Scaling up Funding for Clean Energy Projects in Developing and Emerging Countries via PPPs: Costs, Benefits, Challenges and Some Cases

Clean energy investments such as geothermal and hydropower projects tend to be large capital intensive and with long repayment periods. These projects can be challenging, especially in developing and emerging countries in transition that are often characterized by a changing and unpredictable political and business environment. Public private partnerships (PPPs) can enable pooling of public, private and donor funds for clean energy investments. A well-designed PPP can be a venue for scaling up funding for clean energy investment internationally. However, little point exists in forming PPPs if, for example, the private sector partner receives most or all the benefits, or if the government keeps changing the rules of the game resulting in a non-viable project. The focus of this article is on PPPs, potential benefits and challenges for host governments and various partners, including the private sector investors, bilateral donors, multilateral institutions such as international financial institutions (IFIs). The objective of this article is to review some theoretical research done on PPP, potential benefits as well as some challenges using this model in developing and emerging countries and finally, present some cases that demonstrate how various partners have cooperated under the PPP model. In addition to reviewing relevant theoretical literature the methodology used in the article is the case study method. The cases also show innovative use of the funding and risk mitigation instruments offered by international financial institutions in partnerships with other market players, such as host governments, private sector, bilateral development institutions, export credit agencies, where sharing the risks and the rewards in a fair and sustainable manner is the key to success.

Keywords: hydro- and geothermal energy projects, public private partnerships, international and national financial institutions.
Introduction

Clean energy investments such as geothermal and hydropower projects tend to be large, capital intensive and with long repayment periods. Construction of such projects is important in developing and emerging countries for environmental reasons and as part of the battle against climate change. Due to their long-term nature, those investments are challenging in economies that are in transition and are often characterized by a changing and unpredictable political situation and unfavourable business environments. PPPs enable pooling of public, private and donor funds for clean energy investment in developing and emerging countries. These countries are eligible for support from international financial institutions, such as the World Bank Group and regional development banks as well as bilateral institutions. A well-designed PPP can be a venue for scaling up funding in those countries.

The objective of the article is to analyse potential benefits and challenges of using PPPs for capital intensive clean energy projects in the developing and emerging countries. This includes host government cooperation with the private sector (domestic and foreign), and can also involve other players such as international and bilateral financial institutions. This article reviews some theoretical research recently done on PPP and at the end presents some cases where the PPP model has been used. Among the sources of evidence used for analysis is secondary data, including analytical reports and scholarly literature. Thus, in addition to reviewing relevant literature, the methodology used in the article is the case study method (for example see Yin, 2009).

What is a Public Private Partnership?

What exactly is a public private partnership (PPP)? Many different definitions are used for PPPs by different individuals and institutions. One definition is “any public sector service provided partially or wholly by the private sector” (Delmon, 2009, p. 601). Another definition is “co-operative institutional arrangements between public and private sector actors” (Hodge & Greve, 2009, p. 33). The World Bank (2008) has defined PPPs as “the transfer to the private sector of investment projects that traditionally have been executed or
financed by the public sector” (p. 93). The Organization for Economic Co-operation and Development (OECD, 2012) has defined PPPs as “long term contractual arrangements between the government and a private partner whereby the latter delivers and funds public services using a capital asset, sharing the associated risks” (p. 18). Notably, OECD and World Bank definitions mention capital investment by the private sector. The other definitions are more general, highlighting service and cooperation.

**Some Benefits from Using Public Private Partnerships**

Why would governments of developing and emerging market economies want to cooperate with the private sector under a PPP arrangement? The answer is: for several reasons. A PPP can be a feasible option for governments because in most developing and many emerging countries the government has limited capacity to mobilize funds. This means that a partnership with the private sector can help the government obtain much-needed long term capital. The private sector may also possess technical knowledge that the public sector does not have and be a more efficient operator of power plants. In this case a PPP can be formed to allow for a sharing of risks and rewards from the project.

PPP can be a favoured model in developing and emerging markets and be beneficial if well designed and if risks and rewards are shared fairly. However, little point exists in forming PPPs if, for example, the private sector partner receives most or all the benefits, or if the government keeps changing the rules of the game resulting in a non-viable project.

With pressure on physical infrastructure and limited resources, governments of developing and emerging countries may want to cooperate with the private sector via a PPP to help finance, build, and/or operate public projects. While doing so, the government could at least in theory: (1) utilize the better skills and better management from the private sector which may lead to increased efficiency for the project in a competitive environment; (2) access private sector funds to undertake more projects than it would be possible with public funds alone – this can contribute to fiscal stabilization, and increase investment and growth; (3) provide more affordable and better services to end-users; and (4) share risks with the private sector (see Leruth, 2009; de Palma, Leruth & Prunier, 2009; Estache, 2005).

