Squeezing out the Drop$ Improving Water Utility Efficiency through Performance-Based Investment

PUBLIC-PRIVATE PARTNERSHIPS CONFERENCE

JUNE 5-8, 2012 | DAKAR, SENEGAL
There is an $80B global water market for private sector

Projected Private Water Market Growth

Source: Global Water Intelligence (GWI) – Global Water Market 2008
But private sector participation has been limited due to 3 Rs

Risk
• Political risk in large scale concessions

Returns
• Tariff issues limit bankable deals

Regulations
• Private investment tends to flow to countries with favorable regulation, political support

Source: Public-Private Partnerships for Urban Water Utilities - A Review of Experiences in Developing Countries by Philippe Marin (World Bank)
Need to focus on what private sector does best

Morocco: Evolution of water losses per connection (m3 per day) under private concessionaires

Water Utility Efficiency Improvement
Squeezing out Every Last Drop
Resource Efficiency in the Water Sector

Non-Revenue Water (NRW)
# The Water Balance Table

<table>
<thead>
<tr>
<th>System Input Volume</th>
<th>Authorized Consumption</th>
<th>Billed Authorized Consumption</th>
<th>Billed Metered Consumption</th>
<th>Billed Unmetered Consumption</th>
<th>Revenue Water</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Commercial Losses</td>
<td>Unbilled Authorized Consumption</td>
<td>Unbilled Metered Consumption</td>
<td>Unbilled Unmetered Consumption</td>
<td>Non Revenue Water</td>
</tr>
<tr>
<td></td>
<td>Physical Losses</td>
<td>Unauthorized Consumption</td>
<td>Customer Meter Inaccuracies and Data Handling Errors</td>
<td>Leakage on Transmission and Distribution Mains</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leakage and Overflows from the Utilities Storage Tanks</td>
<td>Leakage on Service Connections up to the Customer Meter</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: International Water Association (IWA)
Typical Losses from a Water System

Physical losses:
- Trunk Mains Leaks
- Illegal Connections
- Unrecorded Users

Leaks from:
- Mains
- Services Pipes
- Booster Stations
- Service Tanks
- Pipes
- Air Valves
- Washout Valves
- Hydrants

Commercial losses:
- Reading Errors
- Slow Running Meter
- Tampering With Meters
- Broken Meters
- No meters
- Illegal Connections:

- Admin. Errors
- Data Entry Errors
- Delays
- Loss of Records

Source: The Manager’s Non-Revenue Water Handbook
A Guide to Understanding Water Losses (July 2008)
Ranhill Utilities Berhad and the United States Agency for International Development (USAID)
## Global Non-Revenue Water (NRW) Volumes

<table>
<thead>
<tr>
<th></th>
<th>Supplied Population - millions (2002)</th>
<th>System Input l/capita/day</th>
<th>Level of NRW % of System Input</th>
<th>Physical Losses</th>
<th>Commercial Losses</th>
<th>Volume, billion m³/year</th>
<th>Physical Losses</th>
<th>Commercial Losses</th>
<th>Total NRW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developed Countries</td>
<td>744.8</td>
<td>300</td>
<td>15%</td>
<td>80%</td>
<td>20%</td>
<td>9.8</td>
<td>2.4</td>
<td>12.2</td>
<td></td>
</tr>
<tr>
<td>Eurasia (CIS)</td>
<td>178.0</td>
<td>500</td>
<td>30%</td>
<td>70%</td>
<td>30%</td>
<td>6.8</td>
<td>2.9</td>
<td>9.7</td>
<td></td>
</tr>
<tr>
<td>Developing Countries</td>
<td>837.2</td>
<td>250</td>
<td>35%</td>
<td>60%</td>
<td>40%</td>
<td>16.1</td>
<td>10.6</td>
<td>26.7</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>32.7</strong></td>
<td><strong>15.9</strong></td>
<td><strong>48.6</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: The Challenge of Reducing Non-Revenue Water (NRW) in Developing Countries How the Private Sector Can Help: A Look at Performance-Based Service Contracting – World Bank (December 2006 - Bill Kingdom, Roland Liemberger, Philippe Marin)
## Cost of Non-Revenue Water (NRW)

