IMPLEMENTATION OF BUILD-OPERATE-TRANSFER SCHEMES: OBSTACLES & SOLUTIONS

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Abstract

The past 15 years have shown increasing interest in large-scale desalination worldwide, where seawater desalination has been proven a reliable and feasible source of potable and industrial water, alleviating increasing consumer needs, pressures and demands.

Many of the large-scale seawater desalination facilities built in the past years, or presently under construction, are delivered under a Public-Private-Partnership framework, and most of these projects are implemented by the adoption of a Build-Operate-Transfer (BOT) business structure.

The reason for the preference of municipalities, public utilities for the BOT structure relies mainly on the benefits associated with its cost-effectiveness, affordability and efficiency, as well as the clear transfer of risks from public to private sectors.

Successful large-scale BOT seawater desalination projects can be pinpointed in different business sectors and geographical (and cultural) areas, but all show common features that paved the way for their successful development and implementation.

Unfortunately, alongside the successful examples of large-scale BOT schemes implemented so far, plenty of initiatives and project offerings never materialized, being aborted at different stages of development. This bears the heavy cost of considerable effort, innumerable man-hours and significant resources, while ultimately not providing the requested service to the party in need of the water.

This paper focuses on these cases, addressing the main causes of the failure of suggested/initiated BOT scheme offerings and what prevented their successful implementation. The paper analyses the main constraints and obstacles characterizing these setbacks, and presents different solutions and alternatives to by-pass and/or overcome these obstacles that, if adopted, could enhance the possibilities of successful implementation of the projects.

In particular, the paper will focus on the obstacles to the execution and the implementation of a BOT scheme in developing countries, where a reliable water supply is one of the major keys for economic and social development.
I. INTRODUCTION

Historically, water management has been governed by the concept that it is a social liability to supply and subsidize water for the entire population. Social policy on water has inhibited the presence of the private sector. Water management has generally been fragmented and unsystematic. With a few exceptions, ministries, municipalities or public boards have managed water services among other priorities, with no investment planning and incentive for optimization. The lack of certain technical and managerial skills required to improve services and reduce costs, also characterized the global picture of the public water sector [1].

Shrinking budgets, fast track projects, new technologies constantly emerging in the market, and public demand for more/better service and lower rates mean that water providers can no longer afford to operate in the manner of “business as usual”. Consequently, over the last 15 years, there has been a major revolution in private involvement in the development and management of water resources in various parts of the world. In addition to great interest in private development of seawater desalination facilities, there are also increasing numbers of large municipalities that are contracting with private water management services companies to manage regional/urban water systems.

When Public-Private-Partnerships (PPP) are adopted to deliver large-scale desalination projects, they are often project financed with non- or limited recourse debt that is secured entirely by the project assets and the Water Purchasing Agreement (WPA). Rather than relying on the developer’s assets and creditworthiness, the lenders rely solely on the project cash flow for repayment of the senior debt, while the project assets are pledged to the lenders and serve as security.

On the other hand, the developer also needs the guarantee that the sale of the water will be remunerated. This guarantee comes from the take or pay contract. The payment structure considered in the WPA is based on the ability of the plant to meet water output requirements as requested (quantity and quality); the off-taker pays the Capacity Payment under the assumption that the facility is available to meet these requirements, and pays the Output Payment as compensation for the plant’s variable costs of dispatch.

Successful large-scale BOT seawater desalination projects can be pinpointed in different business sectors and geographical (and cultural) areas, which show that the development and financing on a non- or limited recourse basis is well established nowadays.

Although the peculiarities and contractual and financial characteristics differ between the projects, some common features can be distinguished that have paved the way for successful development and implementation of the project:

- A good understanding among all stakeholders (parties) involved of their respective roles, assignments, commitments and associated risks under the BOT structure;
- A balanced contractual structure, with clear allocation of the identified risks to the party best capable and more incentivized to handle and control these risks.
Unfortunately, many initiatives and project offerings never materialize, being aborted at different stages of development. This bears the heavy cost of considerable effort, innumerable man-hours and significant resources, while ultimately not providing the requested service to the party in need of the water.

