parties to the joint venture.

##### Article 26

The foreign currency contributed by the foreign participant shall be converted into Renminbi according to the exchange rate announced by the State General Administration of Foreign Exchange Control of the People's Republic of China thereafter referred to as the State General Administration of Foreign Exchange Control on the day of its submission or be cross exchanged into a predetermined foreign currency.

Should the cash Renminbi contributed by the Chinese participant be converted into foreign currency, it shall be converted according to the exchange rate announced by the State Administration of Foreign Exchange Control on the day of the submission of the funds.

##### Article 27

The machinery equipment and other materials contributed as investment by the foreign participant shall meet the following conditions:

- (1) They are indispensable to the production of the joint venture;
- (2) China is unable to manufacture them, or manufactures them only at too high a price, or their technical performance and time of availability cannot meet the demand;
- (3) The price fixed shall not be higher than the current international market price for similar equipment or materials.

##### Article 28

The industrial property or know-how contributed by the foreign participant as investment shall meet one of the following conditions:

- (1) Capable of manufacturing new products urgently

- needed in China or products suitable for export;
- (2) Capable of improving markedly the performance quality of existing products and raising productivity;
- (3) Capable of notable savings in raw materials, fuel or power.

##### Article 29

Foreign participants who contribute industrial property or know-how as investment shall present relevant documentation on the industrial property or know-how, including photocopies of the patent certificates or trademark registration certificates, statements of validity, their technical characteristics, practical value, the basis for calculating the price and the price agreement signed with the Chinese participants. All these shall serve as an annex to the contract.

##### Article 30

The machinery, equipment or other materials, industrial property or know-how contributed by foreign participants as investment shall be examined and approved by the department in charge of Chinese participant and then submitted to the examination and approval authority for approval.

##### Article 31

The parties to the joint venture shall pay in full the investment subscribed according to the time limit stipulated in the contract. Delay in payment or partial delay in payment will be subject to a payment of interest on arrears or a compensation for the loss as defined in the contract.

##### Article 32

After the investment is paid by the parties to the joint venture, a Chinese registered accountant shall verify it and provide a certificate of verification, in accordance with which the joint venture shall issue an investment certificate, which includes the following items: name of the joint venture; date, month and year of the establishment of the joint venture; names of the participants and the investment contributed; date, month and year of the contribution of the investment; and date, month and year of issuance of the investment certificate.

#### Chapter V Board of Directors and Management Office

##### Article 33

The highest authority of the joint venture shall be its board of directors. It shall decide all major issues concerning the joint venture.

##### Article 34

The board of directors shall consist of no less than three members. The distribution of the number of

directors shall be ascertained through consultation by the parties to the joint venture with reference to the proportion of investment contributed.

The directors shall be appointed by the parties to the joint venture. The chairman of the board shall be appointed by the Chinese participant and its vice-chairman by the foreign participant.

The term of office for the directors is four years. Their term of office may be renewed with the consent of the parties to the joint venture.

#### Article 35

The board of directors shall convene at least one meeting every year. The meeting shall be called and presided over by the chairman of the board. Should the chairman be unable to call the meeting, he shall authorize the vice-chairman or other director to call and preside over the meeting. The chairman may convene an interim meeting based on a proposal made by more than one-third of the directors.

A board meeting requires a quorum of over two-thirds of the directors. Should the director be unable to attend, he shall present a proxy authorizing someone else to represent him and vote for him.

A board meeting shall generally be held at the location of the joint venture's legal address.

#### Article 36

Decisions on the following items shall be made only after being unanimously agreed upon by the directors present at the board meeting:

- (1) Amendment of the articles of association of the joint venture;
- (2) Termination and dissolution of the joint venture;
- (3) Increase or assignment of the registered capital of the joint venture;
- (4) Merger of the joint venture with other economic organizations.

Decision on other items shall be made according to the rules of procedure stipulated in the articles of association.

#### Article 37

The chairman of the board is the legal representative of the joint venture. Should the chairman be unable to exercise his responsibilities, he shall authorize the vice-chairman of the board or other director to represent the joint venture.

#### Article 38

A joint venture shall establish a management office which shall be responsible for daily management.

The management office shall have a general manager and several deputy general managers who shall assist the general manager in his work.

#### Article 39

The general manager shall carry out the decisions of the board meeting and organize and conduct the daily management of the joint venture. The general manager shall, within the scope empowered him by the board, represent the joint venture in outside dealings, have the right to appoint and dismiss his subordinates, and exercise other responsibilities and rights as authorized by the board within the joint venture.

#### Article 40

The general manager and deputy general managers shall be engaged by the board of directors of the joint venture. These positions may be held either by Chinese citizens or foreign citizens.

At the invitation of the board of directors, the chairman, vice-chairman or other directors of the board may concurrently be the general manager, deputy general managers, or other high-ranking management personnel of the joint venture.

In handling major issues, the general manager shall consult with the deputy general managers.

The general manager or deputy general managers shall not hold posts concurrently as general manager or deputy general managers of other economic organizations. They shall not have any connections with other economic organizations in commercial competition with their own joint venture.

#### Article 41

In case of graft or serious dereliction of duty on the part of the general manager, deputy general managers or other high-ranking management personnel, the board of directors shall have the power to dismiss them at any time.

#### Article 42

Establishment of branch offices (including sales offices) outside of China or in Xianggang or Aomen is subject to approval by the Ministry of Foreign Economic Relations and Trade.

