Boswell Capital

Investing in Water Infrastructure Projects

Installment 3: Performance-Based Contracts & Water Loss Control

January 2009

This is the third in a series of notes titled *Investing in Water Infrastructure Projects* to be published by Vatten Infrastructure Inc. This note is to raise awareness of the investment potential of performance based contracts in relation to reducing water loss and increasing efficiency of water usage.

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Summary

"Climate issues, growing populations and deteriorating water infrastructure are exerting unprecedented pressure on water resources throughout the world."[1]

The quantity of water that is lost in existing water transmission and distribution systems around the world is staggering, with loss rates often in excess of 30% and even above 50% or 60% in certain cases. Clearly, given the backdrop of decreased supply and increased demand, the case for improving these systems becomes increasingly important. This importance is directly linked to the cost of supplying additional water which, in turn, increases as the availability and quality of source water is reduced.

There is a body of knowledge and expertise that has been developed surrounding this issue and which has brought this complicated matter into a rather scientific framework which can be used as the basis for investments in these systems to improve not only their operational performance, but also their financial performance through reduced costs in producing water and increased revenues from the user base. This expertise has largely been developed in the United Kingdom in response to their rather early shift towards increased private sector participation in the provision of water, amongst other, services.

From a service delivery perspective, there appears to be ample opportunity for consultants and contractors engaged in this type of activity and, therefore, this work is of interest from an investment perspective on its own. What ought to be of even greater interest to investors is the potential gains that can be realized through performance based contracts which shift certain risks to the private sector in exchange for a portion of the improved bottom line of the utility for a specified period of time. These types of arrangements provide the appropriate incentive structure to private sector participants which benefit from maximizing profit while simultaneously improving a utility's system at little or no financial cost.

Furthermore, the water market, particularly in the United States and in Canada, as well as elsewhere in the world, is following the lead of the U.K. and Europe in taking steps towards increasing the role that the private sector can play in the delivery of water services. This market is host to a massive number of municipalities and utilities which heretofore have been closed to private sector participation when it comes to profit sharing but has rather opted for the less efficient methods of traditional procurement.

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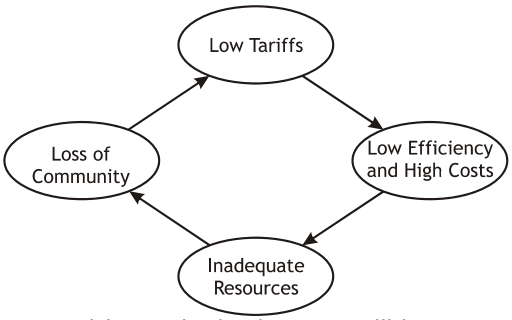
It is estimated that more than US$14 billion is lost every year by water utilities around the world of which more than one-third is in developing countries.[2]

"…it is not only financial consideration[s] (which) encourage utility managers to reduce water losses – in many parts of the world it becomes increasingly difficult to meet the water demand...

NRW rediction is extremely manpower intensive and thus difficult to manage. Governmentally owned water utilities which have very limited possibilities to pay performance related salaries to their staff and are limited by all kind[s] of legal restrictions, are mostly not in a position to substantially reduce NRW – even if the necessary know-how is available."[3]

The following graphic illustrates the vicious circle (adapted from source) that is plaguing many water utilities which have not established a sustainable regime for service delivery, whether for water or other goods[4]*:*



Vicious cycle plaguing water utilities.
Adopted from source[4].

Non-Revenue Water (NRW) Reduction

The following definition is from World Bank literature[5]:

Non-revenue water (NRW) is the difference between the volume of water put into a distribution system and the volume that is billed to consumers. It is comprised of three components:

- **Physical losses** comprise leakage from all parts of the system and overflows at the utility's storage tanks. They are caused by poor operations and maintenance, the lack of active leakage control, and poor quality of underground assets.
- **Commercial losses** are caused by customer meter under registration, data-handling errors, and theft of water in various forms.
- **Unbilled authorized consumption** includes water used by the utility for operational purposes, water used for firefighting, and water provided for free to certain consumer groups.

The Asian Development Bank estimates that the average NRW among asian cities is 30%, however, the range is wide from as high as 65% in Manila to as low as 4% in Singapore[6]. As noted in the original note in this series, the outstanding performance in Singapore has arisen out of the interests of national security and substantial government attention has been paid to this sector. As a point of comparison, Toronto's NRW is 14%[7].