<table>
<thead>
<tr>
<th></th>
<th>Marginal cost of water (US$/m³)</th>
<th>Average tariff (US$/m³)</th>
<th>(Estimated values, billions of US$/year)</th>
<th>Total cost of NRW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developed countries</td>
<td>0.30</td>
<td>1.00</td>
<td>2.90</td>
<td>5.30</td>
</tr>
<tr>
<td>Eurasia (CIS)</td>
<td>0.30</td>
<td>0.50</td>
<td>2.00</td>
<td>3.50</td>
</tr>
<tr>
<td>Developing countries</td>
<td>0.20</td>
<td>0.25</td>
<td>3.20</td>
<td>5.80</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>0.85</strong></td>
<td><strong>1.75</strong></td>
<td><strong>8.10</strong></td>
<td><strong>14.60</strong></td>
</tr>
</tbody>
</table>

Source: The Challenge of Reducing Non-Revenue Water (NRW) in Developing Countries How the Private Sector Can Help: A Look at Performance-Based Service Contracting – World Bank (December 2006 - Bill Kingdom, Roland Liemberger, Philippe Marin)
Many water utilities spiral down in the vicious NRW cycle

Expenditure is concentrated on meeting increasing customer demands

Revenues decrease and operational costs increase

Operational budgets are reduced especially in areas of network maintenance

NRW Increases

Source: The Manager’s Non-Revenue Water Handbook
A Guide to Understanding Water Losses (July 2008)
Ranhill Utilities Berhad and the United States Agency for International Development (USAID)
Squeezing out Every Last Drop
Resource Efficiency in the Water Sector

Commercial Loss Reduction
Commercial Loss Reduction
First Priority in NRW Reduction Effort

• Low Hanging Fruit
• Reducing commercial loss is easier than physical loss
• Customer data base
• Improved metering
• Improved billing
• Improved collection
• Illegal connections
• Reduction to 2 - 5% easy
• Investments are low
• Short payback period
• Increased revenues can help to fund physical loss reduction
Water Utility NRW/Energy Efficiency Study
AAA Colombia – Commercial Efficiency

Average Payback = 9 months

<table>
<thead>
<tr>
<th>Priority</th>
<th>Type of Intervention (Commercial)</th>
<th>Est Minimum Rate of Water Usage (m³/sec)</th>
<th>Est Minimum Monthly Water Usage (m³/mo)</th>
<th>Est Average Additional Revenue per Month (US$/mo)</th>
<th>Investment (US$)</th>
<th>Monthly Water Savings ($/mo)</th>
<th>Monthly Energy Savings (US$/mo)</th>
<th>Other Savings (US$/mo)</th>
<th>Total Savings (US$/yr)</th>
<th>Pay-back Period (Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Install new meters on industrial high usage customers</td>
<td>0.03000</td>
<td>77,760</td>
<td>4.00</td>
<td>311,040</td>
<td>162,947</td>
<td>311,040</td>
<td>0</td>
<td>0</td>
<td>3,732,480</td>
</tr>
<tr>
<td>2</td>
<td>Replace older customer meters with new technology</td>
<td>0.01000</td>
<td>25,920</td>
<td>3.00</td>
<td>77,760</td>
<td>1,899,958</td>
<td>77,760</td>
<td>0</td>
<td>0</td>
<td>933,120</td>
</tr>
<tr>
<td>3</td>
<td>Install small meters on currently unmetered customers</td>
<td>0.01000</td>
<td>25,920</td>
<td>3.00</td>
<td>77,760</td>
<td>1,631,063</td>
<td>77,760</td>
<td>0</td>
<td>0</td>
<td>933,120</td>
</tr>
<tr>
<td>4</td>
<td>Detect fraud and meter irregularities and correct them</td>
<td>0.01000</td>
<td>25,920</td>
<td>3.00</td>
<td>77,760</td>
<td>692,021</td>
<td>77,760</td>
<td>0</td>
<td>0</td>
<td>933,120</td>
</tr>
</tbody>
</table>

Sub-total estimated investment: $4,385,990
Sub-total estimated annual savings: $6,531,840

Improvements
- New meters – high use customers
- New consumer meters – unmetered customers
- Fraud detection and regularization
Squeezing out Every Last Drop
Resource Efficiency in the Water Sector

Leakage Reduction
Leakage Reduction Strategies

• Water Balance
• Consumer metering
  – Often reduces usage
• District Metering
  – Bulk Metering
  – Hydraulic Zones
• Leak Detection
  – Night Flows
  – Telemetry/SCADA
  – Flow Statistics
• Pressure Management
  – Pressure zones
  – Pressure reducing valves
  – Pump VFDs
• Leak Reduction
  – Leak repairs
  – Pipe replacement
Leakage Reduction Strategies