The following sections analyze and discuss the main constraints and obstacles characterizing these setbacks, and presents different solutions and alternatives to by-pass and/or overcome these obstacles that, if adopted, could enhance the possibilities of successful implementation of the projects.

In particular, the paper will focus on the obstacles to the execution and the implementation of a BOT scheme in developing countries, where a reliable water supply is one of the major keys for economic and social development.

II. CONSTRAINTS AND OBSTACLES

2.1 Political Environment

BOT projects bear political risks, constraints and obstacles that vary in nature and magnitude: the environmental lobby or related bureaucracy and regulatory issues in California for instance, as opposed to those associated with dealing with an emerging market, or a low credit rated and developing country, can all impede or stop a project!

A stable political environment in the relevant developing country is a mandatory pre-condition for the successful implementation of BOT projects. Private sponsors will not be willing to spend the substantial amounts of time and money required to put together a BOT project, and then remain at risk for the 10 to 25 year periods that are typically required, if they cannot count on political stability and continuity over this period [2].

Additional political constraints can be associated with the risks of nationalization, a succeeding government repudiating the acts of the prior government, foreign currency restrictions, tax regime changes, change in law (for instance, changes in quality of the water supply legislation and regulations), loss or cancellation of land property concession, impossibility of obtaining license and permits, etc.

2.2 Financial/Economic Environment

Typical Project Financing is characterized by a long term loan, where the senior debt payment is secured through the capacity of the project to generate sufficient free cash-flow.

When evaluating involvement in a desalination BOT project, lenders’ first questions relate to whether the off-taker and/or the host country are bankable and whether the project itself is robust enough. Later, lenders relate to the investment grade required by international lenders; if this is not available or satisfactory, the risk insurance in place, or the involvement of export credit or multilateral agencies, is considered.
The financial constraints and obstacles in low credit-rated and developing countries refer particularly to the lack of funding sources, local or external long-term funding that is derived either from shortage of liquidity in the financial markets, lack of long term finance sources, poor appetite of international commercial banks and finance markets and lack of experience of local financial institutions.

Due to the associated high risk-profile of the off-taker and/or the low credit rating in the developing countries, long tenors and high gearing are unexpected to be available; Furthermore, high margins are most likely to be imposed by prospective lenders in the financial agreements.

Additional financial constraints relate to currency issues, such as drastic movements in the rates of exchange (local currency devaluation) and the inability in many cases to link the capital-recovery portion of the water price to hard currencies. Although hedging the local currency risks might be possible in some cases, the charges associated with this exercise are generally extremely high and the tenor of such exercise will be relatively short, not covering the loan tenor.

Other economic constraints are related to fluctuations in the base interest rate, the inflation indexes and fluctuations in the electricity tariff that affect the debt service, the returns to the developers and construction, operation and maintenance costs

2.3 Infrastructure and Site Related Issues

Allocation of a suitable site for a large-scale desalination facility demands thorough analysis of several factors; the most important being technical, economic, social and environmental [3, 4, 5, 6]:

- Site location shall meet land use, environmental, town/rural planning regulations, law requirements and statutory restrictions;

- Site area shall be suitably located in a marine environment where adequate quantity of feed seawater with good and steady quality can be abstracted at reasonable cost;

- Site shall be at a location where the brine can be discharged without adverse environmental effects, while other effluents can be properly discharged according to set parameters for effluent water quality;

- Site area extent and geometry shall be appropriate to accommodate all the facility’s operation units, thus optimizing its layout and minimizing construction work costs; site’s soil and geotechnical conditions shall be suitable for construction of the facility structures;

- Easy access to the site;

- Site location shall enable easy and feasible access and interconnection to energy sources (power grid or independent power production), and to the water supply networks;

- The proximity of the desalination plant to populated neighborhoods and environmentally protected and sensitive areas are also critical factors.
The selection of a technically, economically, environmentally and socially accepted site, as per the above criteria, will reduce the risks involved in the design, construction, and operation and maintenance of the project, as well as generally decrease the unit cost of water.