### Chapter VI Acquisition of Technology

#### Article 43

The acquisition of technology mentioned in this chapter refers to the necessary technology obtained by the joint venture by means of technology transfer from a third party or participants.

**Article 44**

The technology acquired by the joint venture shall be appropriate and advanced and enable the venture's products to display conspicuous social economic results domestically or to be competitive on the international market.

**Article 45**

The right of the joint venture to do business independently shall be maintained when making technology transfer agreements, and relevant documentation shall be provided by the technology exporting party in accordance with the provisions of Article 29 of the regulations.

**Article 46**

The technology transfer agreements signed by a joint venture shall be examined and agreed to by the department in charge of the joint venture and then submitted for approval to the examination and approval authority.

Technology transfer agreements shall comply with the following stipulations:

(1) Expenses for the use of technology shall be fair and reasonable. Payments are generally made in royalties, and the royalty rate shall not be higher than the standard international rate, which shall be calculated on the basis of net sales of the products turned out with the relevant technology or other reasonable means agreed upon by both parties.

(2) Unless otherwise agreed upon by both parties, the technology exporting party shall not put any restrictions on the quantity, price or region of sale of the products that are to be exported by the technology importing party.

(3) The term for a technology transfer agreement is generally no longer than ten years.

(4) After the expiration of a technology transfer agreement, the technology importing party shall have the right to use the technology continuously.

(5) Conditions for mutual exchange of information on the improvement of technology by both parties of the technology transfer agreement shall be reciprocal.

(6) The technology importing party shall have the right to buy the equipment, parts and raw materials needed from sources they deem suitable.

(7) No irrational restrictive clauses prohibited by Chinese law and regulations shall be included.

**Chapter VII Right to the Use of Site and its Fee**

**Article 47**

Joint ventures shall practice economy in the use of

land for their premises. Any joint venture requiring the use of a site shall file an application with local departments of the municipal (county) government in charge of land and obtain the right to use a site only after securing approval and signing a contract. The acreage, location, purpose and contract period and fee for the right to use a site (hereinafter referred to as site use fee), rights and obligations of the parties to a joint venture and fines for breach of contract should be stipulated in explicit terms in the contract.

**Article 48**

If the Chinese participant already has the right to the use of site for the joint venture, the Chinese participant may use it as part of its investment. The monetary equivalent of this investment should be the same as the site use fee otherwise paid for acquiring such site.

**Article 49**

The standard for site use fee shall be set by the people's governments of the province, autonomous region or municipality directly under the central government where the joint venture is located according to the purpose of use, geographic and environmental conditions, expenses for requisition, demolishing and resettlement and the joint venture's requirements with regard to infrastructure, and filed with the Ministry of Foreign Economic Relations and Trade and the state department in charge of land.

**Article 50**

Joint ventures engaged in agriculture and animal husbandry may, with consent of the people's government of the local province, autonomous region or municipality directly under the central government, pay a percentage of the joint venture's operating revenue as site use fees to the local department in charge of land.

Projects of a development nature in economically undeveloped areas shall receive special preferential treatment in respect of site use fees with consent of the local people's government.

**Article 51**

The rates shall not be subject to adjustment in the first five years beginning from the day the land is used. After that the interval of adjustment shall not be less than three years according to the development and changes in geographic and environmental conditions.

Site use fee as part of the investment by the Chinese participant shall not be subject to adjustment during the contract period.

**Article 52**

The fee for the right to the use of site obtained by a joint venture according to Article 47 of the regulations shall be paid annually from the day to use the land stipulated in the contract. For the first calendar year, the venture will pay a half-year fee if it has used the land for over six months; if less than six months, the site use fee shall be exempt. During the contract period, if the rates of site use fees are adjusted, the joint venture shall pay it according to the new rates from the year of adjustment.

**Article 53**

Joint ventures that have permission to use a site shall only have the right to the use of it but no ownership. Assignment of the right to use land is forbidden.

**Chapter VIII Planning, Purchasing and Selling**

**Article 54**

A joint venture shall work out a capital construction plan (including construction ability, building materials, water, power and gas supply) according to the approved feasibility study report, and the plan shall be included in the capital construction plan of the department in charge of the joint venture and shall be given priority in arranging supplies and be ensured to be carried out.

**Article 55**

Funds earmarked for capital construction of a joint venture shall be put under unified management of the bank where the venture has opened an account.

**Article 56**

A joint venture shall work out a production and operating plan in accordance with the scope of operation and scale of production stipulated in the contract. The plan shall be carried out with the approval of the board of directors and filed with the department in charge of the joint venture.

Departments in charge of the joint ventures and planning and administration departments at all levels shall not issue directive on production and operating plans to joint ventures.

**Article 57**

In its purchase of required machinery, equipment, raw materials, fuel, parts, means of transport and things for office use, etc. (hereinafter referred to as materials), a joint venture has the right to decide whether it buys them in China or from abroad. However, where conditions are the same it should give first priority to purchase in China.

**Article 58**

Joint ventures can purchase materials in China through the following channels:

- (1) Those under planned distribution shall be brought into the supply plan of departments in charge of joint ventures and supplied by materials and commercial departments or production enterprises according to contract;
- (2) Those handled by materials and commercial departments shall be purchased from these departments;
- (3) Those freely circulating on the market shall be purchased from production enterprises or their sale or commission agencies;
- (4) Those export items handled by foreign trade corporations shall be purchased from the appropriate foreign trade corporations.

