



Public-Private Partnerships: a focus on Energy Infrastructures and Green Investments

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Abstract

The potential of Private Public Partnerships (PPPs) for accessing finance and reducing capital expenditure (capex costs) of energy infrastructure projects becomes more and more important in a time of shrinking financial resources, which have widened the gap between public and private funding. Economic recession has limited national budget spending and the lending capacities of commercial banks for the realization of infrastructure projects in the field of energy generation, transmission and distribution. These, as capital intensive projects, require high up-front investment and long-term commitment with variable returns into the future. The private and public sectors can reach a mutually beneficial agreement through a PPP: the private sector needs guarantees to face risks entailed in the time gap between the project's planning phase and its actual implementation, whereas the public sector needs capital investment and management expertise. The IEA foresees \$260 billion of investments in new transmission and distribution lines through 2035. With approximately \$71 trillion in managed assets, institutional investors such as insurance companies or pension funds are a promising source of funding.

Introduction

The 2008 financial crisis significantly restrained the capacity of banks to lend financial resources in terms of volume, cost, and duration across many sectors, including the power sector, a situation which caused many renewable energy projects to be postponed until market conditions improved. The subsequent economic crisis also endured a series of consequences on the energy market, ranging from lower commodity prices to reduced demand forecasts. Nevertheless, renewable energy has maintained its attractiveness for banks and equity investors, and new funds have been raised throughout the whole crisis period. While in late 2008 and early 2009 investments in renewable generation fell much lower than those for other types of generating capacity¹, and global investment in renewable energy fell 3% during 2009, it rebounded strongly in 2010 and 2011, when it reached \$260-290 billion². Interestingly, in the developed countries, where the financial crisis hit hardest, investment generally dropped 14%, while renewable energy investment continued to grow in developing countries.³ In 2012, 25,954 MW of renewable energy projects with private participation reached financial closure in developing countries, with total project costs of \$46,390 million.⁴ In this economic and financial framework, Public-Private Partnership (PPP) becomes the most valuable instrument for green energy projects financing capable of overcoming the shrinkage of available financial resources. Cooperation between private and public actors is pivotal in an investment decision, since they compensate each other to their mutual advantage: the private sector needs guarantees to face the risks entailed in the time gap between a project's planning phase and its actual implementation, and the public sector needs capital investment and management expertise. Debt and equity are the two major sources for investments in renewable energy projects and a well-structured combination of these two is the key to a healthy investment climate. This is true especially with regard to the financing of energy infrastructure projects, where challenges for access to capital can be greater, given the large investment requirements. This reflection attempts to answer the following research questions: which financial instruments are best for tackling the credit crunch and fostering the development of energy infrastructure? Would equity come from infrastructure funds or institutional investors, such as pension funds?

¹ IEA (2009)

² REN21 (2013)

³ UNEP (2012)

⁴ <http://ppi-re.worldbank.org/Snapshots/Global>

Public-Private Partnership: a definition and its main characteristics

Although there is no broad international consensus about what constitutes a Public-Private Partnership (PPP), this can be defined as an organizational form that originated from the rapprochement between governments and private enterprises. It involves contractual arrangements to for designing, financing, producing or operating public projects⁵. Although these organizational forms vary with national governance systems, PPPs present common features that allow them to be defined as follows: *any long-term association between distinct legal and administrative entities in the public and private sector for the pursuit of ends they would not be able to attain efficiently, effectively, economically, or equitably on an individual basis.*⁶ The World Bank has provided a similar definition: **a long-term contract between a private party and a government agency, for providing a public asset or service, in which the private party bears significant risk and management responsibility.**⁷

This definition encompasses a PPP that provides new assets and services (greenfield), and one that is structured for existing assets and services (brownfield). It can include a PPP in which the private party is paid entirely by service users, and one in which a government agency makes some or all of the payments. The definition encompasses contracts in many sectors and for many services, provided that there is a public interest in the provision of the service, and that significant risk and management responsibility have been transferred to a private party. The distinctive characteristic of a PPP is that it builds on a **long-term relationship** and an extensive series of agreements between the public and private sector with the aim of realizing a **project of public interest**. Thus, public services provided entirely by the public sector, or passed on to the private sector through full divestiture (privatization), cannot be considered a PPP.