Among the above topics, the main topic that poses a serious constrain and obstacle in a developing country is that related to a reliable supply of high-voltage energy to the plant site. The inability of a water supplier to produce desalted water due to a grid failure is a critical risk affecting Capacity and Output Payments, which seriously concerns the lenders who seek continuing payment of the senior debt during outage periods. It is also a major concern of the developer that must secure a continuous reliable energy supply in order to fulfill its’ obligations under the water supply agreement and in order to meet the return of its investment.

2.4 Statutory and Regulatory Frameworks

Good practice dictates that government policy and statutory and regulatory frameworks should be in place to enable long-term desalted water sale under a BOT scheme. Good regulation largely relates to whether, and to what extent, the regulatory process helps achieve government policy objectives for the infrastructure sector, whatever those policies may be. However, one should bear in mind that regulation is only part of an entire sector reform package that might encompass sector restructuring, corporatization, commercialization, and private sector participation [7].

Under a BOT scheme involving the sale of water produced in a desalination facility, such a statutory and regulatory framework is necessary to ascertain that the construction and operation of the plant is performed according to existing regulations and laws, as well as to regulate the allocation and split of risks between the developers and the off-taker, for instance, assuring the take-or-pay principles [3, 8].

Taxation pre-rulings are also an important framework defining the tax related liabilities of the developer under the WPA. These also apply to mandatory payments concerning the plant site.

A legislation framework related to environmental issues, seawater abstraction and brine discharge, land occupation and activities, building permits, rights-of-way, etc., are also crucial for ensuring the compliance of the WPA terms and conditions under the BOT structure [9].

In countries where no regulator or regulatory regime has been established, the terms and nature of the commercial agreement between the private operator and the grantor becomes even more important, particularly considering the impacts of the future introduction of a regulatory regime. There must be a clear division of operational responsibility between the private and public sector. It is expected that such statutory and regulatory frameworks may not be extensively in force in developing countries, in addition to the lack of knowledge and experience of the off-taker and/or host country governmental bodies and entities in charge, thus imposing certain constraints and obstacles to both the developer and the lenders.
2.5 Contractual and Off-Taker Related Issues

Although there are different ways or structures adopted for desalination BOTs, some fundamental principles apply, for example, drafting the off-take agreement according to international practice addressing lenders’ requirements regarding the “bankability” of the WPA and imposing limited risks on the developer, especially under circumstances beyond its control. The main issue refers to whether there is a suitable contractual and commercial framework for risk allocation that addresses the following main questions [10]:

- Is there a strong off-take covenant in place?
- Can the future cash-flow of the project be reasonably and well determined?
- Are the tariff structure and regime robust enough to ensure that the project is able to meet debt service requirements?
- Is additional sponsor support required in terms of construction, operation and maintenance, or other risks?
- Are senior lenders secured in cases of termination?
- Do Force Majeure provisions in the WPA (at least those listed as “governmental” or “political” events) allow performance relief and assure the payment of the Capacity Payments?
- How solid is the Land Lease Agreement in securing the developer’s rights?

As can be expected, a negative answer to the above questions emphasizes an unbalanced allocation of risks and consequently a high risk profile of the transaction, thus boosting the reluctance of the developer to embark on such a venture and reducing the availability of potential lenders to offer attractive finance packages. Such a situation is most likely to occur in developing countries and among less sophisticated off-takers.

2.6 Construction and Operating Issues

In order to produce a guaranteed amount of desalted water against an agreed tariff, the developer needs to manage, inter alia, the construction of the facility and its subsequent operation and maintenance, and equip itself with all related services required to meet his obligations. The failure to complete the project according to the budget and in a timely manner, and the incapacity to run the facility smoothly, are fundamental risks, since this is when all stakeholders involved are more exposed. In order to control these crucial points, a reputable EPC contractor is engaged under a lump-sum, turn-key data certain EPC contract, while a reputable O&M Contractor undertakes to operate and maintain the facility at a fixed annual agreed and variable price under a long-term (identical to the term of the BOT agreement) O&M agreement. The operator is liable for the complete service scope of operation, maintenance and repair, including spare parts and procurement of consumables, metering and monitoring plant output.
The O&M price mechanism should also be linked to a basket of indices reflecting its main inputs, thus enabling the contractor to undertake the operation for the full term of the contract. This indices basket should be supported back-to-back by the indices basket under the off-take agreement.