**Article 59**

The amount of materials needed for office and daily life use for joint ventures purchased in China is not subject to restriction.

**Article 60**

The Chinese Government encourages joint ventures to sell their products on the international market.

**Article 61**

Products of joint ventures that China urgently needs or imports can be mainly sold on the Chinese market.

**Article 62**

A joint venture has the right to export its products itself or entrust sale agencies of the foreign participant or Chinese foreign trade corporations with sales on a commission or distribution.

**Article 63**

Within the scope of operation stipulated in the contract, a joint venture can import machinery, equipment, parts, raw materials and fuel needed for its production. A joint venture shall make a plan every year for items on which import licenses are required by the stipulation of the state, and apply for them every six months. For machines, equipment and other objects a foreign participant has contributed as part of his investment, the foreign participant can apply directly for import licenses with documents approved by examination and approval authority. For materials to be imported exceeding the stipulated scope of the contracts, separate application for import licenses according to state regulations is required.

A joint venture has the right to export its products by

itself. For those export licenses are required by the stipulation of the State, the joint venture shall make an export plan every business year and apply for them every six months.

#### Article 64

A joint venture may sell its products on the Chinese market in the following ways:

(1) For those items under planned distribution, departments in charge of joint ventures will bring them into the distribution plan of the materials administration departments, which sell them to designated users according to plan.

(2) For those items handled by materials and commercial departments, the materials and commercial departments will sign purchase contracts with the joint ventures.

(3) For excess portions other than those purchased by plan of the above two categories, and materials that do not belong to these two categories, the joint venture has the right to sell by itself or entrust sales to the organizations concerned.

(4) For products of a joint venture that Chinese foreign trade companies need to import, the joint venture may sell to Chinese foreign trade companies, and foreign currency shall be paid.

#### Article 65

Materials purchased and services needed in the China by joint ventures shall be priced according to the following stipulations:

(1) The six raw materials — gold, silver, platinum, petroleum, coal and timber — that are used directly in production for export shall be priced according to the international market prices provided by the State General Administration of Foreign Exchange Control or foreign trade departments, and paid in foreign currency or Renminbi.

(2) When purchasing export or import commodities handled by Chinese foreign trade companies, the suppliers and buyers shall negotiate the price, with reference to the prices on the international market, and foreign currency shall be paid.

(3) The prices for purchasing coal used as fuel and oil for motor vehicles, which are needed for manufacturing products to be sold domestically, as well as materials other than those listed in (1) and (2) of this article, and the fees charged for water, electricity, gas, heat, goods transportation, service, engineering, consultation service and advertisement etc, provided to joint venture, shall be treated equally with state-owned enterprises and paid in Renminbi.

#### Article 66

Prices of products of a joint venture for sale on the

Chinese domestic market, except those items approved by the price control department for valuation with reference to the international market, shall correspond with state-set prices, be rated according to quality and paid for in Renminbi. Prices fixed by a joint venture for its products shall be filed with departments in charge of joint ventures and of prices control.

Prices of export products of a joint venture will be fixed by the joint venture itself and shall be filed with departments in charge of joint ventures and of price control.

#### Article 67

A joint venture and other Chinese economic organizations shall, in their economic exchanges, undertake economic responsibilities and settle disputes over contracts in accordance with relevant law and the contract concluded between both parties.

#### Article 68

A joint venture shall fill statistical forms on production, supply and marketing in accordance with relevant regulations, and file them with departments in charge, statistics departments and other departments concerned.

### Chapter IX Taxes

#### Article 69

Joint ventures shall pay taxes according to the stipulations of relevant laws of the People's Republic of China.

#### Article 70

Staff members and workers employed by joint ventures shall pay individual income tax according to the Individual Income Tax Law of the People's Republic of China.

#### Article 71

Joint ventures shall be exempt from customs duty and industrial and commercial consolidated tax for the following imported materials:

(1) Machinery, equipment, parts and other materials (materials here and hereinafter mean required materials for the joint venture's construction on the factory site and for installation and reinforcement of machines,) which are part of the foreign participant's share of investment according to the provisions of contract.

(2) Machinery, equipment, parts and other materials imported with funds which are part of the joint venture's total investment.

(3) Machinery, equipment, parts and other materials imported by the joint venture with the additional capital under the approval of examination and approval authority on which China cannot guarantee production and supply.

(4) Raw materials, auxiliary materials, components, parts and packing materials imported by the joint venture for production of export goods.

Taxes shall be pursued and payable according to regulations when the above-mentioned duty-free materials are approved for sale inside China or switched to the production of items to be sold on the Chinese domestic market.

#### Article 72

Except for those export items restricted by the state, products of a joint venture for export will be exempt from industrial and commercial consolidated tax, subject to the approval by the Ministry of Finance of the People's Republic of China.

A joint venture can apply for reduction or exemption of industrial and commercial consolidated tax for a certain period of time for products that are sold on the domestic market when it has difficulty to pay such tax in its initial period of production.

### Chapter X Foreign Exchange Control

#### Article 73

All matters concerning foreign exchange for joint ventures shall be handled according to the Interim Regulations on Foreign Exchange Control of the People's Republic of China and relevant regulations.