Developing and emerging economies on the one hand and high-income economies on the other may have different reasons for participating in PPPs. As Hart (2003) points out, “policy makers frequently argue that PPPs are good because the private sector is a cheaper source of financing or insurance than the public sector” (p. c75). Furthermore, he emphasizes that “this thinking is strange for an economist since it is hard to imagine an agent that is more able to borrow or to provide insurance than the government (with its enormous powers of taxation)” (Hart, 2003, p. c75). Leruth (2009) also argues that “the government is often able to borrow at [an] almost risk-free rate (no credit risk), which gives it an advantage” (p. 230).

These arguments may well be true in countries that enjoy strong creditworthiness (e.g., via AAA or other high credit rating status). The countries discussed in this article, however, are developing and emerging countries. They often have large
unutilized energy resources and strong medium- or long-term demand for energy, but their creditworthiness is limited. Their nationals often have limited ability to pay for the services rendered to them and the government has weak capacity to force them to do so through taxation. Such governments can be risky partners for the private sector in a PPP. In this situation, efficient and effective risk allocation is the key to success, and the international community can play a constructive role, for example, through participation by an international financial institutions (IFIs), which can involve a variety of funding and mitigation instruments.

When discussing finance of green infrastructure, the World Bank (2012) states that “the international community has recognized that the majority of new investment financing will need to come from private sources” (p. 16). The World Bank (2012) is focusing on the developing and emerging markets. This means that some sort of PPPs will need to be formed for a large share of clean energy investment in those markets in transition. This is a major challenge not only for the private sector, but also for the participating developing and emerging countries. Moreover, as the World Bank (2012) has stated, “developing a framework for improved collaboration between public and private sectors could greatly benefit green infrastructure financing mechanisms” (p. 6).

Interest in PPPs is growing among Asian countries, including a notably prominent market in China. The Association of Southeast Asian Nations (ASEAN) for example recently stated that “PPPs are seen to be beneficial in meeting ASEAN infrastructure needs, estimated by the Asian Development Bank at USD 60 billion per annum. Private participation in infrastructure provision can enhance existing public capacity in providing economic (e.g. transport, telecommunication, power, water and sanitation) and social (e.g. health and education) infrastructures” (ASEAN, 2014). Great need is also present in other developing and emerging regions such as Africa and Latin America.

**Challenges in Using Public Private Partnerships**

According to the Public Private Infrastructure Advisory Facility countries using the PPP model need to have: strong institutions, legal systems and rule of law, high standards of public and corporate governance, transparency, competition, protection of investments, enforcement of laws, and dispute resolution mechanisms (World Bank, 2015). This is an impressive list, but some would argue that it is unrealistic even for developed high income countries. If international financial institutions insisted that those criteria should be satisfied before an investment could take place using the PPP model, very few places in the world would receive any private finance. This would especially be a challenge in developing Africa.

Because of this challenge, key international organizations such as ASEAN, the European Union, the International Monetary Fund, the United Nations, and the World Bank have formulated and displayed substantial policy documents on PPPs. A recent paper on PPPs shows that international organizations use roughly the same categories and conceptions of stages for what is needed to establish effective PPPs (Greve, 2015).

Multilateral as well as bilateral financial organizations can, at least in theory,
be a catalyst in supporting PPP projects, including the clean energy sector. Institutions such as the World Bank Group and regional development banks can, via their policy dialogue, assist governments when undertaking reforms needed for effective use of the PPP model. Support from international financial institutions can be important because developing and emerging countries often have limited capacity to negotiate with multinational enterprises. Since the Public Private Infrastructure Advisory Facility is a multi-donor technical assistance facility, financed by 17 multilateral and bilateral donors, it can play an important role here.