Public-Private Partnerships can take a wide range of forms varying in the degree of involvement of the private entity in a traditionally public infrastructure. A PPP generally takes shape as a contract or agreement outlining the responsibilities of each party and clearly allocating risk. If risk is the main driver of supply and demand for finance, **risk sharing** is the fundamental characteristic of a PPP agreement because it facilitates the commitment of the public actors and at the same time the attractiveness of investment by the private actors. **Risk sharing is even more important in green investments, which are typically characterized by higher risk perception** because of the relative immaturity of technologies, markets, and industries, and uncertainty about public policy. Therefore, *policy risks* and *technology risks* add to already existing *financing* and *liquidity risks* (luck of funding and the variation of the cost of capital). On top of that there is also a *country risk*, especially in the case of developing countries, where the perception of risk is higher than in developed countries and financing risks are higher because of immature financial institutions and markets.

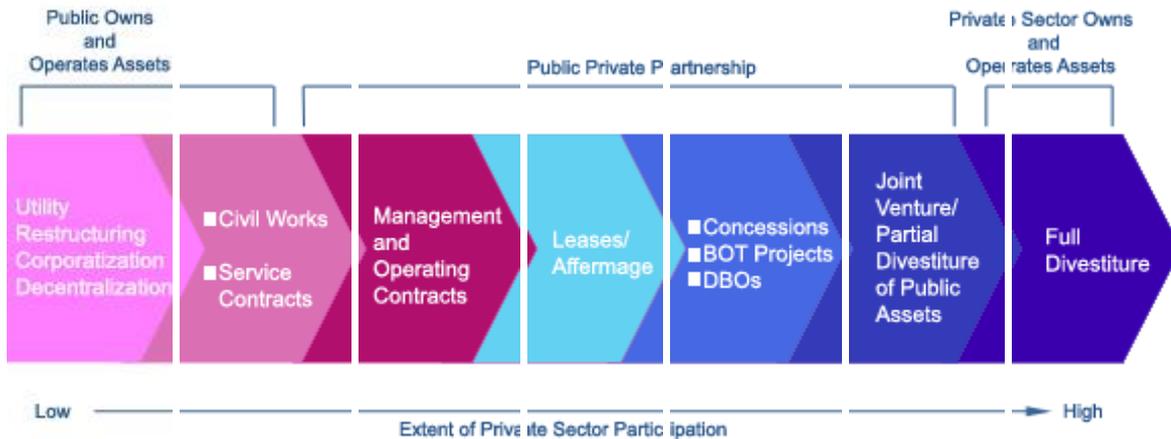
The graph below (Fig. 1) depicts the spectrum of PPP agreements and the entire range of **ownership structure**, which is a very important factor that needs to be clearly determined in advance of a PPP agreement.

⁵ Mazouz, B. (2009)

⁶ Mazouz, B., J. Facal and J. M. Viola (2008)

⁷ World Bank (2012)

Figure 1. PPP agreements and ownership structure⁸



When discussing brownfield and greenfield investments, the crucial issue is the balance between the pre-existing shareholders' interests and the need to make new investments and attract new investors. Another important factor is **effective regulation** whose stability and straightforwardness are essential for the well-being of PPP agreements. In the energy sector, Italy, for example, has been able for a certain period of time to attract foreign investments to invest in Italian utilities, especially in renewable energy projects. Last but not least, the issue of the **quality of the project**, which needs to be useful for the whole community and to have a long-run long-term strategy and horizon. Because of the higher political instability in developing countries, investors are particularly reluctant to invest in projects with such a long investment horizon. Indeed, financing low carbon infrastructure in economies lacking a good track record in low carbon technologies requires long-term financing and faces significant risks.