That developing countries often report poor NRW figures further supports the increased use of performance-based contracts, in that the public does not have to finance any system improvements from its own sources, provided that appropriate deal structures can be established to protect the interests and investments made by the private sector.

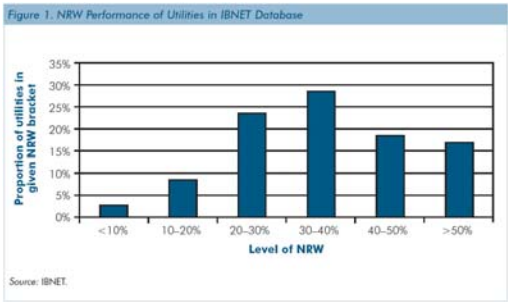
Miya Group (www.miya-water.com)

This group, based in Israel, has taken serious steps at establishing a dominant position in the global market for water loss. Commencing with an initial seed investment of US$100 million, they have engaged in the acquisition of what we understand to be controlling interests in established companies which are profitable in their own right and which include:

- **Veritec Consulting** (Engineering Consultancy, Mississauga, Canada)
- **WRP** (Engineering Consultancy, South Africa)
- **Romiya** (JV with Grup Romet, Romania)
- **Dorot** (Valve manufacturer, Israel)
- **Gutermann** (Data acquisition and leak detection, Switzerland)
- **IMGD** (Water Loss Manaement Specialists, Croatia)

In addition, a number of influential members from the International Water Association (IWA) Water Loss Task Force have been integrated into the Miya organization, all of which were present for Miya's official launch at the IWA World Water Congress which took place in Vienna in September 2008.

Although Miya has several relatively large scale contracts in their pipeline of prospects, as of the time of writing they have yet to engage their first. However, they appear to be very close to a deal with one of the concessionaires of Manila's water distribution system. Notwithstanding, the partner organizations (e.g., Veritec, etc.) continue to be productive and are likely yielding positive returns on investment to the consolidator.



Source: The World Bank[8, 9]

Based on the foregoing graph, more than 60% of utilities have NRW levels of over 30%[10].

Trinidad & Tobago

Instalment 2 in this series discussed the environment for investment in water infrastructure in Trinidad & Tobago.

There is currently a massive investment plan laid out for this country and some of the first projects that will be awarded (c. Q2 2009) include up to five relatively large desalination plants which will produce more water. This water will be delivered to distribution systems which currently lose **more than 50%** of the water which is currently produced. Adding additional water to these systems will result in at least this proportion being lost, and likely more as increased pressure translates into increased losses. Furthermore, desalination is a relatively expensive method for producing potable water and the value of any programme to control water loss is directly related to the marginal cost of water delivered.

Any investment in the production of new water must be met with investments in the integrity of the physical distribution as well as the relevant institutional systems (e.g., metering, billing, enforcement, etc.). Consequently, there is clear and present need for such work and the estimated value of capital required is on the order of hundreds of millions of US dollars.

The literature suggests that the root causes of high levels of non-revenue water include lack of training among the utility's personnel, lack of capacity and management focus as well as the appropriate institutional structuring. The recent completed replacement of the Board of Directors for the Water and Sewerage Authority (WASA) as well as other reforms are positive signals that reinforce the government's explicit aims of dealing with such issues.

Although the situation in Trinidad & Tobago is used as an example here, these and similar problems are relatively widespread throughout the world and particularly in undeveloped nations. Significant performance improvements are likely attainable and may be accompanied by impressive investment gains in this field.

Performance-Based Service Contracting

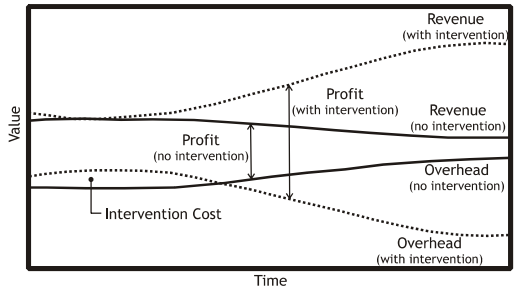
Thornton *et al.*[13], who estimate the domestic U.S. market size to be on the order of US$3.4 billion per year, provide an excellent overview of this matter:

"(Using) performance-based service contracting (PBSC)…the firm is paid for services and offered incentives to meet targets."[11]

"…the utility enters a special partnership agreement with a contractor or consultant…[who] is paid a portion of the money recovered from the project over a certain time frame. This is an excellent way of undertaking a project, especially for utilities that do not have a substantial initial budget to allocate for loss control, but do have an existing operating budget, which includes a fixed cost to operate the system *with* losses. The performance approach allows the utility to continue budgeting their normal allocation, however the actual cost of operation will drop and the revenue stream increase as the work continues. At a certain point the contractor drops out of the equation and the annual operating budget either reduces with an increased income, therefore profitability; or the additional funds can be redirected into other maintenance or training functions as required."