In this manner, the construction schedule and plant performance risks under the WPA are transferred to the EPC contractor through a mechanism of delay and performance liquidated damages. With regard to the operator, the O&M agreement incorporates a performance incentive and penalty regime (plant availability, capacity, and desalted water quality and energy consumption) ensuring that it continues to meet the WPA requirements and project O&M budget.

The main constraints and obstacles when undertaking this type of venture in a developing country relate mainly to the following factors:

- Lack or shortage of a local professional work force and sub-contractors able to support the EPC and O&M Contractors;
- Lack or shortage of availability of raw materials and construction equipment, machinery, tools, consumables, etc., thus imposing encumbrances on construction and operation performance, delays in construction, increased logistics, increased costs and longer lead time.

III. MITIGATION OF CONSTRAINTS/OBSTACLES AND POSSIBLE SOLUTIONS IN DEVELOPING COUNTRIES

In making a decision to implement a seawater desalination BOT project, the off-taker seeks to achieve a number of objectives. It wants limited or no capital investment from its budget and looks to the developer to assume most of the financial and technological risks. If the off-taker is a governmental, state-owned entity, it also seeks to maintain control, or a certain involvement, over the crucial aspects of the project, mainly because the government needs to assure a continuous and sufficient water supply and because governments always want to control their country’s water resources.

The developer seeks government support and endorses the project, as the project’s likelihood to be financed increases when lenders are more secure in their belief that they will recover their money. Sometimes it is a public organization that guarantees the project, but this organization does not always have sufficient resources to guarantee the financing of the project.

3.1 Political Environment

A stable political environment in the envisaged developing country is a mandatory pre-condition for the successful implementation of BOT projects.

A recommendable tool is to rely on the support of insurance companies that can cover certain political risks. Such coverage can be purchased with MIGA, which is part of the World Bank Group, and it is also available in most Export Credit Agencies (ECAs). Although such insurance coverage increases the financing costs of the project, it provides the only solution available to mitigate these types of risks in certain developing countries. Additional mitigation measures comprise:
• Appropriate contractual clauses such as a “tax pre-ruling” or “pass through” for tax regime changes;

• A Direct Agreement between the off-taker and the lender, which will provide certain protection to the latter if the project is nationalized, although this does not really protect the developer;

• Adequate legal status of the land if the land lease agreement is violated.

3.2 Financial/Economic Environment

The credit rating of the off-taker and the host country is a primary factor in evaluating the bankability of a BOT project and its’ likelihood to be implemented. Developing countries that have a relatively high credit rating seem to have a better chance of developing BOT projects than countries with lower ratings.

The first rule here should be: developer, be ready for lower gearing (i.e., more equity) and shorter tenor. The limited funding resources and higher risk profile in the developing countries will immediately affect three important parameters: a) the interest rate will be high; b) the gearing will be low; and c) the loan tenor will be relatively short. This will, without doubt, have an impact on the desalted water price.

While negotiating the water price with the off-taker in developing countries, developers must convey this message and reasoning behind it to its counter party. In such cases, a sovereign guarantee could assist, but it should still be borne in mind that through the eyes of an international lender, the risk of a project, even when the off-taker payments are backed by this type of tool, will always be higher than those associated with the country risk as indicated in the risk profiles of the different countries. Therefore, the margins negotiated will always be higher than the government bonds’ yield traded in the international markets.

Local financing should always be explored, as local lenders will see a lower risk profile than international lenders. This path should be assessed with the assistance of local advisors, familiar with the market and the local prospective lenders.

Other possible alternatives include relying on bilateral financing institutions such as the World Bank group, various Development Finance Institutions (DFIs), ECA’s and international commercial banks. Since for countries with low credit rating it is expected to be extremely difficult to obtain senior debt from commercial banks, developers should rely mainly on the bilateral organizations.

Local financing in local currency can eliminate the need for currency risk hedge of the Capital Recovery Component of the water price (at least for the senior debt service portion), a hedge which cannot always be found. Financing in hard currency will require that the WPA stipulate the linkage of the Capital Recovery Component of the water price to the exchange rate of this hard currency. Very few, if any, lenders will be willing to take long term currency risks.
With regard to other financial and economic issues, the BOT contract should provide a clear mechanism for linking the water tariff to fluctuations in the CPI indexes associated with the different currencies and changes in the electricity tariff (pass-through).