But, as mentioned before, using the PPP model and working in partnership with IFIs and bilateral development institutions can also come at a cost. A recent book published by the World Bank, entitled *Public Private Partnerships in Europe and Central Asia – Designing Crisis-Resilient Strategies and Bankable Projects*, comments very cautiously that “working with these institutions may also lengthen the project development process, given specific requirements in terms of environmental and social safeguards requirements and stringent procurement procedures” (Cuttaree & Mandri-Perrott, 2011, p. 59). Another recent book also published by the World Bank entitled: *Doing a dam better: the Lao People’s Democratic Republic and the story of Nam Theun 2 (NT2)*, is more critical when discussing World Bank cooperation with the private sector. The authors simply state that: “The bad news is that the World Bank is seen as a high-cost/high-hassle partner of last resort. There is therefore a critical need to reduce the costs the private sector incurs for doing business with the World Bank. Doing so will require the World Bank to better understand the constraints under which the private sector works” (Porter & Shivakumar, 2010, p. 22). These comments are especially notable given that the authors have both served as World Bank country directors. Shivakumar, for example, played an important role in enabling the Nam Theun 2 hydropower project in Lao.

### Host Government Cooperation with the Private Sector

PPPs are not only a challenge for the private sector. Cooperating with private enterprise can also be a serious challenge for the host governments in developing and emerging market economies, especially during times of economic and financial crisis. In their book, *Making Foreign Investment Safe – Property Rights and National Sovereignty*, Wells and Ahmed (2007) document a dramatic dispute between CalEnergy, an entity founded as a consulting and service company for geothermal power in North America, and the Indonesian government. This dispute resulted in a claim under official political risk insurance filed by CalEnergy and paid by the US government agency, the Overseas Private Investment Corporation. Less dramatic, but still consequential, was the dispute between Enron, then a private power developer, and the Indonesian government, that ended with the Multilateral Investment Guarantee Agency (MIGA), the insurance agency of the World Bank Group, paying out its first claim ever.

As Wells and Ahmed (2007) state; “The Indonesian experience with official political risk insurance has not been the only one that has made developing countries a bit wary. From the point of view of host countries, the new property rights system
was not being very constructive. The moral hazard associated with the insurance surely had encouraged some investors to avoid renegotiation when economic crisis hit Indonesia and other countries. And Indonesians saw themselves as having few rights when CalEnergy filed a claim with [the Overseas Private Investment Corporation] or when [the Overseas Private Investment Corporation] sought reimbursement from Indonesia” (p. 246). Insurance can thus under certain conditions put the host government in a very difficult position vis-à-vis a private sector investor who is insured, in this case with the powerful US agency Overseas Private Investment Corporation. Moreover, Wells and Ahmed (2007) also criticize the public agencies providing guarantees as follows: “Further, and unlike many private insurers, public agencies appear to pay little attention to actual or potential moral hazards. If [the Overseas Private Investment Corporation] would insure only the smaller percentage of the equity, forcing more of the risk onto the investor, one aspect of moral hazard ought to decline. Second, allowing [the Overseas Private Investment Corporation] to seek something less than full reimbursement from host countries would reduce the perception that it faces no loss if it decides to pay claims” (p. 246).

In the case of the Enron dispute in Indonesia, the Multilateral Investment Guarantee Agency paid Enron in the end. MIGA then demanded reimbursement from the government of Indonesia and got it. A good relationship with the World Bank Group, which MIGA is a part of, must also have been considered important for the government of Indonesia because of other projects and programs that could be jeopardized in the event of an unresolved dispute. It is, however, questionable whether the World Bank Group should use its leverage in this way.

While the tensions between the government of Indonesia and MIGA did not run as high as in the case of the Overseas Private Investment Corporation, both were costly for the government of Indonesia in terms of money and international relations. In their concluding chapter, Wells and Ahmed (2007) raise doubts about whether the international system of property rights can accomplish its goal of encouraging foreign investment that is helpful for the host country. Nevertheless, and in spite of the serious problems that a host government can experience, they recognize the need for public private partnerships when they state that “meeting the huge infrastructure needs for development will surely require a mix of private investment, state investment, multilateral lending, hybrid arrangements, and very substantial aid money” (p. 283).

IFIs are well placed to mitigate the risks at competitive prices. As Wells (2005) says, “official insurance can be priced low, since the threat of sanctions by the organizations backing the insurance sharply reduce the chances of the events being insured against occurring” (p. 91).

Regional and global economic crises, such as those that struck Asia in 1997/98, Argentina in 2001, and the whole world in 2008/09, can pose significant threats to the international investment regime. As Salacuse (2010) states, “countries under great stress, faced with potential social and political upheaval as a result of rapidly declining standards of living, often seek radical solutions and are impatient with international investment rules that may restrict their latitude of action. For example, during times of economic crisis, governments may be unwilling to grant
national treatment to foreign investors, to avoid changing regulations in the name of “fair and equitable treatment,” and to refrain from seizing vital national resources held by foreigners simply because they have made treaty promises not to expropriate. Thus Argentina, to cope with one of the most serious economic and financial crises in its history in 2001/02, took a series of measures that foreign investors believed violated their legal rights and economic interests, resulting in the initiation of numerous investor-state arbitration claims” (p. 471). International financial institutions can play an important role in resolving disputes between host governments and foreign investors during economic and financial crises and they should make efforts to facilitate settlements that are fair for all parties involved. It should be the action of last resort to pay out a claim to the private investor and then use the leverage of the IFI to force reimbursement from the host government.