- Pressure Management
- Economic Level of Physical Losses
- Unavoidable Annual Physical Losses
- Active Leakage Control
- Pipeline and Assets Management:
  - Selection
  - Installation
  - Maintenance
  - Rehabilitation
  - Replacement
- Speed and Quality of Repairs
- Current Annual Physical Losses

Source: The Manager’s Non-Revenue Water Handbook
A Guide to Understanding Water Losses (July 2008)
Ranhill Utilities Berhad and the United States Agency for International Development (USAID)
The Economic Level of Leakage (ELL)

Source: The Challenge of Reducing Non-Revenue Water (NRW) in Developing Countries How the Private Sector Can Help: A Look at Performance-Based Service Contracting – World Bank (December 2006 - Bill Kingdom, Roland Liemberger, Philippe Marin)
NRW Payback Period Calculations

Payback of leakage activities depending on cost

- US$ 200 per m3/day
- US$400 per m3/day
- US$600 per m3/day
- US$ 800 per m3/day

Payback period in years

New Water Treatment Plant = US$200-500 per m3/day
New Desalination Plant = US$ 1000 – 2000 per m3/day

Source: The Challenge of Reducing Non-Revenue Water (NRW) in Developing Countries How the Private Sector Can Help: A Look at Performance-Based Service Contracting – World Bank (December 2006 - Bill Kingdom, Roland Liemberger, Philippe Marin)
## Water Utility NRW/Energy Efficiency Study
### AAA Colombia – Leak Reduction

<table>
<thead>
<tr>
<th>Type of Intervention (Technical)</th>
<th>Estimated Rate of Water Leakage (m³/sec)</th>
<th>Estimated Monthly Water Leakage (m³/mo)</th>
<th>Estimated Average Cost of Leaking Water (US$/m³)</th>
<th>Est. Cost of Leaking Water per Month (US$/m³/mo)</th>
<th>Investment (US$)</th>
<th>Monthly Water Savings ($/mo)</th>
<th>Monthly Energy Savings (US$/mo)</th>
<th>Other Savings (US$/mo)</th>
<th>Total Savings (US$)</th>
<th>Pay-back Period (Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subdivide Zone 3 into gravity and pressure districts, served from Recreo Tanks</td>
<td>0.07231</td>
<td>187,428</td>
<td>1.00</td>
<td>187,428</td>
<td>355,753</td>
<td>9,370</td>
<td>590</td>
<td>9,750</td>
<td>236,520</td>
<td>1.5</td>
</tr>
<tr>
<td>Replace AC pipe in selected circuits</td>
<td>0.07231</td>
<td>187,428</td>
<td>1.00</td>
<td>187,428</td>
<td>2,586,924</td>
<td>18,740</td>
<td>590</td>
<td>9,750</td>
<td>348,960</td>
<td>7.4</td>
</tr>
<tr>
<td>Replace older valves in selected circuits</td>
<td>0.01392</td>
<td>36,082</td>
<td>1.00</td>
<td>36,082</td>
<td>171,579</td>
<td>720</td>
<td>0</td>
<td>9,750</td>
<td>125,640</td>
<td>1.4</td>
</tr>
<tr>
<td>Complete macro metering of all unmetered circuits</td>
<td>0.07231</td>
<td>187,428</td>
<td>1.00</td>
<td>187,428</td>
<td>955,263</td>
<td>9,370</td>
<td>0</td>
<td>0</td>
<td>112,440</td>
<td>8.5</td>
</tr>
<tr>
<td>Install pressure regulator valves on selected circuits</td>
<td>0.07231</td>
<td>187,428</td>
<td>1.00</td>
<td>187,428</td>
<td>338,193</td>
<td>9,370</td>
<td>0</td>
<td>9,750</td>
<td>229,440</td>
<td>1.5</td>
</tr>
<tr>
<td>Investigate circuits for leakage in Barranquilla + Soledal</td>
<td>0.07231</td>
<td>187,428</td>
<td>1.00</td>
<td>187,428</td>
<td>94,737</td>
<td>5,620</td>
<td>0</td>
<td>0</td>
<td>67,440</td>
<td>1.4</td>
</tr>
<tr>
<td>Investigate circuits for leakage in Atlantic coastal region</td>
<td>0.07231</td>
<td>187,428</td>
<td>1.00</td>
<td>187,428</td>
<td>31,579</td>
<td>5,620</td>
<td>0</td>
<td>0</td>
<td>67,440</td>
<td>0.5</td>
</tr>
<tr>
<td>Install monitoring equipment to measure pressure in real time</td>
<td>0.07231</td>
<td>187,428</td>
<td>1.00</td>
<td>187,428</td>
<td>121,053</td>
<td>3,750</td>
<td>0</td>
<td>9,750</td>
<td>162,000</td>
<td>0.7</td>
</tr>
<tr>
<td>Other activities including linking customer connections with GIS database and matching with circuits</td>
<td>0.07231</td>
<td>187,428</td>
<td>1.00</td>
<td>187,428</td>
<td>105,263</td>
<td>5,620</td>
<td>0</td>
<td>0</td>
<td>66,840</td>
<td>1.6</td>
</tr>
<tr>
<td>Procurement of additional leak detection and fraud detection equipment to accelerate water loss reductions</td>
<td>0.07231</td>
<td>187,428</td>
<td>1.00</td>
<td>187,428</td>
<td>500,000</td>
<td>5,620</td>
<td>300</td>
<td>9,750</td>
<td>188,040</td>
<td>2.7</td>
</tr>
</tbody>
</table>