#### Article 74

With the business license issued by the General Administration for Industry and Commerce of the People's Republic of China, a joint venture can open foreign exchange deposit accounts and Renminbi deposit accounts with the Bank of China, or some other banks designated. The bank handling the account of the joint venture exercises supervision of receipts and expenditures.

All foreign exchange income of a joint venture must be deposited in the foreign exchange deposit account in the bank where an account has been opened; all payments by the joint venture in foreign exchange are to be made from its foreign exchange deposit account. The deposit interest rate shall be set as announced by the Bank of China.

#### Article 75

A joint venture shall in general keep balance between

its foreign exchange income and expenses. When a joint venture whose products are mainly sold on domestic market under its approved feasibility study report and contract has an unbalance of foreign exchange income and expenses, the unbalance shall be solved by the people's government of a relevant province, an autonomous region or a municipality directly under the central government or the department in charge under the State Council from their own foreign exchange reserves, if unable to be solved, it shall be solved through inclusion into plan after the examination and approval by the Ministry of Foreign Economic Relations and Trade together with the State Planning Commission of the People's Republic of China.

#### Article 76

A joint venture shall get permission from the General Administration of Foreign Exchange Control or one of its branches to open a foreign exchange deposit account with an overseas bank or one in Xianggang or Aomen, and report to the State General Administration of Foreign Exchange Control or one of its branches its foreign exchange receipts and expenditures, and provide account sheets.

#### Article 77

Sub-divisions set up by a joint venture in foreign countries or in Xianggang or Aomen shall open an account with the Bank of China wherever there is a branch. The sub-division shall submit its annual statement of assets and liabilities and annual profit report to the State General Administration of Foreign Exchange Control or one of its branches through the joint venture.

#### Article 78

A joint venture can apply to the Bank of China for foreign loans and Renminbi loans according to business needs and following the Provisional Regulations for Providing Loans to Joint Ventures Using Chinese and Foreign Investment by the Bank of China. Interest rates on loans to joint ventures are as announced by the Bank of China. A joint venture can also borrow foreign exchange as capital from banks abroad or in Xianggang or Aomen, but shall file a report with the State General Administration of Foreign Exchange Control or one of its branches.

#### Article 79

After foreign staff and workers and staff and workers from Xianggang and Aomen have paid income tax on their salaries and other legitimate incomes according to the law, they can apply to the Bank of China for permission to remit outside China all the remaining foreign exchange after deduction of their living expenses in China.



## Chapter XI Financial Affairs and Accounting

### Article 80

Procedures for handling financial affairs and accounting of a joint venture shall be formulated in accordance with China's relevant laws and procedures on financial affairs and accounting, and in consideration of the conditions of the joint venture, and then being filed with local financial departments and tax authorities.

### Article 81

A joint venture shall employ a treasurer to assist the general manager in handling the financial affairs of the enterprise. If necessary a deputy treasurer can be appointed.

### Article 82

A joint ventures shall (small venture may not) appoint an auditor to be responsible for checking financial receipts, payments and accounts, and to submit reports to the board of directors and the general manager.

### Article 83

The fiscal year of a joint venture shall coincide with the calendar year, i.e. from January 1 to December 31 on the Gregorian calendar.

### Article 84

The accounting of a joint venture shall adopt the internationally used accrual basis and debit and credit accounting system in their work. All vouchers, account books, statistic statements and reports prepared by the enterprise shall be written in Chinese. A foreign language can be used concurrently with mutual consent.

### Article 85

Principally joint venture shall adopt Renminbi as the standard currency. In keeping accounts, however, another currency can be used through consultation by the parties concerned.

### Article 86

In addition to the use of standard currency to record accounts, joint ventures shall record accounts in currencies actually used in payments and receipts, if such currencies in cash, bank deposits, funds of other currencies, creditor's right, debts, gains, expenses, etc. are inconsistent with the standard currency in recording accounts.

Joint ventures using a foreign currency in accounting shall work out a statement of accounts in Renminbi equivalents in addition to those in the foreign

currency.

The actual amounts of losses and gains caused by differences in exchange rates in the course of remittances shall be recorded in the year's losses and gains accounts. No adjustments shall be made for recorded changes in exchange rates and remaining sum on the book of related foreign exchange accounts.

### Article 87

Principles of profit distribution after payment of taxes in accordance with the Income Tax Law of the People's Republic of China concerning Joint Ventures with Chinese and Foreign Investment are as follows:

(1) Allocations for reserve funds, bonuses and welfare funds for staff and workers and expansion funds of the joint venture. Proportion of allocations is decided by the board of directors.

(2) Reserve funds can be used to make up the losses of the joint venture, and with the consent of examination and approval authority, to increase the joint venture's capital for production expansion.

(3) After the funds described in (1) of this article have been deducted and if the board of directors decides to distribute the remaining profit, it should be distributed according to the proportion of each participant's investment.

### Article 88

Profits cannot be distributed unless the losses of previous year's have been made up. Remaining profits from previous year (or years) can be distributed together with that of the current year.

### Article 89

A joint venture shall submit quarterly and annual fiscal reports to parties to the joint venture, the local tax authority, department in charge of the joint venture and financial department at the same level to those departments.

A copy of the annual fiscal reports shall be submitted to the original examination and approval authority.

### Article 90

Only after being examined and certified by an accountant registered in China can the following documents, certificates and reports be considered valid.

