Financing Damns and Sustainable Development

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LESSONS FROM THE HYDROPOWER SECTOR

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Introduction

About 55% of the dams built in the last two decades have been for hydropower. Irrigation accounts for about 35% and water supply/flood control only about 10%. These are very crude figures, masked by the fact that many projects are multi-purpose, but they are sufficient to show that hydropower is a main player when it comes to dam building.

Experience shows that in general it is only hydropower and, in some circumstances water supply, that has the necessary financial muscle to attract private investment. In most cases irrigation and flood control cannot generate the level of revenue that is necessary to sustain the additional cost and debt servicing obligations inherent in private financing.

In a world where financial resources are limited, it is therefore logical that the organs of public sector financing (the multilateral development banks, bilateral donors and state enterprises) should draw back from power, leaving it to fend for itself and find funds wherever it can in the private arena. This has been the policy over the last decade or more. It has worked reasonably well in the thermal power field, funnelling investment into a large number of mainly gas-fired power stations, but it has not been a success as far as hydropower is concerned. We urgently need to learn the lessons from this experience, and to determine where they are pointing for the future.

In a study carried out by the author a few years ago[1] it was found that, amongst the new-start generating projects in the private, hydro was outnumbered by fossil-fuel projects (measured on a capacity basis) by a factor of forty to one. More recent figures covering the period 1994-2000, when private power investment was probably at its height, suggests that hydro accounts for only 4% of new private generating projects, with over 90% being fossil fuelled. Although there may be a very small minority amongst the anti-dams lobby who might welcome this, most people would regard it as an untenable situation for a world that is worried about global warming and sustainability.

There is insufficient space here to go into all the reasons for the weak performance of hydropower under the private funding scenario. It is sufficient to note that, with only a few exceptions, the hydro sector is just not proving to be sufficiently attractive to private investors or lenders. Therefore we should try to learn the lessons and focus on the changes that need to be made to improve the prospects of funding new dams, irrespective of whether they are for hydropower or any other purpose.

It goes without saying that such projects should be environmentally sound. This aspect will no doubt be covered extensively in other papers, so this paper will instead look briefly at some of the key factors that can be drawn from our experience of the hydropower sector other areas, relating in particular to:

- The role of the public sector in private development;
- The need for alternative financing models;
- The relationship between financing and the contracting arrangements for the construction phase.

The Role of the Public Sector

The normal vehicle for private sector participation in power generation is the single-purpose company, often referred to as an Independent Power Producer (IPP). In the early days of IPPs there was a mistaken belief that the public sector would somehow become a completely passive party to the process, leaving the private sector with total responsibility for financing and development of the projects - and certainly carrying all of the associated risks. This was never a starter, particularly for hydropower where all our experience to date suggests that a well-structured IPP arguably requires more involvement on the part of the government than any public project implemented along traditional lines. The private option is certainly more demanding in many respects, and requires an entirely different range of skills from the government side.

It is claimed that good practice in IPP development implies[2]:

- Competition and Transparency
- Predictability
- Reduction of risk (for the public sector)

If only it were that easy! These are laudable objectives, but in practice they are proving to be extremely elusive, and governments are facing serious challenges in trying to attract private sector participation into hydropower. Amongst the issues that the host government, or its utility, has to address are the following:

i) **Project definition studies.** It is essential that the host government gets the project that is most suited to its long-term objectives, as opposed to the project that the private developer wishes to build. The two can be very different because the perspective of the private company will be dominated by the need to optimise its own commercial position, which will be dictated by the terms of the PPA and the need build the project as quickly as possible at the lowest risk. An obvious example would be the temptation to build a run-of-river plant at a site where storage is possible and might ultimately prove highly beneficial for multipurpose use in the longer term. This is essentially the difference between optimising the project on economic criteria (the government's viewpoint), and financial criteria (the private developer's viewpoint).

ii) **Procurement.** Once the preferred project has been identified and prioritised, the host government then faces the problem of procurement. How does it identify the private sector partner, and negotiate the terms of the concession, bearing in mind that neither party will know the exact cost or output of the scheme, and that the situation surrounding each project is totally unlike any other? A hydro site is a unique national asset, and there is clearly an obligation on the part of the government to obtain the best deal, but experience has shown that price-related bidding is not usually a viable option and attracts little, if any, interest. The solution to this is normally to develop a formula, based on benefit sharing principles, but in these circumstances it can sometimes be difficult to demonstrate adequate competition and transparency.