|                                                                 | Sub-total estimated investment | $5,290,344 | Sub-total estimated annual savings: | $1,695,360 |

### Improvements
- Macro-metering
- Leak detection
- Pipe replacement

**Average Payback = 3.5 years**
Sometimes the Best Supply is Plugging the Leaks
Squeezing out Every Last Drop
Resource Efficiency in the Water Sector

Energy Efficiency
## Water Utility NRW/Energy Efficiency Study
### AAA Colombia – Energy Efficiency

<table>
<thead>
<tr>
<th>Priority</th>
<th>Location</th>
<th>Annual energy cost (US$/yr)</th>
<th>Type of intervention</th>
<th>Investment (US$)</th>
<th>Energy savings (kWh/yr)</th>
<th>Energy savings (US$/yr)</th>
<th>Other savings (US$/yr)</th>
<th>Total savings (US$/yr)</th>
<th>Pay-back</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alta 3 pumping station (E.T.AP)</td>
<td>$4,040,150</td>
<td>Variable speed drive to control two pumps - Alta 3</td>
<td>$550,000</td>
<td>1,700,994</td>
<td>$202,075</td>
<td>$117,000</td>
<td>$319,075</td>
<td>1.7</td>
</tr>
<tr>
<td>2</td>
<td>Delicias re-pumping station</td>
<td>$1,059,495</td>
<td>Variable speed drive to control two pumps - Delicias</td>
<td>$420,000</td>
<td>696,120</td>
<td>$105,949</td>
<td>$117,000</td>
<td>$222,949</td>
<td>1.9</td>
</tr>
<tr>
<td>3</td>
<td>Baja 1 pumping station (E.T.AP)</td>
<td>$989,386</td>
<td>Replacement of 2 vertical pumps with 2 horizontal pumps</td>
<td>$380,000</td>
<td>612,000</td>
<td>$72,706</td>
<td>$0</td>
<td>$72,706</td>
<td>5.2</td>
</tr>
<tr>
<td>4</td>
<td>Alta 2 pumping station (ET.AP) main pipe to Reoreo</td>
<td>$1,747,786</td>
<td>Replacement of 150 mls of pipe to remove 36&quot;-24&quot;-36&quot; constraint</td>
<td>$150,000</td>
<td>294,240</td>
<td>$34,956</td>
<td>$0</td>
<td>$34,956</td>
<td>4.3</td>
</tr>
<tr>
<td>5</td>
<td>Motor associated with re-pumping stations in low voltage (440)</td>
<td>$146,006</td>
<td>Replacement of standard motor with high efficiency motor</td>
<td>$16,000</td>
<td>99,924</td>
<td>$15,208</td>
<td>$0</td>
<td>$15,208</td>
<td>1.1</td>
</tr>
</tbody>
</table>

|                      | Total estimated investment:   | $1,516,000                   | Total estimated savings per yr:                                                      | $664,894         |                                      |                         |                        |           |