Allocating Risks and Sharing Rewards

In spite of the many potential problems and issues that can be associated with public private cooperation, PPPs can be a feasible platform to fund infrastructure development and to increase the efficiency of public sector service delivery in developing and emerging economies. The PPP becomes a venue for the public and private sectors to cooperate on a project that would traditionally have been in the public domain. Infrastructure projects in the clean energy sector are often large, capital intensive and long term. Repayment periods are also often long. It can take a private investor 10–30 years to recover the investment and project returns. It is often challenging to maintain a good working relationship within a PPP for such a long time, while the local, regional and global environment may change dramatically during this period.

For years, the private sector has been recognized as a significant financing source for meeting developing country investment requirements. However, financial markets remain largely untapped for this purpose and have yet to live up to their potential (Asian Development Bank, 2006). PPPs are one platform worth considering for the private sector to engage in infrastructure projects, including geothermal and hydropower projects. Private capital, bilateral and multilateral donor support, including IFIs, and public funds can be combined in a PPP project. A well-designed policy and institutional framework for PPPs offers the opportunity to leverage and combine all three sources of financing and expertise without crowding out private investment. By forming a PPP both public and private sectors can share the risks and rewards of infrastructure projects.

Private sector funding and participation in clean energy projects is a challenge for various reasons. Among them is that the host government is often the only buyer of the electricity or hot water produced i.e. it is the so-called offtake purchaser. Many developing and emerging countries with large clean energy potential have limited creditworthiness. They have low per capita income and are often going through economic and political transition. Developing and emerging countries can also be vulnerable during regional and global crises. In such cases the sponsors of a project may hesitate to inject funding because of uncertainty with the income stream from the investment. Lenders, including commercial
investment banks, would also often hesitate to provide loans to such projects because of uncertainty whether the project company, whose income stream is at risk, can service its loans. Sponsors may also hesitate to provide equity capital.

To engage in cooperation, the public and private sectors can employ several different schemes including the so-called BOT, i.e. Build-Operate-Transfer (International Monetary Fund, 2004). In BOT projects the private sector is responsible for financing, constructing and operating the project. Under this arrangement the host country grants a concession, i.e. the right for a private firm to undertake a public sector project and operate it over an agreed period of time. When the concession expires the ownership of the project is transferred back to the party granting the concession.

The partners typically involved in a BOT project are: the project company that undertakes the project, the host government (that can also be the offtake/power purchaser and guarantor), the shareholders, the lenders, the grantor, the construction contractor, the operator, the offtake purchaser/power purchaser, and the input supplier. Figure 1 below shows a typical PPP BOT contractual structure.

The project company uses the income stream from the project to service its debt and to pay returns to its investors. The lenders to a BOT project might, for example, be commercial investment banks,
IFIs and bilateral agencies. The IFIs could also serve as guarantors e.g. for payment to the lenders, including commercial investment banks. National institutions such as export credit agencies, which support trade finance (goods and services), can also play a constructive role in reducing the risks taken by private sector investors (see e.g. Dinh & Hilmarsson, 2012a, 2012b, 2012c, 2013).

The lenders would typically be keen to manage their risks and would receive a fixed margin on their loan whereas the shareholders maximize the profits on their equity investment. In addition to obtaining funding for the project, the project company procures the design and coordinates the construction and operation of the project in line with the requirements of the concession agreement. The project company shareholders often include firms with construction and operation experience, and with offtake purchase capabilities (Delmon, 2009).

The offtake purchase agreement secures the project payment stream. The offtake purchaser will be looking for guaranteed long-term output from the project. The credit risk associated with the offtake purchaser will be of particular concern to the project company and the lenders. This is where guarantees from host governments or IFIs, including the World Bank, become important.

Critical to the design of PPPs is the way risks are allocated between the partners in the PPP. In fact, effective risk allocation is the key to success in any PPP. A general principle is that risk should fall on the party that is able to do something about it. Risks in PPPs tend to be allocated on the basis of commercial and negotiating strength. The stronger party will allocate risk that it does not want to bear to the weaker party. Efficient allocation of risk will generally result in a more successful and profitable project and will benefit each of the parties involved (Delmon, 2009).