3.3 Infrastructure and Site-Related Issues

In many developing countries, electricity supply and grid distribution are not sufficiently stable. Production capacity is lacking and the electricity supply is not always reliable, uniform and continuous. Ensuring mitigation of these interruptions and failures in the grid is the main concern of the stakeholders involved in the BOT, as these affect the ability of the water supplier to produce product water, thus preventing him from fulfilling his obligations under the WPA.

Mitigation is possible in two ways. The first is to include an Independent Power Producer (IPP) as part of the project. This will complicate the transaction and require a long term, continuous and reliable supply of fuel (natural gas, oil, etc.), but in many developing countries the oil and/or natural gas supply are more achievable than electricity, making this a good solution. In many cases the off-taker will encourage this solution as it also helps alleviate the problem of electricity shortage.

If this type of solution is not achievable or feasible, the developer will have to take the second route and make sure that the responsibility of electricity supply falls under the off-taker’s obligations under the WPA, and any interruption in such supply will not derogate from the Capacity Payment obligation.

Furthermore, since energy comprises a relatively large proportion of the operating costs of a desalination plant, a clear and transparent indexation mechanism, according to fluctuations in electricity tariffs, should be incorporated in the WPAs. Regarding rest of the obstacles mentioned in section 2.3, there is not much difference between developing countries and other places. The developer has to make sure that the site is properly located, that connection to the water grid is available and that land lease agreement for the project term is drafted in an appropriate manner as to ensure that it will be bankable and will secure the developers rights.

3.4 Statutory and Regulatory Frameworks

Proper statutory and regulatory frameworks are key elements for the successful implementation of a BOT scheme. In developing countries, such frameworks are not always available and in some instances the experience of the off-taker and/or authorities in this regard is limited. Therefore, the primary objective is the development of a legal framework that permits the grant of BOT concessions or specific contractual or licensing rights to private sector entities.
The extent to which the legal regime minimizes legal uncertainty in connection with the award and implementation of BOT schemes, allows the BOT granting authority, allows developers and lenders to contractually allocate risks among themselves and takes into account the interests of lenders to ensure effective security over a project, can enhance the bankability, and thus the viability, of BOT projects. There are a few areas where policy makers can act to enhance the bankability of projects through the development of appropriate BOT regulation [11]:

- **Power of Granting Authorities:** A risk that lenders are not comfortable taking is whether or not the BOT agreement was properly signed by the responsible authority.

- **Tax and Licensing Regimes:** The implementing or overriding legislation that supersedes other laws has to be transparent and crystal clear.

- **Means of Resolution:** BOT schemes should be governed by investor-friendly choice of laws, rules and dispute resolution mechanisms.

- **Aim for Market-Sensitive Stabilization:** Lenders are not comfortable taking legal risks associated with changes in the legal regime that affects the economics of a project. Therefore, a clear compensation principle regulation shall be in force to address such changes.

- **Securities:** Regulation shall allow lenders to take effective securities.

- **Direct Agreements:** These provide formal recognition of lenders’ interest in a given security; provide cure and substitution rights if the developer does not fully meet its obligations and ultimately provide a waiver of sovereign immunity.

Developers must make sure that they work within a framework that supports and protects the BOT structure and principles. Direct discussions with the regulators is very important for understanding the legal environment, as well the use of leading local law firms that will ensure that implementation of the BOT scheme is possible from a legal point of view. In cases were such an environment does not exist, developers may also suggest that an international and reputable consulting firm help with and advise on, the creation of such frameworks, thus enabling a workable structure. It is imperative that the relevant authorities understand that the necessity of such frameworks is crucial for lenders, and that BOT projects cannot be successfully implemented in its absence.
3.5 Contractual and Off-Take Related Issues

An off-take agreement based on international practice and proper risk allocation is a key element in the execution of a project. It is recommended that this agreement be drafted with the assistance of an experienced international law firm, and that it incorporate a proper and bankable risk allocation mechanism. The main elements to be considered are [7]:

- Bankability of the off-taker and sovereign credit support in cases where the off-taker is not stable and not financially strong enough.