(1) Certificates of investment from all parties to a joint venture (lists of assessed value shall be attached to documents on investments involving materials, site use rights, industrial property and know-how);

- (2) Annual fiscal reports of the joint venture;  
(3) Fiscal reports on liquidation of the joint venture.

#### Chapter XII Staff and Workers

##### Article 91

The employment, recruitment, dismissal and resignation of staff and workers of joint ventures, and their salary, welfare benefits, labour insurance, labour protection, labour discipline and other matters shall be handled according to the Regulations of the People's Republic of China on Labour Management in Joint Ventures Using Chinese and Foreign Investment.

##### Article 92

Joint ventures shall make efforts to conduct professional and technical training of their staff and workers and establish a strict examination system so that they can meet the requirements of production and managerial skills in a modernized enterprise.

##### Article 93

The salary and bonus systems of joint ventures shall be in accordance with the principle of distribution to each according to his work, and more pay for more works.

##### Article 94

Salaries and remuneration of the general manager, deputy general manager(s), chief engineer, deputy chief engineer(s), treasurer and deputy treasurer(s), auditor and other high-ranking officials shall be decided upon by the board of directors.

#### Chapter XIII Trade Union

##### Article 95

Staff and workers of a joint venture have the right to set up grass-roots trade unions and carry on trade union activities in accordance with the Trade Union Law of the People's Republic of China (hereinafter referred to as Chinese Trade Union Law) and the Articles of Association of Chinese Trade Union.

##### Article 96

Trade unions in joint ventures are representatives of the interests of the staff and workers. They have the power to represent the staff and workers to sign labour contracts with joint ventures and supervise the execution of these contracts.

##### Article 97

The basic tasks of the trade unions in joint ventures are: to protect the democratic rights and material interests of the staff and workers pursuant to the law; to help the joint ventures with the arrangement and rational use of welfare and bonus funds; to organize

political, professional, scientific and technical studies, carry out literary, art and sports activities; and to educate staff and workers to observe labour discipline and strive to fulfil the economic tasks of the enterprises.

##### Article 98

Trade union representatives have the right to attend as nonvoting members and to report the opinions and demands of staff and workers to meetings of the board of directors held to discuss important issues such as development plans, production and operational activities of joint ventures.

Trade union representatives have the right to attend as nonvoting members of meetings of the board of directors held to discuss and decide on awards and penalties to staff and workers, salary systems, welfare benefits, labour protection and labour insurance, etc. The board of directors shall heed the opinions of the trade unions and win its co-operation.

##### Article 99

A joint venture shall actively support the work of the trade union, and, in accordance with stipulations of the Chinese Trade Union Law, provide housing and facilities for the trade union's office work, meetings, and welfare, cultural and sports activities. The joint venture shall allot an amount of money totalling 2 percent of all the salaries of the joint venture's staff and workers as trade union's funds, which the trade union of the joint venture shall use according to the relevant managerial rules for trade union funds formulated by the All China Federation of Trade Unions.

#### Chapter XIV Duration, Dissolution and Liquidation

##### Article 100

The duration of a joint venture shall be decided upon through consultation of all parties to the joint venture according to actual conditions of the particular lines of business and projects. The duration of a joint venture engaged in an ordinary projects requiring large amount of investment, long construction periods and low interest rates on funds can be extended to more than 30 years.

##### Article 101

The duration of a joint venture shall be stipulated by all parties to the joint venture in the agreement, contract and articles of association. The duration begins from the day when the joint venture is issued a business license.

When all parties to a joint venture agree to extend the duration, the joint venture shall file an application for

extending the duration signed by representatives authorized by the parties with the examination and approval authority six months before the date of expiration of the duration. The examination and approval authority shall give an official written reply to the applicant within one month beginning from the day it receives the application.

Upon approval of the extension of the duration, the joint venture concerned shall go through registration formalities for the alteration in accordance with the Procedures of the People's Republic of China for the Registration and Administration of Chinese-Foreign Joint Ventures.

#### Article 102

A joint venture may be dissolved in the following situations:

- (1) Termination of duration;
- (2) Inability to continue operations due to heavy losses;
- (3) Inability to continue operations due to the failure of one of the contracting parties to fulfil the obligations prescribed by the agreement, contract and articles of association;
- (4) Inability to continue operations due to heavy losses caused by force majeure such as natural calamities and wars, etc.;
- (5) Inability to obtain the desired objectives of the operation and at the same time to see a future for development;
- (6) Occurrence of other reasons for dissolution prescribed by the contract and articles of association.

In cases described in (2), (3), (4), (5) and (6) of this article, the board of directors shall make an application for dissolution to the examination and approval authority.

In the situation described in (3) of this article, the party failed to fulfill the obligations prescribed by the agreement, contract and articles of association shall be liable to the losses thus caused.

#### Article 103

Upon announcement of the dissolution of a joint venture, its board of directors shall work out procedures and principles for the liquidation and nominate candidates for the liquidation committee. It shall report to the department in charge of the joint venture for examination, verification and supervision of the liquidation.

#### Article 104

Members of a liquidation committee are usually selected among directors of a joint venture. In case

the directors cannot serve or are unsuitable to be members of the liquidation committee, the joint venture may invite accountants and lawyers registered in China to do the job. When the examination and approval authority deems necessary, it may send personnel to supervise the process.

