Urban Water Sector in China – Development and Reform

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A Sketch

- Demands for larger capacity and better service to urban water sector in China
  - Water supply
  - Wastewater treatment and disposal
  - Urban water environment

- Reform in urban water sector
  - Financing and investment system
  - Operation and management system
  - Regulation system
  - Water pricing system
Increases in Urban Water Demand

- 15 million people shift from rural areas to urban districts annually.
- GDP annual growth remains a rate at 7%~8%.
- By 2010, the percentage of population served by public water supply should exceed 95%.
- Domestic water consumption increases constantly.
- Total urban water consumption started to increase again since 2003.
Urban Water Consumption in Recent 10 Years

- Total urban water consumption
- Urban domestic water consumption

Annual water consumption (billion m³)

Years: 1995 to 2005
Rehabilitation of Urban Water Supply Distribution Networks

- **Water loss control**
  - Up to 20% of water loss in distribution system
  - Objective: reducing the water loss rate to the international level of 7%〜9%

- **Water quality**
  - Aging and breakage of the water pipelines
  - Water quality deterioration in distribution system
  - New water quality standards
Examples of water pipes breakage
Quality Safeguard of Urban Water Supply

- New drinking water quality standards
    - Required parameters from 35 to 103
  - Upcoming “National Water Quality Standard for Drinking Water”
    - Required parameters from 35 to 106
Quality Safeguard of Urban Water Supply

- Quality deterioration of drinking water sources
  - Organic pollutants
  - Water eutrophication (algae growth)
  - Water pollution emergencies by industrial discharge
  - Requirements for upgrading water purification process and emergency response system
Drinking Water Safety in Rural Areas

- Balanced development of urban and rural water supply through regional water supply strategy
  - Urban water supply services extending to rural areas
  - Improving drinking water quality in rural areas
Drinking Water Safety in Rural Areas

- Improve and guarantee drinking water safety
  - Drinking water source exploitation in water-shortage areas
  - Fluoride and arsenide removal
  - Objective: the drinking water conditions for a population of 160 million being improved by 2010
By 2010

- Planning and construction of centralized wastewater treatment facilities in cities and counties
- Municipal wastewater treatment rate not less than 70% in average:
  - Cities above prefecture-level, 80% in average
  - Cities at prefecture-level, 60% in average
  - Cities at county level, 50% in average
Municipal wastewater treatment volume — 1995 to 2005

Municipal wastewater treated (billion m³ per year)
Municipal Wastewater Treatment Facilities

- Construction and upgrading of municipal wastewater treatment plants
  - New plants, 35 million m³/day
  - Upgrading, 20 million m³/day
- Construction and improvement of sewerage
  - Enhancement of separate systems
  - New sewers, 200,000 km
- Urban flooding control and rainwater management
Number of municipal wastewater treatment plants (WWTPs) from 1995 to 2005
Examples of WWTPs
Wastewater Reclamation

- Over 20% of treated municipal wastewater being reused, especially in water shortage cities;
- The treated wastewater can be reused for:
  - Industrial uses
  - Environmental uses
  - Municipal uses
  - Toilet flushing
Sludge Disposal

Objective: wet sludge cake production reaching 35,000 ton/day by 2010 (dry solid content 20%)

- Sludge stabilization and sanitization
- Sludge drying and incineration
- Land applications and landfill

An unadvisable sludge dumping site
Improvement of Urban Water Environment

- River ecosystem rehabilitation
- Rivers and lakes remediation
- Construction of Landscaping and scenic waters
- Urban wetland protection
Capital Demand of the Urban Water Sector Development

- Estimated capital demand for the next 5-10 years:
  - 270 billion RMB for drinking water sources protection and water supply safety control
  - 330 billion RMB for municipal wastewater treatment and reuse facilities
  - 250 billion RMB for long distance water transfer projects
  - 150 billion RMB for water environment and ecological rehabilitations

Over 1,000 billion RMB of Total capital demand
Major Aspects of Urban Water Sector Reform in China

- Open market & break monopoly
  - State-owned enterprise reform
  - Involvement of foreign enterprises and private sector
- Establish a fair, equitable and open market
  - Concession system
  - Standardized contract model
- Build effective regulatory system
  - Strengthen regulation regarding to water quality, tariff, service and etc.
  - Ensure public interests and public health
Diversified Financing and Investment

- Financing and investment system reform
  - Government input and multi-channel financing
  - Investment of foreign and non-governmental capital
  - Encouraging private sector in construction and operation of facilities
  - Concession system for urban water and wastewater services
Diversified Financing and Investment

- Measures
  - Financial support from government to pipeline construction and developing regions
  - Encouraging joint venture, partnership, BOT, TOT and etc.
  - Mortgage loan through wastewater tariff collecting entitlement and service income right
  - Preferential loan from policy banks and international financial organizations
  - Studying the feasibility of issuing enterprise bonds
Enterprise Reform

- Modern enterprise system
  - Corporatisation of water and wastewater units
  - Restructure and diversification of proprietorships
  - Incentive and restriction mechanism for enterprise operation and management

- Competitive enterprise groups
  - Scale economy and integrated management
  - Cross-region investment and operation
  - International cooperation
Water Pricing Mechanism

- Full-cost recovery tariff system
  - Water resource fee reflecting water scarcity
  - Water supply tariff covering costs of construction and operation
  - Wastewater charge ensuring costs of wastewater treatment and sludge disposal

- Control the operation costs of monopolies
  - Performance Monitoring System
  - Operation auditing system
  - Public hearing system
Regulation System Tailored for Local Conditions

- **Government’s regulation responsibilities**
  - Market entrance and withdrawl mechanism
  - Regulation of product and service quality
  - Regulation of costs and tariff
  - Public benefit and public health

- **Public consultation mechanism**
  - Information transparency
  - Water quality data publication
  - Public hearing of tariff adjustment
  - Complain channels
Thanks for your attention