- Macroeconomic risks such as exchange rates, inflation, electricity price and fluctuation in base interest rates should be assumed by the off-taker. Private developers and/or lenders cannot take such long term risks, especially in developing countries where the economic environment is less stable.

- The take or pay mechanism should be clearly defined and it should be ensured that, subject to availability, the capital recovery component is always paid and senior lenders are protected.

- Events that are beyond the control of the developer (such as force majeure) should be covered by the off-taker (in cases where insurance is not available). This is a basic and fundamental request of every lender.

- A refined compensation mechanism is required in order to achieve a more balanced agreement in case of change in law.

- Dispute resolution: due to the long-term nature of BOT schemes, it is necessary to make use of a range of different mechanisms, from expert determination to arbitration, often a panel or committee mechanism of some kind to allow adjustment of the agreement to cope with the impact of exceptional events. The subject of choice of law and jurisdiction creates an inevitable clash between lenders’ policy (seek some form of widely recognized international system) and local off-taker policy (who claim that they have to make use of the local arbitration system). This conflict can become even more severe in developing countries where the legal system is not well recognized by and not always transparent to, foreign entities. In such cases, the most one can do is offer a plea for restraint, understanding and flexibility on both sides in order to reach the most appropriate result.

- Termination events must be clearly drafted and lenders must be protected under such events. If the agreement is terminated, the sponsors will lose their investment, the lenders will lose the cornerstone of their security and the project will collapse. Defining the ground for termination is one difficulty. However, addressing the issue of compensation is the greater difficulty. Off-takers such as municipalities and conceding authorities may have difficulty understanding why any compensation should be paid to the project company when it is in default. Why should the developer, who has made a mess of things, be paid anything? Of course the answer to this is in the fact that some very valuable assets could be transferred to the off-taker as a result of this.
termination. Lenders, however, are likely to insist on being paid out, whatever the reasons for termination, and that has to be respected.

- A similar rationale also applies to step-in rights, which have to be duly incorporated into the WPA.

In the developing countries, the political environment is not always stable and the regulatory environment of BOT schemes is not always comprehensive and supportive. In this case, the developer should pay particular attention on legal aspects by using experienced legal advisors (local and international), making sure that the legislation is supportive and enables the execution of such a project. Another solution often used is joining forces with local entrepreneurs that have the local connections necessary to maintain good working relations with the offices in charge.

3.6 Construction and Operating Issues

Under the assumption that reputable and experienced EPC and O&M contractors are fully engaged in the construction and operation and maintenance of the desalination facility under adequate EPC and O&M agreements, customary construction and operational risks (mistaken design, equipment failures, delays, budget overruns, inefficient operation management, etc.) are actually transferred from the project company to these contractors, thus they are controlled and hedged.

Regarding the constraints and obstacles mentioned before and more likely to occur in a developing country, namely lack or shortage of a local professional work force and sub-contractors to support the EPC and O&M Contractors, and lack or shortage of the availability of raw materials and construction equipment, machinery, tools, consumables, etc., the mitigation measures are restricted to a) performing thorough local market research analyzing the local alternatives for subcontractors, import restrictions tax and duties, local costing, etc., or b) factorizing the anticipated additional costs, delays in construction, increased logistics and longer lead time into the corresponding EPC and O&M prices, and the related commitments of these contractors, as expressed in the EPC and O&M agreements.

IV. CLOSING REMARKS

Many BOT projects have been proposed, but few have proceeded to financial closure and full implementation in developing countries. BOT projects bear some complexity from both financial and legal points of view. They require potential sponsors to spend years and millions of dollars on development and negotiation. They present novel issues for many potential off-takers and host governments as to the proper allocation of risks.