iii) **Risk allocation.** The financing of any private project tends to be dominated by the debt element, and therefore it is the lenders who in the end will dictate what is acceptable. In practice they will be more conservative than the developer because for them there is no upside, only a downside if things go wrong. The power of the lenders is considerable, and it is not unknown for the project promoter to be forced back to the negotiating table by them with a view to placing more of the risk on the public sector. The outcome is that in many cases the expected transfer of risk from

the public to the private partner does not occur, and the public sector ends up assuming most of the risks it had previously carried in order to make the project bankable.

iv) **Project Agreements.** A privately financed project involves a hierarchy of interlaced agreements, starting at the top with the Concession (or Implementation) Agreement where the relationship between the host government and the private developer are set out. This is a critically important document for the government - as is the Power Purchase Agreement with the local utility. Such negotiations are proving to be long and costly affairs, and the host government needs support to ensure that it remains actively engaged at all stages. There are many other agreements to be put into place (e.g. financing, owners, construction, O&M) in which the government will have an interest. It is not to the benefit of either side to spin out the pre-contract stages, but there are cases where it has taken nearly ten years to reach Financial Closure, and sometimes then failed. This is not an acceptable state of affairs, and it is certainly not producing predictability.

v) **Guarantees and Counter Guarantees.** The financing of projects like dams, where there is a large element of local costs, means that the scope for export credits is limited. Therefore, in addition to the equity, there will need to be a significant element of commercial financing, possibly as much as 50% of the total cost. This places heavy demands on the need for Sovereign Guarantees on the part of the government, which will often have to be backed in one form or another, from the multilateral development banks and similar organisations. The MDBs will usually require the host government to provide counter-guarantees, which are classified as potential liabilities. There is concern that not all governments fully appreciate the implications from the viewpoint of managing external borrowings and maintaining their international credit ratings.

These are just a few of the issues that governments or their agencies have to address. There is still a need for many government agencies to develop skills in the negotiation and management of private financing deals, where the constraints and objectives are very different from those that they were accustomed to under the old system of public sector financing.

Need for Alternative Financing Models

In meetings of this sort it is commonplace to hear the phrase “Public-Private Partnership” without any clear definition of what this means. The reason is quite simple - it means all things to all people. This is a large subject that clearly merits closer attention, but in the interests of brevity I will just focus on two issues - "ownership" and "risk allocation"

Ownership.

The existing financing model for IPP projects generally associates the concept of “ownership” with the idea of private funding. The reasoning is that the Special Purpose Company finances the project, and therefore owns it. While this is entirely logical in the case of, say, a piece of capital equipment, the idea of “ownership” takes on an entirely different perspective when applied to immovable infrastructure such as a dam. In this situation the owner is invariably bound into a Single-buyer model and, irrespective of what it cost, the asset has no intrinsic value of its own other than the revenue stream it creates. Under these circumstances it is not meaningful to equate "ownership" with "asset value" and it is questionable whether there is any benefit to the private partner in actually owning the project.

On the other hand "ownership" can be a sensitive issue to the host government. The idea of handing over the ownership of a unique site, and the control of valuable land and water

resources to a private company that is often foreign-owned can be very troublesome for any government. As we have already seen, it is not easy to determine how such rights can be valued, or how the concession can be awarded in a competitive and transparent manner. There are also potential conflicts that can underlie the interests of the short-term owner (the private partner) and the long term owner (the government); for example, over standards of design and construction, or flow release patterns if the project affects other riparian interests..

While all of these matters should be manageable under the private scenario, it becomes much more difficult for the host government if it is called upon to freeze its rights in agreements (with private owners) which might extend over a period of perhaps twenty-five years. Without knowing what the future may bring, there has to be some flexibility to allow the host government to alter the principles of water resources management (and, in particular, the operation of any reservoirs) to reflect changing circumstances and shifting priorities.

These factors make the idea of private ownership difficult to apply in the context of a large storage dam. But what is the alternative, given that there is likely to be very little public funding available? In the author's view, when it comes to dams we need to stop thinking in terms of private projects, and focus on the best way of attracting private funding to public projects. There is nothing new in this concept in the developed countries (it is, after all, the basis of the *Private Finance Initiative* in the UK) but it is virtually unknown in the emerging economies where much of the future dam building activity is likely to occur.

Risk Allocation

A lot is said about risk. But the risk of developing a dam/hydro project has not changed. The only thing that has changed is the way we view it.