Benefits and challenges of Public-Private Partnerships

A growing number of governments are using Private Public Partnerships as a way to supplement limited public sector funding, in order to meet the growing demand for infrastructure development. While a lot of attention has been focused on fiscal leveraging of projects, governments look to the private sector to help them deliver infrastructure for a number of other reasons (Fig. 2):

1. Exploring PPPs as a way of **introducing private sector technology and innovation** in order to provide better public services through improved operational efficiency.
2. Using PPPs as a way of gradually exposing governments and state-owned enterprises to **increasing levels of private sector participation** (especially from foreign direct investments - FDI) and structuring PPPs in a way **to ensure transfer of skills**.
3. Extracting **long-term value-for-money** through appropriate **risk transfer to the private sector** over the life of a project, from its design and construction to its operations and maintenance.

⁸ <http://ppp.worldbank.org/public-private-partnership/agreements>

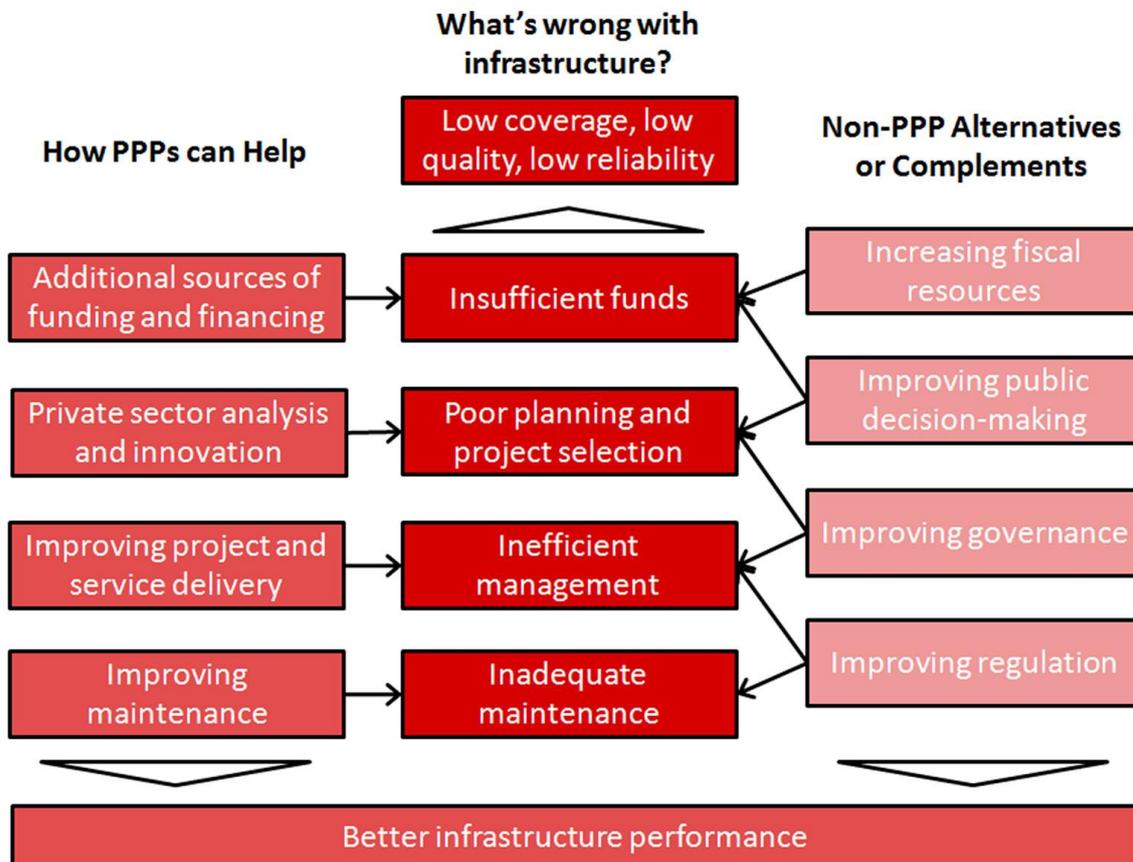
4. Imposing **budgetary certainty** by setting present and the future costs of infrastructure projects over time, and incentivizing the private sector to **deliver projects on time and within budgets**.
5. Utilizing PPPs as a way of **developing local private sector capabilities** through joint ownership with large international firms.
6. Creating diversification in the economy by **making the country more competitive** through facilitating its infrastructure base as well as **boosting its business and industry associated with infrastructure development**.