### Improvements
- Pumps Efficiency – Pump Curve Position
- Hydraulics – Gravity feed vs. Pumping
- Pipeline hydraulics – excessive head loss
- Pump Motor Efficiency
- Load Factor Correction
- Water Loss Reduction – Less Water Pumped

Average Payback = 2.3 years
Squeezing out Every Last Drop
Resource Efficiency in the Water Sector

Performance Based Contracting (PBCs) & Water Efficiency Service Cos (WESCOs)
Performance-based contracting
An innovative delivery model

Performance-Based Contracting (PBC)
• Private companies work at risk
• Out-sourced contracts/ lower profile
• Performance reward for savings
• Shared savings / returns
• Favors WESCO companies
• Targets greatest efficiency gains

Examples of NRW PBCs
• Selangor (Malaysia)
  – NRW reduction
• Bangkok (Thailand)
  – DMA leakage reduction
• Ho Chi Minh City (Vietnam)
  – DMA and NRW reduction
• Dublin (Ireland)
  – DMA and leakage reduction
• São Paulo (Brazil)
  – Debt Collection
  – Large Customer Meter Replacement
SABESP – Commercial Efficiency PBC Successes

- SABESP - serves the São Paulo Metropolitan Region,
- One of largest public water utilities in the world (population: 25 million).
- Proactive approach to water loss reduction with the help of the local private sector.
- Commercial management traditionally left to in-house crews.
- SABESP was losing revenues in the equivalent of one million cubic meters per day.
- SABESP decided to experiment with some innovative performance-based contracts

Reduction of bad debts
1. Contract local private firms to negotiate unpaid invoices
2. Contractors paid 6% to 20% of debt collected (bonus for cash)
3. Original value of bad debt was US$ 65 M
4. Total Collected was US$ 43 M (78%)
5. Contractors’ payment was US$ 6.6 M

Increase of large customer meter accuracy
1. Largest customers (2%) account for 34% of revenues
2. Large meters were under-registering compared to true consumption
3. Innovative solution => turnkey contracts for meters replacement.
4. Replace meters of 27,000 large revenue accounts
5. Five 36-month contracts were put in place
6. Design, supply and installation of the new meters.
7. No upfront payment / contractor had to pre-finance the entire investments.
8. Payment based on the average increase in consumption volume
9. Results => volume of metered consumption increased by 45 million m³
10. Revenues increased by BRL 172 million (US$ 72 millions).
11. BRL 42 millions (US$18 millions) was paid to the contractors
12. Net benefit to SABESP three times as high at BRL 130 million (US$ 54 millions).

Source: The Challenge of Reducing Non-Revenue Water (NRW) in Developing Countries How the Private Sector Can Help: A Look at Performance-Based Service Contracting – World Bank (December 2006 - Bill Kingdom, Roland Liemberger, Philippe Marin)
Sebokeng/Evaton (South Africa) - NRW Reduction PPP
Advanced Pressure Management

• Emfuleni Township, ±50 km south of Johannesburg
• 500 000 residents in low-income township
• NRW before project was 75-80%
• Annual water bill R 150 million ($20 million).
• Pressure reduction facility with PRVs
• Designed, built, operated financed by WRP
• Contract period - period of 5 years.
• Payment to WRP based upon 15% of savings
• Remaining 85% returning to Municipality
• Saved 30 million m3 in water in first 36 months
• Saved more than R90 million ($12 million)
• Sewer flows reduced from 2500 m3/h to 1800 m3/h
• Annual energy savings in excess of 14 000 MWh
• Equivalent 12 000 Tons of CO2 per year
• Pressures also reduced number of bursts in the area.
• Payback Less Than One Year
Squeezing out Every Last Drop
Resource Efficiency in the Water Sector

Brazil WESCO Project
Water efficiency is an issue in Brazil... NRW averages 43%

<table>
<thead>
<tr>
<th>Region</th>
<th>Population (million)</th>
<th>NRW</th>
<th>Max NRW</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORTH</td>
<td>5.03</td>
<td>4%</td>
<td>54%</td>
</tr>
<tr>
<td>NORTHEAST</td>
<td>30.52</td>
<td>27%</td>
<td>53%</td>
</tr>
<tr>
<td>SOUTHEAST</td>
<td>56.28</td>
<td>49%</td>
<td>37%</td>
</tr>
<tr>
<td>SOUTH</td>
<td>13.55</td>
<td>12%</td>
<td>36%</td>
</tr>
<tr>
<td>CENTER-WEST</td>
<td>9.76</td>
<td>8%</td>
<td>37%</td>
</tr>
<tr>
<td>Total</td>
<td>115.13</td>
<td>43%</td>
<td></td>
</tr>
</tbody>
</table>