The liquidation expenses and remuneration to members of the liquidation committee shall be paid in priority from the existing assets of the joint venture.

#### Article 105

The tasks of the liquidation committee are: to conduct thorough check of the property of the joint venture concerned, its creditors' rights and liabilities; to work out the statement of assets and liabilities and list of property; to put forward a basis on which property is to be evaluated and calculated; and to formulate a liquidation plan. All these shall be carried out upon approval of the board of directors.

During the process of liquidation, the liquidation committee shall represent the joint venture concerned to sue and be sued.

#### Article 106

Joint venture shall be liable to its debts with all of its assets. The remaining property after the clearance of debts shall be distributed among parties to the joint venture according to the proportion of each party's investment unless otherwise provided by agreement, contract and articles of association of the joint venture.

At the time when a joint venture is being dissolved the value added to its net assets or remaining property that exceeds the registered capital is regarded as profit on which income taxes shall be levied according to law. The foreign participant shall pay income taxes according to law for the portion of the net assets or remaining property that exceeds his investment when he remits it abroad.

#### Article 107

On completion of the liquidation of a dissolved joint venture, the liquidation committee shall submit a liquidation report approved by a meeting of the board of directors to the original examination and approval authority, go through formalities for nullifying its registration and hand in its business license to the original registration authority.

#### Article 108

After dissolution of a joint venture, its account books and documents shall be left in the care of the Chinese participant.

## Chapter XV Settlement of Disputes

### Article 109

Disputes arising over the interpretation of execution of the agreement, contract or articles of association between the parties to the joint venture shall, if possible, be settled through friendly consultation or mediation. Disputes that cannot be settled through these means may be settled through arbitration or courts of justice.

### Article 110

Parties to a joint venture shall apply for arbitration in accordance with the relevant written agreement. They may submit the dispute to the Foreign Economic and Trade Arbitration Commission of the China Council for the Promotion of International Trade in accordance with its arbitration rules. With mutual consent of the parties concerned, arbitration can also be carried out through an arbitration agency in the country where the sued party is located or through one in a third country in accordance with the arbitration agency's procedures.

### Article 111

If there is no written arbitration agreement between the parties to a joint venture, each side can file a suit with the Chinese People's Court.

### Article 112

In the process of solving disputes, except for matters in dispute, parties to a joint venture shall continue to carry out other provisions stipulated by the agreement, contract and articles of association of the joint venture.

## Chapter XVI Supplementary Articles

### Article 113

The Chinese office in charge of visas shall give convenient service by simplifying procedures for staff and workers from foreign countries or from Xianggang and Aomen (including their family members) who frequently cross Chinese borders.

### Article 114

Departments in charge of joint ventures are responsible for handling applications and procedures for Chinese staff and workers going abroad for study tours, business negotiations or training.

### Article 115

Staff and workers from foreign countries or from Xianggang and Aomen working for a joint venture can bring in needed means of transport and items for

office use, paying regular customs duty and industrial and commercial consolidated tax on them.

### Article 116

Joint ventures set up in the special economic zones shall abide by the provisions, if any, provided otherwise in the laws and regulations adopted by the National People's Congress, its Standing Committee or the State Council.

### Article 117

The power to explain the Regulations is vested in the Ministry of the Foreign Economic Relations and Trade.

### Article 118

The regulations shall come into force on the day of promulgation.

The Introduction by Yuan Mu, State Council Spokesman,  
to Chinese and Foreign Correspondents to the  
Regulations for Implementation of the Law of the  
People's Republic of China on Joint Ventures Using  
Chinese and Foreign Investment

*Sept. 26, 1983*

The Regulations for Implementation of the Law of the People's Republic of China on Joint Ventures Using Chinese and Foreign Investment are formally promulgated today. I'd like to make a brief introduction to the Regulations now:

The introduction is composed of three points:

- I. The basis and purposes of formulating the Regulations;
- II. The main contents of the Regulations;
- III. The preferential treatment to joint ventures.

#### I. The basis and purposes of formulating the Regulations

As everyone knows that it is the long term and unshakable policy of our country to persist in open-door policy, developing foreign trade and economic and technical exchanges, and to welcome foreign investors to make investment in our country.

The 18th Article of the Constitution of the People's Republic of China has stipulated explicitly that the People's Republic of China permits foreign enterprises, other foreign economic organizations or foreign individuals to invest in China or to undertake various forms of economic cooperation with Chinese enterprises or other Chinese economic organizations. This article also provides that the lawful rights and interests of the foreign enterprises and other economic organizations, as well as joint ventures using Chinese and foreign investment located in China

are protected by the laws of the People's Republic of China.

The Second Session of the Fifth Chinese National People's Congress held in July, 1979 adopted and promulgated the Law of the People's Republic of China on Joint Ventures Using Chinese and Foreign Investment, and thereafter has promulgated a series of separate laws and regulations concerning joint ventures in accordance with that law, such as the Regulations of the People's Republic of China on the Registration and Administration of Joint Ventures Using Chinese and Foreign Investment, Regulations of the People's Republic of China on Labour Management in Joint Ventures Using Chinese and Foreign Investment and the Income Tax Law of the People's Republic of China Concerning Joint Ventures Using Chinese and Foreign Investment, etc.