On the other hand, there are a number of potential **challenges** associated with Public Private Partnerships (Fig. 2):

1. A **clear and stable legal and regulatory framework** is pivotal for enabling private investors to enter into PPPs, and setting the rules and boundaries for how PPPs are to be implemented.
2. Private sector financing will only be available where the operating cash flows of the project company are expected to provide a **Return on Investment (ROI)**.
3. Contracting and financing costs of PPP projects are likely to be greater than for traditional government procurement models - the government should therefore determine whether the greater costs involved are justified. A number of PPP and implementation units around the world have developed methods for analysing these costs and looking at **value-for-money** (e.g., UK Treasury)⁹.

⁹ World Bank (2013)

Figure 2. Public-Private Partnerships for a better infrastructure performance



Private-Public Partnerships for green investments

Risk and return are crucial factors in any investment decision, including green growth investments. **The higher the perceived risk, the higher the internal rate of return (IRR) will be.** The risk-return profile which is acceptable for an investor or lender depends on the type of capital. Public sector funds flow through government budgets and development banks while private sector funds originate from private and public finance institutions, institutional investors, capital markets, and corporate cash flow. Debt financiers, like banks, have an interest in ensuring that their loans are paid back and hence provide funds to less risky, proven technologies and established companies. On the opposite side, early venture capitalists typically invest in new companies and technologies, and are therefore willing to take higher risks while expecting much higher returns. Venture capitalists may require an IRR of 50% (Table 1) or higher because of the high chances that individual projects will fail. Private equity companies that invest in more established companies and technologies may still require an IRR of about 35% (Table 1). However, other factors are figured into the IRR calculation, such as the perceived risks of the investment category, which vary significantly from project to project, technology to technology, industry to industry, and country to country.

Many energy projects, especially in developing countries where additional risk margins are added, are struggling to achieve high returns that satisfy the expectations of financiers of equity and debt. For renewable energy projects, higher costs of capital will increase start-up costs, which are generally front loaded. Lenders require a higher equity share if a project is perceived as risky. A typical project finance structure in an industrialised country consists of 10-30% equity, whereas in developing countries this share tends to be higher. However, equity tends to be scarce in many developing countries.

One of the most relevant outcomes of the financial crisis was that **banks were reluctant to lend money for more than 6 or 7 years**, a situation which forced projects requiring longer-term loans, such as those in the energy sector, to run the risk of what financial conditions will be like at that point in the future. It is estimated that in 2009 debt financiers (both bank senior debt and bank mezzanine debt) required an average IRR of around 300-700 basis points above the LIBOR (London Interbank Offered Rate) for RE projects in industrialised countries (Table 1). On the other hand, **private equity** generally expects to make their return and exit the investment in a **3 to 5 year timeframe**, whereas **venture capital funds** have an investment horizon of around **4 to 7 years**. In this framework, **institutional investors** such as **pension funds** look like those best-suited for renewable energy investment thanks to their **longer time investment horizon** and **larger amounts of money to invest**, with **lower expectation of returns (IRR)**.

Moreover, other important factors determining the IRR are the availability of alternative investment opportunities, and prevailing basis interest rates (i.e. the current LIBOR rate).