The difficulty with the conventional Project Finance model is that it tries to ring-fences all the foreseeable risks within the one project. By the time that each party has covered itself against every possible adverse event, and contingency has been heaped upon contingency, the project price has escalated out of all reasonable contemplation.

There is an urgent need to move this risk (which is unavoidable in the case of dams) away from the individual project and onto a higher plane where it can be pooled amongst a wide portfolio of projects. To a large degree this is happening anyway, as the utility and the host government end up assuming many of the project risks.

Under a system where the government supports the obligations of the utility, and the international agencies in turn supporting the obligations of the government, one wonders why people are bothering with all of the complexities of Project Financing. Why, instead, not adopt a system under which the utility raises the funding directly under essentially the same package of guarantees?

Time for a Hybrid Approach?

In the hydropower world we have attempted to move from one end of the spectrum to the other - from the old system of publicly owned and publicly funded projects, to a totally new system of privately owned and privately-funded projects. On the face of it neither of these options is going to be tenable in the future, and in the author's opinion we should now be actively considering hybrid models based on the private financing of public projects.

Under a hybrid approach the utility would retains ownership and total control of the project at all stages, and private financing would then need to be raised by bonds backed by the government and international guarantees. Of course there are many questions to be answered, including when the bonds are raised (before construction or refinancing?). An alternative approach could be a formula reverting more towards contractor financing of civil works, to supplement the ECA support that is generally used to finance the equipment portion of the works.

In effect, we have to totally rethink the formula for the relationship between the public and private sectors to attract private investment in dams and avoid a situation where the private sector is at best lukewarm, and the public sector ends up with many of the disadvantages of privatisation (such as higher tariffs) with few of the benefits.

Contracting Arrangements for Construction

Finally, it would be wrong to finish without some reference to the relationship between the financing and the construction arrangements, because this has been another problem area since the emergence of IPP companies with their insistence on fixed-price, turnkey contracts. This concept, driven as much by the lenders as the investors, derives from industries where the project specification and the inputs required can be clearly defined in advance. This is not possible with dams and similar projects where civil works with a large ground-contact element give rise to the need to continually refine the design as work proceeds.

In practice it is very difficult to persuade any responsible contractor to bid a fixed price for a dam or similar works. Few are prepared to expend the time or money involved in preparing a complicated bid, or to take the risk of cost overruns if the tender is accepted. The difficulty is accentuated in the case of hydro projects where there are likely to be many contractors involved in a turnkey consortium, so that there are inevitably a lot of interfacing problems. Therefore the result of any solicitation for a fixed price bid is likely to be an embarrassing absence of bidders, or a very high price - or, worst of all, an apparently attractive price from a poor contractor who fails to understand the nature of the works or the risks involved until it is far too late.

Some owners have been slow to recognise the implications of accepting a fixed price from a turnkey contractor, and then giving the contractor effective control over the design. Without a secure Project Brief (which is very difficult to achieve with civil works) the temptation for the contractor and his designer to pare down the design to reduce costs will be irresistible. In many cases the owner may suspects that things are going wrong, but be in no position to intervene because of the contractual consequences. This is a thoroughly unsatisfactory state of affairs, and is likely to result in a project that will require more maintenance in the long run.

These problems do not arise when the owner retains control of the design and specification throughout the implementation phase, so that he retains the right to change the design to respond to ground conditions as the work proceeds. The corollary of this is that the final cost of the works is not known until the end, but most experienced engineers would agree that this is a modest price to pay for ensuring the quality and longevity of the final project. Unfortunately most lenders have yet to be convinced of the strength of this argument, as their interests are best served by having a fixed price in advance.

The financing model largely determines the construction arrangements, and the construction arrangements have a significant influence on the cost of the project. It is important for people to understand the nuances of the different contracting arrangements, and in particular the effect that they can have on the quality of the finished product or the end cost (for turnkey the general consensus is that it adds 20% to 30%). It is necessary to recognise that risk and responsibility are linked, and that the assumption of risk comes with a price tag. In the final reckoning it is essential that all parties appreciate the implications of the actual construction arrangements adopted, and that adequate contractual checks-and-balances are in place from then outset.

Conclusion

It is evident that with public funding is drying up we still have some way to go to establish workable mechanisms for attracting private finance for dam construction. Financing is all about confidence – confidence in the security of the investment, in the economic/financial robustness of the project, and in its acceptability at the wider level by all stakeholder groups.

References

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