Source: Diagnostico dos Servicos de Agua e Esgotos – 2008, Ministerio das Cidades, Secretaria Nacional de Saneamento Ambiental, Sistema Nacional de Informacoes sobre saneamento (SNIS)
Reducing NRW would increase revenues by US$4B

Potential Savings if top water utilities reduced NRW to an efficient benchmark

<table>
<thead>
<tr>
<th># of companies</th>
<th>Average NRW</th>
<th>Water Losses (M m3/yr)</th>
<th>Savings (a) (M m3/year)</th>
<th>Savings (b) (M BRL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public-State</td>
<td>20</td>
<td>41%</td>
<td>3,994</td>
<td>2,525</td>
</tr>
<tr>
<td>Public-Local</td>
<td>16</td>
<td>41%</td>
<td>441</td>
<td>280</td>
</tr>
<tr>
<td>Private</td>
<td>6</td>
<td>49%</td>
<td>198</td>
<td>104</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>44%</td>
<td>4,634</td>
<td>2,910</td>
</tr>
</tbody>
</table>

(a) If NRW reduced to SABESP levels (26%) and assuming same level of consumption
(b) Based on the water tariff of each company. (IN005)
(c) Companies with more than BRL50 mm in Op. Revenues

Source: Diagnostico dos Servicos de Agua e Esgotos – 2008, Ministerio das Cidades, Secretaria Nacional de Saneamento Ambiental, Sistema Nacional de Informacoes sobre saneamento (SNIS)
PPP – PUBLIC-PUBLIC WITH PRIVATE OPERATOR

PBC – WITH 55% COST SHARE

REDUCED LOSSES BY 35%

INCREASED SUPPLY FROM 11 HOURS TO 24 HOURS PER DAY

USED PRESSURE MANAGEMENT

Maceio/CASAL NRW PBC
Energy Efficiency for Rio de Janeiro

- Guandu Water Treatment Plant
- Capacity 43 m³/s (3.7 Mm³/day)
- One of the largest in the world
- ANEEL (Brazilian Electricity Regulatory Agency) Energy Efficiency Program
- Pump/Motor replacement
- Valve installation
- Variable frequency drives
- Energy savings = 25 M kWhr/yr
- Total investment = US$12M
- Annual Savings = US$1.67M
- Payback Period = 7.2 Years
FOZ - Brazil Private Concessions

By 2010, about 15% (486,000 people) of the population served by Foz will be located in Bahia (frontier).

Foz’s short-term growth targets would, even if achieved partially, consolidate Foz’s market share, while being strongly anchored in serving low-income population (“BOP”) concentrated in Brazil’s frontier markets (particularly with Compesa and Saneatins).

2.5 million people served (approx. 17.5% served by the WSS private sector)

Source: Brazilian Institute of Geography and Statistics (IBGE), Map of Poverty elaborated in 2003, based on the census of the year 2000
Brazil - Water Utilities / WESCO
Performance-Based Contracting (PBC) Manual

Phase 1
• Market Scoping
• Water Utility PBC Manual
  – Water loss reduction
  – Energy efficiency
  – Commercial efficiency
  – PPPs for water utility efficiency
  – Guidelines on performance contracts
  – Economic, legal, engineering aspects
  – Case studies

Phase 2
• Preparation of standard WESCO contracts

Phase 3
• Seminars
• Training
Keys to Success for Performance-Based Contracts

- Procurement methods
- Solid, transparent, agreed Baseline
- Understanding of existing conditions
- Measurable performance metrics
- Achievable, measurable targets
- Alignment of interests
- Well-designed incentives
- Performance monitoring system
- Payments linked to metrics
- Access to sites
- Clear accountability
- Risk allocation
- Ease of installation
- Security on investment/equipment
- Ownership of assets
- Payback periods
Squeezing out Every Last Drop
Resource Efficiency in the Water Sector

Thank You
Typical Water Supply System

Source: The Manager's Non-Revenue Water Handbook
A Guide to Understanding Water Losses (July 2008)
Ranhill Utilities Berhad and the United States Agency for International Development (USAID)