Table 1. Sources of capital, typical deployment and IRR for renewable energies¹⁰

Source of capital						
	Venture capital	Private equity	Infrastructure funds	Pension funds	Bank mezzanine debt	Bank senior debt
Deployment	Equity investments in start ups New technology Prototypes	Equity investments prior to initial public offering Demonstrator technologies	Equity investments in private companies Proven technology	Equity investments in private companies and projects Proven technology	Loans for emerging technology New and poorly capitalised companies and projects	Loans for Proven technology Established and well capitalised companies and projects
IRR	>50 %	35%	15%	15%	LIBOR + 700 bps	LIBOR + 300 bps

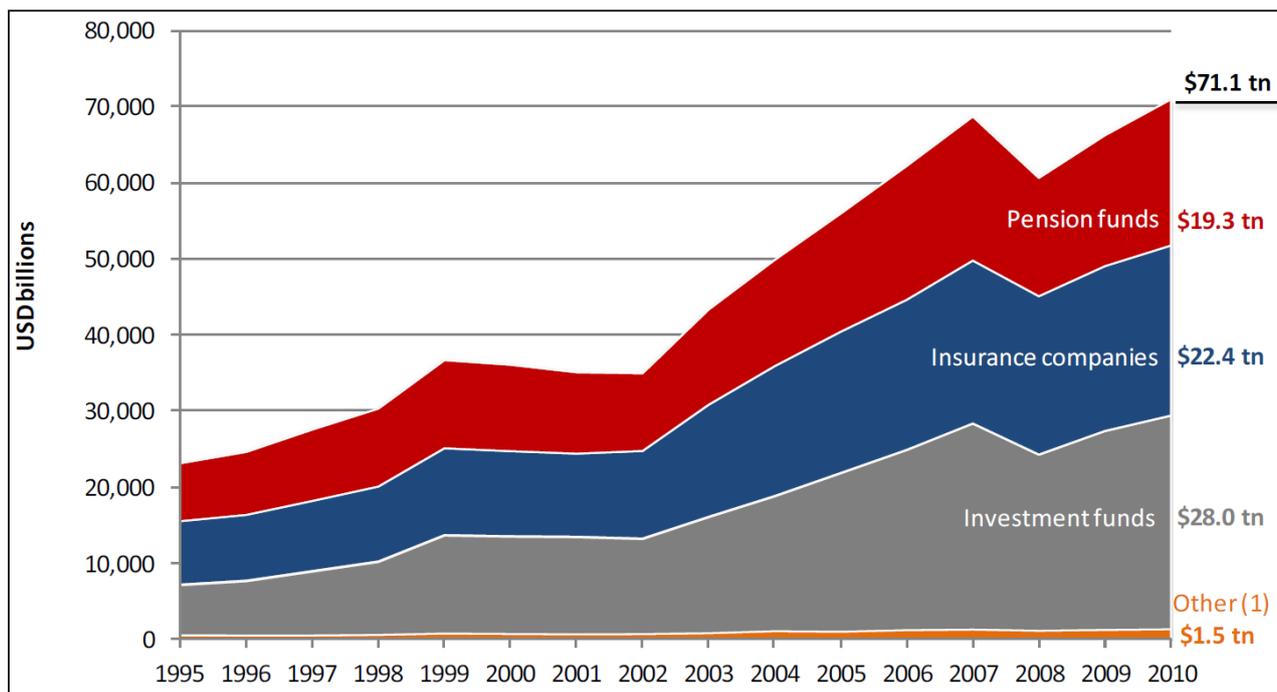
In response to the financial crisis, stimulus packages focused on getting credit flowing again, although the impact on banks and equity actors took long time to recover. A redefinition of the role of public financing and of relevant issues in the operation of financial markets and institutions characterized the post financial crisis period. G20 governments implemented economic stimulus packages amounting to \$2.6 trillion dollars.