This approach is a form of the Output Based Aid (OBA) approach advocated by the World Bank and which has the following characteristics[14]:

- Performance improvement is made against defined contractual objectives where the private sector participant is paid for delivering results (i.e., outputs), instead of just inputs.
- In exchange for taking risks on project performance, the private contractor is given enough flexibility and resources to carry out the



Water System Optimization:
Sustainable solutions for improving water system performance (Source: Thornton *et al.*)[12]

Some interesting statistics for the U.S.:

"…many locations in the United States suffer from periodic water shortages, or project a long-term deficit in water supply…Surprisingly, there are no federal regulations governing how much water a supplier can lose…

There are 55,000 community water systems in the United States alone…

The amount of water lost…is more than enough to meet the delivery needs of the country's 10 largest cities."[15]

work according to its best judgement and experience.

- Reduces risk that the public utility will end up financing a large program with no or limited results.
- Does not affect the debt capacity of the government.

A simplified and typical application of this model requires that the private sector participant cover the required initial outlay of capital and benefit from all or part of the improvements in the system output above the established baseline performance at the time the contract iss initiated.

A straightforward example would be in the case of a financially underperforming utility where the private contractor is charged with making operational and physical improvements along with management of the system. Any improvements in the financial performance, such as net income, can accrue to the private contractor for the life of the contract; this provides an environment which promotes efficiency as the contractor has strong incentives to improve performance. At the end of the contract, the utility takes over a healthy and financially self-sustaining system, all without having paid any money from its own sources; all funds required to repay the contractor and provide its return on investment are derived from the improved performance.

Investment Characteristics

Performance-based service contracts for water loss (or non-revenue water) reduction typically have the following investment characteristics:

- A blend of work fees and performance bonuses appropriate to balance the risks and rewards amongst both the public and private sectors.
- In some cases, cost savings and/or increased revenues can be partially, if not entirely, enjoyed by the private sector contractor, making the upside potential significant.
- Payback periods can vary, however, and are often in the range of months to single-digit years.
- Internal rates of return can be in excess of 30%[16], unlevered.
- Relatively short contract and, consequently, investment tenors. That is, contract lengths of 5 to 10 years are common.

Economic Drivers

The key economic drivers underpinning the investment potential of such contracts include:

- The value of water.

  There are a variety of ways in which this can be measured, such as the tariff charged, or the marginal cost of production. As production costs increase, the more effective water loss control measures become.

- Structuring of performance based payments.

  This ties into the appropriate selection of performance indicators (PIs), their measurement, and the thresholds or relationships that drive the performance based payments.

- Flexibility on part of contractor.

  The extent to which the private sector contractor can influence design and implementation can have a dramatic effect on the overall project economics.

Concluding Remarks

"(By) reducing NRW to just half the current level in the developing world…water utilities would gain access to an additional US$2.9 billion in self-generating cash flow…"[17]

Source: The World Bank[18]

The world is only now waking up to the fact that there is an increasing relative shortage of clean, potable water to service a not insignificant rate of population growth and consumption patterns. Furthermore, as a result of its fundamental importance to life, coupled with the complete lack of potential substitutes, the investment potential is rather strong.

There are compelling reasons to invest in the improvement of existing water transmission and distribution systems, particularly those suffering from massive amounts of water loss. Some of these reasons include:

- Potential to decrease cost per unit of water delivered.
- Potential to increase revenue through increased delivery volumes.
- Generally a complete lack of substitutes for water.
- General increase in demand with population and lifestyle.
- General decrease in availability of affordable supply.

These systems are generally complicated and not well understood on a broad scale, however, there is a growing number of professionals in an established field of practice who are able to firstly and accurately assess, then target improvements, to these systems which will go towards cost reduction and additional revenue recognition.

It is this asymmetry which results in excellent investment potential, often resulting in projects which have very short payback periods, excellent rates of return and relatively short tenors when compared to more traditional infrastructure investment opportunities.

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