In order to minimize the market risk from the project company and the project lenders, an offtake purchase agreement, or in the case of a power project, a power purchase agreement, may be made. This is to create a secure payment stream which will be an important basis for financing the project. The offtake purchaser may also be the grantor, or a government entity such as a public utility, in which case the offtake purchase agreement and the concession agreement may be on the same document (Delmon, 2009).

The lenders will want project risks to be allocated to project participants, i.e. the construction contractor and the operator but not the project company, which is their debtor. The project company will enter into a contract with the construction contractor to divest its obligations to the grantor to design, build, test, and commission the project. Completion risk for the project should be allocated to the construction contractor. In the case of a turnkey project, completion and performance risk should fall on the construction contractor.

If the main risks are associated with poor management of the service, shifting the risk to the operator could provide the right incentives to ensure that the project delivers. If risks are related to changes in policies, then the government should bear the risk. This is because the project company will not generally be able to manage political risk. The project company will ask the government to bear those risks, not necessarily to claim compensation at a future date but to pressure the government to avoid such risks and to minimize the probability that such risk events will occur.
Large Scale Hydropower Projects in Africa and Asia

Some cases do indeed demonstrate that international financial institutions, bilateral development financial institutions and export credit agencies can work with host governments and the private sector to mobilize funding for the clean energy projects in difficult business and investment environments, where the private sector would generally hesitate to engage alone, and where local governments alone would also have difficulty in mobilizing sufficient funding for large projects that require long term commitments. Among those cases are two hydropower projects, one in Asia and the other in Africa. One project is Nam Theun 2 (NT2) in Lao PDR and the other is the Bujagali project in Uganda.

Geothermal projects are different from hydropower projects, especially regarding initial development costs, but both have common characteristics in the form of large initial investment commitments with long repayment periods. The projects in Lao and Uganda, both developing countries, are located in challenging environments. The financial solutions for these projects demonstrate how funding and risk mitigation instruments from various multilateral and bilateral institutions can be successfully used to mobilize private sector funding for clean energy projects under challenging circumstances.

The Nam Theun 2 Project in Lao PDR

Lao PDR is one of the poorest countries in South East Asia, with weak human capacity, governance, institutions and physical infrastructure. Nam Theun 2 (NT2) is an example of how the public and private sectors can form a partnership and construct a major infrastructure project in the energy sector in a developing country with limited creditworthiness with support from IFIs and export credit agencies. Estimated project costs were US$1.25 billion at financial close (excluding contingencies), equity 28% (US$350 million) and 72% debt (US$900 million).

The NT2 hydropower project was implemented by the Nam Theun 2 Power Company Limited (NTPC). The shareholders (equity holders) in NTPC were: Électricité de France International (35%), Italian-Thai Development Public Company Limited of Thailand (15%), Electricity Generating Public Company Limited of Thailand (25%) and Lao Holding State Enterprise (25%). Several IFIs provided loans to the Nam Theun2 Power Company and/or guarantees to the private sector lenders: 1) multilateral institutions including the World Bank Group’s IDA and Multilateral Investment Guarantee Agency (MIGA); 2) bilateral agencies; and 3) export credit agencies. Notably, a consortium of 16 commercial banks supported the project.

A shareholders’ agreement signed by Électricité de France International, the Government of Lao PDR, Electricity Generating Public Company Limited of Thailand, and Italian-Thai Development Public Company Limited set out the rights and obligations of the shareholders, provides for the objective, establishment, management, and operation of the project company, i.e. NTPC, and agrees on the Articles of Association of NTPC. The shareholders’ agreement lasts for 45 years from signing (World Bank, 2005). In the concession agreement, the Government of Lao PDR granted NTPC a concession to develop, own, finance, construct, and operate the
hydroelectric plant and related facilities, and to transfer the project to the Government of Lao PDR at the end of the concession period, i.e. after 25 years (World Bank, 2005).

Nam Theun 2 is the largest ever foreign investment in Lao PDR and was the Asia Power Deal of the year 2005. The project has an electric generating capacity of 1070 megawatts, out of which 995 megawatts of the power was for export to Thailand and 75 megawatts for domestic use in Lao PDR. The power purchase agreements are between NTPC and the Electricity Generating Authority of Thailand, and between NTPC and Electricité du Laos.