¹⁰ Justice S. (2009)

Of that amount, \$180 to 242 billion were allocated to low-carbon funding.¹¹ **The stimulus spending supported the rapid recovery of renewable energy investment by compensating for reduced financing from banks.** Some countries facing large public sector deficits scaled down green spending when the economy started recovering¹². Other governments responded to this challenge by introducing specific measures to support PPP through the crisis, e.g. in the United Kingdom, the Treasury established an Infrastructure Finance Unit (TIFU).

Often, the lack of debt available in the market meant difficulty for private investors to complete projects where debt was required to complement the available equity, or to spur equity returns to an acceptable IRR. On the other hand, **pension funds have long-term horizon investments diversified across asset classes with varying risk return profiles and investment duration, sectors and geographies.** Although they may have a cap set on the amount of renewable energy as a proportion of the allocation within wider infrastructure funds, at least they have a large amount of money to invest. According to the OECD, **institutional investors have an important role to play in financing green growth projects with \$ 71 trillion in assets** (Fig. 3).¹³

Figure 3. Share and total assets by type of institutional Investors in OECD (1995-2010)¹⁴



Nevertheless, despite the evident advantages of these instruments, **institutional investors' direct asset allocations to green investments remain low.** This could be due to lack of environmental policy support, lack of appropriate investment vehicles and market liquidity, regulatory disincentives, lack of knowledge and expertise among pension funds,

¹¹ IEA (2009)

¹² Eyraud et al., (2011)

¹³ Inderst G., C. Kaminker, and F. Stewart (2012)

¹⁴ OECD Global Pension Statistics and Institutional Investor databases and OECD estimates

and scale issues.¹⁵ Pension funds usually require a sizeable investment, of around \$250 million or more equity investment, with debt taken on to support the investment.

In this context, where debt financing is scarce and private investment alone is not self-sustainable, it is evident how **a combination of debt and equity financing through a Public-Private Partnership long-term agreement can be the key driver to investment in energy infrastructures and green growth.**

Conclusions

"The power infrastructure has a crucial role to play in ensuring sustainable development and optimal utilization of a country's natural resources. We need to develop and disseminate an entirely new paradigm and practice of collaboration that supersedes the traditional mechanisms and replace it with **public-private-people partnership model** to make the electricity sector more viable to provide universal access to all".¹⁶

The current economic climate has posed a serious challenge to huge investment needs in energy infrastructure development. **A new financial paradigm based on innovative approaches to fund raising that can improve bankability and enhance value for investors and governments needs to be implemented.**

Delivering energy to the world's seven billion people requires the public and private sectors to better align their understanding of the implied challenges and the strategic balance of the opposing objectives of energy security, energy equity and environmental protection. **The public sector has a major role in establishing an enabling environment for green technologies, especially in reducing political and policy uncertainty.** The pivotal role of straightforward national policy and regulation, its stability, and the importance of being embedded in a wider energy policy, are conditions for scaling investment in renewable energy. The need for smart grids' infrastructure for delivering renewable energy is a key part of the overall energy system. **Optimising transmission infrastructure to support the integration of renewable energy sources should not be perceived as a cost but as a significant economic opportunity.** In Europe, a roughly \$1.5 billion annualized investment in transmission expansion could lead to electricity savings of roughly \$11 billion annually by 2030¹⁷. This is just a small share if compared to IEA forecasts of \$260 billion of investments in new transmission and distribution lines up to 2035, but it gives a clear measure of the potential economic benefits to be derived from energy infrastructure development in the power sector.¹⁸

A well-designed Private Public Partnership structure which reaps private sector advantages in terms of innovation and knowledge transfer, efficient management and mobilization of funds is a key factor in energy infrastructure investments and should play a central role in government strategies for achieving universal energy access goals and reliable power in order to foster economic development.

¹⁵ Della Croce, R. D., C. Kaminker and F. Stewart (2011)

¹⁶ Christoph Frei, Secretary General, World Energy Council

¹⁷ The Global Green Growth Forum (3GF) (2012)

¹⁸ IEA (2013)

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