By the end of 1982, the total amount of direct foreign investment absorbed in various forms by our country is 4.9 billions of U.S. dollars according to agreements, of which 1.7 billions have been put into use; among these 83 projects are joint ventures, which have actually utilized 100 millions of U.S. dollars of foreign investments. During these years, certain experiences have been gained for running Chinese and foreign joint ventures.

The Regulations promulgated today are formulated in accordance with the open-door policy of our country, the relevant provisions of the Constitution, the Law of the People's Republic of China on Joint Ventures Using Chinese and Foreign Investment and the practical experiences gained during these years. The Law of the People's Republic of China on Joint Ventures Using Chinese and Foreign Investment promulgated in 1979 is comparatively principled and simple. The present Regulations have further concretized those principles on the basis of that law, and clarified the issues that have not been involved in the joint venture law but put forward for solution by the practice of running joint ventures. Therefore, the formulation of the Regulations has made the laws of our country concerning Chinese and foreign joint ventures more concret and perfect.

The Chinese government hopes that the formal promulgation and implementation of the Regulations shall not only enable the existing Chinese-Foreign joint ventures to be run more successfully and have a greater development on basis thereof, but also attract more foreign investors to cooperate with various departments concerned of our country to establish new joint ventures.

## II. The Main Contents of the Regulations

The Regulations include altogether 16 chapters,

with 118 articles and 15,000 words.

The Regulations have reflected the principle of equality and mutual benefit for both parties to joint ventures, and reflected the spirit of the Chinese government to further relax the policy for utilizing foreign investments and running joint ventures.

The main contents provided for by the Regulations are as follows:

1. The legal status of joint ventures in China. The Regulations stipulate explicitly that joint ventures are the Chinese legal persons, which are under the jurisdiction and protected by the Chinese law.

2. The industries in which joint ventures are encouraged, the requirements to joint ventures and the prohibited items. The industries in which joint ventures are encouraged by China are:

Energy development, the building material, chemical and metallurgical industries;

Machine manufacturing, instrument and meter industries and offshore oil exploitation equipment manufacturing;

Electronics and computer industries, and communication equipment manufacturing;

Light textiles, foodstuffs, medicine, medical apparatus and packing industries;

Agriculture, animal husbandry and aquaculture;

Tourism and service trades.

From all these we can see that the field of joint ventures are very broad.

The requirements set by the Regulations are mainly that the joint ventures shall facilitate the construction of the four modernizations of our country and the acquisition of the advanced technologies which suit the needs of our country. The prohibited items are mainly that the joint ventures shall not be detriment to China's sovereignty, in violation of Chinese law, unconformity with the requirements of the development of China's national economy, and impairment to the rights and interests of one of the parties to the joint venture. All these are the minimum requirements of a sovereign state, but not excessive demands, let alone any discriminations to joint ventures.

3. The procedure for establishment and approval of joint ventures, the agreement, contract, articles of association of joint ventures and the main contents thereof, their organizational form and method of making investment as well as their operation rights.

4. The board of directors and management organizations of joint ventures. The Regulations stipulate explicitly that the board of directors composed of on basis of agreement by both parties to the joint venture is the highest authority of the venture and shall decide all the major issues thereof.

5. The relations between joint venture plan and the state plan, the marketing channel and price of joint venture products. The Regulations stipulate

fall short of the total amount of investment, the joint venture may, in its own name, obtain loans from the banks as its investment. Therefore, the total amount of investment of a joint venture may generally consist of two categories, funds provided by the parties to the venture themselves and loans obtained in the name of the venture.

#### **Registered capital**

The registered capital of a joint venture refers to the total amount of investment registered at the administrative departments for industry and commerce for the establishment of the joint venture, and it should be the sum of investment subscribed by the parties to the joint venture. The parties to the joint venture may, in accordance with the provisions of the joint venture contract, put in their subscribed investments to the venture in a lump sum or by installments.

#### **Investment subscribed**

This refers to the amount of capital the parties to a joint venture agreed to put in for the establishment of the venture. The contribution to the joint venture by the parties is to be judged by the amount of investment subscribed and the responsibility of each party for the joint venture is limited to their respective investment subscribed.

#### **The Right to the use of site**

The right to the use of site of a joint venture is the right to the use of a site obtained by the joint venture in accordance with the needs of its operation. The right may be obtained by the joint venture by concluding a leasing contract with the land department concerned of the local government or it may be contributed by the Chinese participant as its investment by evaluating the right. Whichever way did the joint venture obtain the right to the use of site, it should only have the right to use, but not the ownership. And transfer of the right to the use of site is not permitted.

#### **Investment certificates**

Investment certificates are the certificates issued by a joint venture to testify the amount of investment subscribed by the parties to the joint venture. They are issued to the joint ventures after the parties to the venture have put in their respective subscribed investment and after the Chinese-registered accountant has verified the amount and issued the verification report. Without the consent of the other parties and the approval of the examination and approval authority of the joint venture, no party to the joint venture is allowed to dispose of the certificate by transfer, mortgage or other ways.

#### **Reserve fund**

The reserve fund of a joint venture is a special fund withheld from its profits to make up for the losses the venture may be subjected to and to guard against accidents. The proportion of the fund is to be decided

upon by the board of directors, but it is not to exceed a certain amount. The reserve fund is in general not to be used for other purposes, but, with the approval of the joint venture's examination and approval authority, may be used by the joint venture for increasing its capital or expanding production.