A Head Construction Contract was signed between NTPC and Électricité de France International (the head contractor). This was a turnkey, price-capped engineering, procurement and construction contract (World Bank, 2005). The subcontractors were Italian-Thai Development Public Company Limited of Thailand, Nishmatsu Contracting Company of Japan, General Electric of the USA and Mitsubishi-Sumitomo Electric of Japan. The head contractor and the subcontractors are all reputable international companies.

IFIIs played an instrumental role in enabling this project. In fact, the international dollar lenders to the project informed the NTPC that without political risk mitigation they would not be able to lend to the project. The Government of Lao PDR requested the World Bank Group to provide risk mitigation to support the international lending package (World Bank, 2005). IFI guarantees were thus the key in lowering the project’s risk profile sufficiently to attract the commercial financing needed.

Political risk guarantees were provided by MIGA (World Bank) and the Asian Development Bank. IDA (World Bank) also provided a partial risk guarantee. The NT2 partial risk guarantee is the first IDA guarantee to support hydropower development and is also the first project to use a mix of IDA, MIGA and Asian Development Bank guarantees. Debt guarantees were provided by IDA, MIGA and the Asian Development Bank supporting about US$126 million of private financing. Direct loans from IFIs were about US$144 million provided to NTPC (World Bank, 2005).

Loans were also provided by the Asian Development Bank, the European Investment Bank, the Nordic Investment Bank, Agence Française de Développement, Proparco and the Export-Import Bank of Thailand. The IDA and Agence Française de Développement also provided grants.

Nine international commercial banks and seven Thai commercial banks helped fund the project. In addition, the NT2 project received export credit agency support from COFACE of France, Exportkreditnamnden of Sweden and its equivalent in Norway, Garanti-instituttet for eksportkreditt.

The Nam Theun 2 project can be viewed as a test case for infrastructure development in the developing world. It is an excellent demonstration of what is possible if the public and private sectors, supported by IFIs, team up and join forces. The use of IFI risk mitigation instruments is particularly interesting as it demonstrates how a modest commitment through such instruments can help mobilize much larger amounts of private funding.

The NT2 project was the world’s largest private sector cross border power project financing, and the largest private sector hydropower project financing. Lessons learned from this landmark project would be a valuable study for all companies that
intend to participate in infrastructure projects in developing and emerging market economies. In 2010 two senior managers from the World Bank published a book with comprehensive discussion about the lessons learned from Nam Theun 2 (see Porter & Shivakumar, 2010).

The Bujagali Project in Uganda

Uganda is a developing country in Sub-Saharan Africa. Its first large scale independent power producer project, Bujagali Hydropower, was planned when the country was suffering from severe prevailing power shortages in the country slowing economic growth and reducing the wellbeing of its citizens. Bujagali is an example of how the public and private sectors can form a partnership and construct a major infrastructure project in the energy sector in a developing country with a challenging business and investment environment and with limited creditworthiness. In this case the project was built with support from international financial institutions and development financial institutions. The total financing requirement for the project was US$798 million, of which US$627 million is financed by debt, and US$171 million is financed by equity. The debt equity ratio is around 78:22 (World Bank, 2007).

The Bujagali 250-megawatt hydropower project was implemented by Bujagali Energy Limited. The Implementation Agreement between the Government of
Uganda/Uganda Electricity Transmission Company Limited sets out the terms on which the Government grants to Bujagali Energy Limited the concession to design, finance, construct, own, operate, and maintain the project (World Bank, 2007). The sponsors of Bujagali Energy Limited are Industrial Promotion Services (Kenya) Limited and SG Bujagali Holdings Ltd, an affiliate of Sithe Global Power, LLC (USA). The sponsors provided US$151 million equity and the Government of Kenya provided US$20 million.

Several IFIs provided loans to Bujagali Energy Limited and/or guarantees to the private sector lenders: multilateral institutions including the World Bank Group's IDA, IFC and MIGA and development finance institutions. Two commercial banks, Standard Chartered and Absa, supported the project.

The project was developed on an independent power producer basis. It is developed, built, owned, and operated by Bujagali Energy Limited. The project sells electricity to Uganda Electricity Transmission Company Limited under a 30-year power purchase agreement (World Bank, 2007).

An engineering, procurement and construction contract was signed between Bujagali Energy Limited and Salini SPA. The proposed project was built pursuant to a fixed price, date certain, turnkey engineering, procurement and construction contract. The engineering, procurement and construction contractor, Salini SPA (Italy) (with Alstom Power Hydraulique (France) as a key subcontractor) was selected pursuant to a competitive engineering, procurement and construction contract selection process in accordance with European Investment Bank procurement rules (World Bank, 2007).

