Municipal Wastewater Cost Recovery in China

Greg Browder
World Bank Water Week
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Presentation Based on:

- World Bank 2007 AAA: “Strategic Directions for Improving the Performance of China’s Urban Water Utilities.”

- Since 1990: 25 Bank-financed wastewater project with $4.0 billion investment
Organization of Municipal Wastewater Service in China

3 Common Models:

-- Drainage Departments + Municipal Conveyance/Treatment Company

-- Drainage Departments + Private BOT Treatment Project

-- Municipal Wastewater Company: Collection, Conveyance & Treatment

Wastewater Services Provided By Local Government With Minimal Oversight By Provincial Governments
Rapid Construction of Treatment Plants

- 2000 State Council Circular: 60% Urban WW Treatment by 2010
- 2005: 364 out of 662 cities have WW Treatment Plants
Large WW Investment Program Ahead

2006-2010: US$35 Billion

Preliminary Estimates for Wastewater Investments:
11th Five Year Plan

Source: CIECC 11th Five Year Sector Plan
Average Water and Wastewater Tariffs in China

Based upon 128 sample cities*, as of July 2005, in RMB

Source: H20 Reports
General China Wastewater Tariff Approach

- Drainage Operating and Capital Costs Paid by Government (Considered a Public Good)
- Wastewater Tariff Pays for Treatment Only (Considered a Commercial Activity)

Wastewater Treatment Fee and BOT Price (RMB/m³)

<table>
<thead>
<tr>
<th>Region</th>
<th>Average BOT Price</th>
<th>Average Wastewater Fee</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Largest Cities</td>
<td>0.99 ($0.12)</td>
<td>0.75</td>
<td>76%</td>
</tr>
<tr>
<td>Coastal Areas</td>
<td>0.80</td>
<td>0.55</td>
<td>68%</td>
</tr>
<tr>
<td>Northeast</td>
<td>0.55</td>
<td>0.46</td>
<td>83%</td>
</tr>
<tr>
<td>Middle and West</td>
<td>0.50</td>
<td>0.33</td>
<td>66%</td>
</tr>
</tbody>
</table>

Source: Tsinghua University Brief, 2006
Why Wastewater is Not Managed as a Network Business in China

- Existing Drainage Departments are Overstaffed and Inefficient:
  --Start Fresh with Wastewater Treatment Company

- Tariff Levels Can Be Set At Cost Recovery Levels for Treatment
  --Can Attract BOT Investment or Bank Loans

- Many Combined Wastewater and Stormwater Drainage Systems:
  --Stormwater Costs Not Related to Wastewater Generation
Problems With Not Managing Wastewater as a Network Business

- No Single Entity Responsible for Wastewater Management

- Municipal Government Funding Constraints: Capital and Operating Costs
  --Collection Infrastructure Lags Behind
  --Operation and Maintenance Suffers

- True Cost of Service Remains Hidden
National State Bond Program: Concessionary Finance

- China’s Central Government Issues GO Bonds
  --Distributes to Provinces/Cities for All Types of Infrastructure

- 1998 Start: Stimulate Economy; Present: Promote Equity

- Grants and Concessionary Loans:
  --Approximately 30% of WW Investments/Mainly Drainage

- Not a Structured Program for Water and Wastewater
  --Limited Eligibility Criteria, Appraisal, Monitoring, etc.
Affordability and Efficiency

- Environmental Agency Has High Discharge Standards:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Class 1A</th>
<th>Class 1B</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD (mg/l)</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>SS (mg/l)</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Total-P (mg/l)</td>
<td>0.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Total-N (mg/l)</td>
<td>15</td>
<td>20</td>
</tr>
</tbody>
</table>

- Cities Are Constructing Separate (SW and WW) Collection Systems

- Sludge Management Costs Are Large and Growing

--Construction and Labor Costs are Low in China--
## Economic Disparity Among Cities in China

<table>
<thead>
<tr>
<th>City Type</th>
<th>Per-Capita (US$)</th>
<th># of Cites</th>
<th>Population (Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large and Rich</td>
<td>&gt; $3,000</td>
<td>21</td>
<td>100</td>
</tr>
<tr>
<td>Medium</td>
<td>$1500-$3000</td>
<td>330</td>
<td>200</td>
</tr>
<tr>
<td>Small and Poor</td>
<td>&lt; $1500</td>
<td>2,000</td>
<td>160</td>
</tr>
</tbody>
</table>

Note: Small and Poor Include County Capital Towns, Source: EASUR Estimate
# Getting the Wastewater Package Right: Strategic Directions for China

<table>
<thead>
<tr>
<th>Component</th>
<th>China Issue</th>
<th>Proposed Strategic Directions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Service Standards</td>
<td>• High Effluent Standards&lt;br&gt; • Separate Collection System</td>
<td>For Poorer Cities:&lt;br&gt;- Transitional Effluent Standards&lt;br&gt;- Combined Systems</td>
</tr>
<tr>
<td>2. Utility Efficiency</td>
<td>• Inefficient Drainage Departments</td>
<td>- Manage WW as Network Utility Business: Collection &amp; Treatment</td>
</tr>
<tr>
<td>3. Tariffs</td>
<td>• Below Treatment Full Cost</td>
<td>- Recover Full Costs for Treatment and at Least O&amp;M for Drainage</td>
</tr>
<tr>
<td>4. Government Capital Contribution</td>
<td>• City Funds Drainage Works&lt;br&gt; • Unstructured National Program</td>
<td>- Incentive Based National Finance Programs</td>
</tr>
<tr>
<td>5. Government Operating Contribution</td>
<td>• City Funds Drainage O&amp;M</td>
<td>- Reliance on Tariffs</td>
</tr>
</tbody>
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