#### **Bonus and welfare fund for staff and workers**

The bonus and welfare fund for the staff and workers of a joint venture is a special fund withheld from the venture's profits to improve the welfare of the staff and workers and encourage individuals or groups who have made comparatively great contributions to the production and work. It can be used only for commending those who have made comparatively great contributions and providing collective welfare facilities for the staff and workers, medical and health service and financial aids.

#### **Enterprise expansion fund**

The expansion fund of a joint venture is a special fund withheld from the joint venture's profits to expand its production. It can be used for purchasing fixed assets, increasing circulating funds and expanding operation. It can also be used for the trial manufacture of new products, undertaking scientific research and running technical training for the staff and workers.

#### **Industrial property**

The industrial property is the proprietary right acquired in accordance with the law for patented inventions, new designs and trade marks. It is to be protected according to the law, although such protection is strictly regional. Exclusive in character, the industrial property shall not be encroached upon by others. Use of such a right by others must have the consent of the owner of the right and a fixed amount of reward for him. The Law on Joint Ventures Using Chinese and Foreign Investment stipulates that a joint venture may make its investment in industrial property, to which provision have been added in the Regulations for the Implementation of the Law on Joint Ventures Using Chinese and Foreign Investments.

#### **Knowhow**

Knowhow, also called technical secret, is technical knowledge which can be transferred or imparted and which not know to the public and not patented. Unlike the patent right whose effective period is limited, knowhow is monopolized by means of secrecy.

#### **Accrual basis**

This is an accounting method of ascertaining the income and costs of a venture in a fiscal period (a month, a season or a year). In other words, the income and costs of a current period should be dealt with as such, no matter if the sum is received or paid in that particular period. Conversely, the income and costs not of the current period shall not be dealt with as

that a joint venture shall work out its plan according to the scope of operation and production scale fixed in the contract, and carry it out upon approval by its board of directors. The Chinese department in charge and its planning and administrative departments at various levels shall not assign the instructive plan to the joint venture.

6. The foreign exchange matter and the financial and accounting system of joint ventures. The foreign exchange income and expenses of a joint venture is an issue that is concerned by foreign investors. All the matters concerning foreign exchanges of a joint venture shall be handled in accordance with the special laws and regulations on foreign exchange control of our country. And our country encourages joint ventures to sell their products outside China, so as to solve their problems of foreign exchange expenditure. If their products are approved to be sold outside China but still have an unbalance in foreign exchange, the amount lacked will be solved by the department in charge of the enterprise. On the whole, the legitimate rights and interests of foreign investors are guaranteed.

7. The departments in charge of joint ventures and the regulations between these departments and joint ventures. The Regulations stipulate that departments in charge of joint ventures are responsible for guidance, assistance and exercising supervision to joint ventures. That is to say the relation between these departments and joint ventures is not the leadership relation as that to the state-owned enterprises. This has reflected that the operation and management autonomy of joint ventures are respected.

8. The matters concerning labour management and trade union of joint ventures.

9. Matters concerning consultation, conciliation and arbitration of the disputes arising between parties to joint ventures. The Regulations stipulate that the disputes between parties to a joint venture may be submitted for arbitration in China, or in the country where the party is being sued, or through the arbitration agency of the third country, if failed in friendly consultation or conciliation.

All these matters mentioned above are in common concern both at home and abroad, and needed to be clarified and resolved in practical work. It can be anticipated that joint ventures are surely developed in a further step as all these issues have the laws to follow and been clarified.

### III. The Preferential Treatment to Joint Ventures

The Regulations have permeated, from the beginning to the end, the principle of equality and mutual benefit. And at the same time stipulate some preferential treatments to joint ventures, such as:

1. Certain goods imported by joint ventures are exempt from customs duty and industrial and commercial consolidated tax. According to the stipulations of our country, the machinery, equipment and other goods as investment made by foreign participant or imported with the funds which are part of the total investment, and the raw materials which China cannot guarantee production and supply or those for production of export goods imported with the increased capital, are exempt from customs duty and industrial and commercial consolidated tax.

2. Joint ventures may be granted a reduction or exemption, upon approval of their application, from industrial and commercial consolidated tax for exported products produced by them, except for those are prohibited to be exported by our country.

3. The products produced by joint ventures, if are urgently needed in China or to be imported by China, may be sold mainly in Chinese domestic market.

All these are the preferential treatments favourable to foreign investors.

China has a rich natural resources and labour sources, with certain level of production technologies and low wages. There are many enterprises that are needed and possibly to be developed, the Chinese market is broad, the political situation is increasingly stable and will be stable continuously. The Chinese economy has been brought into line of healthy development. And the open-door policy adopted by China has gained obvious results and shall be persisted in continuously. All these have provided a favourable condition and environment for the investments made by foreign investors. I would like, on this occasion, to express again our welcome to foreign investors to make investment in our country, and wish a new and greater development of joint ventures on the basis of equality and mutual benefit.


So much for my introduction and now my colleagues, the leaders concerned from the Ministry of Foreign Economic Relations and Trade, and I are ready to answer your questions concerning this matter.

### Some Key Terms Used in the "Regulations for the Implementation of the Law on Joint Ventures Using Chinese and Foreign Investment"

#### Total amount of investment

The total amount of investment of a joint venture refers to the sum (total) of the capital construction funds needed for the production scale specified in the contract and the articles of association of joint venture and the circulating funds for production. If the funds contributed by the parties to the venture

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