IFIs played an instrumental role in enabling this project. After unsuccessful attempts to develop the project in the late 90s, the Government of Uganda initiated a new bidding process, with the support of the World Bank, seeking a new project sponsor to develop the Bujagali project (World Bank, 2007). The IDA guarantee reduced the perceived risk in the project to such an extent as to allow commercial debt to be mobilized.

The debt facility consisted of a commercial loan of US$115 million, from the Standard Chartered and Absa banks, covered by a World Bank partial risk guarantee. The rest of the financing came from other multilateral institutions, such as International Finance Corporation, which committed US$130 million in loans, the European Investment Bank lent US$140 million and the African Development Bank US$110 million. European development finance institutions financing consists of French development agency Proparco, with a US$73 million loan, Deutsche Investitions und Entwicklungsgesellschaft mbH/KfW of Germany with US$45 million, and Dutch financier FMO with US$73 million (World Bank, 2007). The Multilateral Investment Guarantee Agency (MIGA) provided an equity investment guarantee of up to US$115 million for a 20-year period.

The Bajagali project is one of the largest project financed by private sector in Sub-Saharan Africa so far and the first of its kind in Uganda. It was awarded the The Africa Power Deal of the Year 2007 by Euromoney Project Finance Magazine.

Along with the Nam Theun 2 project, also discussed in this article, it demonstrates what is possible if the government, the private sector and the international community use available multilateral and
bilateral institutions to mobilize funding for clean energy in developing countries. The IDA guarantee reduces the risk faced by the commercial lenders. MIGA reduces the risk for the private equity providers. A loan from the International Finance Corporation further reduces the risk profile for this project. The other IFIs, the African Development Bank and the European Investment Bank and the development finance institutions also play a key role to make this project bankable.

**Conclusions**

Clean energy investments such as geothermal and hydropower projects tend to be large, capital intensive and with long repayment periods. Projects with such a long duration are challenging, especially in developing and emerging market economies that are in transition and typically characterized by a changing and unpredictable political and business environment. PPPs enable pooling of public, private and donor funds for clean energy investment in developing and emerging market economies and those countries are eligible for support from international financial institutions such as the World Bank and regional development banks as well as form bilateral financial institutions. A well-designed PPP can be a venue for scaling up funding for clean energy internationally. However, little point exists in forming PPPs if, for example, the private sector partner receives most or all of the benefits, or if the government keeps changing the rules of the game resulting in a non-viable project.

*Fig. 3. Bujagali hydropower project in Uganda: contractual structure*

*Source: World Bank (2007); constructed by the author.*
Sharing the risks and the rewards in a fair and sustainable manner is important for the success of a PPP. Partners of PPPs can be vulnerable, including private partners as well as host governments. During the long duration of geothermal and hydropower projects economic and financial crisis can hit. Those risks should be factored into the project. This can result in demands for higher returns for private sector participants. Crises in East Asia as well as in Latin America can teach valuable lessons to the private and public sectors, as well as to bilateral and multilateral providers of loans, equity and guarantees.

Reducing the risk of failure through efficient project company operations as well as good government policies is important for all parties involved. Shifting the risk to a weaker party is, however, questionable; e.g. if an insured private sector participant files a claim against the host government of a developing country without trying to resolve issues and then an insurer, such as an international financial institution (IFIs) or a national institution, files a reclaim against the host government without making credible efforts to resolve the dispute. IFIs and national institutions should avoid using their leverage vis-à-vis host government this way.

PPPs place a strong demand on host government capacity to communicate and negotiate both with private participants and IFIs when these are involved. Low government capacity is an obstacle when using the PPP framework, but one must keep in mind that a weak government is also less likely to be able to run a project with full public ownership efficiently. When disputes occur between the private sector and host governments IFIs can, and should, play a role in resolving disputes and help ensure the fair sharing of the risks and the rewards of the PPP for all the parties involved.