The BOT approach appears to offer one possible method for developing and financing infrastructure projects in developing countries, provided these countries are sufficiently ready to deal with the technical, financial and legal complexities, are willing to provide the necessary government support, and are sufficiently creditworthy to attract the necessary private sector equity investment and debt financing. Any host government contemplating a BOT project should obtain expert counsel and advice on the technical, financial and legal issues involved.
The main constraints and obstacles preventing the smooth implementation of a BOT scheme in developing countries have been discussed and analyzed, together with different solutions and alternatives that overcome or mitigate their intensity and impact. The main solutions are:

- **Political Environment:** Rely on the support of insurance companies, such as MIGA (World Bank) and most ECAs, which can cover certain political risks. Furthermore, additional mitigation measures include: a) appropriate contractual clauses such as “pass through” for tax regime changes; b) Direct Agreement between the off-taker and the lender that protects the latter if the project is nationalized; and c) adequate legal status of the land if the land lease agreement is violated.

- **Financial/Economic Environment:** As the funding resources in the developing countries are limited and the risk profile is higher, it will immediately affect three important parameters: a) the interest rate will be high; b) the gearing will be low (more equity); and c) the loan tenor will be relatively short. This will, without doubt, have an impact on the desalted water price.

A sovereign guarantee from the host country could assist, although even in this case the project risk will be higher than that associated with the country risk as indicated in the risk profiles of the different countries.

Local financing should always be explored, as local lenders will see a lower risk profile than international lenders. Furthermore, financing in local currency can eliminate the need for currency risk hedge of the Capital Recovery Component of the water price. Financing in hard currency will require the WPA to stipulate the linkage of the Capital Recovery Component of the water price to exchange rate of this hard currency.

With regard to other financial and economic issues, the BOT contract should provide a clear mechanism to link the water tariff to fluctuations in the CPI indexes associated with the different currencies and changes in the electricity tariff (pass-through).

- **Infrastructure and Site-Related Issues:** The selection of a technically, economically, environmentally and socially accepted site reduces the risks involved in the design, construction, and operation and maintenance of the project, as well as generally decreases the unit cost of water. A continuous and reliable supply of electricity to the site is to enable the water supplier to fulfill its commitments under the WPA. A possible solution to overcome electricity supply constraints is to incorporate an IPP at site, although this increases the complexity of the project and the achievement of the Financial Close. Another possible alternative is to entirely allocate the liabilities of the energy supply to site to the off-taker, so that any interruption in such supply will not derogate from the Capacity Payment obligation thus protecting the developer’s rights.

- **Legal Environment:** the laws and regulations under which the BOT project operates must be readily ascertainable and compatible with the project’s private nature. Developers must ensure that they work within a framework that supports and protects the BOT structure and principles. Direct discussions with the regulators are very important for understanding the legal
environment, as is the use and support of leading local law firms in the host country to ensure that the implementation of the BOT scheme is possible from a legal point of view. Direct Agreements between the off-taker and the lenders provide formal recognition of lenders’ interest in a given security; provide cure and substitution rights if developer does not properly fulfill its obligations, and ultimately provide a waiver of sovereign immunity.

An off-take agreement based on international practice and proper risk allocation is a key element in the execution of a project. It is recommended that such agreement be drafted with the assistance of an experienced international law firm, and that it incorporate a proper and bankable risk allocation mechanism. The main elements to be considered are: a) take or pay mechanism; b) non-insurable events, or events beyond the control of the developer, should be covered by the off-taker; c) transparency regarding macro-economic risks (exchange rates, inflation, electricity price and fluctuation in base interest rates); and d) dispute resolution, compensation, termination and step-in rights.

- Construction and Operation Issues: to cope with the lack or shortage of a local professional work force and sub-contractors to support the EPC and O&M Contractors, and the lack or shortage of the availability of raw materials and construction equipment, machinery, tools, consumables, etc., the mitigation measure is simply to factorize the anticipated additional costs, delays in construction, increased logistics and longer lead time into the correspondent EPC and O&M prices, and these contractors’ related commitments as expressed in the EPC and O&M agreements.

The experience of recent years has shown that, notwithstanding the constraints, a few desalination projects have been implemented in developing countries despite their higher risk profile. Although their implementation took longer than the time required for similar projects in other places, both the securing of financial close and the construction of the facilities, they nevertheless provide a good example that such an endeavor is achievable. These plants provide an additional water supply in these areas and definitely contribute to the economic and social development of the region in which they have been implemented.
V. REFERENCES