The article discussed two cases of clean energy investment in Lao and Uganda. These cases represent an effort to build new infrastructure to generate electric power without carbon dioxide emissions and is thus part of the global battle against climate change, for a cleaner and healthier environment. These project cases are important because they demonstrate how clean energy projects have been structured in two different countries and continents, under challenging circumstances. The cases also show innovative use of the funding and risk mitigation instruments offered by international financial institutions in partnerships with other players, such as host governments, private sector, bilateral development institutions, export credit agencies, etc.
The Public Private Infrastructure Advisory Facility was created in 1999 to act as a catalyst to increase private sector participation in emerging markets. It provides technical assistance to governments to support creation of a sound enabling environment for the provision of basic infrastructure services by the private sector. According to the Public-Private Infrastructure Advisory Facility a sound business-enabling environment consists of strong institutions, legal systems and rule of law, high standards of public and corporate governance, transparency, competition, protection of investments, enforcement of laws, and dispute resolution mechanisms. The Public-Private Infrastructure Advisory Facility is a multi-donor technical assistance facility, financed by 17 multilateral and bilateral donors: the Asian Development Bank, Australia, Austria, Canada, the European Bank for Reconstruction and Development, France, Germany, the International Finance Corporation, Italy, Japan, the Millennium Challenge Corporation, the Netherlands, Sweden, Switzerland, the United Kingdom, the United States, and the World Bank. Public-Private Infrastructure Advisory Facility funds are untied, and grants are provided on a demand-driven basis, see further: http://www.ppiaf.org/node/23#What%20is%20PPIAF?

An offtake purchaser is a purchaser of the product produced by a project. In the case of a power project the product produced is the electricity generated.

A sponsor of a project is a party wishing to develop or undertake a project. A sponsor would normally provide financial support for the project, e.g. early equity capital.

PPP schemes and modalities other than Build-Operate-Transfer (BOT) include for example: Build-Own-Operate-Transfer (BOOT), Build-Rent-Operate-Transfer (BROT), Build-Lease-Operate-Transfer (BLOT), Build-Transfer-Operate (BTO).

A concession is the right granted by the host government for a private company to undertake a public sector project and operate it over an agreed period.

For a comprehensive discussion on BOTs see Delmon (2009) outstanding book Private Sector Investment in Infrastructure.

i.e. equity contributors to the project company.

i.e. they would only take measurable and measured risks.

i.e. equity holders in the project company.

The international commercial banks were: ANZ Bank, BNP Paribas, Bank of Tokyo Mitsubishi, Calyon, Fortis Bank, ING, KBC, SG and Standard Chartered. The Thai commercial banks were: Bangkok Bank, Bank of Ayudhya, KASIKORN-BANK, Krung Thai Bank, Siam City Bank, Siam Commercial Bank and Thai Military Bank.

References


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Švarios energijos investicijoms, pavyzdžiui, geoterminiams ir hidroenergijos projektams, būdingos didelės kapitalo investicijos, kurių grąžinimo laikotarpiai yra ilgūs. Šie projektai gali būti sudėtingi, ypač besivystančiose ir pereinamojo laikotarpio besiformuojančiose šalyse. Viešojo ir privataus sektoriaus partnerystė galėtų padėti suteikti viešųjų, privačių ir finansavimo fondų lėšas švarios energijos investicijoms. Tinkamai suorganizuota viešųjų ir privataus sektoriaus partnerystė galėtų panaudoti švariai energijai finansuoti tarptautiniu mastu.

Šiame straipsnyje pagrindinis dėmesys skiriamas viešojo ir privataus sektoriaus partnerystėms, priimančių šalių vyriausybių ir įvairių partnerių, įskaitant privataus sektoriaus investorius, dvišalius investuotojus, daugiašalius partnerystės modelį, ir galiausiai pateikti keli atvejai pagal privataus ir viešojo sektoriaus partnerystės modelį.

Rizikų ir atlygio dalijimasis sąžiningu ir tvariu būdu yra svarbus siekiant užtikrinti sėkmingą viešojo ir privataus sektorių partnerystę. Privataus ir viešojo sektoriaus partnerystės vaidmuo yra svarbus įvairių projektų vykdomoje aplinkoje, nes galiausiai tai leidžia siekti švarios energijos energijos projektams pasiekti sėkmingą atlygio dalijimą. Šis procesas gali būti sudėtingas ir reikalauja gera planavimo ir valdymo. Tai yra svarbu, nes šis procesas gali turėti didelę įtaką šalis visoje pasaulio energetikos srityje.

Be to, straipsnyje nagrinėjama aktuali teorinė literatūra ir taikomas atvejo analizės metodas. Tai iliustruoja pastangas sukurti naują infrastruktūrą, generuojant elektros energiją be anglies dioksido emisijos, todėl tai yra pastangos susiformuoti energijos projektams besiformuojančiose šalyse. Šie projektai yra svarbūs, nes jiems būtina pasiruošti atsiimti didelį atlygio dalijimą.

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